attachments

Attachment 1

Objectives and Criteria GAP Analysis

Objectives and Criteria GAP Analysis

This assessment was undertaken concurrently with the White Rock Quarry MOP Review document, in accordance with Regulation 82 (r. 82 (a – d)) of the Mining Regulations. The assessment includes a summary of:

a) Assessment of the achievement existing approved MOP objectives when measured against the criteria.

b) Indication of the extent to which the objectives have not been met (where applicable).

c) Analysis of whether the existing approved objectives are still appropriate and will continue to be appropriate.

d) Details of the proposed alterations to the objectives and criteria (if any).

Regulation 82 (e) is fulfilled separate to this assessment, with analysis of potential impacts that may occur as a result of the proposed alterations to operations undertaken in the risk assessment contained in the proposed revised MOP Review document.

Pursuant to Section 73G (4) of the Act, when a MOP Review is undertaken, the set of objectives and criteria contained within the MOP must be re-submitted for approval (whether any changes to the previously approved set of objectives and criteria are proposed or not).

The review has been undertaken to include consideration of objective and criteria for both the operational phases of quarry life and mine closure.

Table 1 – Objectives and Criteria GAP Analysis

Information Extracted from the Existing MOP					**Section 82 of the Mining Regulations - MOP Review requirements**			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
Soil and Water Erosion	**Operational**	Erosion effects of mining on the adjacent land will be minimised.	A program to avoid initiating erosion, minimise impact to soil and soil contamination will be	Periodical monitoring and evaluation of the program will be undertaken Hanson staff to observe and	The existing MOP objective has been achieved to the extent	Erosion and drainage control are monitored in the monthly rainfall and environmental	The reference to adjacent land is ambiguous and the measurement criteria may be	The PM holder must during the construction and operation ensure no adverse impact on surface water quality within the

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			maintained. Cleared areas will be grassed on completion of clearing, or finishing of overburden placement.	report on Landcare report.	reasonable and practicable.	report. The Landcare report is filled in on a daily basis and includes section regarding erosion and drainage control (observations of rain, storm event, erosion locations, actions undertaken etc.).	hard to quantify. Suggest reviewing / consolidating this Objective and Measurement Criteria with consideration of recent data and design / implementation of surface water management infrastructure , EPA Licence and concurrent with Topsoil and Surface Water Management Criteria.	Horsnell Gully Creek as a result of contamination and sedimentation from quarry operations. The PM Holder must, during construction and operation ensure that reasonable and practicable measures are adopted to prevent contamination by wastes, hydrocarbons and chemicals entering the stormwater system.
	Site Closure	nil	nil	nil	NA	N/A	N/A	No adverse impact on surface water quality within the Horsnell Gully Creek as a result of contamination and

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								sedimentation post closure.
Noise	**Operational**	Noise levels from the operation will be kept within EPA Standards or as otherwise approved by the Director of Mines.	Crushing is avoided at night to achieve noise criteria for neighbours. The Concrete Plant does operate 24 hrs but drivers are instructed to avoid the use of engine brakes, banging tailgates and reverse beepers are modified to reduce noise impact. Implementation of OH & S requirements has resulted in the replacement of old noisy mobile equipment; noise suppression has been incorporated in recent equipment purchases. Modifications to fixed plant have included	Periodical monitoring and evaluation of the program will be undertaken by Hanson personnel. Keep a record of any complaints and action taken to rectify the problem.	Based upon review of the available data, the Existing MOP Objective has been achieved.	Periodical noise monitoring has been undertaken by an external party to inform operations and achieve compliance with EPA standards. Engineering controls are used in HME to mitigate potential impacts. Control and mitigation strategies are recorded in the monthly Site inspection, pre-start inspection, SAP maintenance database and procurement purchasing policy.	The existing approved Objective is considered to be broadly appropriate, however the wording could be improved to make the Objective and Measurement Criteria clearer. It is recommended that the Objective wording is revised to reflect the potential impact (i.e. public nuisance impacts as a result of noise emissions from the Site). It	No public nuisance impacts from noise emanating from the quarry operations.

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			the use of rubber and polyurethane screen cloths and the construction and modification of the primary operator's control cabin and reconstruction of the primary crusher-receiving hopper. All of these modifications have meant a reduction in noise emitted from the fixed plant. All quarry mobile equipment and road transport trucks have been fitted with adequate silencing equipment. Blast in favourable weather conditions.			Noise monitoring undertaken to measure compliance with the SA Environment Protection (Noise) Policy requirements on 28 January 2011, confirmed compliance with the day time criteria at a sensitive receptor location to the south west of the Site (representative location adjacent to Coach Road / Whitbread Grove). Further noise monitoring was undertaken on 7	is recommended that the *Environment Protection (Noise) Policy 2007* noise criteria applicable to the surrounding sensitive receivers be specified in the proposed Measurement Criteria in order to remove any ambiguity.	

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						April 2020 at a number of sensitive receptor locations, as part of the MOP review process. Compliance was demonstrated to have been achieved, with two (2) exceedances of the Indicative Noise Level of 52 dB(A) being attributed to local traffic on public roads. Hanson keep a detailed complaints register and summary of actions taken for all complaints made by interested stakeholders,		

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						including those regarding noise emissions emanating from the Site.		
	Site Closure	nil	nil	nil	NA	NA	NA	NA
Dust	**Operational**	Dust concentration will be kept within Australian dust guidelines.	Dust suppression sprays are fitted to conveyor transfer points in the fixed plant. In the summer months, dust sprays are used before plant is started to minimise dust before crushing commences. A 20,000-litre water truck waters all the quarry haul roads as required prior to the mobile equipment starting This greatly reduces dust when crushing commences. Plan to strip topsoil	Visually check the site to determine dust levels of pit and haul roads. Record of levels of dust monitored and recorded at selected sites in accordance with the dust monitoring program and AS 2724.3-1987 for TSP (total suspended particles)	The Existing MOP objective is not clearly defined. Recent monitoring of dust deposition (Total Insoluble Matter) demonstrated compliance with a nominated performance target of 4 g / m2 / month when monitored in	Daily visual inspections, use of water for suppression purposes when required, records in pre-start meetings and dust deposition monitoring undertaken monitored since December 2019. Hanson have advised that all results comply with the nominated performance target of 4 g/ m2/ month.	The current Objective and Measurement Criteria is very ambiguous. Currently, the Site monitors deposited dust (AS3580.10.) as opposed to TSP (AS2724.3-1987), which is referenced in the existing Measurement Criteria. Amend Measurement Criteria to reflect a Total Insoluble	**Proposed Objective:** No public health and/or nuisance impacts from dust generated by quarrying operations. **Proposed Measurement Criteria:** Air Quality monitoring is to occur at locations as outlined within the DMP as agreed with the Regulator to demonstrate that dust deposition conforms with the following,

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			and overburden in favourable weather conditions. last in favourable weather conditions. A dust management program will be developed & maintained to: Determine dust mitigation , monitoring requirements and dust control program. Maintain complaints register with complaints addressed within a reasonable.		accordance with AS3580.10.		Matter performance target of 4 g / m2/ month when / if monitoring is required. Due to the proximity of the Site to adjacent sensitive receivers the Objective and Measurement Criteria is required to be amended to reflect potential health and nuisance impacts upon sensitive receivers. Specifically, Measurement Criteria is required to be	- dust deposition of 4g/m2/month, when monitored in accordance with Australian Standard AS 3580.10.1 *Methods for sampling and analysis of ambient air – Determination of particulates – Deposited matter – and or – an aerodynamic diameter of less than 10 µm (PM10) suspended in the atmosphere of* 50 µg/m³ *over*

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							updated to reflect the deposited dust monitoring methods and associated Australian Standards.	*a 24-hour averaging time (Air NEPM levels)*
	Site Closure	nil	nil	nil	NA	NA	The existing approved MOP does not contain any risk assessment with respect to air quality post quarry closure. Due to the scale and extent of the extraction footprint and associated progressive rehabilitation, the long term achievement of air quality outcomes for the	No public nuisance and / or health impacts from dust generated on the land, post quarrying operations.

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							Site is dependent upon the successful delivery of the rehabilitation strategies. It is recommended that an applicable Objective and Measurement Criteria be established to enable the achievement of successful long term air quality outcomes to be demonstrated.	
Traffic	**Operational**	To ensure traffic to and from the site causes minimal disturbance to normal road traffic.	Access to the site has been established for many years. The intersection with Old Norton Summit Road has stop sign and	Visual by Hanson Personnel and completion of complaint resolution.	The existing approved MOP objective has been achieved.	Review of the complaints register (dating back to 2008) indicates that there has been one (1) complaint	The current Objective wording is ambiguous and difficult to measure and demonstrate	No traffic accidents involving the public at the quarry access point that could have been reasonably prevented by the operator.

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			good visibility. Trucks to observe speed signs. Loads for quarry trucks to be covered to prevent spillage. Shoulders of roads to be maintained to prevent ripples in the shoulder. Keep complaints register and act on complaints.			made to Hanson in relation to this component (vehicles leaving the Site) on 7/4/17. Two (2) additional traffic related complaints were made during the period, however these were pertaining to dust and noise (nuisance) as a result of vehicles leaving the Site.	achievement. It is recommended that the existing approved Objective and the Measurement Criteria be reviewed to reflect the potential for traffic accidents involving members of the public and quarry related traffic (potential impact) that could have reasonably been prevented by the Private Mine holder. Given that Horsnells Gully Road within the Site is closed to	

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							public road users, the potential impact is limited to the Site access point. The existing approved measurement criteria measures the achievement of the objective against visual observations noted by Hanson personnel and complaints made to the Private Mine holder. It is proposed that the measurement criteria be amended to be clear and measurable, including the	

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							location of measurement and frequency (or trigger for further investigation).	
	Site Closure	nil	nil	nil	NA	NA	NA	NA
Blasting Nuisance	**Operational**	Blasting on the site will be undertaken in the manner to minimise the effects of noise and vibrations on the environment, and in accordance with the Australian EPA Guidelines.	Blasts are carried out between 9.00 am and 4.00 pm where possible and never on Sundays. Blast in favourable weather conditions as much as possible. Blasting management program – control and monitoring of noise, vibrations and dust from blasting will be developed as a part of the site noise and dust management programs. Keep complaints	Monitoring will be done as required, based on performance to date.	The existing approved MOP objective has been achieved.	All blasts are monitored, and the data is used to inform future blast events. The complaints register (dating back to 2008) indicates that blasting noise and vibration are a key concern to community members. The Objective is considered to have been achieved as Hanson have used the ongoing correspondence	The current Objective and Measurement Criteria is ambiguous and difficult to measure as the references to guidelines are outdated or no longer applicable. It is recommended that the Objective and Measurement Criteria be amended to	No infrastructure, public health and / or nuisance impacts from air blast, flyrock and vibration caused by blasting.

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			register and act on complaints.			with neighbouring residents and blast monitoring data to inform ongoing practices at the Site.	address the potential impact (adverse impacts to receptors) and to remove ambiguity. The Measurement Criteria can then be amended to reflect the applicable Australian Standards.	
	Site Closure	nil	nil	nil	NA	NA	NA	NA
Vegetation Clearance	**Operational**	Vegetation clearance or disturbance will be kept to minimum. Clearance or disturbance to rare, vulnerable, and endangered flora species will be avoided.	All vegetation will be taken out in the path of workings as approved in the Development Program. Where possible vegetative material and topsoil will be stored for re-use in rehabilitation programs.	Monitoring and recording of vegetation disturbance will be undertaken periodically. Monitoring will be done by Hanson Personnel and report by the Landcare report.	The existing approved MOP objective has been achieved.	Clearance has been limited to the approved footprint / reasonable and practicable extent.	The current approved Objective and Measurement Criteria does not provide for the measurement of indirect offsite native vegetation impacts that may occur as a result	No loss of abundance and / or diversity of native vegetation on or off the land as a result of quarrying activities, unless approved in accordance with the approved QDRP.

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			The quarry will comply with good environmental management practices and comply with Mine Development Planning and with relevant legislation. Removal of trees, shrubs and dead wood will be avoided whenever possible. Any unnecessary excursions from established roads will be avoided. Weeds and plant pathogens control program will be established.				of future extraction activities. It is recommended that the Objective and Measurement Criteria be amended to include consideration for clearance of native vegetation in accordance with the approved QDPs.	
	Site Closure	nil	nil	nil	NA	NA	NA	NA
Visual Measures	**Operational**	Visual impacts will be minimised by adequately	Effective and visually screening measures will be established	Photographs taken periodically from sensitive vantage	The existing approved MOP	A complaints register is maintained for the	The current Objective and Measurement	During construction and operation the form, contrasting and reflective

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		screening the operation from sensitive vantage points.	and maintained: direction of the operation will be chosen to screen the operation (from the road/new housing development/adjacent properties etc). Northern section of the site will only be lowered after establishment of rehabilitated faces to east and south. Complaints register regarding visual impact of the operation will be maintained on the site.	points Complaints register.	objective has been achieved.	Site. Quarry Development is confined to the approved footprint and is considered to be adequately screened from sensitive vantage points and impacts are considered to be reasonably minimised.	Criteria is ambiguous and will be difficult to achieve based upon the proposed future operations. It is recommended that the Objective and Measurement Criteria is revised to provide further clarity and define the appropriate measurement criteria to demonstrate compliance, particularly given potential changes to the extraction footprint. In addition, it is recommended	aspects of quarrying operations are visually softened to blend in with the surrounding landscape. No public nuisance impacts from light spill generated from fixed quarry light sources.

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							that consideration for light spill be included in the Risk Assessment given close proximity to sensitive receptors.	
	Site Closure	nil	nil	nil	NA	NA	The existing approved MOP does not contain any risk assessment with respect to visual amenity post quarry closure. Due to the scale and extent of the extraction footprint and associated progressive rehabilitation, the long term achievement of visual amenity	During post-mine completion, the form, contrasting and reflective aspects of mining operations are visually softened to blend in with the surrounding landscape.

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							outcomes for the Site is dependent upon the successful delivery of the rehabilitation strategies. It is recommended that a applicable Objective and Measurement Criteria be established to enable the achievement of successful long term visual amenity outcomes to be demonstrated.	
Silt Control	**Operational**	All silt will be retained within the boundaries of the private mine.	Under the surface water management plan sediment traps will be appropriately	Monitoring and reporting in accordance with water monitoring plan.	The existing approved MOP objective has	The objective is partially achieved via the Environment	The current Objective and Measurement Criteria does not	Refer to **Soil and Water Erosion** of this table.

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			constructed on the site and maintained regularly so that their capacity should not be reduced below 70% of their design capacity. Downstream from the spillway, silt traps have been installed along the creek for the reduction of silt and run-off water from the haul roads and quarry benches. These are designed for easy cleaning with an excavator. Tonnages are recorded as per the EPA license conditions. Run-off water that falls in the stockpile area and the concrete plant is diverted down into a catchment dam outside the quarry		been partially achieved.	Improvement Program (EIP) associated with the EPA Licence 12714 regulating activities concrete batching and extractive industries at the Site. The EIP contains a number of actions that have been undertaken to improve the quality of water discharge from the Site and is closely monitored by Hanson and the EPA. It is noted that the EIP was established following an extreme weather	currently reflect the surface water management and the requirements of the EIP. Hanson have been in discussion with the South Australia Environment Protection Authority (EPA) and the Department for Energy and Mining (DEM) regarding the possibility of integrating any actions contained in the EIP that have not been closed out into the new MOP for the	

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			gate on quarry property (Map 4). This is also designed for easy cleaning with an excavator. Tonnages are recorded.			event that resulted in an exceedance of the conditions contained withing the EPA Licence as well as the objective listed under this component.	Site. For this reason, the Objectives and Measurement Criteria under the environmental component are deemed to no longer be appropriate and require review.	
	Site Closure	nil	nil	nil			The existing approved MOP does not contain any risk assessment and Objective and Measurement Criteria under the environmental component for the mine closure	Refer to **Soil and Water Erosion** of this table.

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							phase, with regard to this component. It is recommended that a applicable Objective and Measurement Criteria be established to enable the achievement of successful long term silt control outcomes to be demonstrated.	
Stormwater Control	**Operational**	All stormwater affected by the mining operation will be contained within the mine site. Any water discharged from the site will meet EPA water quality guidelines.	The emphasis on the water quality management for White Rock Quarry is for the reduction of suspended solids entering the small creek. An Environmental and	Conformance with EPA criteria and conditions, at appropriate intervals as set by EPA. Reporting in Landcare Report.	The existing approved MOP objective has been partially achieved.	As above	As above	Refer to **Soil and Water Erosion** of this table.

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			Water Quality Plan is being used and is reviewed regularly as per present E.P.A. licence conditions. There will always be a mindset of continuous improvement to drainage and storm water systems. Every effort is being made to ensure that little silted or contaminated water leaves the site or breaches Hanson's EPA license conditions.					
	Site Closure	nil	nil	nil			As above	Refer to **Soil and Water Erosion** of this table.
Topsoil Stripping onsite and Management	**Operational**	All available topsoil and subsoil disturbed by the mining operation will be preserved and managed.	Because the rocky area contains little depth of topsoil it is vitally important to collect as much as possible for	Photographic evidence of stockpiles and weed control. All available topsoil will be gathered and retained during	The existing approved MOP objective has been achieved, there has not been any	There are no topsoil stockpiles onsite. There have not been any new areas of quarry expansion since	The existing approved Objective is considered to be broadly appropriate,	Ensure that existing topsoil quality and quantity is contained onsite and is maintained.

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			rehabilitation purposes. All topsoil will be preserved either on old benches or stored on the present overburden site and kept isolated from contamination. Any topsoil, subsoil and overburden will be identified and separated prior to mining. All stripped and stockpiled topsoil and subsoil held for rehabilitation is to be located within the upstream catchment facilities. All stripped topsoil will be stored on the site and managed according to the standards set by the company. The topsoil and	mining operations. Because the rocky area contains little depth of topsoil it is vitally important to collect as much as possible for rehabilitation purposes. All topsoil will be preserved either on old benches or stored on the present overburden site and kept isolated from contamination.	stripping of topsoil and subsoil cleared since prior to 1990.	the 1990s under current management. Clearance was undertaken prior to 1990. Additionally, topsoil onsite is minimum / shallow.	however the wording could be improved to make the Objective and Measurement Criteria clearer. It may be considered appropriate to introduce an alternative measure to ensure that the rehabilitation strategy can be achieved, in the absence of available topsoil.	

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			subsoil stockpiles should have a suitable slopes to encourage and maintain vegetation growth for erosion control. The adequate weed control of topsoil and subsoil stockpiles will be undertaken.					
	Site Closure	nil	nil	nil	NA	NA	It is considered appropriate to consider Site Closure under this environmental aspect withing the MOP Review Impact Assessment.	Ensure the functionality of the ecosystem and landscape is stable and self-sustaining to achieve the agreed post quarry land use.
Waste Management	**Operational**	Rational & effective waste management to minimise environmental damage will be established.	All waste components of mining such as oil, chemicals etc. is managed under EPA Licence conditions and Hanson	Records of stored, removed & recycled waste including the type of waste, quantity, description etc.	The existing approved objective has been achieved.	Waste storage and disposal records are maintained onsite.	The existing approved Objective a Measurement Criteria is ambiguous and	All commercial and industrial waste is disposed of in accordance with relevant legislation.

Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
			Management Policies Waste products are minimal on the site as rock extraction is the main purpose of the operation. Silt dams when available for rehabilitation will be made safe and they will be returned to conform with the natural environment and Mine Operation Plans. All waste will be contained within the site and waste management program for each specific type of waste will be developed and implemented. It will also incorporate targets to reduce, reuse or recycle all	Public complaints register.			difficult to measure. It is recommended that the Objective and Measurement Criteria is reviewed and updated with references to specific legislative requirements.	No adverse impacts to the environment from Construction and Demolition Waste (inert) waste brought onto the land unless authorised through the relevant legislation.

Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
			waste generated on a site during the life of the operation. All stockpiled material held for transport or rehabilitation should be located within the upstream catchment facilities.					
	Site Closure	nil	nil	nil	NA	NA	The existing approved MOP does not contain any risk assessment and Objective and Measurement Criteria under the environmental component for the mine closure phase. It is recommended that a applicable Objective and	No industrial or commercial waste and infrastructure is left onsite post closure.

Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
							Measurement Criteria be established.	
Weed Management	**Operational**	Control weeds and reduce infestation over time.	Implement and maintain the Weed Control Plan for White Rock Quarry prepared by Landscape Profile Pty Ltd, (attached as Appendix XX). Weeds Gorse, Montpelier Broom, English Broom and Boneseed to be managed in long term. Treat new rehabilitation sites before planting (see below).	Monitor and follow the programme using the land care report.	The existing approved MOP objective has been achieved.	The ongoing weed control program contributes to the achievement of the objective.	The existing approved Objective and Measurement Criteria remains largely appropriate, though it is recommended that the Objective and the Measurement Criteria be reviewed to ensure that they are up to date, clear and measurable The Objective may also be updated to include consideration for plant pathogen	No introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the land compared to baseline.

Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
							and pest (including feral animal) species.	
Rehabilitation	**Operational**	Progressive and final rehabilitation program will be prepared and implemented to prevent adverse environmental impacts and to satisfy requirements of the relevant regulatory agencies. All disturbed land on the mine site will be rehabilitated to a stable condition consistent with the proposed land use, and aesthetically acceptable with the surrounding land.	Progressive mine rehabilitation will be carried out as benches become available. At present the upper levels of the eastern faces, as shown in the photo below, are being rehabilitated. The general sequence of rehabilitation is terminal benches of 5 metres width, an angle on the face of 70 degrees giving the base a width of 6.8 metres. **Bench Treatment** - Benches will be graded to the back and will gently slope to	Accurate records will be kept of the works and that monitoring procedures be introduced. Likely measurements would include data on planting techniques, watering regimes, plant replacements, species successes and failures, percentage of foliage cover, accumulating litter depth and growth rates. These are covered by the Landcare Report. (a) The after use the undisturbed parts of the site will be a return to the natural environment, and	The achievement of the existing approved objective has been partially achieved to date.	The existing approved MOP for the site contains some detail pertaining to progressive and final rehabilitation. Rehabilitation is undertaken progressively at the site, within areas that are no longer used for extraction and / or operational purposes.	The Objective and Measurement Criteria are lengthy and difficult to measure. The environmental component requires sufficient description of the proposed mine rehabilitation strategies to demonstrate the closure objectives will be achieved. This environmental component is	NA

Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
			allow for water runoff. Material will be mounded on the face and the mound will be grassed and planted with tree and scrubs as given in the list in the flora section above and in the CLASP report dated 4th May 1973. A general arrangement of these faces is shown in map 9. **Plant Removal** - Upon cessation of processing, structures that cannot be used for subsequent use and their foundations will be removed. All redundant roads and tracks will be removed and scarified	may become part of the conservation park and used for recreational purposes such as bush walking and camping. Disturbed areas will subject to council approval, be developed for urban purposes.			considered to be addressed under the Visual Amenity environmental component.	

Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
			to minimum 75mm depth and prepared for revegetation. **Sub Soil Strata** - Material suitable for the formation of a sub-soil will be placed by a "loose tipping" procedure carried out when the material is in a friable condition. Depth will be to 150mm below final finished surface levels. The essence of this operation will be to avoid soil compaction which severely inhibits growth. Revegetation - The rehabilitation strategy seeks to recreate indigenous vegetation					

Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
			units similar to those in the surrounding area. It is proposed to match the existing vegetation in both the upper canopy and understorey species. It will seek to achieve a similar percentage of foliage cover, litter depth, microbial activity and ultimately canopy height. After planting and throughout the Establishment Period, each plant shall be maintained with a 450mm diameter depression filled with 40mm depth organic mulch. Revegetation seeks to achieve an average					

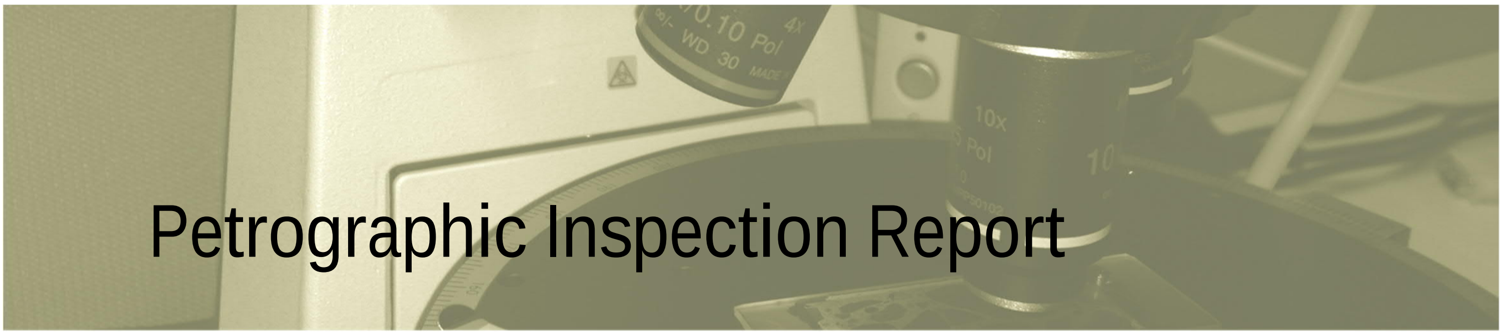
Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
			density of 100 trees/shrubs per 4,000sqM, with a minimum 50 trees/shrubs in any 4,000sqM quadrat. These densities will be achieved in areas not required for open grassland. Plant species are from the list in the flora section above and others as advised by park rangers and horticultural experts form the area. **Surface Soil Layer** - The naturally occurring surface soil in the area varies from 50-100mm in depth. Depth of soil will be 150mm. Material used will be topsoil					

Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
			from the western acoustic mound, imported material and conditioning of other soils and subsoils brought in. Final conditioning techniques may to include a 6-month procedure: Loosely Spread. Fallow (to germinate weed). Herbicide. Hoe to medium tilth. Seasonal annual legume crop (e.g. rye corn, lupins, clover, acacias). Slash. Hoe. Fallow. Herbicide. Ready for planting.					

Information Extracted from the Existing MOP					Section 82 of the Mining Regulations - MOP Review requirements			
Environmental Component	**Mine Life Phase**	**Existing Approved MOP Objective**	**Existing Approved Strategy to Achieve the Objective**	**Existing Approved Measurement Criteria**	**Result**	**Assessment of the Achievement of the Objective**	**Appropriateness of Objectives and Measurement Criteria**	**Proposed Objective** (note: the proposed Objectives are informed via the MOP Review Risk Assessment and this document. Refer to MOP Review for Measurement Criteria)
	Site Closure	nil	nil	nil	NA	NA	NA	NA

Attachment 2

Petrographic Analysis



Petrographic Inspection Report

Title:	Petrographic Inspection Report
Prepared for:	Hanson Construction Material Pty Ltd
Date Sampled:	19/02/2018
Sample Type:	Spall
Source:	White Rock Quarry – Adelaide Hills, South Australia
Sample ID:	White Rock
Date of Inspection:	22/03/2018
Report Issued:	04/04/2018
Project/ File Ref.:	P2018_0014_001v1

Author:

Luke Ryan (BGeo)
Geologist,
Groundwork Plus

Reviewer:

Rod Huntley (BSc, M.App.Sc, M.Eng)
Principal Resource Consultant,
Groundwork Plus

Rock Identity

Name: Quartzite

Lithology Metamorphic Rock

Introduction

This report provides the results of a general petrographic assessment of a spall sample which was submitted to the Groundwork Plus petrographic laboratory and describes the method and standards used to assess the sample. The thin section was prepared and analysed by Groundwork Plus with instructions from the client to conduct petrographic testing to ASTM C295 and recommend further testing if significant deleterious characteristics are identified pursuant to Clause 16.3 of this standard. The spall was sampled by the client and sectioned at the Groundwork Plus petrographic facility. The provided modal mineral percentages relate to the supplied sample which is understood to be representative of material on site. Assessment regarding the Alkali-Silica Reactivity (ASR) potential of the aggregate has been advised by AS1141.65-2008 and is communicated pursuant to Clause 9. Communication of findings are advised by AS 1726-1993 Geotechnical Site Investigations.

Method

The petrographic assessment of the slide was carried out using a Nikon polarising microscope equipped with a digital camera at the Groundwork Plus petrographic laboratory. A photograph of the hand specimen and thin section photomicrographs showing grain sizes and any particular aspects of the minerals were included as part of the report (Plates 1, 2, and 3). Modal analysis was conducted on the sample using JMicroVision image analysis software on 200 points (Table 2 – Modal Analysis of Minerals).

The petrology assessment was based on:

- ASTM C 295 Standard Guide for Petrographic Examination of Aggregates for Concrete.
- AS2758.1 – 1998 Aggregates and Rock for Engineering Purposes Part 1: Concrete Aggregates (Appendix B).
- AS1141 Standard Guide for the Method for Sampling and Testing Aggregates.
- Alkali Aggregate Reaction - Guidelines on Minimising the Risk of Damage to Concrete Structure in Australia - Cement and Concrete Association of Australia and Standards Australia (HB 79-2015).
- The accepted definition of free silica is set out in the Queensland Department of Transport and Main Roads Test Method Q188, and tested pursuant to the AS1141.65-2008 Methods for sampling and testing aggregates – Alkali aggregates reactivity – Qualitative petrological screening for potential alkali-silica reaction and AS1141.26 Secondary Mineral Content.

Interpretation

- The supplied rock sample is identified as Quartzite, a Metamorphic Rock.

- In hand sample the aggregate is described as white-brown, siliceous rock displaying sacharoidal fracture faces revealing tightly intergrown 0.2 to 0.5mm quartz and feldspar grains with no denuded cementitious material residual to the metamorphic process. Quartz filled veins are discontinuous, erratic and host fine opaques and isolated iron oxide staining. Characteristic among quartzites the sample is exceptionally hard, presenting a glassy sectioned face and is duly expected to be of extremely high strength and offer exceptional durability in service. Rare opaque and interstitial muscovite is detected as bright flakes measuring to 0.5mm. The rock is not appreciably magnetic and no sulfides are detected in hand sample.

- Petrographic analysis reveals the quartzite is comprised principally of robust recrystallised quartz crystals (74%), feldspar (21%), magnetite/ilmenite (1%) with subordinate inter-crystalline calcite (2%), muscovite (1%) and minor iron oxide. The rock is essentially unweathered and is non-porous.

- The sample contains 74% free silica in the form of heavily strained or finely annealed quartz. Duly, material represented by this sample is regarded as presenting risk significant Alkali-Silica Reactivity (ASR) in concrete.

- Pending material testing, the quartzite is regarded as suitable for use as Coarse Aggregate in Concrete (provided account is made in mix design for the stated potential for ASR) and Unbound Pavements. The rock may also be suitable as Cover Aggregate and Asphalt following bitumen affinity and Polished Aggregate Friction Value (PAFV) testing. The rock is also suitable for use as marine armour, gabion and revetment if large enough blocks can be recovered. Extensive crushing is expected to produce quality manufactured sand. The highly competent nature of the quartzite may result in increased wear on crushing and processing equipment.

- For engineering purposes the rock may be summarised as:

  - Quartzite, a metamorphic rock.
  - Essentially unweathered and non-porous.
  - Composed principally of robust and comprehensively consolidated grains with subordinate weak metamorphic or weathering products.
  - Very hard and of expected extremely high strength and superior durability.
  - Containing 74% free silica.
  - Presenting risk of significant ASR in concrete.
  - Exposure of ferruginous material to cement paste may result in staining.
  - Quartzite's such as this may present a risk of separation from cement paste if used as concrete aggregate due to heavy strain among constituent grains.

Table 1 – Risk Rating for Specific Applications and Source Rock Quality

Risk Rating for Application	Low	Mod	High	Comments (Pending material testing results and assuming the sample is indicative of overall source rock quality)
Coarse Aggregate in Concrete	✓			Composed principally of robust phases with relatively minor texturally isolated weak micas and calcite. Unlikely to be released in significant quantities with crushing
Unbound Pavements	✓			Suitable high strength, hard and durable material
Cover Aggregate	✓			Mechanically suitable with high strength. Hard and durable material
Graded Asphalt Aggregate	✓			Mechanically suitable with high strength. Hard and durable material
Rail Ballast	✓			Mechanically suitable high strength, hardness and durability
Manufactured Sand	✓			Weak secondary phases are rare and consolidated within the robust fabric of the rock. A proportion of these are expected to be released by extensive crushing but are very unlikely to constitute deleterious fines
Marine Armour	✓			Mechanically suitable provided adequately sized blocks can be recovered
Risk Rating Source Rock	**Low**	**Mod**	**High**	
Alkali Silica Reactivity			✓	Risk of significant ASR in concrete associated with heavily strained quartzites
Weak/secondary Mineral Impacts	✓			4% weak phases
Durability	✓			Suitable
Strength	✓			Suitable
Hardness	✓			Suitable
Voids	✓			No voids observed and duly regarded as non-porous rock
Fractures	✓			No significant fracturing or weakened planes observed
Bitumen affinity		✓		Coarsely grained siliceous rock can be associated with sub-optimal bitumen affinity. Bitumen affinity testing recommended prior to allocation to cover aggregate
Polishing		✓		Sacharoidal fracture faces likely to offset tendency of siliceous material to polish in service
Free Silica Content			✓	74% as quartz
Sulfides	✓			None observed
Light micaceous particles	✓			Subordinate fine texturally isolated muscovite

*Low risk means a low probability of causing source rock related issues in regard to material performance in any particular applications. Risk is recommended to be considered in conjunction with a sampling frequency protocol for production of any particular product.

Plate 1: Photograph displaying sectioned face of the quartzite including fine to medium grain size of constituent quartz and feldspar.

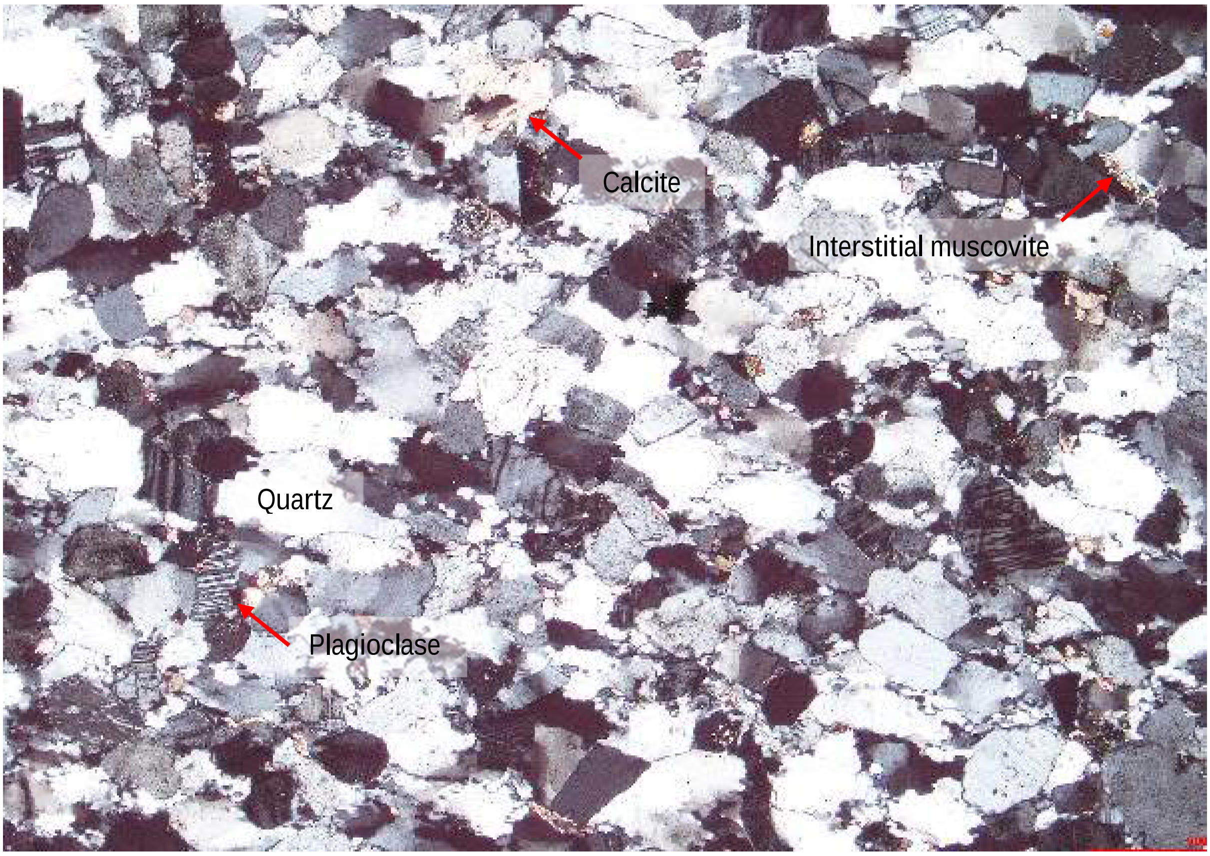


Plate 2: Microphotograph displaying representative mineral assembly and pressure solution textures which characterise the quartzite. Subordinate metamorphic muscovite is detected interstitial to otherwise sutured grains. Image shown in cross polarised light.

Plate 3: Microphotograph utilising plane polarised light to better distinguish dusty feldspar profiles from clear quartz and illustrate calcite, opaque and rare zircon distributions within the quartzite.

Thin Section Description

Petrographic analysis reveals that the spall represents a medium grain quartzite, the metamorphic product of an arkose sandstone protolith. Duly, the rock is comprised almost exclusively of 0.2 to 0.5mm quartz and feldspar grains with any interstitial argillic material metamorphosed to produce subordinate muscovite crystals which accommodate the compressed elongate boundaries of more competent quartz and feldspars. Fine magnetite/ilmenite crystals occur as 0.05mm opaques which frequently show alteration halos of rutile and leucoxene with associated emanative iron oxide staining. Additional accessary zircon crystals occur as persistent quartz inclusions as do fine filaments of apatite. 05 to 0.1mm euhedral calcite crystals are evenly distributed as euhedral crystals superimposed over quartz and feldspar mosaic fabric of the quartzite. These are likely the consolidation of fine carbonate sediments or shell fragments in the protolith.

Quartz crystals which account for the majority of the observed rock show universal heavy strain, elongate parallel crystal shapes and suturing at interfaces producing erratic boundaries between quartz grains. Finely annealed quartz crystals occur at boundaries with feldspar grains which include pristine plagioclase and microcline. These grains which composed the arkose sandstone protolith show mature development into a cohesive and highly competent quartzite with no observable voids or micaceous/argillic and consequently labile planes. Duly, aggregate derived from this rock is predicted to be well-suited to a broad range of engineering applications provided the stated high risk of ASR in concrete can be accommodated in mix design and appropriate measures can be taken in terms of dust suppression due to the high free silica content inherent to all quartzites. The highly competent nature of the rock is also likely to increase wear on crushing and processing equipment.

A mode based on a count of 200 widely spaced points is listed in Table 2- Modal Analysis of Minerals.

Table 2 – Modal Analysis of Minerals

STRONG MINERALS	MODE (per cent)	COMMENTS
Quartz	74	0.2 to 0.5mm sutured grains or finely annealed crystals
Feldspar	21	Including plagioclase and microcline variants
Opaques	1	Occurring as magnetite/ilmenite with progressive leucoxene alteration and associated sphene
Zircon	Trace	Rare quartz inclusions
Apatite	Trace	Fine filament inclusions
WEAK MINERALS		
Calcite	2	Occurring as euhedral crystals throughout the rock
Muscovite	1	As fine interstitial mica
Goethite	Minor	Fine 0.01mm sub-opaque botryoids associated with altered opaques
Iron oxide	Minor	Emanative ferruginous staining associated with opaques
TOTAL	100	Balance accounted for by minor and trace phases

Summary

Pending material testing, the quartzite is regarded as suitable for use as Coarse Aggregate in Concrete (provided account is made in mix design for the stated potential for ASR) and Unbound Pavements. The rock may also be suitable as Cover Aggregate and Asphalt following bitumen affinity and Polished Aggregate Friction Value (PAFV) testing. The rock is also suitable for use as marine armour, gabion and revetment if large enough blocks can be recovered. Extensive crushing is expected to produce quality manufactured sand. The highly competent nature of the quartzite may result in increased wear on crushing and processing equipment.

For engineering purposes the rock may be summarised as:

- Quartzite, a metamorphic rock.
- Essentially unweathered and non-porous.
- Composed principally of robust and comprehensively consolidated grains with subordinate weak metamorphic or weathering products.
- Very hard and of expected extremely high strength and superior durability.
- Containing 74% free silica.
- Presenting risk of significant ASR in concrete.
- Exposure of ferruginous material to cement paste may result in staining.
- Quartzite's such as this may present a risk of separation from cement paste if used as concrete aggregate due to heavy strain among constituent grains.

Free Silica Content

74% free silica content.

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Enquiries regarding the content of this report should be directed to Groundwork Plus 07 3871 0411

Samples are disposed of after 3 months from the date of report. Thin sections will remain on site indefinitely.

Attachment 3

Bushfire Management Plan

Bushfire Management Plan

	Name	Position	Date
Document Reviewed by	Simon Kitson	Quarry Manager	June 2022
Document Reviewed by	Steve Seal	Operations Manager	June 2022

White Rock Quarry

2022

Contents

Bushfire Management Plan

1 INTRODUCTION

The Bushfire Management Plan (BMP) has been prepared in consultation with workers and covers activities which may impact on, or influence the risk of bushfire occurrence and/or management and represents a working document to aid in the decision-making process and provides details of:

- Potential causes of bushfires.
- Controls including fire equipment and locations.
- Emergency contact details.
- Identification of Bushfire Safer Places and Areas of Last Resort Refuge.
- Defined responsibilities during the Fire Danger Season.
- Defined responsibilities on Days of Severe, Extreme or Catastrophic Fire Danger.
- Training requirements.
- A process for audit and review.

2 OBJECTIVES

The objectives of White Rock Quarry relating to bushfire management are to:

- Identify hazards that could cause significant risk during a bushfires threat, and avoid any increase in the threat of life, vegetation, property, and infrastructure. The preservation of life and the management of bushfire impact are paramount.
- Outline the property and its features, including the current surrounding fuel types, loadings, topography and fire climate and any significant bushfire history that may influence the impact of a bushfire.
- To outline Control Methods and Strategies to reduce the risk of occurrence and the impact of a bushfire threat on this property.

3 DESCRIPTION OF THE AREA

3.1 General

The subject land is the existing White Rock Quarry, located in the Adelaide Hills face zone 10km east of Adelaide. The vegetation of the area is of similar to that within the Mt Lofty region, the Quarry lies within the Mount Lofty Ranges Fire Ban District, at 98 Horsnells Gully Road, Skye, South Australia, 5072. The site has 136.87 hectares, with approximately only 30% being disturbed.

3.2 Meteorology

Climate data has been sourced from the Mount Lofty Bureau of Meteorology (BoM) (Station No. 023842), located approximately 5.9 km to the south of the Site. Climate throughout the Mount Lofty Ranges consists of a Mediterranean pattern with hot, dry summers and moderately wet winters. The Mount Lofty Ranges are subject to orographic rain, correlating to the topography of the ranges, resulting in higher rainfall averages when compared with the Adelaide Plains. Most rain falls between May and September and the driest month is January. The annual mean rainfall is approximately 989.3 millimetres (mm) (BoM, 2020).

Table 1. Meteorological Data sourced from BoM Mount Lofty (station No. 023842).

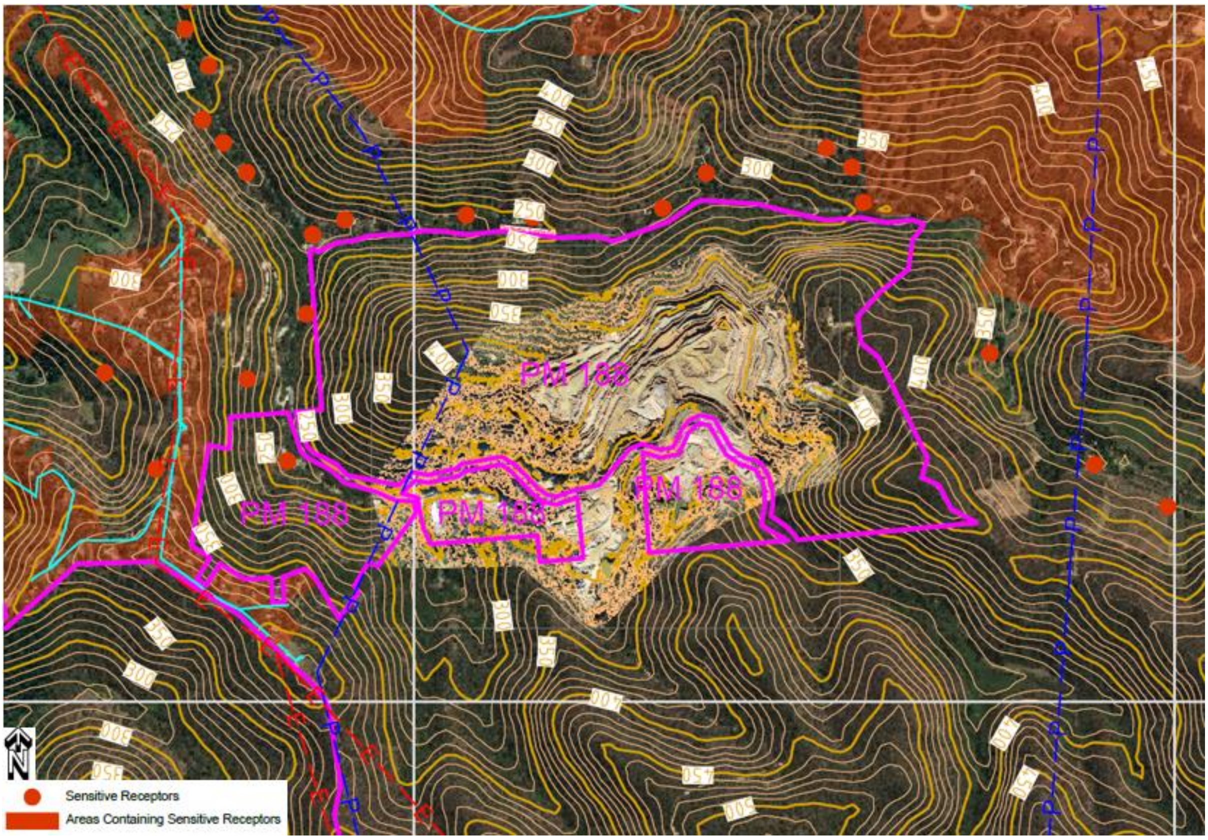
Month	Mean temp (°C)		Mean monthly rainfall (mm)	Highest rainfall (mm)	Lowest rainfall (mm)	Wind speed (km/h)		Wind direction	
	Max	Min				9:00 AM	3:00 PM	9:00 AM	3:00 PM
January	22.5	12.4	36.5	79.6	0	19.1	18.1	E	W
February	22.5	12.9	39.5	107.4	1.6	19.2	18	E	W
March	19.6	11.2	40.4	142.4	0.6	18.6	16.8	E	W
April	16.2	9.9	63.4	128.6	8.6	20	18	E/NW	W
May	12.3	7.7	109.6	201.8	0	22.1	19.9	NW	W/NW
June	9.4	5.6	129.6	176	22.4	26.5	23.7	NW	W/NW
July	8.9	5	153.5	233.6	42.8	26.2	24.3	NW	W/NW
August	10	5.2	137	232.4	36	27.1	25.5	NW/W	W/NW
September	12.3	6.1	111.1	312.2	31.4	26.7	25.7	NW/W	W
October	15.2	7.5	58.7	174.2	12	23.7	22.9	W	W
November	17.8	9.2	40.9	82.8	1	20.7	19.5	E	W
December	20.1	10.8	52.7	133.6	15.6	20	19.4	E	W
Annual	15.6	8.6	989.3	1570.4	789.4	22.5	21	E/W/NW	W

The area is dominated by westerly and easterly winds. North easterly and south westerly winds are minimal. Wind speed is similar during morning and afternoon. Highest wind speed occurs in winter/spring and the lowest in summer/autumn. At 9 am the wind direction is primarily from east in spring/summer and north-west and west in autumn/winter. At 3 pm the wind tends to blow from west through the year. Mean 9 am and 3 pm wind direction and speed from 1991 to 2008. Temperature ranges from 5°C (July) to 22°C (January), mean maximum and minimum temperatures for years 1991 to 2020.

3.3 Topography

The site is located on the western face of the Adelaide Hills. The Adelaide Hills region is defined by significant variation in topography within the Western Mount Lofty Ranges. A number of valleys exist in the area associated with creeks and gullies. The ground height of the development site is in the range of 215 to 461 metres above sea level. Image 1 presents ground contours of the site and surrounding area.

Image 1. Site Topography



3.4 Water Supply

The Site is located in the centre of the Torrens River Catchment receiving surface waters from the Horsnell Gully and Giles Conservation Parks forming part of the Third Creek Sub-Catchment. There are two (2) permanent natural water bodies (Giles Conservation Park Dam and Horsnell Gully Conservation Park Dam) and several constructed sediment basins within the Site.

There is a sufficient access for emergency services to water supply for Bush Fire Suppression.

4 BUSHFIRE RISK ASSESSMENT

4.1 Bushfire Risk

The “Risk Rating” for the site with regards to risk of Bushfires occurring is based upon topography, vegetation type, available fuel and prevailing conditions found just prior to and during the Previous Fire Danger Season and are therefore rated as **“High”**. Image 2 shows different levels of bushfire risk sourced from Plan SA.

Image 2. Level of bushfire risk, Plan SA, Planning and Design Code

4.3 Bushfire hazard identification

Bushfire prevention is a year-round responsibility and a necessity for property owners in the Adelaide Hills Face Zone. The Bushfire Danger Period for the Mount Lofty Ranges commences on 1 December and run until 30 April. In addition, the Country Fire Service can declare a Total Fire Ban at any time requiring additional fire restrictions and measures.

Outside of the Bushfire Danger Period, White Rock Quarry will undertake informal bushfire hazard analysis. The bushfire hazard or potential will be determined by an assessment of the topography, vegetation type, available fuel and prevailing conditions. A variation in each or any of these elements can mean the difference between having a high or low bushfire potential.

In addition to the approved operational activities, identified hazards which may cause a bushfire include:

- Lightning.
- Arson.
- Accidental ignition e.g. smoking/hot work.

- Sparking / arcing from power lines.

4.4 Ignition

The most common sources of ignition of fires in the immediate area are:

- Illegal burning off (without a permit).
- Hot works conducted without adequate permits and controls (Schedule 10 Permit)
- Fires associated with the operation of Mobile Plant within the Quarry site.

The type and amount of fuel will also influence the intensity of a fire. Fuel also differs according to vegetation type.

5 BUSHFIRE MITIGATION CONTROLS AND STRATEGIES

White Rock Quarry controls and strategies are achievable, practical, and cost effective categorised as follows:

5.1 Mobile Plant Operation

All earth moving equipment will be maintained in good working order with efficient exhaust systems. Regular inspections shall be undertaken with all earth moving machinery and mobile equipment will be fitted with appropriately sized, regularly maintained and approved fire extinguishers suitable for the control of flammable liquid and electrical fires.

Selected heavy machinery will be fitted with independent fire suppression systems in addition to the standard fire extinguisher.

Additionally, prior to any mobile equipment working in vegetated areas, it will be inspected to ensure:

- It is fitted with a securely fixed, spark-free exhaust in good condition.
- The fuel, electrical and braking systems, combustion chambers, manifolds, exhaust pipes and expansion chambers of the machine and joints are in all respects in good order and condition (including fuel tanks and fuel lines being of a satisfactory design and firmly anchored).
- Equipment is free from surplus oils, dust impregnated with oil and vegetative matter.
- The exhaust system of any equipment working in a stationary position is directed away from flammable material.
- The catalytic converter of vehicles using unleaded petrol will not come into contact with dry and flammable material, equipment restricted to car parking areas.

Any mobile equipment working in vegetated areas will not be left unattended within vegetated areas and will be parked in approved park up or cleared areas. Mobile equipment which must be left unattended within vegetated areas, eg break downs, will first be inspected and made fire safe (e.g. through cleaning of vegetation debris etc.) before personnel leave the site.

5.2 Clearing Operations

No burning off to clear vegetation unless an special requirement is determined, in that case, a complete risk assessment is to be undertaken and approved by State manager.

The Quarry Manager is responsible for ensuring the following undertakings are completed prior to the beginning of the Bush Fire Season (1 December and run until 30 April and that the maintenance of such items listed below ensures the reduction of Bushfire impacts during this period.

- Check that trees and shrubs around potential sources of ignition still have space between them (horizontally and vertically) so they don’t form a continuous canopy. Prune if needed.
- Check and service all mechanical equipment, including water pumps, any sprinkler systems and fire extinguishers.
- Check extinguisher and associated equipment every 6 months and review the Bushfire Management Plan every 3 years or as required.
- All vehicle movements within the Quarry boundary will be routinely confined to defined roads or tracks.

5.3 Blasting Operations

Any blasting operations will be carried out and confined to the face area of the Quarry. All flammable materials will be removed by pre-stripping the topsoil prior to any drilling and blasting operations taking place. All blasting will be carried out in accordance with the guidelines, standards and regulatory requirements.

5.4 Welding and Grinding Operations

All welding activities during the Fire Danger Season will, so far as practicable, be conducted and confined to the main workshop area. Should welding or cutting have to be conducted outside the workshop area, the following safeguards will be employed.

- A schedule 10 permit must be obtained
- A hot works permit is to be completed indicating what control measures will be in place and the approved by a competent person
- An area within 4 metres cleared space of the worksite of all flammable materials.

- All oils, greases etc. will be cleared from the immediate work area.
- Fire extinguishers will be positioned in close proximity to the work area.
- A responsible person is in attendance at all times during use.

During a Total Fire Ban NO Welding or grinding can take place outside unless process and procedures approved by Country Fire Services or/and Regulator (Schedule 10 permit).

5.5 Building and Fixed Plant

All workshops and offices will be equipped with approved fire extinguishers. Their locations will be indicated by appropriate signage. The approved extinguishers will be installed at the following locations:

- Fuel and Oil Storage areas.
- Offices: Reception and Administration.
- Lunchrooms.
- Process Plant.
- Workshops.

5.6 Flammable Liquids

All fuel and oil storage will be located and constructed in accordance with the requirements of legislation and Australian standards. Fuel and Oil storage areas will be signposted regarding the content of the storage and will be fitted with approved rated fire extinguishers.

All fuel tanks on-site will be fully or self-bunded so that in the event of a leak or rupture, no fuel escapes from the bunded area. Each bunded area shall have a minimum capacity of at least 110% of the largest tank. Bunds may be integrated, i.e. forms part of the tank structure, or external.

Drainage from the workshop, workshop apron and wash down areas will be directed to an oil separator or similar construction and containment system for subsequent pump out and disposal.

5.7 Fire Fighting and Protection Equipment

All fire extinguishers will comply with Australian Standards and kept in a serviceable condition and inspected and tested to meet legislation requirements. The Quarry will maintain a water truck on site, primarily for dust suppression that could be used for water supply or/and fire suppression. The water truck has the capability for rapid fill from the current standpipe. Water for fire-fighting purposes will be sourced from the water storages within the Quarry boundaries.

5.8 Fire Tracks & Access

Access to the Property will be maintained for emergency service vehicles. Fire tracks are designated and signed within the site.

5.9 Future Development

As the quarry develops the risks identified in this BMP may change, therefore it is best practice to review this BMP after any significant development and/or as necessary.

5.10 Consultation

White Rock Quarry will consult with relevant stakeholders on the environmental aspects of this Bushfire Management Plan on an ‘as needs basis’.

Examples of situations which may require consultation includes, but are not limited to:

- Hazard reduction.
- Fire-break maintenance.

White Rock Quarry management will be actively involve and consult with The Adelaide Hills Council, City of Burnside Council and the South Australian Country Fire Service and other stakeholders.

5.11 Fire Safer Areas

To ensure the safety of personnel on site, Hanson have already designated emergency assembly points and educate their personnel through on-site inductions.

6 TRAINING

All White Rock Quarry personnel will receive basic fire control training and undertake refresher training at regular intervals.

The Quarry will ensure that, during site induction, all contractors receive basic firefighting knowledge.

Part of this training will include the:

- Identification of the Emergency Assembly Area in the case of an emergency.
- Ban on all smoking within vegetated/flammable areas.
- Ban of all open fires site wide.

7 EMERGENCY CONTACT DETAILS

SERVICE	CAPABILITY	RESPONSE CONTACT DETAILS	LOCALITY
SA Police	The **SA Police** are responsible for: • Upholding the law and preserving the peace • Preventing Crime • Assisting the public in Emergency Situations • Coordinating and Managing responses to Emergencies • Regulating road use and prevent vehicle collisions	**In the event of an Emergency** Call 000 – Police **Police Assistance Line** for non-urgent police assistance: 13 14 44	**Norwood** 38 Osmond Terrace, Norwood SA 5067 **Opening hours:** 8am to 9pm - 7 days **Contact:** (08) 8207 6800 **Holden Hill** 2a Sudholz Road, Holden Hill SA 5067 **Opening hours:** 7 days, 9am - 9pm **Contact:** (08) 8207 6000; email holdenhill@police.sa.gov.au
SA Country Fire Service	The **SA Country Fire Service** is volunteer service responsible for: • Dealing with outbreaks of fire. • Rescuing persons trapped by fire. • Dealing with hazardous materials incidents excluding radioactive. • Arranging additional fire-fighting resources as required. • Providing fire protection for vehicle accidents and rescue operations.	**In the event of an Emergency:** Call 000 – Fire (CFS) **CFS Bushfire Information Hotline:** 1300 362 361 **CFS Headquarters**: (08) 8391 1866 **Burn off notification** – 1300 362 361	**Region 1 - Adelaide Hills, Fleurieu Peninsula and Kangaroo Island** **Address** 75 Gawler Street, Mount Barker SA 5251 **Phone** 08 8391 1866 **Email** CFSRegion1@sa.gov.au

SERVICE	CAPABILITY	RESPONSE CONTACT DETAILS	LOCALITY
SA Metropolitan Fire Service	The **SA Metropolitan Fire Service** is responsible for: • Dealing with outbreaks of fire. • Rescuing persons trapped by fire or other means. • Motor Vehicle Accident Rescue. • Urban Search and High Angle Rescue. • Dealing with HAZMAT threats (Chemical, Biological and Radiological).	**In the event of an Emergency** Call 000 – Fire **SAMFS Headquarters** 8204 3600 **Country Callers** (Toll Free) 1300 737 637 **Information Hotline** 1800 362 361	**CFS State Headquarters** 99 Wakefield Street Adelaide SA 5000
SA Ambulance Service	The **SA Ambulance Service** is the principal provider of ambulance services in South Australia comprising: • Out-of-hospital emergency medical care and transport. • A non-emergency ambulance transport service. • Emergency and major events management. • Rescue services in collaboration with other emergency services – e.g. water rescue, cliff rescue, confined space rescue. • SAAS MedSTAR Emergency Medical Retrieval – utilising road, rotary wing and fixed wing transport platforms.	**In the event of an Emergency** Call 000 – Ambulance	**SA Ambulance Stations** are located in: • Campbelltown • Parkside • Ashford • Mitcham

SERVICE	CAPABILITY	RESPONSE CONTACT DETAILS	LOCALITY
State Emergency Service	The **State Emergency Service** is a Volunteer Emergency Service organisation specialises in the following: • Severe Weather Response. • Road Crash Rescue. • Land Search. • Emergency Management. • Urban Search and Rescue. • Marine Rescue. • Vertical Rescue. • Air Search Observation. • Flood and Swift Water Rescue. • Bike Search and Rescue.	**In the event of an Emergency** Call 000 – SES Call 13 25 00 for **Storm and Flood Response**	**Norwood** **Campbelltown**
Royal Adelaide Hospital	RAH provides a specific range of tertiary referral services to the people of South Australia and the nearby states and territories, and a broad range of clinical services.	**Accident and Emergency** A 24-hour service is provided.	**Adelaide** North Terrace Adelaide SA 5000 (08) 8222 4000 (08) 8232 6408
Safework SA	SafeWork SA delivers a full range of workplace safety, public safety and industrial relations services to promote and encourage safe, fair and productive working lives in South Australia. As the state's Work Health and Safety agency, SafeWork SA achieves success by working with employers, employees, unions and industry representatives to ensure compliance and help people understand and meet their obligations.	Special Note: Notification in the event of a serious workplace injury or incident will only be undertaken by the Chief Executive Officer (PCBU) Mining and Construction Materials in consultation with the SHQ Advisor and will brief the General Manager. **To report serious workplace injuries and incidents** Call: 1800 777 209	**Adelaide** – Level 4 33 Richmond Road Keswick SA 5035 1300 365 255 To report serious workplace injuries and incidents **1800 777 209**

SERVICE	CAPABILITY	RESPONSE CONTACT DETAILS	LOCALITY
The Office of the Technical Regulator	The Office of the Technical Regulator is responsible for the electrical, gas and plumbing safety and technical regulation in South Australia.	**Special Note:** Notification of an incident involving electricity or gas supplies will only be undertaken by the Chief Executive Officer (PCBU) Mining and Construction Materials in consultation with the SHQ Advisor and will brief the General Manager. • Deaths will be reported immediately via telephone. • Any incident whereby a person requires medical assistance must be reported within one working day. • All other incidents involving electricity or gas must be reported within 10 working days of the incident. Call (08) 8226 5518 Bus Hrs 1800 558 811 After Hrs	**Adelaide** – Level 8 ANZ Building 11 Waymouth Street Adelaide SA 5000 **Bus Hrs** (08) 82265518 **After Hrs** 1800 558 811
Environment Protection Authority	The Environment Protection Authority is an independent statutory authority responsible for the protection of air and water quality, and the control of pollution, waste, noise and radiation. They influence and regulate human activities to protect, enhance and restore the environment.	**Special Note:** Notification of a pollution incident will only be undertaken by the Chief Executive Officer (PCBU) Mining and Construction Materials in consultation with the Risk Management (as required) and will brief the General Manager. **Freecall (non-metropolitan only)** **1800 623 445**	**Adelaide** - 250 Victoria Square Adelaide SA 5000 (08) 8204 2000 To obtain information on pollution: (08) 8204 2004
Senior Mining Compliance Officer	Mining Regulator	Mining Regulation Quarry Resources Division Department of Energy and Mining	**Adelaide –** 11 Waymouth St, Adelaide SA 5000 (08) 8463 3000

SERVICE	CAPABILITY	RESPONSE CONTACT DETAILS	LOCALITY
Employee Assistance Program	CONVERGE INTERNATIONAL Supporting great workplaces and employees: • EAP & critical incident • Career change • Conflict resolution • Leadership • Critical incident • Mental health and wellbeing.	CONVERGE INTERNATIONAL provides trauma management services around the clock, 24 hours a day, and 7 days a week. A traumatic event may include such things as an armed hold-up, assault, death, industrial accident, or similar emergencies that require immediate attention. If you need immediate support, or would like to speak to someone immediately, please call 1300 687 327	**Converge International** 5/108 King William Rd, Adelaide SA 5000 1300 687 327 Download the app: EAP Connect
Council	Adelaide Hills Council City of Burnside Council	Adelaide Hills Council Contact: 08 8408 0400 City of Burnside Council Contact: (08) 8366 4200	**Adelaide Hills Council** principal office is located at 63 Mount Barker Road Stirling. **City of Burnside Council** is located at 401 Greenhill Rd, Tusmore 5065
Water	SA Water	SA Water Service problems and Faults (24hrs, 7 days a week) **Call:** 1300 883 121	Customer Service (Monday to Friday 0830 to 1700) 1300 650 950
SA Power Networks	SA Power Networks	To report an electricity fault or emergency **Call:** 13 13 66 Reporting major electricity incidents **call Triple Zero (000)**	**SA Power Networks** 1 Anzac Hwy, Keswick SA 5035

8 MAINTAINING BUSHFIRE INFORMATION

White Rock Quarry shall during days of Catastrophic, Extreme and Severe periodically monitor the CFS Bushfire Information on the CFS website:

https://cfs.sa.gov.au/warnings-and-incidents/

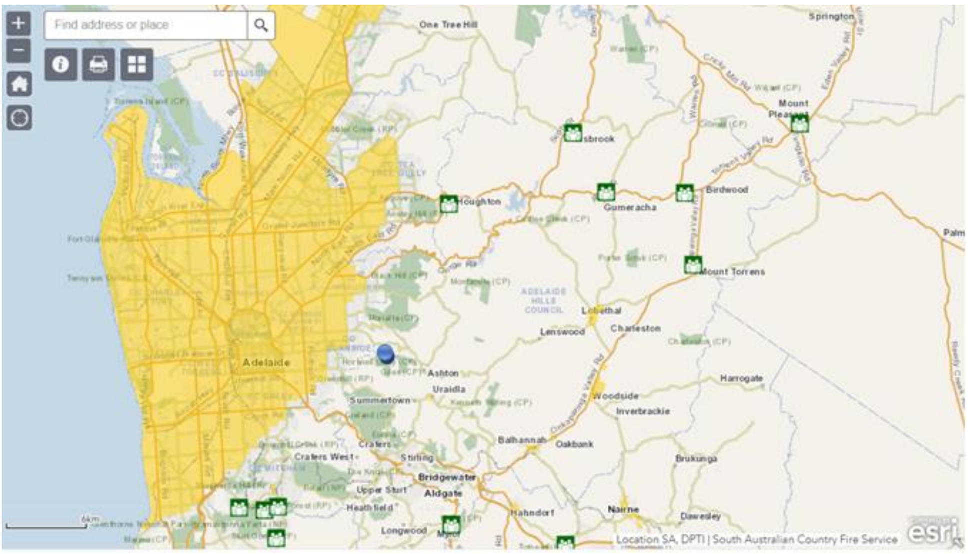
or Hotline on 1300 362 361 and Monitor local ABC Radio Station:

891 ABC Adelaide

9 SAFER PLACES AND LAST RESORT REFUGES

Bushfire Safer Place is an area designated as relative safe (metropolitan Adelaide and some regional townships). It may be used as a first resort for those people who have planned to leave high risk locations early on a high-risk fire day	**Will you be safe in a Bushfire Safer Place?** • There are no guarantees regarding your safety if you choose to stay in a Bushfire Safer Place or if you relocated to one. • However, it is unlikely you will be exposed to direct flame or severe radiant heat. • You may be exposed to sparks, embers and smoke, which can cause secondary fires in vegetation, gardens and structures. • A Bushfire Safer Place will be safer than being in high bushfire risk areas.
Last Resort Refuge is a space or building which could be used as a place of last resort for individuals to go to and remain in during the passage of a bushfire. The area provides a minimum level of protection from the immediate life-threatening effects of radiant heat and direct flame contact in a bushfire. It does not guarantee the survival of those who assemble there. You should only use a Bushfire Last Resort Refuge when your Bushfire Survival Plan has failed, and you cannot safely relocate to a Bushfire Safer Place.	**Will you be safe in a Last Resort Refuge?** • Travelling to a Last Resort refuge may be dangerous due to traffic congestion, fire activity, heavy smoke, accidents or fallen trees that may block the route. • There are no guarantees you will be safe from radiant heat during travel or whilst sheltering at a Last Resort refuge. • Do not expect Emergency Services to be present on site. • The areas have limited capacity and do not cater for animals. • No food, amenities and specialised support services will be provided. • May not provide shelter from elements, particularly flying sparks and embers. • There are no guarantees regarding your safety if you choose to relocate to a Last Resort refuge during a bushfire. • It is important to remember that once workers have left the site, they must take responsibility for their own safety during a bushfire.

There are 3 signed Emergency Assembly Points on site as per CFS Operation Response Pre-Plan. Then the nearest "Safer Place" (yellow area) to the quarry is the metropolitan Adelaide area. Approximate quarry location highlighted in blue.



10 FIRE DANGER RATINGS

Fire Danger Rating	What does it mean?	What you should do
CATASTRO-PHIC Total Fire Ban	• These are the worst conditions for a bush or grass fire. • If a fire starts and takes hold, it will be extremely difficult to control. It will take significant fire-fighting resources and cooler conditions to bring it under control. • Spot fires will start well ahead of the main fire and cause rapid spread of the fire. Embers will come from many directions. • Buildings are not designed or constructed to withstand fires in these conditions. • The safest place to be is away from bushfire prone areas.	**YOU NEED TO ACT NOW** • Put your survival first and leave bushfire-prone areas the night before or early in the day – this is your safest option. • Act immediately – do not wait and see. • Avoid forested areas, thick bush or long, dry grass. • Prepare, know, and practice a plan for: - When you will leave - How you will get there - What you will do if you cannot leave - Where you will go - When you will return
EXTREME Total Fire Ban	• These are very hot, dry and windy conditions for a bush or grass fire. • If a fire starts and takes hold, it will be unpredictable, move very fast. It will be very difficult for fire fighters to bring under control. • Spot fires will start and move quickly. Embers may come from many directions. • Buildings that are prepared to the highest level, have been constructed to bushfire protection levels and are actively defended may provide safety. • You must be prepared physically and mentally to defend in these conditions. • The safest place to be is away from bushfire prone areas.	**YOU NEED TO GET READY TO ACT** • Only stay with your property if you are prepared to the highest level. This means your property has been constructed to bushfire protection levels - enclosed eaves, covers over external air conditioners, metal flyscreens etc. • You must be well prepared and able to actively defend your property. This means you have the right equipment and resources to put out fires around your property - enough water supply, petrol/diesel portable pump, generator, protective clothing etc. • If you are not prepared to the highest level, leaving bushfire prone areas early in the day is your safest option.
SEVERE Total Fire Ban	• These are hot, dry and possibly windy conditions for a bush or grass fire. • If a fire starts and takes hold, it will be hard for fire fighters to bring under control. • Well-prepared properties that are actively defended can provide safety.	**YOU NEED TO BE AWARE** • Well-prepared properties that are actively defended can provide safety. This means you have the right equipment and resources to put out fires around your property - enough water supply, petrol/diesel portable pump, generator, protective clothing etc.

	• You must be prepared physically and mentally to defend in these conditions.	• Leave bushfire prone areas early in the day is your safest option.
VERY HIGH	• If a fire starts, it is likely to be controlled in these conditions and buildings can provide safety. • Be aware of how fires can start and reduce the risk.	• Monitor conditions. • You may need to act. • Leave if necessary.
HIGH		
LOW-MODERATE		

11 MANAGEMENT RESPONSIBILITIES

White Rock Quarry Management shall identify daily the Fire Danger Rating for the Adelaide Hills Fire Area during the Bush Fire Season and identify the course of action (whether to stay or leave the site). White Rock Quarry management shall consult with higher management on either Severe, Extreme or Catastrophic Fire Danger Rating Days, prior to shift start.

11.1 Fire Danger Rating Considerations

The following considerations shall be undertaken when determining the course of action during these days with the above noted Fire Danger Ratings. As per SA Country Fire Service recommendations, it is not recommended that Management and Workers stay and defend the site if:

- There is a Catastrophic Fire Danger Rating.
- There is an Extreme Fire Danger Rating and the site or refuges have not been specially designed and constructed.
- It is a Total Fire Ban and:
    - White Rock Quarry has not been well maintained and management and workers do not have the right equipment or a plan (this Plan) to stay and defend.
    - White Rock Quarry Management and Workers are not emotionally prepared and physical fit for what may lie ahead.

11.2 Management Actions on days of Severe, Extreme or Catastrophic Fire Danger Rating

- Check the Fire Danger Rating for the next day and the morning of that day and confer with higher management to ascertain the need to open the site for normal operations.

- Should the need to close the site for the next day's operations confer with all workers as to the decision taken.

- Should conditions change rapidly or deteriorate during the day undertake Toolbox Talk and remind all workers of the plan and check that they understand their role and the plan to for Evacuation of the site to a "Safer Place" if safe to do so, if not follow the Bushfire Management Plan and Emergency plan

  - Ensure workers let their families know what the plan is to do.

  - Check site pumps and any generators.

  - Wet down surrounding areas with the Water Truck.

  - Block down pipes and fill gutters with water.

  - Move flammable items away from buildings shut off gas at the bottle(s).

  - Prepare for completed site evacuation in consultation with CFS.

12 EMERGENCY ITEMS

Consideration should be had for the provision of the following items within the site:

- Extra Fire Extinguishers – a stock of spare fire extinguishers should be available for transport and use at refuge(s) in the event of a Bushfire impact.

- Drinking Water – a minimum of one 5 litres cask of spring water per refuge should be made available.

13 REFERENCE

Legislative requirements as well as guidelines and codes that are relevant to the Bushfire Management Plan.

- Country Fires Act 1989
- Fire and Emergency Services Act 2005
- Emergency Management Act 2004
- Native Vegetation Act 1991
- Environment Protection and Biodiversity Conservation Act 1999
- Code of Practice for fire management on Public Land in South Australia 2012-2016
- The National Parks and Wildlife Act 1972
- Wilderness Protection Act 1992

ADDITIONAL INFORMATION

Maps related to Bushfire Risk

Scale 1:10000

0 500metres

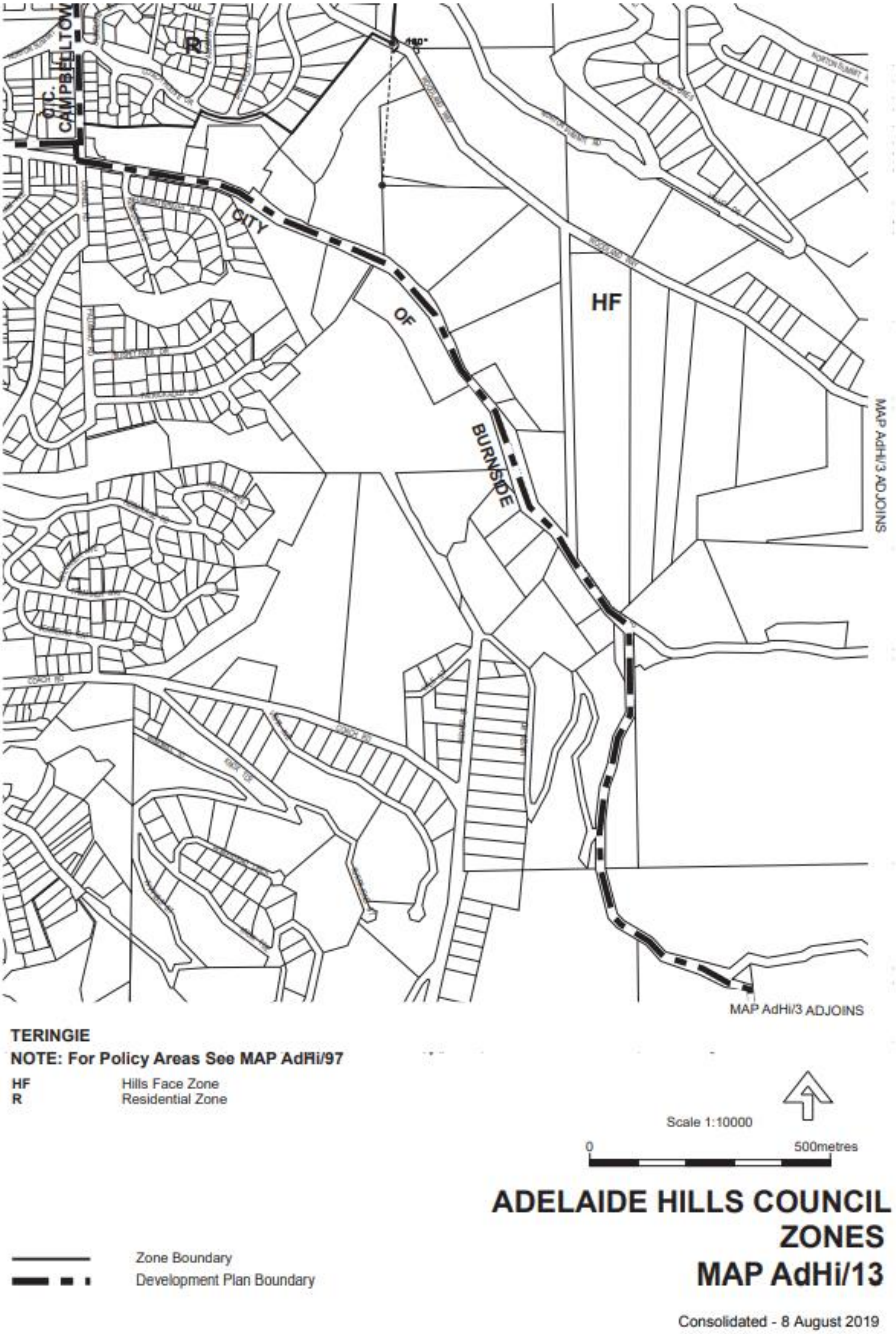
High Bushfire Risk

Excluded Area from Bushfire Protection Planning Provisions

Development Plan Boundary

ADELAIDE HILLS COUNCIL
BUSHFIRE PROTECTION AREA
FIGURE AdHi(BPA)/11

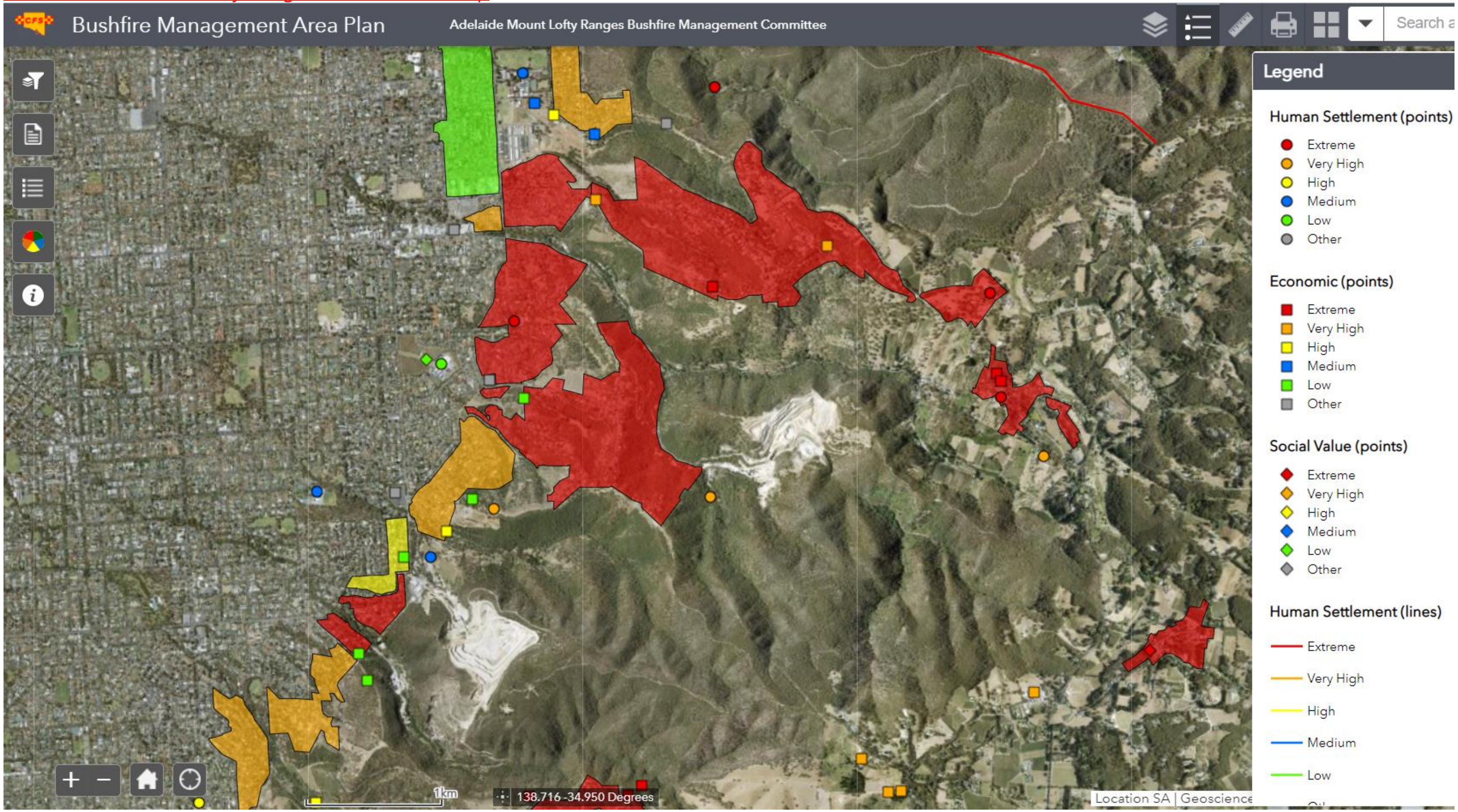
Consolidated - 24 October 2017



[Adelaide Hills Council Development Plan (dit.sa.gov.au)](dit.sa.gov.au)

Adelaide and Mount Lofty Ranges - Status: Approved (July 2016)

Adelaide and Mount Lofty Ranges BMAP Online Map



Attachment 4

Visual Assessment Photomontage

Plate 1: VP01 – Photo Location 1 (Reserve on corner of Edward Street and St Bernard Road, Magill) - Base.

Plate 2: VP01 – Photo Location 1 (Reserve on corner of Edward Street and St Bernard Road, Magill) - Stage 1.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP01 Photo Plates – Sheet 1		
Hanson Construction Materials Pty Ltd	GROUNDWORK **plus**	Date: 21/12/2022	Ref. 1901.600.002v1

Plate 3: VP01 – Photo Location 1 (Reserve on corner of Edward Street and St Bernard Road, Magill) - Stage 2.

Plate 4: VP01 – Photo Location 1 (Reserve on corner of Edward Street and St Bernard Road, Magill) - Stage 3.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP01 Photo Plates – Sheet 2		
Hanson Construction Materials Pty Ltd	GROUNDWORK plus	Date: 21/12/2022	Ref. 1901.600.002v1

Plate 5: VP01 – Photo Location 1 (Reserve on corner of Edward Street and St Bernard Road, Magill) - Stage 3a.

Plate 6: VP02 – Photo Location 2 (Roadside adjacent 64 Woodland Way, Teringie) - Base.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP01 Photo Plates – Sheet 3		
Hanson Construction Materials Pty Ltd	GROUNDWORK plus	Date: 21/12/2022	Ref. 1901.600.002v1

Plate 7: VP02 – Photo Location 2 (Roadside adjacent 64 Woodland Way, Teringie) - Stage 1.

Plate 8: VP02 – Photo Location 2 (Roadside adjacent 64 Woodland Way, Teringie) - Stage 2.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP02 Photo Plates – Sheet 4		
Hanson Construction Materials Pty Ltd	GROUNDWORK **plus**	Date: 21/12/2022	Ref. 1901.600.002v1

Plate 9: VP02 – Photo Location 2 (Roadside adjacent 64 Woodland Way, Teringie) - Stage 3.

Plate 10: VP02 – Photo Location 2 (Roadside adjacent 64 Woodland Way, Teringie) - Stage 3a.

1901 Hanson – White Rock Quarry	**MOP Review Visual Montage – VP02 Photo Plates – Sheet 5**		
Hanson Construction Materials Pty Ltd	GROUNDWORK **plus**	Date: 21/12/2022	Ref. 1901.600.002v1

Plate 11: VP03 – Photo Location 3 (Roadside adjacent 631 Old Norton Summit Road, Norton Summit) - Base.

Plate 12: VP03 – Photo Location 3 (Roadside adjacent 631 Old Norton Summit Road, Norton Summit) - Stage 1.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP03 Photo Plates – Sheet 6		
Hanson Construction Materials Pty Ltd	GROUNDWORK **p l u s**	Date:	Ref.
		21/12/2022	1901.600.002v1

Plate 13: VP03 – Photo Location 3 (Roadside adjacent 631 Old Norton Summit Road, Norton Summit) - Stage 2.

Plate 15: VP03 – Photo Location 3 (Roadside adjacent 631 Old Norton Summit Road, Norton Summit) - Stage 3.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP03 Photo Plates – Sheet 7		
Hanson Construction Materials Pty Ltd	GROUNDWORK plus	Date:	Ref.
		21/12/2022	1901.600.002v1

Plate 16: VP03 – Photo Location 3 (Roadside adjacent 631 Old Norton Summit Road, Norton Summit) - Stage 3a.

Plate 17: VP04 – Photo Location 4 (Roadside adjacent 120 Coach Road, Skye) - Base.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP03 Photo Plates – Sheet 8		
Hanson Construction Materials Pty Ltd	GROUNDWORK plus	Date: 21/12/2022	Ref. 1901.600.002v1

Plate 18: VP04 – Photo Location 4 (Roadside adjacent 120 Coach Road, Skye) - Stage 1.

Plate 19: VP04 – Photo Location 4 (Roadside adjacent 120 Coach Road, Skye) - Stage 2.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP04 Photo Plates – Sheet 9		
Hanson Construction Materials Pty Ltd	GROUNDWORK plus	Date: 21/12/2022	Ref. 1901.600.002v1

Plate 20: VP04 – Photo Location 4 (Roadside adjacent 120 Coach Road, Skye) - Stage 3.

Plate 21: VP04 – Photo Location 4 (Roadside adjacent 120 Coach Road, Skye) - Stage 3a.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP04 Photo Plates – Sheet 10		
Hanson Construction Materials Pty Ltd	GROUNDWORK plus	Date: 21/12/2022	Ref. 1901.600.002v1

Plate 22: VP05 - Photo Point 5 (Private property at 84 Coach Road, Skye) - Base.

Plate 23: VP05 - Photo Point 5 (Private property at 84 Coach Road, Skye) - Stage 1.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP05 Photo Plates – Sheet 11		
Hanson Construction Materials Pty Ltd	GROUNDWORK plus	Date: 21/12/2022	Ref. 1901.600.002v1

Plate 24: VP05 - Photo Point 5 (Private property at 84 Coach Road, Skye) - Stage 2.

Plate 25: VP05 - Photo Point 5 (Private property at 84 Coach Road, Skye) - Stage 3.

1901 Hanson – White Rock Quarry	**MOP Review Visual Montage – VP05 Photo Plates – Sheet 12**		
Hanson Construction Materials Pty Ltd	GROUNDWORK **plus**	Date:	Ref.
		21/12/2022	1901.600.002v1

Plate 26: VP05 - Photo Point 5 (Private property at 84 Coach Road, Skye) - Stage 3a.

1901 Hanson – White Rock Quarry	MOP Review Visual Montage – VP05 Photo Plates – Sheet 12		
Hanson Construction Materials Pty Ltd	GROUNDWORK **plus**	Date: 21/12/2022	Ref. 1901.600.002v1

Attachment 5

Light Spill Assessment

DECEMBER 2020

GROUNDWORK PLUS

WHITE ROCK QUARRY

LIGHT SPILL MEASUREMENTS

Question today
Imagine tomorrow
Create for the future

White Rock Quarry
Light Spill Measurements

Groundwork Plus

WSP
Level 1, 1 King William Street
Adelaide SA 5000
GPO Box 398
Adelaide SA 5001

Tel: +61 8 8405 4300
Fax: +61 8 8405 4301
wsp.com

REV	DATE	DETAILS
0	22 December 2020	Initial issue

	NAME	DATE	SIGNATURE
Prepared by:	Adam Cook	22 December 2020	
Reviewed by:	Gavin Hall	22 December 2020	
Approved by	Simon Moore	22 December 2020	

TABLE OF CONTENTS

GLOSSARY

Light spill	Light emitted by a lighting installation which falls outside the boundary of the property on which the installation is sited
Lux	The SI derived unit of illuminance, equal to one lumen per square meter. Used as an objective measure of perceived intensity of light.

1 INTRODUCTION

1.1 SITE

Groundwork Plus has engaged WSP to undertake measurements of light spill from the White Rock Quarry.

White Rock Quarry (the Site) is located at Horsnells Gully Road, approximately 1km west of Norton Summit. The Site is operated by Hanson Construction Materials Pty Ltd (Hanson).

1.2 PURPOSE AND SCOPE

The purpose of this assessment is to quantify the artificial illumination levels within the site and at adjacent locations, and ascertain if spill light presents a significant environmental emission from the site.

The scope of this assessment is limited to measurement of existing illuminance levels within the site boundary and at representative receiver locations. Information regarding the operation of on-site lighting has been provided by Hanson.

Survey and/or inventory of individual luminaires is outside of the scope of this assessment.

2 CRITERIA

2.1 AUSTRALIAN STANDARD 4282

Assessment criteria for light spill were adopted from Australian/New Zealand Standard *AS/NZS 4282:2019 Control of the Obtrusive Effects of Outdoor Lighting* (AS/NZS 4282). Criteria are summarised in Table 2.1

Table 2.1 AS/NZS 4282 recommended maximum illuminance in the vertical plane during curfewed hours

AREA	MAXIMUM ILLUMINANCE (LUX)	
	NON-CURFEW HOURS	CURFEWED HOURS
A0 – Intrinsically dark	-	0 lx
A1 - Dark	2 lx	0.1 lx
A2 – Low district brightness	5 lx	1 lx
A3 – Medium district brightness	10 lx	2 lx
A4 – High district brightness	25 lx	5 lx

Curfew/Non-curfew limits apply at a position 10 metres inside of the relevant boundaries (as defined by clause 3.3.1.3) of nearby residential properties, in the vertical plane parallel to the relevant boundary, to a height commensurate with the height of the potentially affected dwellings. Values given are for the direct component of illuminance.

To account for the worse-case scenario, maximum illuminance values have been taken under Curfewed Hours; corresponding to between hours of 23:00 and 06:00 daily as defined by AS/NZS 4282.

The quarry is situated in the Adelaide Hills, on the fringe of residential, rural and conservation park areas. The area directly surrounding the site is a mixture of low-density residential and conservation uses. The residential areas are illuminated by sparsely-placed street lighting. It is considered that assessment against the 'A2 – Low district brightness' criteria provides a conservative assessment of illuminance levels from the Site.

3 MEASUREMENTS

Measurements were undertaken on Friday 4 December 2020, between 03:00 and 05:00. Hanson staff were present during the measurements to escort WSP staff around the site, and ensured that all regularly-lit luminaries were active and functioning normally during the measurements.

3.1 ENVIRONMENTAL CONDITIONS

Measurements were scheduled commencing in the early morning, prior to nautical twilight, to minimise the influence of natural light on the measured levels.

Moon phase data was sourced from Geoscience Australia and the Bureau of Meteorology. The moon was reported as 94% full. During the measurements the moon was visible in the sky, located at an altitude of 30°, with moonset occurring at 08:46. Moonlight did not appear to influence the measurements, with ambient horizontal illuminance measured as 0 Lux throughout the measurements.

Sky conditions observed on site were clear (estimated 0 Oktas cloud cover).

3.2 SITE LIGHTING LAYOUT

Prior to the site visit, Hanson advised of the positioning of the on-site lighting. On-site lighting is utilised to illuminate work areas around the weighbridge, concrete plant, processing plant and workshop when natural light is not sufficient for safe operation.

Luminaires are typically LED floodlights, mounted to buildings or site structures such as power poles. Dedicated light towers were not observed. There is also internal lighting for select buildings which is visible externally through windows.

The location of luminaires observed to be operational while on site is shown in Figure 3.1 through Figure 3.4. Floodlights with specific orientation are shown with the direction of the luminaire identified as an orange arrow. Site buildings where internal lighting was visible are shown highlighted in yellow.

Figure 3.1 Site lighting – Site office, weighbridge and transport area

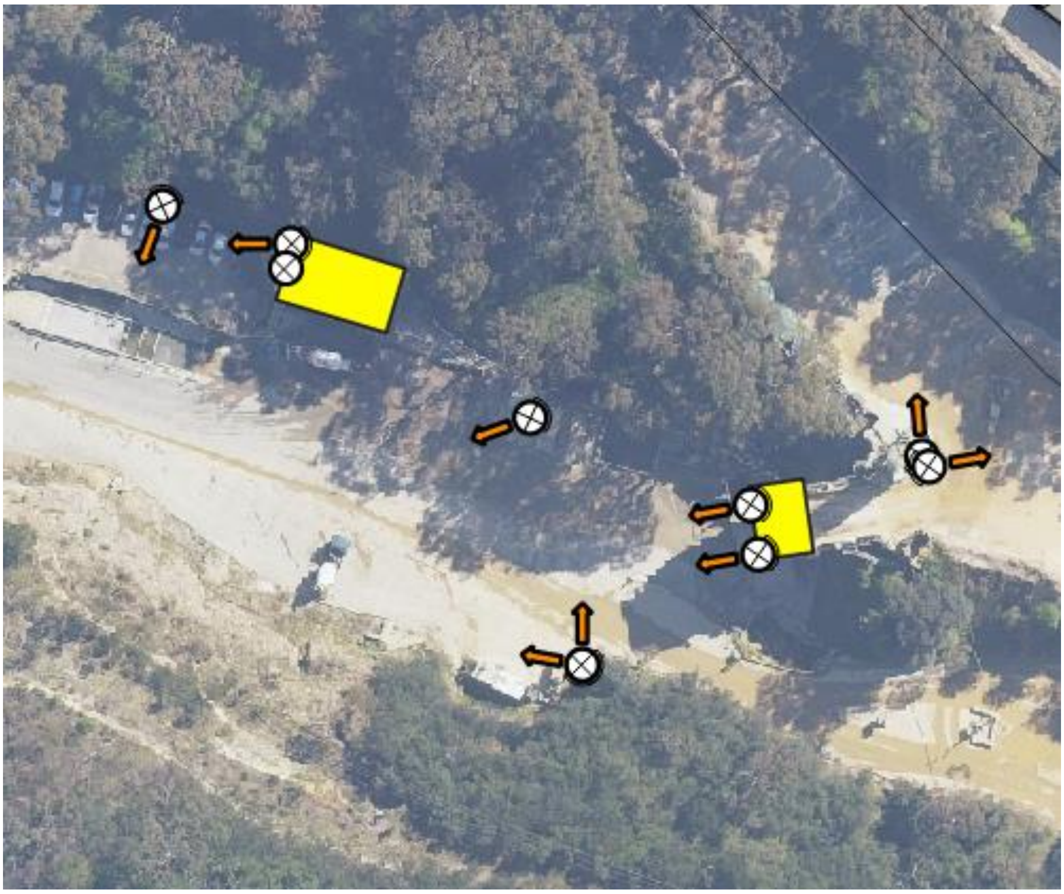


Figure 3.2 Site lighting – Concrete plant

Figure 3.3 Site lighting – Processing plant

Figure 3.4 Site lighting – Workshop

3.3 METHODOLOGY

The terrain surrounding the site is undulating and heavily vegetated. There is limited direct line of sight between luminaries and many of the closest residential locations. Receivers with direct line of sight to illuminated areas of the Site are limited to residential locations within the Suburb of Skye, which overlooks Horsnell Gully and Site. The terrain, luminaries and receiver locations are shown in Figure 3.5.

Measurements of illuminance were taken at representative locations surrounding the Site, including publicly accessible locations in Teringie, Norton Summit and Skye; respecting the private property of landholders. It was elected to supplement these receiver measurements with on-site measurements of the illuminance levels in close proximity to each illuminated area. On-site measurements were taken in the lit area adjacent the luminaire, moving further away until vertical plane illuminance levels were found to be within the most stringent of the criteria levels (1 lux), or there was an obstruction preventing movement further away.

Measurements of illuminance were taken with the sensor orientated in the vertical and horizontal plane at a height of between 1.2-1.5 metres above the ground plane:

- Vertical-plane measurements orientate the sensor towards the luminaire.
- Horizontal-plane measurements orientate the sensor directly upwards, towards the sky.

Figure 3.5 Site lighting, terrain contours and nearest receiver property locations (green outline)

The measurement locations corresponding to the tabulated measurement results are shown in Figure 3.6 through Figure 3.9.

Figure 3.6 Measurement locations – Site office, weighbridge and transport area

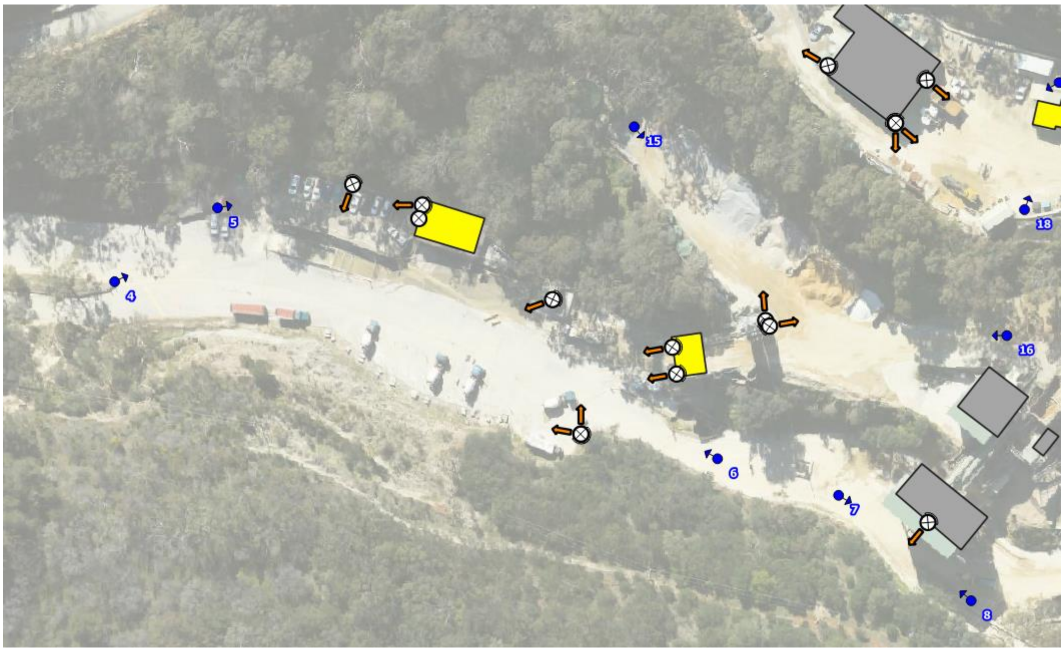


Figure 3.7 Measurement locations – Concrete plant

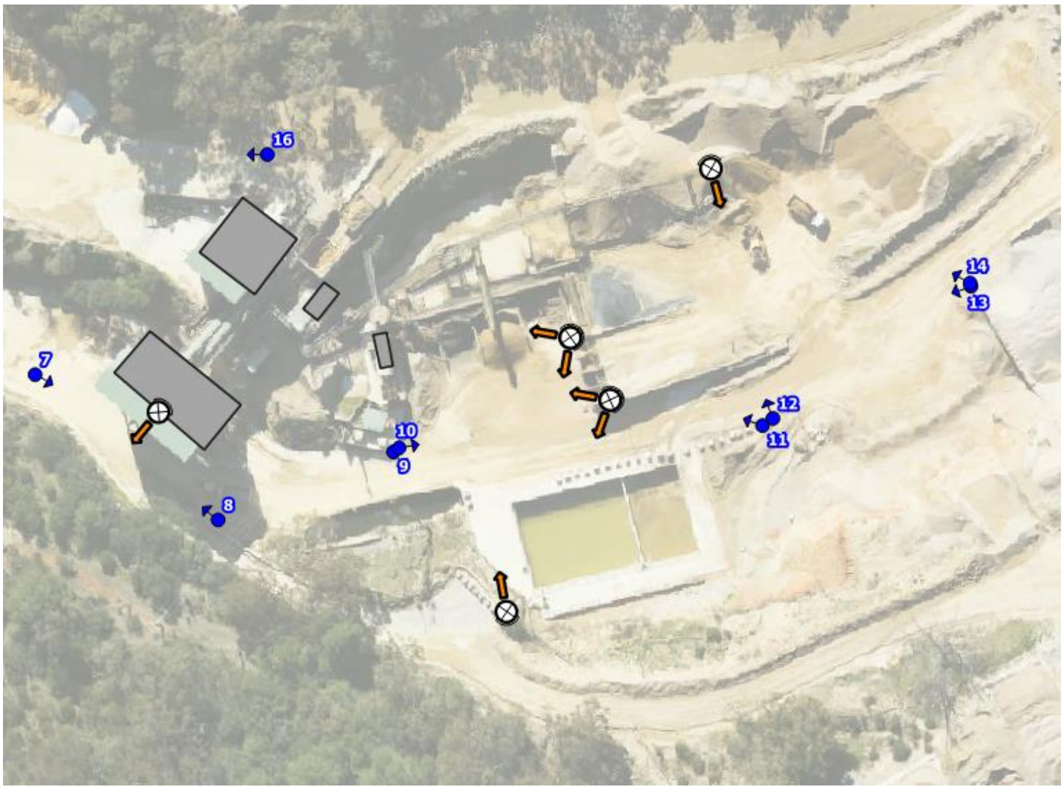


Figure 3.8 Measurement locations – Processing plant

Figure 3.9 Measurement locations - workshop

Figure 3.10 shows the measurement locations corresponding to residential land use surrounding the Site.

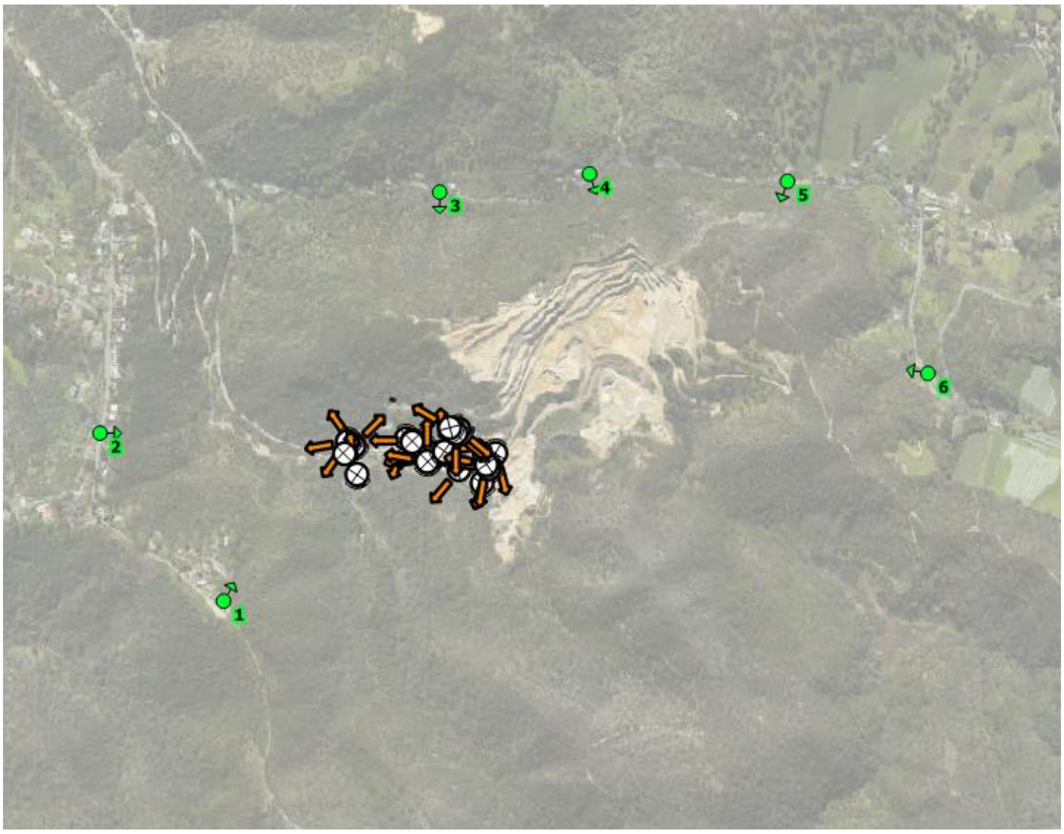


Figure 3.10 Measurement locations – Quarry surrounds

3.4 INSTRUMENTATION

A Hagner EC1-x Lux Meter (Serial number 54693) was used for the illuminance measurements, shown in Figure 3.11. This instrument carries a current NATA certificate of calibration, a copy of which is included in Appendix A.

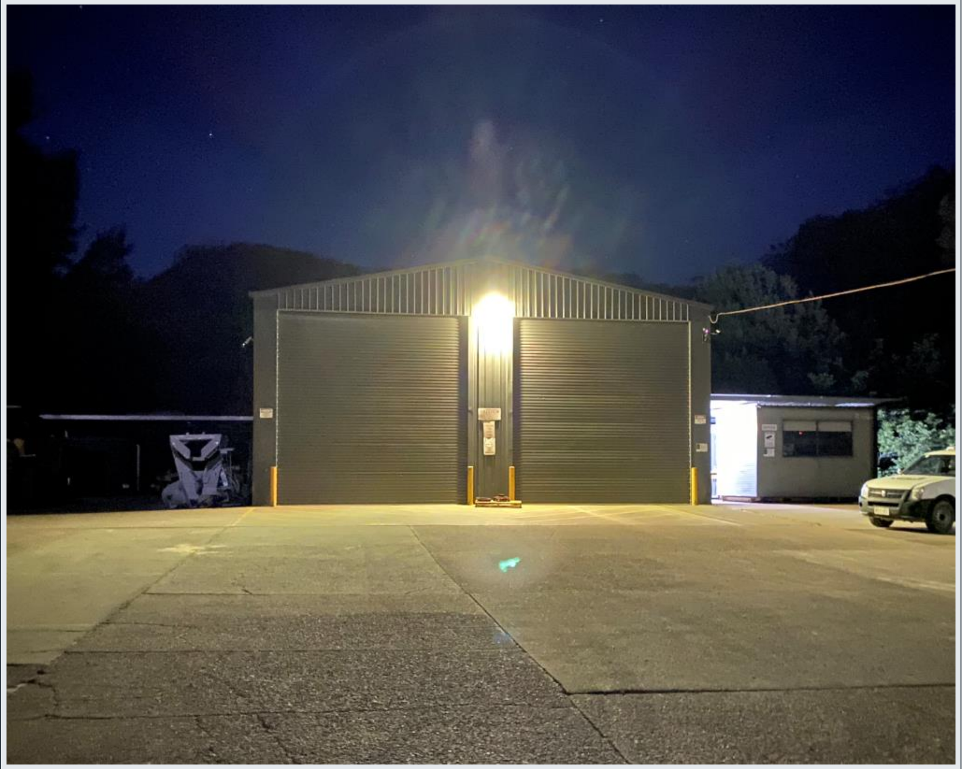
Figure 3.11 Lux meter

3.5 RESULTS – ON SITE

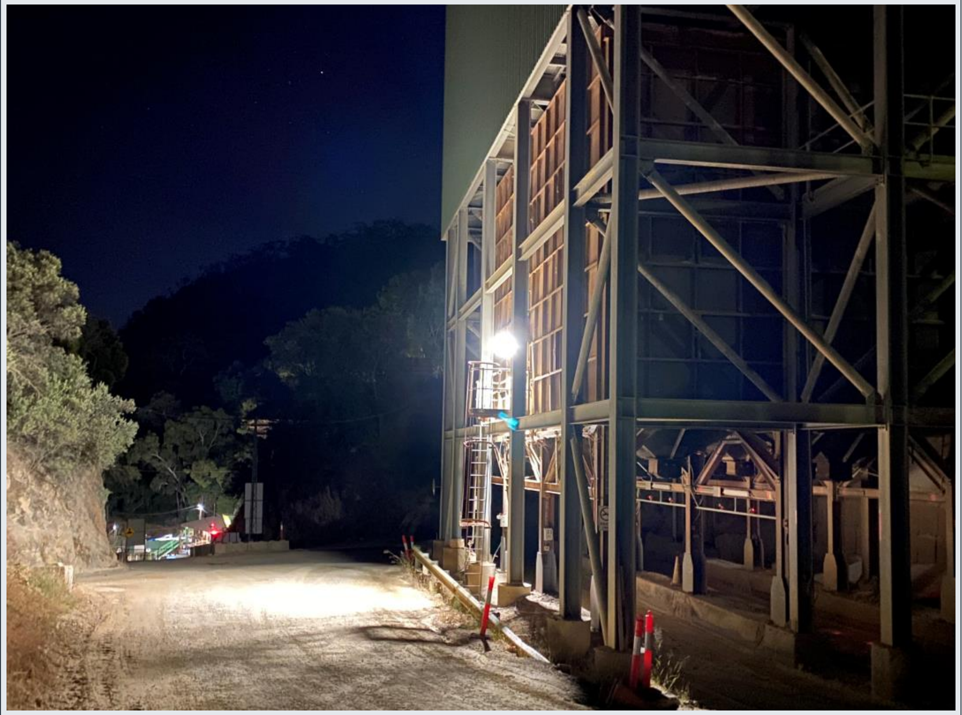
Results of the light spill measurements taken within the Site boundary are presented in Table 3.1

Table 3.1 Light spill on-site measurement results

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
1	1	0	Approximately 5 metres from quarry front gate and 35 metres from Site Office floodlights. Illuminance levels compliant with 1 lux criterion at this setback distance or further from lighting.	
2	72	17	At site office facing weighbridge floodlighting, 10 metres from luminaries.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
3	1	0	Transport area hardstand, approximately 30 metres from floodlight. Illuminance levels compliant with 1 lux criterion at this setback distance or further from lighting.	
4	4	0	Concrete plant staff parking area, approximately 35 metres to nearest flood light.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
5	1	0	Site road, approaching concrete plant, approximately 60 metres from nearest floodlight. Illuminance levels compliant with 1 lux criterion at this setback distance or further from concrete plant lighting	
6	1	0	Site road, adjacent concrete plant, approximately 25 metres from nearest floodlighting, noting that nearest luminaries are directed away from this location. Illuminance levels compliant with 1 lux criterion at this setback distance or further from concrete plant lighting	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
7	1	0	Site road, adjacent screenhouse, approximately 23 metres from floodlight. Illuminance levels compliant with 1 lux criterion at this setback distance or further from screenhouse flood light	
7	1	0	Site road, adjacent screenhouse, approximately 23 metres from floodlight. Illuminance levels compliant with 1 lux criterion at this setback distance or further from screenhouse flood light.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
9	1	0	In Sales Yard, approximately 35 metres from pugmill floodlights Illuminance levels compliant with 1 lux criterion at this setback distance or further from pugmill flood lights.	
10	1	0	In Sales Yard, approximately 35 metres from Power pole lighting overlooking sediment catchment basin. Illuminance levels compliant with 1 lux criterion at this setback distance or further from the flood light shown.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
11	2	0	Overlooking sales yard lighting facing north-west. Measurement located approximately 28 metres from floodlights on Pugmill.	
12	2	0	Overlooking Sales Yard facing north, approximately 45 metres from floodlight on Sales Yard conveyer.	

<table>
<tr><th rowspan="2">LOCATION</th><th colspan="2">ILLUMINANCE [LUX]</th><th rowspan="2">COMMENTS</th><th rowspan="2">PHOTO</th></tr>
<tr><th>VERTICAL PLANE</th><th>HORIZONTAL PLANE</th></tr>
<tr><td>13</td><td>1</td><td>0</td><td>Overlooking sales yard lighting facing west. Measurement located approximately 70 metres from floodlights on Pugmill.
Illuminance levels compliant with 1 lux criterion at this setback distance or further from the Pugmill flood lights.</td><td></td></tr>
</table>

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
14	1	0	Overlooking sales yard lighting facing north-west. Measurement located approximately 50 metres from floodlights on Sales Yard conveyor. Direct line of sight from illuminance meter to floodlight, although mounding present in foreground. Illuminance levels compliant with 1 lux criterion at this setback distance or further from the conveyor flood light.	
15	1	0	In stockpile area for concrete plant aggregates. Approximately 60 meters from concrete plant hopper area floodlights. Illuminance levels compliant with 1 lux criterion at this setback distance or further from the concrete plant hopper area flood lights.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
16	1	0	Access road between concrete plant and processing plant. Approximately 60 meters from concrete plant hopper area floodlights. Illuminance levels compliant with 1 lux criterion at this setback distance or further from the concrete plant hopper area flood lights.	
17	1	0	On access road east of workshop. Approximately 75 metres to workshop floodlights. Illuminance levels compliant with 1 lux criterion at this setback distance or further from the workshop hardstand area flood lights.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
18	1	0	Southern side of Workshop hardstand, facing breakroom. Approximately 20 metres to breakroom. Note that Workshop Floodlights were shielded by plant on the workshop hardstand. Level represents mostly illuminance from breakroom lighting.	
19	18	0	At breakroom facing workshop, 35 metres from workshop floodlights.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
20	1	0	On access road west of workshop. Approximately 50 metres to workshop floodlights. Illuminance levels compliant with 1 lux criterion at this setback distance or further from the workshop building flood light.	

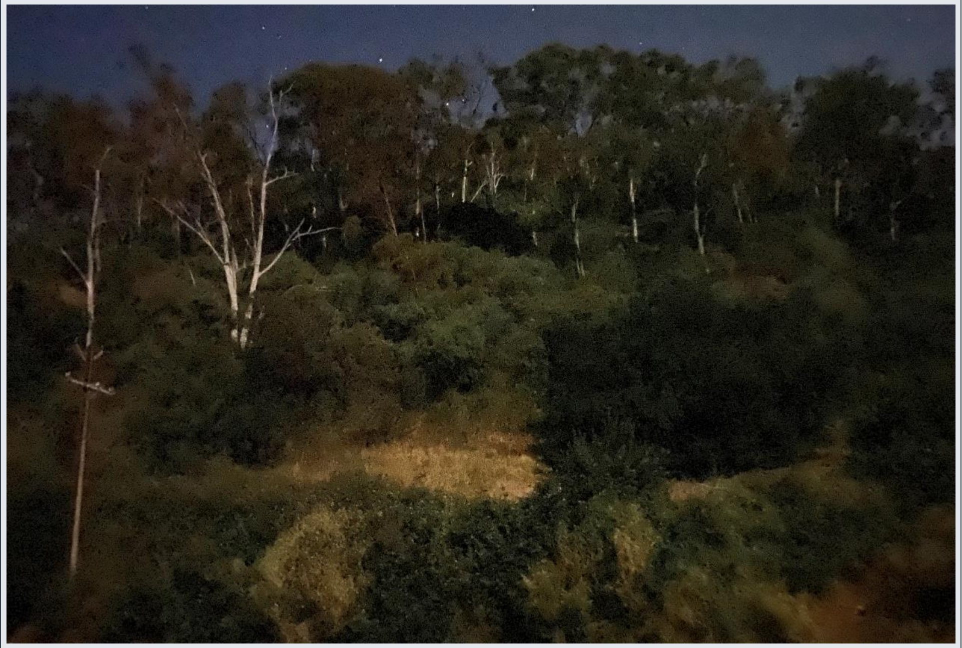
3.6 RESULTS – OFF SITE

Results of the light spill measurements taken in publicly accessible areas outside the Site boundary are presented in Table 3.2

Table 3.2 Light spill off-site measurement results

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
1	0	8	On public land adjacent carpark at the top of Coach Road. Sodium lamp public carpark lighting illuminating the foreground of the image, and influences the horizontal plane result. Lighting visible from White Rock Quarry, however vertical plane measurement result of 0 Lux was measured, compliant with 1 lux criterion.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
2	0	0	Roadside of Coach Road, facing quarry which is visible in an open space between two houses. Lighting from White Rock Quarry visible in the gully below. Measured illuminance level compliant with the 1 lux criterion.	
3	0	0	On side of Old Norton Summit Road, adjacent residential property entrances. No visible light from White Rock Quarry. Measured illuminance level compliant with the 1 lux criterion.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
4	0	0	On side of Old Norton Summit Road, adjacent residential property entrances. No visible light from White Rock Quarry. Measured illuminance level compliant with the 1 lux criterion.	
5	0	0	On side of Old Norton Summit Road, adjacent Third Creek. No visible light from White Rock Quarry. Measured illuminance level compliant with the 1 lux criterion.	

LOCATION	ILLUMINANCE [LUX]		COMMENTS	PHOTO
	VERTICAL PLANE	HORIZONTAL PLANE		
6	0	0	On side of Old Norton Summit Road, adjacent hairpin bends beginning the ascent to Norton Summit. No visible light from White Rock Quarry. Measured illuminance level compliant with the 1 lux criterion.	

3.7 DISCUSSION

Illuminance levels were compared to the 'Curfewed hours, A2 – Low district brightness' criterion of 1 Lux. It is noted that this criterion is normally applicable on the boundary of properties containing residential structures, between hours of 23:00 and 06:00. Measurements closer to the light source provide a conservative measure of the light spill level relative to this location.

From the on-Site measurement results, generally, illuminance levels were less than or equal to 1 Lux at the following distances to the Luminaries (with direct line of sight):

- Site office and weighbridge – 35 metres
- Transport area hardstand – 30 metres
- Concrete plant hardstand – 60 metres
- Processing plant (screenhouse) – 23 metres
- Sales Yard – 70 metres
- Concrete plant hopper and stockpiles – 60 metres
- Workshop 75 metres

Each of these distances are much less than the closest separation distance between luminaries and the site boundary. The nearest residential buildings are further again.

Residential locations do not have direct line of sight, with the exception of selected receivers on the eastern side of Coach Road in the suburb of Skye. These receivers overlook Horsnell Gully, and consequently the quarry Site. Illuminated areas of the site were visible at measurement locations representative of these receivers, however measured illuminance levels were found to comply with the assessment criteria.

From the above, light spill levels from the surveyed on-Site lighting at White Rock Quarry are unlikely to exceed the AS/NZS 4282 criterion at the applicable residential boundary locations surrounding the Site.

4 CONCLUSION

WSP undertook measurements of illuminance levels from lighting in use on the White Rock Quarry.

Site lighting was observed to be comprised of fixed floodlights and some internally lit site buildings. It is understood that this lighting is used daily until ambient light is sufficient for safe operation.

Illuminance levels from this site lighting were found to be less than or equal to the most stringent illuminance criterion at set-back distances of much less than the distance between luminaries and the site boundary.

APPENDIX A

CALIBRATION CERTIFICATE

LightLab INTERNATIONAL

LightLab International
Brisbane QLD 4019.

ilac-MRA NATA

Accredited for compliance with ISO/IEC 17025 - Calibration.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.
Accreditation No. 2258.

Report of Calibration LL22911

Client	Company	TR Pty. Ltd.	Address	18 Joseph Street, Blackburn North, VIC 3130.
	Contact	Cris Ascenzo		Ph: 03 9896 3000
Meter	Make	Hagner		
	Model	EC1-x		
	Serial no.	54693		
	Ref. plane	Front face of diffuser		
	Notes	Asset #: 202015 Cable/socket repaired prior to calibration.		
	Compliance	Infra-red response within BS667 limits for both field & laboratory meters.		

Calibration

(a) To determine the illuminance response of the meter when tested over a range of values in accordance with BS667:1996 clauses "B.2 Calibration Methods" and "B.2.1. Using a reference lamp".

(b) To determine the response of the meter when illuminated with light transmitted through three coloured filters.

(c) To determine the infra-red response of the meter when irradiated through a Schott RG780 near-IR transmitting filter.

Procedure Cal-Z1001. Reference illuminance setpoints were realised on a four metre optical rail, calibration points using a radiance source. In both cases the illuminating source was operated at a CCT equivalent to the CIE Standard Illuminant A. Appropriate filters and baffling were used during all measurements to ensure the elimination of stray light.

Traceability

Reference standards	Photo Research PR-670 spectroradiometer, Czibula Ph-St-B11,3 photodetector
Working standards	LightLab optical rail, Photo Research LRS-455 luminance source

Uncertainties

Measurement uncertainties are calculated at the 95% confidence interval with factor $k = 2$ & are estimated to be:

Illuminance	Refer table of results
Temperature	+/- 1 degree C
Luminous Transmittance	Refer table of results
Infrared Transmittance *	Refer table of results
Correction Offset *, Correction Factor *	Informational values only

Notes

Quantities marked with * : NATA accreditation does not cover the performance of this service. Results relate only to the item that was calibrated in the condition that it was received. Results are "as found" unless otherwise noted.

Where compliance against a limit has been reported, the decision rule used does not consider the uncertainty of measurement.

Authorised Signatory Toby Southgate

Date of Calibration 15-Oct-2020
Date of Report 15-Oct-2020

ORIGINAL REPORT

USA west coast LightLab International, LLC 24825 N. 16th Avenue Suite 125 Phoenix, AZ, 85085 Ph : +1 623-434-1499 Fx : +1 623-434-1492 www.lightlabint.com

USA east coast LightLab Int'l Allentown LLC 905 Harrison Street Suite 135 Allentown, PA 18103 Ph: +1 484-273-0705 www.lightlabint.com

Australasia & S.E. Asia LightLab International 50 Redcliffe Gardens Drive Clontarf Queensland, 4019, Australia Ph : +61 7 3283 7862 Fx : +61 7 3283 8751 www.lightlabint.com (issuing laboratory)

Attachment 6

White Rock Quarry Operational Noise Assessment

OCTOBER 2022

GROUNDWORK PLUS

WHITE ROCK QUARRY

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REV	DATE	DETAILS
1	21/10/2022	Initial issue

	NAME	DATE	SIGNATURE
Prepared by:	Leanne Farmer	21/10/2022	
Reviewed by:	Adam Cook	21/10/2022	
Approved by:	Adam Cook	21/10/2022	

TABLE OF CONTENTS

GLOSSARY

Acoustic terminology

A-Weighting	The "A" weighting scale is designed to adjust the absolute sound pressure levels to correspond to the subjective response of the human ear.
Assessment period	15-minute period of time for noise emission assessment against criteria derived from the Noise Policy
Day time	Time period between 07:00 and 22:00, as defined in the Noise Policy
dBA	A-Weighted sound pressure level measured in decibels.
L_{Aeq}	Equivalent (energy averaged) noise level measured over a time period. This noise descriptor is commonly used in environmental noise policies and assessments. The time period the measurement is averaged over may be included in the subscript, i.e. $L_{Aeq,15min}$
Night time	Time period between 22:00 and 07:00, as defined in the Noise Policy
Noise Policy	South Australian *Environment Protection (Noise) Policy (2007)*

Extractive industry terminology and abbreviations

ADT	Articulated Dump Truck
EXC	Excavator
FEL	Front End Loader
HME	Heavy Mobile Equipment
MOP	Mine Operation Plan
RD	Rock Drill / Blast-hole drill
RDT	Rigid Dump Truck
ROM	Run of Mine – Unprocessed material extracted from shot face
ROM Pad	Area of quarry Site where ROM material is temporarily stockpiled prior to crushing
Shot face	The area of the quarry pit which is being actively blasted with resulting material extracted for processing

TPA	Tonnes per Annum, a measure of material throughput
WC	Water Cart

Other Terminology and abbreviations

DEM	South Australian Department for Energy and Mining
EPA	South Australian Environment Protection Authority

1 INTRODUCTION

Groundwork Plus has engaged WSP to undertake an Operational Noise Assessment of the proposed MOP Review of the Hanson White Rock Quarry (the Project).

1.1 BACKGROUND

White Rock Quarry (the Site) is located at Horsnells Gully Road, approximately 1km west of Norton Summit. The Site is operated by Hanson Construction Materials Pty. Ltd. (Hanson).

The Site primarily produces construction aggregates, as well as manufacturing concrete from the on-Site batching plant (Hanson Magill Concrete Plant). Site extractive operations commence with extraction from the active quarry face, through haulage to the on-Site crushing and screening plant, then stockpiling, loading and sales of finished product.

The Site currently operates under a Private Mine (PM 188), This is shown overlaid on an aerial image of the Site in Figure 1.1.

Figure 1.1 White Rock Quarry location and PM 188

The MOP Review of the White Rock Quarry is detailed in the Quarry Development Plan (QDP). The QDP has been developed by Groundwork Plus, and considers future extraction as incremental Stages of Development (Stages). The duration of each Stage will be dependent on market conditions for quarry products. This assessment considers Operational Noise Impacts for four Stages of future quarry development.

1.2 PURPOSE OF ASSESSMENT

It is intended that this Operational Noise Assessment will be used to inform the MOP Review for the White Rock quarry. Regulatory authorities require that impacts are considered for future operation of the whole quarry Site, across multiple stages of Site development.

As a Whole-of-Site assessment, this document may also inform inputs into the Environmental Impact Assessment with the MOP Review Document.

1.3 NOISE ASSESSMENT METHODOLOGY

The Operational Noise Assessment for the Site involves assessing predicted future noise levels at noise sensitive receptors surrounding the Site (such as residential dwellings) against applicable noise criteria.

The noise assessment utilises computer modelling to predict future noise levels in the vicinity of the Site. Three Stages of Site development from the Quarry Development Plan (QDP) are modelled, with separate analysis of future daytime and night-time noise emissions. These are:

- Stage 1
- Stage 2/3
- Stage 3A

The QDP Stages modelled in this assessment are those which are considered to represent significant changes in the noise emissions from the site, due to changes in landform, operations, or similar. Note that Stages 2 and 3 are quite similar from a noise generation aspect, and so have been combined into one model which considers the worst-case noise emissions from both of these Stages.

Noise models consider the future landform, Site layout, quarry plant noise emission levels, typical vehicle movement patterns and equipment operating conditions for each of the Stages of Site development.

Where future levels are predicted to exceed the noise criteria a noise mitigation strategy is developed. Conceptual noise mitigation is detailed, providing a methodology of treatment to reduce receiver noise levels to satisfy the relevant criteria to the extent which is reasonable and practicable, as required by the regulatory authorities.

1.4 LIMITATIONS

Note that the following are outside the scope of the Operational Noise Assessment:

- Noise and vibration from blasting activities (regulated under Mining Act 1971 and adherence to Australian Standard *AS2187.2 Explosives – Storage and Use*)
- Road traffic noise from vehicles operating on the public road network

2 NOISE SENSITIVE RECEIVERS

2.1 LOCALITY

The White Rock Quarry Site is located in Horsnell Gully, to the west of Norton Summit and east of Skye. The terrain in the quarry area is undulating and the positioning of the Site within a natural gully shields the quarry from surrounding land uses on most sides.

The surrounding area features a mixture of existing residential land, undeveloped land, national park open space, and some semi-rural land uses. Residential locations were identified on the land surrounding the Site, in all direction except due South. To the west of the Site, residential buildings are located on closely spaced suburban allotments. In other areas, residential buildings are located on larger rural allotments, typically supplementing agricultural or hobby-farm land uses. Larger land holdings in the locality were observed to feature animal keeping and horticultural uses such as fruit production. The land to the South of the Site is open space, held as the Horsnell Gully and Giles Conservation Parks.

2.2 RECEIVER LOCATIONS

Noise-sensitive receivers in the Project locality are the properties with residential use as noted in Section 2.1.

In the denser suburban areas to the West of the Site such as the suburb of Skye, representative receiver locations are used for modelling noise emissions for groups of closely spaced receivers with similar noise exposure. In more sparsely populated areas receivers were positioned on individual noise sensitive locations.

For ease of identification, the receiver locations used in modelling have been identified by spatial location. Four groups have been used:

- Skye (receivers S01-S06)
- Horsnell Gully (receivers HG01-HG04)
- Teringie (receivers T01-T10)
- Norton Summit (receivers NS01-NS06)

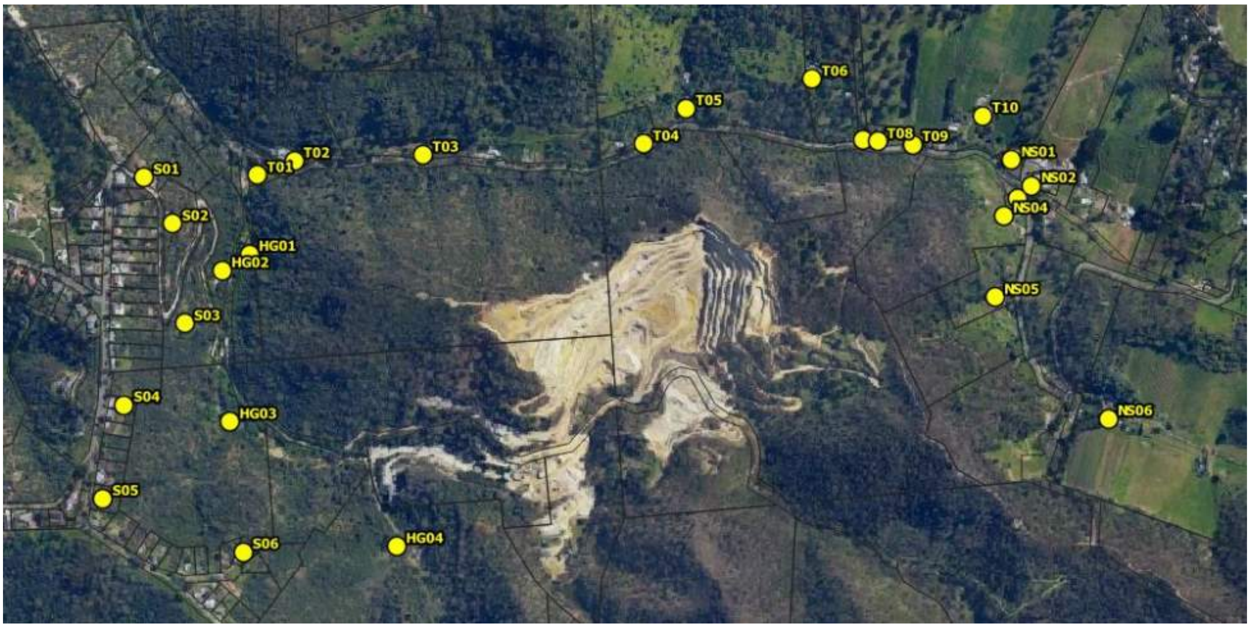

Figure 2.1 Receiver structures surrounding the Site

2.3 EXISTING NOISE ENVIRONMENT

Attended noise measurements were undertaken at noise-sensitive areas in the vicinity of the quarry during a Site visit on 7 April 2020.

Relevant meteorological observations recorded at the nearest Bureau of Meteorology weather station (Mt Lofty) during the attended measurements are presented in Table 2.1

Table 2.1 Bureau of Meteorology Mt Lofty weather station observations

TIME	TEMPERATURE [°C]	WIND SPEED [ms^{-1}]	WIND DIRECTION	HUMIDITY [%]	RAINFALL [mm]
12:00	8	5	WNW	100	0
12:30	8	5	WNW	100	0
13:00	9	5	WNW	100	0
13:30	9	4	WNW	100	0
14:00	9	4	WNW	100	0
14:30	9	4	WNW	100	0

Noise measurements were taken with a NTi XL2 Class 1 sound level meter. Results from the attended noise measurements are summarised in Table 2.2. A copy of the current certificate of calibration for this instrument is provided in Appendix A.

Table 2.2 Noise measurement results

LOCATION	TIME	DURATION	L_{EQ} [dBA]	L_{90} [dBA]	COMMENTS
HG04	12:56	15 minutes	42(1)	30	Quarry audible when vehicles accessing the Site passed the entry gate nearby. Generally, ambient noise consisted of sounds from birds and breeze in trees.
HG03	1:16	5 minutes	37	32	Quarry operation inaudible. Birds and distant construction work from a non-quarry source both audible.
HG02	1:26	7 minutes	40	31	Quarry operation inaudible. Birds, breeze in foliage and crickets audible.
S06	2:39	15 minutes	45	42	Quarry operation audible, typically as a steady noise of rock movement from processing plant. Localised noise from birds, breeze in foliage.
T03	1:40	5 minutes	64	36	Quarry operation inaudible. Mostly noise from steady traffic flow on Old Norton Summit Road. Construction/Earthworks audible at a nearby property.

LOCATION	TIME	DURATION	L_{EQ} [dBA]	L_{90} [dBA]	COMMENTS
T08	1:50	5 minutes	59	46	Quarry operation inaudible. Noise from steady traffic on Old Norton Summit Road. Birds and crickets both audible during lulls in traffic flow.

Notes:

(1) Reported noise level includes a +5 dBA penalty for amplitude modulation character observed during measurements at this location from on-Site truck movements

The existing noise environment in the Site locality varies by location. At locations away from Old Norton Summit Road, the ambient noise consisted mostly of natural sounds such as birds and noise from foliage rustling in the breeze. At locations adjacent Old Norton Summit road the noise environment was controlled by passing road traffic.

Quarry noise was audible at two locations, both to the Southwest of the Site. At HG04 the noise environment was typically controlled by natural sounds, however occasional noise from heavy vehicle movements past the quarry entrance was audible. At S06, the local noise environment was comprised of natural sources, but a steady broadband noise from materials passing through the processing plant was audible from the quarry in the distance.

3 ASSESSMENT CRITERIA

3.1 MINING ACT (1971)

Quarrying operations are regulated under the South Australian *Mining Act (1971)*. DEM is the government body which administers the *Mining Act (1971)*. The Act defines how Mineral Land is delineated into Mining Tenements and how subsequent claims, licenses and leases are granted and managed.

The *Mining Act (1971)* and subordinate regulations do not contain provisions specific to noise. However, it is common practice in South Australia for the extractive industry licensing and approvals to refer to the South Australian Environment Protection Authority's *Environment Protection (Noise) Policy (2007)* (Noise Policy) when assessing noise impacts. The referral to SA EPA policy is formalised under an Administrative Arrangement which recognises a joint responsibility between DEM and SA EPA for regulation of environmental matters, specifically including noise.

Part 4 of the Noise Policy is used when assessing noise emissions from extractive industry.

3.2 NOISE POLICY

In Part 4 of the Noise Policy, compliance is assessed based upon a Source Noise Level being compliant with noise goals. Specifically:

> *"The noise complies with the noise goals if measurements taken in relation to the noise source and the noise-affected premises show that –*
> *(a) The source noise level (continuous) does not exceed the background level plus 5 dBA; or*
> *(b) The source noise level (continuous) does not exceed the indicative noise level for the source"*

The indicative noise levels were derived in accordance with Part 1, Clause 5 of the Noise Policy. They are provided in Table 3.1. Further details of the derivation of noise criteria are provided in Appendix B.

Table 3.1 Noise Policy criteria

RECEIVER ZONE APPLICABLE LAND USE CATEGORIES	**NOISE CRITERIA [$L_{EQ,15MIN}$, dBA]**	
	DAY [07:00-22:00]	**NIGHT [22:00-07:00]**
Hills Face Zone Rural Industry, Rural Living	52	45
Conservation Zone Rural living	50	43

As the activities subject to this assessment are to occur in the future, noise modelling software has been used to predict the Source Noise Levels assessed against the criteria.

The relevant receiver assessment location, time period, and procedures for determining a Source Noise Level are provided in Part 3 of the Noise Policy; Source Noise levels are to be assessed at outdoor locations frequented by persons residing at the residential premises surrounding the Site.

The Source Noise Level considers contributions from all noise sources which could operate during a 15-minute assessment period within the White Rock Quarry.

The Source Noise Level must be adjusted by the following amounts if the noise source contains modulation, tonal, impulsive, or low-frequency characteristics:

- +5 dBA if the noise source contains 1 characteristics
- +8 dBA if the noise source contains 2 characteristics
- +10 dBA if the noise source contains 3 or more characteristics

4 MODELLING METHODOLOGY

4.1 STAGING

4.1.1 STAGING USED IN NOISE MODELS

Noise models have been developed for three Quarry Development Plan Stages provided to WSP by Groundwork Plus:

- Stage 1
- Stage 2 and 3 (combined worst case of Stages 2 and 3)
- Stage 3A

In each Stage mobile plant was modelled as noise sources located within the work areas advised by Hanson and Groundwork Plus. Mobile plant will operate within a relatively large work area over the duration of each Stage. However, in any 15-minute noise assessment period, plant positioning will be largely static and haul paths will remain the same.

To present a worst-case interpretation of 15-minute noise exposure for each receptor and Stage combination, source locations and travel paths within these work areas were selected based upon proximity to residential receptors and where there would be minimal terrain noise shielding effects. Typically, this involved placing noise sources and travel paths for extraction occurring on the highest active bench of the pit, with a shot face location closest to the nearest receptors.

The noise source arrangement in the noise models is considered to represent a worst-case Site configuration for noise emissions during each Stage/Scenario. It is noted that Site operations over the majority of a Stage/Scenario's duration are likely to result in lower receiver noise levels than those predicted, particularly when quarry plant is positioned in shielded locations, such as on lower benches of the pit or on haul paths further away from receivers.

4.1.2 REHABILITATION ACTIVITIES

It is understood that rehabilitation activities such as backfilling will take place using the same fleet of haul and earthmoving HME as regular extraction activities, and in similar work areas within the Pits. Generally, rehabilitation is a less noisy process than regular extraction activity as it does not require blast-hole drilling or face loading. Noise levels for Rehabilitation will therefore be less than or equal to extraction activity for each Stage. As such, specific noise models were not produced for rehabilitation works.

4.2 NOISE MODELLING INPUTS

The following data inputs and information was used to develop the noise models for each Stage of the Project:

- Elevation data for within the Site boundary and the Site vicinity provided by Hanson and Groundwork Plus
- Elevation data for the wider locality surrounding the Site from Geoscience Australia 1-Second DEM Version 1.0, sourced in August 2020
- Processing plant layout provided by Groundwork Plus in August 2022
- Future pit shell designs provided by Groundwork Plus in August 2022
- Site layout, usage patterns, proposed future usage and other general information provided by Groundwork Plus and White Rock Quarry staff during a Site visit on 7 April 2020 and 7 September 2022.
- Sound power levels from manufacturer data sheets, WSP's internal database, and derived from measurements of Site plant on 7 April 2020 and 7 September 2022.

4.3 TECHNICAL APPROACH

The following outlines technical aspects of the noise modelling undertaken for the White Rock Quarry Site.

4.3.1 NOISE LEVEL PREDICTION SOFTWARE

Prediction of the Source Noise Levels for future Site operation was undertaken using noise models developed in SoundPLAN v8.2 noise modelling software.

4.3.2 NOISE MODEL ASSESSMENT PERIOD

For assessment against the Noise Policy criteria, noise modelling for each Stage considers on-Site operations which could occur simultaneously in a 15-minute period.

Assessments have been undertaken for both day time and night time operation of the Site, based upon the understood likely operational plant during these times.

4.3.3 ENVIRONMENTAL CONDITIONS

Ground surfaces within the quarry pits and surrounding active or developed areas within the Site boundary were modelled as acoustically reflective hard ground (ground absorption coefficient = 0.0).

Other areas surrounding the Site were modelled as partially absorptive (ground absorption coefficient = 0.8) ground. This is considered a conservative approach for representing the mixture of natural terrain and farming areas surrounding the Site, which typically feature more absorptive ground conditions.

4.3.4 METEOROLOGICAL CONDITIONS

Noise propagation was calculated using the CONCAWE industrial noise propagation algorithm.

CONCAWE can predict noise levels under varying meteorological conditions which effect the propagation of noise. For this assessment, meteorological conditions which are most conducive for noise propagation are utilised, namely:

- CONCAWE meteorological Category 5 for the day time-period
- CONCAWE meteorological Category 6 for the night time-period

These CONCAWE meteorological condition inputs are consistent with those suggested by the SA EPA in their guideline document *"Guidelines for Use of the Environment Protection (Noise) Policy 2007"*.

4.3.5 REPRESENTATIVE RECEIVER LOCATIONS

Noise levels were predicted at representative receiver locations defined in accordance with the requirements of Clause 12 of the Noise Policy.

Receptors in the noise models were positioned at outdoor areas which would be frequented by persons residing at the locations identified in Section 2. Noise model receptors are positioned in the free field, away from shielding or reflections from built form, and noise levels are predicted for a receptor height of 1.5 metres above local ground level.

4.3.6 NOISE CHARACTER PENALTIES

In accordance with the Noise Policy, noise character penalties are required to be applied at receiver locations where the noise contains characteristics which are considered annoying. Where the receiver noise environment is characterised by noise from the subject Site which has impulsive, tonal, modulating amplitude and/or low frequency noise characteristics these penalties are applicable. The approach for the application of these penalties to predicted noise from the White Rock Quarry Site is described below.

Impulsive noise character can be evident from noise associated with blast-hole drilling. Where the noise level contribution from blast-hole drilling is within 10 dB of the predicted receiver noise level an impulsive character penalty was applied to the receiver noise level.

Tonal characteristics can be evident when reverse beeper warning alarms are used on industrial sites. It is understood that HME plant will be fitted with broadband reverse alarms (squawkers) instead of tonal reverse alarms (beepers), and visiting road vehicles will utilise a forward-in forward-out movement path. Consequently, reverse beepers will not be routinely audible on the Site and therefore a character penalty for tonality has not been applied at any of the receptor locations.

Amplitude modulation can be present at receiver locations surrounding quarry sites when haul truck or other HME movements are the controlling noise source and vehicles (on Site or otherwise) are intermittently present. Where this occurs, the ambient environment does not contain modulating character (such as near busy roads), and the contribution from mobile quarry noise sources is within 10 dB of the predicted receiver noise level a character penalty for amplitude modulation is applied to the predicted noise levels.

Low frequency noise character is not typically observed at residential receiver locations surrounding quarries. A character penalty for low frequency noise has not been applied at any of the receiver locations.

4.3.7 PREDICTION HORIZON

It is acknowledged that there is difficulty in predicting noise levels in later Quarry Development Plan Stages due to the time into future that these Stages will occur. This is particularly relevant for Stage 3A, which will occur a significant time into the future. Noise modelling is based on current quarrying technologies which will likely improve in efficiency and noise emissions in the future. For example, the use of diesel powered HME could be phased out in later Stages in favour of other quieter technologies such as electric power. In the relatively short term (5-30 years) advances in technology are leading to quieter equipment which may be phased in as replacements for existing plant.

With this considered, predicted noise emissions for Stage 3A are likely to form a conservative indication. It is intended that the noise model developed for this assessment can be progressively updated to account for changes to future Site operations.

4.4 TERRAIN

3D CAD models for the future pit shells for each Stage were combined with existing elevation data for the wider locality to form 3D terrain profiles for noise models. An example showing the Stage 1 model terrain is shown in Figure 4.1.

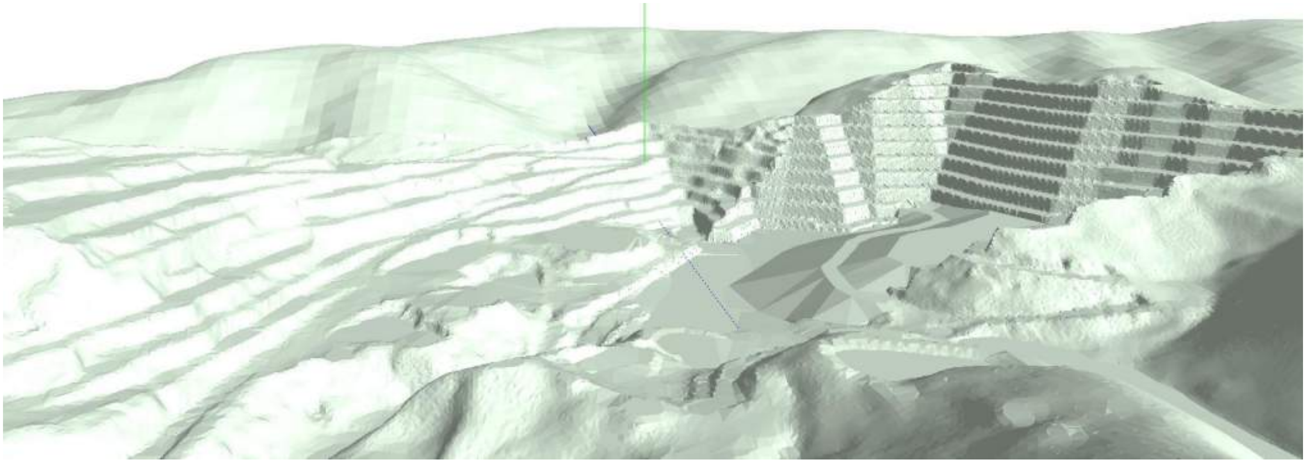

Figure 4.1 Stage 1 terrain example from noise model

4.5 NOISE MODEL GENERAL ARRANGEMENT

Stage 1 differs from existing approved operations by means of expansion of the pit extent. The Site has recently decommissioned the aging fixed processing plant, replacing this with more modern mobile plant which has been located on the pit floor. The change to this mobile processing plant represents a reduction in overall noise emissions as it is further from receivers and can take advantage of the shielding provided by the pit.

As the Site progresses through Stages 2 onwards, the location of pit-based mobile plant represents the most significant cause of changes to noise emissions. The noise-generating activities included in the pits for noise modelling are blast-hole drilling, face loading, and haul truck movements.

4.5.1 STAGE 1

The arrangement of noise sources in the Stage 1 noise model is shown in Figure 4.2. The Atlas Drill Rig is not planned to operate at night and has not been included in the night time assessment.

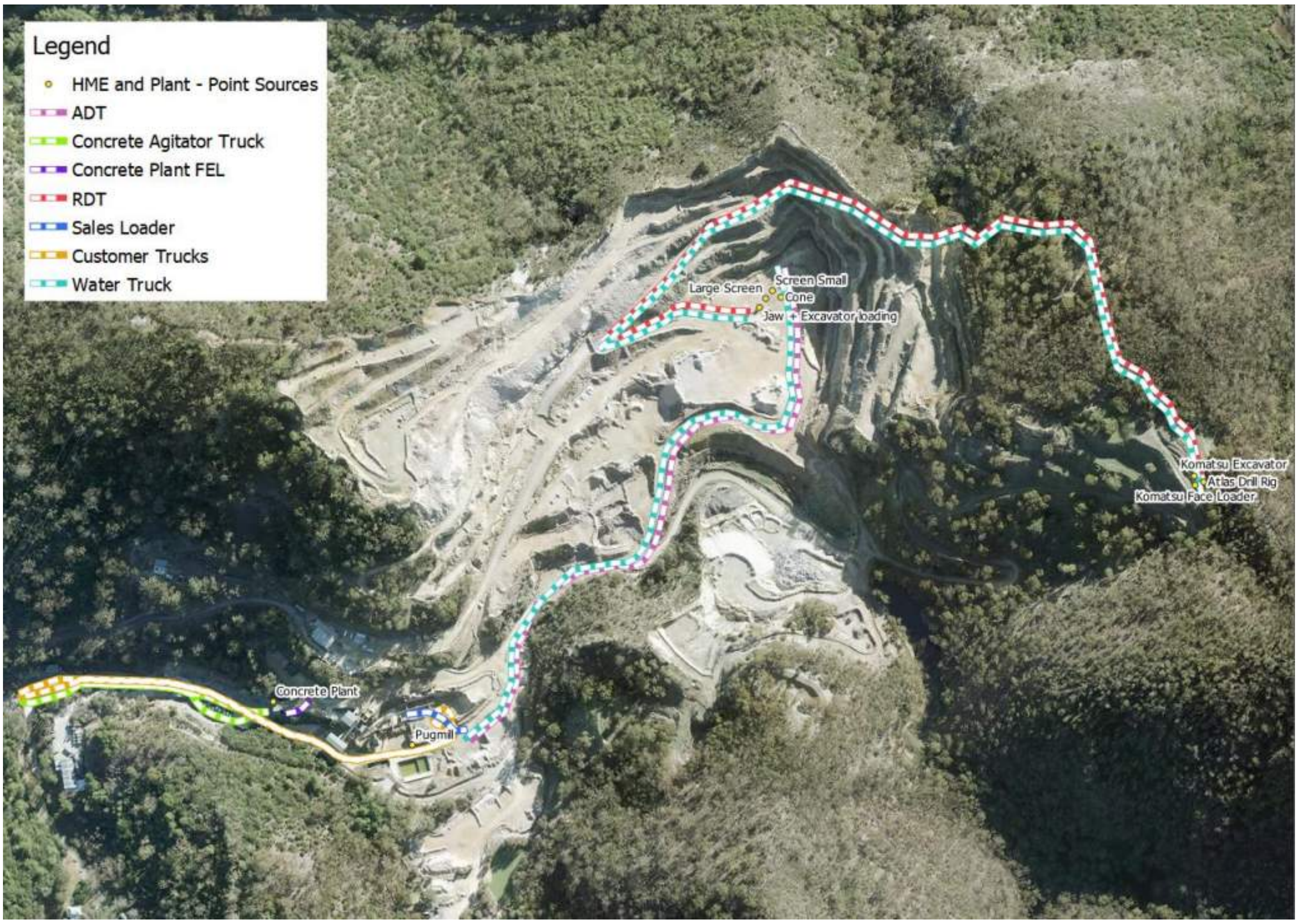

Figure 4.2 Stage 1 noise source arrangement

4.5.2 STAGE 2/3

The Stage 2/3 noise model includes extractive pit activities on the highest active western bench to be used. Stage 2/3 features similar pit activity. The Atlas Drill Rig is not planned to operate at night and has not been included in the night time assessment.

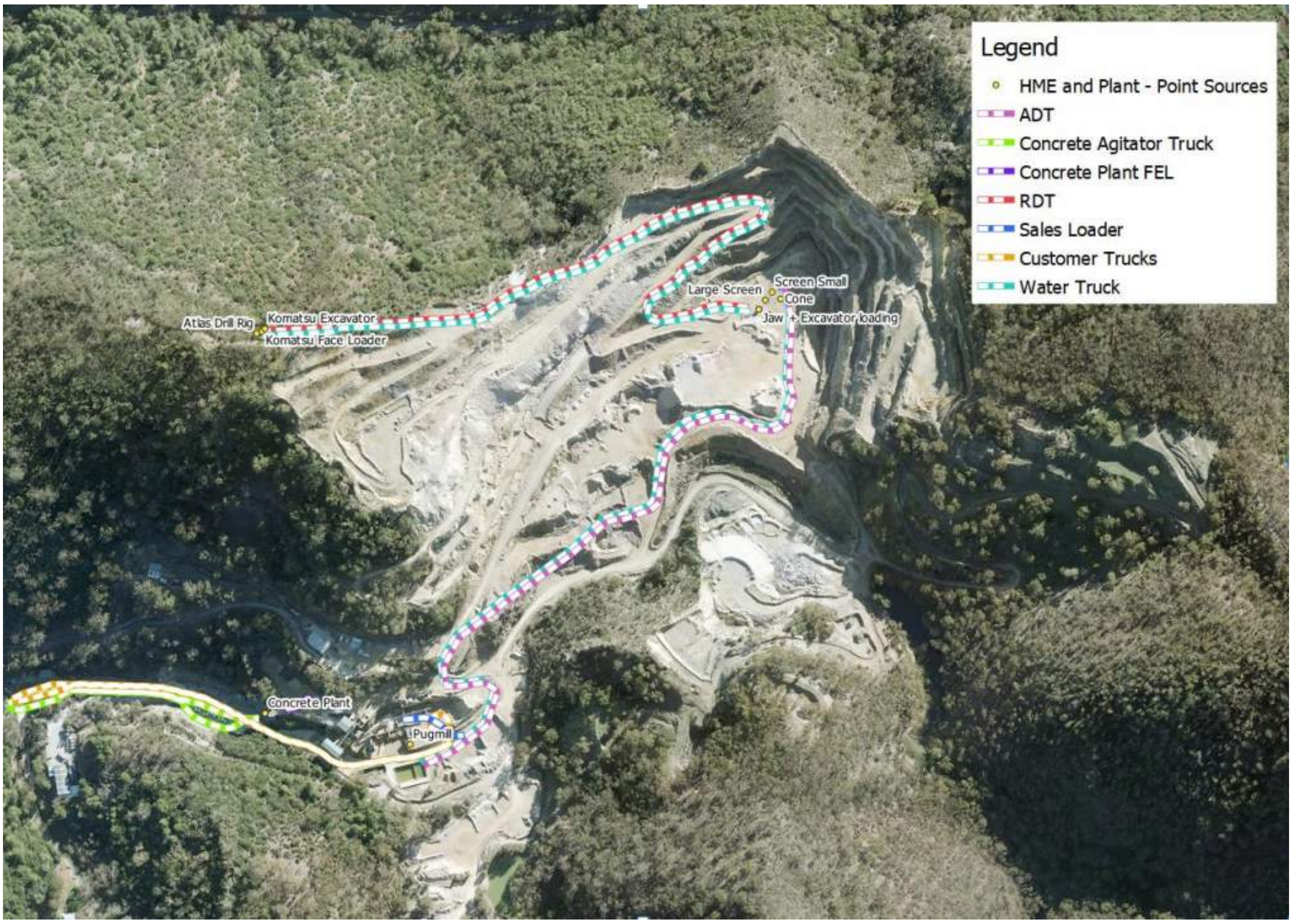

Figure 4.3 Stage 2/3 noise source arrangement

4.5.3 STAGE 3A

Stage 3A features an expansion of the western extent of the pit. This scenario has the haul path running on the Northern extent of the pit.

The arrangement of noise sources in the Stage 3A noise model are shown in Figure 4.4. The Atlas Drill Rig is not planned to operate at night and has not been included in the night time assessment.

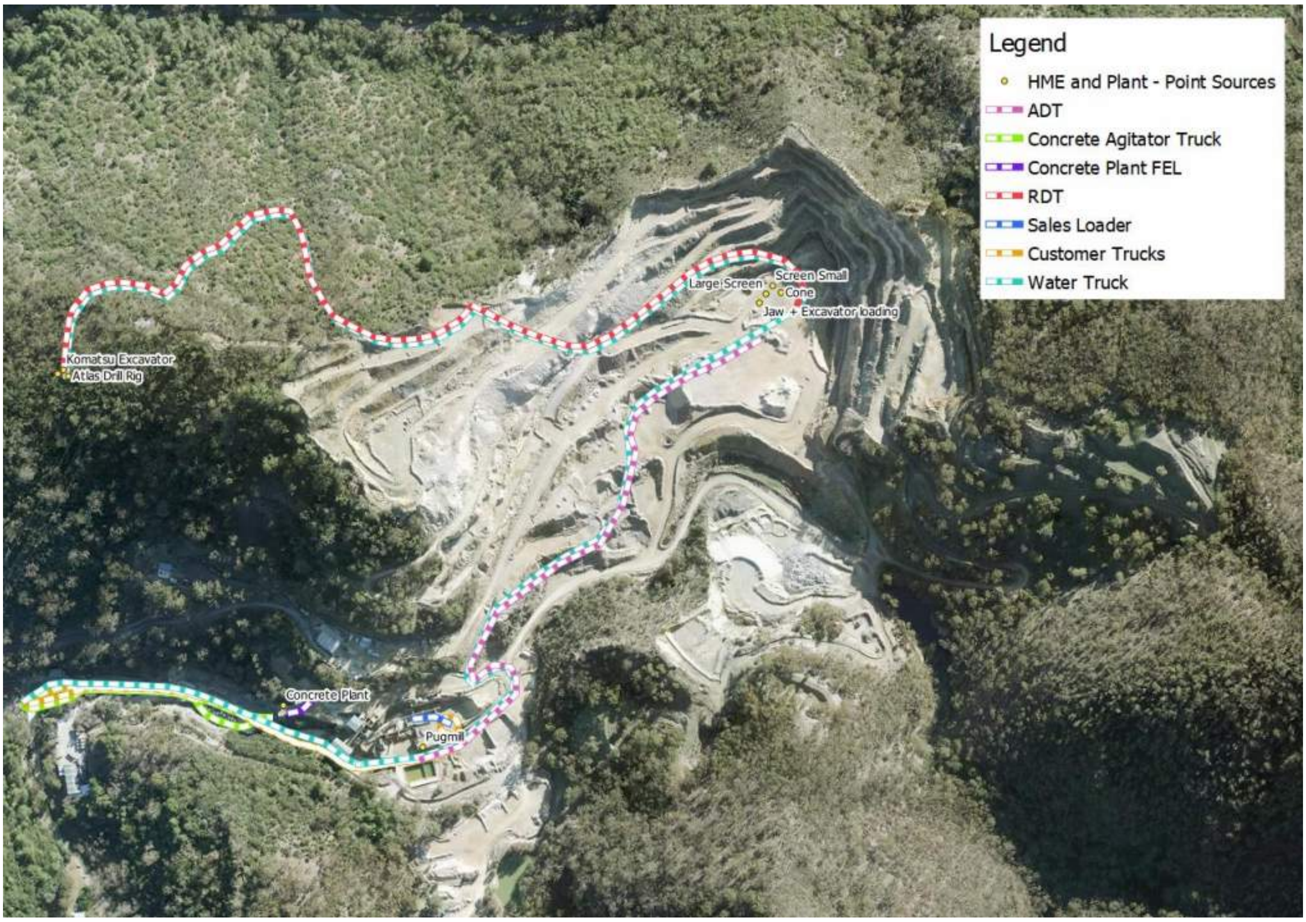

Figure 4.4 Stage 3A noise source arrangement

4.6 NOISE SOURCES

4.6.1 HEAVY MOBILE EQUIPMENT

Dedicated Heavy Mobile Equipment (HME) currently utilised by the Site includes articulated haul trucks, front end loaders, excavators, a drill rig and a water cart. It is understood that this HME will be retained. Details of the Site HME and work areas is provided in Table 4.1.

Table 4.1 HME used in noise modelling

ITEM	LOCATION, NOISE SOURCE TYPE	MAKE/MODEL
Blast hole drill(1)	Drill area – modelled at the bench above shot face *Point source*	Atlas Copco Epiroc SmartRoc T40
Excavator	Shot face excavator *Point source*	Komatsu PC450LC-8
Front End Loaders	Shot face loader *Point Source*	Komatsu WA480-6 Komatsu WA600-3
	Sales yard *Line source*	Volvo L180H
Haul trucks	Haul roads - Shot face to ROM bin *Line source*	CAT 771D Komatsu HD325-7
	Haul roads - Processing plant to sales yard *Line Source*	Volvo A25D
Water cart	Haul roads, access road and sales area *Line source*	CAT 725

Notes:

(1) Blast hole drilling is assumed that to occur during the day period only

4.6.2 PROCESSING PLANT

The mobile processing plant design consists of a multiple stage crushing and screening operation, comprising both jaw and cone crushers, and screens. These discharge into multiple stockpiles of finished product grades.

The mobile processing plant is understood to typically include the following noise generating items:

- Hitachi Zaxis 330LC excavator
- Metso 106 Jaw Crusher
- Metso HP300 Cone Crusher
- Metso ST2.8 Reclaimer Screen
- Metso ST620 Screen
- Portastack TC80 Stacker

ROM material is input to the stockpile via tip off from haul trucks, where it loaded into the processing plant by an excavator. Finished products are transported to the Sales Yard also using the haul trucks.

Noise sources corresponding to the process plant design operating at full capacity are used for noise models of all QDP Stages. Sound power data for these plant items was sourced from WSP's measurements taken on site on 7 September 2022. The processing plant will be located on the pit floor for each future Stage.

4.6.3 CONCRETE PLANT

The concrete plant is to be retained. It is fed from aggregate stockpiles adjacent the top hoppers using the Sales Area loader. Concrete Agitator trucks are filled at the bottom of the plant, as shown in Figure 4.5. Noise modelling assumes two agitator trucks are filled every 15-minutes.

Figure 4.5 Concrete plant

4.6.4 PUGMILL

A pugmill is also to be retained. It is located within the Sales Yard, fed from the processing plant and is used intermittently based upon customer demand. Noise modelling considers one use of the pugmill in 15 minutes.

4.6.5 ACCESS ROADS

The Site access road is utilised by both customer road trucks and concrete agitator trucks.

Customer road trucks are typically three-axle, rigid body tipper trucks, with dolly trailers. These are loaded in the Sales Area, accessing the sales yard by driving through the Site along the access road. and exit along the same access road via a loop containing the weighbridge.

Concrete agitator trucks access the concrete plant for loading via the access road, leaving via the same path.

Vehicle movement numbers on the access road were derived from Site material throughput provided by Hanson and are summarised in Table 4.2.

Table 4.2 Noise sources on Site roads

LOCATION	ITEM	DESCRIPTION
Site entry to sales area	Customer road trucks	2x movements in 15 minutes
	Concrete agitator trucks	2x movements in 15 minutes
Active Site roads	CAT 725 water cart	1x movement in 15 minutes

The vehicle paths along the Site access road are shown in Figure 4.6; the green line for concrete agitator trucks, and the orange line for customer road trucks.

Figure 4.6 Access Road customer truck path.

4.7 SUMMARY OF NOISE MODELLING SCENARIOS

Table 4.3 provides a summary of the noise sources included for each operation Stage/Scenario which has been modelled.

Table 4.3 Noise modelling scenario summary

STAGE	STAGE 1		STAGE 2/3		STAGE 3A	
PERIOD	**DAY**	**NIGHT**	**DAY**	**NIGHT**	**DAY**	**NIGHT**
Processing plant						
Location	Pit floor					
Mobile processing plant	✓	✓	✓	✓	✓	✓
Volvo A25 ADT	✓	✓	✓	✓	✓	✓
Sales						
Sales FEL	✓	✓	✓	✓	✓	✓
Customer trucks	✓	✓	✓	✓	✓	✓
Concrete plant	✓	✓	✓	✓	✓	✓
Pugmill	✓	✓	✓	✓	✓	✓
Extraction						
Blast-hole drill	✓	-	✓	-	✓	-
Shot face FELs	✓	✓	✓	✓	✓	✓
Shot face excavator	✓	✓	✓	✓	✓	✓
Haul trucks CAT 771D and Komatsu 325-7	✓	✓	✓	✓	✓	✓
Water cart	✓	✓	✓	✓	✓	✓

5 RESULTS

Noise modelling results without noise mitigation in place are summarised in this section. Noise contour plots are also provided in Appendix C, noting that contour plots do not include the application of noise character penalties which are specific to individual receivers.

5.1 STAGE 1

Predicted receiver noise levels from Site operation during Stage 1 are provided in Table 5.1. Where the predicted noise level exceeds the relevant criterion the result is highlighted in **bold red** text.

Table 5.1 Stage 1 - Predicted noise levels vs Criteria

LOCATION	DAYTIME $L_{EQ,15MIN}$ [dBA]		NIGHT $L_{EQ,15MIN}$ [dBA]	
	PREDICTED	CRITERIA	PREDICTED	CRITERIA
HG01	29(1)	52	23	45
HG02	28(1)	52	22	45
HG03	31(1)	52	25	45
HG04	35(2)	50	35(2)	43
NS01	36(1)	52	30	45
NS02	35(1)	52	30	45
NS03	34(1)	52	27	45
NS04	34(1)	52	27	45
NS05	42(1)	52	33	45
NS06	36(1)	52	28	45
S01	40(1)	52	31	45
S02	27(1)	52	26(2)	45
S03	32(3)	52	28(2)	45
S04	47(3)	52	42(2)	45
S05	46(3)	52	41(2)	45
S06	50(3)	52	45(2)	45
T01	28(1)	52	22	45
T02	27	52	26	45
T03	31	52	30	45
T04	38	52	38	45
T05	37	52	36	45
T06	33	52	33	45
T07	35(1)	52	29	45

LOCATION	DAYTIME $L_{EQ,15MIN}$ [dBA]		NIGHT $L_{EQ,15MIN}$ [dBA]	
	PREDICTED	CRITERIA	PREDICTED	CRITERIA
T08	35(1)	52	28	45
T09	36(1)	52	31	45
T10	34(1)	52	29	45

Notes:

(1) Denotes that the predicted receiver noise level includes a +5 dBA penalty for impulsive characteristics from blast-hole drilling

(2) Denotes that the predicted receiver noise level includes a +5 dBA penalty for amplitude modulation characteristics from on Site vehicle movements

(3) Denotes that the predicted receiver noise level includes a +8 dBA penalty for both impulsive and amplitude modulation characteristics from on Site vehicle movements and blast hole drilling.

Noise levels are predicted to comply with the noise criteria at all the nearest receivers during day and night operations.

5.2 STAGE 2/3

Predicted receiver noise levels from Site operation during Stage 2/3 are provided in Table 5.2. Where the predicted noise level exceeds the relevant criterion, the result is highlighted in **bold red** text.

Table 5.2 Stage 2/3 - Predicted noise levels vs Criteria

LOCATION	DAYTIME $L_{EQ,15MIN}$ [dBA]		NIGHT $L_{EQ,15MIN}$ [dBA]	
	PREDICTED	CRITERIA	PREDICTED	CRITERIA
HG01	33(1)	52	24	45
HG02	29(1)	52	23	45
HG03	33(1)	52	28	45
HG04	50(3)	50	37(2)	43
NS01	29	52	29	45
NS02	29	52	29	45
NS03	31(1)	52	25	45
NS04	32(1)	52	26	45
NS05	32	52	32	45
NS06	28	52	27	45
S01	32(1)	52	31	45
S02	31(1)	52	27(2)	45
S03	33(1)	52	26	45
S04	40(2)	52	40(2)	45
S05	40(1)	52	40(2)	45

LOCATION	DAYTIME $L_{EQ,15MIN}$ [dBA]		NIGHT $L_{EQ,15MIN}$ [dBA]	
	PREDICTED	CRITERIA	PREDICTED	CRITERIA
S06	50(3)	52	**46**(2)	45
T01	32(1)	52	23	45
T02	35(1)	52	28	45
T03	40(1)	52	41	45
T04	49(1)	52	43	45
T05	49(1)	52	40	45
T06	46(1)	52	37	45
T07	34(1)	52	28	45
T08	34(1)	52	28	45
T09	30	52	30	45
T10	43(1)	52	34	45

Notes:

(1) Denotes that the predicted receiver noise level includes a +5 dBA penalty for impulsive characteristics from blast-hole drilling

(2) Denotes that the predicted receiver noise level includes a +5 dBA penalty for amplitude modulation characteristics from on Site vehicle movements

(3) Denotes that the predicted receiver noise level includes a +8 dBA penalty for both impulsive and amplitude modulation characteristics from on Site vehicle movements and blast hole drilling.

Noise levels are predicted to exceed the noise criteria at one receiver in Skye during night operations. Noise levels at the exceeding location are controlled by the mobile processing plant.

5.3 STAGE 3A

Predicted receiver noise levels from Site operation during Stage 3A are provided in Table 5.3. Where the predicted noise level exceeds the relevant criterion the result is highlighted in **bold red** text.

Table 5.3 Stage 3A - Predicted noise levels vs Criteria

LOCATION	DAYTIME $L_{EQ,15MIN}$ [dBA]		NIGHT $L_{EQ,15MIN}$ [dBA]	
	PREDICTED	CRITERIA	PREDICTED	CRITERIA
HG01	35(1)	52	27	45
HG02	38(1)	52	29	45
HG03	37(1)	52	29	45
HG04	**55**(1)	50	43	43
NS01	30	52	29	45
NS02	29	52	29	45

LOCATION	DAYTIME $L_{EQ,15MIN}$ [dBA]		NIGHT $L_{EQ,15MIN}$ [dBA]	
	PREDICTED	CRITERIA	PREDICTED	CRITERIA
NS03	31(1)	52	25	45
NS04	32(1)	52	26	45
NS05	32	52	32	45
NS06	27	52	27	45
S01	46(1)	52	38	45
S02	47(1)	52	39	45
S03	40(1)	52	31	45
S04	50(1)	52	45(2)	45
S05	51(1)	52	44	45
S06	**55**(1)	52	**48**	45
T01	36(1)	52	27	45
T02	37(1)	52	28	45
T03	40(1)	52	33	45
T04	52(1)	52	42	45
T05	49(1)	52	40	45
T06	46(1)	52	36	45
T07	34(1)	52	28	45
T08	33(1)	52	28	45
T09	32(1)	52	26	45
T10	43(1)	52	34	45

Notes:

(1) Denotes that the predicted receiver noise level includes a +5 dBA penalty for impulsive characteristics from blast-hole drilling

(2) Denotes that the predicted receiver noise level includes a +5 dBA penalty for amplitude modulation characteristics from on Site vehicle movements

(3) Denotes that the predicted receiver noise level includes a +8 dBA penalty for both impulsive and amplitude modulation characteristics from on Site vehicle movements and blast hole drilling.

Noise from daytime operations is predicted to exceed the Noise Policy criterion at one location in the Skye locality and one location within Horsnell Gully. Noise levels at these locations is typically controlled by blast-hole drilling.

Noise levels from night time operations are predicted to exceed the noise criteria at one location in the Skye locality. These night noise levels are controlled by noise from the mobile processing plant.

5.4 SUMMARY

Predicted noise levels from future quarry operation are compliant with the noise criteria at the majority of receivers. In particular, Stage 1 of quarry development is compliant with criteria for both day and night operation without any specific noise mitigation in place. Furthermore, predicted noise levels for receivers in Norton Summit and Teringie are compliant with the noise criteria for all Stages of quarry development also without the provision of noise mitigation.

Exceedances of the noise criteria are limited to two receivers:

- Day period exceedances occur at both Horsnell Gully and Skye locations for Stage 3A only.
  The predicted day exceedances are attributed to blast-hole drilling on the Western extent of the pit.
- Exceedances of criteria during the night period are predicted to occur for the receiver in Skye in Stages 2/3 and 3A due to the operation of the processing plant.

Noise mitigation is recommended for the blast-hole drill and processing plant.

A table summarising noise criteria exceedances (without provision of noise mitigation) is provided below.

Table 5.4 Summary of predicted noise criteria exceedances – without mitigation

AREA	NUMBER OF CRITERIA EXCEEDANCES					
	STAGE 1		STAGE 2/3		STAGE 3A	
	D	N	D	N	D	N
Horsnell Gully	0	0	0	0	1	0
Norton Summit	0	0	0	0	0	0
Skye	0	0	0	1	1	1
Teringie	0	0	0	0	0	0

Noise mitigation should be implemented on the controlling noise sources for the proposed operations to comply with the noise criteria. A conceptual noise mitigation strategy is discussed in Section 6.

6 NOISE MITIGATION

The implementation of noise mitigation is required for noise from quarry operations in Stage 2/3 and Stage 3A, to achieve compliance with the noise criteria for the Site. Different noise mitigation is required for day and night periods due to the changing Site operation, noise criteria and noise propagation conditions.

A conceptual noise mitigation strategy is presented which demonstrates a means of achieving compliance with noise criteria. This mitigation can be designed in detail as the Site progresses and future operations are confirmed.

6.1 STAGE 2/3

Exceedances of the noise criteria are predicted for Stage 3 in the night-time (one receiver in the Skye catchment). The predicted night-time exceedances are controlled by noise from the mobile processing plant.

6.1.1 MOBILE PROCESSING PLANT MITIGATION

To reduce noise from the processing plant and achieve compliance at the S06 receiver during night-time operation for Stage 2/3 and Stage 3A, positioning of acoustic shielding around the southern extent of the mobile processing plant has been evaluated.

The following processing plant items are relevant to the acoustic shielding recommendations:

- Mobile jaw crusher
- Mobile screen
- Mobile cone crusher
- Mobile reclaimer screen.

The acoustic shielding should have a minimum height of 4 metres above the ground RL which the processing plant items are located upon. The top of the shielding (crest of a bund, top of a concrete block wall, etc) should be located no more than 11 metres horizontally from the mobile plant items listed above. The acoustic shielding should be positioned on the Southern side of the processing plant, to block the line-of-sight between the processing plant and the S06 receiver.

To present a practical example and outcomes, this acoustic shielding has been implemented in the noise model as a bund. The bund has a repose angle of 25 degrees for the purpose of calculating the indicative bund dimensions. However, the angle of repose for the noise bund is inconsequential to the receiver noise levels. A section detail of the conceptual noise bund design is provided in Figure 6.1.

A noise bund may be comprised of dedicated civil earthworks, stockpiled materials (ROM, overburden, waste rock, finished product) or utilise the landform as acoustic shielding. The acoustic performance will be equivalent as long as the minimum relative height and maximum horizontal separation to the processing plant equipment is maintained.

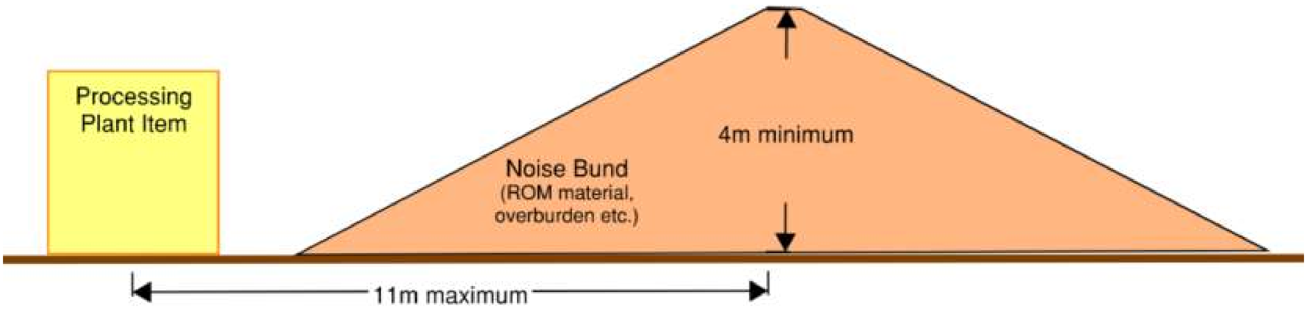

Figure 6.1 Section detail of the conceptual noise bund design (width of bund is indicative only)

6.1.2 STAGE 2/3 NIGHT TIME PREDICTED RESULTS WITH MITIGATION

Table 6.1 presents predicted noise levels for Stage 2/3 night time operation with processing plant noise mitigation in place, which is arranged as per the conceptual design discussed in Section 6.1.1.

Table 6.1 Night time noise modelling results with mitigation in place – processing plant noise bund

LOCATION	RESULTS WITH PROCESSING PLANT NOISE MITIGATION – NIGHT-TIME $L_{EQ,15MIN}$ [dBA]	
	STAGE 2/3 NIGHT	NIGHT TIME CRITERIA
HG01	24	45
HG02	23	45
HG03	27	45
HG04	36(2)	43
NS01	29	45
NS02	29	45
NS03	25	45
NS04	26	45
NS05	32	45
NS06	27	45
S01	31	45
S02	27(2)	45
S03	26	45
S04	40(2)	45
S05	39(2)	45
S06	45(2)	45

LOCATION	RESULTS WITH PROCESSING PLANT NOISE MITIGATION – NIGHT-TIME $L_{EQ,15MIN}$ [dBA]	
	STAGE 2/3 NIGHT	NIGHT TIME CRITERIA
T01	23	45
T02	28	45
T03	41	45
T04	43	45
T05	40	45
T06	37	45
T07	28	45
T08	28	45
T09	30	45
T10	34	45

Notes:

(1) Denotes that the predicted receiver noise level includes a +5 dBA penalty for impulsive characteristics from blast-hole drilling

(2) Denotes that the predicted receiver noise level includes a +5 dBA penalty for amplitude modulation characteristics from on Site vehicle movements

With the conceptual noise mitigation for Stage 2/3 night time operation, noise levels are predicted to comply with the nominated noise criteria at all nearby receiver locations.

6.2 STAGE 3A

Exceedances of the noise criteria are predicted for Stage 3A in the day time and night time (one receiver in Horsnell Gully Catchment, one receiver in the Skye catchment). The predicted day-time exceedances are controlled by noise from the rock drill. The predicted night-time exceedances are controlled by noise from the mobile processing plant. As such, the processing plant mitigation for Stage 2/3 night operation also applies to Stage 3A.

6.2.1 ROCK DRILLING

For Stage 3A, blast-hole drilling is the controlling noise source for day-time criteria exceedances at receivers in the Skye and Horsnell Gully area. At locations where the blast-hole drill source is predicted to control the receiver levels the +5 dB character penalty described in Section 4.3.6 has been applied.

To achieve compliance with the noise criteria at Skye receivers, noise emitted from the rock drill needs to be reduced, or modified in character so that the noise character penalty is not applicable. At the most affected locations this corresponds to a reduction of rock drill noise of approximately 10 dBA to ensure it does not control the noise environment.

6.2.1.1 ROCK DRILL NOISE ATTENUATION

A rock drill noise mitigation package will reduce the total noise produced by the drill, as well as reducing the impulsive character of the noise emissions by treating the drill mast noise source. This would allow freedom of drill operation around the whole pit area without the need for positioning the drill behind acoustic shielding.

Epiroc have advised that a noise mitigation package is available for the Smartroc T40 Rock Drill,. The package consists of mast encapsulation, rubber boot, and vibration isolation components, as shown in Figure 6.2. Epiroc claim the kit can provide a noise level reduction of 12 dB over the standard Epiroc T40 drill. To achieve criteria compliance a reduction of 10 dB is required. Noise modelling of a mitigated drill source assumes a 12 dB reduction is achieved.

Figure 6.2 Epiroc Smartroc T40 drill with noise mitigation package (Image source: Epiroc Website)

6.2.2 STAGE 3A DAY TIME PREDICTED RESULTS WITH NOISE MITIGATION

Predicted noise levels for Stage 3A with rock drill noise attenuation and the processing plant noise bund in place (as per the conceptual design discussed in Section 6.1.1) are provided in Table 6.2

Table 6.2 Day time noise modelling results with mitigation in place – rock drill and processing plant noise bund

LOCATION	RESULTS WITH ROCK DRILL AND PROCESSING PLANT NOISE BUND - DAYTIME $L_{EQ,15MIN}$ [dBA]	
	STAGE 3A DAY	DAY TIME CRITERIA
HG01	26	52
HG02	29	52
HG03	29	52
HG04	48(1)	50
NS01	29	52
NS02	28	52
NS03	25	52
NS04	26	52
NS05	31	52
NS06	26	52
S01	38	52
S02	40	52
S03	32	52
S04	46(1)	52

LOCATION	RESULTS WITH ROCK DRILL AND PROCESSING PLANT NOISE BUND - DAYTIME $L_{EQ,15MIN}$ [dBA]	
	STAGE 3A DAY	DAY TIME CRITERIA
S05	41	52
S06	45	52
T01	26	52
T02	32(1)	52
T03	32	52
T04	46(1)	52
T05	44(1)	52
T06	36	52
T07	28	52
T08	33(1)	52
T09	33(1)	52
T10	39(1)	52

Notes:

(1) Denotes that the predicted receiver noise level includes a +5 dBA penalty for impulsive characteristics from blast-hole drilling

(2) Denotes that the predicted receiver noise level includes a +5 dBA penalty for amplitude modulation characteristics from on Site vehicle movements

With the conceptual noise mitigation for Stage 3A day time operation, noise levels are predicted to comply with the nominated noise criteria at all nearby receiver locations.

6.2.3 STAGE 3A NIGHT TIME PREDICTED RESULTS WITH NOISE MITIGATION

Table 6.3 presents predicted noise levels for Stage 3A night time operation with processing plant noise mitigation in place (as per the conceptual design discussed in Section 6.1.1).

Table 6.3 Night time noise modelling results with mitigation in place –processing plant noise bund

LOCATION	RESULTS WITH PROCESSING PLANT NOISE MITIGATION – NIGHT-TIME $L_{EQ,15MIN}$ [dBA]	
	STAGE 3A NIGHT	NIGHT TIME CRITERIA
HG01	25	45
HG02	28	45
HG03	28	45
HG04	43	43
NS01	29	45

LOCATION	RESULTS WITH PROCESSING PLANT NOISE MITIGATION – NIGHT-TIME $L_{EQ,15MIN}$ [dBA]	
	STAGE 3A NIGHT	NIGHT TIME CRITERIA
NS02	28	45
NS03	25	45
NS04	26	45
NS05	31	45
NS06	26	45
S01	38	45
S02	39	45
S03	30	45
S04	45(2)	45
S05	40	45
S06	44	45
T01	25	45
T02	26	45
T03	32	45
T04	42	45
T05	40	45
T06	36	45
T07	28	45
T08	27	45
T09	28	45
T10	34	45

Notes:

(1) Denotes that the predicted receiver noise level includes a +5 dBA penalty for impulsive characteristics from blast-hole drilling

(2) Denotes that the predicted receiver noise level includes a +5 dBA penalty for amplitude modulation characteristics from on Site vehicle movements

With the conceptual noise mitigation for Stage 3A night time operation, noise levels are predicted to comply with the nominated noise criteria at all nearby receiver locations.

7 DISCUSSION

The existing noise environment surrounding the Site is of a suburban to semi-rural character, and existing ambient noise levels could generally be considered moderate. Quieter areas feature ambient noise controlled by natural sounds such as foliage and birds. Louder areas in the locality are those influenced by traffic noise on Old Norton Summit Road. Existing quarry noise can be audible in the background at the closest noise-sensitive locations during existing daytime operation hours. However noise is currently compliant with the relevant noise criteria.

Noise from the Site in future will remain audible at the nearest noise sensitive receivers. The controlling sources of noise at each receiver will gradually change as the Site is developed. Noise modelling results indicate that compliance with criteria can be achieved for both daytime and night time operation with mitigation measures in place.

The highest levels of noise during the Stages of quarry development are likely to occur when shot face operation is on the higher benches of the pit; i.e. when drilling and extraction occurs closest to the natural terrain surface. Noise levels at the surrounding receivers will subsequently be reduced as rock drilling occurs on lower benches, with the pit providing acoustic shielding. Noise modelling undertaken for this assessment has utilised noise source locations for HME and pit-based equipment which are near the interface of for the pit design with the natural surface. The assessment results can therefore be considered indicative of this worst-case noise exposure.

For day period operation in Stage 3A, noise mitigation is required to be applied to the rock drill. This mitigation is suggested to be implemented as acoustic treatment to the rock drill itself.

To enable compliant night period operation during Stage 2/3 and Stage 3A, acoustic shielding such as a noise bund will need to be applied adjacent to the processing plant.

It has been demonstrated that with the implementation of noise mitigation the Site can satisfy the noise criteria.

It is suggested that any changes to night operation are phased in with prior consultation with nearby community to minimise uncertainty regarding changes to the character of the local noise environment.

8 CONCLUSION

WSP has undertaken an assessment of operational noise from proposed future development Stages of the White Rock Quarry.

Operational noise from the future Site is predicted to comply with the relevant environmental noise criteria with the implementation of noise mitigation measures for key noise sources during the day and night periods.

APPENDIX A

EQUIPMENT CALIBRATION CERTIFICATE

CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: SLM 26175 & FILT 5589

Equipment Description: Sound Level Meter

Manufacturer: NTI Audio

Model No:	XL2-TA	**Serial No:**	A2A-13461-E0
Microphone Type:	MC230	**Serial No:**	A14410
Preamplifier Type:	MA220	**Serial No:**	6912
Filter Type:	1/3 Octave	**Serial No:**	A2A-13461-E0

Comments: All tests passed for class 1.
(See over for details)

Owner: WSP Australia Pty Ltd
Level 1, 1 King William Street
Adelaide, SA 5000

Ambient Pressure: 994 hPa ±1.5 hPa

Temperature: 24 °C ±2° C **Relative Humidity:** 66% ±5%

Date of Calibration: 16/01/2020 **Issue Date:** 16/01/2020

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: ..... **AUTHORISED SIGNATURE:** ..... Jack Kielt

Accredited for compliance with ISO/IEC 17025 - Calibration
The results of the tests, calibration and/or measurements included in this document are traceable to Australian national standards.

NATA
WORLD RECOGNISED ACCREDITATION

ACU-VIB
ELECTRONICS

HEAD OFFICE
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02)96808233
Mobile: 0413 809806
web site: www.acu-vib.com.au

Accredited Lab. No. 9262
Acoustic and Vibration
Measurements

CERTIFICATE NO.: **SLM 26175 & FILT 5589**

The performance characteristics listed below were tested. The tests are based on the relevant clauses of IEC 61672-3:2013

Tests Performed:	*Clause*	*Result*
Absolute Calibration	10	Pass
Acoustical Frequency Weighting	12	Pass
Self Generated Noise	11.1	Entered
Electrical Noise	11.2	Entered
Long Term Stability	15	Pass
Electrical Frequency Weightings	13	Pass
Frequency and Time Weightings	14	Pass
Reference Level Linearity	16	Pass
Range Level Linearity	17	Pass
Toneburst	18	Pass
Peak C Sound Level	19	Pass
Overload Indicator	20	Pass
High Level Stability	21	Pass

Statement of Compliance: The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC61672-1:2013.
A full technical report is available if required.

This Sound Level Meter included an Octave Filter Set. Tests were based on IEC 1260: 1995 and AS/NZS 4476 - 1997 and were conducted to test the following performance characteristics:

1. Relative attenuation clause 5.3

Date of Calibration: 16/01/2020 **Issue Date:** 16/01/2020

Checked by: LK

Accredited for compliance with ISO/IEC 17025 - Calibration
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.

NATA
WORLD RECOGNISED ACCREDITATION

Accredited Lab. No. 9262
Acoustic and Vibration Measurements

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APPENDIX B

NOISE CRITERIA DERIVATION

B1 NOISE CRITERIA DERIVATION

As noted in Section 3.2, noise criteria for the project are derived from the Indicative Noise Levels determined in accordance with Part 1 Clause 5 of the Noise Policy.

Separate criteria are provided for the day and night periods; the day period refers to the time between 7am and 10pm, and the night period from 10pm to 7am.

These Indicative Noise Levels are $L_{eq,15min}$ noise levels which are derived based on the uses principally promoted by the SA Planning and Design Code zoning for the source and receiver locations.

The Indicative Noise Factors from the Noise Policy for determining Indicative Noise Levels are presented in Noise Policy Table 1 and Table 2. Indicative Noise Factors are selected from Table 1 when both the noise source and noise-affected premises fall within one of the two specified industrial land uses, otherwise Table 2 is used.

The day period refers to the time between 7am and 10pm, and the night period from 10pm to 7am.

Noise Policy Table 1

LAND USE CATEGORY	INDICATIVE NOISE FACTOR [dBA]	
	DAY	NIGHT
General Industry	65	65
Special Industry	70	70

Noise Policy Table 2

LAND USE CATEGORY	INDICATIVE NOISE FACTOR [dBA]	
	DAY	NIGHT
Rural living	47	40
Residential	52	45
Rural Industry	57	50
Light Industry	57	50
Commercial	62	55
General Industry	65	55
Special Industry	70	60

Figure B.1 shows the zoning of the Site and surrounding noise sensitive receivers.

The Noise Policy in Clause 5 states:

> “*(4) If the land uses principally promoted by the relevant Development Plan provisions for the noise source and those principally promoted by the relevant Development Plan provisions for the noise-affected premises all fall within a single land use category, the indicative noise level for the noise source is the indicative noise factor for that land use category.*

(5) *Subject to subclause (6), if the land uses principally promoted by the relevant Development Plan provisions for the noise source and those principally promoted by the relevant Development Plan provisions for the noise-affected premises do not all fall within a single land use category, the indicative noise level is the average of the indicative noise factors for the land use categories within which those land uses fall.*

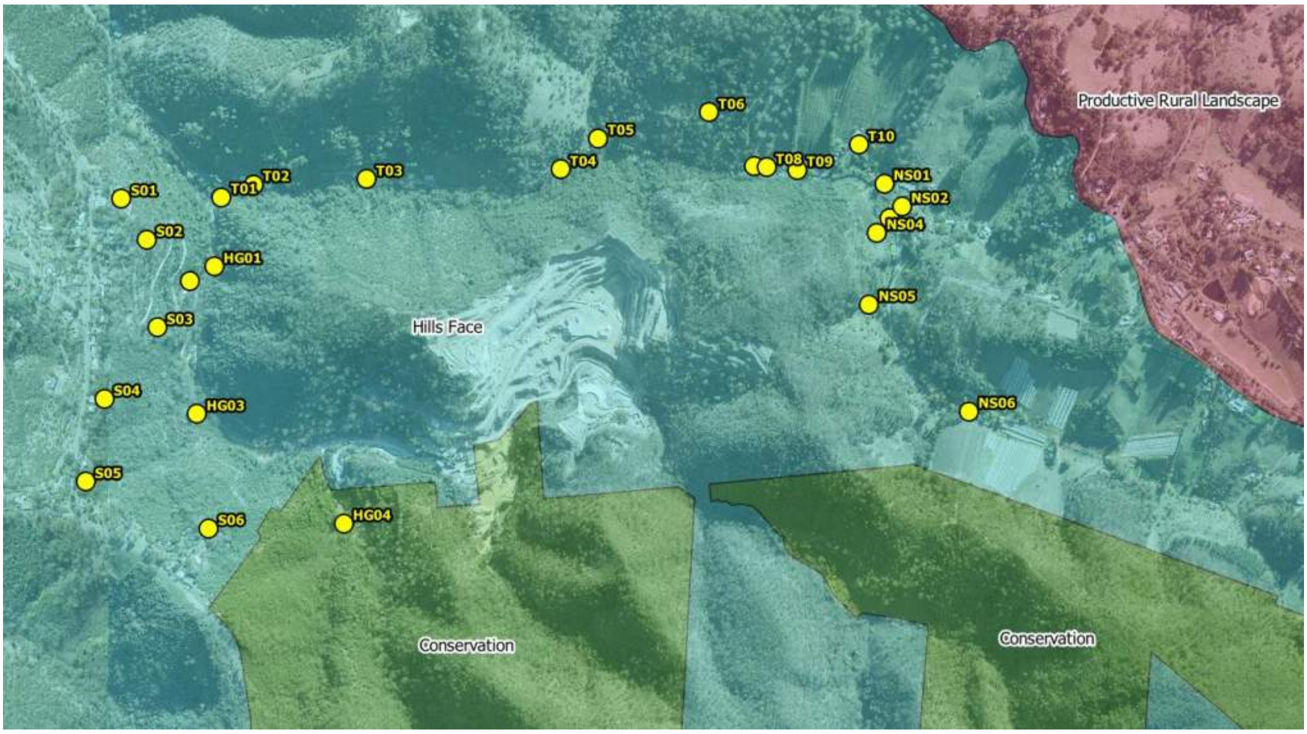


Figure B.1 Zoning of the White Rock Quarry Site and nearest noise-sensitive receivers

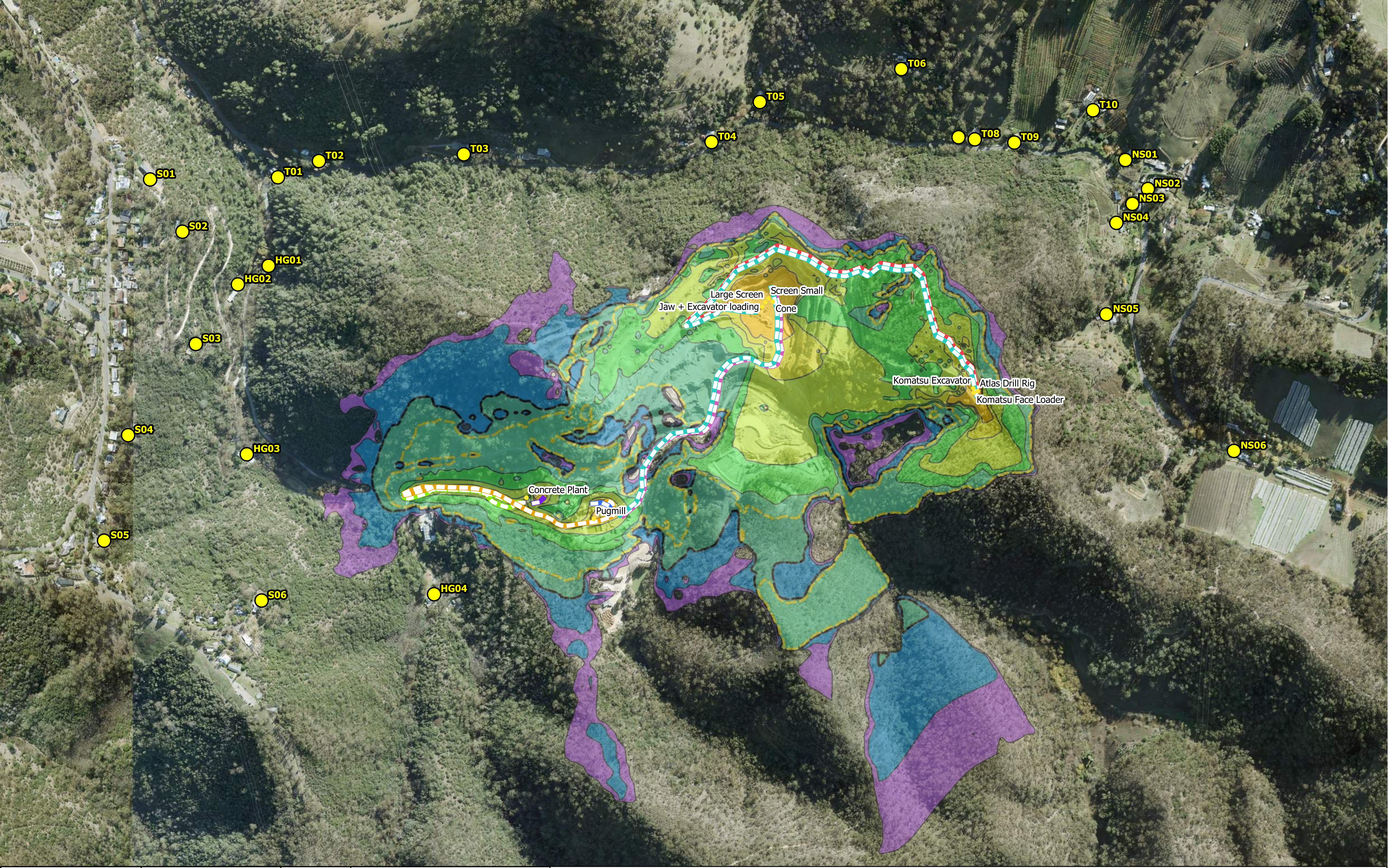
Both the Site and nearest noise sensitive receivers are located within a Hills Face Zone, with the exception of one receiver in the Horsnell Gully catchment which is located in a Conservation Zone.

The land uses promoted for the Hills Face zone are broad, including conservation, agricultural and horticultural uses, while limited development of existing residential uses is also permitted.

In consultation with the SA EPA, the applicable Land Use Categories from the Noise Policy for the Hills Face zone were interpreted as Rural Living and Rural Industry. The applicable Land Use Category from the Noise Policy for the Conservation zone is interpreted as Rural Living.

APPENDIX C

NOISE CONTOUR PLOTS



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Date: 20/10/2022	Approved by: AC

N

To be read in conjunction with WSP document: PS114434-ACO-REP-005 Rev1

Map Source: Metromap

0 100 200 300 m

1:7,000 at A3

Legend

- Receiver Locations
- Stationary Noise Sources

Vehicle Paths

- ADT
- Concrete Agitator Trucks
- Concrete Plant FEL
- RDT
- Sales Loader
- Sales Road Trucks
- Water Truck

Noise level, dBA Leq period

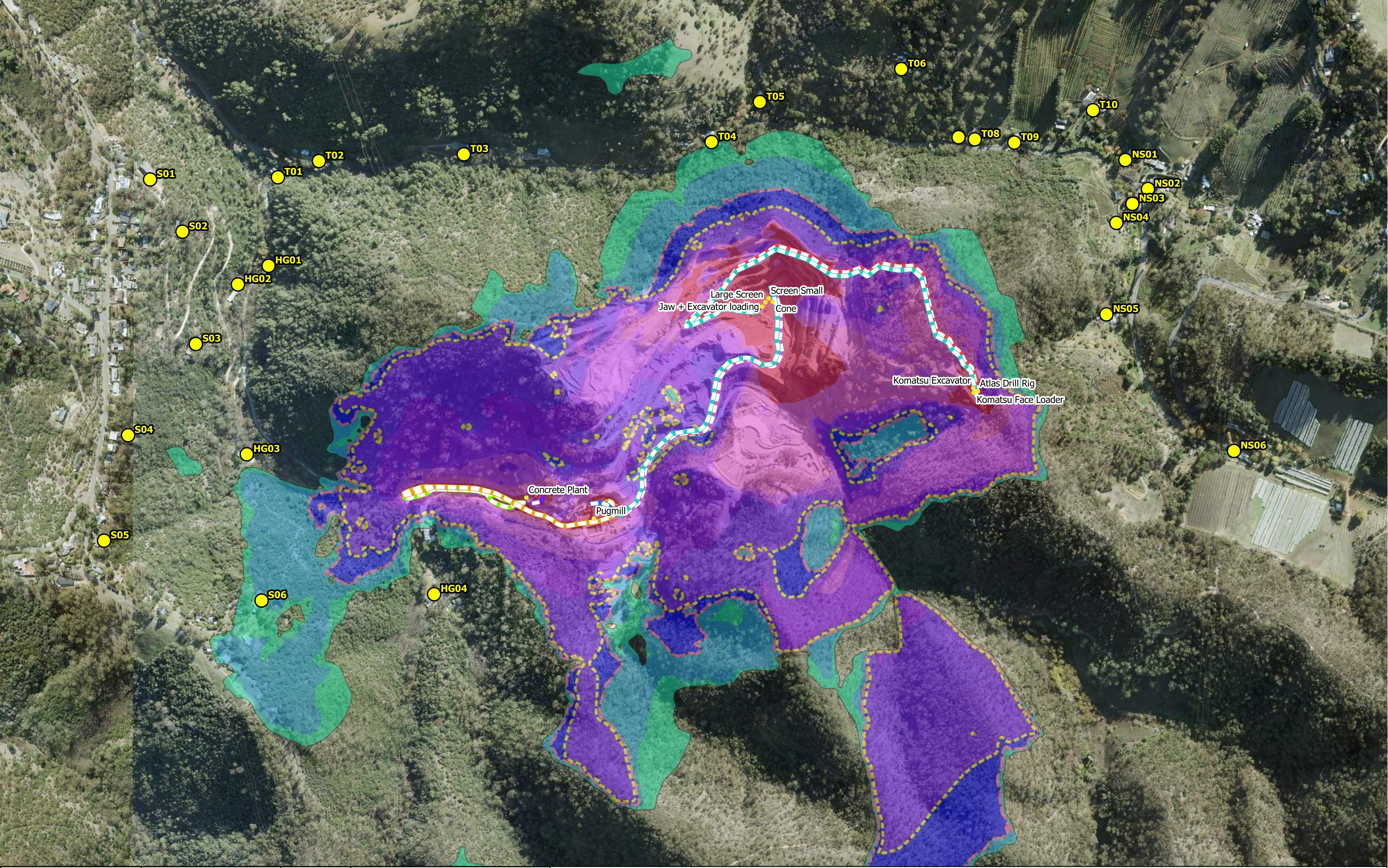
- 45 dBA
- 47 dBA
- 50 dBA
- 52 dBA
- 57 dBA
- 62 dBA
- 67 dBA
- 71 dBA

White Rock Quarry
Operational noise assessment

Stage 1 - Day - no mitigation

wsp

www.wsp.com



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Date: 20/10/2022	Approved by: AC

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To be read in conjunction with WSP document: PS114434-ACO-REP-005 Rev1

Map Source: Metromap

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1:7,000 at A3

Legend

- Receiver Locations
- Stationary Noise Sources

Vehicle Paths

- ADT
- Concrete Agitator Trucks
- Concrete Plant FEL
- RDT
- Sales Loader
- Sales Road Trucks
- Water Truck

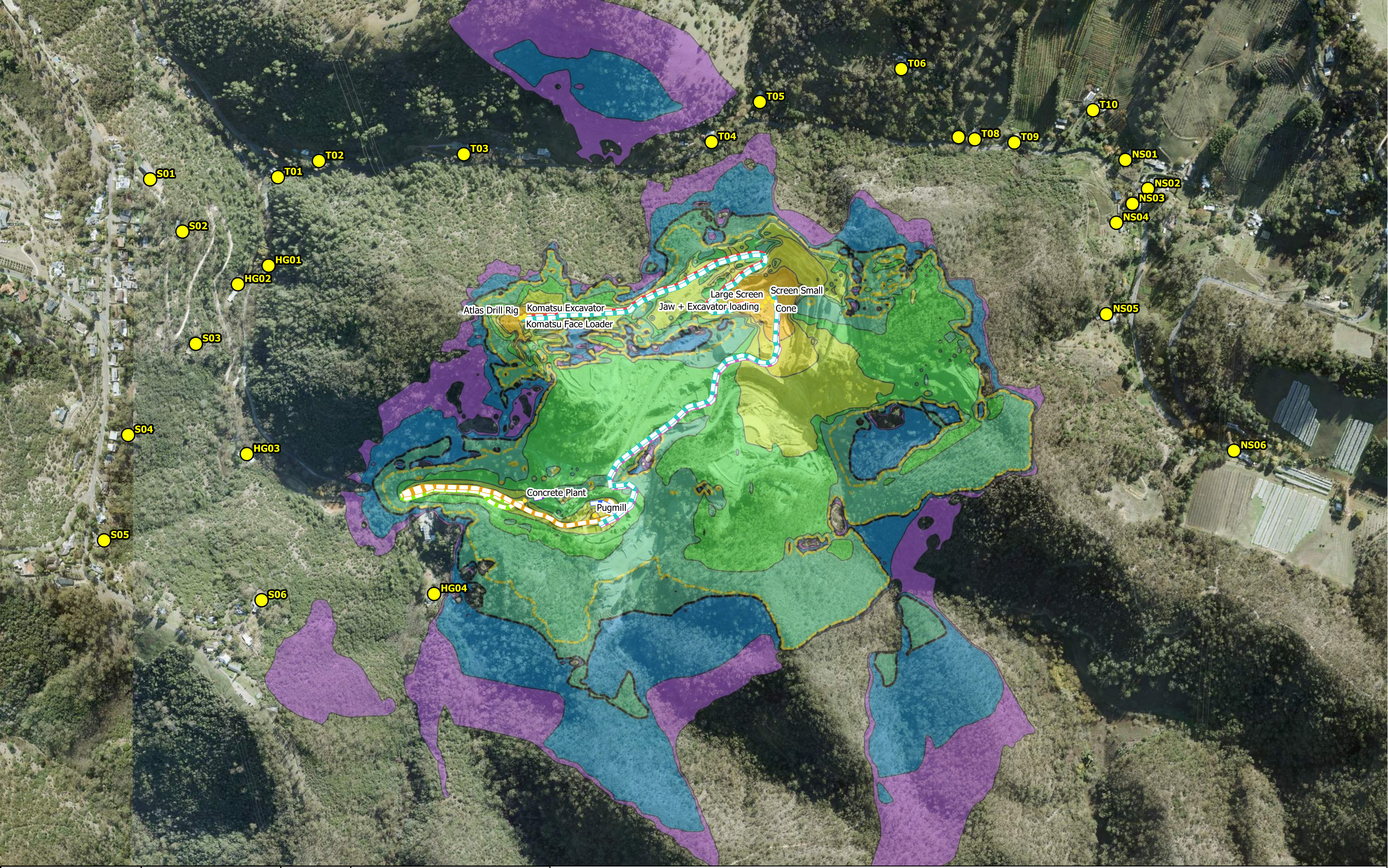
Noise level, dBA Leq period

- 38 dBA
- 40 dB(A)
- 43 dBA
- 45 dB(A)
- 50 dB(A)
- 55 dB(A)
- 60 dB(A)
- 65 dB(A)

White Rock Quarry
Operational noise assessment

Stage 1 - Night - no mitigation

wsp



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Date: 20/10/2022	Approved by: AC

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To be read in conjunction with WSP document: PS114434-ACO-REP-005 Rev1

Map Source: Metromap

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Legend

- Receiver Locations
- Stationary Noise Sources

Vehicle Paths

- ADT
- Concrete Agitator Trucks
- Concrete Plant FEL
- RDT
- Sales Loader
- Sales Road Trucks
- Water Truck

Noise level, dBA Leq period

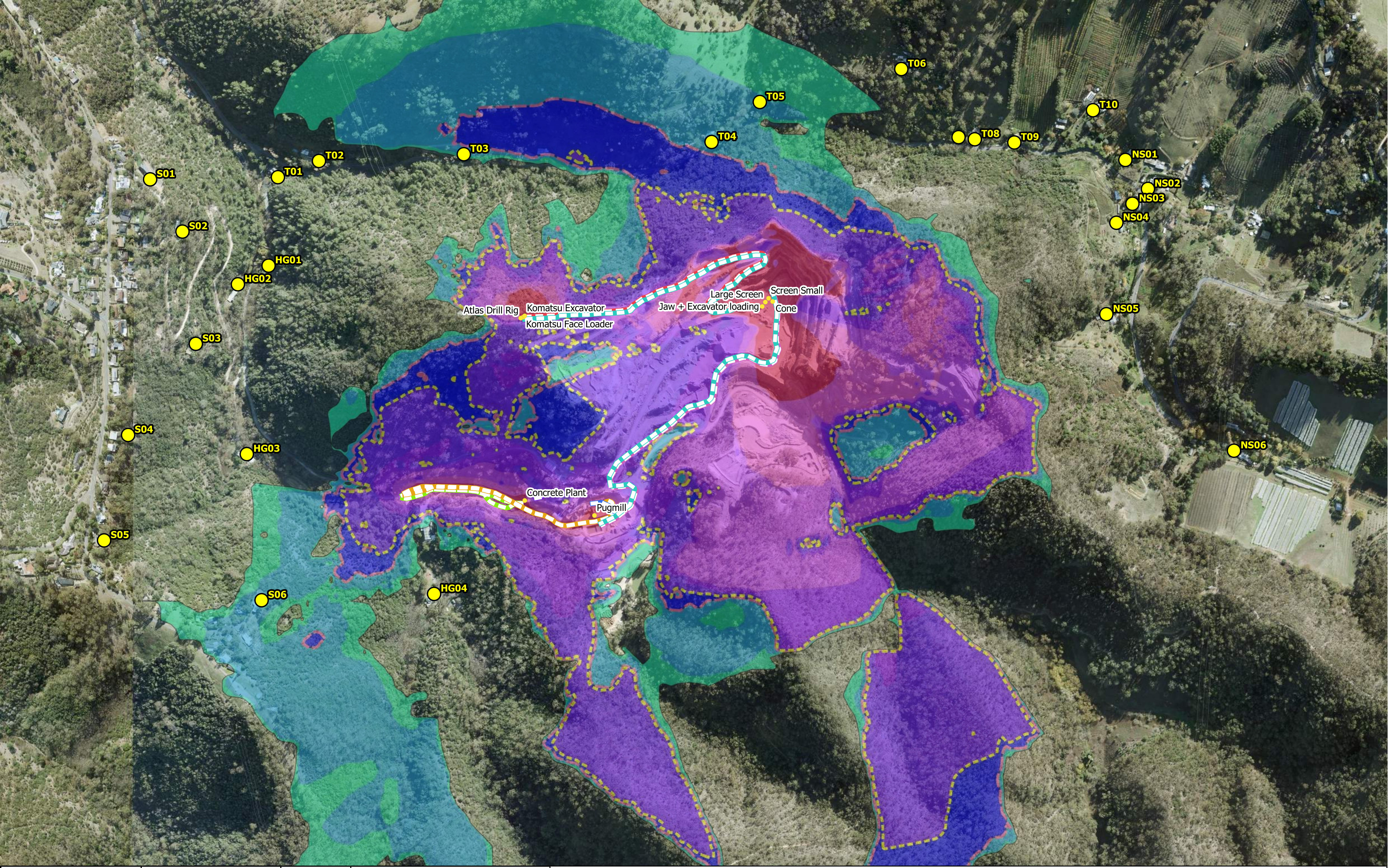
- 45 dBA
- 47 dBA
- 50 dBA
- 52 dBA
- 57 dBA
- 62 dBA
- 67 dBA
- 71 dBA

White Rock Quarry
Operational noise assessment

Stage 2/3 - Day - no mitigation

wsp

www.wsp.com



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Date: 20/10/2022	Approved by: AC

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Map Source: Metromap

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Legend

- Receiver Locations
- Stationary Noise Sources

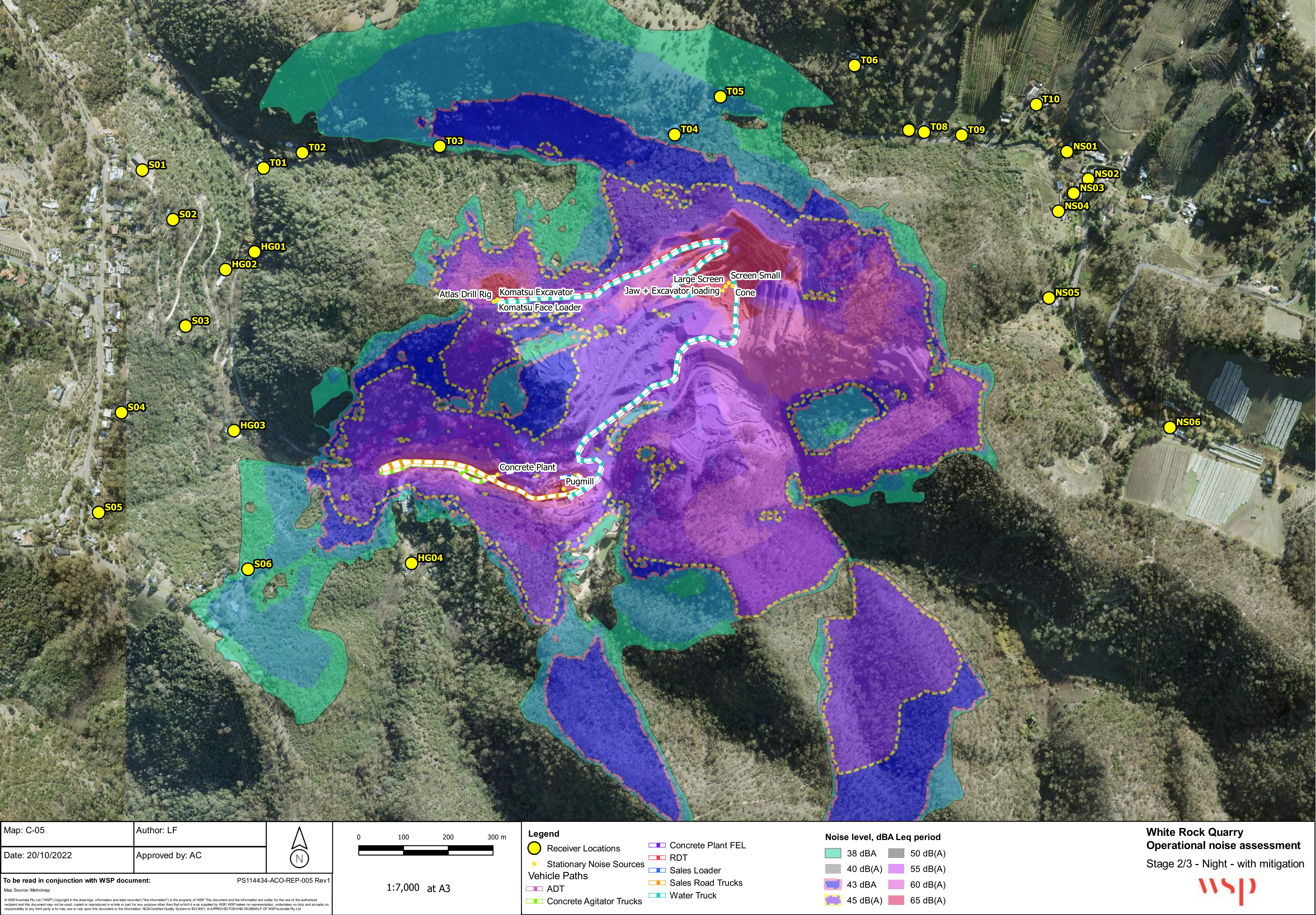
Vehicle Paths
- ADT
- Concrete Agitator Trucks
- Concrete Plant FEL
- RDT
- Sales Loader
- Sales Road Trucks
- Water Truck

Noise level, dBA Leq period

- 38 dBA
- 40 dB(A)
- 43 dBA
- 45 dB(A)
- 50 dB(A)
- 55 dB(A)
- 60 dB(A)
- 65 dB(A)

White Rock Quarry
Operational noise assessment

Stage 2/3 - Night - no mitigation



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Date: 20/10/2022	Approved by: AC

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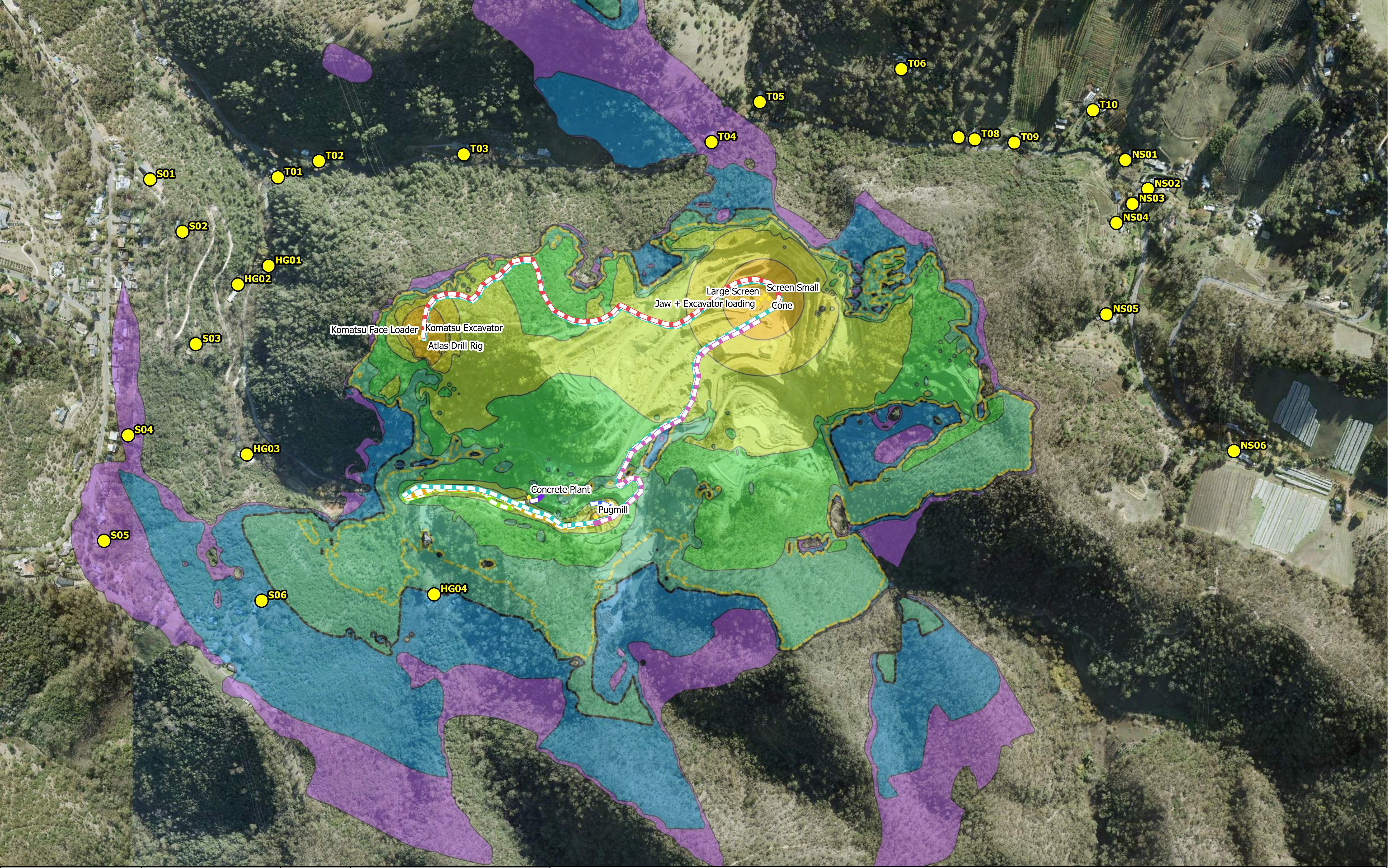
Map Source: Metromap

White Rock Quarry
Operational noise assessment

Stage 2/3 - Night - with mitigation



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Date: 20/10/2022	Approved by: AC

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To be read in conjunction with WSP document: PS114434-ACO-REP-005 Rev1

Map Source: Metromap

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Legend

- Receiver Locations
- Stationary Noise Sources

Vehicle Paths

- ADT
- Concrete Agitator Trucks
- Concrete Plant FEL
- RDT
- Sales Loader
- Sales Road Trucks
- Water Truck

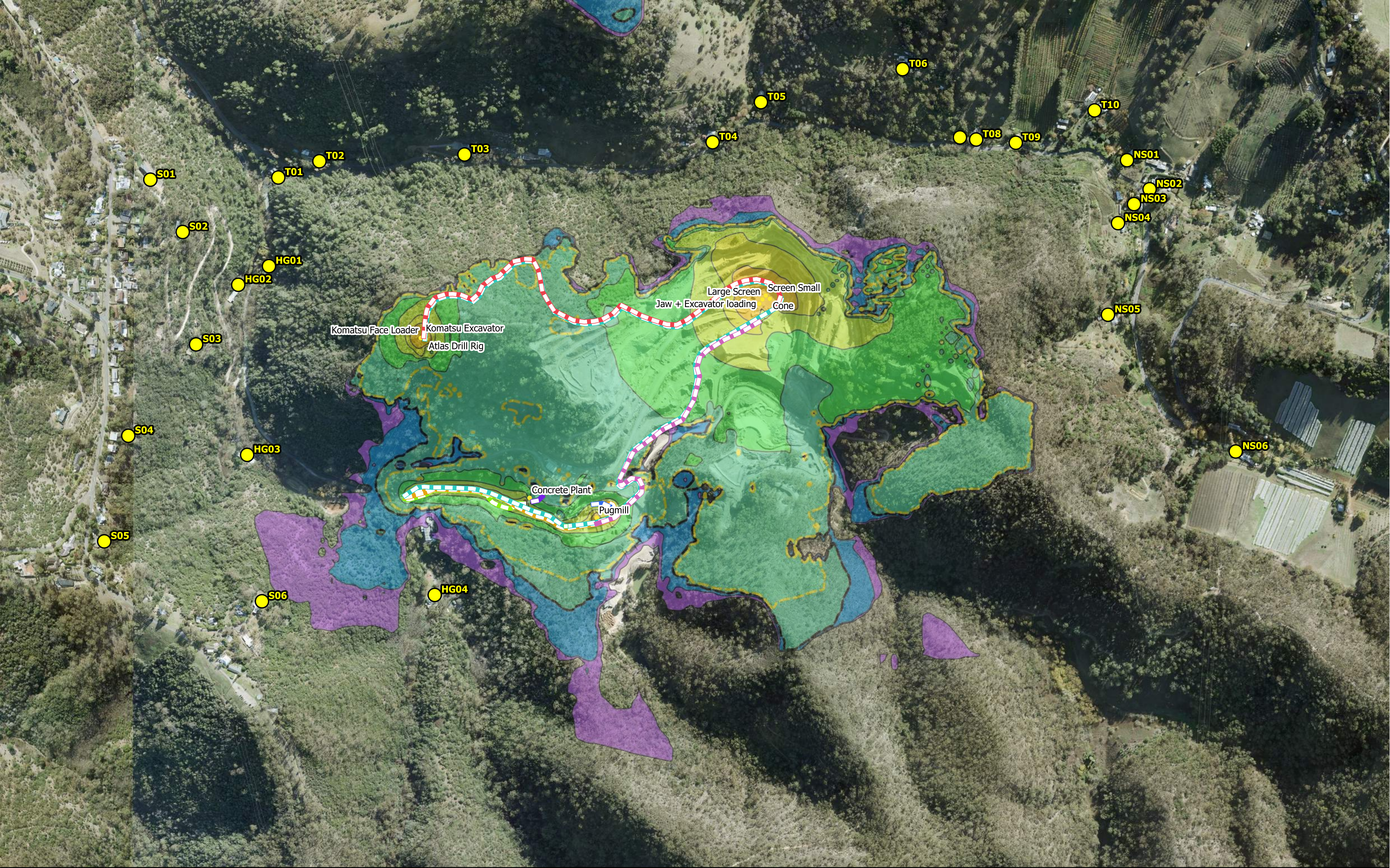
Noise level, dBA Leq period

- 45 dBA
- 47 dBA
- 50 dBA
- 52 dBA
- 57 dBA
- 62 dBA
- 67 dBA
- 71 dBA

White Rock Quarry
Operational noise assessment

Stage 3a - Day - no mitigation

wsp



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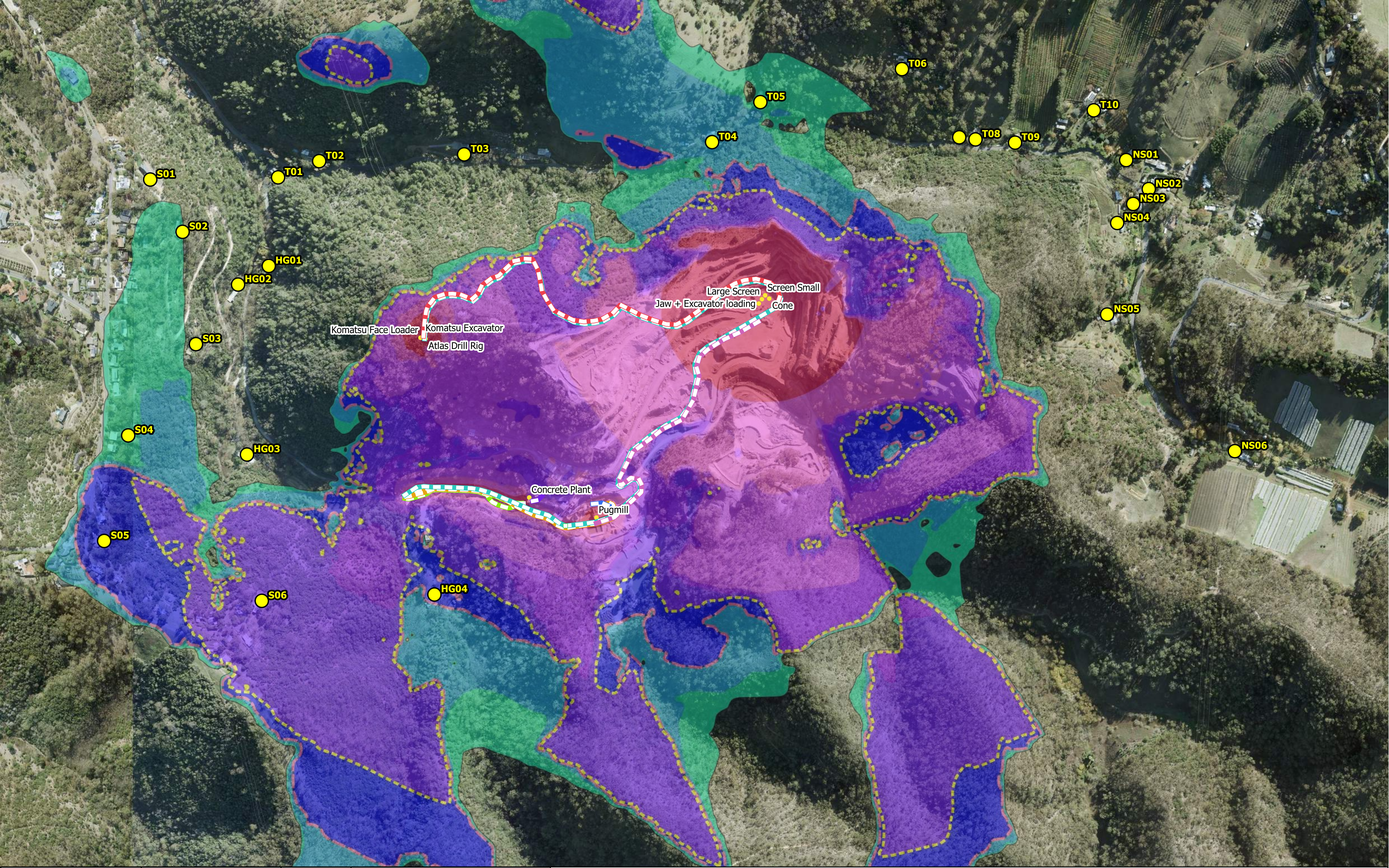
Map Source: Metromap

White Rock Quarry
Operational noise assessment

Stage 3a - Day - with mitigation



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Date: 20/10/2022	Approved by: AC

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To be read in conjunction with WSP document: PS114434-ACO-REP-005 Rev1

Map Source: Metromap

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Legend

- Receiver Locations
- Stationary Noise Sources

Vehicle Paths

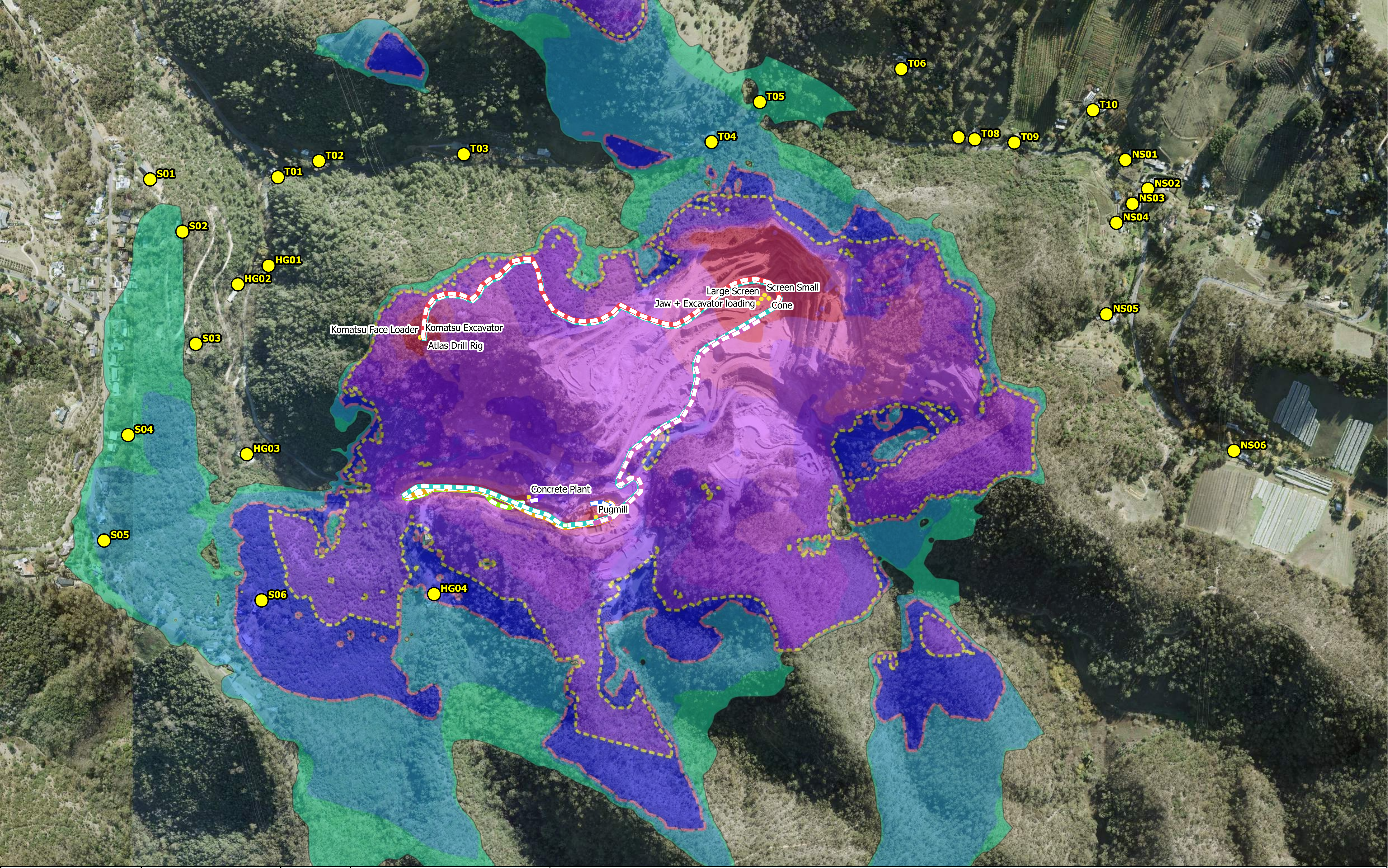
- ADT
- Concrete Agitator Trucks
- Concrete Plant FEL
- RDT
- Sales Loader
- Sales Road Trucks
- Water Truck

Noise level, dBA Leq period

- 38 dBA
- 40 dB(A)
- 43 dBA
- 45 dB(A)
- 50 dB(A)
- 55 dB(A)
- 60 dB(A)
- 65 dB(A)

White Rock Quarry
Operational noise assessment

Stage 3a - Night - no mitigation



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Date: 20/10/2022	Approved by: AC

To be read in conjunction with WSP document: PS114434-ACO-REP-005 Rev1

Map Source: Metromap

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1:7,000 at A3

Legend

Receiver Locations
Stationary Noise Sources
Vehicle Paths
ADT
Concrete Agitator Trucks
Concrete Plant FEL
RDT
Sales Loader
Sales Road Trucks
Water Truck

Noise level, dBA Leq period

38 dBA
40 dB(A)
43 dBA
45 dB(A)
50 dB(A)
55 dB(A)
60 dB(A)
65 dB(A)

White Rock Quarry
Operational noise assessment

Stage 3a - Night - with mitigation

Attachment 7

Air Quality Assessment

Air Noise Environment
Environmental Monitoring and Assessment

Air Quality Assessment - White Rock Quarry - MOP Review

Groundwork Plus

Date of Issue: 12 December 2022

Prepared by:
Air Noise Environment

ABN: 13 081 834 513

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DOCUMENT CONTROL SHEET

Document Details

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Client: Groundwork Plus

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02				
03				
04				
Revision:	**Issue Date:**	**Author:**	**Details of Revision:**	

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Where site inspections, testing or fieldwork have taken place, the report is based on the information made available by the client or their nominees during the visit, visual observations and any subsequent discussions with regulatory authorities. It is further assumed that normal activities were being undertaken at the site on the day of the site visit(s).

The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Air Noise Environment Pty Ltd for the purposes of this project is both complete and accurate.

Executive Summary

Hanson Construction Materials Pty Ltd (Hanson) are undertaking a Mine Operations Plan (MOP) review of their White Rock Quarry located at Horsnells Gully Road, Horsnell Gully. The review will involve additional extraction areas over 4 stages. For the purpose of this assessment, Stages 1, 2, 3 and 3A have been considered. Operations at the site are currently approved and proposed to occur 24 hours per day, 7 days a week however activities specific to crushing and screening are proposed to occur between the hours of 6 AM and 6 PM. Air Noise Environment was commissioned by Groundwork Plus (SA) Pty Ltd (Groundwork Plus) on behalf of Hanson to assess potential changes in air quality in the surrounding area as a result of the proposal.

Key air emission sources for the quarry development include extraction activity, wind erosion over exposed surfaces/stockpiles, haul routes, a concrete batching plant and processing plant. Particulate matter ($PM_{2.5}$, PM_{10}, TSP and deposited dust) is considered to be the main indicator for these air emission sources. Residential receptors are located to the north and north east at Norton Summit and to the west at Skye. In order to minimise potential dust impacts on nearby sensitive receptors, water spraying is proposed on unsealed haul routes and at the mobile processing plant.

To assess the potential for air quality impacts as a result of the quarry development, computational air dispersion modelling was undertaken using the CALPUFF modelling system. The modelling has utilised meteorological data derived from CALMET, and emission rates estimated from published emission factors (e.g. NPI Mining Manual, US EPA AP 42) and proposed operational data (e.g. throughputs, air emission controls). CALMET was run with observations only using Bureau of Meteorology data from the Mount Lofty and Adelaide (Kent Town) surface stations and upper air data from the Adelaide Airport station. The year 2009 was adopted based on advice from the South Australia Environmental Protection Authority. Comparison of predicted wind roses with those derived from the Bureau of Meteorology monitoring data for the years 2009 - 2014 indicates that the CALMET model is predicting local wind fields accurately.

To understand the variation in potential air quality impacts as well as to assess a worst-case scenarios, various modelling scenarios have been considered (Stage 1, 2, 3 and 3A).

The results of the modelling demonstrate compliance with the air quality criteria for all the stages of the proposed development. This takes into account Level 1 watering on unsealed haul routes and a mobile processing plant with water sprays. It is also essential that sealed access roads are cleaned regularly and maintained at all times to ensure silt loading minimised.

Overall, the proposed quarry operations are expected to result in increased particulate concentrations in the surrounding area, however, the potential for dust impacts can be effectively managed to achieve the relevant air quality goals with the above measures are in place.

Table of Contents

Index of Tables

Index of Figures

1 Introduction

1.1 Scope of Study

Groundwork Plus (SA) Pty Ltd (Groundwork Plus) commissioned Air Noise Environment on behalf of Hanson to undertake an air quality assessment for the proposed White Rock quarry MOP (Mine Operations Plan) review at Horsnell Gully, South Australia. The proposed development includes additional extractive areas over four stages with an in-pit mobile processing plant.

The study considers the potential impacts of the proposed development on nearby sensitive receptors in accordance with the requirements of the South Australia Environmental Protection Authority. Computational modelling has been undertaken for assessing potential air quality impacts and results have been compared to criteria defined in the South Australia Environmental Protection (Air Quality) Policy 2016.

1.2 This Report

This report presents the methodology, results and recommendations of the air quality assessment. Report sections are summarised below:

- Section 2 Site Operations
- Section 3 Existing Environment
- Section 4 Assessment Criteria
- Section 5 Modelling Approach
- Section 6 Meteorological Modelling
- Section 7 Air Emissions Data
- Section 8 Air Dispersion Modelling
- Section 9 Predicted Results
- Section 10 Crystalline Silica Review
- Section 11 Conclusion

A glossary of terms is provided in Appendix A to assist the reader.

2 Site Operations

2.1 Site Location

The subject site is located at Horsnells Gully Road, Horsnell Gully, and covers land parcels identified as F130081 A27, F130079 A25, F130094 A40, F130063 A9, F130671 Q9, F130945 QP1, F130062 A8 and F130945 QP2. The site is currently zoned as Hills Face under the Planning and Design Code (South Australia). The surroundings are zoned as Hills Face and Conservation zones under the Adelaide Hills Council Development Plan 2017.

The nearest sensitive receptors includes rural residential dwellings located to the north and north-east at the Norton Summit township. Residential dwellings are also located in close proximity at Skye, to the south-west and west, as follows:

- 30 m from the northern property boundary to the rural residential dwellings to the north.
- 225 m from the eastern property boundary to the rural residential dwellings to the north east, Norton Summit.
- 50 m from the western boundary of the property to residential dwellings to the west, Skye.
- 105 m from the sediment basins to an existing dwelling, owned by Hanson.

Figure 2.1 presents an aerial photo identifying the site location and surrounding land uses. Figure 2.1 also identifies potential residential dwellings identified through a review of aerial photography.

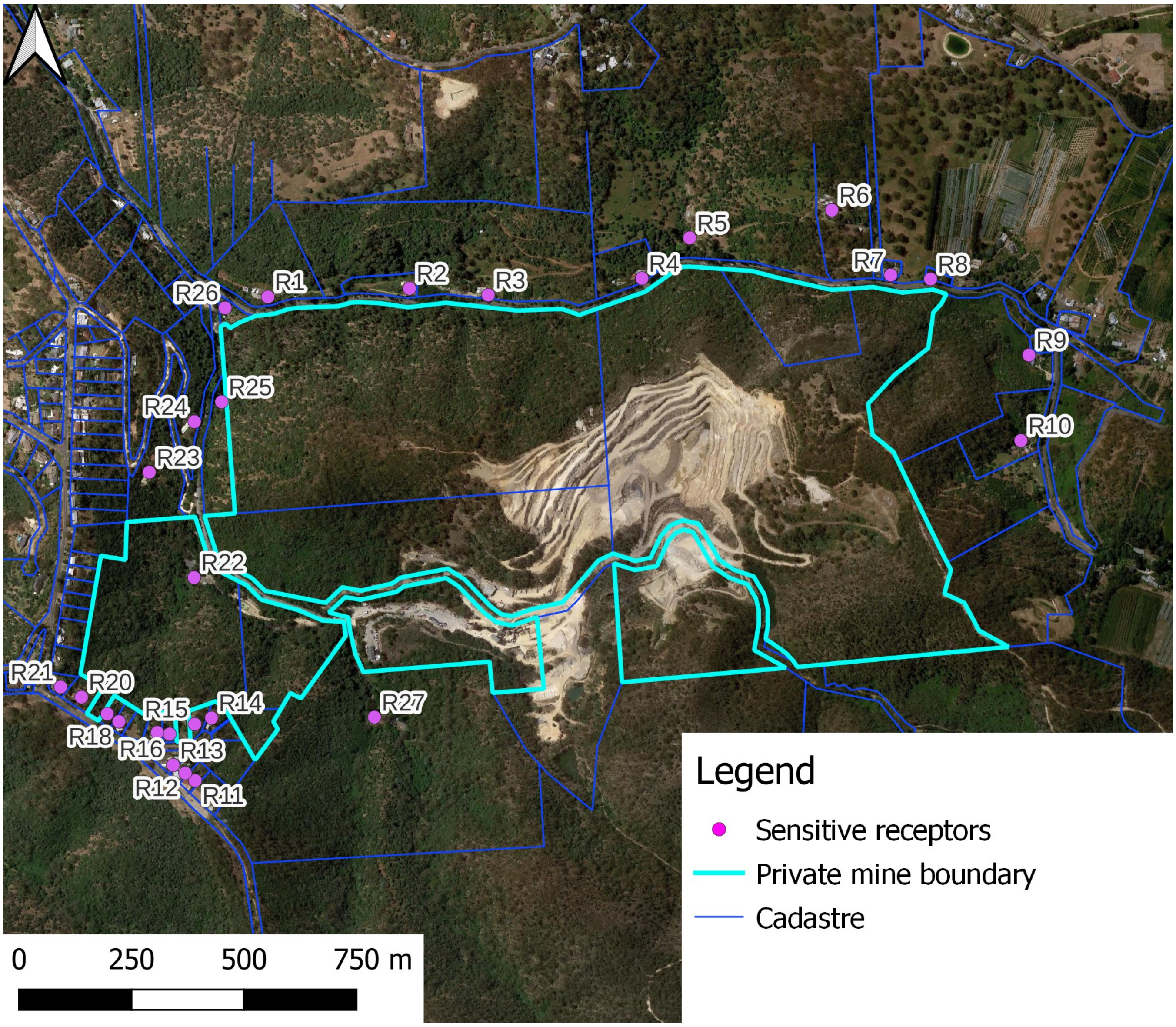


Figure 2.1 - Site Location and Surrounding Land Uses

2.2 Proposed Operations

The proposal is to increase the extraction area over stages 1, 2, 3 and 3a which will be associated with an increased throughput from the current average throughput of 300 ktpa up to a worst case estimated annual throughput of 500 ktpa.

Blasting is expected to occur 1-2 times a week during the early stages. The frequency of blasting is expected to be reduced to 1-2 times per fortnight as the quarry develops.

Mobile crushing equipment will be implemented in the pit floor. A typical mobile equipment train will be comprised of a jaw crusher, a re-claimer, a cone crusher, a screen deck and a return stacker, as per Figure 2.2. Water sprays will be used to wet down ROM material and at transfer points.

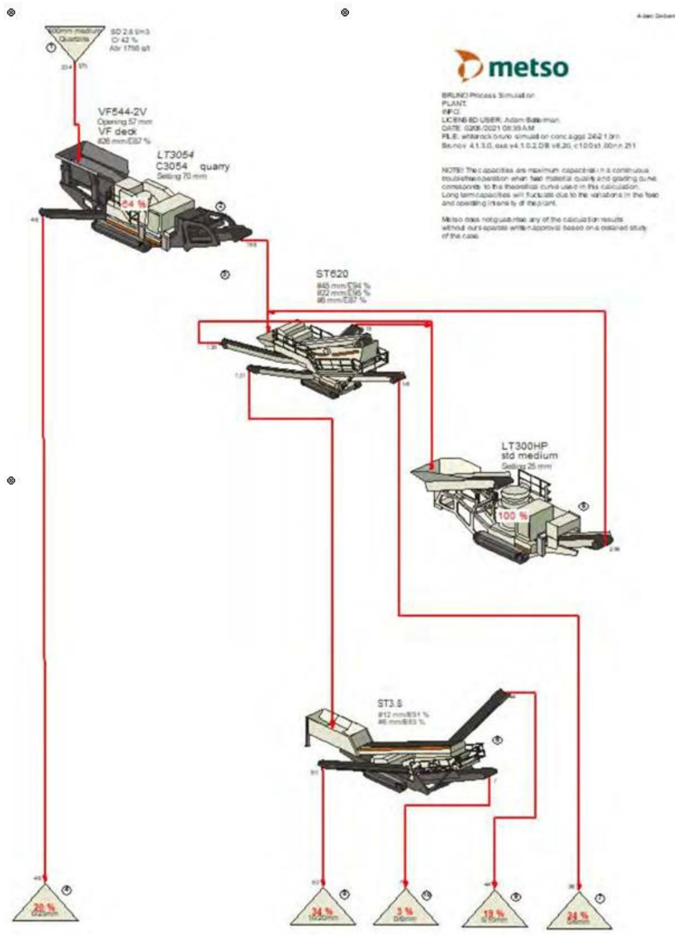


Figure 2.2 - Mobile plant layout

Appendix D presents figures of the proposed quarry stages.

2.3 Air Emission Sources

Particulate matter ($PM_{2.5}$, PM_{10}, TSP and deposited dust) is considered to be the main indicator for assessing potential air quality impacts for the site. On-site haul routes and wind blown dust from large exposed surface areas are likely to be the main contributor to air emissions from the site operation. The proposed mobile processing plant will have a water spraying system at transfer points, minimising dust emissions from this source. A summary of key air emission sources is listed below:

Extraction Area

- Drill and blasting;
- Extraction of overburden and rock; and
- Wind erosion over exposed extraction areas and material stockpiles.

- Concrete Batching Plant
  - Material handling including aggregate loading, weigh hopper loading, truck loading and cement deliveries; and
  - Wind erosion over material stockpiles.

Proposed Processing Plant

- Crushing;
- Screening; and
- Transfer Points.

Material Stockpile Area

- Wind erosion over material stockpile area.

Haul Route

- On-site haul trucks between extraction area and processing plant (in pit);
- Haul trucks between the processing area (in pit) to the stockpiles;
- Product trucks between stockpiles and site exit/entry; and
- Concrete trucks between concrete batching plant and site exit/entry.

3 Existing Environment

3.1 Topography

The subject site is located on the western face of the Adelaide Hills. The Adelaide Hills region is defined by significant variation in topography within the Western Mount Lofty Ranges. A number of valleys exist in the area associated with creeks and gullies. The ground height of the development site is in the range of 215 to 461 metres above sea level. Figure 3.1 presents ground contours of the site and surrounding area.

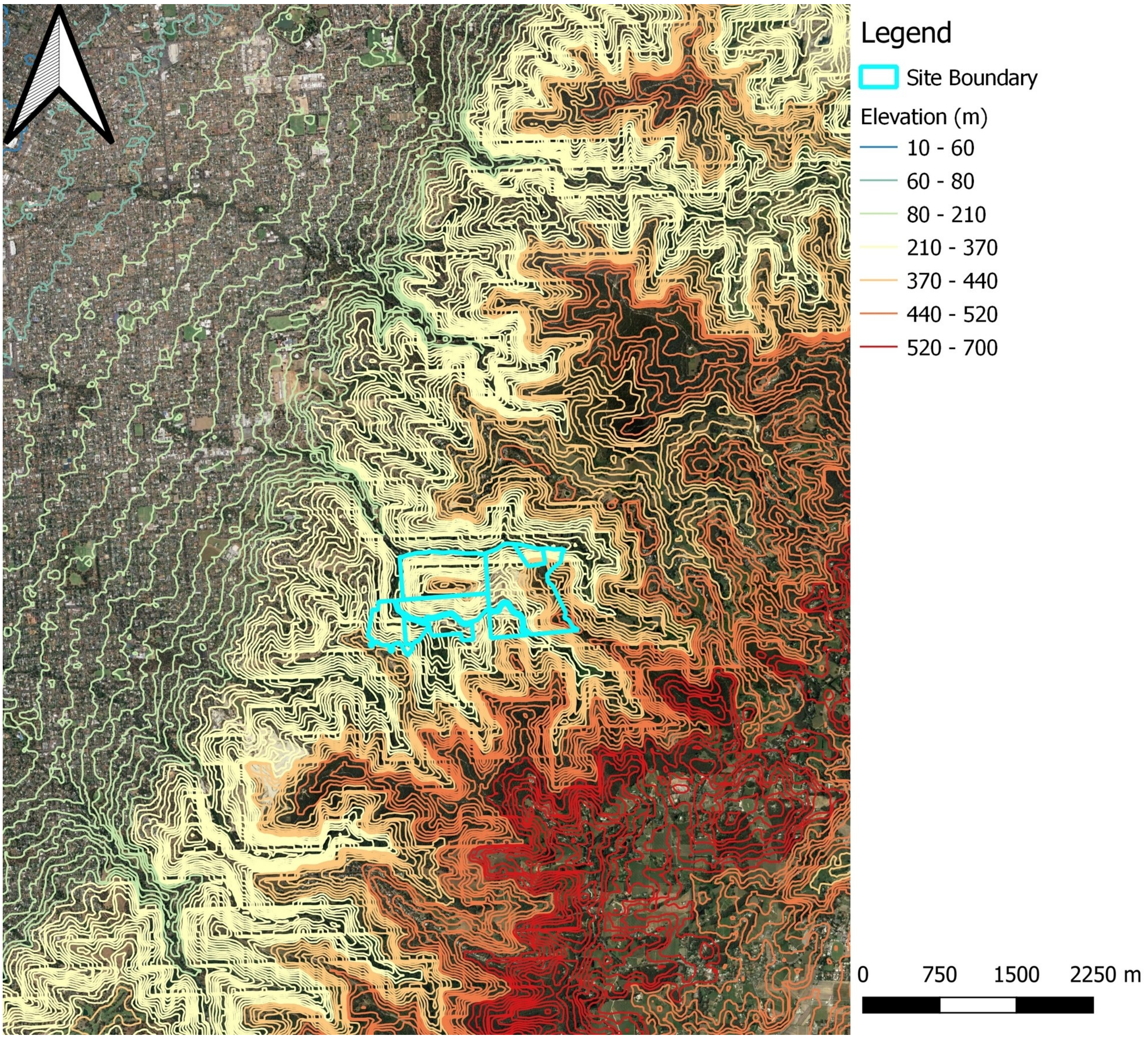


Figure 3.1 - Site Topography

3.2 Meteorology

The Adelaide Hills area is characterised as having a Mediterranean climate. Based on the nearest Bureau of Meteorology station at Mount Lofty (5.9 km south east of the proposed development site), historical temperatures range from 5.2 - 9.4 °C in winter to 12.0 – 21.7 °C in summer, and the mean annual rainfall is 989 mm.

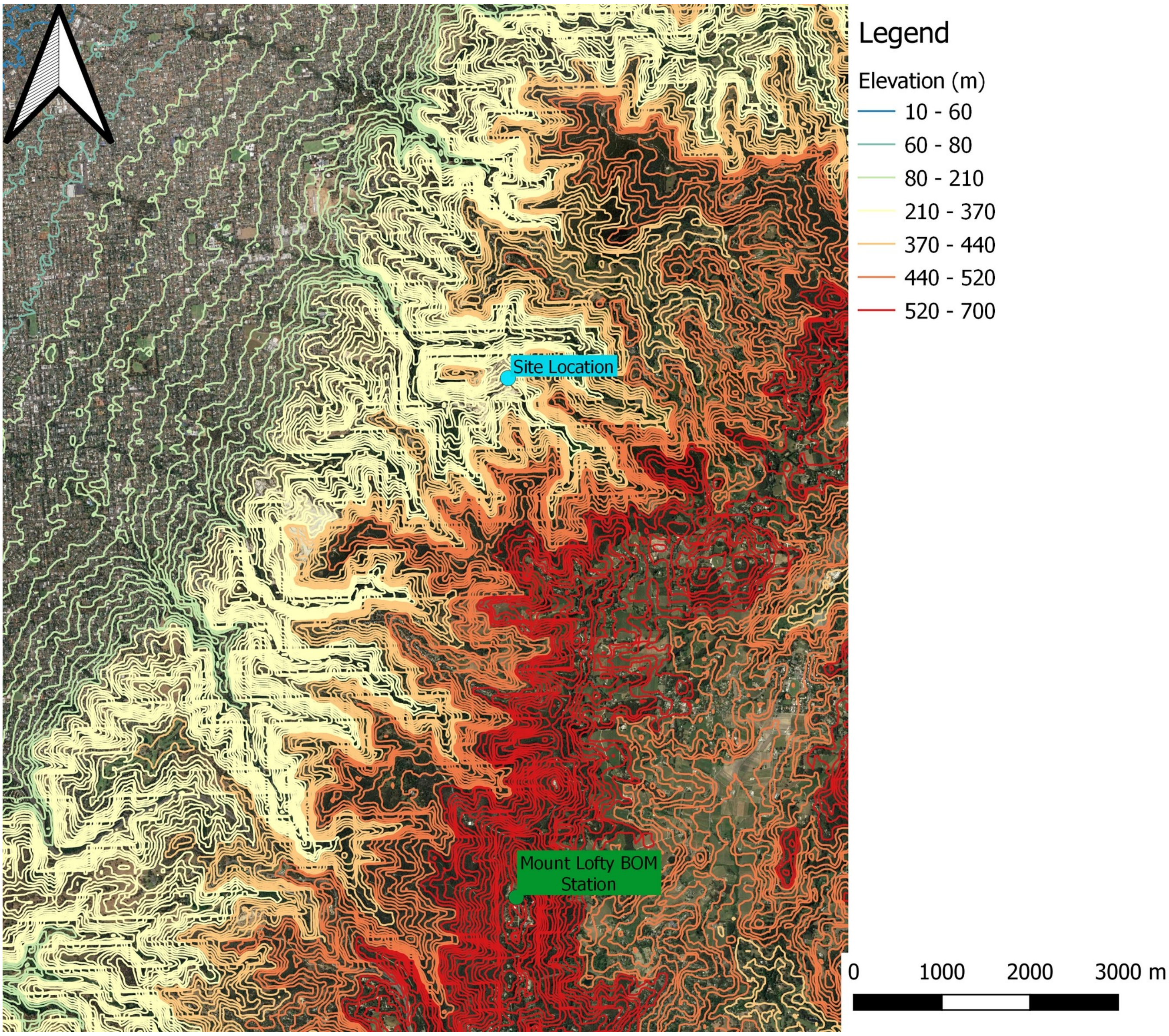


Figure 3.2 - Site location and nearby Bureau of Meteorology station

With regards to wind conditions, the Mount Lofty stations shows that the area is dominated by westerly and easterly winds. North easterly and south westerly winds are noted to be minimal.

Average wind speeds for Mount Lofty are 3.3 m/s. Calms are not considered to be a major feature of the area, with the proportion of calms being 1.1%.

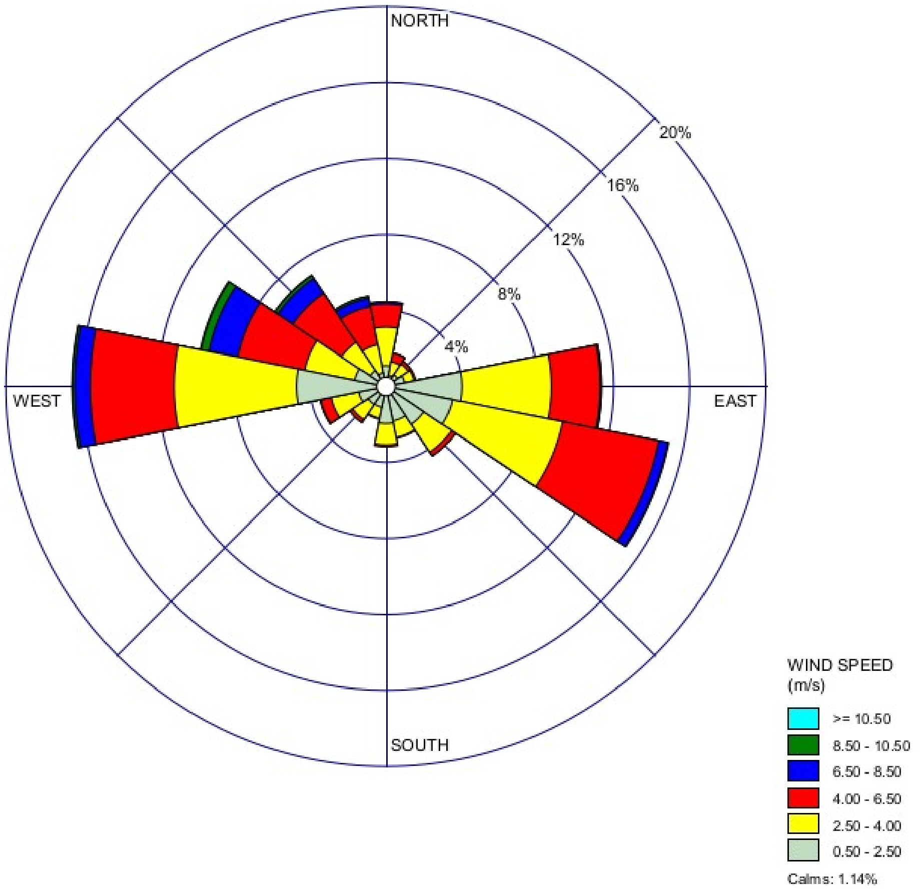


Figure 3.3 - 2009 - 2014 Mount Lofty BoM Station Wind Rose

3.3 Background Particulate Monitoring

Besides contribution from the White Rock Quarry, ambient particulate concentrations in the Adelaide Hills area are defined by local traffic and the Stonyfell Quarry where sandstone and quartzite are extracted (located 1.9 km from the nearest emission sources of the White Rock Quarry). Besides these sources, there are no other major anthropogenic dust emission sources in the area. To allow for the assessment of cumulative pollutant concentrations, the assessment has considered ambient concentrations from the South Australia Environmental Protection Authority air quality monitoring stations at Christie Downs, Elizabeth Downs, Kensington Gardens, Netley, Adelaide CBD, Le Fevre 1 and Le Fevre 2.

The location of the South Australia EPA monitoring stations are presented in Figure 3.4.

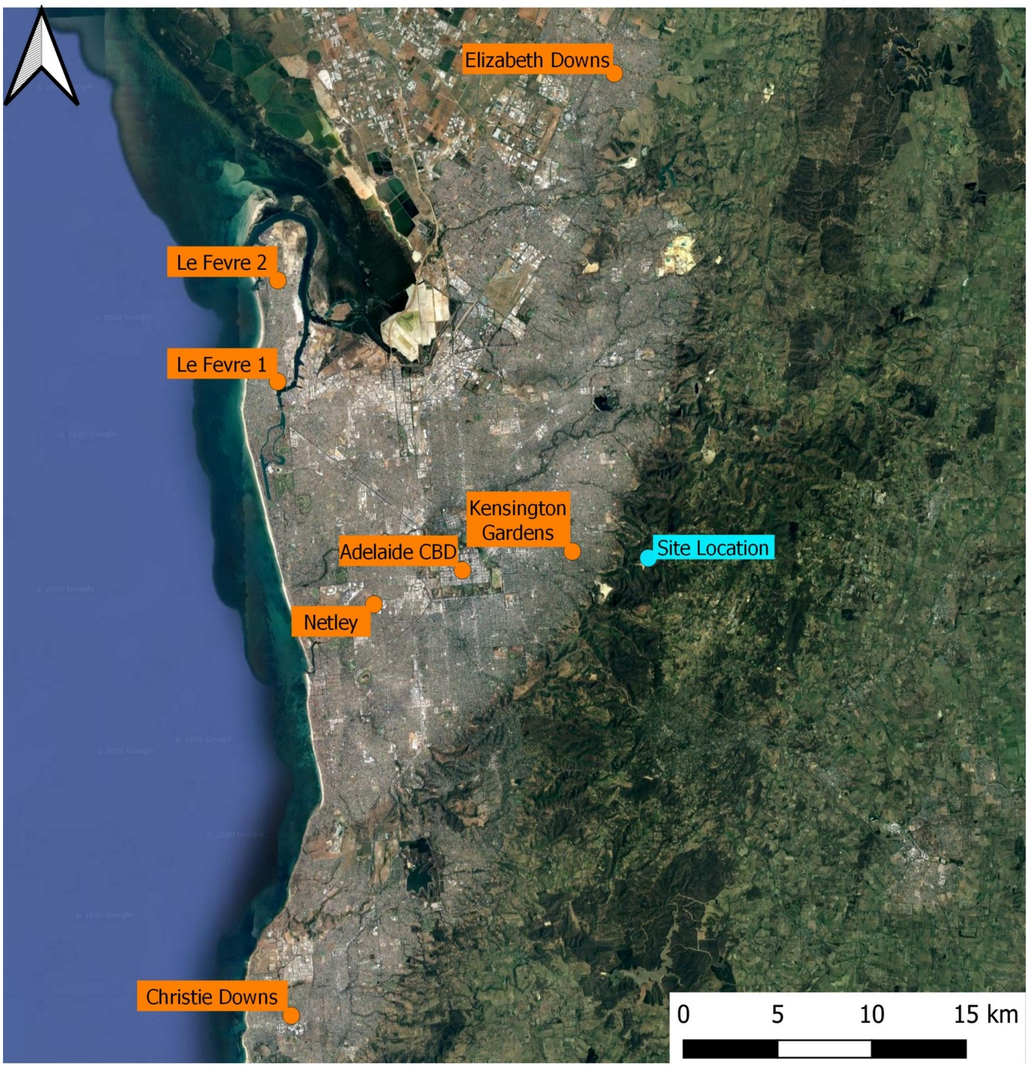


Figure 3.4 - SA EPA Monitoring Station Locations

Table 3.1 presents the ambient monitoring data from the nearby SA EPA monitoring stations for the year 2019.

Table 3.1 - PM_{10} and $PM_{2.5}$ Data – SA EPA Monitoring Stations

Monitoring Station	Measured Concentration (µg/m³)			
	$PM_{2.5}$	$PM_{2.5}$	PM_{10}	PM_{10}
	24-hour, 70th Percentile	Annual Average	24-hour, 70th Percentile	Annual Average
Adelaide CBD	6.6	6.1	18.7	17.4

Monitoring Station	Measured Concentration (µg/m^3)			
	$PM_{2.5}$	$PM_{2.5}$	PM_{10}	PM_{10}
	24-hour, 70th Percentile	Annual Average	24-hour, 70th Percentile	Annual Average
Netley	6.8	6.2	29.6	28.3
Le Fevre 1	6.9	6.3	23.9	22.2
Le Fevre 2	6.7	6.5	23.9	22.2
Elizabeth Downs	6.5	6.1	22.6	21.4
Kensington Gardens			16.1	15.3
Christie Downs			20.0	17.9
Adopted Background	**6.5**	**6.1**	**16.1**	**15.3**

To provide an assessment of cumulative PM_{10} impacts, data from the Kensington Garden air quality monitoring station has been adopted. The Kensington Gardens Air Quality Monitoring station is noted be located 3.5 km from the White Rock Quarry.

It is noted that TSP is not measured at the South Australia EPA monitoring stations. In order to assess cumulative TSP impacts, a TSP/PM_{10} ratio has been derived for a typical residential area (i.e. Cannon Hill (Queensland Department of Environment and Science) station data). This ratio was then applied to the Kensington Gardens PM_{10} 24-hour 70th percentile and annual average to derive the TSP 24-hour and annual background concentrations.

Table 3.2 - Adopted TSP Background

TSP/PM_{10} ratio (DES Cannon Hill station)	TSP 24-hour (µg/m^3)	TSP annual average (µg/m^3)
2.1	34.5	32.6

4 Assessment Criteria

The results of the modelling have been compared to ambient air quality goals defined in the *South Australia Environment Protection (Air Quality) Policy 2016 (SA Air Quality EPP)* and *National Environment Protection (Ambient Air Quality) Measure 2016 (NEPM Air).*

The air quality goals for $PM_{2.5}$ and PM_{10} are based on 24-hour and annual average concentrations, and are related to the protection of human health. The SA EPA has also identified a suggested TSP target limit of 120 µg/m^3 as a 24 hour average to prevent nuisance impacts. It is noted that other states reference an annual average 90 µg/m^3 goal for TSP. Reference has also been made to a commonly adopted dust deposition limit of 4 g/m^2/month (e.g. NSW EPA).

The air quality criteria are applicable at the nearest sensitive receptors, which are defined as a 'fixed location such as a house, building, other premises or open area where health, property or amenity is affected by emissions that increase the concentration of the emitted parameter above background levels' in the SA EPA Ambient Air Quality Assessment (August 2016) guideline.

Table 4.1 summarises the air quality criteria.

Table 4.1 - Air Quality Criteria

Compound	Air Quality Criteria (µg/m^3)	Averaging Period	Source
TSP	120	24-hour	SA EPA advice
	90	Annual	Other Australian states
PM_{10}	50	24-hour	SA Air Quality EPP
	25	Annual	NEPM
$PM_{2.5}$	25	24-hour	SA Air Quality EPP, NEPM
	8	Annual	SA Air Quality EPP, NEPM
Deposited Dust	4 g/m^2/month	Month	Other Australian states

In addition to the above, SA EPA is currently adopting an interim air quality goal of 3 µg/m^3 ambient air quality for crystalline silica (as PM_{10})[1].

1 SA EPA, 26 September 2022, Respirable crystalline silica (RCS) monitoring and analysis, https://engage.epa.sa.gov.au/white-rock-quarry-hanson/news_feed/granting-of-the-licence

5 Modelling Approach

To assess the potential for air quality impacts, air dispersion modelling has been undertaken to predict pollutant concentrations at the nearest sensitive receptors based on the proposed operational details of the quarry.

Atmospheric dispersion modelling involves the mathematical simulation of the dispersion of air contaminants in the environment. The modelling utilises a range of information to estimate the dispersion of pollutants released from a source including:

- meteorological data for surface and upper air winds, temperature and pressure profiles, as well as humidity, rainfall, cloud cover and ceiling height information;
- emissions parameters including source location and height, source dimensions and physical parameters (e.g. exit velocity and temperature) along with pollutant mass emission rates;
- terrain elevations and land use both at the source and throughout the surrounding region;
- the location, height and width of any obstructions (such as buildings or other structures) that could significantly impact on the dispersion of the plume; and
- sensitive receptor locations and heights.

The CALPUFF modelling system has been adopted for the dispersion modelling. The CALPUFF modelling system comprises of three components, including CALMET for meteorological predictions, CALPUFF for air dispersion modelling and CALPOST for results analysis.

CALPUFF treats emissions as a series of puffs. These puffs are then dispersed throughout the modelling area and allowed to grow and bend with spatial variations in meteorology. In doing so, the model is able to retain a memory of the plume's movement throughout a single hour and from one hour to the next while continuing to better approximate the effects of complex air flows.

CALPUFF utilises the meteorological processing and prediction model CALMET to provide three dimensional wind field predictions for the area of interest. The final wind field developed by the model (for consideration by CALPUFF) includes an approximation of the effects of local topography, the effects of varying surface temperatures (as is observed in land and sea bodies) and surface roughness (resulting from varied land uses and vegetation cover in an area). The CALPUFF model is able to resolve complex terrain influences on local wind fields including consideration of katabatic flows and terrain blocking.

Post processing of modelled emissions is undertaken using the CALPOST package. This allows the rigorous analysis of pollutant predictions generated by the CALPUFF system. In particular CALPOST is able to provide an analysis of predicted pollutant concentrations for a range of averaging periods from 1 hour to 1 year.

For the purpose of the assessment, the meteorological year 2009 has been selected based on previous discussions with the SA EPA. Meteorological predictions have been reviewed to confirm the suitability of the model year.

A total of 4 modelling scenarios have been completed as follows:

- Stage 1
- Stage 2
- Stage 3
- Stage 3A

The following sections present the methodology, assumptions and outcomes of the meteorological and air dispersion modelling (Section 6 Meteorological Modelling, Section 7 Air Emissions Data and Section 8 Air Dispersion Modelling).

6 Meteorological Modelling

6.1 Overview

CALMET has been run to predict meteorological data for the year 2009 based on advice from the SA EPA. CALMET has been run in No-OBS mode with a prognostic data set developed using TAPM. CALMET was originally run with a TAPM-developed 3D prognostic data set with no observations included. The results of the CALMET run with no observations did not accurately represent the wind conditions of Adelaide Airport. Given the CALMET predicted dataset was not an accurate representation of the existing environment, CALMET was run with observations only, utilising measured Bureau of Meteorology surface station data from the Adelaide (Kent Town) and Mount Lofty and measured Bureau of Meteorology upper air data from the Adelaide Airport station.

The following sections provide an overview of the data utilised in the CALMET modelling, along with details of some of the key parameters selected to establish calculation limits within CALMET.

6.2 Vertical Stations

For the purposes of the modelling, CALMET was initialised with a total of 10 vertical layers with layer boundaries at 20 m, 40 m, 80 m, 160 m, 320 m, 640 m, 1,200 m, 2,000 m, 3,000 m and 4,000 m respectively. The vertical levels used in the modelling were selected to provide the model with the ability to predict atmospheric conditions at a range of heights. A greater resolution of vertical heights has been adopted nearer to the ground, given the ground level sources considered in the assessment.

6.3 Terrain and Land Use Data

Terrain data for the area surrounding the development was obtained from the Shuttle Radar Topography Mission (SRTM) 1-arc-second dataset. Data for a 20 km x 20 km area (0.2 km spacing) has been extracted for use in the modelling.

The TERRAD value in CALMET is used to determine the radius of influence for terrain features within the model domain. The TERRAD value has been calculated based on the rule ‘ridge-to-ridge divided by 2, rounded up’ recommended by the NSW Office of Environment and Heritage[2]. A TERRAD value of 6 km has been adopted after review of the surrounding terrain features.

Land use data was also created based from the USGS and satellite imagery and incorporated into the CALMET model. Where land use categories do not correspond with the CALMET land use input file categories, satellite imagery has been reviewed to determine the most appropriate land use category. Figures 6.1 and 6.2 presents the modelled terrain and land use in CALMET.

2 TRC Environmental Corporation (March 2011) 'Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the ‘Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia’ prepared on behalf of the NSW Office of Environment and Heritage.

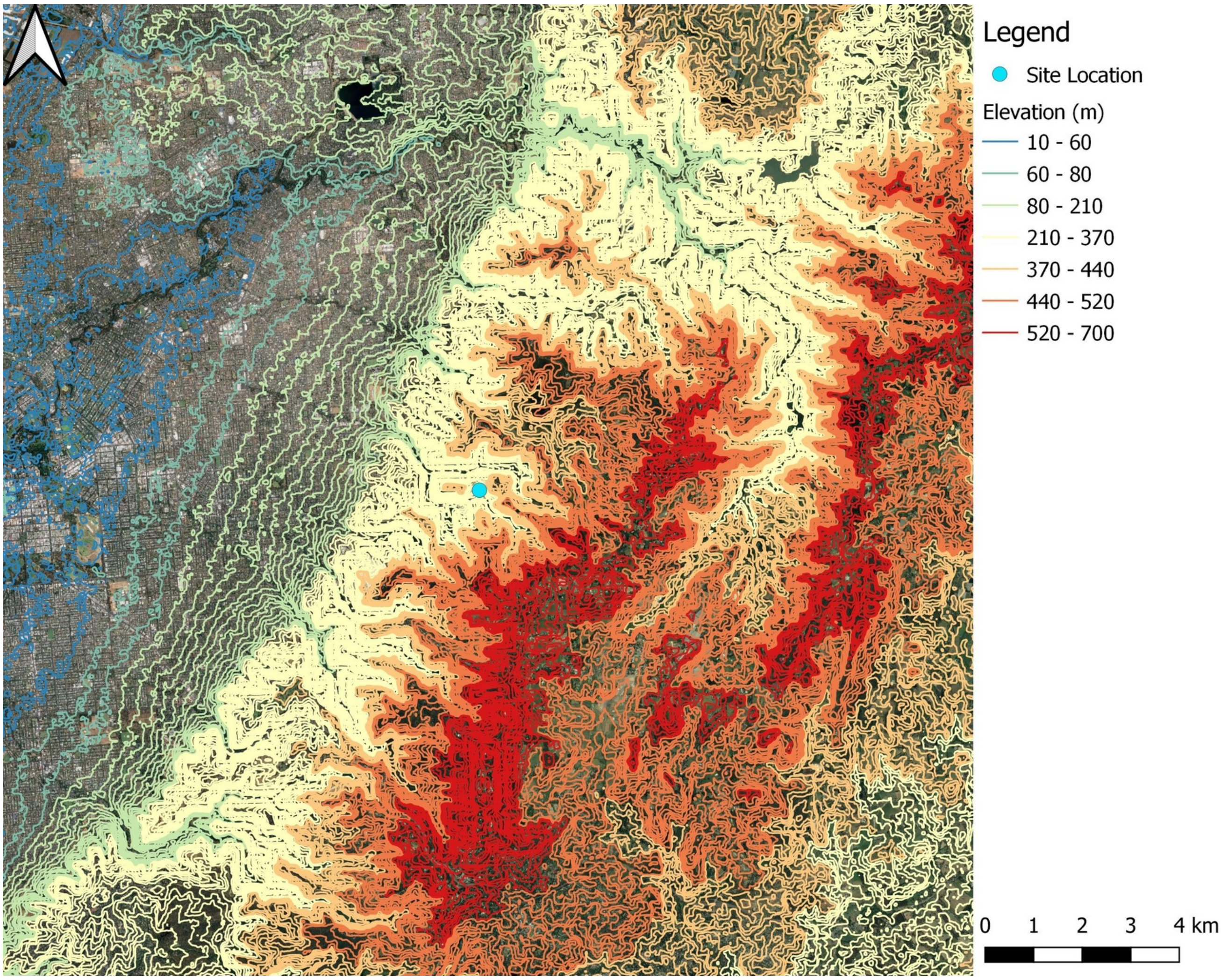


Figure 6.1 - Modelled Terrain

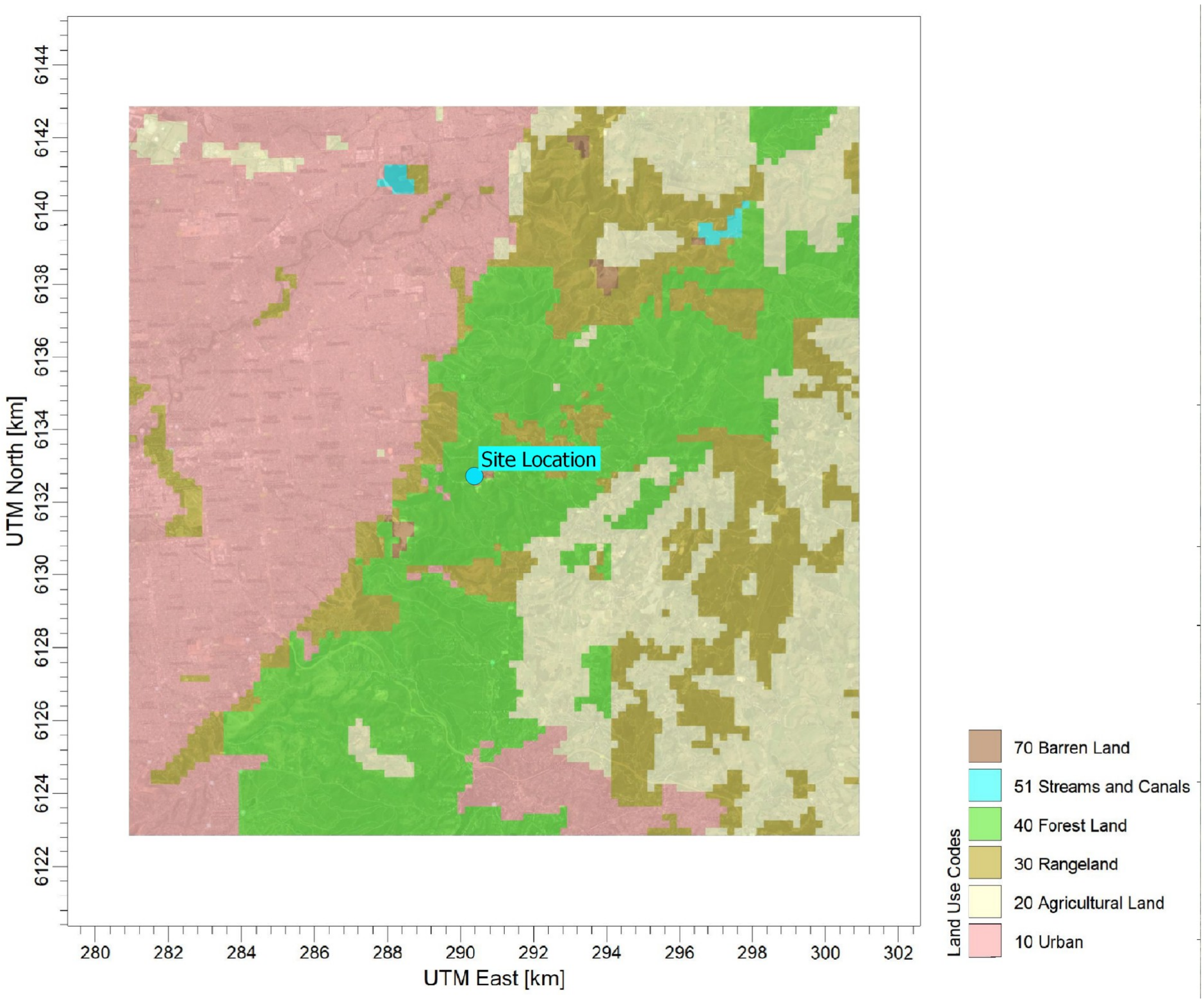


Figure 6.2 - Modelled Land Use

6.4 Observational Data

Observational data has been included in the CALMET modelling in order to ensure the accuracy of the predicted CALMET dataset. A number of Bureau of Meteorology stations are present in the surrounding area, Figure 6.3 presents the location of the nearby BoM observational data sites and the South Australia EPA air quality monitoring sites along with the site location.

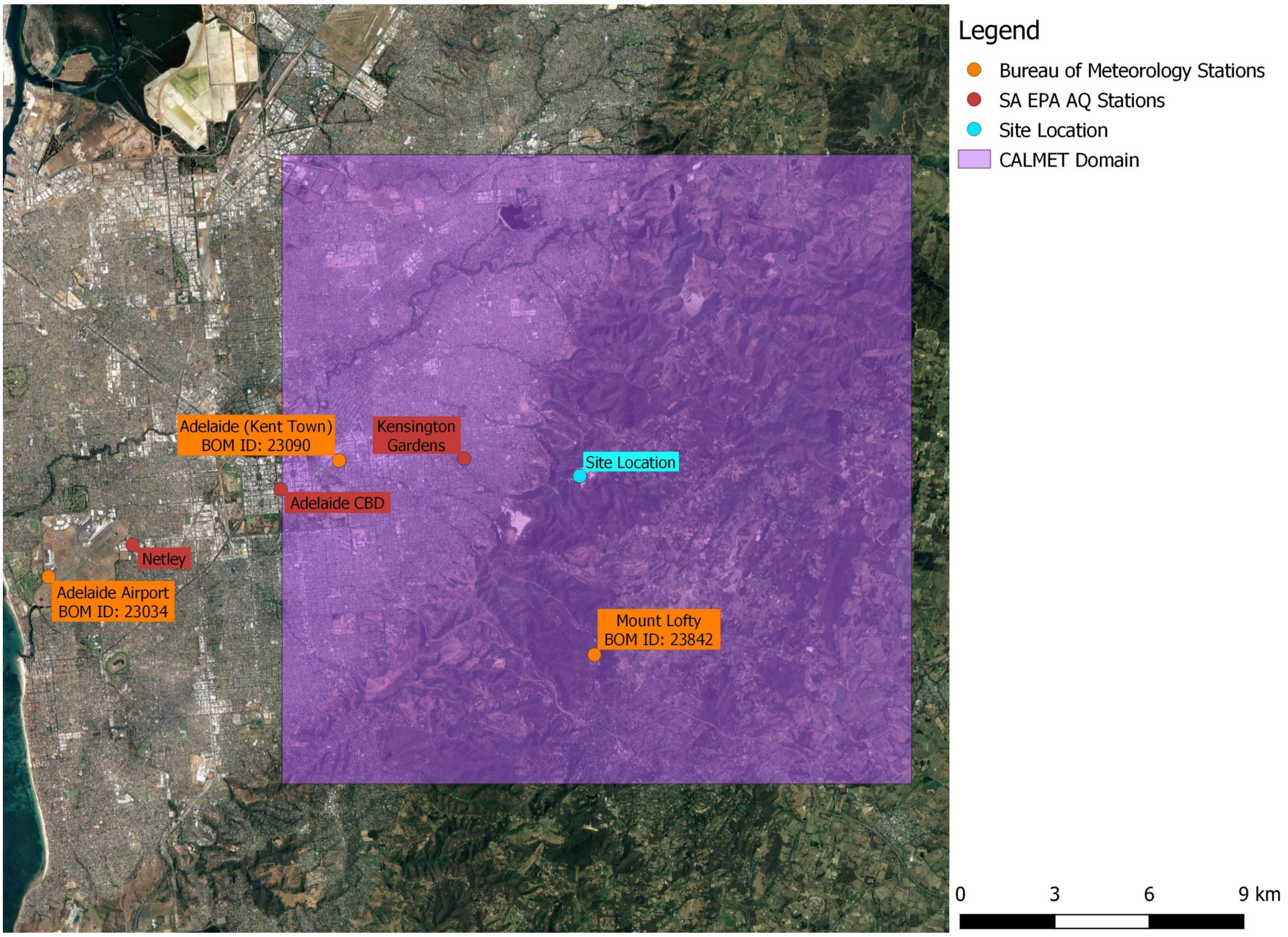


Figure 6.3 - CALMET Domain Available Meteorological Stations

Surface data from the Adelaide (Kent Town) and Mount Lofty BoM stations are considered appropriate for inclusion in the CALMET modelling due to their close proximity to the site. It is noted that meteorological data is also measured at the Netley, Adelaide CBD and Kensington Gardens stations however, data was not publicly available at the time of the assessment (based on a review of the SA Government online data portal). These stations are located in close proximity to the BoM stations – the Kensington Gardens and Adelaide CBD stations are both located within 4 km of the Adelaide (Kent Town) station. The Netley station is located well outside that CALMET domain. Hence, adopting the data from either EPA or BoM stations is considered appropriate.

In order to determine the appropriateness for inclusion in CALMET, the completeness of the required CALMET parameters were reviewed. CALMET requires observational data for the following parameters wind speed (m/s), wind direction (°), temperature (°C), pressure (hPa), cloud cover (Tenths) and relative humidity (%).

Table 6.1 presents the availability of data required by CALMET for 2009.

Table 6.1 - Data availability of BoM observational data

BoM Station	Parameter	Data Availability (%)
Adelaide (Kent Town)	Temperature	99.9%
	Pressure	99.9%
	Wind Speed	99.9%
	Wind Direction	99.9%
	Relative Humidity	99.9%
	Cloud Cover	0%
Mount Lofty	Temperature	99.7%
	Pressure	0%
	Wind Speed	61.6%
	Wind Direction	61.6%
	Relative Humidity	99.7%
	Cloud Cover	0%

There are minimal gaps in the data from the Adelaide (Kent Town) BoM station for all parameters aside from cloud cover which are not recorded at Adelaide Kent Town. Wind direction and wind speed data is noted to be unavailable at the Mount Lofty station from January 1 2009 until 21 May 2009. There are minimal gaps in the relative humidity and temperature parameters for the Mount Lofty Dataset. It is noted that data is unavailable for cloud cover at both the Mount Lofty and Adelaide (Kent Town) stations. In the absence of observed cloud cover data, the MCLOUD option in CALMET has been set to the gridded cloud cover from prognostic relative humidity at 850mb (Teixera).

Pressure is noted only to be recorded at the Adelaide (Kent Town) station. For CALMET to run, at least one station must have a value for all parameters for any given hour. Where gaps exist in the data for both stations, gap filling has been undertaken in accordance with the US EPA Meteorological Monitoring Guidance for Regulatory Modelling Applications[3]. Gaps in the data which overlap between the Mount Lofty and Adelaide (Kent Town) data sets have been linearly interpolated. The US EPA suggests caution be used when gaps in data persist for longer than several hours and when gaps occur during day/night transition periods. Gaps in the overlapping data sets for 2009 are noted to persist no longer than 2 hours and do not occur during day/night transition periods.

Adelaide Airport is noted to be the only nearby BoM station to record upper air data. A review of the upper air data from the Adelaide Airport for 2009 has concluded that the data available is appropriate for use in the CALMET modelling. CALMET requires data from two soundings per day for the modelling period at intervals of 14 hours or less. Analysis of the available 2009 upper data from Adelaide Airport indicates that, during the two years, a number of soundings are missing or inappropriate for use (missing both wind speed and wind direction for top cell face level). Where sounding data is unavailable, TAPM upper air data has been used to supplement the missing

3 United States Environmental Protection Agency (February 2000), 'Meteorological Monitoring Guidance for Regulatory Modelling Applications'.

sounding. Consecutive missing sounding data is noted to occur for no more than 3 consecutive soundings

An R1 and RMAX1 value of 3 km and 5 km have been adopted given the nearest ridges to the BoM station (5 km to the north).

6.5 CALPUFF Dispersion Modelling

The CALPUFF modelling system treats emissions as a series of puffs. These puffs are then dispersed throughout the modelling area and allowed to grow and bend with spatial variations in meteorology. In doing so, the model is able to retain a memory of the plume's movement throughout a single hour and from one hour to the next while continuing to better approximate the effects of complex air flows.

CALPUFF utilises the meteorological processing and prediction model CALMET to provide three dimensional wind field predictions for the area of interest. The final wind field developed by the model (for consideration by CALPUFF) includes an approximation of the effects of local topography, the effects of varying surface temperatures (as is observed in land and sea bodies) and surface roughness (resulting from varied land uses and vegetation cover in an area). The CALPUFF model is able to resolve complex terrain influences on local wind fields including consideration of katabatic flows and terrain blocking.

6.6 CALPOST

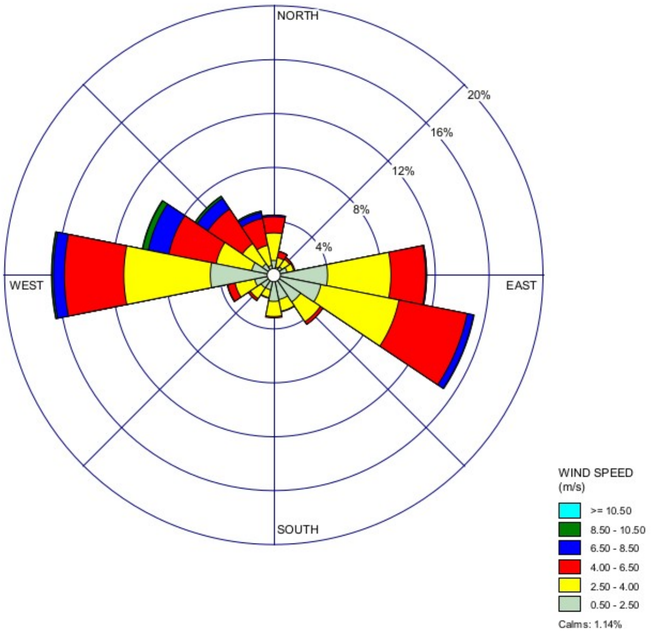
Post processing of modelled emissions is undertaken using the CALPOST package. This allows the rigorous analysis of pollutant predictions generated by the CALPUFF system. In particular CALPOST is able to provide an analysis of predicted pollutant concentrations for a range of averaging periods from 1 hour to 1 year.

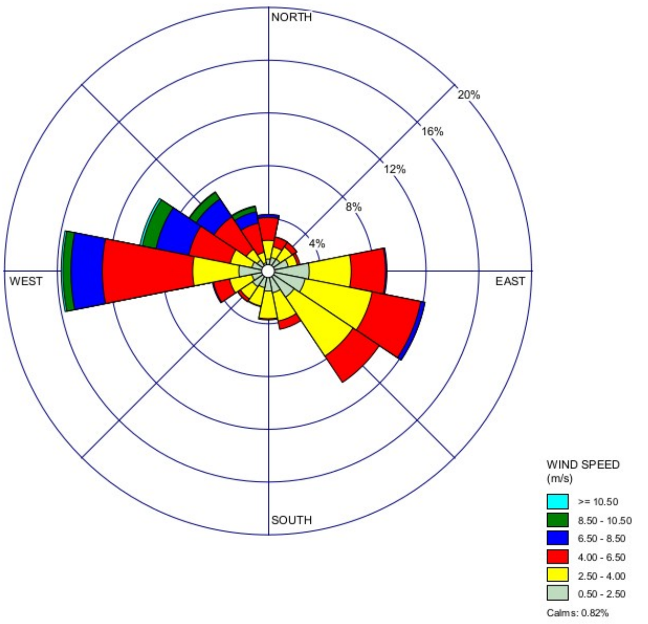
6.7 Meteorological Predictions

6.7.1 Wind Predictions

For the purpose of verifying the accuracy of the CALMET modelling, predicted wind roses for the year 2009 have been compared to the available wind monitoring data at the Mount Lofty and Adelaide (Kent Town) Bureau of Meteorology stations. These stations are located 6 to 8 km south and west of the site as shown in Section 3.2.

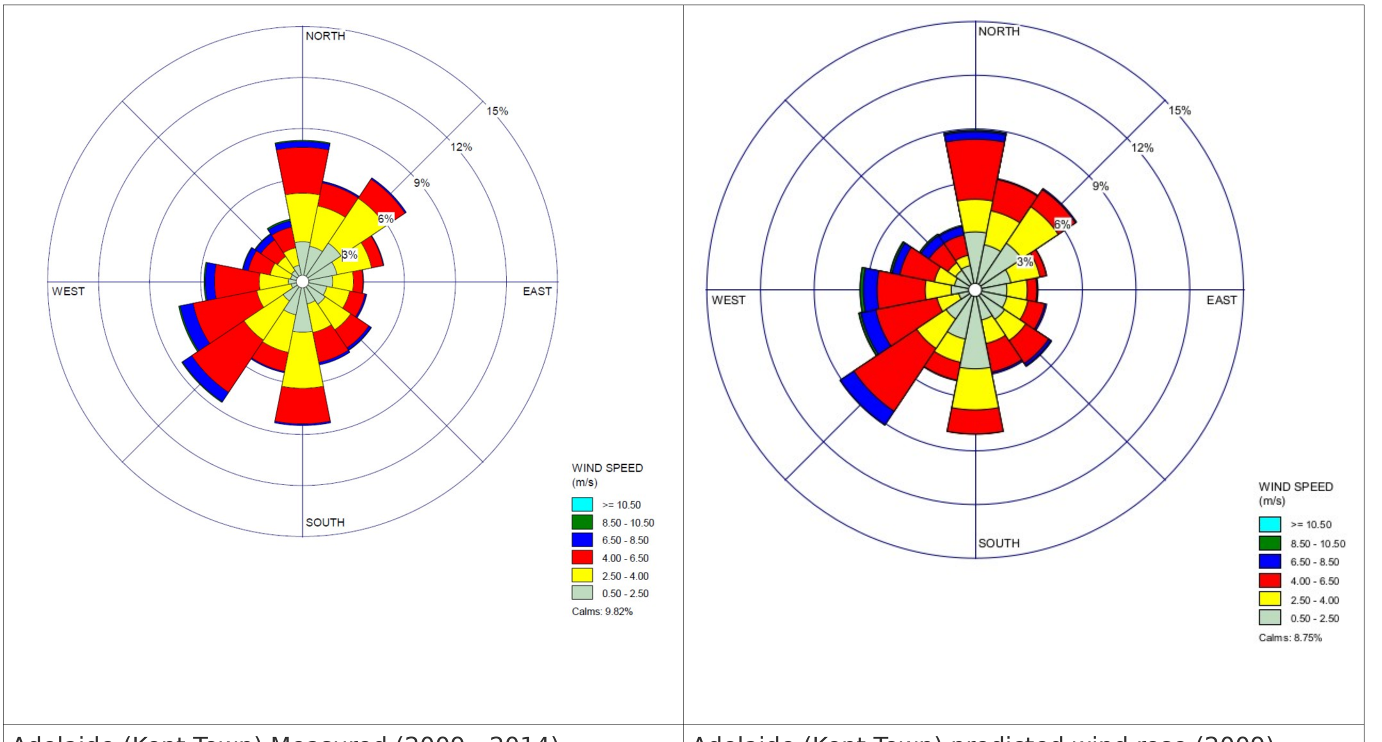
Figures 6.4 to 6.6 show a comparison of the predicted and measured wind roses for Mount Lofty station and Adelaide (Kent Town) station. As discussed earlier, the CALMET model year of 2009 has been adopted (as requested by the SA EPA).





Mount Lofty Measured (2009 - 2014)	Mount Lofty predicted wind rose (2009)

Figure 6.4 - Mount Lofty Measured (2009 – 2014) vs 2009 Predicted Wind Roses



Adelaide (Kent Town) Measured (2009 - 2014)	Adelaide (Kent Town) predicted wind rose (2009)

Figure 6.5 - Adelaide (Kent Town) Measured (2009 – 2014) vs 2009 Predicted Wind Roses

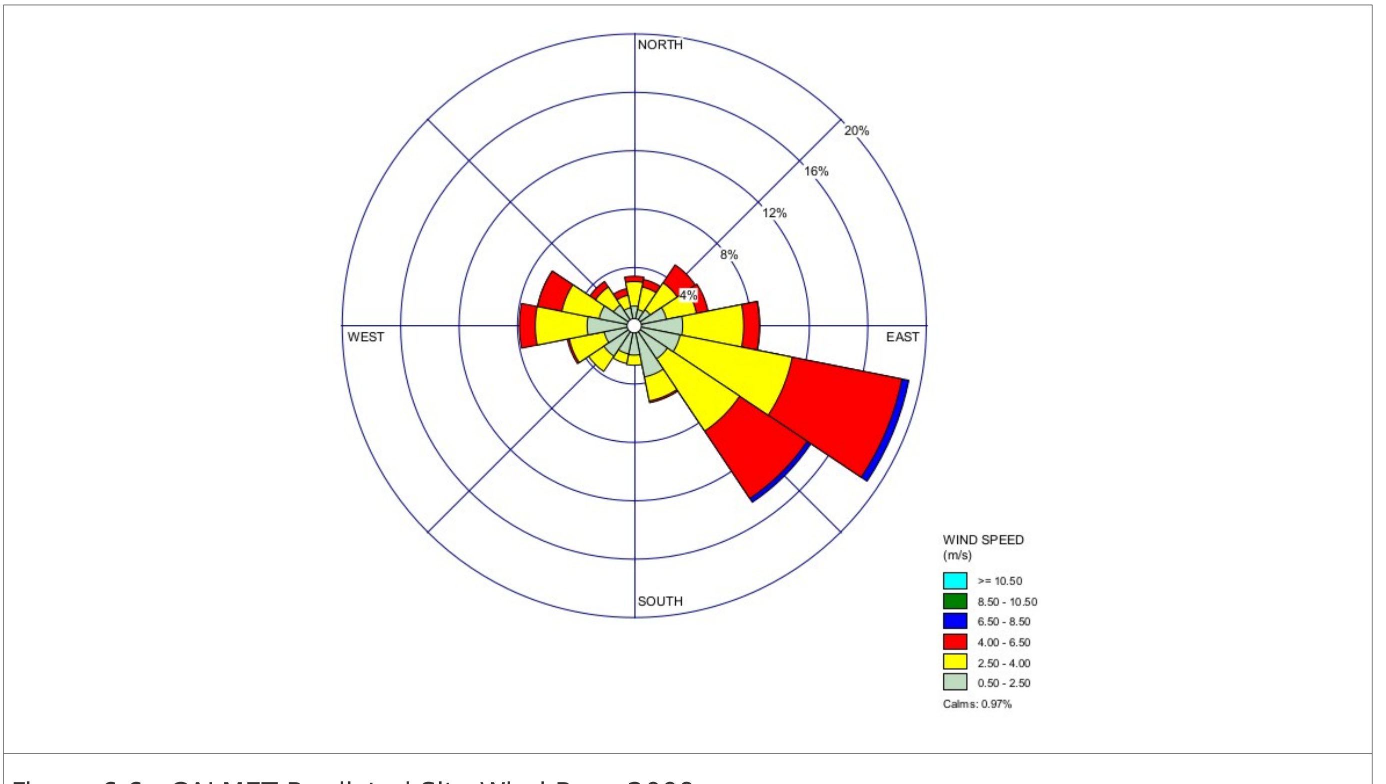


Figure 6.6 - CALMET Predicted Site Wind Rose 2009

The measured data set at Mount Lofty shows dominant westerly and easterly flow with minimal north easterly and south westerly flows, which is reflected in the CALMET 2009 predicted dataset. Differences include, a higher proportion of south easterly winds. At the Adelaide (Kent Town) station, wind directions are accurately represented by CALMET.

The predicted wind rose at the subject site shows similar wind patterns to those predicted at the Mount Lofty Bureau of Meteorology station, with minimal southerly and northerly components. The main difference is a higher proportion of easterly and south easterly winds and a low proportion of westerly winds. This is likely due to the subject site being located on the western face of the Adelaide Hills rather than the higher point of the range where the Mount Lofty station is located.

Table 6.2 presents a comparison of predicted and measured wind speeds.

Table 6.2 -- Comparison of Measured and Predicted Wind Speed Categories

Category (m/s)	Mount Lofty		Adelaide (Kent Town)		Site
	Measured	Predicted	Measured	Predicted	Predicted
0.50 - 2.50	29.0%	25.3%	25.8%	33.6%	36.1%
2.50 - 4.00	33.7%	33.2%	31.9%	23.4%	40.7%
4.00 - 6.50	23.9%	29.4%	27.7%	28.4%	21.4%
6.50 - 8.50	4.5%	8.1%	4.2%	5.1%	0.8%
8.50 - 10.50	0.9%	2.7%	0.5%	0.7%	0.0%
>= 10.50	0.1%	0.4%	0.1%	0.1%	0.0%
Calms	1.1%	0.8%	9.8%	8.7%	1.0%

In terms of wind speeds, the predicted data set is over-predicting lower speed categories (0.5 – 2.5 m/s), at the Adelaide (Kent Town) Station. This feature of the model has a potential to result in conservative pollutant concentrations, since lower wind speeds are associated with poor pollutant dispersion conditions. In relation to calms at the Adelaide (Kent Town) station, calm conditions are slightly lower with 9.8% measured compared with 8.7% measured. However, given that the low wind speeds are represented, the wind speed data predicted by CALMET is considered to be representative.

At the Mount Lofty station, low wind speeds are slightly under represented, with 29.0% measured and 25.3% predicted. In relation to calms, the predicted data set shows a slightly lower proportion of calms with 1.1% measured and 0.8% predicted. However, both data sets confirm that calms are a minor feature of the area (with measured and predicted proportions being less than 2% at all locations).

Overall, predicted wind conditions are considered appropriate for the assessment of potential air quality impacts from the proposed development.

6.7.2 Atmospheric Stability Class

The amount of turbulence in the ambient air has a major effect upon the rise and dispersion of emissions. The amount of turbulence in the atmosphere is often described using series of six Pasquill stability classes A, B, C, D, E and F. Of these, Class A denotes the most unstable or most turbulent conditions and class F denotes the most stable or least turbulent conditions. Figure 6.7 provides a summary of the predicted atmospheric stability conditions for the site.

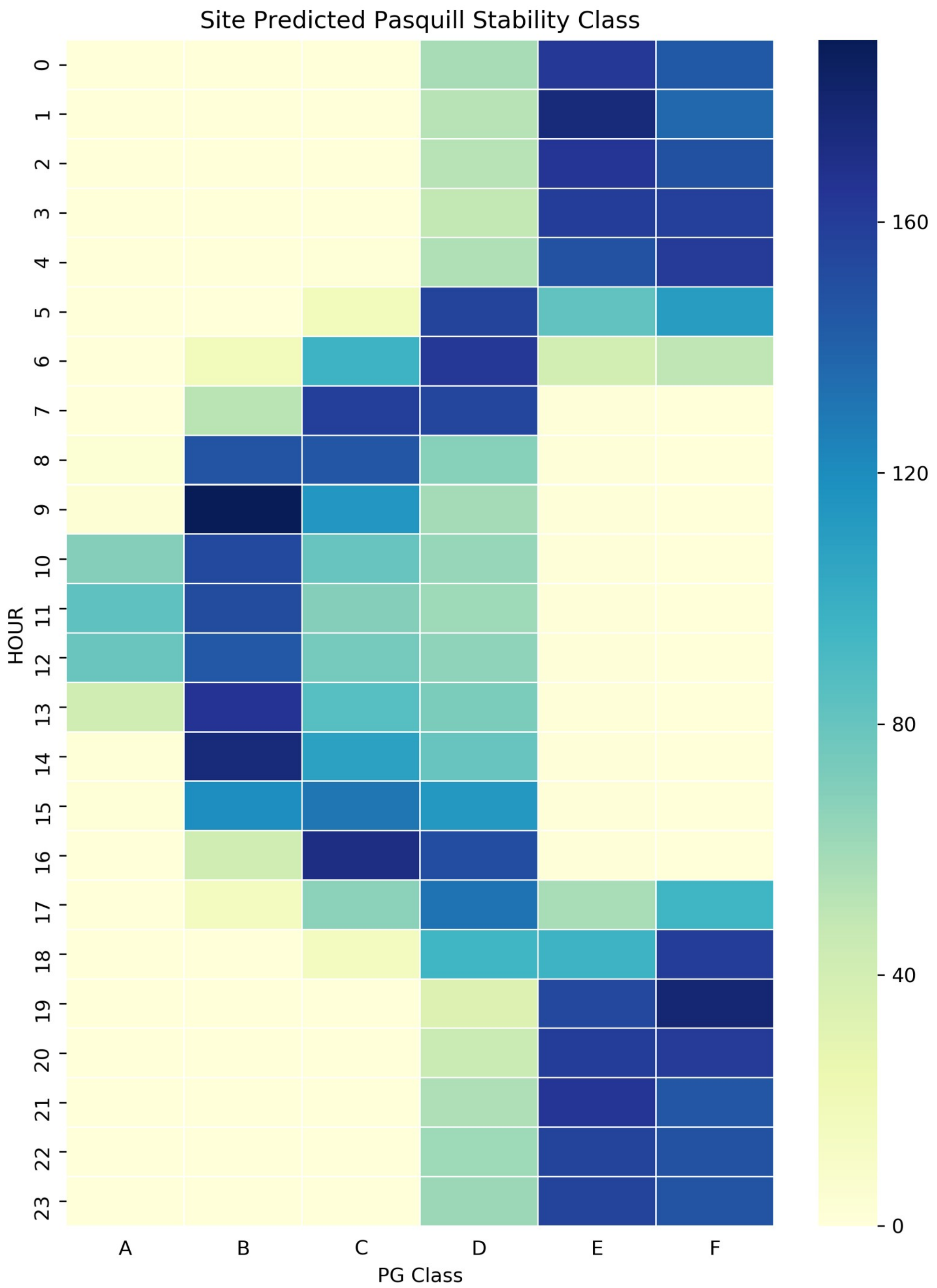


Figure 6.7 - CALMET Predicted Site Stability Classes

6.7.3 Mixing Heights

Figure 6.8 presents a plot showing predicted mixing heights for each hour of the day. The range and pattern of predicted mixing heights are considered typical of a rural area. As expected, higher mixing heights occur during the day time, while lower mixing heights occur during the night period when stable conditions are dominant and temperature inversions occur.

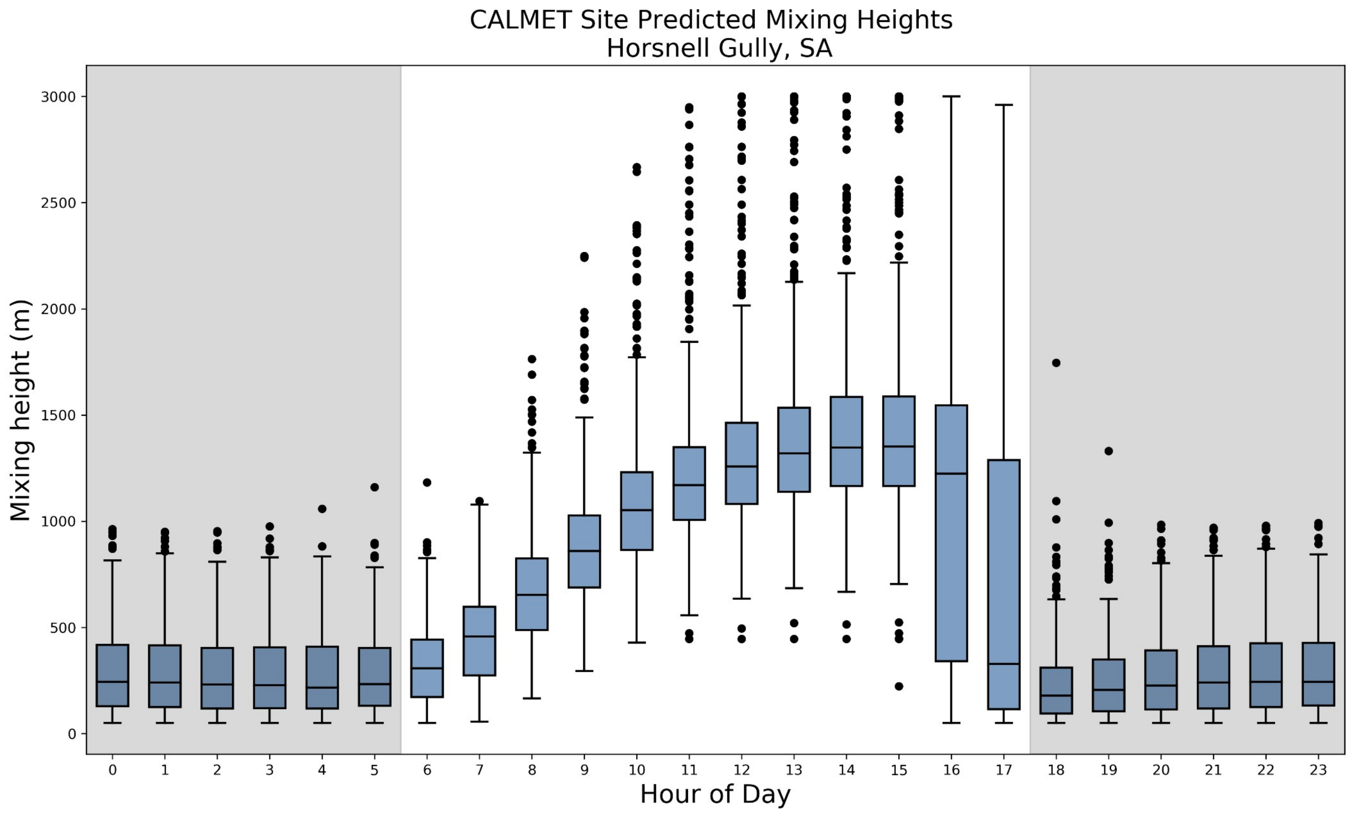


Figure 6.8 - CALMET Predicted site Mixing Heights

6.7.4 Temperature

Figure 6.9 presents a plot showing predicted temperatures for each hour of the day. The range and pattern of predicted temperatures are considered typical of a rural area. As expected, higher temperatures occur during the day time, while lower temperatures occur during the night period when there is no solar radiation. The average predicted temperature at the site is 15ºC, which is comparable to the average measured temperatures of 13ºC at the Mount Lofty BoM station and 18ºC at the Adelaide (Kent Town) station.

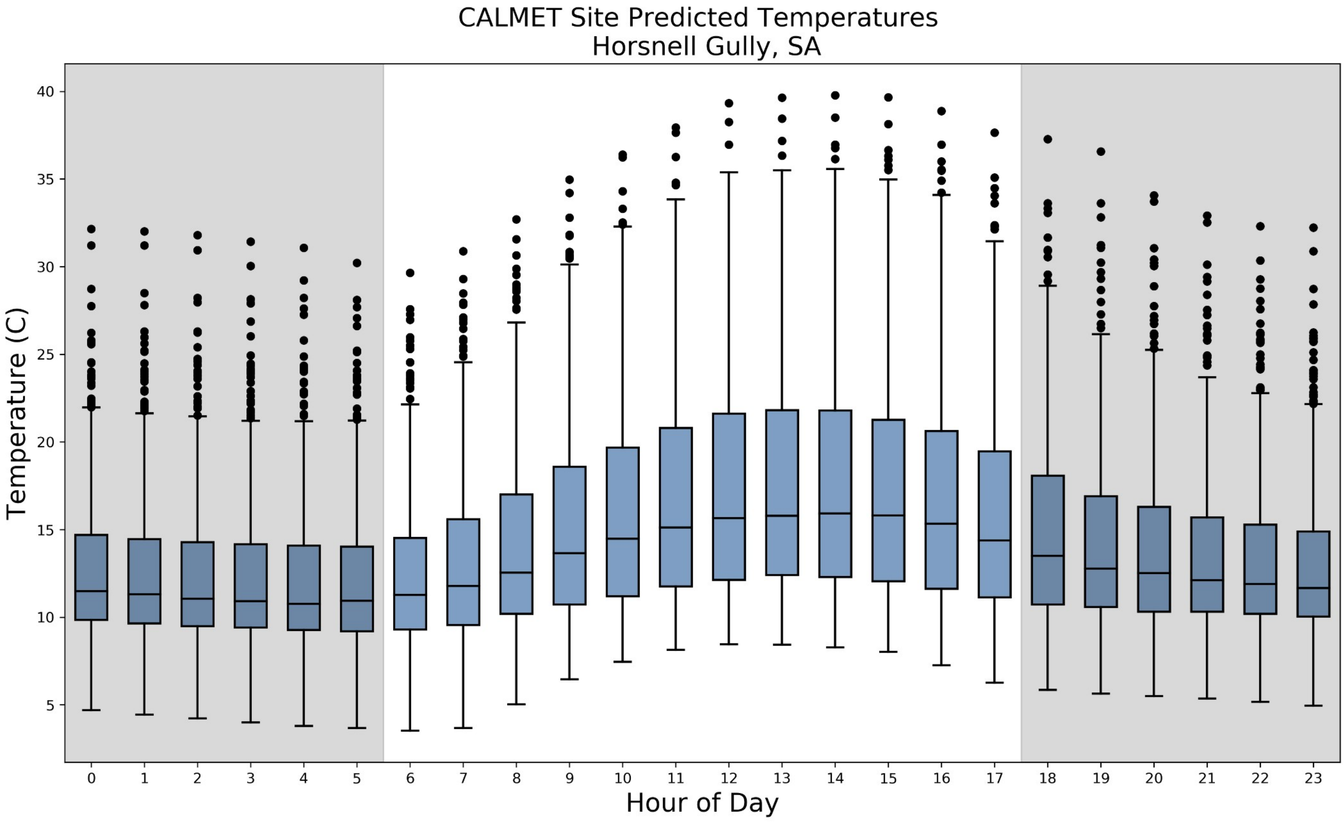


Figure 6.9 - CALMET Predicted Site Temperature

6.8 Summary of Outcomes

A review of the predicted data sets for the year 2009 indicate that the outcomes of CALMET model are suitable for predicting potential air quality impacts from the proposed development. Key meteorological parameters including wind field, stability class and temperature are considered to be representative of the subject site and surrounding area based on a comparison to measured data.

7 Air Emissions Data

7.1 Overview

The following sections present the emission factors and emission rates derived for each modelling scenario. These emission rates have been used in the CALPUFF modelling described later in Section 8.

7.2 Emission Factors

In order to predict emission rates for the relevant air emission sources, a review of available published literature relating to quarry and batching plant operations has been completed. The following documents have been utilised to estimate emissions, and are referenced in Table 7.1:

1. AP 42 (5th Edition), Compilation of Air Pollutant Emission Factors, Vol. 1 Stationary Point and Area Sources, Chapter 13.2.2, Unpaved Roads.
2. AP 42 (5th Edition), Compilation of Air Pollutant Emission Factors, Vol. 1 Stationary Point and Area Sources, Chapter 13.2.4, Aggregate Handling and Storage Piles, November 2006.
3. AP 42 (5th Edition), Compilation of Air Pollutant Emission Factors, Vol. 1 Stationary Point and Area Sources, Chapter 11.19.2, Crushed Stone Processing and Pulverised Mineral Processing, August 2004.
4. National Pollution Inventory, Emission Estimation Technique Manual for Mining (Version 3.1), January 2012.
5. AP 42 (5th Edition), Compilation of Air Pollutant Emission Factors, Vol. 1 Stationary Point and Area Sources, Chapter 11.12.1, Concrete Batching.
6. AP 42 (5th Edition), Compilation of Air Pollutant Emission Factors, Vol. 1 Stationary Point and Area Sources, Chapter 13.2.1, Paved Roads.

The following sections present details on the derivation of emission factors and rates used in the modelling.

Table 7.1 presents emission factors sourced from the US EPA AP42 and NPI literature. Assumptions in selecting or deriving emission factors are also presented in the last column of Table 7.1.

Table 7.1 - Emission Factors

Activity	Units	TSP	PM_{10}	$PM_{2.5}$	Reference	Comments
Extraction Area						
Extracted material handling	kg/Mg	0.00289	0.00137	0.00021	Ref 2, Eqn 1	Assumes 1% moisture content, 2.1 m/s wind based on measured wind speed at Mount Lofty BoM station (factored down to a height of 2 m)
Concrete Batching Plant						
Aggregate delivery	kg/Mg	0.00130	0.00062	0.00009	Ref 5 and Ref 2, Eqn 1	Assumes 1.77% moisture content (US AP 42 default for aggregate), 2.1 m/s wind based on measured wind speed at Mount Lofty BoM station (factored down to a height of 2 m)
Aggregate transfers	kg/Mg	0.00130	0.00062	0.00009	Ref 5 and Ref 2, Eqn 1	Assumes 1.77% moisture content (US AP 42 default for aggregate), 2.1 m/s wind based on measured wind speed at Mount Lofty BoM station (factored down to a height of 2 m)
Sand delivery	kg/Mg	0.00039	0.00019	0.00003	Ref 5 and Ref 2, Eqn 1	Assumes 1.77% moisture content (US AP 42 default for aggregate), 2.1 m/s wind based on measured wind speed at Mount Lofty BoM station (factored down to a height of 2 m)
Sand transfer	kg/Mg	0.00039	0.00019	0.00003	Ref 5 and Ref 2, Eqn 1	Assumes 1.77% moisture content (US AP 42 default for aggregate), 2.1 m/s wind based on measured wind speed at Mount Lofty BoM station (factored down to a height of 2 m)
Cement unloading to elevated storage silo (pneumatic)	kg/Mg	0.00050	0.00017	0.00005	Ref 5	Controlled emission factor
Fly ash unloading to elevated storage silo (pneumatic)	kg/Mg	0.00450	0.00240	0.00071	Ref 5	Controlled emission factor
Weigh hopper loading	kg/Mg	0.00260	0.00130	0.00038	Ref 5	Controlled emission factor
Mixer loading (truck mix)	kg/Mg	1.11800	0.31000	0.09118	Ref 5	Uncontrolled emission factor
Future Processing Plant						
Material transfer to process line	kg/Mg	0.00289	0.00137	0.00021	Ref 2, Eqn 1	Assumes 1% moisture content, 2.1 m/s wind based on measured wind speed at Mount Lofty BoM station (factored down to a height of 2 m)
Cone Crusher	kg/Mg	0.00060	0.00027	0.00005	Ref 3	No secondary crushing factors are available. Conservatively based on emission factor for tertiary crushing (controlled).
Screen Deck	kg/Mg	0.00110	0.00037	0.000025	Ref 3	Screening – controlled
Jaw Crusher	kg/Mg	0.00060	0.00027	0.00005	Ref 3	No primary crushing factors are available. Conservatively based on emission factor for tertiary crushing (controlled).
Reclaimer	kg/Mg	0.00110	0.00037	0.000025	Ref 3	Screening – controlled
Transfer Points	kg/Mg	0.00007	0.000023	0.000007	Ref 3	Transfer point - controlled
Material transfer to stockpiles	kg/Mg	0.00289	0.00137	0.00021	Ref 2, Eqn 1	Assumes 1% moisture content, 2.1 m/s wind based on measured wind speed at Mount Lofty BoM station (factored down to a height of 2 m)
Area Sources						
Pits	kg/m²/hr	0.00002	0.00001	0.000001	Ref 4, Eqn 22	Assumes height of 0.5 m, 8.3 % silt content and wind and precipitation data from the Mount Lofty BoM station (factored down to a height of 0.5 m).
Stockpiles	kg/m²/hr	0.0000009	0.00000047	0.0000001	Ref 4, Eqn 22	Assumes height of 5 m, 8.3% silt content and wind and precipitation data from the Mount Lofty BoM station (factored down to a height of 0.5 m).

Activity	Units	TSP	PM_{10}	$PM_{2.5}$	Reference	Comments
Blasting	kg/blast	7.37858	3.82345	0.57898	Ref 4, Eqn 19	Blasting area of 1040 m^2
Drilling	kg/hole	0.59000	0.31000	0.04130	Ref 4	A total of 54 holes assumes (based on assumed 3.8 m burden and 4.3 m spacing over a 1040 m^2 area)
Haul Routes						
On-site haul trucks over unsealed sections	g/VKT	4115	1170	117	Ref 1 Eqn 1	Silt content of 8.3% as per Table 13.2.2-1 of Ref 3, and average (empty, full) truck weight of 45 tonnes. 8.3% silt content represents the average of the data set provided in Ref 3.
Product trucks over unsealed sections	g/VKT	3186	906	91	Ref 1 Eqn 1	Silt content of 8.3% as per Table 13.2.2-1 of Ref 3, and average (empty, full) truck weight of 31 tonnes.
Product trucks over sealed access road	g/VKT	118	23	5	Ref 6	Silt loading value of 1.0 g/m^2 as per Table 13.2.1-4 of Ref 6, and average (empty, full) truck weight of 31 tonnes.
Concrete agitators over sealed access road	g/VKT	114	22	5	Ref 6	Silt loading value of 1.0 g/m^2 (for concrete batching as per Table 13.2.1-4 of Ref 6), and truck weight of 30 tonnes.

7.3 Emission Rates

7.3.1 Overview

Emission rates have been derived for an average throughput operating day and an assumed worst-case operating day. The average throughput operating day is based on the proposed throughput of each stage (as presented in Section 2.2), averaged over a 365 day year and 12 hour working day (6 am to 6 pm). A 220 tph throughput was assumed as worst case scenario. Results for the worst-case operating day have been compared to criteria associated with a 24-hour averaging period only.

In order to predict g/s emission rates for use in the air dispersion modelling, it is necessary to multiply the emission factors presented in Table 7.1 by the relevant multiplying factors:

- kg/Mg emission factors to be multiplied by material throughputs (e.g. Mg/year);
- kg/blast emissions to be multiplied by the total area of the blast area sources;
- kg/hole emissions to be multiplied by the number of drilling holes and the total area of the drilling area sources;
- g/VKT emission factors to be multiplied by amount of km vehicles travel over the haul route (e.g. km/hr);
- kg/m^2/hr emission factors to be multiplied by the total area of the area sources.

The following sections present details of input data used to derive emission rates from the emission factors.

7.3.2 Mitigation

With regards to mitigation, the following measures have been accounted for in the emission rates:

- mobile processing plant – water sprays; and
- standard watering rate (Level 1, < 2 L/m^2/hr) for all haul routes.

For a standard watering rate, a 50% control efficiency has been considered based on the recommendations of NPI Mining Manual.

For the proposed processing plant, controlled emission factors from the US AP 42 Chapter 11.19.2 emission factor documentation (as shown in Table 7.1) has been adopted to account for the use of water sprays. The controlled emission factor in the US AP 42 documentation is based on the use of water sprays within crushed stone processing plants.

7.3.3 Estimated Emissions

In order to derive maximum emission rates (g/s, for the maximum plant production rate) for the proposed quarry operations, the following client information has been considered:

- A summary of calculated average and daily maximum throughputs is provided below:

	Stage 1	Stage 2	Stage 3	Stage 3A
Average				
Annual Throughput (kt)	500	500	500	500
Daily Throughput (Tonnes)	1369.9	1369.9	1369.9	1369.9
Per Hour (Tonnes)	114.2	114.2	114.2	114.2
Worst-case Assumed				
Per Day (Tonnes)	2640.0	2640.0	2640.0	2640.0
Per Hour (Tonnes)	220.0	220.0	220.0	220.0

- Areas for exposed areas and stockpiles are shown in Table 7.1 and are based on plans provided by Client;
- Truck movement estimations:

Road Source	Truck Payload (tonnes)	Route Distance (m)	Average Throughput		Worst-Case Throughput	
			Throughput (t/hr)	Trucks Per Hour	Throughput (t/hr)	Trucks Per Hour
Concrete Agitators Sealed	21	544.5	33.0	1.6	50.0	2.4
Product Trucks Sealed Stage 1	40	265.4	114.2	2.9	220.0	5.5
Product Trucks Unsealed Stage 1	40	709	114.2	2.9	220.0	5.5
Product Trucks Sealed Stage 2	40	265.4	114.2	2.9	220.0	5.5
Product Trucks Unsealed Stage 2	40	709	114.2	2.9	220.0	5.5
Product Trucks Sealed Stage 3	40	265.4	114.2	2.9	220.0	5.5
Product Trucks Unsealed Stage 3	40	709	114.2	2.9	220.0	5.5
Product Trucks Sealed Stage 3A	40	265.4	114.2	2.9	220.0	5.5
Product Trucks Unsealed Stage 3A	40	709	114.2	2.9	220.0	5.5
Haul route – Stage 1	40	1669.3	114.2	2.9	220.0	5.5
Haul Route – Stage 2	40	811.2	114.2	2.9	220.0	5.5
Haul Route – Stage 3	40	689.6	114.2	2.9	220.0	5.5
Haul Route – Stage 3a	40	2182.3	114.2	2.9	220.0	5.5

Table 7.2 and 7.3 presents the emission rates derived for the quarry for an average and worst-case operating day, respectively. It is noted that the concrete batching plant and product truck access requires 24/7 flexibility. The modelling assumes all operations are from 6 am to 6 pm, which is the typical operating time period for the site. While there could be occasional operations out of hours

(when dispersion conditions are less favourable), the modelling is conservative by assuming all air emission sources are operating on the same day and the quarry is operating at a maximum capacity of 220 tonnes per hour (associated with the capacity of the processing plant).

Source IDs are also provided in Column 1 and have been used in the air dispersion modelling. Sources have been modelled as unit emission rates (i.e. 1 g/s, 1 g/s/m, 1 g/s/m^2) in individual CALPUFF files, and the results have been factored using the derived emission rates. The results for each source have then been added in CALSUM to provide total predicted concentrations in the surrounding area. Some air emission sources have been combined as one source in the modelling based on their close proximity to each other.

Table 7.2 - Proposed Quarry Estimated Emission Rates (g/s) – Average Daily Throughput

Source ID	Applicable Scenario/s	Activity	Factoring Value	Factoring Unit	Mitigation Reduction	Mitigation Description	TSP	PM_{10}	$PM_{2.5}$	Operating Time
Extraction Area – Material Handling										
S1-EF	Stage 1	Extraction – Stage 1	114.2	tonnes/hr	0%	None	0.0917	0.0434	0.0066	6 am - 6 pm
S3-EF	Stage 2	Extraction – Stage 2	114.2	tonnes/hr	0%	None	0.0917	0.0434	0.0066	6 am - 6 pm
S3-EF	Stage 3	Extraction – Stage 3	114.2	tonnes/hr	0%	None	0.0917	0.0434	0.0066	6 am - 6 pm
S3A-EF	Stage 3A	Extraction – Stage 3A	114.2	tonnes/hr	0%	None	0.0917	0.0434	0.0066	6 am - 6 pm
Concrete Batching Plant										
CB-SAD	All Stages	Aggregate Delivery	38.7	tonnes/hr	0%	None	0.0140	0.0066	0.0010	6 am - 6 pm
CD-SAT	All Stages	Aggregate Transfers	77.4	tonnes/hr	0%	None	0.0279	0.0132	0.0020	6 am - 6 pm
CB-SAD	All Stages	Sand Delivery	29.6	tonnes/hr	0%	None	0.0032	0.0015	0.0002	6 am - 6 pm
CB-SAT	All Stages	Sand Transfers	59.2	tonnes/hr	0%	None	0.0064	0.0030	0.0005	6 am - 6 pm
CB-CD	All Stages	Cement Unloading to elevated storage silo (pneumatic)	10.2	tonnes/hr	0%	None	0.0014	0.0005	0.0001	6 am - 6 pm
CB-WHL	All Stages	Weigh Hopper Loading	80.0	tonnes/hr	70%	Roofed enclosure	0.0173	0.0087	0.0025	6 am - 6 pm
CB-TL	All Stages	Mixer Loading (truck mix)	11.7	tonnes/hr	70%	Roofed enclosure	1.0899	0.3022	0.0889	6 am - 6 pm
Future Processing Plant – All Stages										
FP-TP1	All Stages	Material transfer to process line	114.2	tonnes/hr	0%	None	0.0917	0.0434	0.0066	6 am - 6 pm
FP-CR1	All Stages	Cone Crusher	114.2	tonnes/hr	0%	Controlled emission factor for dust suppression as per Table 7.1)	0.019	0.009	0.002	6 am - 6 pm
FP-SC1	All Stages	Screen Deck	114.2	tonnes/hr	0%		0.035	0.012	0.001	6 am - 6 pm
FP-CR2	All Stages	Jaw Crusher	114.2	tonnes/hr	0%		0.019	0.009	0.002	6 am - 6 pm
FP-SC2	All Stages	Reclaimer	114.2	tonnes/hr	0%		0.035	0.012	0.001	6 am - 6 pm
FP-TP3	All Stages	Material transfer to stockpiles	114.2	tonnes/hr	0%	None	0.0917	0.0434	0.0066	6 am - 6 pm
FP-S1/S2/S3/S3A	All Stages	Combined emission rates	-	-	-	-	0.2912	0.1273	0.0179	6 am - 6 pm
Area Sources										
CB-AREA	All Stages	Concrete batching plant stockpiles	811	m^2	30%	Three sided walls	0.0030	0.0015	0.0002	24 hours
FP-AREA	All Stages	Future processing plant stockpiles	7254	m^2	30%	Three sided walls	0.0272	0.0136	0.0020	24 hours
S1-AREA	Stage 1	Stage 1 Extraction Area	182367	m^2	0%	None	0.0476	0.0238	0.0036	24 hours
S1-Blasting	Stage 1	Stage 1 Drilling	1015	m^2	0%	None	0.1666	0.0863	0.0131	6 am - 6 pm

Source ID	Applicable Scenario/s	Activity	Factoring Value	Factoring Unit	Mitigation Reduction	Mitigation Description	TSP	PM_{10}	$PM_{2.5}$	Operating Time
S1-Drilling	Stage 1	Stage 1 Blasting	1015	m^2	0%	None	0.4284	0.2251	0.0300	6 am - 6 pm
S2-AREA	Stage 2	Stage 2 Extraction Area	293368	m^2	0%	None	0.0766	0.0383	0.0057	24 hours
S2-Blasting	Stage 2	Stage 2 Drilling	1020	m^2	0%	None	0.1675	0.0868	0.0131	6 am - 6 pm
S2-Drilling	Stage 2	Stage 2 Blasting	1020	m^2	0%	None	0.4307	0.2263	0.0301	6 am - 6 pm
S3-AREA1	Stage 3	Stage 3 Extraction Area 1	296554	m^2	0%	None	0.0775	0.0387	0.0058	24 hours
S3-AREA2	Stage 3	Stage 3 Extraction Area 2	54320	m^2	0%	None	0.0142	0.0071	0.0011	24 hours
S3-Blasting	Stage 3	Stage 3 Drilling	1020	m^2	0%	None	0.0465	0.0241	0.0037	6 am - 6 pm
S3-Drilling	Stage 3	Stage 3 Blasting	1020	m^2	0%	None	0.1196	0.0629	0.0084	6 am - 6 pm
S3A-AREA1	Stage 3a	Stage 3a Extraction Area 1	395383	m^2	0%	None	0.1033	0.0516	0.0077	24 hours
S3A-AREA2	Stage 3a	Stage 3a Extraction Area 2	54676	m^2	0%	None	0.0143	0.0071	0.0011	24 hours
S3A-Blasting	Stage 3a	Stage 3a Blasting	1007	m^2	0%	None	0.1653	0.0857	0.0130	6 am - 6 pm
S3A-Drilling	Stage 3a	Stage 3a Drilling	1007	m^2	0%	None	0.4251	0.2234	0.0298	6 am - 6 pm
Haul Routes										
CB-HR	All Stages	Concrete Batching Plant Haul Route (Sealed)	0.9	VKT/hr	0%	Level 1 Watering	0.0412	0.0079	0.0019	6 am - 6 pm
PROD-SL	All Stages	Product Haul Route (Sealed)	1.5	VKT/hr	0%	Level 1 Watering	0.0497	0.0095	0.0023	6 am - 6 pm
PROD-USL	All Stages	Product Haul Route (Unsealed)	4.0	VKT/hr	50%	Level 1 Watering	1.7907	0.5092	0.0509	6 am - 6 pm
S1-HR	Stage 1	Stage 1 Haul Route	9.5	VKT/hr	50%	Level 1 Watering	5.4461	1.5487	0.1549	6 am - 6 pm
S2-HR	Stage 2	Stage 2 Haul Route	4.6	VKT/hr	50%	Level 1 Watering	2.6465	0.7526	0.0753	6 am - 6 pm
S3-HR	Stage 3	Stage 3 Haul Route	3.9	VKT/hr	50%	Level 1 Watering	2.2498	0.6398	0.0640	6 am - 6 pm
S3A-HR	Stage 3A	Stage 3A Haul Route	6.2	VKT/hr	50%	Level 1 Watering	3.5599	1.0123	0.1012	6 am - 6 pm

Table 7.3 - Proposed Quarry Estimated Emission Rates (g/s) – Worst-Case Daily Throughput

Source ID	Applicable Scenario/s	Activity	Factoring Value	Factoring Unit	Mitigation Reduction	Mitigation Description	TSP	PM_{10}	$PM_{2.5}$	Operating Time
Extraction Area – Material Handling										
S1-EF	Stage 1	Extraction – Stage 1	220.0	tonnes/hr	0%	None	0.1767	0.0836	0.0127	6 am - 6 pm
S3-EF	Stage 2	Extraction – Stage 2	220.0	tonnes/hr	0%	None	0.1767	0.0836	0.0127	6 am - 6 pm
S3-EF	Stage 3	Extraction – Stage 3	220.0	tonnes/hr	0%	None	0.1767	0.0836	0.0127	6 am - 6 pm
S3A-EF	Stage 3A	Extraction – Stage 3A	220.0	tonnes/hr	0%	None	0.1767	0.0836	0.0127	6 am - 6 pm
Concrete Batching Plant										
CB-SAD	All Stages	Aggregate Delivery	38.7	tonnes/hr	0%	None	0.0140	0.0066	0.0010	6 am - 6 pm
CD-SAT	All Stages	Aggregate Transfers	77.4	tonnes/hr	0%	None	0.0279	0.0132	0.0020	6 am - 6 pm
CB-SAD	All Stages	Sand Delivery	29.6	tonnes/hr	0%	None	0.0032	0.0015	0.0002	6 am - 6 pm
CB-SAT	All Stages	Sand Transfers	59.2	tonnes/hr	0%	None	0.0064	0.0030	0.0005	6 am - 6 pm
CB-CD	All Stages	Cement Unloading to elevated storage silo (pneumatic)	10.2	tonnes/hr	0%	None	0.0014	0.0005	0.0001	6 am - 6 pm
CB-CD	All Stages	Fly ash unloading to elevated storage silo (pneumatic)	1.5	tonnes/hr	0%	None	0.0019	0.0010	0.0003	6 am - 6 pm
CB-WHL	All Stages	Weigh Hopper Loading	80.0	tonnes/hr	70%	Roofed enclosure	0.0173	0.0087	0.0025	6 am - 6 pm
CB-TL	All Stages	Mixer Loading (truck mix)	11.7	tonnes/hr	70%	Roofed enclosure	1.0899	0.3022	0.0889	6 am - 6 pm
Future Processing Plant – All Stages										
FP-TP1	All Stages	Material transfer to process line	220.0	tonnes/hr	0%	None	0.1767	0.0836	0.0127	6 am - 6 pm
FP-CR1	All Stages	Cone Crusher	220.0	tonnes/hr	0%	Controlled emission factor for dust suppression as per Table 7.1)	0.0367	0.0165	0.0031	6 am - 6 pm
FP-SC1	All Stages	Screen Deck	220.0	tonnes/hr	0%		0.0672	0.0226	0.0015	6 am - 6 pm
FP-CR2	All Stages	Jaw Crusher	220.0	tonnes/hr	0%		0.0367	0.0165	0.0031	6 am - 6 pm
FP-SC2	All Stages	Reclaimer	220.0	tonnes/hr	0%		0.0672	0.0226	0.0015	6 am - 6 pm
FP-TP3	All Stages	Material transfer to stockpiles	220.0	tonnes/hr	0%	None	0.1767	0.0836	0.0127	6 am - 6 pm
FP-S1/S2/S3/S3A	All Stages	Combined emission rates	-	-	-	-	0.5613	0.2454	0.0345	6 am - 6 pm
Area Sources										
CB-AREA	All Stages	Concrete batching plant stockpiles	811	m^2	30%	Three sided walls	0.0030	0.0015	0.0002	24 hours
FP-AREA	All Stages	Future processing plant stockpiles	7254	m^2	30%	Three sided walls	0.0272	0.0136	0.0020	24 hours
S1-AREA	Stage 1	Stage 1 Extraction Area	182367	m^2	0%	None	0.0476	0.0238	0.0036	24 hours

S1-Blasting	Stage 1	Stage 1 Drilling	1015	m^2	0%	None	0.1666	0.0863	0.0131	6 am - 6 pm
S1-Drilling	Stage 1	Stage 1 Blasting	1015	m^2	0%	None	0.4284	0.2251	0.0300	6 am - 6 pm
S2-AREA	Stage 2	Stage 2 Extraction Area	293368	m^2	0%	None	0.0766	0.0383	0.0057	24 hours
S2-Blasting	Stage 2	Stage 2 Drilling	1020	m^2	0%	None	0.1675	0.0868	0.0131	6 am - 6 pm
S2-Drilling	Stage 2	Stage 2 Blasting	1020	m^2	0%	None	0.4307	0.2263	0.0301	6 am - 6 pm
S3-AREA1	Stage 3	Stage 3 Extraction Area 1	296554	m^2	0%	None	0.0775	0.0387	0.0058	24 hours
S3-AREA2	Stage 3	Stage 3 Extraction Area 2	54320	m^2	0%	None	0.0142	0.0071	0.0011	24 hours
S3-Blasting	Stage 3	Stage 3 Drilling	1020	m^2	0%	None	0.0465	0.0241	0.0037	6 am - 6 pm
S3-Drilling	Stage 3	Stage 3 Blasting	1020	m^2	0%	None	0.1196	0.0629	0.0084	6 am - 6 pm
S3A-AREA1	Stage 3a	Stage 3a Extraction Area 1	395383	m^2	0%	None	0.1033	0.0516	0.0077	24 hours
S3A-AREA2	Stage 3a	Stage 3a Extraction Area 2	54676	m^2	0%	None	0.0143	0.0071	0.0011	24 hours
S3A-Blasting	Stage 3a	Stage 3a Blasting	1007	m^2	0%	None	0.1653	0.0857	0.0130	6 am - 6 pm
S3A-Drilling	Stage 3a	Stage 3a Drilling	1007	m^2	0%	None	0.4251	0.2234	0.0298	6 am - 6 pm
Haul Routes										
CB-HR	All Stages	Concrete Batching Plant Haul Route (Sealed)	1.3	VKT/hr	0%	Level 1 Watering	0.0412	0.0079	0.0019	6 am - 6 pm
PROD-SL	All Stages	Product Haul Route (Sealed)	2.9	VKT/hr	0%	Level 1 Watering	0.0959	0.0184	0.0045	6 am - 6 pm
PROD-USL	All Stages	Product Haul Route (Unsealed)	7.8	VKT/hr	50%	Level 1 Watering	3.4511	0.9814	0.0981	6 am - 6 pm
S1-HR	Stage 1	Stage 1 Haul Route	18.4	VKT/hr	50%	Level 1 Watering	10.4956	2.9846	0.2985	6 am - 6 pm
S2-HR	Stage 2	Stage 2 Haul Route	8.9	VKT/hr	50%	Level 1 Watering	5.1004	1.4504	0.1450	6 am - 6 pm
S3-HR	Stage 3	Stage 3 Haul Route	7.6	VKT/hr	50%	Level 1 Watering	4.3358	1.2330	0.1233	6 am - 6 pm
S3A-HR	Stage 3A	Stage 3A Haul Route	12.0	VKT/hr	50%	Level 1 Watering	6.8605	1.9509	0.1951	6 am - 6 pm

7.4 Modelled Source Locations

Figures 7.1 to 7.6 present the modelled source locations for the proposed quarry. Source IDs are described in Table 7.2.

Figure 7.1 - Concrete Batching Plant – Modelled Sources

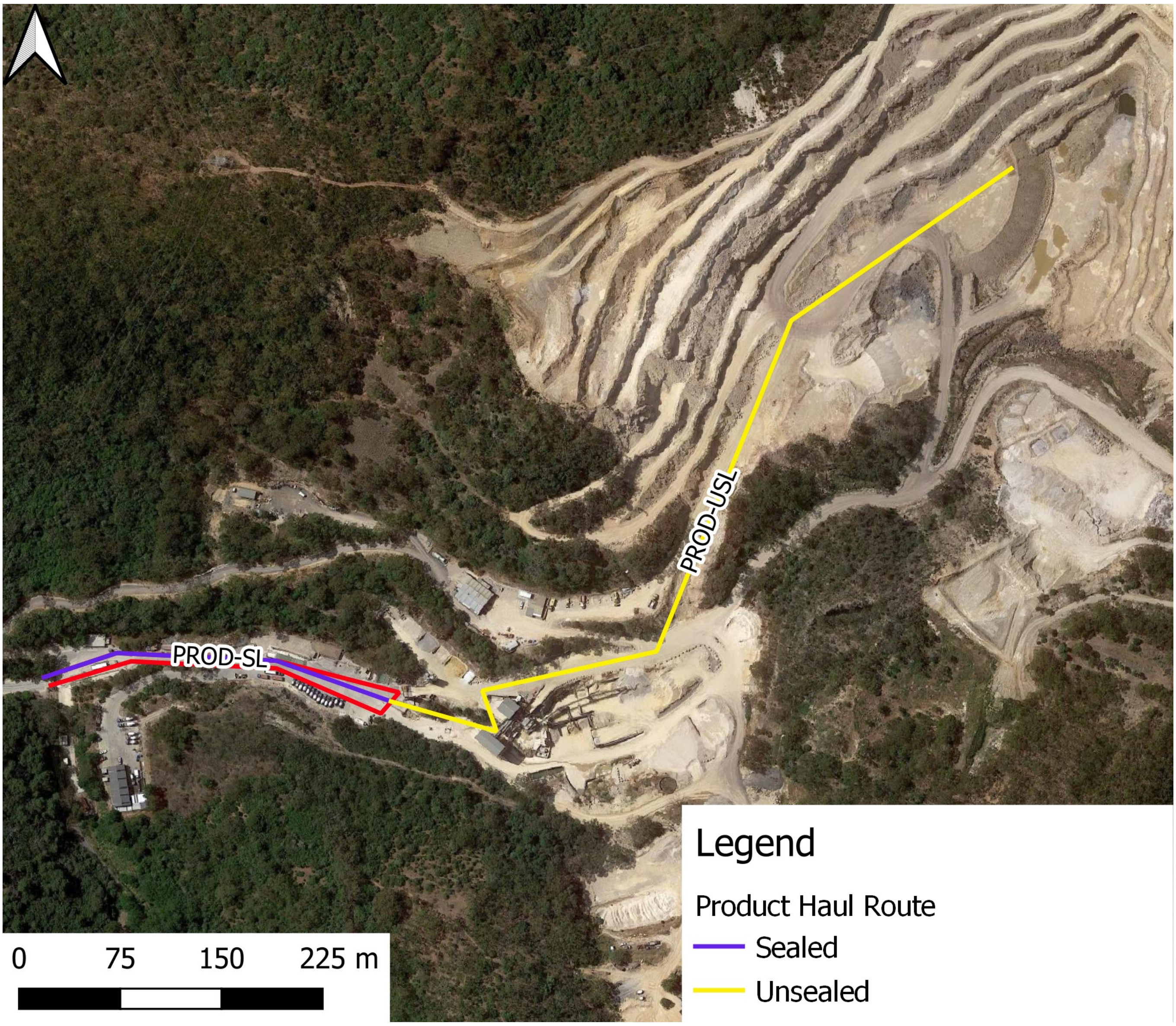


Figure 7.2 - Product Haul Route – Modelled Sources

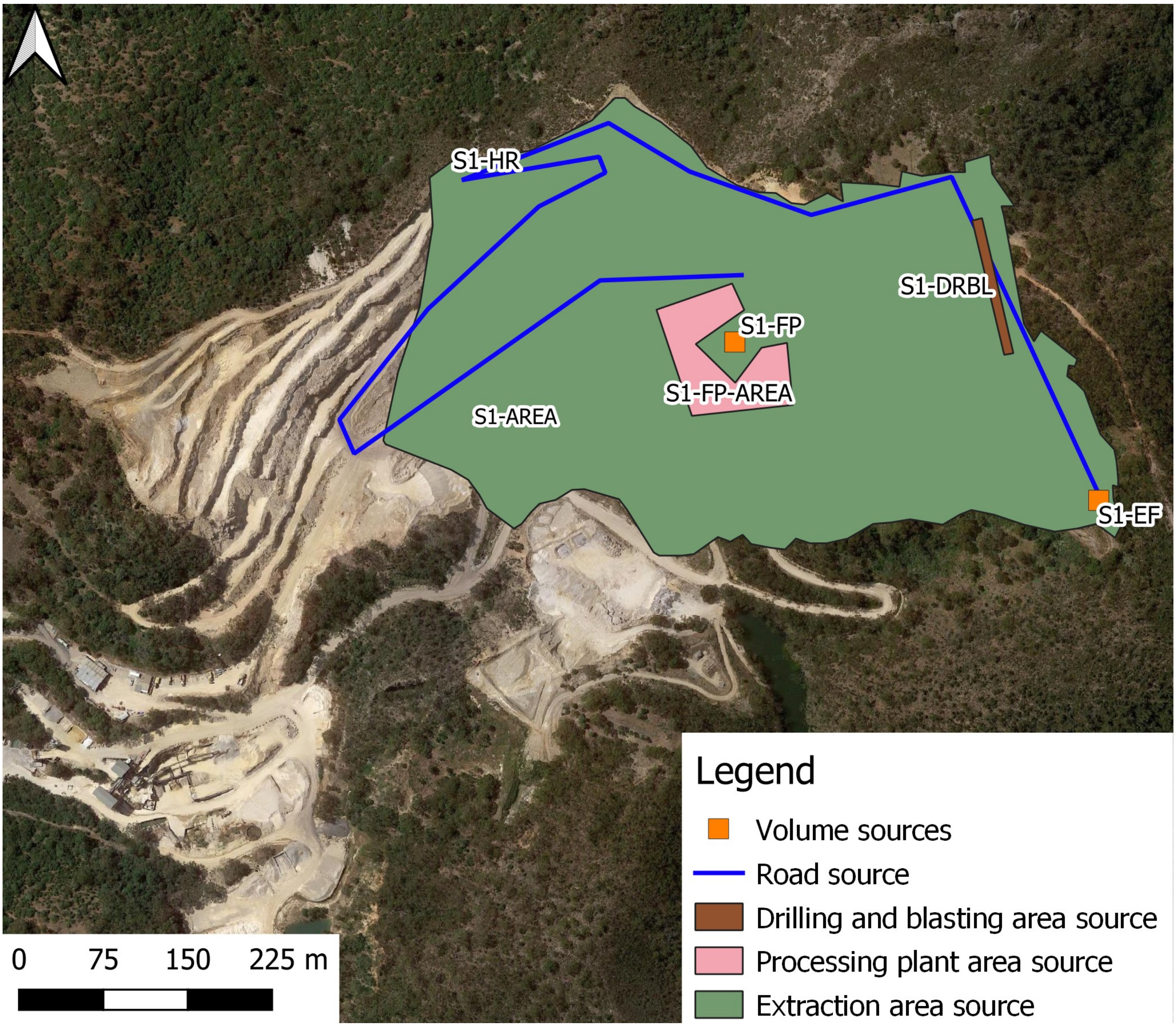


Figure 7.3 - Proposed Stage 1 – Modelled Sources

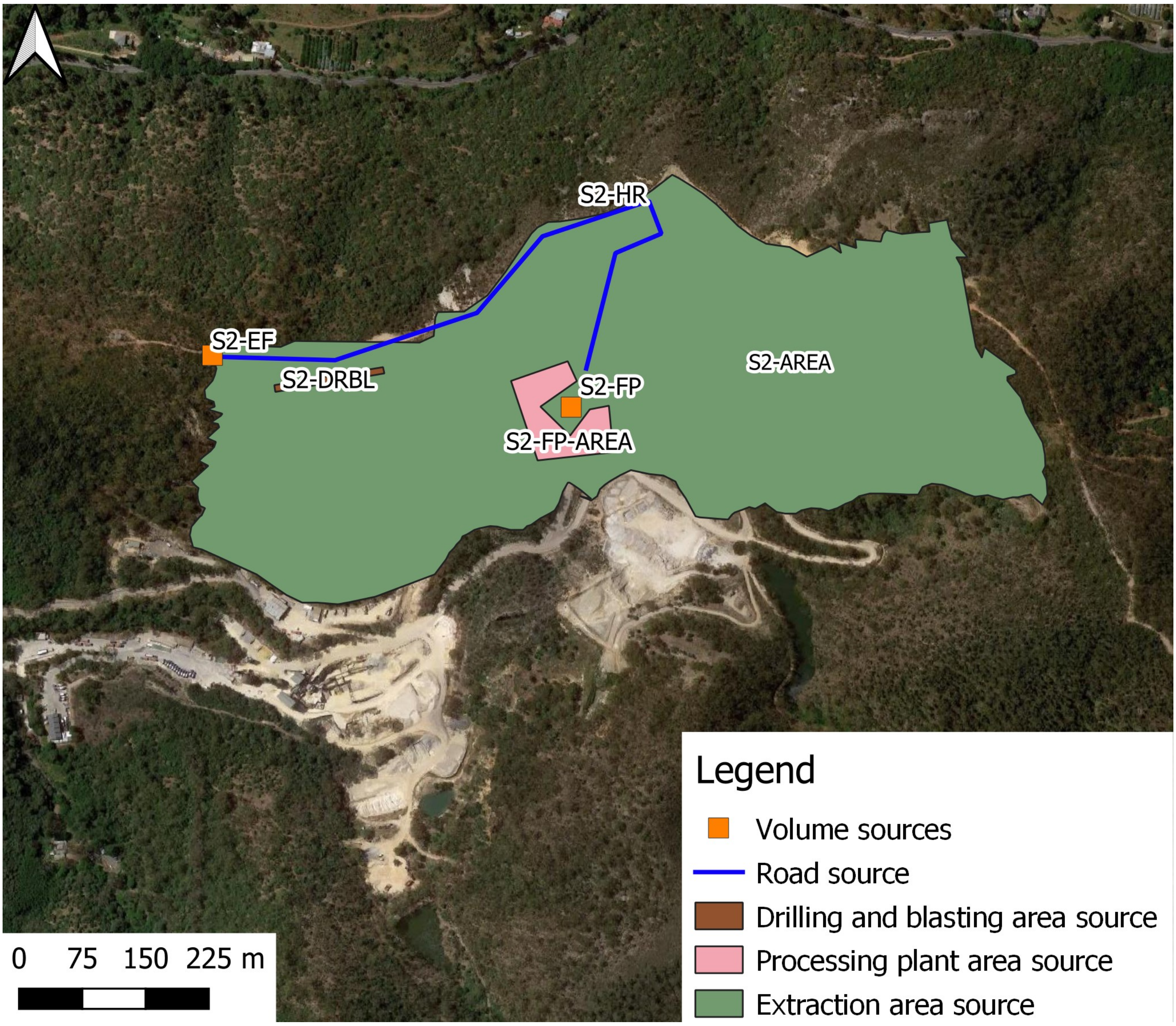


Figure 7.4 - Proposed Stage 2 – Modelled Sources

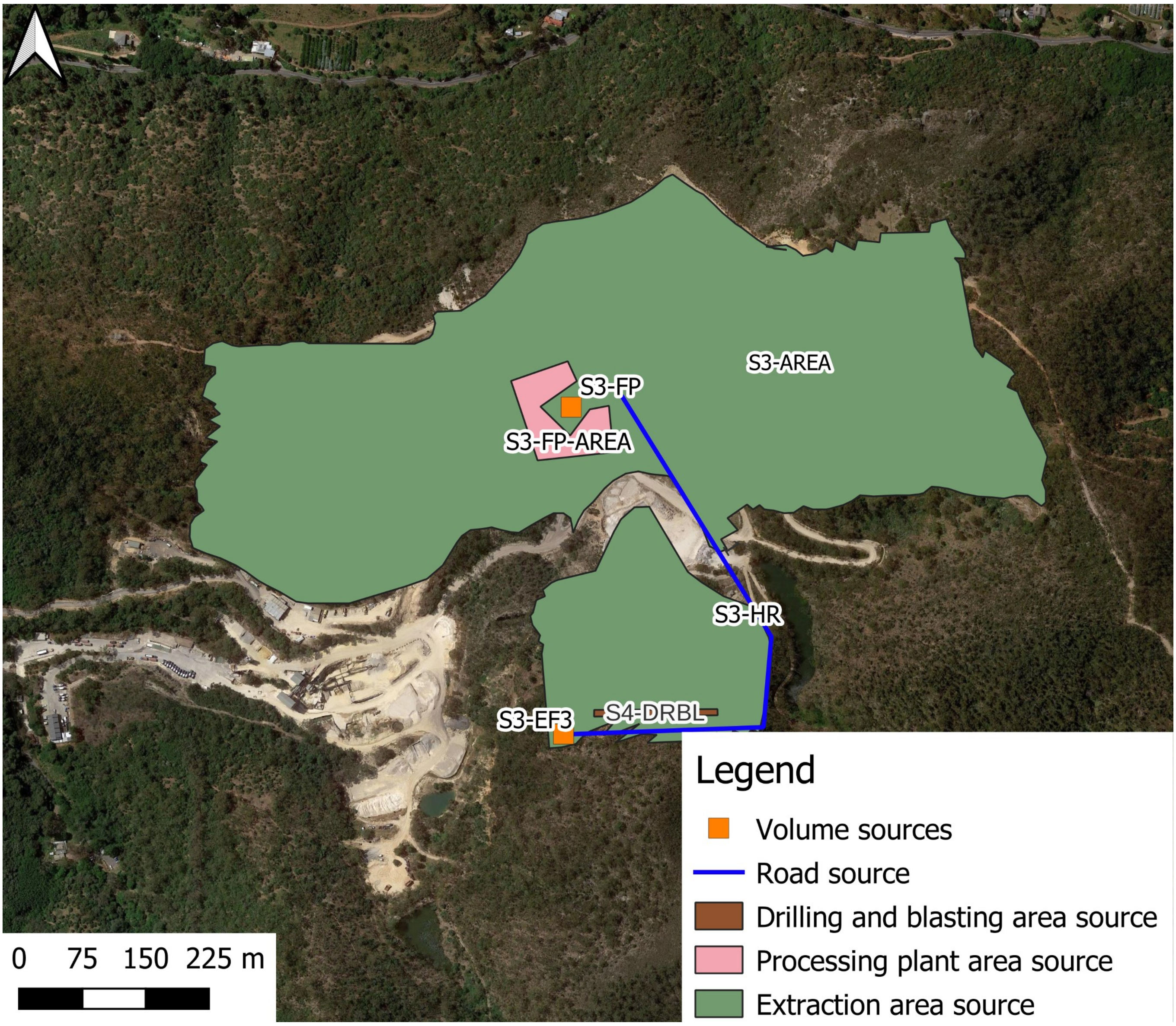


Figure 7.5 - Proposed Stage 3 – Modelled Sources

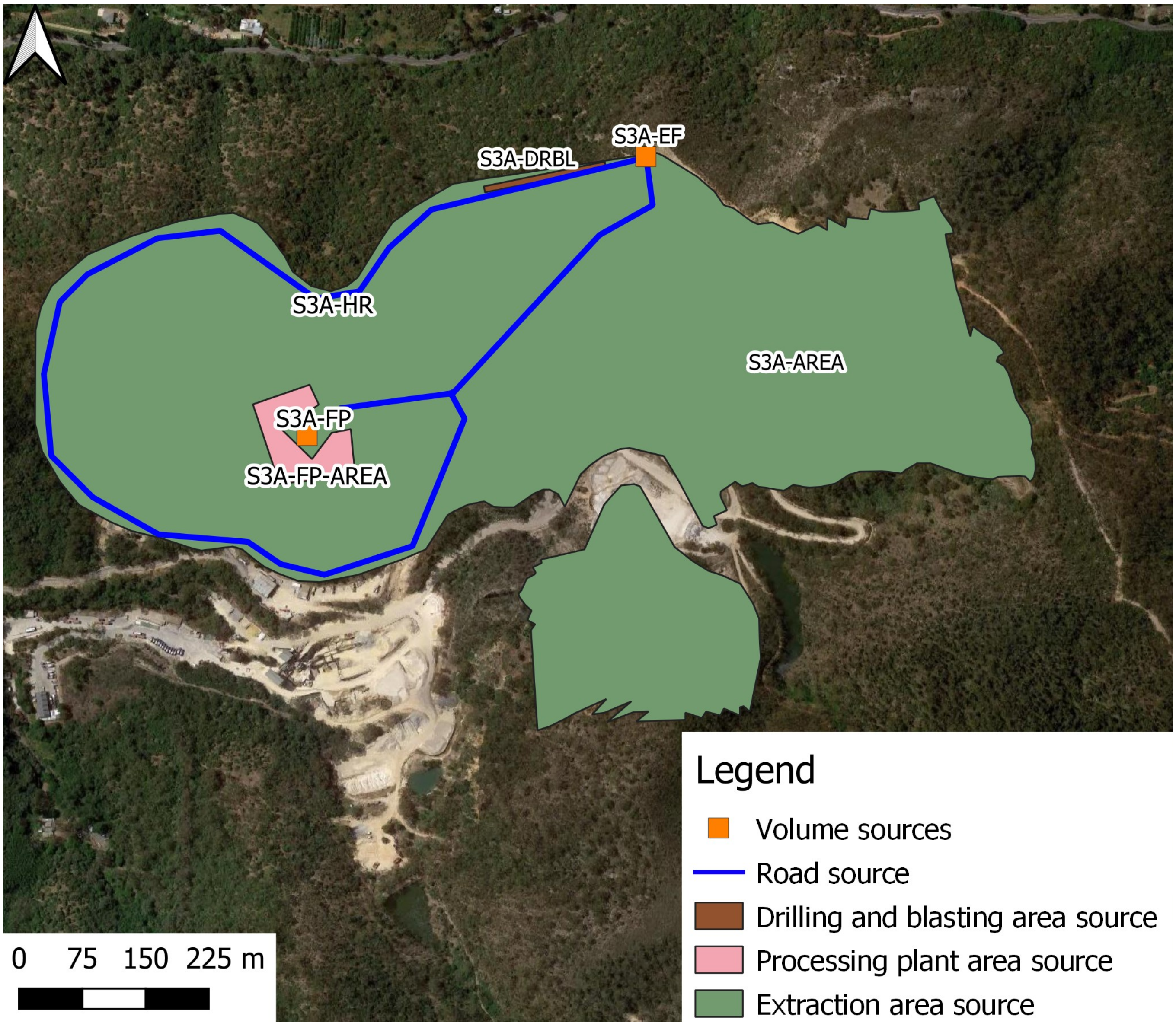


Figure 7.6 - Proposed Stage 3A – Modelled Sources

8 Air Dispersion Modelling

8.1 Overview

The following sections present details of the CALPUFF air dispersion modelling.

8.2 Meteorological Data

Meteorological data has been derived using CALMET. Full details of the inputs and verification outcomes of the CALMET modelling are provided in Section 6.

8.3 Emissions Data

The modelling scenarios and air emissions data used in CALPUFF are provided in the previous Section 7.

8.4 Deposited Dust Data

To allow for the modelling of dust deposition from the site, CALPUFF requires size parameters for dry deposition particles. CALPUFF requires both a Geometric Mass Mean Diameter and Geometric Standard Deviation to compute a deposition velocity. A review of existing literature has determined that limited studies have been conducted to determine the size parameters of rock quarry material. In the absence of any specific studies into size parameters, values have been adopted based on previous air quality assessments which have used CALPUFF to model dry deposition from rock quarry sources. Assessments reviewed include basalt quarries located in the Solomon Islands[4] and Cedar Point, NSW[5] as well as a Limestone quarry in Canada[6] and a Black Andersite quarry at Karuah, NSW[7]. Table 8.1 presents the range of values for TSP, PM_{10} and $PM_{2.5}$.

Table 8.1 - Summary of available quarry dust size parameters

	TSP		PM_{10}		$PM_{2.5}$	
	Geometric Mass Mean Diameter (Microns)	Geometric Standard Deviation (Microns)	Geometric Mass Mean Diameter (Microns)	Geometric Standard Deviation (Microns)	Geometric Mass Mean Diameter (Microns)	Geometric Standard Deviation (Microns)
Range	7.79 - 20	0 – 4.7	1.9 – 5	0 – 2.3	0.48 – 1	0 – 1.5

4 Golder Associates, March 2014. JEJEVO/ISABEL B Projects, Air Quality Assessment Monitoring Report. Report No. 137633001-6004-R-Rev0-2400.

5 Environmental Resources Management Australia, May 2012, Ceder Point Quarry Assessment.

6 Trinity Consultants, Novemebr 2015. CALPUFF Project Modelling Report (Detailed Air Dispersion Modelling Report). Project 134801.0035.

7 SLR Global Environmental Solutions, July 2013. Proposed Karuah East Quarry Projects, Pacific Highway, Karuah Air Quality Impact Assessment & Greenhouse Gas Assessment. Report Number 630.02482-R4R0.

	TSP		PM_{10}		$PM_{2.5}$	
	Geometric Mass Mean Diameter (Microns)	Geometric Standard Deviation (Microns)	Geometric Mass Mean Diameter (Microns)	Geometric Standard Deviation (Microns)	Geometric Mass Mean Diameter (Microns)	Geometric Standard Deviation (Microns)
Adopted	7.79	2.53	4.4	1.7	1	1

The range of size parameters for TSP, PM_{10} and $PM_{2.5}$ are noted to have limited variability between the assessments reviewed. A median value from all of the studies has been adopted for the size parameters (PM_{10} and $PM_{2.5}$) modelled in CALPUFF. A conservative approach has been adopted and TSP has been modelled using the minimum value of the range.

It should be noted that, to predict total deposited dust (mg/m^2/month), dry flux outputs for TSP (which covers the range of relevant particle sizes) has been adopted for comparison to the deposited dust limit.

8.5 Source Parameters

CALPUFF has been used to model to emission sources for the validation and assessment year. Volume, area and road sources have been adopted in CALPUFF to represent the range of air emission sources at the quarry. Area sources have been used for all exposed surface areas. Line sources have been used for all haul routes. All other emission sources have been modelled as volume sources. Source locations are presented in Section 7.4. Table 8.2 to 8.4 presents the modelled source parameters.

Table 8.2 - Volume Source Parameters

Activity/Source Description	Source ID	Elevation (m)	Height (m)	Initial Sigma Y (m)	Initial Sigma Z (m)
Concrete Batching Plant – Sand and Aggregate Deliveries	CB-SAD	274.9	2.0	1.0	1.0
Concrete Batching Plant – Sand and Aggregate Transfers	CB-SAT	274.6	2.0	1.0	1.0
Concrete Batching – Cement Deliveries	CB-CD	273.1	20.0	1.0	1.0
Concrete Batching Plant – Weigh Hopper Loading	CB-WHL	272.5	4.0	1.0	1.0
Concrete Batching Plant – Truck Loading	CB-TL	257.8	2.0	1.0	1.0
Future Plant – Stage 1	FP-S1	364.1	2.0	10	1.0
Future Plant – Stage 2	FP-S2	335.7	2.0	10	1.0
Future Plant – Stage 3	FP-S3	352.1	2.0	10	1.0
Future Plant – Stage 3A	FP-S3A	352.1	2.0	10	1.0
Stage 1 – Extraction Point	S1-EF	414.9	2.0	1.0	1.0
Stage 2 – Extraction Point	S2-EF	379.1	2.0	1.0	1.0
Stage 3 – Extraction Point	S3-EF	337.1	2.0	1.0	1.0
Stage 3A – Extraction Point	S3A-EF	337.1	2.0	1.0	1.0

Table 8.3 - Area Source Parameters

Activity/Source Description	Source ID	Elevation (m)	Height (m)	Initial Sigma Z (m)	Area (m^2)
Future Plant - Stockpile	FP-AREA	302	5	1.0	7254
Concrete Batching Plant - Stockpile	CB-AREA	274.2	2	1.0	811
Stage 1 – Extraction Area	S1-AREA	368.9	0	1.0	182367
Stage 1- Drilling and Blasting	S1-DRBL	407.7	0	1.0	1015
Stage 2 – Extraction Area	S2-AREA	343.8	0	1.0	293368

Activity/Source Description	Source ID	Elevation (m)	Height (m)	Initial Sigma Z (m)	Area (m^2)
Stage 2 – Drilling and Blasting	S2-DRBL	364.4	0	1.0	1020
Stage 3 – Extraction Area 1	S3-AREA-1	335.2	0	1.0	296554
Stage 3 – Extraction Area 2	S3-AREA-2	347.3	0	1.0	54320
Stage 3– Drilling and Blasting	S3-DRBL	358.3	0	1.0	1020
Stage 3A – Area 1	S3A-AREA-1	339.6	0	1.0	395383
Stage 3A – Area 2	S3A-AREA-2	347.3	0	1.0	54676
Stage 3A – Drilling and Blasting	S3A-DRBL	318.1	0	1.0	1007

Table 8.4 - Line Source Parameters

Activity/Source Description	Source ID	Height (m)	Initial Sigma Y (m)	Initial Sigma Z (m)	Total Line Length (m)
Concrete Batching Plant – Haul Route	CB-HR	2.0	4.2	3.4	544.5
Product Haul Route - Sealed	PROD-SL	2.0	4.2	3.4	265.4
Product Haul Route - Unsealed	PROD-US	2.0	4.2	3.4	709
Stage 1 – Haul Route	S1-HR	2.0	4.2	3.4	1541.9
Stage 2 – Haul Route	S2-HR	2.0	4.2	3.4	1242.9
Stage 3 – Haul Route	S3-HR	2.0	4.2	3.4	982.4
Stage 3A – Haul Route	S3A-HR	2.0	4.2	3.4	2127.8

8.6 Discrete Receptors

Figure 8.1 presents the modelled discrete receptors. A total of 26 receptors have been modelled at ground level to represent the nearest residential houses.

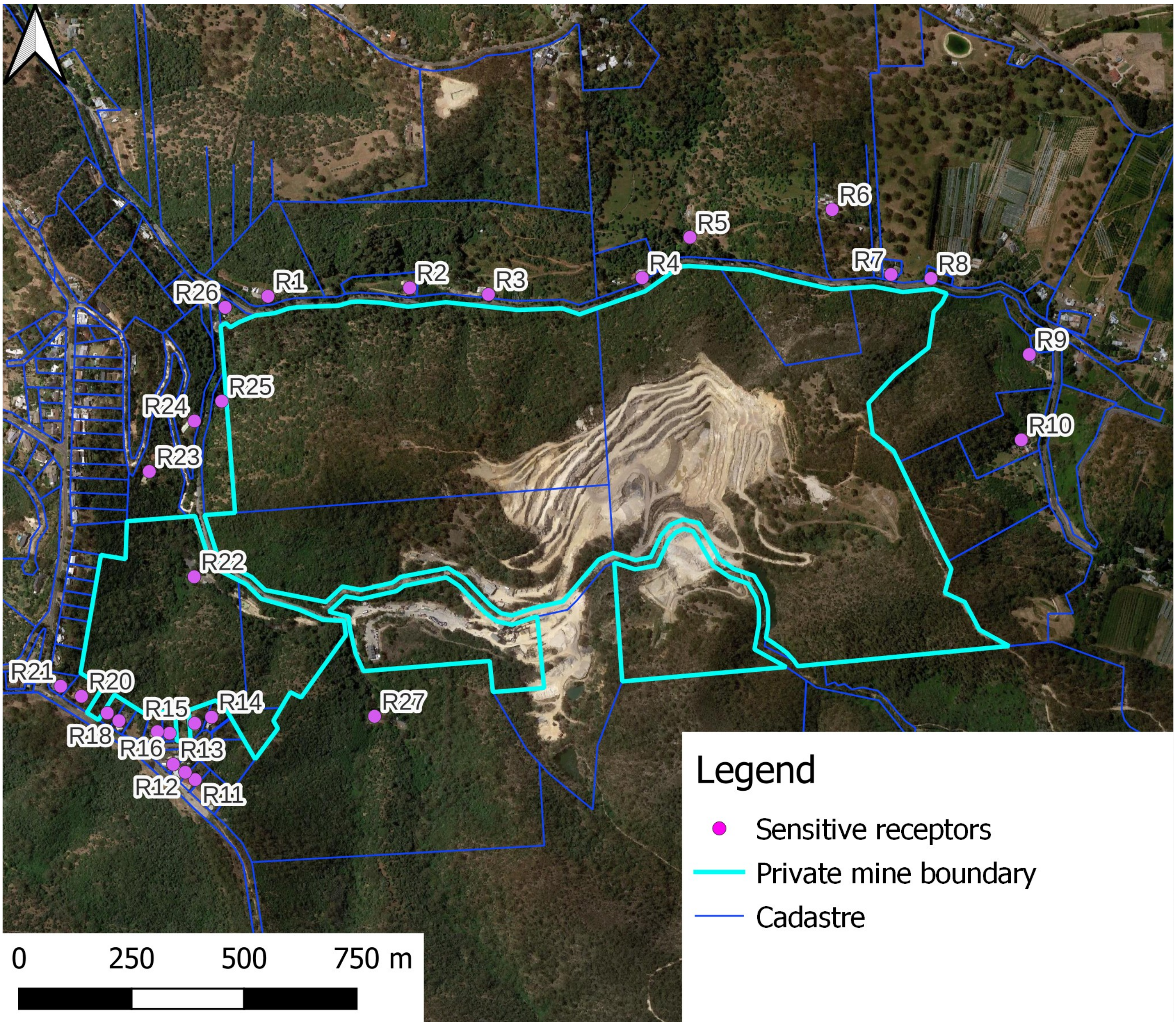


Figure 8.1 - Modelled Discrete Receptors

9 Predicted Results

Table 9.1 and 9.2 presents the predicted results for an average and worst-case throughput operating day. The highest result across all 27 modelled discrete receptors are shown in the results tables. Detailed results for each modelled discrete receptor are presented in Appendix B.

Table 9.1 - Predicted Results – Average Throughput Day

Pollutant	Maximum Predicted Ground Level Concentration at Discrete Receptors (µg/m³)				AVG Time	Criteria
	Stage 1	Stage 2	Stage 3	Stage 3A		
Source Only						
TSP	44.4	44.9	41.8	48.5	24-hour	120
	4.8	3.2	3.1	3.8	Annual	90
PM_{10}	20.0	20.7	19.3	24.8	24-hour	50
	1.8	1.3	1.3	2.5	Annual	25
$PM_{2.5}$	4.5	4.6	4.5	5.0	24-hour	25
	0.3	0.3	0.3	0.3	Annual	8
Deposited Dust	1.6	1.0	0.7	1.7	g/m²/month	4
Cumulative						
TSP	78.9	79.4	76.3	83.0	24-hour	120
	37.5	35.8	35.7	36.4	Annual	90
PM_{10}	36.1	36.8	35.4	40.9	24-hour	50
	17.1	16.6	16.6	17.8	Annual	25
$PM_{2.5}$	11.0	11.1	11.0	11.5	24-hour	25
	6.4	6.4	6.4	6.4	Annual	8
Deposited Dust	-	-	-	-	g/m²/month	4

Table 9.2 - Predicted Results – Worst-Case Throughput Day

Pollutant	Maximum Predicted Ground Level Concentration at Discrete Receptors (µg/m³)				AVG Time	Criteria
	Stage 1	Stage 2	Stage 3	Stage 3A		
Source Only						
TSP	81.9	63.0	57.7	70.1	24-hour	120
PM_{10}	31.9	28.3	26.3	31.0	24-hour	50
$PM_{2.5}$	5.3	5.4	5.3	5.7	24-hour	25
Cumulative						
TSP	116.4	97.4	92.2	104.6	24-hour	120
PM_{10}	48.0	44.4	42.4	47.1	24-hour	50
$PM_{2.5}$	11.8	11.9	11.8	12.2	24-hour	25

The results of the modelling demonstrate compliance with the air quality criteria for all the stages of the proposed development for the average and worst-case scenarios. The highest predicted concentrations are associated with Stages 1 and 3A, but in general, the concentrations are similar across stages (due to an identical material throughput). Concentrations differ due to extraction footprints, which also affects haul routes and worst-case extraction face locations. The highest pollutant prediction (relative to the ambient air quality goal) is for PM_{10} 24-hour. Ground level concentration plots for PM_{10} 24-hour during the worst-case operating day are presented in Appendix C.

The modelling is noted to take into account water cart spraying on the haul routes and water sprays at the mobile processing plant.

10 Crystalline Silica Review

10.1 Air Quality Criteria

The following sections presents a review of cyrstalline silica predictions, with a comparison to the interim air quality goal of 3 µg/m^3 (as PM_{10}).

10.2 Background RCS

Ambient RCS has been undertaken by Hanson during August and September 2022. The results are summarised in Table 10.1. The monitoring location is located along Coach Road, west of the quarry site.

Table 10.1 - Mesaured RCS Concentrations

Date	Measured RCS Concentrations (µg/m^3)
18/07/2022	0.073
24/07/2022	0.087
30/07/2022	0.076
05/08/2022	0.1 (wood burning nearby)
11/08/2022	0.030
17/08/2022	0.0080
23/08/2022	0.025
29/08/2022	0.026
04/09/2022	0.018
12/09/2022	0.027
18/09/2022	0.033
24/09/2022	0.019
Average Across All Days	0.044

In addition to the above data, based on a review of literature, three studies in South-East Queensland have been identified which have involved RCS sampling in areas surrounding various quarries from 2007 to present. These quarries are located in Mt Cotton[8], Yatala[9] and Oxenford[10]. Table 10.2 presents the background RCS concentrations measured at these locations and the RCS to $PM_{2.5}$ ratio for the same monitoring period.

8 DSITIA, Mount Cotton Quarry Dust Investigation, December 2008 to December 2009, Final Version.

9 DSITIA, Ormeau/Yatala Air Quality Investigation, March 2017.

10 DSITIA, Oxenford Air Monitoring Project, Fact Sheet: Oxenford Crystalline Silica and Dust Deposition – Interim Results from May to August 2020.

Table 10.2 - Background RCS Concentrations

Study Area	Measured RCS Concentrations	RCS:$PM_{2.5}$ Ratio	Averaging Time	Distance from Quarry
Mt Cotton	Site 1 – 0.14 µg/m^3 Site 2 – 0.26 µg/m^3	0.027 0.039	1 year	Site 1 – 1 km from quarry site Site 2 (neighbouring property): • 200 m from quarry truck site access route • 600 m from processing plant • 1000 m from quarry pit
Ormeau	Harts Road - 0.04 µg/m^3 Vennor Drive - 0.03 µg/m^3	0.0067 0.0093	14 months	Distance from 3 different quarries: • Harts Rd - 600 m, 1.6 km and 2.3 km • Vennor Dr - 2 km, 1.7 km and 1.3 km
Oxenford	0.04 µg/m^3	0.010	4 months	Not provided.

The measured RCS concentrations ranged from 0.03 µg/m^3 to 0.26 µg/m^3. The measured 0.044 µg/m^3 near White Rock Quarry is noted to be within the range of this data set, and similar to the results measured or Ormeau and Oxenford.

Ultimately, the purpose of reviewing background RCS concentrations is to allow for an assessment of cumulative impacts associated with proposed quarry operations (background RCS plus contribution from quarry). For the purpose of this review, the measured 0.044 µg/m^3 concentration has been adopted as an annual average for assessment against the relevant RCS annual average ambient air quality goal. Use of this measured concentration is considered conservative, as it is based on only 12 weeks of sampling. There is a potential that the measured concentration over 1-year would be lower (due to averaging/smoothing out of data). Furthermore, as the quarry was in operation at the time of the sampling, it is assumed that the quarry operations has some contribution to the measured RCS.

10.3 RCS to PM_{10} Ratio

Emissions factors for quarries are provided as typical particle size fractions of TSP, PM_{10} and $PM_{2.5}$. There are no available emission factors for RCS that have been identified during this review. In the absence of such information, one approach is to estimate RCS concentrations by factoring predicted PM_{10} concentrations by a known ratio of RCS to PM_{10} found in quarries.

Key sources for the quarry site include haul truck routes, processing plant and the extraction area (i.e. wind erosion, extraction activity, drill/blasting). RCS emissions from the site are influenced by the crystalline silica content of the rock being extracted. Sandstone-based material, as extracted at the White Rock Quarry (and typical of what is to be found in the Adelaide region and elsewhere in Australia), has a crystalline silica content in the order of 70%. This does not mean that 70% of PM_{10} emissions emitted from the quarry is expected to be crystalline silica, as not all particulate emissions from the quarry are from the rock deposit. In fact, the majority of emissions are associated with truck movements over haul routes (in the order of 40% of total emissions), for which the crystalline silica content is expected to be lower.

As a conservative approach, a 70% RCS composition has been assumed for all emission sources.

10.4 Predicted RCS Concentrations

Based on the above information, the following RCS concentrations are predicted for each stage of the quarry development.

Table 10.3 - Predicted RCS Concentrations

Parameter	Maximum Predicted Ground Level Concentration at Receptors (µg/m^3)			
	Stage 1	Stage 2	Stage 3	Stage 3A
PM_{10} Source Only[a]	1.8	1.3	1.3	2.5
RCS Source Only	1.3	0.9	0.9	1.8
Background RCS	0.044	0.044	0.044	0.044
RCS Cumulative	1.3	1.0	1.0	1.8
Criteria	3 µg/m^3			

[a] Based on Table 9.1 results

The predicted RCS concentrations for each stage of the quarry are well below the 3 µg/m^3 ambient air quality goal. Overall, based on the information gathered to date, crystalline silica concentrations in the surrounding area are expected to be within acceptable levels with the proposed quarry in operation. As noted previously, the assessment is conservative by assuming a 70% RCS composition (in PM_{10}) for all emission sources and it is likely that the adopted background RCS is relatively high.

11 Conclusion

An air quality assessment using air dispersion modelling has been undertaken for the proposed development; of the Hanson White Rock Quarry at Horsnells Gully Road, Horsnell Gully. To assess the potential for air quality impacts, computational air dispersion modelling has been undertaken to predict particulate (TSP, PM_{10} and $PM_{2.5}$) and deposited dust concentrations at the nearest sensitive receptor groups. The conclusions of the assessment are summarised below:

- The nearest sensitive receptors are dwellings located on rural residential land to the north and north-east of the site at the Norton Summit Township. The nearest dwelling is located 30 m north of the property boundary. The suburb of Skye is located 50 m to the west of the of the development site.
- The main air emission sources for the site include haul routes, the processing plant, concrete batching plant, extraction activity and wind erosion over extraction areas.
- The results of the modelling, assuming Level 1 haul route watering and a processing plant with water sprays, indicate compliance with the air quality criteria for all the stages of the proposed development for the average and worst-case scenarios. In addition to the watering and processing plant controls, it is essential that sealed access roads are cleaned regularly and maintained at all times to ensure silt loading is minimised.

Overall, the proposed quarry development is expected to result in increased particulate concentrations in the surrounding area, however, the potential for dust impacts can be effectively managed to achieve the relevant air quality goals with the above measures are in place.

Appendix A - Air Quality Glossary

APPENDIX A: GLOSSARY OF AIR QUALITY TERMINOLOGY	
Conversion of ppm to mg/m^3	Where R is the ideal gas constant; T, the temperature in Kelvin (273.16 + T°C); and P, the pressure in mm Hg, the conversion is as follows: $mg\ m^{-3} = (P/RT) \times \text{Molecular weight} \times (\text{concentration in ppm})$ $= \frac{P \times \text{Molecular weight} \times (\text{concentration in ppm})}{62.4 \times (273.2 + T°C)}$
g/s	Grams per second
mg/m^3	Milligrams (10^{-3}) per cubic metre.
$\mu g/m^3$	Micrograms (10^{-6}) per cubic metre.
ppb	Parts per billion.
ppm	Parts per million.
PM_{10}, $PM_{2.5}$	Fine particulate matter with an equivalent aerodynamic diameter of less than 10 or 2.5 micrometres respectively. Fine particulates are predominantly sourced from combustion processes. Vehicle emissions are a key source in urban environments.
50th percentile	The value exceeded for 50 % of the time.

Appendix B – Detailed Modelling Results (Base Scenario)

Table B1 - Stage 1 - Detailed Results - Average Throughput

No.	X	Y	Source Only ug/m3							Cumulative ug/m3						
			TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust	TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust
			24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$	24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$
1	289832	6133248	8.8	1.5	3.5	0.6	0.7	0.1	0.37	43.3	34.2	19.6	15.9	7.2	6.2	-
2	290147	6133267	14.1	2.7	5.4	1.0	0.8	0.1	0.66	48.6	35.3	21.5	16.3	7.3	6.2	-
3	290322	6133252	18.2	3.7	6.8	1.4	1.1	0.2	0.95	52.6	36.4	22.9	16.7	7.6	6.3	-
4	290664	6133289	23.9	4.8	9.2	1.8	1.4	0.2	1.08	58.4	37.5	25.3	17.1	7.9	6.3	-
5	290770	6133379	24.2	3.0	10.4	1.2	1.5	0.1	0.56	58.7	35.7	26.5	16.5	8.0	6.2	-
6	291086	6133441	43.6	2.3	17.3	1.0	2.1	0.1	0.40	78.1	35.0	33.4	16.3	8.6	6.2	-
7	291217	6133297	23.0	2.8	9.7	1.2	1.3	0.1	0.54	57.4	35.4	25.8	16.5	7.8	6.2	-
8	291306	6133288	27.0	2.5	10.8	1.1	1.3	0.1	0.47	61.5	35.1	26.9	16.4	7.8	6.2	-
9	291524	6133119	31.5	2.3	13.8	1.0	1.7	0.1	0.40	66.0	35.0	29.9	16.3	8.2	6.2	-
10	291507	6132929	38.7	3.6	16.9	1.6	2.0	0.2	0.74	73.2	36.3	33.0	16.9	8.5	6.3	-
11	289670	6132173	18.3	1.0	9.3	0.4	1.5	0.1	0.16	52.8	33.6	25.4	15.7	8.0	6.2	-
12	289648	6132190	17.2	1.0	8.8	0.4	1.4	0.1	0.16	51.7	33.6	24.9	15.7	7.9	6.2	-
13	289621	6132207	15.8	0.9	8.2	0.4	1.3	0.1	0.15	50.3	33.6	24.3	15.7	7.8	6.2	-
14	289707	6132312	20.7	1.3	9.6	0.5	1.6	0.1	0.20	55.2	33.9	25.7	15.8	8.1	6.2	-
15	289669	6132298	19.0	1.1	8.9	0.5	1.5	0.1	0.18	53.5	33.8	25.0	15.8	8.0	6.2	-
16	289613	6132277	16.2	1.0	7.8	0.4	1.3	0.1	0.16	50.6	33.6	23.9	15.7	7.8	6.2	-
17	289586	6132280	15.5	0.9	7.3	0.4	1.2	0.1	0.15	50.0	33.6	23.4	15.7	7.7	6.2	-
18	289501	6132304	14.3	0.8	6.8	0.4	1.0	0.1	0.14	48.8	33.5	22.9	15.7	7.5	6.2	-
19	289475	6132321	14.3	0.8	6.8	0.4	1.0	0.1	0.14	48.8	33.5	22.9	15.7	7.5	6.2	-
20	289417	6132359	14.1	0.8	6.7	0.3	1.0	0.1	0.13	48.6	33.4	22.8	15.6	7.5	6.2	-
21	289371	6132381	13.4	0.7	6.4	0.3	1.0	0.1	0.13	47.9	33.4	22.5	15.6	7.5	6.2	-
22	289668	6132624	14.2	1.5	5.6	0.6	1.1	0.1	0.23	48.7	34.1	21.7	15.9	7.6	6.2	-
23	289568	6132858	11.9	1.3	4.7	0.5	0.7	0.1	0.27	46.3	33.9	20.8	15.8	7.2	6.2	-
24	289669	6132971	9.7	1.4	4.2	0.6	0.8	0.1	0.32	44.2	34.1	20.3	15.9	7.3	6.2	-
25	289729	6133015	9.8	1.6	4.2	0.6	0.7	0.1	0.35	44.3	34.2	20.3	15.9	7.2	6.2	-
26	289737	6133224	7.7	1.3	3.2	0.5	0.5	0.1	0.31	42.2	34.0	19.3	15.8	7.0	6.2	-
27	290069	6132314	44.4	3.2	20.0	1.2	4.5	0.3	0.53	78.9	35.8	36.1	16.5	11.0	6.4	-
Criteria			**120**	**90**	**50**	**25**	**25**	**8**	**4**	**120**	**90**	**50**	**25**	**25**	**8**	**4**

Table B2 - Stage 2 - Detailed Results - Average Throughput

No.	X	Y	Source Only ug/m3							Cumulative ug/m3						
			TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust	TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust
			24-hour	Annual	24-hour	Annual	24-hour	Annual	g/m^2/month	24-hour	Annual	24-hour	Annual	24-hour	Annual	g/m^2/month
1	289832	6133248	8.5	1.5	4.1	0.7	0.7	0.1	0.38	43.0	34.2	20.2	16.0	7.2	6.2	-
2	290147	6133267	14.7	2.5	6.9	1.1	0.9	0.1	0.65	49.2	35.1	23.0	16.4	7.4	6.2	-
3	290322	6133252	16.2	3.1	7.1	1.3	1.3	0.2	0.78	50.6	35.7	23.2	16.6	7.8	6.3	-
4	290664	6133289	24.5	3.1	12.0	1.3	1.8	0.2	0.50	59.0	35.7	28.1	16.6	8.3	6.3	-
5	290770	6133379	26.8	1.9	12.6	0.8	1.7	0.1	0.34	61.2	34.6	28.7	16.1	8.2	6.2	-
6	291086	6133441	29.6	1.4	13.4	0.6	1.7	0.1	0.22	64.1	34.0	29.5	15.9	8.2	6.2	-
7	291217	6133297	19.2	1.4	8.6	0.6	1.1	0.1	0.22	53.7	34.0	24.7	15.9	7.6	6.2	-
8	291306	6133288	21.6	1.2	9.8	0.6	1.2	0.1	0.18	56.1	33.8	25.9	15.9	7.7	6.2	-
9	291524	6133119	17.5	1.0	8.3	0.5	1.1	0.1	0.18	51.9	33.6	24.4	15.8	7.6	6.2	-
10	291507	6132929	16.5	1.3	9.3	0.6	1.2	0.1	0.27	51.0	34.0	25.4	15.9	7.7	6.2	-
11	289670	6132173	16.6	0.9	9.9	0.4	1.6	0.1	0.14	51.0	33.5	26.0	15.7	8.1	6.2	-
12	289648	6132190	15.8	0.9	9.6	0.4	1.5	0.1	0.14	50.3	33.5	25.7	15.7	8.0	6.2	-
13	289621	6132207	14.9	0.8	9.1	0.4	1.5	0.1	0.14	49.3	33.5	25.2	15.7	8.0	6.2	-
14	289707	6132312	18.3	1.2	11.0	0.6	1.8	0.1	0.19	52.7	33.8	27.1	15.9	8.3	6.2	-
15	289669	6132298	17.0	1.1	10.4	0.5	1.7	0.1	0.17	51.5	33.7	26.5	15.8	8.2	6.2	-
16	289613	6132277	14.6	0.9	9.1	0.4	1.4	0.1	0.15	49.1	33.6	25.2	15.7	7.9	6.2	-
17	289586	6132280	13.6	0.9	8.6	0.4	1.4	0.1	0.14	48.1	33.5	24.7	15.7	7.9	6.2	-
18	289501	6132304	11.5	0.8	7.1	0.4	1.1	0.1	0.13	46.0	33.4	23.2	15.7	7.6	6.2	-
19	289475	6132321	11.5	0.7	6.7	0.4	1.0	0.1	0.13	46.0	33.4	22.8	15.7	7.5	6.2	-
20	289417	6132359	11.5	0.7	6.3	0.3	1.0	0.1	0.12	46.0	33.4	22.4	15.6	7.5	6.2	-
21	289371	6132381	11.2	0.7	6.2	0.3	1.0	0.1	0.12	45.7	33.3	22.3	15.6	7.5	6.2	-
22	289668	6132624	13.2	1.5	6.1	0.6	1.2	0.1	0.23	47.7	34.1	22.2	15.9	7.7	6.2	-
23	289568	6132858	11.1	1.3	4.8	0.6	0.8	0.1	0.27	45.5	33.9	20.9	15.9	7.3	6.2	-
24	289669	6132971	9.8	1.5	4.7	0.6	0.8	0.1	0.33	44.3	34.1	20.8	15.9	7.3	6.2	-
25	289729	6133015	10.2	1.7	4.9	0.7	0.8	0.1	0.38	44.7	34.3	21.0	16.0	7.3	6.2	-
26	289737	6133224	7.7	1.4	3.7	0.6	0.6	0.1	0.33	42.2	34.0	19.8	15.9	7.1	6.2	-
27	290069	6132314	44.9	3.2	20.7	1.3	4.6	0.3	0.55	79.4	35.8	36.8	16.6	11.1	6.4	-
Criteria			**120**	**90**	**50**	**25**	**25**	**8**	**4**	**120**	**90**	**50**	**25**	**25**	**8**	**4**

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Table B3 - Stage 3 - Detailed Results - Average Throughput

No.	X	Y	Source Only ug/m3							Cumulative ug/m3						
			TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust	TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust
			24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$	24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$
1	289832	6133248	7.1	1.1	3.6	0.5	0.7	0.1	0.27	41.6	33.7	19.7	15.8	7.2	6.2	-
2	290147	6133267	10.8	1.5	5.0	0.7	0.8	0.1	0.37	45.2	34.1	21.1	16.0	7.3	6.2	-
3	290322	6133252	11.9	1.7	5.4	0.8	1.1	0.1	0.39	46.4	34.4	21.5	16.1	7.6	6.2	-
4	290664	6133289	15.8	1.5	8.1	0.7	1.4	0.1	0.20	50.3	34.2	24.2	16.0	7.9	6.2	-
5	290770	6133379	16.2	1.1	8.5	0.5	1.4	0.1	0.16	50.7	33.7	24.6	15.8	7.9	6.2	-
6	291086	6133441	25.1	0.9	14.1	0.5	1.8	0.1	0.13	59.6	33.6	30.2	15.8	8.3	6.2	-
7	291217	6133297	17.3	1.0	9.6	0.5	1.2	0.1	0.16	51.8	33.6	25.7	15.8	7.7	6.2	-
8	291306	6133288	15.2	0.9	8.6	0.5	1.0	0.1	0.15	49.7	33.6	24.7	15.8	7.5	6.2	-
9	291524	6133119	13.9	0.8	7.4	0.4	1.0	0.1	0.12	48.4	33.5	23.5	15.7	7.5	6.2	-
10	291507	6132929	19.8	1.1	10.9	0.6	1.4	0.1	0.19	54.3	33.8	27.0	15.9	7.9	6.2	-
11	289670	6132173	11.5	0.8	7.2	0.4	1.3	0.1	0.13	46.0	33.5	23.3	15.7	7.8	6.2	-
12	289648	6132190	11.5	0.8	6.7	0.4	1.2	0.1	0.13	46.0	33.4	22.8	15.7	7.7	6.2	-
13	289621	6132207	11.5	0.8	6.2	0.4	1.1	0.1	0.13	46.0	33.4	22.3	15.7	7.6	6.2	-
14	289707	6132312	18.8	1.1	9.6	0.5	1.6	0.1	0.18	53.3	33.8	25.7	15.8	8.1	6.2	-
15	289669	6132298	16.6	1.0	8.5	0.5	1.4	0.1	0.16	51.0	33.6	24.6	15.8	7.9	6.2	-
16	289613	6132277	13.7	0.8	7.2	0.4	1.1	0.1	0.14	48.2	33.5	23.3	15.7	7.6	6.2	-
17	289586	6132280	13.0	0.8	6.9	0.4	1.1	0.1	0.13	47.5	33.4	23.0	15.7	7.6	6.2	-
18	289501	6132304	11.6	0.7	6.1	0.3	1.0	0.1	0.12	46.0	33.3	22.2	15.6	7.5	6.2	-
19	289475	6132321	11.4	0.7	6.0	0.3	1.0	0.1	0.12	45.9	33.3	22.1	15.6	7.5	6.2	-
20	289417	6132359	11.0	0.6	5.8	0.3	0.9	0.1	0.12	45.5	33.3	21.9	15.6	7.4	6.2	-
21	289371	6132381	10.5	0.6	5.5	0.3	0.9	0.1	0.11	45.0	33.2	21.6	15.6	7.4	6.2	-
22	289668	6132624	14.9	1.4	6.3	0.6	1.2	0.1	0.24	49.4	34.0	22.4	15.9	7.7	6.2	-
23	289568	6132858	10.3	1.2	4.5	0.5	0.8	0.1	0.28	44.7	33.8	20.6	15.8	7.3	6.2	-
24	289669	6132971	9.2	1.3	4.4	0.6	0.8	0.1	0.32	43.7	33.9	20.5	15.9	7.3	6.2	-
25	289729	6133015	9.2	1.4	4.3	0.6	0.7	0.1	0.34	43.7	34.0	20.4	15.9	7.2	6.2	-
26	289737	6133224	6.6	1.0	3.0	0.5	0.6	0.1	0.24	41.0	33.7	19.1	15.8	7.1	6.2	-
27	290069	6132314	41.8	3.1	19.3	1.3	4.5	0.3	0.51	76.3	35.7	35.4	16.6	11.0	6.4	-
Criteria			**120**	**90**	**50**	**25**	**25**	**8**	**4**	**120**	**90**	**50**	**25**	**25**	**8**	**4**

Table B4 - Stage 3A - Detailed Results - Average Throughput

No.	X	Y	Source Only ug/m3							Cumulative ug/m3						
			TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust	TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust
			24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$	24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$
1	289832	6133248	17.2	2.6	6.9	0.8	0.8	0.1	0.85	45.2	34.4	22.0	16.4	7.5	6.2	-
2	290147	6133267	26.9	4.0	13.1	1.2	1.3	0.2	0.24	52.4	35.3	24.2	16.6	7.6	6.3	-
3	290322	6133252	36.0	5.2	19.1	2.6	1.5	0.2	0.35	53.2	36.0	25.2	16.9	8.0	6.3	-
4	290664	6133289	59.0	5.7	28.5	2.9	2.9	0.3	0.61	69.8	36.4	34.0	17.2	9.2	6.4	-
5	290770	6133379	66.7	3.5	20.5	1.2	3.0	0.2	0.56	71.2	34.8	30.0	16.6	9.5	6.3	-
6	291086	6133441	27.4	2.5	15.0	0.8	2.3	0.1	0.29	62.2	34.0	35.2	16.3	8.6	6.2	-
7	291217	6133297	29.2	2.5	16.0	0.7	1.9	0.1	0.29	56.1	34.0	27.8	16.0	8.2	6.2	-
8	291306	6133288	50.0	2.2	16.4	0.6	1.6	0.1	0.26	56.5	33.8	27.5	16.2	8.4	6.2	-
9	291524	6133119	42.4	1.6	16.7	0.5	1.5	0.1	0.27	51.7	33.6	24.7	16.8	7.8	6.2	-
10	291507	6132929	34.0	2.2	13.2	0.6	1.2	0.1	0.39	48.5	33.9	24.3	16.9	7.9	6.2	-
11	289670	6132173	42.0	1.0	10.3	0.5	2.2	0.1	0.33	54.5	33.7	26.4	16.8	8.2	6.2	-
12	289648	6132190	40.9	1.0	10.0	0.6	2.7	0.1	0.34	53.8	33.7	26.5	15.8	8.2	6.2	-
13	289621	6132207	39.4	1.6	13.5	0.4	2.6	0.1	0.33	52.9	33.7	26.6	15.9	8.5	6.2	-
14	289707	6132312	49.5	2.5	17.2	0.6	2.6	0.1	0.52	59.0	34.1	28.9	16.2	8.5	6.2	-
15	289669	6132298	45.6	2.3	16.5	0.6	2.8	0.1	0.46	56.8	34.0	27.6	16.9	8.9	6.2	-
16	289613	6132277	40.2	1.8	14.5	0.5	2.6	0.1	0.38	53.6	33.8	26.0	16.8	8.5	6.2	-
17	289586	6132280	37.9	1.7	13.7	0.5	1.5	0.1	0.37	52.3	33.7	25.8	16.8	8.0	6.2	-
18	289501	6132304	32.7	0.5	11.7	0.4	1.2	0.1	0.36	49.2	33.6	23.8	15.9	7.7	6.2	-
19	289475	6132321	30.9	0.5	11.2	0.4	1.2	0.1	0.35	48.9	33.6	23.4	15.9	7.0	6.2	-
20	289417	6132359	28.3	0.4	10.1	0.4	1.4	0.1	0.35	48.9	33.5	23.2	15.7	7.6	6.2	-
21	289371	6132381	27.8	0.8	9.0	0.4	1.4	0.1	0.33	48.6	33.5	23.1	15.7	7.6	6.2	-
22	289668	6132624	30.6	2.7	9.2	0.0	1.5	0.2	0.28	51.1	34.5	23.8	16.0	7.9	6.2	-
23	289568	6132858	19.2	2.6	5.6	0.9	0.8	0.1	0.85	47.7	34.3	21.5	16.0	7.5	6.2	-
24	289669	6132971	18.0	2.8	5.0	0.8	0.9	0.2	1.02	46.5	34.6	21.2	16.4	7.6	6.2	-
25	289729	6133015	19.9	3.2	5.8	0.9	0.9	0.2	1.09	47.3	34.8	21.5	16.2	7.6	6.2	-
26	289737	6133224	13.5	2.6	5.0	0.7	0.7	0.1	0.79	43.7	34.3	20.9	16.0	7.2	6.2	-
Criteria			120	90	50	25	25	8	4	120	90	50	25	25	8	4
Criteria			120	90	50	25	25	8	4	120	90	50	25	25	8	4

Table B5 - Stage 1 - Detailed Results - Worst-case Throughput

No.	X	Y	Source Only ug/m3							Cumulative ug/m3						
			TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust	TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust
			24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$	24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$
1	289832	6133248	16.6	2.7	6.1	1.0	0.9	0.1	0.67	51.1	35.4	22.2	16.3	7.4	6.2	-
2	290147	6133267	26.6	4.9	9.9	1.8	1.1	0.2	1.22	61.1	37.5	26.0	17.1	7.6	6.3	-
3	290322	6133252	34.4	6.9	12.6	2.5	1.3	0.3	1.78	68.9	39.5	28.7	17.8	7.8	6.4	-
4	290664	6133289	45.2	9.0	16.3	3.3	2.1	0.4	2.03	79.7	41.7	32.4	18.6	8.6	6.5	-
5	290770	6133379	43.7	5.5	18.2	2.1	2.3	0.2	1.04	78.2	38.2	34.3	17.4	8.8	6.3	-
6	291086	6133441	81.9	4.2	31.9	1.7	3.6	0.2	0.73	116.4	36.9	48.0	17.0	10.1	6.3	-
7	291217	6133297	42.7	5.0	17.7	2.0	2.1	0.2	0.99	77.2	37.7	33.8	17.3	8.6	6.3	-
8	291306	6133288	50.9	4.5	20.0	1.8	2.3	0.2	0.85	85.4	37.2	36.1	17.1	8.8	6.3	-
9	291524	6133119	57.0	4.2	23.9	1.7	2.8	0.2	0.73	91.5	36.8	40.0	17.0	9.3	6.3	-
10	291507	6132929	69.2	6.4	28.5	2.7	3.3	0.3	1.32	103.7	39.1	44.6	18.0	9.8	6.4	-
11	289670	6132173	31.4	1.6	15.5	0.7	2.2	0.1	0.27	65.9	34.3	31.6	16.0	8.7	6.2	-
12	289648	6132190	29.5	1.6	14.7	0.7	2.1	0.1	0.26	64.0	34.2	30.8	16.0	8.6	6.2	-
13	289621	6132207	27.3	1.6	13.7	0.7	1.9	0.1	0.26	61.8	34.2	29.8	16.0	8.4	6.2	-
14	289707	6132312	34.9	2.1	15.7	0.9	2.3	0.1	0.33	69.4	34.7	31.8	16.2	8.8	6.2	-
15	289669	6132298	32.3	1.9	14.8	0.8	2.1	0.1	0.31	66.8	34.5	30.9	16.1	8.6	6.2	-
16	289613	6132277	27.8	1.6	13.0	0.7	1.9	0.1	0.27	62.3	34.3	29.1	16.0	8.4	6.2	-
17	289586	6132280	26.7	1.6	12.2	0.7	1.7	0.1	0.26	61.2	34.2	28.3	16.0	8.2	6.2	-
18	289501	6132304	24.6	1.4	11.3	0.6	1.5	0.1	0.24	59.1	34.0	27.4	15.9	8.0	6.2	-
19	289475	6132321	24.6	1.3	11.3	0.6	1.5	0.1	0.23	59.0	34.0	27.4	15.9	8.0	6.2	-
20	289417	6132359	24.1	1.3	11.1	0.5	1.5	0.1	0.22	58.6	33.9	27.2	15.8	8.0	6.2	-
21	289371	6132381	23.0	1.2	10.6	0.5	1.4	0.1	0.21	57.4	33.8	26.7	15.8	7.9	6.2	-
22	289668	6132624	21.8	2.3	8.4	0.9	1.4	0.1	0.35	56.2	34.9	24.5	16.2	7.9	6.2	-
23	289568	6132858	20.1	2.0	7.8	0.8	1.0	0.1	0.41	54.6	34.7	23.9	16.1	7.5	6.2	-
24	289669	6132971	15.9	2.3	6.4	0.9	1.0	0.1	0.52	50.4	35.0	22.5	16.2	7.5	6.2	-
25	289729	6133015	16.8	2.6	6.7	1.0	1.0	0.1	0.58	51.3	35.2	22.8	16.3	7.5	6.2	-
26	289737	6133224	14.5	2.4	5.6	0.9	0.7	0.1	0.56	49.0	35.0	21.7	16.2	7.2	6.2	-
27	290069	6132314	62.8	4.8	27.6	1.8	5.3	0.3	0.79	97.3	37.4	43.7	17.1	11.8	6.4	-
Criteria			**120**	**90**	**50**	**25**	**25**	**8**	**4**	**120**	**90**	**50**	**25**	**25**	**8**	**4**

Table B6 - Stage 2 - Detailed Results - Worst-case Throughput

No.	X	Y	Source Only ug/m3							Cumulative ug/m3						
			TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust	TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust
			24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$	24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$
1	289832	6133248	14.3	2.6	6.4	1.1	0.9	0.1	0.64	48.7	35.2	22.5	16.4	7.4	6.2	-
2	290147	6133267	25.3	4.2	11.1	1.7	1.3	0.2	1.13	59.7	36.9	27.2	17.0	7.8	6.3	-
3	290322	6133252	29.1	5.5	11.9	2.2	1.6	0.3	1.40	63.5	38.1	28.0	17.5	8.1	6.4	-
4	290664	6133289	41.3	5.5	18.9	2.1	2.5	0.3	0.90	75.8	38.2	35.0	17.4	9.0	6.4	-
5	290770	6133379	46.6	3.4	20.6	1.4	2.6	0.2	0.61	81.1	36.1	36.7	16.7	9.1	6.3	-
6	291086	6133441	53.3	2.5	23.0	1.1	2.8	0.1	0.39	87.8	35.1	39.1	16.4	9.3	6.2	-
7	291217	6133297	34.7	2.4	14.7	1.0	1.7	0.1	0.39	69.2	35.1	30.8	16.3	8.2	6.2	-
8	291306	6133288	39.0	2.1	16.7	0.9	2.0	0.1	0.32	73.5	34.7	32.8	16.2	8.5	6.2	-
9	291524	6133119	30.8	1.8	13.8	0.8	1.8	0.1	0.32	65.2	34.4	29.9	16.1	8.3	6.2	-
10	291507	6132929	29.6	2.3	14.9	1.0	1.8	0.1	0.47	64.1	34.9	31.0	16.3	8.3	6.2	-
11	289670	6132173	26.7	1.4	15.1	0.6	2.2	0.1	0.23	61.1	34.1	31.2	15.9	8.7	6.2	-
12	289648	6132190	25.5	1.4	14.6	0.6	2.1	0.1	0.23	60.0	34.0	30.7	15.9	8.6	6.2	-
13	289621	6132207	24.1	1.3	13.9	0.6	2.0	0.1	0.22	58.6	34.0	30.0	15.9	8.5	6.2	-
14	289707	6132312	29.1	1.9	16.7	0.8	2.5	0.1	0.30	63.6	34.5	32.8	16.1	9.0	6.2	-
15	289669	6132298	27.3	1.7	15.8	0.8	2.3	0.1	0.27	61.8	34.3	31.9	16.1	8.8	6.2	-
16	289613	6132277	23.7	1.5	13.9	0.7	2.0	0.1	0.24	58.2	34.1	30.0	16.0	8.5	6.2	-
17	289586	6132280	22.1	1.4	13.1	0.6	1.9	0.1	0.23	56.6	34.0	29.2	15.9	8.4	6.2	-
18	289501	6132304	18.7	1.2	10.9	0.6	1.5	0.1	0.20	53.2	33.9	27.0	15.9	8.0	6.2	-
19	289475	6132321	18.7	1.2	10.3	0.5	1.5	0.1	0.20	53.2	33.8	26.4	15.8	8.0	6.2	-
20	289417	6132359	18.6	1.1	9.7	0.5	1.4	0.1	0.19	53.1	33.8	25.8	15.8	7.9	6.2	-
21	289371	6132381	18.1	1.0	9.4	0.5	1.3	0.1	0.18	52.6	33.7	25.5	15.8	7.8	6.2	-
22	289668	6132624	19.5	2.2	8.7	0.9	1.5	0.1	0.33	54.0	34.8	24.8	16.2	8.0	6.2	-
23	289568	6132858	17.8	2.0	7.4	0.8	1.0	0.1	0.40	52.3	34.6	23.5	16.1	7.5	6.2	-
24	289669	6132971	14.9	2.3	6.7	1.0	1.0	0.1	0.52	49.4	34.9	22.8	16.3	7.5	6.2	-
25	289729	6133015	16.1	2.6	7.3	1.1	1.0	0.2	0.60	50.6	35.3	23.4	16.4	7.5	6.3	-
26	289737	6133224	12.8	2.3	5.8	1.0	0.8	0.1	0.55	47.3	34.9	21.9	16.3	7.3	6.2	-
27	290069	6132314	63.0	4.6	28.3	1.8	5.4	0.3	0.80	97.4	37.2	44.4	17.1	11.9	6.4	-
Criteria			**120**	**90**	**50**	**25**	**25**	**8**	**4**	**120**	**90**	**50**	**25**	**25**	**8**	**4**

Table B7 - Stage 3 - Detailed Results - Worst-case Throughput

No.	X	Y	Source Only ug/m3							Cumulative ug/m3						
			TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust	TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust
			24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$	24-hour	Annual	24-hour	Annual	24-hour	Annual	$g/m^2/month$
1	289832	6133248	11.0	1.8	5.1	0.8	0.8	0.1	0.45	45.5	34.4	21.2	16.1	7.3	6.2	-
2	290147	6133267	18.9	2.5	8.1	1.1	1.0	0.1	0.65	53.4	35.2	24.2	16.4	7.5	6.2	-
3	290322	6133252	20.3	2.9	8.8	1.3	1.4	0.2	0.68	54.7	35.6	24.9	16.6	7.9	6.3	-
4	290664	6133289	26.3	2.6	13.0	1.1	1.9	0.1	0.35	60.8	35.2	29.1	16.4	8.4	6.2	-
5	290770	6133379	27.6	1.8	14.0	0.8	2.0	0.1	0.28	62.1	34.5	30.1	16.1	8.5	6.2	-
6	291086	6133441	43.1	1.5	22.4	0.8	2.8	0.1	0.22	77.5	34.2	38.5	16.1	9.3	6.2	-
7	291217	6133297	29.5	1.7	14.9	0.8	1.8	0.1	0.29	64.0	34.3	31.0	16.1	8.3	6.2	-
8	291306	6133288	25.9	1.6	13.2	0.8	1.5	0.1	0.26	60.4	34.2	29.3	16.1	8.0	6.2	-
9	291524	6133119	24.2	1.4	12.1	0.7	1.6	0.1	0.21	58.7	34.0	28.2	16.0	8.1	6.2	-
10	291507	6132929	34.1	1.9	17.1	0.9	2.2	0.1	0.32	68.5	34.5	33.2	16.2	8.7	6.2	-
11	289670	6132173	19.0	1.3	10.9	0.6	1.8	0.1	0.20	53.4	33.9	27.0	15.9	8.3	6.2	-
12	289648	6132190	18.9	1.2	10.2	0.6	1.7	0.1	0.20	53.4	33.9	26.3	15.9	8.2	6.2	-
13	289621	6132207	18.8	1.2	9.4	0.6	1.5	0.1	0.20	53.3	33.8	25.5	15.9	8.0	6.2	-
14	289707	6132312	29.9	1.7	14.3	0.8	2.1	0.1	0.28	64.4	34.3	30.4	16.1	8.6	6.2	-
15	289669	6132298	26.5	1.5	12.8	0.7	1.9	0.1	0.25	61.0	34.2	28.9	16.0	8.4	6.2	-
16	289613	6132277	22.1	1.3	10.9	0.6	1.6	0.1	0.22	56.6	34.0	27.0	15.9	8.1	6.2	-
17	289586	6132280	21.0	1.2	10.4	0.6	1.5	0.1	0.21	55.5	33.9	26.5	15.9	8.0	6.2	-
18	289501	6132304	18.6	1.1	9.2	0.5	1.3	0.1	0.19	53.1	33.7	25.3	15.8	7.8	6.2	-
19	289475	6132321	18.3	1.0	9.1	0.5	1.3	0.1	0.19	52.8	33.7	25.2	15.8	7.8	6.2	-
20	289417	6132359	17.5	1.0	8.7	0.5	1.3	0.1	0.18	52.0	33.6	24.8	15.8	7.8	6.2	-
21	289371	6132381	16.7	0.9	8.3	0.4	1.2	0.1	0.18	51.2	33.6	24.4	15.7	7.7	6.2	-
22	289668	6132624	22.2	2.0	9.1	0.9	1.5	0.1	0.35	56.7	34.7	25.2	16.2	8.0	6.2	-
23	289568	6132858	15.2	1.8	6.5	0.8	1.0	0.1	0.42	49.6	34.4	22.6	16.1	7.5	6.2	-
24	289669	6132971	13.9	2.0	6.3	0.8	1.0	0.1	0.50	48.4	34.6	22.4	16.1	7.5	6.2	-
25	289729	6133015	14.2	2.1	6.4	0.9	1.0	0.1	0.55	48.7	34.8	22.5	16.2	7.5	6.2	-
26	289737	6133224	10.2	1.7	4.7	0.7	0.7	0.1	0.41	44.7	34.3	20.8	16.0	7.2	6.2	-
27	290069	6132314	57.7	4.4	26.3	1.8	5.3	0.3	0.73	92.2	37.1	42.4	17.1	11.8	6.4	-
Criteria			**120**	**90**	**50**	**25**	**25**	**8**	**4**	**120**	**90**	**50**	**25**	**25**	**8**	**4**

Table B8 - Stage 3A - Detailed Results - Worst-case Throughput

No.	X	Y	Source Only ug/m3							Cumulative ug/m3						
			TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust	TSP	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Dust
			24-hour	Annual	24-hour	Annual	24-hour	Annual	g/m^2/month	24-hour	Annual	24-hour	Annual	24-hour	Annual	g/m^2/month
1	289832	6133248	17.7	3.1	7.7	1.3	1.1	0.2	0.80	52.2	35.8	23.8	16.6	7.6	6.3	-
2	290147	6133267	31.2	4.7	13.4	1.9	1.6	0.2	1.15	65.7	37.3	29.5	17.2	8.1	6.3	-
3	290322	6133252	32.4	5.8	14.0	2.5	1.9	0.3	1.28	66.9	38.5	30.1	17.8	8.4	6.4	-
4	290664	6133289	58.3	6.3	27.5	2.8	3.4	0.3	1.02	92.8	39.0	43.6	18.1	9.9	6.4	-
5	290770	6133379	60.4	3.7	29.5	1.7	3.6	0.2	0.63	94.9	36.3	45.6	17.0	10.1	6.3	-
6	291086	6133441	48.9	2.4	22.7	1.2	2.7	0.1	0.37	83.4	35.1	38.8	16.5	9.2	6.2	-
7	291217	6133297	38.0	2.4	18.0	1.1	2.2	0.1	0.36	72.4	35.1	34.1	16.4	8.7	6.2	-
8	291306	6133288	39.1	2.1	18.3	1.0	2.2	0.1	0.29	73.6	34.7	34.4	16.3	8.7	6.2	-
9	291524	6133119	30.6	1.7	13.9	0.8	1.8	0.1	0.29	65.1	34.3	30.0	16.1	8.3	6.2	-
10	291507	6132929	25.0	2.1	12.9	1.0	1.6	0.1	0.43	59.5	34.8	29.0	16.3	8.1	6.2	-
11	289670	6132173	33.9	1.7	17.5	0.8	2.5	0.1	0.30	68.4	34.4	33.6	16.1	9.0	6.2	-
12	289648	6132190	32.9	1.7	17.0	0.8	2.4	0.1	0.29	67.3	34.4	33.1	16.1	8.9	6.2	-
13	289621	6132207	31.5	1.7	16.4	0.7	2.3	0.1	0.28	66.0	34.3	32.5	16.0	8.8	6.2	-
14	289707	6132312	41.8	2.4	20.9	1.0	3.0	0.1	0.40	76.2	35.1	37.0	16.3	9.5	6.2	-
15	289669	6132298	38.1	2.2	19.3	0.9	2.7	0.1	0.36	72.6	34.8	35.4	16.2	9.2	6.2	-
16	289613	6132277	32.9	1.9	16.9	0.8	2.4	0.1	0.31	67.3	34.5	33.0	16.1	8.9	6.2	-
17	289586	6132280	30.9	1.8	16.0	0.8	2.2	0.1	0.30	65.4	34.4	32.1	16.1	8.7	6.2	-
18	289501	6132304	25.7	1.6	13.5	0.7	1.8	0.1	0.26	60.2	34.2	29.6	16.0	8.3	6.2	-
19	289475	6132321	24.6	1.5	12.9	0.7	1.7	0.1	0.26	59.1	34.2	29.0	16.0	8.2	6.2	-
20	289417	6132359	24.6	1.4	11.7	0.6	1.6	0.1	0.25	59.1	34.1	27.8	15.9	8.1	6.2	-
21	289371	6132381	24.1	1.4	11.4	0.6	1.6	0.1	0.24	58.6	34.0	27.5	15.9	8.1	6.2	-
22	289668	6132624	25.8	2.9	11.1	1.2	1.7	0.2	0.45	60.3	35.5	27.2	16.5	8.2	6.3	-
23	289568	6132858	22.6	2.7	9.0	1.1	1.2	0.2	0.56	57.1	35.3	25.1	16.4	7.7	6.3	-
24	289669	6132971	19.6	3.2	8.3	1.3	1.2	0.2	0.75	54.1	35.8	24.4	16.6	7.7	6.3	-
25	289729	6133015	21.9	3.7	9.2	1.5	1.2	0.2	0.89	56.4	36.4	25.3	16.8	7.7	6.3	-
26	289737	6133224	16.2	2.8	6.9	1.1	0.9	0.2	0.69	50.7	35.5	23.0	16.4	7.4	6.3	-
27	290069	6132314	70.1	5.5	31.0	2.1	5.7	0.4	1.01	104.6	38.1	47.1	17.4	12.2	6.5	-
Criteria			120	90	50	25	25	8	4	120	90	50	25	25	8	4

Appendix C – Concentration Plots (Base Scenario)

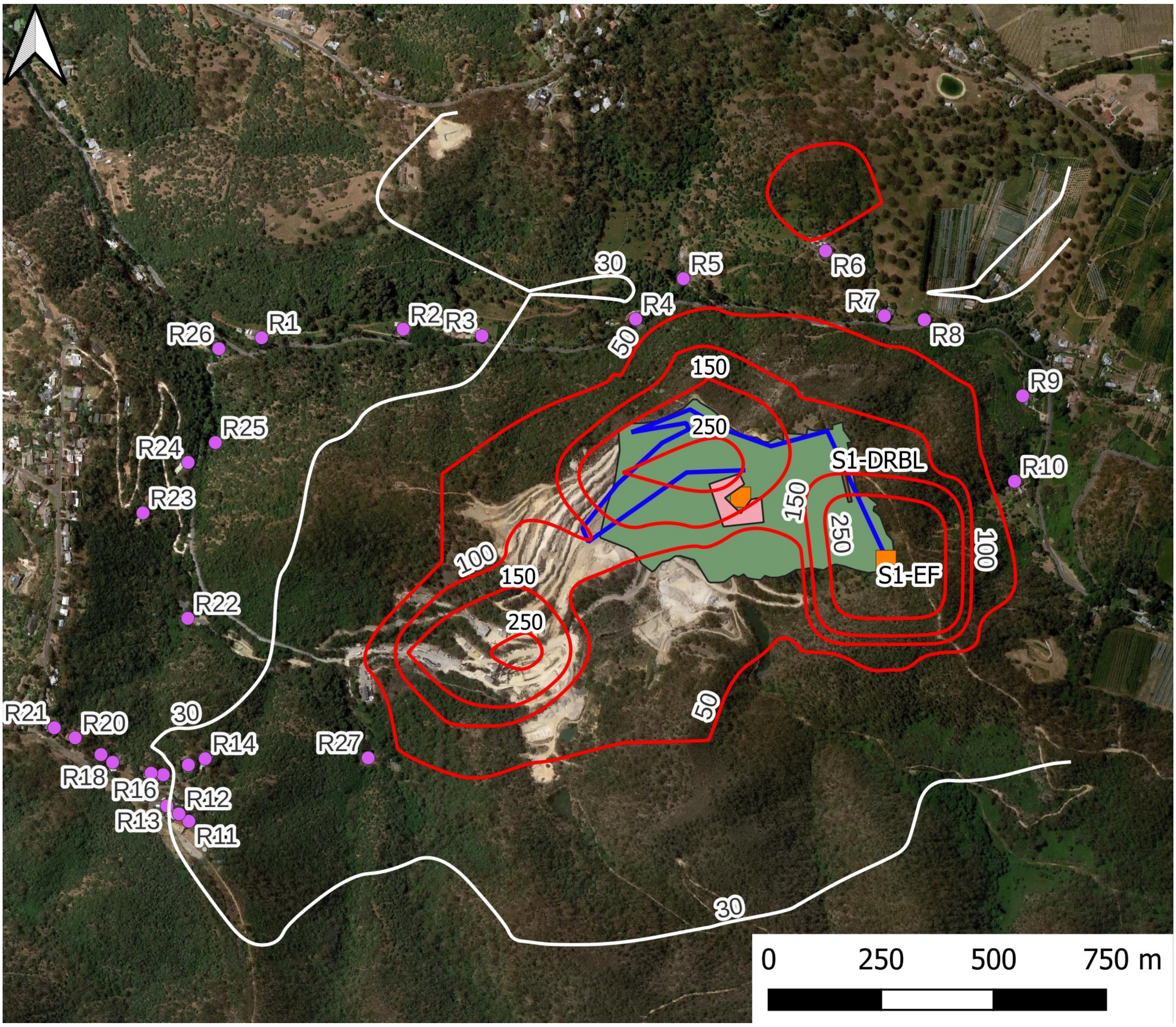


Figure C1: Stage 1 – Worst-case Daily Throughput - Predicted Ground Level PM_{10} 24-hour Concentrations (Cumulative)

Stage 3A	**Pollutant:** PM_{10}
Scenario: Worst-case daily throughput	**Averaging Time:** 24-hour
	Units: µg/m^3
	Criteria: 50

Appendix D – Proposed Development Plans

Attachment 8

White Rock Quarry Dust Management Plan

ENVIRONMENT PROTECTION AUTHORITY

THIS IS THE APPROVED Dust Management Plan

REFERRED TO IN CONDITION S-264

OF EPA AUTHORISATION NUMBER 12714

DELEGATE Justin Richardson Digitally signed by Justin Richardson Date: 2022.12.14 07:52:55 +10'30' DATE

Hanson
HEIDELBERGCEMENTGroup

Dust Management Plan

White Rock Quarry

DOCUMENT & REVISION NUMBER	Dust Management Plan v.3		
MODIFIED BY	Environmental Compliance & Planning Officer	**DATE:**	October 2022
APPROVED BY	Quarry Manager	**DATE:**	December 2022
TITLE OF APPROVER	Operations Manager		

Contents

1. Introduction

This Dust Management Plan (DMP) has been developed in order to manage dust related impacts associated with the operations at White Rock Quarry, Private Mine (PM) 188. The DMP applies to all quarry works by Hanson and its subcontractors.

1.1 Location

Hanson's White Rock Quarry is located in the Adelaide Hills face zone 10km east of Adelaide. The location of PM 188 in relation to the surrounding area is shown on figure 1 below. The formal address is 98 Horsnells Gully Rd, Horsnells Gully SA 5141. The areas surrounding the operation of the quarry are steep valleys with vertical to near vertical quartzite outcrops. The vegetation of the area is of similar to that within the Mt Lofty region. Topsoil is minimal due to the steep terrain of the area.

Figure 1. Site location

1.2 Purpose and scope

The purpose of this DMP is to formally identify and assesses potential emissions and risks from site operations to the surrounding environment, existing and future neighbours. Similarly, this DMP states management actions to be implemented to minimise dust emissions and reduce the risks.

Additionally, under the Environmental Authorisation - EPA 12714, Hanson is required to:

- ✓ Ensure that surfaces at the Premises, including traffic and storage areas, are suitably prepared and maintained in a way that minimises dust emissions (67 - 1084)
- ✓ Take all reasonable and practicable measures to prevent dust from leaving the Premises (S - 264)
- ✓ Develop a Dust Management Plan to the satisfaction of the EPA (S - 264)
- ✓ Implement the Dust Management Plan approved in writing by the EPA (S - 264)

1.3 Interface with other Plans

This plan will form an integral part of the overall Hanson White Rock Management System. The Dust Management Plan interfaces with a range of other management plans as shown in the list below.

- Mine Operation Plan
- Traffic Management Plan
- Emergency Response Plan

1.4 Legislative Context

- South Australian Environment Protection (Air Quality) Policy 2016
- South Australian Environment Protection Act 1993
- South Australian Mining Act 1971

2. Background

2.1 History

The Site has been in operation since at least 1946 and has supplied competent construction materials to the greater Adelaide area over the past 70 years. The Ferraro family operated the quarry in the early years and the land was proclaimed as a PM on 4 October 1973. The Pioneer Group of Companies procured the land and PM in approximately 1991. Hanson later procured the land and the PM in 2007. The nature of the deposit is good hard quartzite, and the Site is regarded as a long-term prospect to supply high quality construction materials to the greater metropolitan area.

2.2 Overview of Operations

The White Rock Quarry produces aggregate for Adelaide building and construction industries. The quarry currently produces around 300,000 tonnes per annum of quartzite sandstone aggregate. This production rate fluctuates annually based primarily on market demand for the product. Hanson have decommissioned the existing crushing plant on site at White Rock Quarry and are utilising a mobile crushing plant in pit. In pit crushing, in addition to dust suppression techniques used on the mobile crusher, have had a positive impact, and have reduced dust emissions from the site.
In consultation with stakeholders, Hanson have extended the period of the air quality monitoring campaign with results recorded to this point below the criteria included in the Environment Protection (Air Quality) Policy 2016.

2.3 Meteorology

Climate data has been sourced from the Mount Lofty Bureau of Meteorology (BoM) (Station No. 023842), located approximately 5.9 km to the south of the Site. Climate throughout the Mount Lofty Ranges consists of a Mediterranean pattern with hot, dry summers and moderately wet winters. The Mount Lofty Ranges are subject to orographic rain, correlating to the topography of the ranges, resulting in higher rainfall averages when compared with the Adelaide Plains. Most rain falls between May and September and the driest month is January. The annual mean rainfall is approximately 989.3 millimetres (mm) (BoM, 2020).

Table 1. Meteorological Data sourced from BoM Mount Lofty (station No. 023842).

Month	Mean temp (°C)		Mean monthly rainfall (mm)	Highest rainfall (mm)	Lowest rainfall (mm)	Wind speed (km/h)		Wind direction	
	Max	Min				9:00 AM	3:00 PM	9:00 AM	3:00 PM
January	22.5	12.4	36.5	79.6	0	19.1	18.1	E	W
February	22.5	12.9	39.5	107.4	1.6	19.2	18	E	W
March	19.6	11.2	40.4	142.4	0.6	18.6	16.8	E	W
April	16.2	9.9	63.4	128.6	8.6	20	18	E/NW	W
May	12.3	7.7	109.6	201.8	0	22.1	19.9	NW	W/NW
June	9.4	5.6	129.6	176	22.4	26.5	23.7	NW	W/NW
July	8.9	5	153.5	233.6	42.8	26.2	24.3	NW	W/NW
August	10	5.2	137	232.4	36	27.1	25.5	NW/W	W/NW
September	12.3	6.1	111.1	312.2	31.4	26.7	25.7	NW/W	W
October	15.2	7.5	58.7	174.2	12	23.7	22.9	W	W
November	17.8	9.2	40.9	82.8	1	20.7	19.5	E	W
December	20.1	10.8	52.7	133.6	15.6	20	19.4	E	W
Annual	15.6	8.6	989.3	1570.4	789.4	22.5	21	E/W/NW	W

The area is dominated by westerly and easterly winds. North easterly and south westerly winds are minimal. Wind speed is similar during morning and afternoon. Highest wind speed occurs in winter/spring and the lowest in summer/autumn. At 9 am the wind direction is primarily from east in spring/summer and north-west and west in autumn/winter. At 3 pm the wind tends to blow from west through the year. Mean 9 am and 3 pm wind direction and speed from 1991 to 2008. Temperature ranges from 5°C (July) to 22°C (January), mean maximum and minimum temperatures for years 1991 to 2020.

3 Site activities

The White Rock Quarry produces aggregate for Adelaide building and construction industries. The usual operational hours are Monday to Friday from 5.30am to 6.00pm and Saturdays from 6.30am to 12.00 pm or as required. Operations outside these times like maintenance or special events may occur as required. Concrete trucks may operate 24 hours per day, 7 days per week as required.

The current quarrying method is the use of traditional Open Cut Quarrying methodology. Dust may be generated by quarrying activities such as extraction of materials (drilling, blasting, crushing and screening; including at start-up and shut-down), vehicle movements on unsealed surfaces (loading and unloading), and wind erosion by strong winds over unsealed surfaces/stockpiles. The potential for dust generation increases over the summer months as dry soil is less cohesive.

Hanson implement a number of dust suppression controls (see table 7), such as application of water to dust prone surfaces and processing plant to prevent dust from becoming airborne. The effectiveness of dust suppression is monitored monthly by two permanent static dust sampling stations at the site boundary. As expected, dust levels drop significantly in the wetter months.

Further detail on the description of site activities can be found in the Mining Operations Plan (MOP).

Table 2. Heavy Mobile Equipment Listing

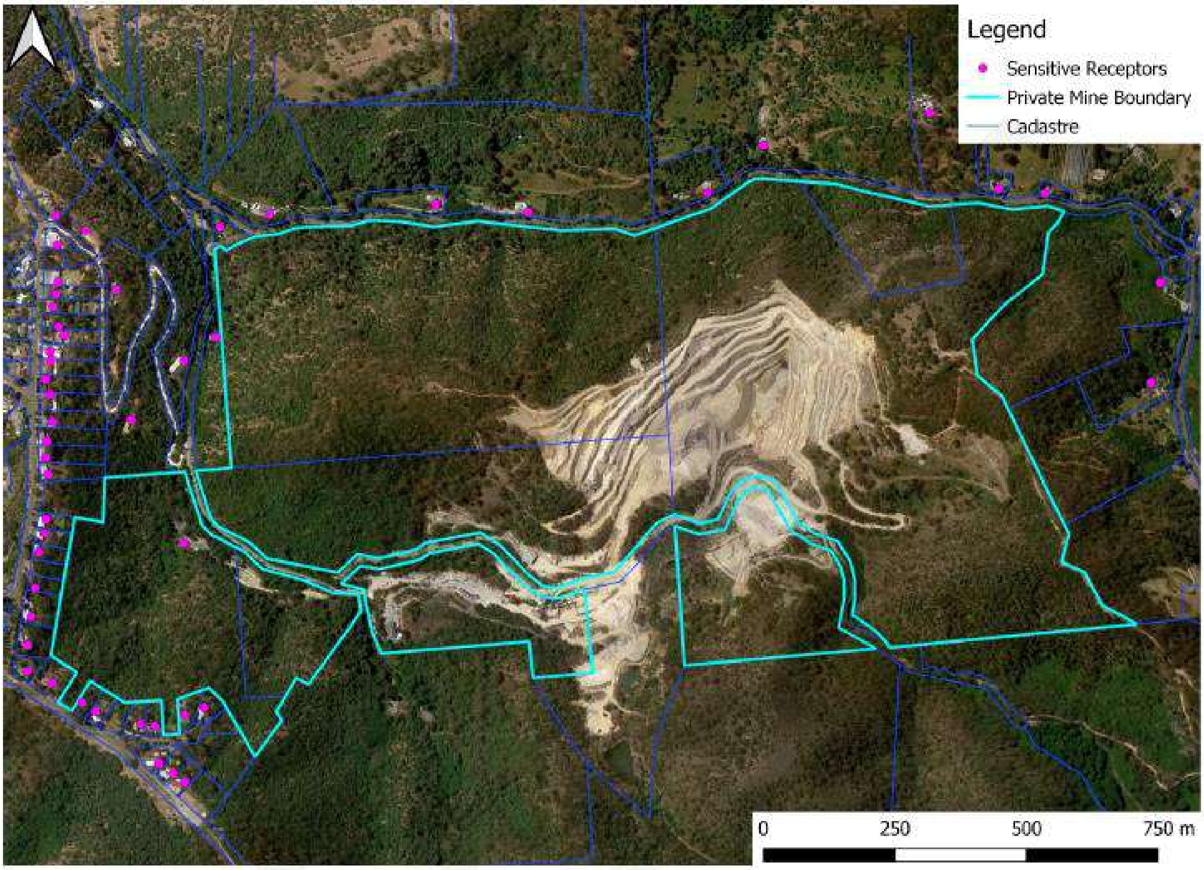
Equipment	Quantity
Blast Hole Rig	1
Excavator	2
FEL	3
Haul Truck	4
Water Cart	1

4 Nearby Receivers

The nearest sensitive receptors include rural residential dwellings located to the north and north-east at the Norton Summit township. Residential dwellings are also located in close proximity at Skye, to the south-west and west, as follows:

- 240 m from the northern boundary of the disturbed area (pit limits) to the rural residential dwellings to the north.
- 430 m from the eastern boundary of the disturbed area (pit limits) to the rural residential dwellings to the north east, Norton Summit.
- 900 m from the western boundary of the disturbed area (pit limits) to residential dwellings to the west, Skye.

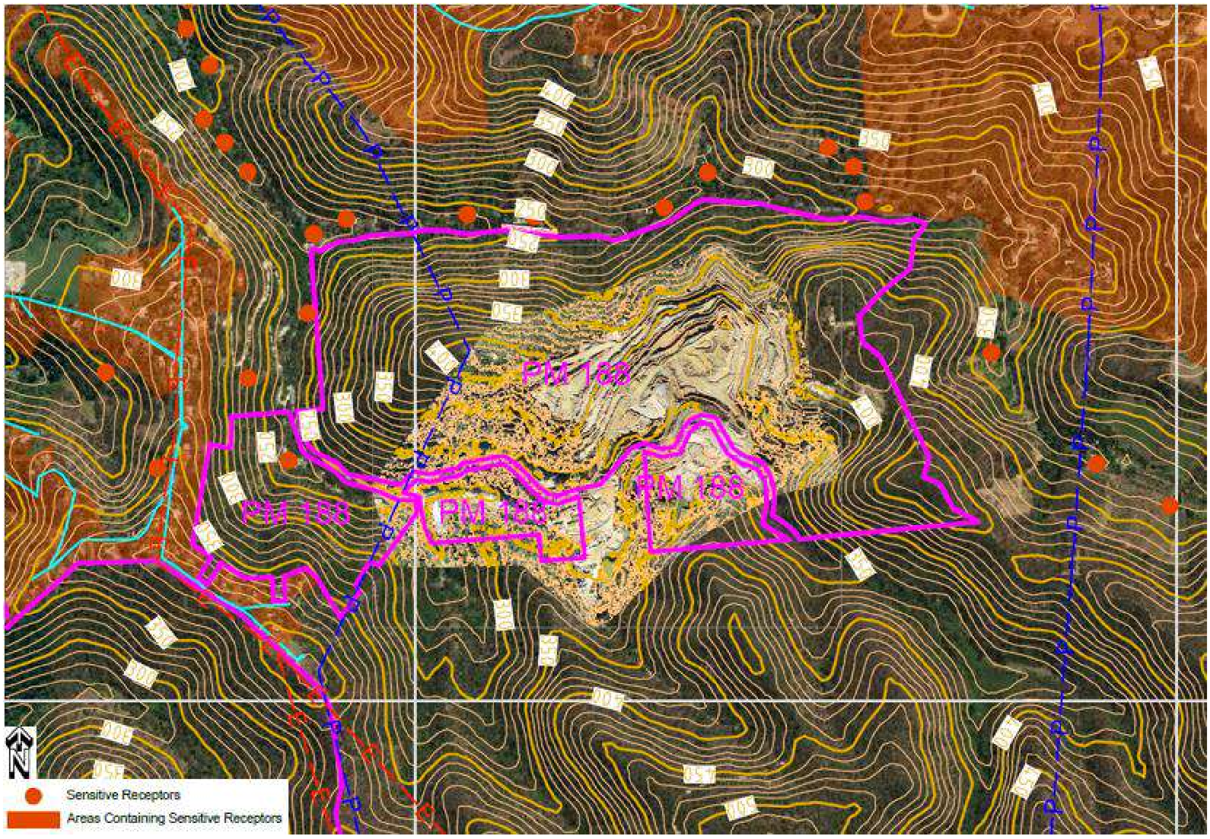
Figure 2. presents an aerial photo identifying the site location and surrounding land uses.



4.1 Topography

The site is located on the western face of the Adelaide Hills. The Adelaide Hills region is defined by significant variation in topography within the Western Mount Lofty Ranges. A number of valleys exist in the area associated with creeks and gullies. The ground height of the development site is in the range of 215 to 461 metres above sea level. Figure 3 presents ground contours of the site and surrounding area.

Figure 3. Site Topography



5 Environmental Risk Assessment

The environmental risk assessment identifies the preliminary risk level of the identified aspect without taking into consideration any design, controls and management strategies used by Hanson to mitigate the associated risks.

The assessment was performed in accordance with leading practice, and considering all operational stages (e.g. start-up, traffic movement, shut down, etc). Identification of potential impacts is based on current activities, similar industrial operations, and key concerns from stakeholders.

The environmental risk assessment has considered the avoidance, mitigation and management strategies that are technically and economically feasible. The assessment involved the residual risk evaluation associated to each potential impact identified, which may remain following the implementation of environmental management strategies at the Site.

Hanson is committed to minimise negative environmental impact, adopting best practice quarrying and environmental management approaches.

The preliminary risk level and the residual risk evaluation have adopted a qualitative risk-based approach, designed to assess risk, based on:

- the likelihood / probability of the impact or event occurring over the time (Table 3)
- the consequences/severity outcomes of the impact or event occurring (Table 4)
- the risk based on the combination of the likelihood and consequence of the impact or event occurring (Table 5)

Table 3. Definitions of likelihood

Description	Definitions
Rare	May occur only in exceptional circumstances
Unlikely	Could occur but doubtful
Possible	Might occur at some time in the future
Likely	Will probably occur
Almost Certain	Is expected to occur in most circumstances

Table 4. Definitions of consequence

Consequence Description	Definition of Significant Environmental Risk		
	Environmental	**Legislative**	**Social**
Negligible	- The event does not breach site boundaries nor causes nuisance to the public. - The environment impact is minimal, controlling the event take 30 minutes or less.	- There have been no breaches of limits prescribed by operating conditions	- No complaints
Minor	- The event has potentially breached site boundaries but does not cause nuisance to the public - The environment impact is minor and easily rectifiable without escalating severity. Controlling the event takes more than 30 minutes but less than 1 hour	- A single breach of prescribed operating conditions - Issue of caution and/or show cause Notice from administering authority	- Any community complaint directly received from the public regarding the site operations.
Moderate	- The event has breached site boundaries with potential to cause nuisance to the public - The environment impact of the event is significant but rectifiable, controlling the event without escalating severity, taking more than 1 but less than 6 hours	- Multiple breaches of prescribed operating conditions - Issue of writing warning from administering authority	- Any community complaint directly received from the public associated with an existing incident or event - Any community complaint directed to administering authorities and relayed to the business
Major	- The event has breached site boundaries and cause reportable nuisance to the public - Long-term consequences	- Multiple breaches of prescribed operating conditions - Issue of penalty Infringement Notice from administering authority	- Multiple community complaints with potential to cause negative and damage media coverage
Catastrophic	- Any event resulting in catastrophic impact to the environment, where damage is irreversible and/or controls would be of a magnitude that may impact on company profitability and reputation - The event has breached site boundaries and caused overwhelming nuisance to the public	- Multiple breaches of prescribed operating conditions with orders from administering authority to rectify issues immediately - Issue of authority order (e.g. Environmental protection order) - Prosecution by administering authorities - Order to stop operations	- Multiple sustained community complaints directed to administering authorities and relayed to the business, with significant negative and damaging media coverage

Note: It is noted the regulatory approach undertaken by the EPA may not reflect the consequence description outlined in the above table.

Table 5 below illustrates the final risk level assigned, determined by the product of the likelihood and consequence scores, which equals the magnitude of the impacts. The higher the risk score, the higher the priority is for management.

Table 5. Risk Assessment Matrix

		Consequence				
		Negligible 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Likelihood	Almost Certain 5	Medium 5	High 10	High 15	Extreme 20	Extreme 25
	Likely 4	Low 4	Medium 8	High 12	High 16	Extreme 20
	Possible 3	Low 3	Medium 6	Medium 9	High 12	High 15
	Unlikely 2	Low 2	Low 4	Medium 6	Medium 8	High 10
	Rare 1	Low 1	Low 2	Low 3	Low 4	Medium 5

5.1 Controls and residual risk level assessment

When a risk has been identified and assessed, controls need to be developed to reduce the risk to an acceptable level. Hanson must always take into consideration the Hierarchy of Controls to ensure that the most effective controls possible are implemented.

When determining the right controls to manage the risks (impacts to nearby receptors), the following must be considered:

Table 6. Hierarchy of Controls

Hierarchy of Controls	
Eliminate	Remove the risk activity/equipment/work practice from the site
Substitute	Replace the risk activity/equipment/work practice with a less impacting one
Isolate	Separate risk activity/equipment/work practice from people involved in the work or people in the surrounding areas
Engineering controls	Modify tools or equipment, automating processes, providing guarding to machinery or equipment or any other engineering measure to reduce or removed the risk
Administrative	Document work practices that reduce the risk, training the appropriate people in all aspects of these documents
PPE	Equipment or clothing to provide protection

The Hierarchy of Controls is a preferred order of control measures which range from the most effective control method being elimination of the risk, to the least preference control methods being the administration/procedural controls and physical barrier.

5.2 Dust types

Dust is a common air pollutant generated by many different sources and activities. Dust/airborne particles vary in size from visible to invisible (e.g. motor vehicle engines, bushfires and solid fuel heaters, etc., produce smaller particles than mechanical process such as earthworks, construction activities, rock crushing and wind erosion). Particles are captured during air monitoring, and classified by size as:

- Deposited dust particles – for assessment of dust nuisance. Amenity degradation effects are mainly associated with larger suspended particles and dust settling out under gravity.
- Total Suspended Particulates (TSP): particles generally up to 100 micrometres in diameter, used for assessment against predominantly nuisance-based criteria.
- PM_{10}: particles less than 10 µm in diameter, used for assessment against health-based criteria. PM_{10} particles are small enough to be inhaled into the lower respiratory tract. PM_{10} may be generated by both combustion and mechanical processes.
- $PM_{2.5}$: particles less than 2.5 µm in diameter, used for assessment against health-based criteria. $PM_{2.5}$ particles are understood to be the primary size fraction of concern with regard to adverse human health effects and are most correlated with negative health outcomes. $PM_{2.5}$ particles are primarily formed by combustion processes. However, emissions from mechanical processes can contain some $PM_{2.5}$
- Respirable Crystalline Silica (RCS): Crystalline Silica in the form of quartz, is one of the most common materials found in the earth's crust (e.g., sand, gravel, rocks, etc.). Silica can be a component of very small airborne particles, and it is that common that it can be found in the air at low levels nearly everywhere. Previous case studies have demonstrated that ambient respirable crystalline silica (RCS) referring to Silica levels in the air associated to mines operations were found lower than the contribution from farming and dirt roads (WISA 2013. P.2).[1] It is unlikely that levels of RCS in airborne dust emitted from the site would be sufficiently high and sustained so as to be of concern to the wider public (Stacey et al. 2018. P.56).[2]

Note: Silicosis, an occupational disease related to irreversible damage to the lungs, is caused by prolonged exposure to high levels of crystalline silica in the respirable size fraction (less than 4 µm in size and small enough to penetrate deep into the lung).

5.3 Potential dust sources/emissions to be managed

The following quarrying activities have been identified as requiring management to ensure dust sources/ emissions from the site do not affect the amenity of nearby dust-sensitive premises:

- **physical disturbance of the land** surface during clearing, topsoil, and overburden removal
- **drilling and blasting** of rock to establish the quarry face and enable extraction of rock
- **vehicle movement** on unsealed roads and movement of heavy vehicles with uncovered loads including Load and Haul of extracted materials (Heavy Mobile Equipment (HME) & Light Vehicles (LV))
- **crushing and screening** to grade aggregate, conveyors, and transfer points
- **batching** loading concrete production
- **material handling** including raw materials extracted at the quarry face, loading and hauling, aggregate loading, weight hopper loading, sales truck loading and deliveries
- **wind erosion** of dry exposed surfaces such as open pit areas, stockpiles, and unsealed roads
- the **movement of trucks** offsite Product trucks between stockpiles and site exit/entry; and concrete trucks between concrete batching plant and site exit/entry.

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[1] Wisconsin Industrial Sand Association, Crystalline Silica, May 2013, https://wisconsinsand.org/wp-content/uploads/sites/77/2013/05/Crystalline-Silica-Final-May-2013.pdf

[2] Peter Stacey, Andrew Thorpe, Paul Roberts, Owen Butler, Determination of respirable-sized crystalline silica in different ambient environments in the United Kingdom with a mobile high flow rate sampler utilising porous foams to achieve the required particle size selection, Atmospheric Environment, Volume 182, 2018, Pages 51-57, Determination of respirable-sized crystalline silica in different ambient environments in the United Kingdom with a mobile high flow rate sampler utilising porous foams to achieve the required particle size selection - ScienceDirect

External dust sources that have potential to contribute to the site dust concentration monitoring include local industrial activities (neighbouring quarries), local unsealed roads, local traffic, planned burn off activities, bush fires, and dust storms.

5.4 Controls and residual risk level

Table 7 outlines practicable controls identified, using the hierarchy of controls, for each of the dust sources (site activities) and the assessment of the residual risk level. All employees have the responsibility to take action, report, manage and follow up dust emission that potentially can leave the site. Table 7 also includes person responsible to ensure controls and dust management strategies are in place:

- Operations Manager (OM)
- Quarry Manager (QM)
- Quarry Supervisor (QS)
- Employee (E) (e.g. Weighbridge operator, HME operator, truck drivers, contractors, concrete manager (CM), concrete supervisor (CS), etc.)

The site has a topographic barrier that minimise dust offsite. Preventative measures include daily check and assessment of meteorological forecast, and water suppression before dust become airborne. Suppression is the application of water to restrict the airborne dissemination of fine particles, capturing airborne dust particles and bringing them to the ground.

Table 7. Residual risk after hierarchy of controls.

Activity	Impact/Risk	Consequence	Likelihood	Risk Rating	Control (Engineering/Procedural)	Consequence	Likelihood	Risk Rating
Physical disturbance of the land	Physical disturbance of the land (e.g. clearing, rehabilitation, overburden movement, etc.) that can generate dust leaving site	3	4	H	• Vegetation will be cleared, and topsoil stripped in months and conditions, which minimize the potential for dust generation (QM, QS) • Short tipping to limit dust during deposition and facilitate faster rehabilitation (QM, E) • Water truck is used to wet down operational areas (QM, QS) • Weather conditions checked and assessed prior to operation to inform control measures to minimise dust generation (QM, QS, E) • No stripping topsoil during periods of high winds (QM) • Vegetation clearance or disturbance will be kept to minimum (QM) • All vegetation will be taken out in the path of workings as approved in the Development Program (QM) • Vegetative material and topsoil will be stored for re-use in rehabilitation programs (QM) • The quarry will comply with good environmental management practices and comply with Mine Development Planning and with relevant legislation (QM) • Any unnecessary excursions from established roads will be avoided (QM) • Weeds and plant pathogens control program will be implemented (QM)	2	2	L
Drilling and blasting	Short term drilling causing localised dust, potentially leaving the site	3	4	H	• All relevant personnel trained and inducted, competent knowledge of their roles and responsibilities (QM) • Controls and dust management measures to be implemented in accordance with the TARP (E) • Weather conditions (wind speed and direction) checked and assessed prior to operation (QM, QS) • Drilling is undertaking by trained personnel in accordance with the TARP (QM. QS, E) • Drills are fitted with dust control equipment (QM)	2	2	L
	Blasting causing dust leaving the site (TSP, PM10)	3	4	H	• Blasting is undertaking by trained personnel in accordance with Australian Standards AS2187.2-2006 (E) • Blasting activities will preferentially occur during weekdays, and never on Sundays (QM) • Blast in favourable weather conditions in accordance with the TARP (QM) • Water truck is used to wet down surface after blasting during level 2 TARP conditions (QM) • Community notifications issued when blasting if dust is likely to be visible and if requested by nearest neighbours (QM, QS) • No blasting activity to occur when conditions are at TARP Level 3 (wind over 50km/hr) (QM, QS)	3	2	M
	Off-site health impacts from blasting	4	3	H	• Drilling and blasting will occur in favourable weather conditions in accordance with the TARP (QM) • Used water truck to wet down surface after blasting in level 2 TARP conditions (QM)	2	2	L

	Dust leaving the site that could cause public concern/compliant	5	4	E	• Public complaints relating to dust shall be recorded In the Environmental Complaint Register (create an Integrated Risk Information System (IRIS) report) and investigated (QM) • Blasting activities will preferentially occur during weekdays, and never on Sundays (QM) • Weather conditions checked and assessed prior to drilling and blasting to inform control measures to minimise dust generation (QM, QS, E) • Blasting is undertaking by trained personnel in accordance with Australian Standards AS2187.2-2006 (E) • Water truck is used to wet down surface after blasting during level 2 TARP conditions (QM) • Community notifications issued when blasting if dust is likely to be visible and if requested by nearest neighbours (QM, QS)	3	3	M
Vehicle movement (HME, trucks & LV)	Excavators, front end loaders and haul trucks movements potentially creating dust that can leave site	3	4	H	• All personnel shall observe onsite vehicle speed limits to reduce dust lift-off from unsealed roads (QM) • Restricting vehicle and mobile machinery movements to designated routes and enforcing on-site maximum speed limits of 40 km/hr in haul roads, 25 km/hr in sales area and concrete area, 15 km/hr in quarry entry/exit, weighbridge, passing stationary vehicles, workshops, near pedestrians passing/crossing (QM, QS) • Daily visual assessment of road surface conditions to minimise dust emissions. Re-route vehicles from problem area/change work area to the most favourable depending on weather conditions (QM) • Wetting down of haul roads and operational areas by water truck where fixed sprays cannot be implemented (QM, QS) • Water truck to wet down operational areas prior to plant start-up during level 1 TARP conditions (QM, QS) • Use a FEL or grader for surface roads maintenance and clearing excess material as required (QM, QS) • Implementation of dust management controls in accordance with the TARP (QM) • Haul trucks operators to monitor road conditions and instruct water truck operator to wet down roads as dust becomes visible (E)	2	2	L
	Movement of company and customers trucks, including concrete trucks, potentially creating dust around entry/exit site that can cause nuisance impact	3	4	H	• Weighbridge operator/concrete supervisor to monitor road conditions and instruct water truck operator to wet down roads as dust becomes visible (E) • Implementation of dust management controls in accordance with the TARP (QM) • Restricting vehicle to designated routes and enforcing on-site speed limits 15 km/hr in entry/exit, speed humps implemented (QM, QS, E) • The access road, entrance and cross-over at Horsnells Gully Road cleaned by street sweeper as required (QM) • Tailgate secured and tarping of loads. All loads must be cover and secured (QM, QS, E) • Spillage from side trails, tail gates and drawbars are cleared (E)	3	3	M

Crushing and screening (Fixed and/or mobile plant)	Dust leaving site from crushing and screening, including mobile equipment	3	4	H	• Sprinklers used in operational areas (e.g. crusher: conveyor, transfer points) (QM, QS, E) • Sprays are used before plant is started to minimise dust before crushing commences (QM, QS, E) • Enclose screens, conveyor entry and exit points where practicable (QM, QS) • Water sprays used at the outputs of conveyors and transfer points (QM, QS) • Adjust the rate of crushing to respond to the meteorological conditions (TARP) (QM, QS) • Material to be conveyed is wetted if dust is visible (QM, QS) • Fines collected under the plant and conveyors will be removed by personnel with appropriate equipment (QM, QS) • Wetting down of haul roads and operational areas by water truck where fixed sprays cannot be implemented (QM, QS, E) • Water truck to wet down operational areas prior to plant start-up during level 1 TARP conditions (QM, QS, E) • Continually monitor and assess effectiveness of dust suppression systems, controls and strategies, during crushing and screening (QM, QS, E)	2	2	L
Concrete batching plant	Dust leaving site from batching plant operations	3	4	H	• Silos filter systems to be maintained (CM, CS) • Silo savers to be regularly checked (CM, CS) • High level alarm sensors to be checked regularly (CM, CS) • High level alarms must be tested before every bulk delivery (CM, CS) • Fill pipes must be locked when not in used (CM, CS) • Washing down traffic areas as required to avoid the accumulation of dust (E) • Stockpiles to be maintained below the level of the walls (CM, CS) • Sprays to be used when loading agitators on the three-sided, roofed enclosure (CM, CS) • Sweeper used as required by quarry management (QM)	2	2	L

Material handling	Dust leaving site while handling materials: loading and unloading (Trucks: HME & Sales trucks)	3	4	H	• Trucks will not be overloaded (E) • Tipping of finer aggregates to occur slowly and in stages (E) • Height of truck loading activity is considered (bucket height above truck tray - FEL and excavator) to minimise dust emissions (E) • Water truck to wet down operational areas during level 1 TARP conditions (QM, QS, E) • Speed limit reductions to minimise dust generation or even stop operation in accordance with the TARP (QM) • Restricting vehicle and mobile machinery movements to designated routes and enforcing on-site maximum speed limits of 40 km / h (QM) • Weather conditions checked and assessed prior to operation to inform control measures to minimise dust generation (QM, QS, E) • Excavators will preferentially work shielded from prevailing winds (QM) • Loader operator to monitor loading conditions and call on water truck to wet down area if visual dusty conditions observed (E) • All personnel shall observe onsite vehicle speed limits to reduce dust lift-off from unsealed roads (E) • Speed limit reductions to minimize dust generation or even stop operation as per TARP trigger level (QM) • Change loading/unloading HME operations or/and cease operation activities at TARP trigger level 3 (QM, QS, E) • Temporary halting of activities and resuming as per TARP trigger level (QM)	2	2	L
Wind erosion	Dust leaving site from dry exposed surfaces such as open pit areas, stockpiles, and unsealed roads	3	4	H	• Minimise stockpile heights (QM, QS, E) • Implement the actions associated with the TARP (QM) • Water truck to wet down disturbed areas during operational hours at level 2 TARP conditions (QM, QS, E)	2	3	M

6 Monitoring methods and response

6.1 Deposited dust monitoring

The dust deposition gauges collect the amount of dust that settles out of the air over time. The dust deposition gauges (comprising a funnel and a collection bottle) catch dust settling on the internal surface area of a funnel over one-month sampling periods. Following the collection of each sample, the dust is washed from the bottle and then filtered, dried, and weighed. Results from dust deposition sampling are expressed as the weight of dust collected per unit of surface area per day, averaged over a standardised 30-day sampling period (e.g. g/m2/day averaged over a 30-day period).
Deposited dust samples are further characterised as insoluble solids (the fraction of total particles deposited which are not water-soluble), ash (the part of the insoluble dust fraction which remains after heating the sample to a temperature of 850 degrees Celsius for 30 minutes) and combustible matter (the part of the insoluble dust fraction which is lost on heating). Insoluble solids are the particles typically responsible for nuisance impacts. Deposited dust is collected and analysed in accordance with the *Australian/New Zealand Standard AS/NZS 3580.10.1:2016 Method 10.1: Determination of particulate matter—Deposited Matter—Gravimetric method*. Deposited dust sampling is carried out by Hanson staff, and the analysis of the collected deposited dust samples is performed by the NATA-accredited Laboratory.

6.2 Continuous PM10 Monitoring

Hanson have been undertaking a continuous air quality monitoring campaign to measure ambient PM10. Hanson committed to an initial six (6) month program of air quality monitoring to inform the risk profile of the Site. Two formal reports demonstrating compliance with the relevant nuisance and health criteria were submitted to the Department of Energy and Mining (DEM) and the South Australia Environmental Protection Authority (EPA). In September 2022, Hanson have extended the air quality monitoring commitment for 6 months more (monitoring PM10 for 18 months) at the current location. Hanson is using an Environmental Beta-Attenuation Mass monitor (EBAM), which is a continuous particulate monitor and automatically measures and records airborne PM10 particulate concentration levels using the principle of beta ray attenuation. This method provides a simple determination of concentration in units of micrograms of particulate per cubic meter of air. The instrument is officially designated as a United States Environmental Protection Agency (USEPA) Federal Equivalent Method for determining compliance with particulate matter National Ambient Air Quality Standards (NAAQS).
The monitoring unit was selected in compliance with AS/NZS 3580.9.11:2016 *Methods for sampling and analysis of ambient air - Determination of suspended particulate matter -* PM_{10} *beta attenuation monitors* and operated in accordance with manufacturer's specifications, including all calibration and maintenance requirements as set out in the operating manual.

6.3 One (1) day in Six (6) ambient crystalline silica filter-based monitoring – PM10

Hanson have proposed an environmental crystalline silica monitoring campaign in order to provide a site representative background concentration and update the crystalline silica predictions (report issued on 23 February 2021). This background concentration can then be incorporated into the modelling predictions as the February 2021 report only considered representative crystalline silica data from sites in other parts of Australia.

The purpose of the proposal is to confirm the WRQ is not causing public health/nuisance impact, and:

- Update the crystalline silica modelling report using site-specific background data.

Hanson proposal is detailed in appendix A. Proposed plan to monitor ambient crystalline silica levels in the area - White Rock Quarry (WRQ).

The submitted proposal was approved by the EPA on 15 June 2022, and the campaign commenced on 7 July 2022, first report submitted to the regulators on 31 August 2022.

6.4 Meteorological monitoring

Daily weather forecast and a three-day outlook forecast will be obtained for the purpose of the daily and weekly planning, Mount Lofty Weather Station.

Wind speed and direction, temperature and rainfall are monitored at the site to assist with determining sources potentially contributing to ambient PM10, and deposited dust levels. The forecast summary will be available at the site prestart toolbox meetings, to:

- Identify and assess possible environmental impacts depending on weather forecast and continuous monitoring, allowing pre-planning of operations and additional management measures.
- Keep employees informed and aware of the importance of weather and dust management measures.

Meteorological monitoring is also conducted next to the EBAM (PM10). Meteorological parameters are measured according to *Australian Standard AS3580.14 "Methods for sampling and analysis of ambient air. Meteorological monitoring for ambient air quality monitoring applications".*

The weather station has the following sensor configuration:

- Air temperature;
- Humidity;
- Atmospheric pressure;
- Wind speed; and
- Wind direction.

6.5 Monitoring Site location

The dust deposition gauge number 1 (DDG1) is located to the west of the quarry next to the nearest residence, and the dust deposition gauge number 2 (DDG2) is located the north-west of the site (blue dots in figure 4 below).

The monitoring equipment (EBAM) is located at Skye, situated at west of the quarry (yellow dot in figure 4 below). The monitoring site location is 300 m from the quarry boundary. Careful consideration has been provided to this location after several other areas to the west of the site were considered however deemed not appropriate due to various reasons (tree foliage, power, gradient of slope (access) and line of sight to the quarry).

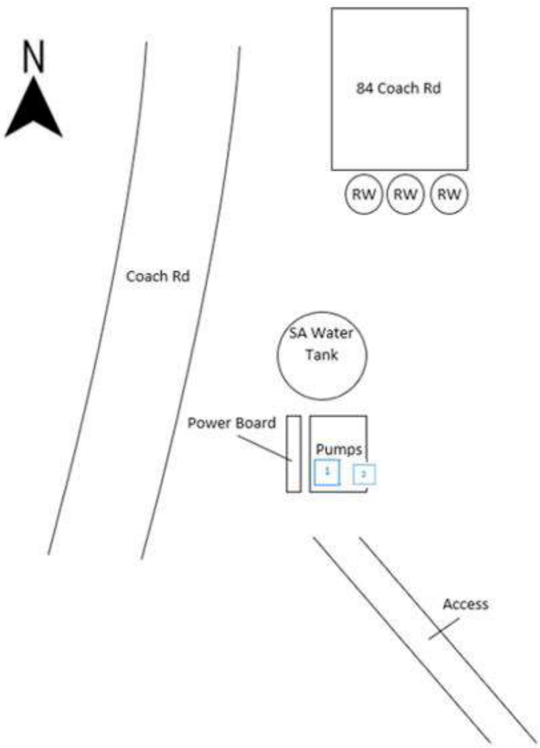
The location has been decided upon based on suitability and engagement with Council, SA Water, representatives of the Department for Energy and Mining (DEM) and the South Australia Environment Protection Authority (SA EPA).

Figure 4. Location of monitoring equipment and dust deposition gauges in relation to the Site.

The monitoring locations were sited to conform with the requirements of *AS 3580.1.1:2016 Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment*, subject to local site constraints.

The figure 5 provides a visual representation of the current PM10 (number 1) and ambient Respirable Crystalline Silica (RCS) (number 2) monitoring location.

Figure 5. Air Quality Monitoring Location – Coach Road, Skye



6.6 Air quality monitoring Program

The following table 8 summarises the air quality monitoring program at White Rock Quarry.

Table 8. Air quality monitoring instruments

Instrument	Parameter	Location	Sampling Frequency	Reporting Frequency	Duration
Dust Deposition Gauge (DDG1)	Deposited dust	West of the site entrance	30 days (± 2 days)	Monthly by request	Undefined
Dust Deposition Gauge (DDG2)	Deposited dust	North-east of the site	30 days (± 2 days)	Monthly by request	Undefined
Automatic Weather Station	Wind speed and direction	West at the boundary of the site	Continuous	Monthly	12 months (Sep 2021 - Sep 2022)
EBAM	PM10	West at the boundary of the site	Continuous	Monthly	18 months (Sep 2021 - Mar 2023)
HiVol (Proposed – Appendix A)	PM10 – filtered RCS	West at the boundary of the site	One (1) in six (6) day	Monthly	12 months (Jul 2022 - Jul 2023)

6.7 Data collection, analysis, and reporting

Under the current MOP, in the event that dust deposition monitoring determines an exceedance of the criteria, detailed within table 8 below, the incident will be documented in Environmental Complaint Register, and Regulators will be notified within 24 hours.

The air quality data will be collected and compared to the criteria described in table 9 below during the period described in table 8 above. (2) Two formal reports had been submitted to DEM and EPA. Hanson commit to extend the monitoring period for 6 months more (monitor PM10 for 12 months) at the current location. Hanson will provide monthly reports to the EPA. The format of the report will be a condensed version of a quarterly report previously supplied to DEM and EPA.

Table 9. Impact Assessment Criteria

Pollutant	Averaging period	Criterion	Source
Particulate matter < 10 µm (PM10)	24-hour	50 µg/m3	SA EPA Air Quality Policy
Deposited dust	Annual	4 g/m2/month	Other Australian States
Deposited dust	Incremental impact (maximum increase)	2 g/m2/month	
Particulate matter < 10 µm (PM10) - ambient crystalline silica (RCS) filter-based	Annual	3 µg/m3	SA EPA

The measured 24-hour average PM10 concentrations will be compared to the criteria. Any 24-hour average PM10 concentrations recorded above the PM10 criteria will be identified, and an assessment of whether they relate to on-site operations or regional background levels will be provided (e.g. bush fire, dust storms).

6.8 Trigger Action Response Plan (TARP)

The purpose of the TARP is to ensure that dust mitigation controls and appropriate management strategies are implemented to minimise any dust impact from site activities. The TARP includes a series of triggers defined by meteorological forecasts, visual observations, and continuous PM10 monitoring during the campaign. Table 10 contains the description of the trigger levels based on wind speed related to observation on land, adopting the Beaufort Wind Scale.

Table 10. Trigger level and description

Trigger	Description
Normal Operation	Normal conditions in daily operations, no dust leaving the site. Winds: Calm (0-25 km/h).
Level 1	Potential dust risk, not of a serious nature, but requires close monitoring to detect further trends. Winds: Moderate (25-35 km/h).
Level 2	Moderate dust risk of a potential impact to nearest neighbours. Corrective action needs to be planned and executed. Winds: Fresh (35-50 km/h).
Level 3	High dust risk, immediate action(s) must be taken to minimise impacts to neighbours. Winds: Strong (over 50 km/h).

Table 11 presents measures/responses to be taken in the event that a specific site activity is identified as the source of a Trigger

Table 11. Trigger level and response per activity

Activity	Trigger	Description	Response
Physical disturbance of the land	Level 1	Visual dust is greater than normal conditions, potentially able to leave the site	Monitor dust levels visually regularly
	Level 2	Dust observed can potentially leave the site, with low impact to neighbours	Concentrate water truck in disturbed area until area is controlled
	Level 3	Dust is leaving the site or likely to leave the site, potentially impacting neighbours	Cease activities (i.e. topsoil stripping, progressive rehabilitation activities, etc.) until normal conditions
Drilling and blasting	Level 1	Visual dust is greater than normal conditions, potentially able to leave the site	Monitor dust levels visually regularly
	Level 2	Dust observed can potentially leave the site, with low impact to neighbours	Adjust/reduce drill speed
	Level 3	Dust is leaving the site or likely to leave the site, potentially impacting neighbours	Cease drilling and/or re-schedule blasting activities until normal conditions
Vehicle movement	Level 1	Visual dust is greater than normal conditions, potentially able to leave the site	Monitor vehicle movements
	Level 2	Dust observed can potentially leave the site, with low impact to neighbours	Concentrate water truck in source areas until area is controlled, or re-route vehicles to controlled areas
	Level 3	Dust is leaving the site or likely to leave the site, potentially impacting neighbours	Modify vehicle movements until normal conditions
Crushing and screening	Level 1	Visual dust is greater than normal conditions, potentially able to leave the site	Monitor feed rate, and modify it as appropriate
	Level 2	Dust observed can potentially leave the site, with low impact to neighbours	Maintain a low feed rate and increase conveyor watering rate
	Level 3	Dust is leaving the site or likely to leave the site, potentially impacting neighbours	Cease crushing and stockpiles activities until normal conditions
Concrete batching plant	Level 1	Visual dust is greater than normal conditions, potentially able to leave the site	Monitor dust levels visually regularly
	Level 2	Dust observed can potentially leave the site, with low impact to neighbours	Request water truck passing across concrete or implement an alternative water suppression
	Level 3	Dust is leaving the site or likely to leave the site, potentially impacting neighbours	If uncontrolled dust is observed, modify activities until normal conditions
Material handling	Level 1	Visual dust is greater than normal conditions, potentially able to leave the site	Monitor dust levels visually regularly
	Level 2	Dust observed can potentially leave the site, with low impact to neighbours	Concentrate water truck in disturbed area until area is controlled
	Level 3	Dust is leaving the site or likely to leave the site, potentially impacting neighbours	Modify activities until normal conditions
Wind erosion	Level 1	Visual dust is greater than normal conditions, potentially able to leave the site	Monitor dust levels visually regularly
	Level 2	Dust observed can potentially leave the site, with low impact to neighbours	Concentrate water truck in concerning areas until areas are controlled
	Level 3	Dust is leaving the site or likely to leave the site, potentially impacting neighbours	Concentrate water truck in concerning areas until areas are controlled

Table 12. Air quality trigger action response

<table>
<tr><th rowspan="2">Trigger Level</th><th colspan="2">Description</th><th colspan="2">Monitoring correlation with campaign period</th><th rowspan="2">Response</th></tr>
<tr><th>Observations</th><th>Meteorology</th><th>PM10 (µg/m3)</th><th>Average</th></tr>
<tr><td rowspan="3">Normal Operations</td><td rowspan="3">• Reasonable conditions in daily operations, no dust leaving the site
• Calm to moderate winds</td><td rowspan="3">Wind speed: 0-25 km/h</td><td>0-39</td><td>Instantaneous (15 minutes)</td><td rowspan="3">• Maintain normal dust suppression activities
• Daily meteorological forecasts discussion in pre-starts toolbox meetings</td></tr>
<tr><td>0-39</td><td>1 Hour</td></tr>
<tr><td>0-39</td><td>24 hours</td></tr>
<tr><td rowspan="3">Level 1</td><td rowspan="3">• Potential dust risk, not of a serious nature, but requires close monitoring to detect further trends
• Moderate to fresh winds and no rain in the past 6 hours</td><td rowspan="3">Wind speed: 25-35 km/h and less than 50% chance of rain</td><td>40-80</td><td>Instantaneous (15 minutes)</td><td rowspan="3">• Communicate change of observed weather conditions to all relevant employees
• Implement management measures until normal conditions
• Quarry Manager to validate potential dust leaving site, review continuous data and compare with site conditions, maintain close monitoring to implement actions when required.
• Alarms received to be investigated
• Quarry Manager to identify sources activities and implement response measures as per table 10
• Water truck used in operational areas as often as required
• Quarry Manager to ensure all strategies are implemented</td></tr>
<tr><td>40-50</td><td>1 Hour</td></tr>
<tr><td>30-39</td><td>24 hours</td></tr>
<tr><td rowspan="3">Level 2</td><td rowspan="3">• Moderate dust risk of a potential impact to nearest neighbours. Corrective action needs to be planned and executed
• Fresh to strong winds and no rain in the past 12 hours</td><td rowspan="3">Wind speed: 35-50 km/h and less than 90% chance of rain</td><td>>80</td><td>Instantaneous (15 minutes)</td><td rowspan="3">• As directed by Quarry Manager, modify or cease identified activity to reduce emissions until normal conditions return
• Quarry Manager to validate potential dust leaving site, hourly off-site visual inspection
• Continue to implement management measures until normal conditions return
• Increase water rate/water truck frequency in emissions areas/activities
• Review conditions before blasting, and re-schedule as appropriate
• Re-route vehicles movements as appropriate</td></tr>
<tr><td>>50</td><td>1 Hour (two consecutive hours)</td></tr>
<tr><td>40-49</td><td>24 hours</td></tr>
<tr><td rowspan="3">Level 3</td><td rowspan="3">• High dust risk, immediate action(s) must be taken to minimise impacts to neighbours
• Strong to gale winds and no rain in the past 24 hours</td><td rowspan="3">Wind speed: over 50 km/h and less than 90% chance of rain</td><td>>120</td><td>Instantaneous (15 minutes)</td><td rowspan="3">• Quarry Manager to cease identified activity to reduce emissions until normal conditions return as required
• Implement level 1 and 2 responses until normal conditions return
• Quarry Manager to identify low sources activities with appropriate controls, and stop non-essential activities
• Emission source activities can recommence when dust controls are proved effective or until normal conditions return
• Document incident(s) in the Environmental Complain Register, records kept by Quarry Manager, and notify regulators within 24 hours</td></tr>
<tr><td>>50</td><td>1 Hour (three consecutive hours)</td></tr>
<tr><td>>50</td><td>24 hours</td></tr>
</table>

Table 13 outlines the roles and responsibilities of the Operational Manager, Quarry Manager, and other employees, including Operational Personnel and Contractors at the Site. Specific responses required are included in table 12 above. It is intended that there is always a Manager or delegate on site during extractive and processing operations to manage the TARP and associated response.

Table 13. Roles and Responsibilities

Role	Responsibility
Operational Manager (OM)	• Promote awareness with regard the importance of dust management controls and strategies • Plan long-term site development • Communicate to community if required
Quarry Manager (QM)	• Provide a daily weather forecast and a three-day outlook forecast • Weather conditions checked and assessed prior to operations • Induct all staff and contractors at the Site on the requirements of the TARP and the dust control, strategies and management measures that are to be used • Implement actions associated to the TARP • Use water truck and sprinklers as required to wet down operational areas, increase frequency/water rate as per environmental conditions • Ensure all personnel observe onsite vehicle speed limits to reduce dust lift-off from unsealed roads. • Maintain roads in good conditions and re-route vehicle movements when required • Engage street sweepers on an ‘as needed’ basis • Ensure equipment is readily available to all operational Personnel and Contractors to allow implementation of the TARP • Respond to any complaints alleging dust nuisance within 48 hours of receipt
Employees (E): Operational Personnel and Contractors	• Site activities undertake by trained personal in accordance with Australian Standards • During operations undertake visual subjective assessment of all potential dust generating sources / activities • Communicate to Quarry Manager immediately upon becoming aware of visible dust, and dust control measures required • Implement control and management strategies in line with the TARP • Ensure water suppression is applied before start-up in in level 2 TARP conditions • Maintain good road surface conditions to minimise dust emissions • Fines collected under conveyors will be removed regularly • Ensure trucks are not overloaded • Implement relevant dust minimisation measures (e.g. excavators will preferentially work shielded from prevailing wind) • Follow all instructions of the Site Manager in relation to dust management measures to be implemented.

7. Management Framework

7.1 Communications and Training

7.1.1 Internal communications

Internal communications methods may include the following, as applicable:

- Onsite personnel inductions, training, and toolbox sessions
- Meetings
- Notice boards

These mechanisms will be used to communicate to the relevant employees on site including but not limited to the assessment of forecast meteorological conditions and controls to be implemented to minimise environmental risk on daily operations, other prevention measures, and/or new dust management process, procedures or/and information to ensure effective implementation of controls.

In case of an event (e.g. peak on dust monitoring, uncontrolled visible dust on-site), employees must report to supervisor/manager in a timely manner. The manager is responsible for conducting air quality monitoring, incident/complaint reporting and investigation.

7.1.2 External communications

Hanson have engaged directly with community members, regulators, local councils, and other stakeholders along the history, and will continue to do so.

The most recent engagement has occurred around the proposed plan to monitor ambient crystalline silica levels in the area. Hanson engaged the nearest neighbour to the proposed location, finding a collaborative welcoming to the initiative. Technical details for installation of the equipment are still under stakeholders' assessment.

External communications may include the following, as applicable:

- Meetings and correspondence with appropriate regulatory authorities and stakeholders
- Discussions and consultation with adjoining landowners
- Handling of, and responding to, complaints or requests.

7.1.3 Inductions and training

All employees, including contractors are inducted before any work is allowed on site. The induction covers dust management controls and strategies measures and responsibilities.

All employees shall receive suitable environmental training, to ensure they are aware of their responsibilities and are competent to carry out their work in an environmentally acceptable manner. Dust management requirements shall be explained to all onsite personnel during a site induction. Ongoing instruction shall be provided via toolbox meetings etc. Inductions and ongoing instruction shall be recorded.

The environmental induction will include the following items:

- Explanation of the purpose and objectives of the Dust Management Plan, including the TARP
- Roles and functions of personnel onsite in relation to dust management
- Brief explanation of their responsibilities under the dust management procedures contained in this report
- Identification of their legal obligations

7.2 Environmental Complaint Register

An Environmental Complaint Register System will be operated to maintain a system of records that provide full documentation of complaint handling. Incidents will be documented in Environmental Complaint Register, and Regulators will be notified within 24 hours by Quarry Manager or Operations Manager.

The following will be recorded in the event that a valid public complaint is received:

- Time and date of the complaint
- The name of the person who received/recorded the complaint
- The method by which the complaint was made (e.g. phone, letter)
- Personal details if the complainant
- The nature of the complaint
- The action to be taken in relation to the complaint and the person/s responsible for taking that action

Following investigation of the complaint, the actions will be recorded and completed by an Integrated Risk Information System (IRIS) report, including:

- An outline of the investigations undertaken
- The actions taken in relation to the complaint (including supplementary monitoring and corrective actions)
- The reason for any decisions of inaction
- Time and date follow-up contact and resolution with the complainant
- The nature of, and outcomes from, follow-up contact with the complainant
- IRIS incident report number
- Any other details relevant to the complaint

7.3 Integrated Risk Information System (IRIS)

Environmental Incidents are events or occurrences that result in, or have the potential to result in, unacceptable impacts to the environment, for example:

- Monitoring results higher than prescribed limits
- A complaint received

Hanson reports these Incidents through the Integrated Risk Information System (IRIS). All incidents will be reported on an IRIS form and/or registered in an electronic database. Incidents will be tracked to ensure that the appropriate corrective actions and measures are taken to prevent the incident from reoccurring. Environmental Incidents will be reviewed on a monthly and annual basis to determine incident trends. This will enable targeting of areas that require further management and will assist in preventing future incidents.

The Emergency Response Plan will be implemented in response to any major environmental Incidents.

7.4 Performance Reporting and Auditing

Performance reporting will be implemented to produce systematic, comprehensive, and informative reports on the environmental management and monitoring activities at the White Rock Quarry. Hanson will also undertake annual internal audits of compliance with environmental management commitments and conditions required as part of the proposal.

Where auditing finds that dust controls and strategies are not being effective, the Quarry Management Team may implement changes to process and procedures to prevent dust from leaving the site. Monitoring data and visual observations will demonstrate effectiveness of controls and strategies, findings will be included in the Annual Compliance Report submitted to the Department of Energy and Mining.

7.5 Review and Revision

This Dust Management Plan shall be reviewed as required throughout the duration of the quarry's useful life. Upon review, the document shall be revised and re-issued when appropriate. In addition, continuous improvement of the plan will occur in response to major changes to site operations, environmental Incident resolutions, audit findings, monitoring results, changes in regulatory, corporative requirements or at least every 5 years.

This Dust Management Plan will be reviewed in July 2023, completion of the 12-month ambient Respirable Crystalline Silica (RCS).

Appendixes

Appendix A. Proposed plan to monitor ambient crystalline silica levels in the area - White Rock Quarry (WRQ).

Purpose

The purpose of the proposal is to confirm the WRQ is not causing public health/nuisance impact.

- Update the crystalline silica modelling report using site-specific background data (12 months).

Scope of work

Hanson is proposing to undertake crystalline silica monitoring in order to provide a site representative background concentration and update the crystalline silica predictions (report issued on 23 February 2021). This background concentration can then be incorporated into the modelling predictions as the February 2021 report only considered representative crystalline silica data from sites in other parts of Australia.

Equipment

High volume air sampler (HiVol 3000) - fitted with a PM10 sampling head to capture samples for analysis. The HiVol maintain a constant flow and collect a truly representative sample of particulate matter.

The HiVol will be co-located with EBAM at the proposed location, western side of the quarry and be operated on 1 day in 6 regime. The PM10 HiVol will be selected and operated in compliance with *AS/NZS 3580.9.3:2003 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - Total suspended particulate matter (TSP) - High volume sampler gravimetric method* and operated in accordance with manufacturer's specifications, including all calibration and maintenance requirements as set out in the operating manual. The monitoring location is to conform to the requirements of *AS 3580.1.1:2007 Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment*, subject to local site constraints with any deviations from the standard noted in the siting documentation. At the end of the six-day sampling period the filter will be transferred to a holding canister and a new filter will be loaded into the sampling filter position. The filter papers (PVC 47mm) will be weighed before and after sampling by a NATA-accredited laboratory. The particle matter collected in the sample will be analysed for crystalline silica content, based on method determined by the National Health and Medical Research Council and National Institute for Occupational Safety and Health methods (NIOSH 7603) Airborne samples analysed according to *AS 2985 for Respirable Dust or AS 3640 for Inhalable Dust. Quartz analysed in accordance with NIOSH 7603.*

The equipment and sampling frequency has been decided upon based on consultation with the South Australia Environment Protection Authority (SA EPA).

Location of Monitoring Equipment

Proposed location adjacent to the current PM10 monitoring location as per figure a and b below.

Figure a. Air Quality Monitoring Location – Coach Road, Skye

1.Real time monitoring PM10
2.PM10 ambient RCS - High volume air sampler (HiVol)

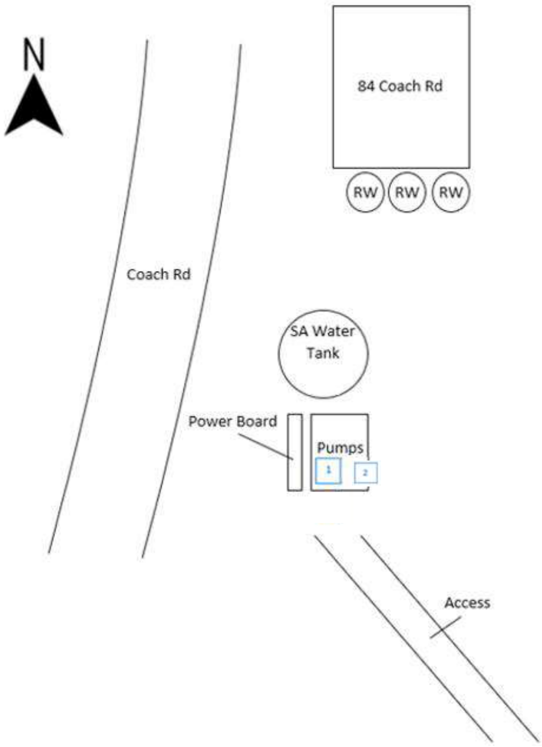


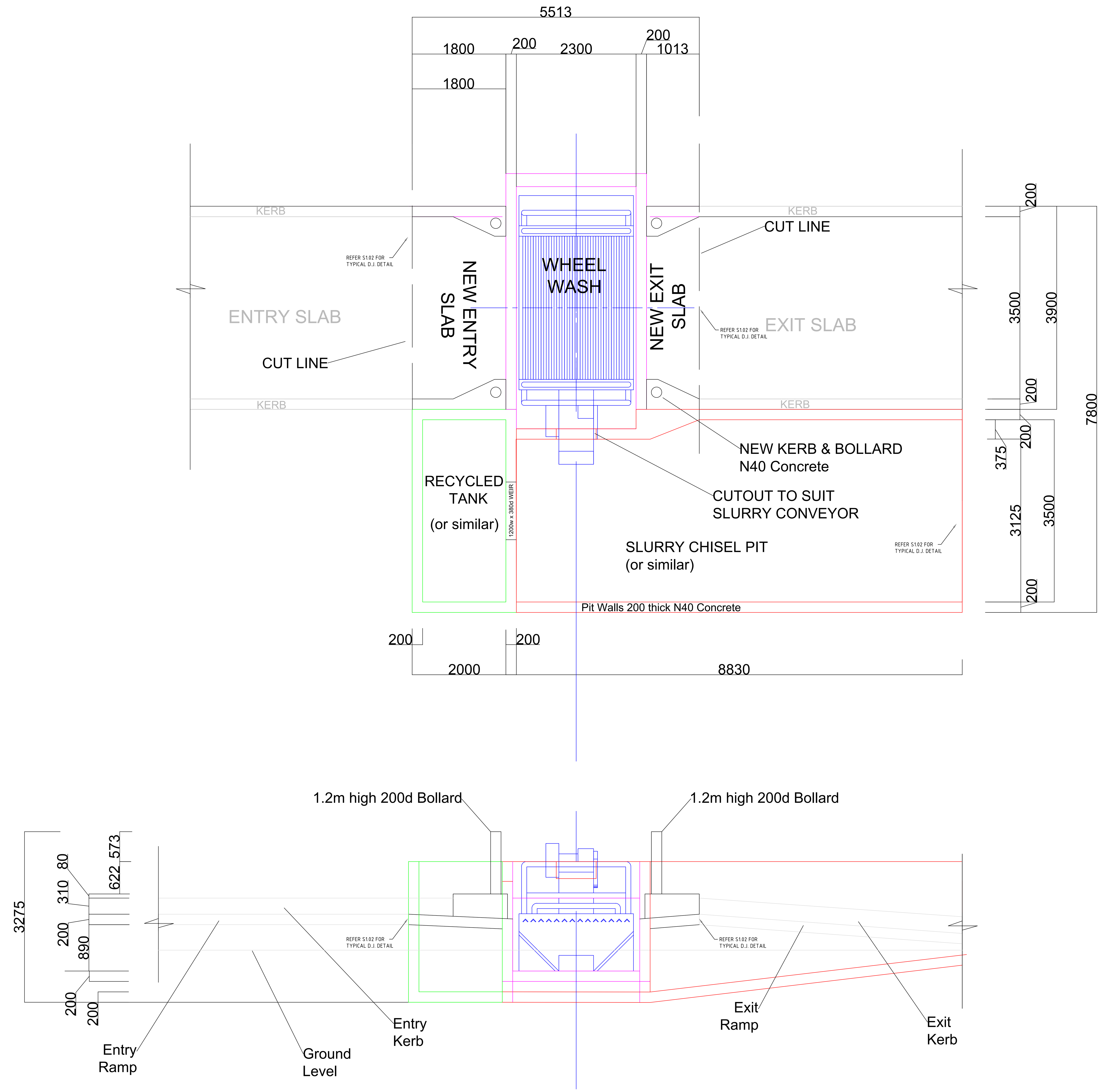
Figure b. Location of monitoring equipment (current and propose) and dust deposition gauges in relation to the Site.

The location of the HiVol was defined after consultation with the closest neighbours of the proposed location. Current location has been decided upon based on suitability and engagement with Council, SA Water, representatives of the Department for Energy and Mining (DEM) and the South Australia Environment Protection Authority (SA EPA).

The proposed location was approved by stakeholders, the Hi-Vol unit is using a exhaust muffler in order to reduce noise levels in the area. The exhaust side of the unit is located away from sensitive receptors.

Attachment 9

Conceptual Truck Wheel Wash Details



1. WHEEL WASH PIT, RECYCLED & SLURRY TANK WALLS 200 THICK IN-SITU CONCRETE WALLS. N16-200 VERTICAL & N12-200 HORIZONTAL EACH FACE. N16 STARTER BARS 600 LAP. 50 COVER. WATER STOP by PARCHEM or SIMILAR

2. TANK BASES TO BE 200 THICK SLAB ON GROUND N40 CONCRETE POURED ON POLYTHENE MEMBRANE. SL102 MESH 40 TOP COVER . 50 EDGE COVER

3. ENTRY RAMP TO BE 200 THICK SLAB ON GROUND N40 CONCRETE POURED ON POLYTHENE MEMBRANE. SL102 MESH 40 TOP COVER. 50 EDGE COVER

4. STEEL BOLLARDS 200dia N40 CONCRETE FILL. N16 STARTER BARS FULL HEIGHT

REV	DATE	DESCRIPTION
B	11/10/21	ISSUED FOR TENDER
A	19/7/21	ISSUED FOR REVIEW

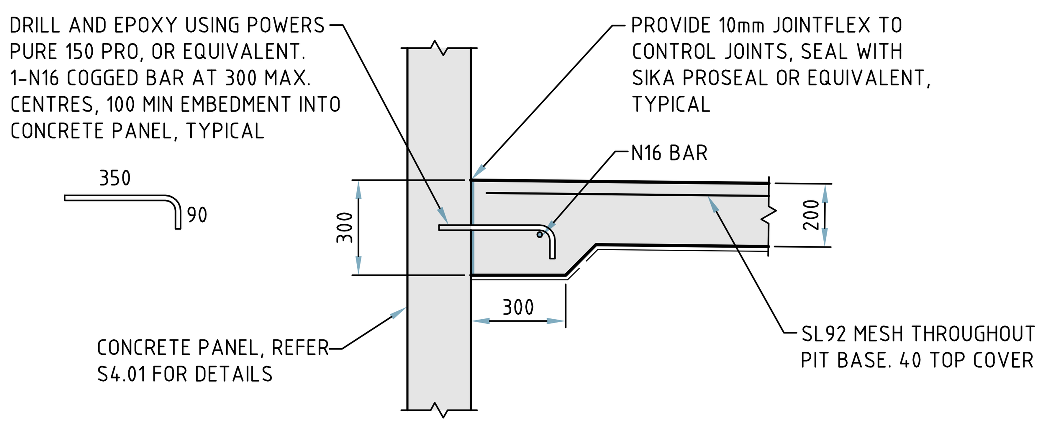
PROJECT
WHITE ROCK QUARRY
HORSNELLS GULLY RD
HORSNELLS GULLY SA

CLIENT
HANSON CONSTRUCTION MATERIALS

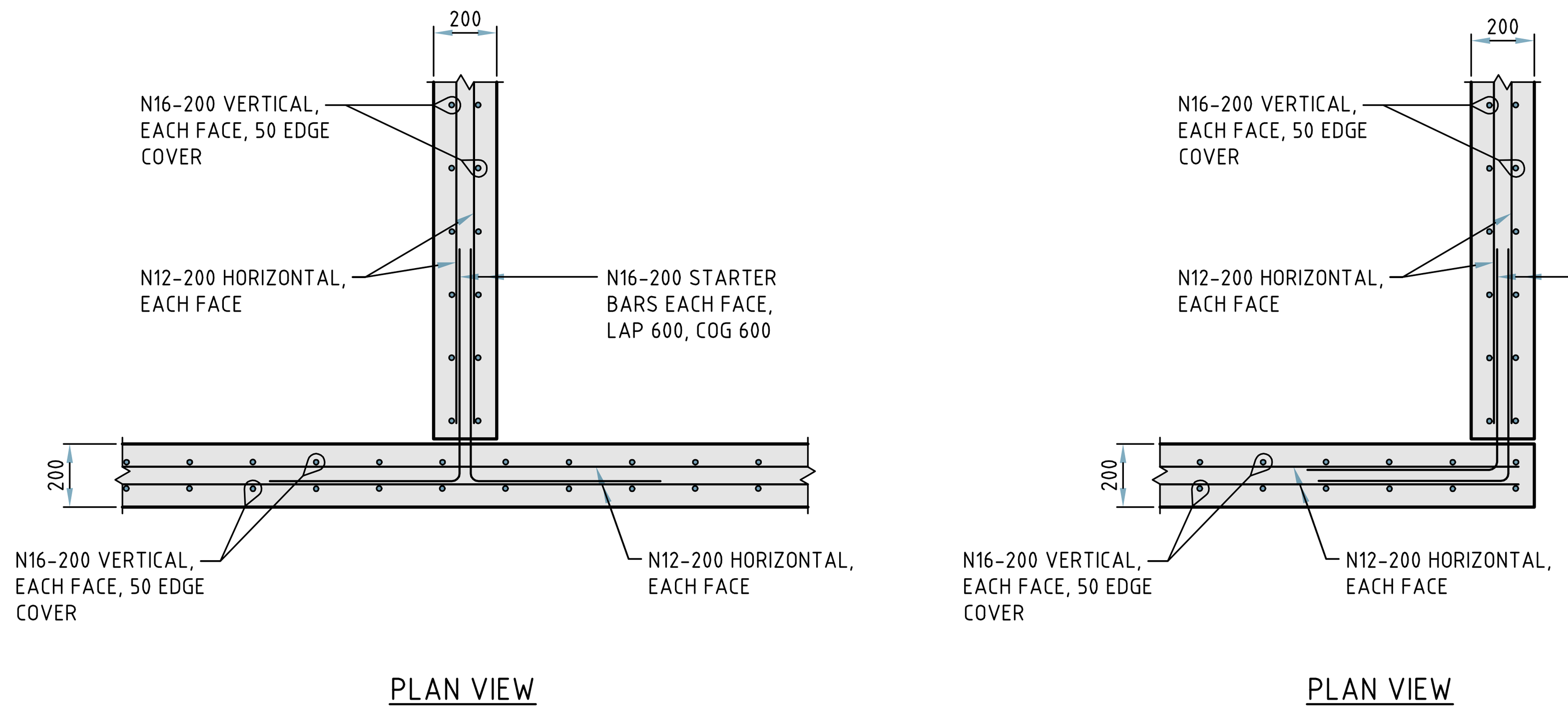
TITLE
CONCEPTUAL PLAN AND ELEVATIONS

SCALE U.N.O.	DATE	DESIGNED	DRAWN	CHECKED
1:30 @ ARCH E	19/07/2021	SPB	SPB	SPB

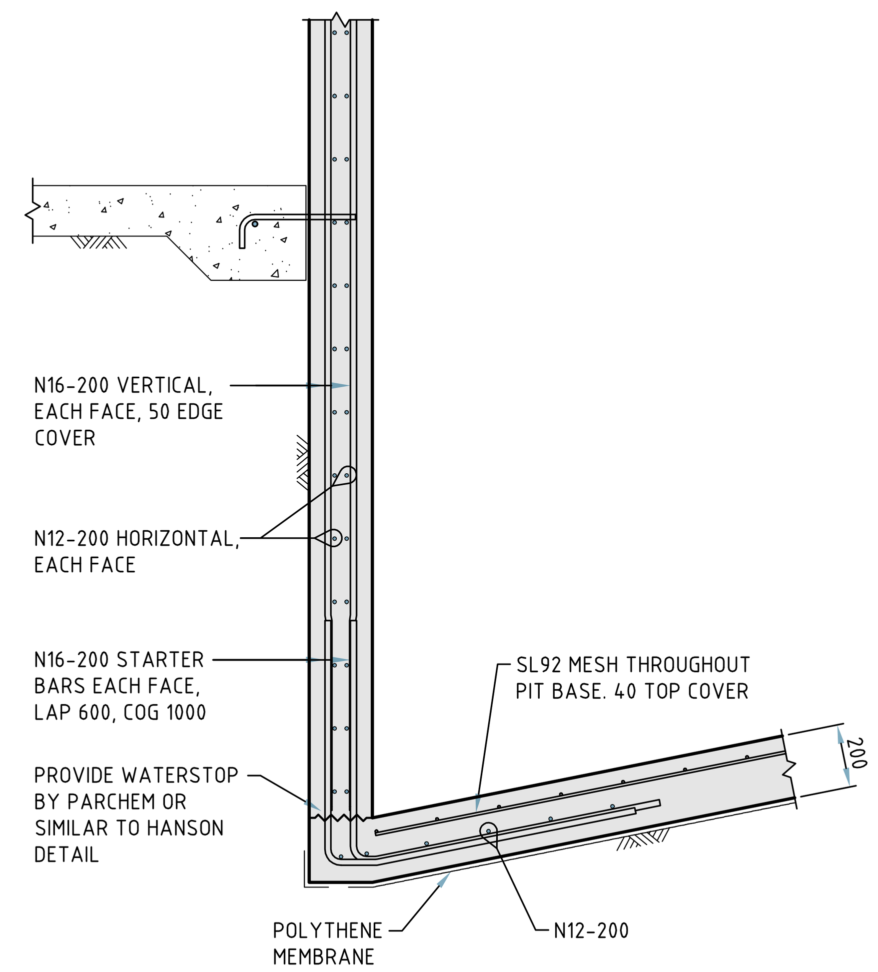
JOB No	DRG No.	REVISION
20211011-WRQ	DR-S1.01	B



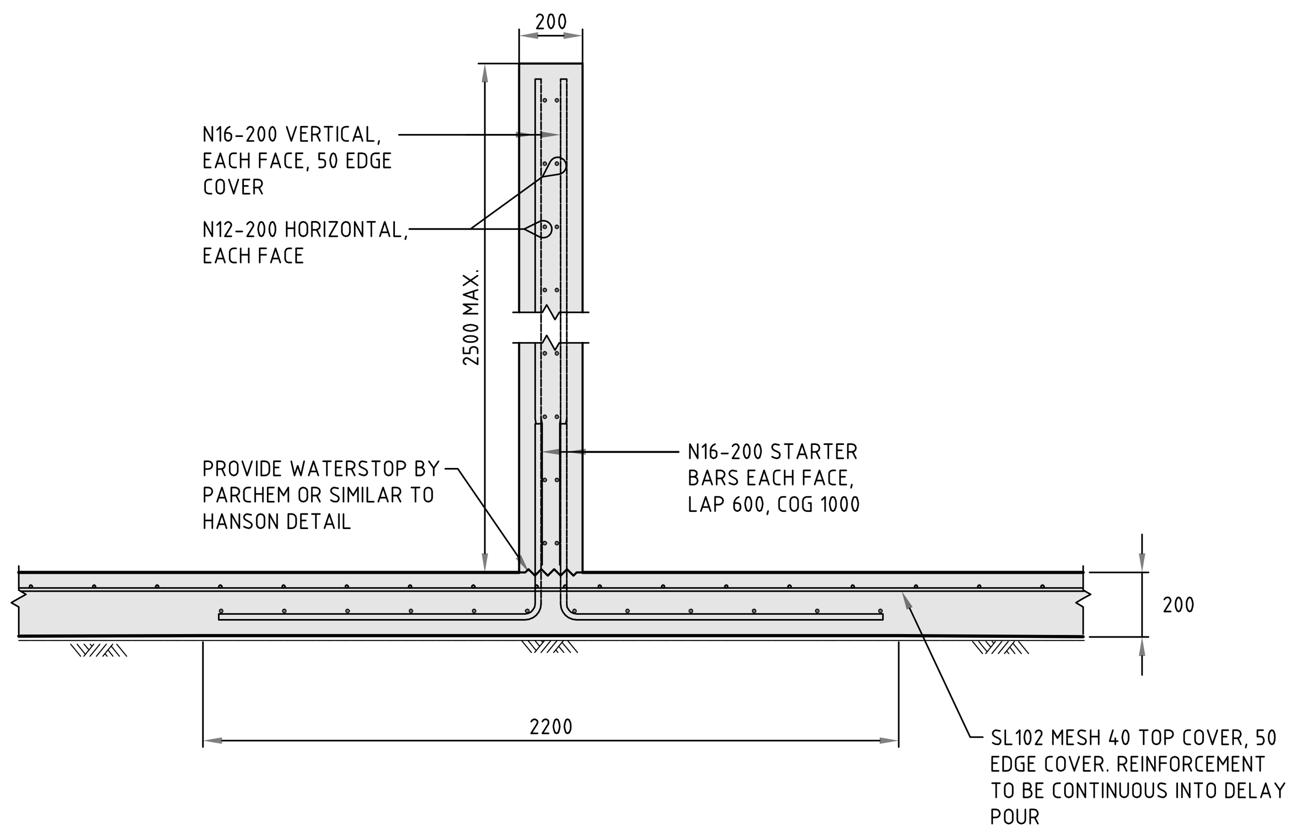
TYPICAL RAMP TO CONCRETE WALL DETAIL



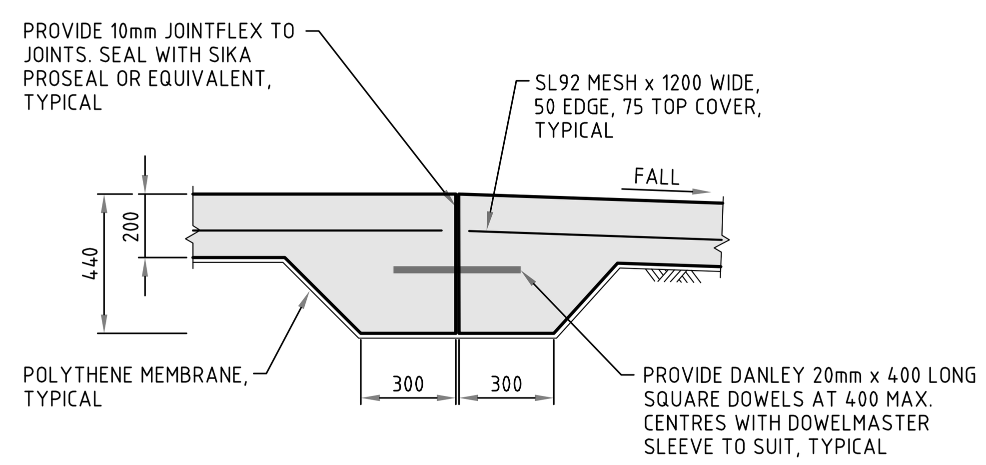
TYPICAL PANEL TO PANEL DETAIL



TYPICAL PIT RAMP TO CONCRETE WALL DETAIL



TYPICAL WALL TO FOOTING DETAIL



TYPICAL SLAB TO RAMP DETAIL (D.J)

REV	DATE	DESCRIPTION
A	19/7/21	ISSUED FOR TENDER

PROJECT
WHITE ROCK QUARRY
HORSNELLS GULLY RD
HORSNELLS GULLY SA

CLIENT
HANSON CONSTRUCTION MATERIALS

TITLE
CONCEPTUAL TYPICAL DETAILS

SCALE U.N.O.	DATE	DESIGNED	DRAWN	CHECKED
1:20 @ A1	19/07/2021	SPB	SPB	SPB

JOB No	DRG No.	REVISION
20210818	DR-S1.02	A

Attachment 10

Long Term Wind Rose Data

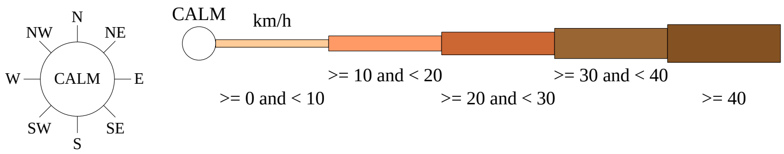
Rose of Wind direction versus Wind speed in km/h (01 Oct 1987 to 11 Aug 2020)

Custom times selected, refer to attached note for details

MOUNT LOFTY

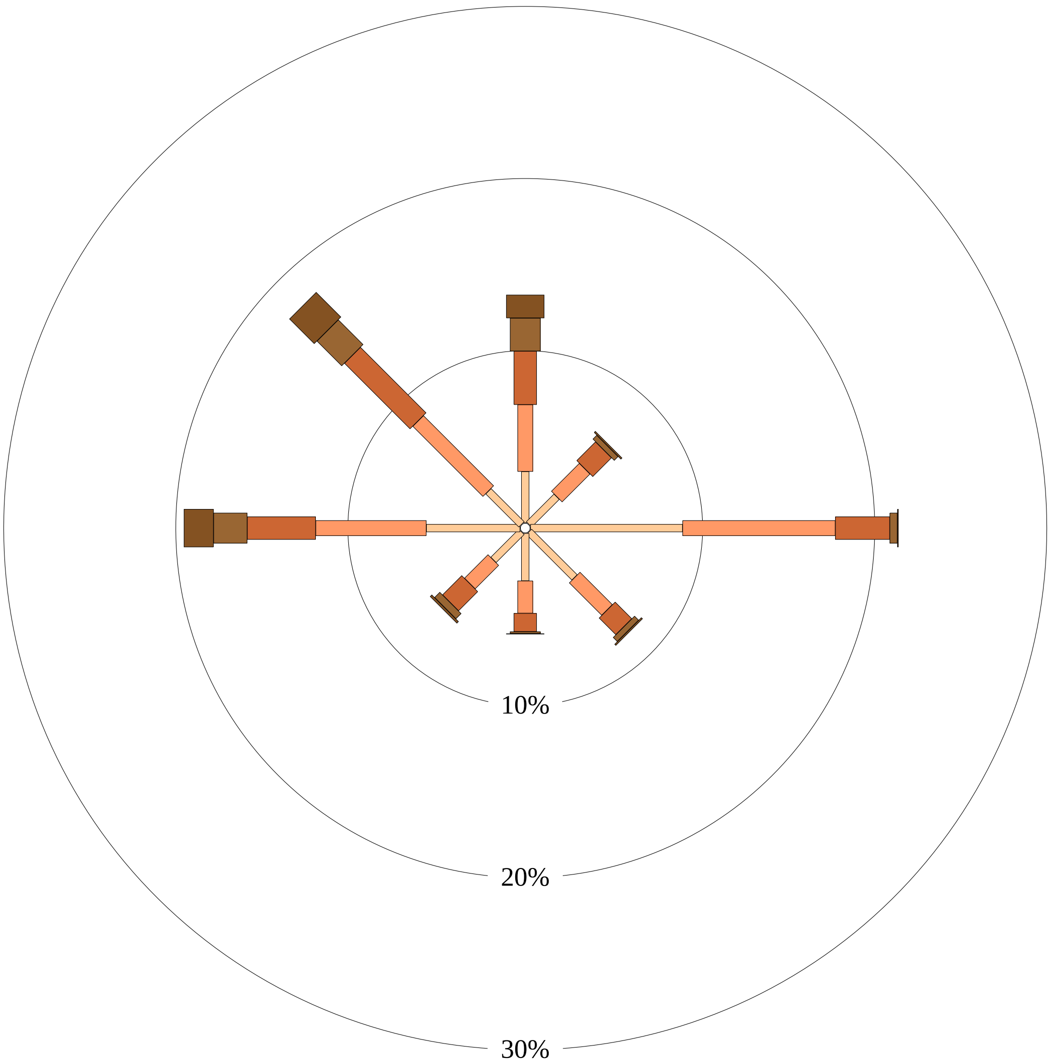
Site No: 023842 • Opened Feb 1985 • Still Open • Latitude: -34.9784° • Longitude: 138.7088° • Elevation 685m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



9 am
13812 Total Observations

Calm 1%



Rose of Wind direction versus Wind speed in km/h (01 Oct 1987 to 11 Aug 2020)

Custom times selected, refer to attached note for details

MOUNT LOFTY

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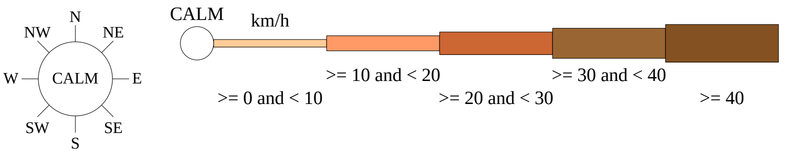
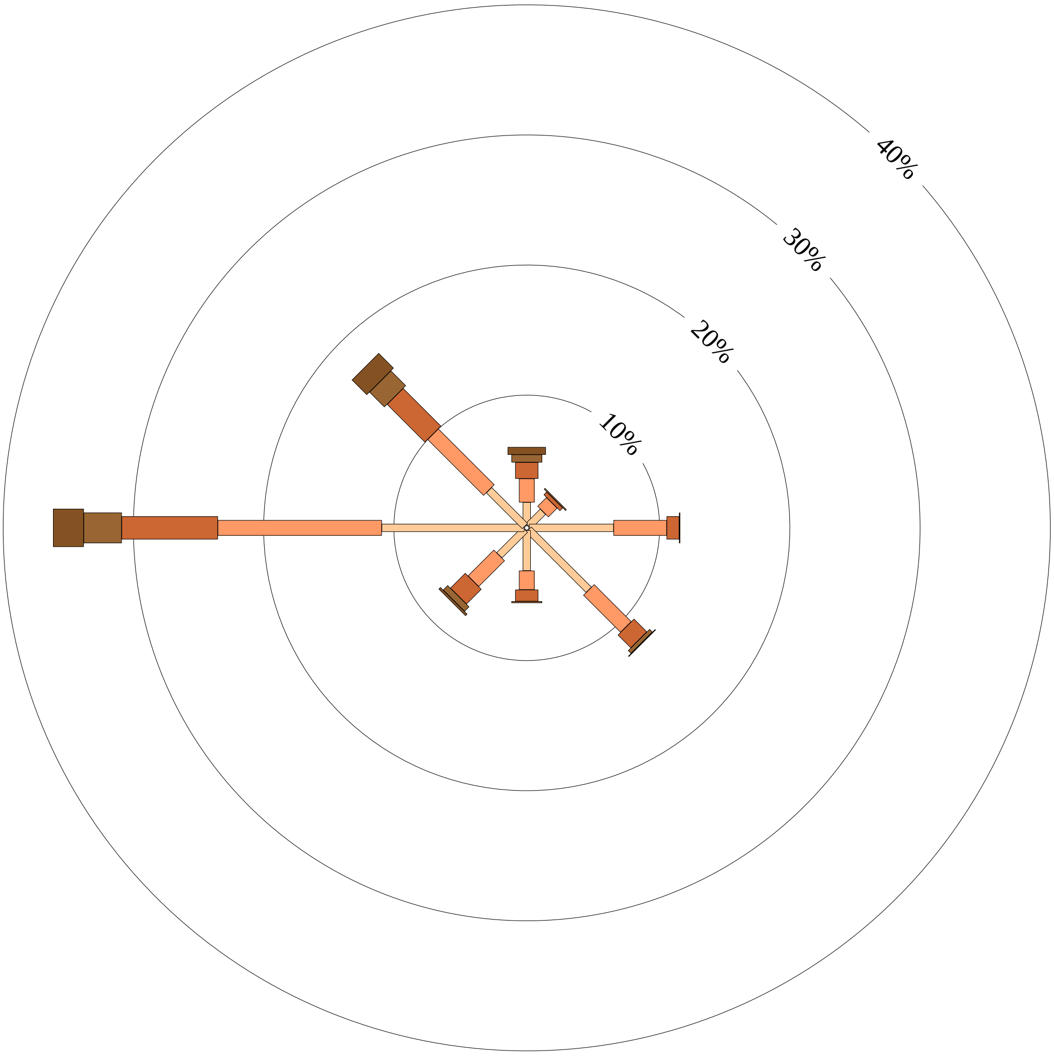


3 pm
13792 Total Observations

Calm 1%



GROUNDWORK plus

WHITE ROCK QUARRY
STORMWATER MANAGEMENT PLAN

Prepared for:
Hanson Construction Materials Pty Ltd

Date:
14 December 2022

File Ref:
1901.800.001

Document Control

Project / Report Details

Document Title:	White Rock Quarry Stormwater Management Plan
Principal Author:	Mark Folker
Client:	Hanson Construction Materials Pty Ltd
Ref. No.	1901.800.001

Document Status

Issue	*Description*	*Date*	*Author*	*Reviewer*
V0	Stormwater Management Plan	4 December 2020	Mark Folker	Matthew Jones
V1	Updated Layout	22 July 2021	Mark Folker	Matthew Jones
V2	Updated to include TARP	11 March 2022	Mark Folker	Matthew Jones
V3	Updated QDP, Water Balance Added	29 November 2022	Mark Folker	Maxim Dupree
V4	Updated Water Balance	14 December 2022	Mark Folker	Maxim Dupree
V5	Updated to reference updated TARP	30 March 2023	Mark Folker	Maxim Dupree

Distribution Record

Recipient	*Distribution Method*
Hanson Construction Materials Pty Ltd	Electronic

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Table of Contents

Table of Contents

TABLES

DIAGRAMS

DRAWINGS

ATTACHMENTS

1 Introduction

1.1 Project Overview

Hanson Construction Materials Pty Ltd (Hanson) have commissioned Groundwork Plus Pty Ltd (Groundwork Plus), to prepare a Stormwater Management Plan (SMP) for the White Rock Quarry, situated within Private Mine (PM) 188 located on Horsnells Gully Road, Horsnell Gully SA 5141 (the Site).

The SMP is prepared as a consolidated document as part of the Mine Operations Plan (MOP) review to support existing and future operations at the Site. The stormwater hydrology assessment and sediment basin design for the Site has been prepared in accordance with commitments of the White Rock Quarry Environment Improvement Programe (EIP) – Stormwater approved by the Environment Protection Authority (EPA) on 29 September 2017 while also adopting consistent strategies to calculate stormwater characteristics to define future surface water management measures and control strategies for the ongoing operation of the Site beyond the close out of the EIP. The SMP is intended to inform the longterm surface water management framework for the Site and will be subject to review through out the life of the quarry.

1.2 Objectives of the SMP

The scope of this SMP includes the following items:

- Establish Operational Management Procedures (OMP) to manage surface water at the quarry in compliance with the relevant operating conditions outlined in **Section 1.3 Relevant Operating Conditions**
- Design stormwater quality treatment systems for the existing and long term development of the quarry
- Outline the implementation and maintenance strategies for stormwater management measures and systems designed for the Site.

This SMP outlines the engineering design details and operational management procedures to be adopted in order to integrate stormwater management into daily operations. The objective of surfacewater management is to ensure that water resources are utilised efficiently on the Site and the quality of water leaving the Site is compliant with the legislative conditions of the Site.

The guiding principles applied for surface water management at the Site are outlined below:

1. Runoff from clean catchments will be diverted around disturbed areas to the extent practicable;
2. Land disturbance will be minimised to the extent necessary;
3. Stormwater control elements will be installed prior to land disturbance and in a logical progression;
4. Water requirements will be collected onsite and recycled to the maximum practical extent; and
5. Monitoring will be undertaken to confirm the effectiveness of water treatment systems, erosion and sediment control measures and also to program maintenance.

1.3 Relevant Operating Conditions

The Site is primarily Regulated under the provisions of an approved MOP pursuant to Section 80 of the *Mining Act 1971.* The MOP contains Surface Water (Erosion, Silt and Stormwater Management) Objective and Measurement Criteria to inform the required performance outcomes required for the Site that are Regulated under the *Mining Act 1971*. Specific Objective and Measurment Criteria are provided within Section 6 – Potiential Impact Risk Assessment of the MOP.

The Site is also Regulated under the *Environment Protection Act 1993* (EP Act) in accordance with EPA Licence No 12714 for licenced activities prescribed by Schedule 1 of the EP Act associated with extractive industries, concrete batching and waste reprocessing activities undertaken within the Site.

The Site must comply with the relevant stormwater management requirements of the EPA Licence No 12714 outlined below:

EPA Licence Condition 1.3 Stormwater (S - 15)

The Licensee must:

1.3.1 take all reasonable and practicable measures to prevent contamination of stormwater at the Premises; and

1.3.2 implement appropriate contingency measures to contain any contaminated stormwater at the Premises unless and until the contaminated stormwater is treated to remove the contamination, or is disposed of at an appropriately licensed facility.

In addition to the above stormwater condition an EIP is also applicable to the Site pursuant to the following condition;

EPA Licence Condition 3.5 Environment Improvement Programme – Stormwater Management (T-1047)

The Licensee must:

3.5.1 Develop and submit to EPA by 30 April 2017, an Environment Improvement Programme – Stormwater Management (EIP), to the satisfaction of the EPA;

3.5.2 Ensure that the EIP includes, but not be limited to, the following:

a. identification of the sources of erosion hazards on or related to the Premises and a quantitative assessment of risk and all potential control measures to effectively minimise erosion, manage flows, capture sediment, manage extracted material and treat contaminant; and

b. selection of a suite of control measures by applying a hierarchy of controls (prevention, source control, structural control, receiving waters management) and justification for their selection over the other potential control measures (cost and benefit analyses); and

c. clearly defined and prioritised timeframes for actions (compliance actions) to achieve compliance with the approved EIP including the implementation of the suite of selected measures; and

d. a framework linking the Hanson White Rock Quarry Water Quality Monitoring Plan (as current from time to time) as a mechanism to evaluate the effectiveness of the control measures implemented and take corrective actions as necessary to ensure ongoing effectiveness of the control measures; and

e. a framework for reporting to the EPA, including frequency, which demonstrates progress and completion of the compliance actions.

3.5.3 Implement and comply with the Environment Improvement Programme – Stormwater Management (EIP) or any revised Environment Improvement Programme – Stormwater Management (EIP) approved in writing by the EPA.

This SMP outlines the operating and engineering requirements associated with stormwater management in order to comply with the conditions and considerations of the *Mining Act 1971*, EPA Licence 12714 and subsequent EIP, including ongoing monitoring and reporting requirements for the Site. The planning, design and implementation of stormwater management measures within the SMP apply industry best practice at the quarry as a minimum standard, in addition to the requirements as outlined by the *Mining Act 1971* and the EPA licence conditions.

This document does not supersede or replace the EIP, however it is intended to provide a stormwater management framework that is consistent with the requirements of the EIP that will support existing and future operations at the Site. As the Site will continue to be primarily regulated under the *Mining Act 1971* by the Department for Energy and Mining (DEM) as the lead Regulator for the Site, the SMP is intended to provide an ongoing stormwater management framework in support of the MOP that will remain in place and be subject to future review beyond the close out of the EIP. While the EIP remains a condition of the EPA Licence for the Site, the SMP should be read in conjunction with the EIP and all other applicable documentation at all times.

2. Operational Procedures

An overview of the proposed Operational Procedures for implementation at the Site are provided within **Table 1 – Stormwater Operational Procedures** below. These are to be regularly reviewed and updated to reflect changes in quarrying practices throughout the life of the quarry.

Table 1 – Stormwater Operational Procedures

<table>
<tr><th>Aspect</th><th>Details</th></tr>
<tr><td>Purpose</td><td>The Operational Procedures have been prepared to manage potential environmental impacts that may result from the operation in relation to stormwater flows erosion and sediment release from the Site.</td></tr>
<tr><td>Risk Sources and Potential Impacts</td><td>Adverse impacts resulting from erosion and sediment control related issues may include the following:
• Impact on quality of surface water as a result of soil disturbance, erosion and sedimentation
• Contamination of surface waters as a result of contamination from wastes, hydrocarbons and chemicals.

Site operations that have the potential to cause erosion and sedimentation or risk to receiving surface waters include:
• Exposed and disturbed soil areas within the Site and extraction operations
• Material stockpiles which contain material sourced from the Site or external sources
• Vegetation clearing and topsoil stripping
• Uncontrolled Sediment Basin releases
• Construction and maintenance of parking areas, roads and hardstands
• Spillage during handling of materials
• Use and storage of oils, greases, fuels and other chemicals.</td></tr>
<tr><td>Surface Water Discharge Performance Criteria</td><td>Table 3.3.9 of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council – ANZECC, 2000) provides default trigger values for lowland river ecosystems applicable to South Australia. Trigger values for this stream type (lowland) are as follows:
<table>
<tr><th colspan="13">Summary of Default Trigger Values Water for Physical and Chemical Stressors
South Central Australia – low rainfall area (Lowland River) *</th></tr>
<tr><th rowspan="2">Chl a (µg L-1)</th><th rowspan="2">Total Phosphorus (TP) (µg P L-1)</th><th rowspan="2">FRP (µg P L-1)</th><th rowspan="2">Total Nitrogen (TN) (µg N L-1)</th><th rowspan="2">NOx (µg N L-1)</th><th colspan="2">DO (%sat)</th><th rowspan="2">Turbidity (NTU)**</th><th rowspan="2">Ammonia NH4+ (µg N L-1)</th><th colspan="2">pH</th><th rowspan="2">Conductivity (μScm^{-1})</th></tr>
<tr><th>lower</th><th>upper</th><th>lower</th><th>upper</th></tr>
<tr><td>No data</td><td>100</td><td>40</td><td>1000</td><td>100</td><td>90</td><td>No data</td><td>50</td><td>100</td><td>6.5</td><td>9.0</td><td>5000</td></tr>
</table>
* Note: Physical-chemical indicator and guideline value for slightly disturbed ecosystems.
** Note: Turbidity and SPM are highly variable and dependent on seasonal rainfall runoff.</td></tr>
<tr><td>Responsibilities</td><td>The Quarry Manager or designated authorised person will be responsible for the implementation of this SMP.</td></tr>
<tr><td>Strategies / Mitigation Measures</td><td><u>Sediment Basin and Clean Water Dam Infrastructure</u>

The infrastructure required to manage stormwater for the existing and future operations at the Site defined by the International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control (BPESC) guidelines, and are comprised of a number of sediment basins, clean water dams and associated drainage infrastructure. The location and size of the sediment basins and associated infrastructure are outlined within a series of drawings listed below corresponding with the staged development of the Site.</td></tr>
</table>

	Drawing No. 1901.DRG.082R2 – Stormwater Management Plan (2022) **Drawing No. 1901.DRG.067R4 – Stormwater Management Plan - Stage 1** **Drawing No. 1901.DRG.068R4 – Stormwater Management Plan - Stage 2** **Drawing No. 1901.DRG.069R4 – Stormwater Management Plan - Stage 3** **Drawing No. 1901.DRG.070R4 – Stormwater Management Plan - Stage 3a** **Drawing No. 1901.DRG.012R1 – Hanson Magill Concrete Water Management Plan** Each sediment basin and clean water dam are to be operated and maintained in accordance with **Section 4 - Stormwater Quality Management** and the requirements below: • Freeboard must be maintained in each sediment basin and clean water dam prior to rainfall events occurring to ensure adequate capture volume is available to meet the design criteria • Appropriate pumping infrastructure (or equivalent system) should be identified and maintained in order to manage freeboard • Where water is required to be discharged offsite from Sediment Basin 2 (SB2) water quality shall be assessed against the water quality turbidity criteria of 50 NTU prior to discharge. Where water quality criteria exceeds the 50 NTU trigger, an investigation shall be undertaken to determine the cause of the exceedance and identify any required corrective action. ***Prevention of Incident Stormwater Runoff*** • Prevent stormwater contacting any wastes or contaminants by ensuring drainage lines are cleared, and drain away from stockpiles and disturbed areas at all times including the clean water drainage line downstream of Giles Gully Dam. • Stormwater which has not been in contact with contaminats resulting from the extractive industry activities must pass through the Site in a controlled manner and at non-erosive flow velocities as far as reasonable and practical. • Minimise erosion resulting from rain, water flow and / or wind. • Minimise adverse effects of sediment runoff, with respect to all safety requirements. • Ensure that use of land / properties adjacent to the development are not diminished as a result of the adopted SMP measures. • Manage Site entry / exit points to minimise the risk of sediment being tracked onto public roadways. ***Diversion of Upstream Runoff*** Clean water diversion bunds and drains are to divert cleanwater away from disturbed areas wherever practical. Drains and bunds should have vegetation coverage where applicable or stabilised using an alternative material (rock lined, geofabric, erosion matting etc.). This coverage is required to be in-place at all times. Where vegetation cover is required to be enhanced, seeding of the exposed areas using approved grass species may be required. The grass species will be required to have the following characteristics (as per IECA 2008). • Plants with a fibrous root system • Plants that primarily grow horizontal rather than upright clumping plants • Leguminous plants • Non-invasive plants. ***Minimisation and Cleaning of Disturbed Areas*** Wherever possible, disturbed areas are to be minimised by: • Progressive rehabilitation of disturbed areas • Increased impervious hardstand areas and roof areas over and around workshop areas • Prevention of vegetation clearing wherever practical and • Diversion of stormwater around disturbed areas.

Cleaning of hard stand and disturbed areas should be carried out without using water as appropriate, and all spills shall be contained and cleaned in accordance with Hansons spill management procedures.

Oil Separators, and Bunding of Fuels and Chemicals

Clearly designate storage areas and do not deviate from assigned bunded areas for storage of chemicals and fuels unless a suitable secondary bund is provided. Oil separators to be provided where necessary.

- All petroleum product storage tanks must be bunded according to Australian Standard (AS) 1940 *The storage and handling of flammable and combustible liquids* and the EPA Guideline: EPA080/16 Bunding and spill management. All empty drums must be stored on a concrete hardstand area with their closures in place
- Drains or bunds must be provided to ensure stormwater runoff is excluded from the contaminated area.

Storing and handling of hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids in accordance with the relevant legislative requirements and AS including but not limited to the provisions of:

- AS 1692:2006 – *Steel tanks for flammable and combustible liquids*
- AS 3780:2008 – *The storage and handling of corrosive substances*
- AS 1940:2004 – *The storage and handling of flammable and combustible liquid*
- AS 3833:2007 – *Storage and handling of mixed classes of dangerous goods, in packaged and intermediate bulk containers*

Erosion and Sediment Control (ESC) – Operation Phase

- ESC structures must be maintained at all times during the period of quarry operation and regularly checked to inform repairs or replacement as required
- The sediment basins and ponds must be maintained on the Site throughout the quarry operation phase and until all remaining disturbed areas are rehabilitated
- Sediment collected in sedimentation basin(s) must be removed whenever the volume of the basin is reduced by 30 percent, or where a build-up of sediments has occurred or may occur around the outlet structure
- Effective erosion and sediment controls must be provided and maintained during Site clearing and construction of works. Such measures must include diversion drainage works and temporary sedimentation traps
- Diversion drains, appropriate earthworks grades or equivalent must be installed to ensure surface waters from disturbed areas, including operational or trafficable areas, are diverted to the sediment control system
- All runoff from the stockpiles and the areas utilised for the operation of the stockpiles must be directed to the sedimentation pond(s)
- Drainage through and from all trafficable areas and production activities must be designed to minimise surface flow velocities
- There must be no disturbance to, filling or obstruction of any part of a natural watercourse channel unless authorised by the Mining Regulator.

Stockpiling of Materials

Staging of works should minimise disturbed areas for stockpiling as far a practical. Stockpiles must be:

- Adequately protected from concentrated surface flow and excessive upslope stormwater surface flows
- Placed to direct drainage water to sediment basin systems where possible in event of surface water runoff

	• Maintained with dust suppression techniques when possible. ***<u>Magill Concrete Plant Stormwater Management</u>*** • Concrete yard surface flow shall be managed by a series of gutters, diversion humps, spoon drains and graded areas creating elevations to segregate surface flows (ph effected) from dirty areas (sediment laden) within the Site • Process waste water generated through the washout of concrete bowls on returning to the plant from deliveries shall be directed into a series of wedge pits as defined by the yellow area within **Drawing No. 1901.DRG.012R1 – Hanson Magill Concrete Water Management Plan** • All water management structures must be maintained at all times during the period of operation and regularly checked to inform repairs or replacement as required • Sediment collected in wedge pits must be removed whenever the volume of the pit is reduced by 30 percent, or where a build-up of sediments has occurred or may occur around the outlet structure • Diversion drains, appropriate hard stand grades or equivalent must be installed to ensure surface waters from concrete batching processing areas, including operational or trafficable areas, are diverted to the sediment control system and reused within the operation.
Auditing	Stormwater management reviews are required to be carried out on a periodic basis to assess the implementation of the management strategies. An audit of the Site shall be undertaken prior to winter to ensure any improvements are identified and implemented prior to the higher risk period.
Identification of Incident or Failure	Non-compliance with the performance criteria herein will be identified by: • Captured stormwater in sediment basin or silt traps exceeds sediment basin capacity occurring from the design rainfall event • Build-up of sediment within sediment basins exceeds 30 percent of the sediment basin volume • Excessive erosion on the Site • Release of contaminants from the Site • Poorly maintained, damaged or failed stormwater management devices • Uncontrolled release from Site occurring from the design rainfall event • Non-compliant water quality being released from Site occurring from the design rainfall event.
Corrective Action	The Quarry Manager or authorised representative shall be responsible for identification of an incident or failure and completion of corrective actions. Following identification of incident or failure, the source / cause is to be immediately identified and corrective actions implemented with records kept preventing future incidents occurring.
Internal Reporting	A copy of all incidents and complaints will be stored at the Site within the incident and complaint register. All engineering, administrative and management control measures applied at the Site will be subject to annual performance review by the Quarry Management team to evaluate the effectiveness of mitigation strategies.
External Reporting	Reporting of non-compliance events including discharge of contaminants from the Site are to be reported to the Mining Regulator and or the EPA in accordance with approval requirements.

An inspection and maintenance program should be implemented as detailed in **Table 2 – Inspections and Maintenance of Erosion and Sediment Control Devices**. A summary schedule of the various inspections, performance criteria and responses that shall be performed onsite are outlined below.

Table 2 – Inspections and Maintenance of Erosion and Sediment Control Devices

Device	Minimum Frequency	Performance Criteria	Required Actions
Sediment Basins / Cleanwater Dams / Ponds	Annually, prior to winter season Weekly during winter. Following rainfall event of 45 mm	• Adequate freeboard volume available, excess sediments removed prior to winter (basin should not lose more than 30 percent capacity)	• Captured water to be reused onsite and treated as required for use in operations • Where captured water volume exceeds the water demand for the Site, water quality shall be assessed against the water quality criteria for the Site prior to controlled release • Where the rainfall event experienced exceeds a sediment basins capacity, inspect the discharge water quality and the functionality of the sediment basin
Inspect drainage lines including catch drains, contour drains and diversions	Annually, prior to winter season Weekly during winter Following rainfall event of 45 mm	• Erosion in areas adjacent to water conveyancing structures	• Eroded areas shall be rehabilitated / rip rapped as soon as practicable
		• Overtopping of water conveyancing structures (i.e. clean water diversion drains) (identified by the scouring of the drain batters perpendicular to the direction of flow)	• Eroded areas shall be repaired and stabilised
Concrete Plant pit and storage tanks	Monthly	• Excess sediments removed (pit capacity should not lose more than 30 percent capacity)	• Captured water to be reused within the concrete batching process. • Ensure that waste material is appropriately removed from Site
Concrete Plant pit and storage tank free board	Daily weather observations	• Adequate free board volume available	• Ensure that adequate free board is maintained and established prior to heavy rainfall events
Concrete returns area	Monthy and prior to forecast rain	• Ensure first flush basins have capacity	• Captured water to be reused onsite and treated as required for use in operations
Waste containers	Monthly	• Waste is stored in appropriate containers • Waste receptacles labelled	• Ensure waste material is stored and disposed of properly in accordance with legislative requirements
Spill response stations	Monthly and following use	• Spill kits located onsite • Equipment is properly maintained	• Maintain equipment • Replace used equipment

Device	Minimum Frequency	Performance Criteria	Required Actions
Maintenance / refuelling area	Monthly	• Fuel, oil spills	• Clean up fuel spills and investigate source
		• Equipment maintenance	• Maintain equipment maintenance records
		• Fuel storage integrity maintained	• Investigate and repair potential leaks

3. Stormwater Quantity Management

3.1 Stormwater Hydrology

The stormwater quantity management objective for the extractive areas of the quarry is to comply with the IECA BPESC, specifically in capturing stormwater runoff from disturbed areas within the Site, generated by (up to and including) a 5-day 95th percentile rainfall event to be retained onsite for stormwater quality treatment.

Given the level of complexity on the Site with regards to stormwater hydrology, a runoff-routing hydrological model was established to fully examine the performance of the Site to meet the proposed storm duration rainfall event and retention ability of the sediment basins at the Site.

3.1.1 Hydrologic Modelling

Hydrologic modelling was undertaken using DRAINS (a computer simulation program by Watercom). Site-based rainfall polynomial coefficients were obtained using the Intensity-Frequency-Duration (IFD) generation tool, available on the Bureau of Meteorology (BoM) website. The IFD data is shown in **Table 3 – Intensity Frequency Duration (IFD) Data**.

Table 3 – Intensity Frequency Duration (IFD) Data

Duration of Rainfall	Average Recurrence Interval (1:n years)						
	1	2	5	10	20	50	100
5 mins	51.4	67.6	88.4	103	123	152	176
6 mins	48.0	63.0	82.4	95.8	114	141	164
10 mins	38.8	50.8	66.0	76.5	91.0	112	129
20 mins	27.7	36.1	46.3	53.2	62.8	76.7	88.2
30 mins	22.2	28.8	36.7	42.1	49.5	60.1	68.9
1 hour	14.8	19.2	24.2	27.5	32.3	39.0	44.5
2 hours	9.79	12.6	15.8	17.9	20.9	25.1	28.6
3 hours	7.69	9.91	12.3	14.0	16.2	19.5	22.1
6 hours	5.09	6.54	8.09	9.12	10.6	12.6	14.3
12 hours	3.30	4.24	5.23	5.89	6.82	8.13	9.21
24 hours	2.04	2.63	3.26	3.68	4.28	5.12	5.81
48 hours	1.18	1.53	1.93	2.19	2.57	3.10	3.54
72 hours	0.841	1.09	1.39	1.59	1.87	2.26	2.59

Note: All rainfall intensities in mm/hr.

3.1.2 Existing Site – Hydrology Parameters

Current catchment details for the Site including associated hydrology features are shown in **Drawing No. 1901.DRG.082R2 – Stormwater Management Plan (2022)** and outlined in **Table 4 – Existing Catchment Details**. The schematic of the DRAINS model is shown in **Diagram 1 – DRAINS Model Schematic Existing Site**.

Table 4 – Existing Catchment Details

ID	Catchment Area (ha)	Disturbed / Clean	Discharge Point
Catchment Q1	26.5	Disturbed	Quarry Sump
Catchment C1	305.5	Undisturbed	Giles Gully Conservation Park Dam
Catchment C2	3.14	Disturbed	Sediment Basin SB3
Catchment C2A	2.11	Disturbed	Existing Pond
Catchment C3	0.88	Disturbed	Sediment Basin SB4
Catchment C4	3.92	Disturbed	Existing Sediment Basin SB1
Catchment C4A	4.66	Undisturbed	Existing Piped Network
Catchment C4C	1.40	Disturbed	Low / ponding area
Catchment C5	9.85	Disturbed	Existing Sediment Basin SB2 via grid
Catchment U1	4.38	Undisturbed	Existing Storage Dam SD1
Catchment U2	25.31	Undisturbed	Existing Storage Dam SD2
Catchment U3	3.54	Undisturbed	Existing Piped Network
Catchment U4	109.63	Undisturbed	Cleanwater drainage system
Catchment U5	6.68	Undisturbed	Cleanwater drainage system

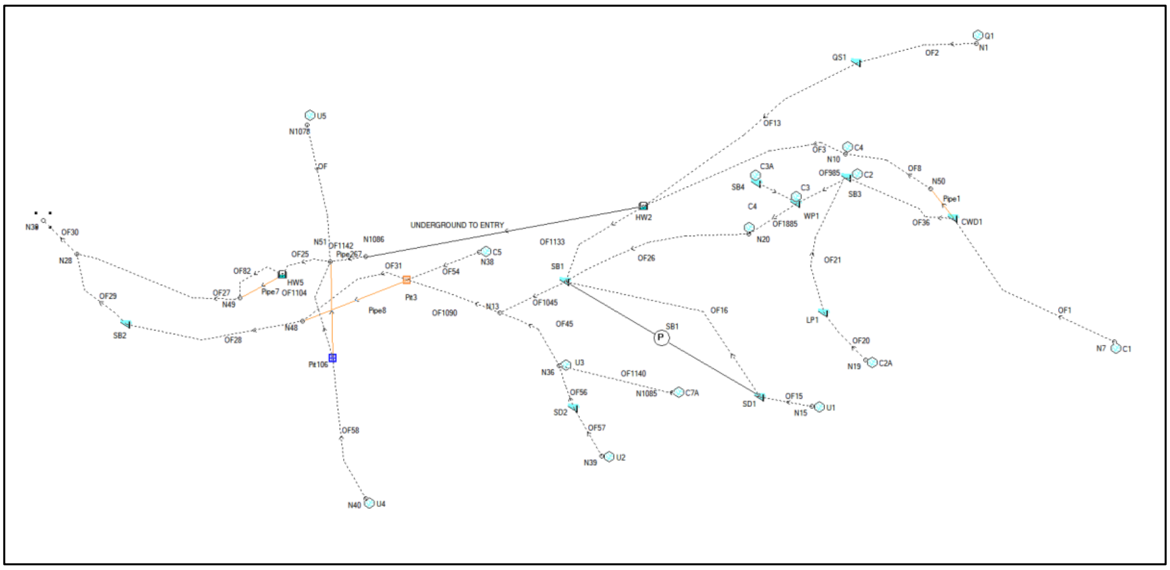


Diagram 1 – DRAINS Model Schematic Existing Site

3.1.3 Existing Site Modelling Results and Associated Discharge Volumes

Estimated discharge volumes are shown in **Table 5 – Estimated Discharge Volumes – 1 in 5 year ARI 6 hour Duration Rainfall Event (Existing Site)**, based on the hydrologic assessment undertaken. The results of the simulation are also shown in **Diagram 2 – DRAINS Schematic – IECA 95th Percentile Retention Simulation**.

As shown, there are no releases expected from all storage dams and sediment basin structures for a 1 in 5 year ARI, 6 hour duration rainfall event, which simulates a total rainfall depth of 48.6 mm (higher than the IECA 95th 5-day depth), provided the water surface levels are able to be managed prior to the event to ensure adequate freeboard is available. The model is limited to the input data and survey available at the time of writing this report.

Table 5 – Estimated Discharge Volumes – 1 in 5 year ARI 6 hour Duration Rainfall Event (Existing Site)

Discharge Location	Volume released (ML)
Sediment Basin SB1	0.0
Sediment Basin SB2	0.0
Sediment Basin SB3	0.0
Sediment Basin SB4	0.0
Storage Dam SD1	0.0
Storage Dam SD2	0.0
Quarry Sump	0.0
Giles Gully Dam	0.0

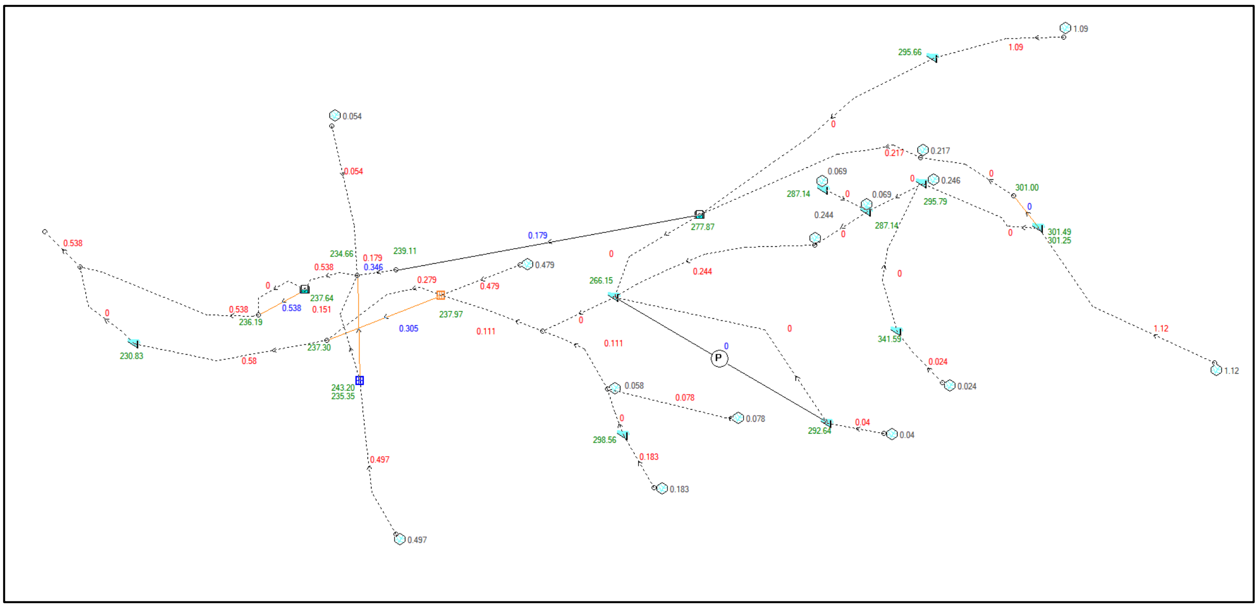


Diagram 2 – DRAINS Schematic – IECA 95th Percentile Retention Simulation

4. Stormwater Quality Management

4.1 Design Criteria

Stormwater runoff from disturbed areas of the Site, generated by (up to and including) a 5-day 95th percentile rainfall event is proposed to be captured by a sediment basin system onsite or managed to remove contaminants prior to offsite discharge.

In addition to the above retention criteria, the final sediment basin system prior to discharging into the receiving waters (SB2A & SB2B) is proposed to include an automatic flocculant dosing system (High Efficiency Sediment Basin) for ensuring optimal water quality treatment and industry best practices are achieved.

Details of all proposed stormwater management measures including sediment basin details are shown in the following drawings which have been developed to correlate with the staged development of the Site.

Drawing No. 1901.DRG.082R2 – Stormwater Management Plan (2022)
Drawing No. 1901.DRG.067R4 – Stormwater Management Plan - Stage 1
Drawing No. 1901.DRG.068R4 – Stormwater Management Plan - Stage 2
Drawing No. 1901.DRG.069R4 – Stormwater Management Plan - Stage 3
Drawing No. 1901.DRG.070R4 – Stormwater Management Plan - Stage 3a

All surface water from within the footprint of the Magill Concrete Batching area as outlined within **Drawing No. 1901.DRG.012 – Hanson Magill Concrete Water Management Plan** is captured and reused within the concrete batching process described within **Section 5 - Magill Concrete Batching Plant**.

4.2 Sediment Basin Design Details

The total upper settling storage requirements for sediment basins are estimated based on the following formula (IECA 2008):

$Vs = 10 \times A * Cv * R_{(Y\%, 5\text{-day})}$, where:
A = Catchment Area (Ha)
Cv = Coefficient of Discharge
R = Rainfall depth (m) from 95th Percentile, 5-day rainfall event

Table 6 – Existing Sediment Basin Storage Requirements details the sediment basin storage requirements, based on a rainfall depth (R) of 45.78 mm, (1 year ARI, 120h intensity source: Bureau of Meteorology).

Table 6 – Existing Sediment Basin Storage Requirements

Stage	Basin ID	Location	Catchment Area (Ha)	Upper Settling Volume (ML)	Sediment Storage Volume (ML)	Total Volume (ML)
Existing Case	SB1	Catchment C4	3.92	1.22	0.61	1.83
	SB2A^	Downstream entry	9.85	2.85	0.80	3.65
	SB3	Catchment C2	3.14	0.98	0.49	1.47
	SB4	Catchment C3	0.88	0.27	0.14	0.41
	QS1	Quarry Sump	15.63	4.87	2.43	7.30

^ SB2A is a High Efficiency Sediment (HES) Basin

The details of the proposed layout for the existing sediment basins are included **in Drawing No. 1901.DRG.082R2 – Stormwater Management Plan - (2022)**. The sediment basins are to be maintained in accordance with **Section 2 Operational Procedures**, including ensuring that sediment collected in the basins are removed whenever the basin is reduced by 30 percent.

3.1.4 Future Quarry Development

It is proposed to apply the same IECA design criteria for the future development of the quarry. The proposed design details for the future retention volume capacity of the quarry sump storage are shown below in **Table 7 – Future Sediment Basin Storage Requirements**, and are also shown on the respective drawings associated with each stage of quarry development outlined below.

Drawing No. 1901.DRG.067R4 – Stormwater Management Plan - Stage 1
Drawing No. 1901.DRG.068R4 – Stormwater Management Plan - Stage 2
Drawing No. 1901.DRG.069R4 – Stormwater Management Plan - Stage 3
Drawing No. 1901.DRG.070R4 – Stormwater Management Plan - Stage 3a

Table 7 – Future Sediment Basin Storage Requirements

Stage	Basin ID	Location	Catchment Area (Ha)	Upper Settling Volume (ML)	Sediment Storage Volume (ML)	Total Volume (ML)
Stage 1	QS1	Catchment Q1	26.50	8.25	4.13	12.38
Stage 2	QS2	Catchment Q1	31.57	9.83	4.92	14.75
Stage 3	QS3	Catchment C2	7.43	2.31	1.15	3.46
Stage 3a	QS2	Catchment Q1	41.08	12.79	6.39	19.18

5. Magill Concrete Batching Plant

Surface waters derived from the concrete plant footprint are harvested, treated and recycled, refer **Drawing No. 1901.DRG.012R1 – Hanson Magill Concrete Water Management Plan**. Additional water when required (i.e. summer periods) is supplemented using fresh water sourced from SB1 and Storage dams SD1 and SD2.

Yard surface flow is managed by a series of gutters, diversion humps, spoon drains and graded areas creating elevations for drainage systems into different flow paths segregating contaminated surface flows (pH effected) from dirty areas (sediment laden).

Process wastewater generated through the washout of concrete bowls on returning to the plant from deliveries, are directed to a series of wedge pits as per the area marked yellow in **Drawing No. 1901.DRG.012R1 – Hanson Magill Concrete Water Management Plan**.

A pump in the wedge pit is activated by a float switch to automatically pump the water to the 99 kilolitres (kL) water storage tank. The water is then re-used for future washout purposes. This is a closed loop system allowing water to be continuously re-used.

Wash down water from the slump stand and yard area is directed to the ground pit area (interceptor pit) to settle suspended sediments before it is pumped to storage tanks for re-use in the concrete mix (via the loading bay) exiting the Site in concrete loads as product.

In 2006 Hanson installed a closed circuit recycled water management system. The first flush system is integrated into the Sites recycled water management system as described below.

The contaminated surface area (production area) of the Site is 980 metre squared (m^2) therefore representing 19.8 kL of first flush water (first 20 mm of rainfall) requiring capture. It is noted that the first flush capacity is restored after 1 day of operation based on concrete production recycled water usage.

A pump installed in the 46 kL interceptor pit is activated by a float switch to automatically pump the water to a series of tanks with a total capacity of 128 kL for re-use in batching exiting the Site in concrete loads as product. The float switch is set to maintain a level allowing 20 kL catchment capacity.

All pits, storage tanks, pumps and float switches are inspected monthly and routinely maintained. The ability of the first flush system to maintain capacity requires routine maintenance of water storage tanks. A monthly maintenance schedule is in place to inspect and where required remove cementitious silts via an industrial vacuum truck. Alkaline solutions (slurry) are removed by a third party contractor and disposed at an appropriated licensed facility. Waste tracking forms are completed and retained onsite in accordance with EPA guidelines (EPA 416/07 Waste tracking form).

The installation of additional storage capacity of 37 kL was installed in March 2018 enabling the plant to store greater volumes of water for re-use and reduce pumping costs associated with obtaining fresh water from SB1 and Storage dams SD1 and SD2.

6. Site Water Balance

6.1 Water Balance Objectives

The water balance assessment was considered for the existing operation and each proposed stage of mining considering inputs/outputs including the following assessment components:

- rainfall;
- water demand and re-use (onsite);
- water use for dust suppression;
- water demand of downstream users natural environment and GDE's (maintaining flows);
- water storage requirements for high bushfire prone areas;
- water draw from dams;
- waste waters generated from operations including contaminated wastewater generated by concrete operations;
- losses (e.g. evaporation, seepage etc), and
- wastewater disposal.

6.2 Water Balance Input Data

Rainfall data was sourced from the Bureau of Meteorology (BoM) for Mount Lofty (023810) for the water balance, which is 4.86 kilometres (km) from the Site. To inform the calculations of the water balance daily rainfall records were downloaded and used for a higher degree of accuracy.

6.2.1 Average Rainfall

The year 1999 was selected for examining an 'average rainfall' scenario, with an annual rainfall depth of 997mm recorded, which is comparable to the mean rainfall of 972mm (within 3% difference based on annual total).

6.2.2 Mean Daily Evaporation

Mean Daily Evaporation data was sourced from BoM for Adelaide West Terrace Station (023000) as it was the closest available (approximately 12.0 km away). A coefficient of 0.8 was applied to the mean pan evaporation rates to take into account the high shading effect experienced at the quarry. The adopted values are shown below in **Table 8 – Mean Daily Evaporation (adopted).**

Table 8 – Mean Daily Evaporation (adopted)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
mm	6.4	5.68	4.64	2.96	1.92	1.44	1.36	1.84	2.72	3.76	4.8	5.76

6.2.3 Exfiltration

There is no anticipated exfiltration as the dams and basins are either impervious or not connected to the groundwater.

6.2.4 Runoff coefficients

The water balance assessment was estimated based on the hydrological parameters shown in **Table 9 –Runoff Coefficients**.

Table 9 – Runoff Coefficients

Rainfall (mm)	10	20	30	40	50	60	70	80	90	100
Quarry	0	0.43	0.56	0.63	0.69	0.74	0.77	0.79	0.81	0.83
Batch Plant	1	1	1	1	1	1	1	1	1	1

The runoff coefficients assume an initial loss for rainfall up to 20mm (i.e no runoff), and then 'clay type' conditions for rainfall of equal or greater than 20mm for the contributing catchments to represent the quarry areas, and a runoff coefficient of 1.0 for the concrete batch plant (impervious areas).

6.2.5 Daily Water Demand

The daily water demand for the quarry was comprised of the following data (provided by Hanson):

- Concrete batching plant demand per day – 52 kL/d
- Concrete slumping per day – 7.5kL
- Water demand for dust suppression over the quarry:
    - Summer / Spring months - 150kL/d
    - Winter months – 0kL/d
    - Autumn months – 10kL/d
- Water demand for other processes within the quarry i.e. pug mill - 3kL/d
- Concrete Batching and Quarry operating 5.5 days per week (weighted to 285 days/yr)
- Applied annual usage overall (upper limit) = 60ML/y

6.3 Water Balance Assessment Results

The water balance assessment results are shown in **Table 10 – Water Balance Assessment Results** for each of the stages of quarry development. Refer to **Appendix 2 – Water Balance Assessment Details** for details.

Table 10 – Water Balance Assessment Results

Parameter	Concrete Batch Plant	SB1	SB2	SB3	SB4	Storage Dams SD1 / SD2
Total inflow (ML)	0.98	17.93	45.07	14.4	2.92	34.40
Total evaporation (ML)	Nil	0.78	1.57	0.80	0.26	1.58
Usage demand operations (ML)	17.10	40.36	Nil	Nil	Nil	Nil
Recycled for operations (ML)	Nil	14.88	n/a	Nil	Nil	25.6
Treated release volume (ML)	0.01	nil	37.90	5.10	1.70	n/a
Overflow release volume (ML)	0	3.03	5.77	4.58	1.10	9.74
Overflow releases (count)	***0***	***2***	***4***	***5***	***4***	***2***

The above overflow releases are provided for each individual basin simulated in isolation. Taking into consideration the timing of the simulated overflow releases and the network configuration, specifically where SB2 is the last basin in sequence before the designated Site offsite discharge point, the predicted total overflow release count from the Site is five (5).

6.3.1 Concrete Batching Plant

As detailed in the results, there is adequate capacity to contain all contaminated water in the concrete plant footprint through harvesting and reuse back into operations. Approximately 1kL of water per year is expected to discharge from the concrete plant footprint upon being surplus to operational needs and first flush capacity from direct surface water runoff. This runoff is not expected to contain pH affected water provided the first flush system maintains the required 19.8kL available capacity. Any overflow is collected in the Sediment Basin SB2 system for monitoring and treatment prior to discharge from the site. An operational shortfall of approximately 16ML per annum is supplied via the SB1 / Storage dams for topping up the batching plant tanks as required.

6.3.2 Sediment Basin SB1 & Storage Dams

Sediment Basin SB1 includes a pumping system to connect with the upper Storage Dams SD1 & SD2, for both returning surplus water from SB1 or sourcing additional water for reuse. Most of the quarry and concrete batching plant operations are operated around this system.

Based on direct surface water catchment runoff, there is approximately a 25.6ML per annum shortfall of water that reports to SB1. This shortfall is sourced via pumping from the storage dam system. Approximately 3.03ML/y is discharged as overflows above the retention capacity of SB1 during an average year, spread across an estimated 2 overflow events (i.e where rainfall exceeds the 5-day 90th percentile).

Similarly, the storage dams are estimated to overtop 2 times in an average year, with corresponding 9.74ML/y being discharged into the clean water drainage system.

The storage dams are expected to hold water all year round and will be suitable for bush fire management, with a surplus of 7.3ML on an average year of inflows remaining after an assumed 25.6ML being pumped to SB1 for operational reuse and approximately 1.6ML per year of evaporation losses.

6.3.3 Sediment Basin SB2

Sediment Basin SB2 is being upgraded to include a High Efficiency Sediment Basin (HES Basin) system (denoted SB2A). This system offers significant improvements to water quality treatment at the quarry, with the ability to automatically treat and release up to an estimated 37.9ML from a total annual inflow of 45.07ML each year. This basin is not required to harvest surface water for the purpose of operations at the quarry and quality of discharge remains the key criteria for management of the SB2 system.

The existing Sediment Basin SB2 (now denoted SB2B) will remain in place as an additional fail safe retention option to further treat and capture overflows from SB2A.

6.3.4 Sediment Basin SB3 & SB4

Sediment Basin SB3 and SB4 treat minor upper catchments in the short to medium term quarry. As outlined in the water balance results, around 5.1ML and 1.7ML is expected to require treatment in an average rainfall year via settling in Sediment Basin SB3 and SB4 respectively. Around 4.58ML and 1.1ML is expected to overflow SB3 and SB4 respectively, with any overflows entering the SB1 and SB2 systems prior to discharging from the site.

6.3.5 Quarry Pit – Future Stages

The Quarry Pit will be developed in all future stages to be self draining with a sump allocated for surface water containment. A water balance was undertaken to determine likelihood of overtopping and treated discharge as shown in **Table 11 – Quarry Pit Volumes.** It is assumed that flocculation will not be required for treatment in the quarry pit, however this will be confirmed via jar testing and monitoring prior to any controlled release occurring. Any uncontrolled overtopping will be directed into the downstream SB1 and SB2 system for treatment prior to discharge from the site.

Table 11 – Quarry Pit Volumes

Parameter	Stage 1	Stage 2 & 3	Stage 3a
Total inflow (ML)	30.71	36.58	47.60
Total evaporation (ML)	2.65	4.59	5.90
Proposed Sump Volume (ML)	8.25	9.83	12.79
Treated release volume (ML/y)	18.20	21.05	27.42
Untreated / overtopping volume (ML/y)	11.12	13.16	17.13

7. Monitoring Plan

Onsite monitoring is conducted in accordance with **Attachment 1 – Hanson White Rock Quarry Water Quality Monitoring Plan** (*Water Data Services, 2021*). Monitoring is focused on turbidity and suspended solids at the point of discharge to the receiving environment against trigger values set out by the ANZECC Guidelines.

The monitoring plan (2021) stipulates 50 NTU as the reporting threshold by which turbidity data should be assessed. This is in reference to default trigger value set by the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000).* Table 3.3.9 of the ANZECC guidelines sets the default trigger value for turbidity and suspended particulate matter (SPM) that are indicative of slightly disturbed ecosystems in south central Australia (low rainfall areas). The trigger value for turbidity (NTU) set by the guideline for upland and lowland rivers is 1-50 NTU.

During the commissioning phase of SB2A, additional water quality monitoring will be undertaken via monthly grab samples to measure the water quality discharge from the outlet of SB2A. Additional water quality monitoring telemetry for NTU will also be installed at the outlet of SB2A to inform the operation of the basin and activation of the automatic shut off system if the 50 NTU criteria is triggered.

All engineering, administrative and management control measures applied at the Site will be subject to annual performance review by the Quarry Management team to evaluate the effectiveness of mitigation strategies in the reduction of suspended solids from the Site.

The annual verification report will demonstrate the effectiveness of mitigation measures through the review of water quality monitoring results and inspection data against the performance criteria for the Site. In the event controls are found to be performing less than satisfactorily, further improvements will be investigated for consideration and implementation.

In the context of Site management where the inspections and monitoring undertaken in accordance **Section 2 - Operational Procedures** reports an incident or failure of the SMP management action is triggered to undertake an investigation aimed to determine the cause of the incident or failure and implement appropriate corrective actions to improve the management measures within the Site.

A detailed Trigger Action and Response Plan (TARP) has been developed for the Site with identification and documentation of site-specific control and management measures required for the effective management of the sediment management infrastructure on the Site, refer **Attachment 2 – White Rock Quarry - Surface Water Management Trigger Action Response Plan (TARP)**.

8. Responsibilities

8.1 Monitoring Management Measures

The following management measures will be implemented during facility operations:

- The Quarry Manager or authorised representative is to regularly inspect the Erosion and Sediment Control (ESC) management devices, particularly prior to forecasted wet weather and following rainfall events as outlined within **Section 2 - Operational Procedures** to ensure that these devices are in good working order and meet the design performance criteria. All inspections are to be documented (including photos) and available onsite at all times
- The Quarry Manager or authorised represenative shall carry out general surveillance to qualitatively assess any stormwater releases from Site during discharge events
- The water quality monitoring programme and associated water quality sampling shall be undertaken by a suitability qualified person.

8.2 Auditing and Review

The effectiveness of the SMP will be reviewed as necessary (e.g. following a change in Site operations) and at least once every year during Q3 to align with the wet season of the Site. The review shall take into account changes to Site activities, available surface water monitoring results, any complaints, pollution incidents and any corrective actions taken.

8.3 Responsibility

The following details the responsibilities with regard to the ongoing management of the SMP;

- The Quarry Manager or authorised representative will be responsible for the implementation of this SMP and for training of Site personnel in their responsibilities in relation to this SMP.
- The Quarry Manager or authorised representative will be responsible for ensuring that all stormwater devices constructed on the Site have adequate free water storage capacity.
- The Quarry Manager or authorised representative will be responsible for ensuring that all complaints pertaining to water quality received will be recorded in the complaints register / log maintained onsite.
- The Quarry Manager or a suitably qualified consultant will prepare water monitoring records if and when required by the Regulatory authority.
- The Quarry Manager or authorised representative shall ensure that records, including results of any monitoring program undertaken onsite, complaints or incidents are retained by Hanson for a minimum of five (5) years.

8.4 Identification of Incident or Failure

An incident or failure may include, but not be limited to:

- Deterioration in surface water quality within waters discharged from Site
- Receipt of a stormwater quality release community complaint
- Evidence or erosion / riling and / or offsite discharges of sediment laden water
- Failure of erosion control structures e.g. bunds and / or drainage features after heavy rainfall events
- Not maintaining onsite stormwater controls or treatment devices in accordance with the requirements of the design rainfall event.

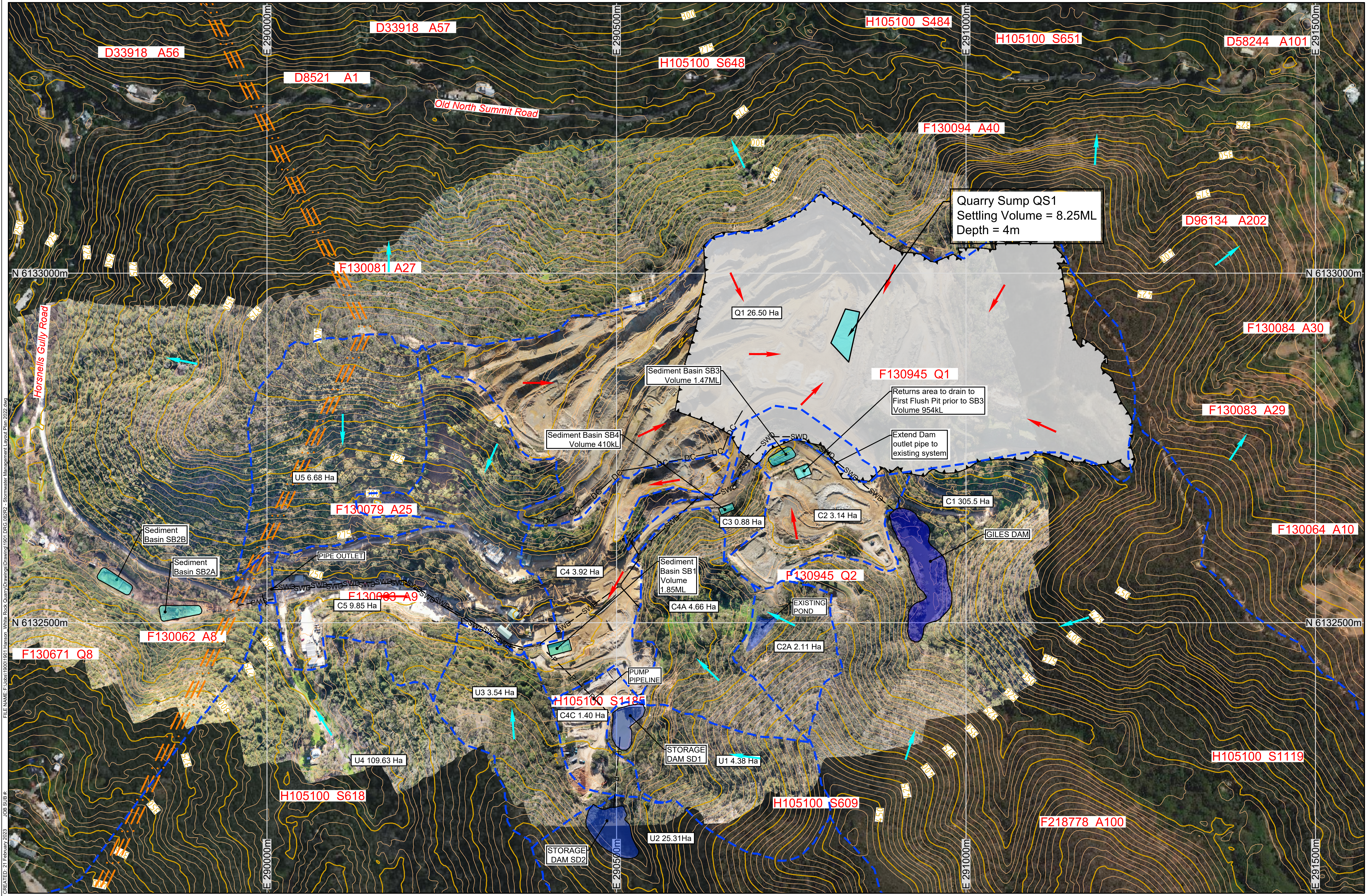
Any identification, investigation and corrective action undertaken in response to an incident or failure will be recorded onsite.

9. Conclusion

This SMP outlines the appropriate treatment measures and operational procedures to be adopted to integrate adequate stormwater management into daily operations and the proposed future development. Specifically, this document has been prepared to ensure that appropriate measures have been developed to meet the requirements of the Site approval conditions and establishes a SMP framework in support of the MOP for the Site.

Operational procedures outlined in this SMP will assist to ensure legislative compliance as a minimum standard.

drawings



REV	DESCRIPTION	DATE	BY
1	Progressive Rehabilitation Modified to Avoid Road Reserve	10-08-20	JHV
2	Pit and Rehabilitation Modified	04-12-20	JHV

Data Sources:
Photography: Groundwork Plus Pty Ltd UAV Photogrammetry, 2020-03-26; 2019-11-19
Topography: LiDAR Sruvey (By Others), 2019-12-06
Cadastre: © The Government of South Australia (DPTI) 2020
Ecosystem:
Other:

Legend:
- Cadastral Boundary
- High Voltage Transmission Cables
- Plant Location
- Catchment Boundary
- Clean Surface Water Flow
- Dirty Surface Water Flow
- —DB— Diversion Bund
- —DC— Diversion Channel
- —P— Pumped Stormwater
- —SWD— Underground Pipe

PROJECT: White Rock Quarry

TITLE: Stormwater Management Plan - (2022)

CLIENT: Hanson Construction Materials Pty Ltd

GROUNDWORK plus
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WWW.GROUNDWORK.COM.AU

SCALE: 1:5,000 When Printed On A3 (0 – 100m)	DRAWING NUMBER: 1901.DRG.082	REVISION: 2
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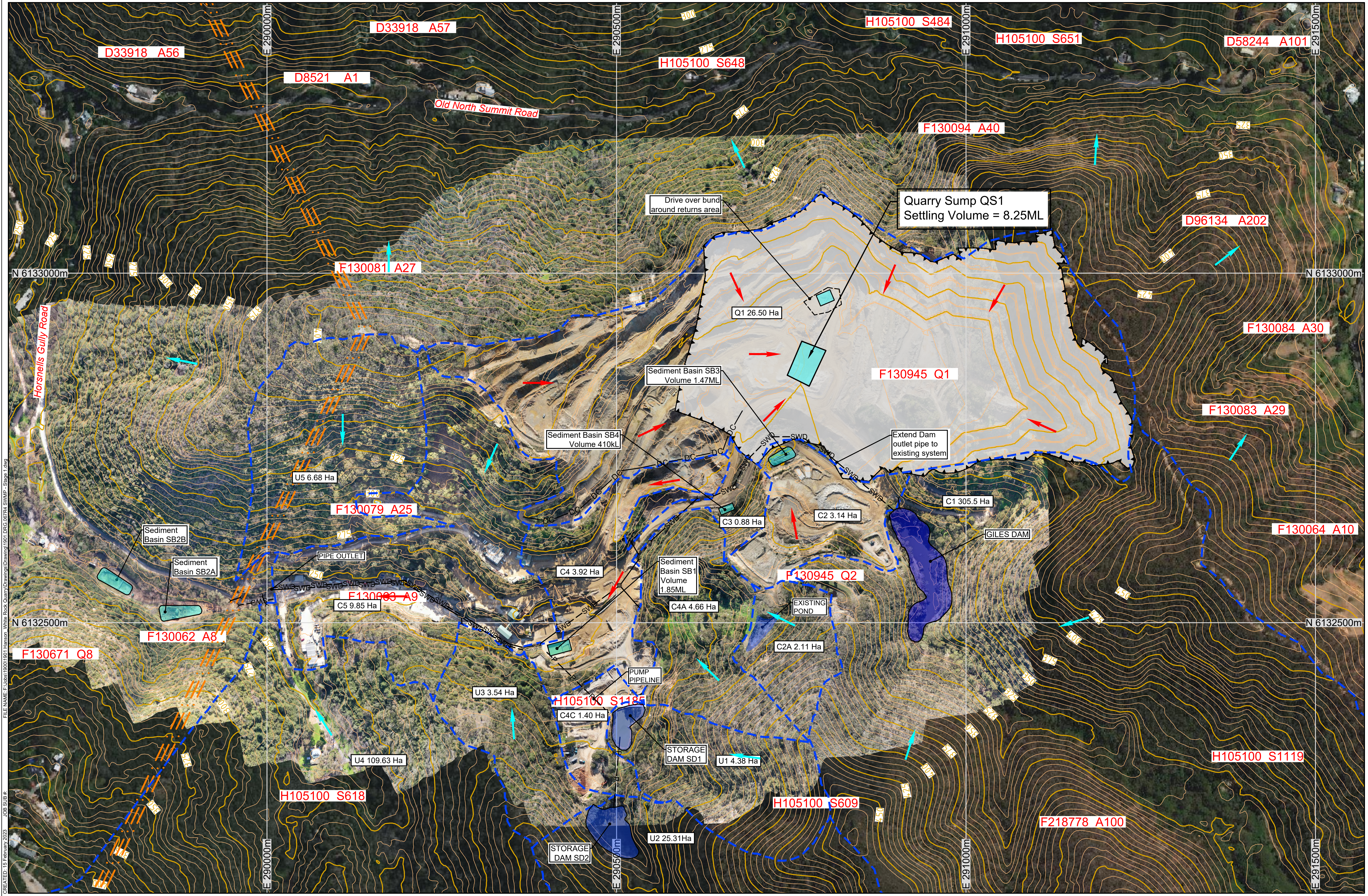
PRINTED: 22 February 2023 / CHECKED: JRowe	MGA / AHD / 54	



REV	DESCRIPTION	DATE	BY
1	Progressive Rehabilitation Modified to Avoid Road Reserve	10-08-20	JHV
2	Pit and Rehabilitation Modified	04-12-20	JHV

Data Sources:
Photography: Groundwork Plus Pty Ltd UAV Photogrammetry, 2020-03-26; 2019-11-19
Topography: LiDAR Sruvey (By Others), 2019-12-06
Cadastre: © The Government of South Australia (DPTI) 2020
Ecosystem:
Other:

Legend:
- Cadastral Boundary
- High Voltage Transmission Cables
- Plant Location
- Catchment Boundary
- Clean Surface Water Flow
- Dirty Surface Water Flow
- —DB— Diversion Bund
- —DC— Diversion Channel
- —P— — Pumped Stormwater
- —SWD— — Underground Pipe

PROJECT: White Rock Quarry

TITLE: Stormwater Management Plan - (Stage 1)

CLIENT: Hanson Construction Materials Pty Ltd

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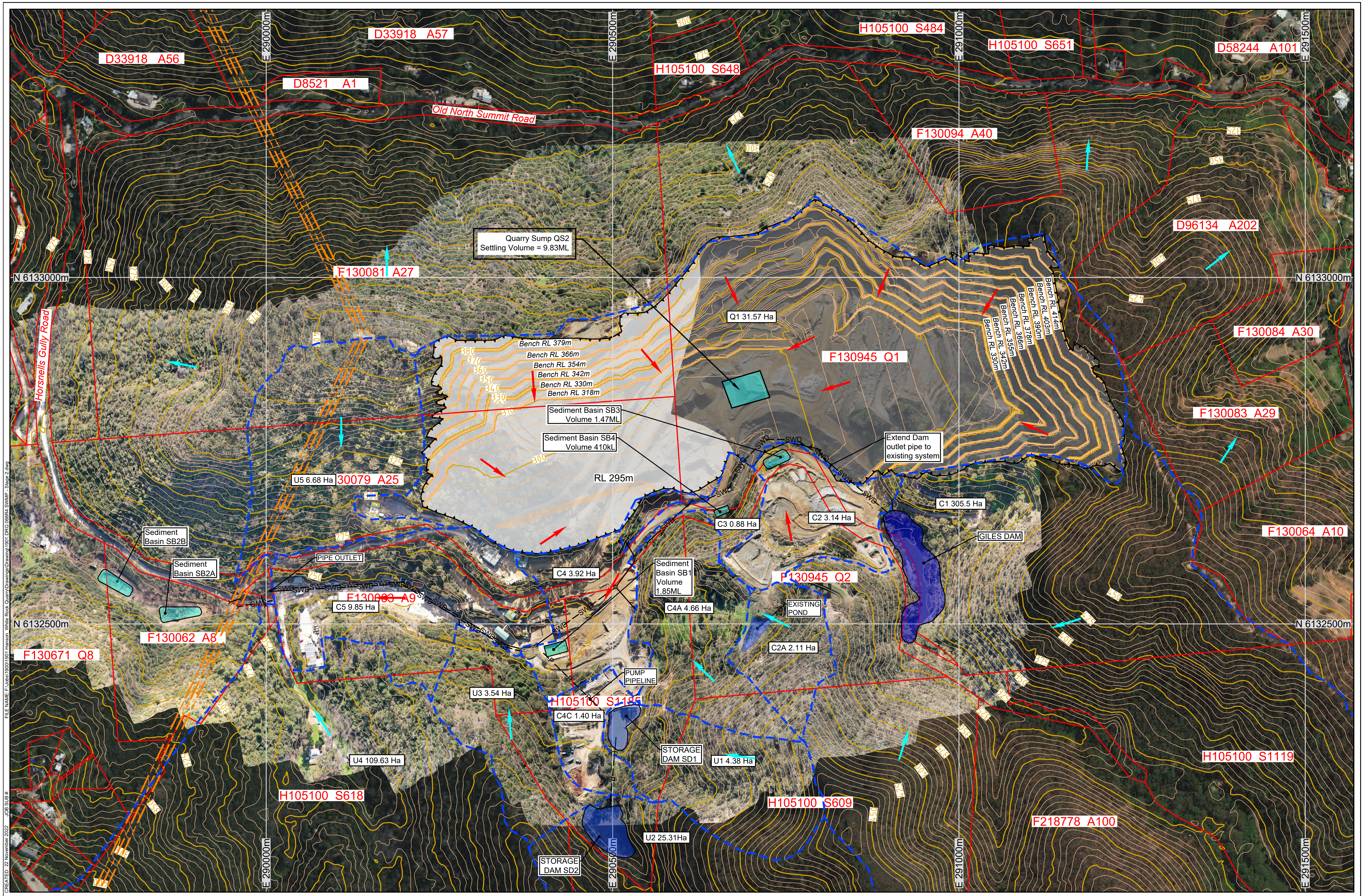
SCALE: 1:5,000 When Printed On A3 | 0 — 100m
DRAWING NUMBER: 1901.DRG.067 | REVISION: 4
DATE: 15 February 2023 | DRAWN: MRescar
PRINTED: 15 February 2023 | CHECKED: JRowe
DATUM: HORIZONTAL / VERTICAL / ZONE MGA / AHD / 54



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1	Progressive Rehabilitation Modified to Avoid Road Reserve	10-08-20	JHV
2	Pit and Rehabilitation Modified	04-12-20	JHV

Data Sources:
Photography: Groundwork Plus Pty Ltd UAV Photogrammetry, 2020-03-26; 2019-11-19
Topography: LiDAR Sruvey (By Others), 2019-12-06
Cadastre: © The Government of South Australia (DPTI) 2020
Ecosystem:
Other:

Legend:
- Cadastral Boundary
- High Voltage Transmission Cables
- Plant Location
- Catchment Boundary
- Clean Surface Water Flow
- Dirty Surface Water Flow
- —DB— Diversion Bund
- —DC— Diversion Channel
- —P— — Pumped Stormwater
- —SWD— — Underground Pipe

PROJECT: White Rock Quarry

TITLE: Stormwater Management Plan - (Stage 2)

CLIENT: Hanson Construction Materials Pty Ltd

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SCALE: 1:5,000 When Printed On A3 (0 — 100m)		DRAWING NUMBER: 1901.DRG.068	REVISION: 4
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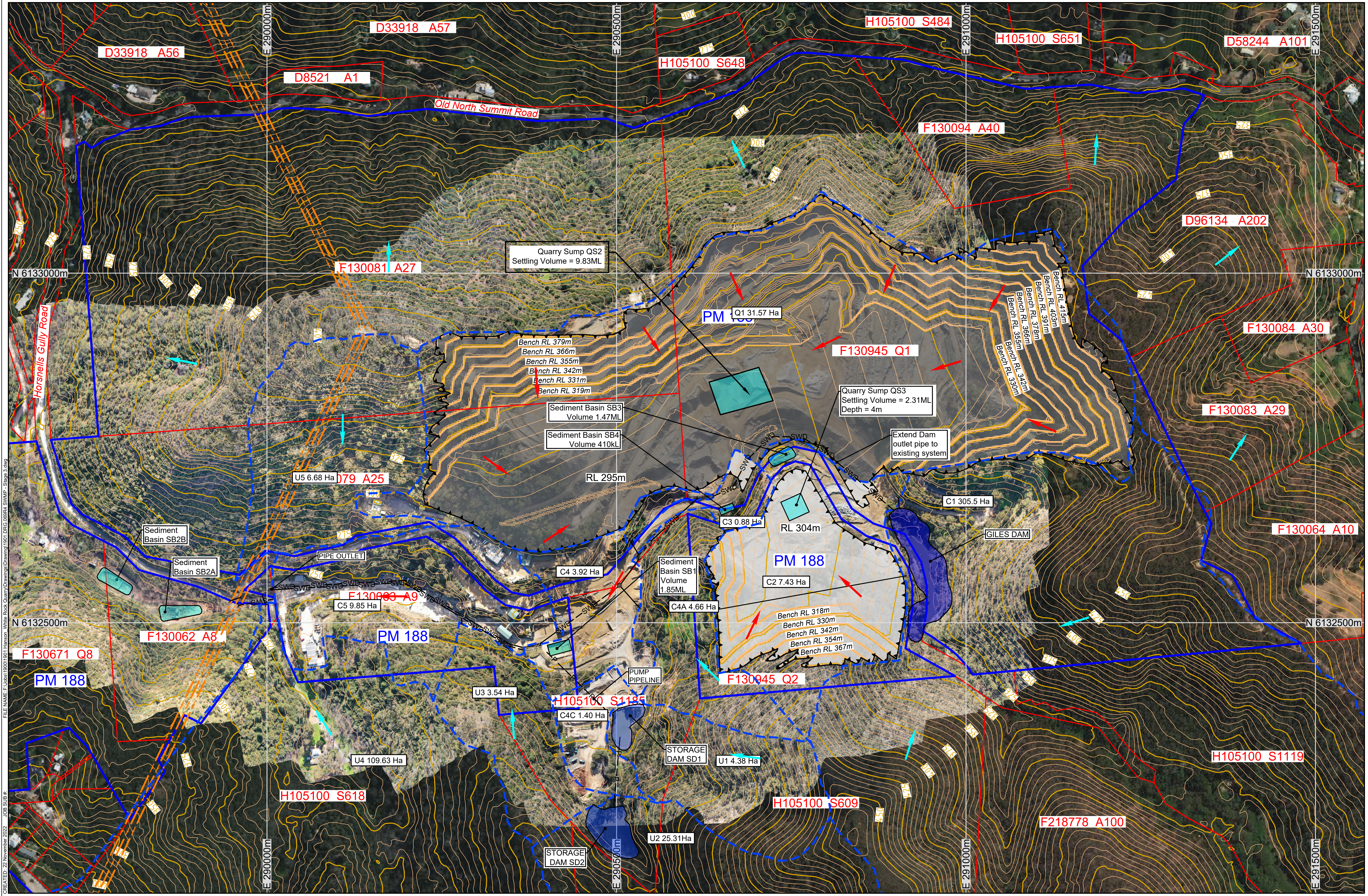

REV	DESCRIPTION	DATE	BY
1	Progressive Rehabilitation Modified to Avoid Road Reserve	10-08-20	JHV
2	Pit and Rehabilitation Modified	04-12-20	JHV

Data Sources:
Photography: Groundwork Plus Pty Ltd UAV Photogrammetry, 2020-03-26; 2019-11-19
Topography: LiDAR Sruvey (By Others), 2019-12-06
Cadastre: © The Government of South Australia (DPTI) 2020
Ecosystem:
Other:

Legend:
- Cadastral Boundary
- High Voltage Transmission Cables
- Plant Location
- Catchment Boundary
- Clean Surface Water Flow
- Dirty Surface Water Flow
- DB — Diversion Bund
- DC — Diversion Channel
- P — Pumped Stormwater
- SWD — Underground Pipe

PROJECT: White Rock Quarry

TITLE: Stormwater Management Plan - (Stage 3)

CLIENT: Hanson Construction Materials Pty Ltd

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SCALE: 1:5,000 When Printed On A3	0 — 100m	DRAWING NUMBER: 1901.DRG.069	REVISION: 4
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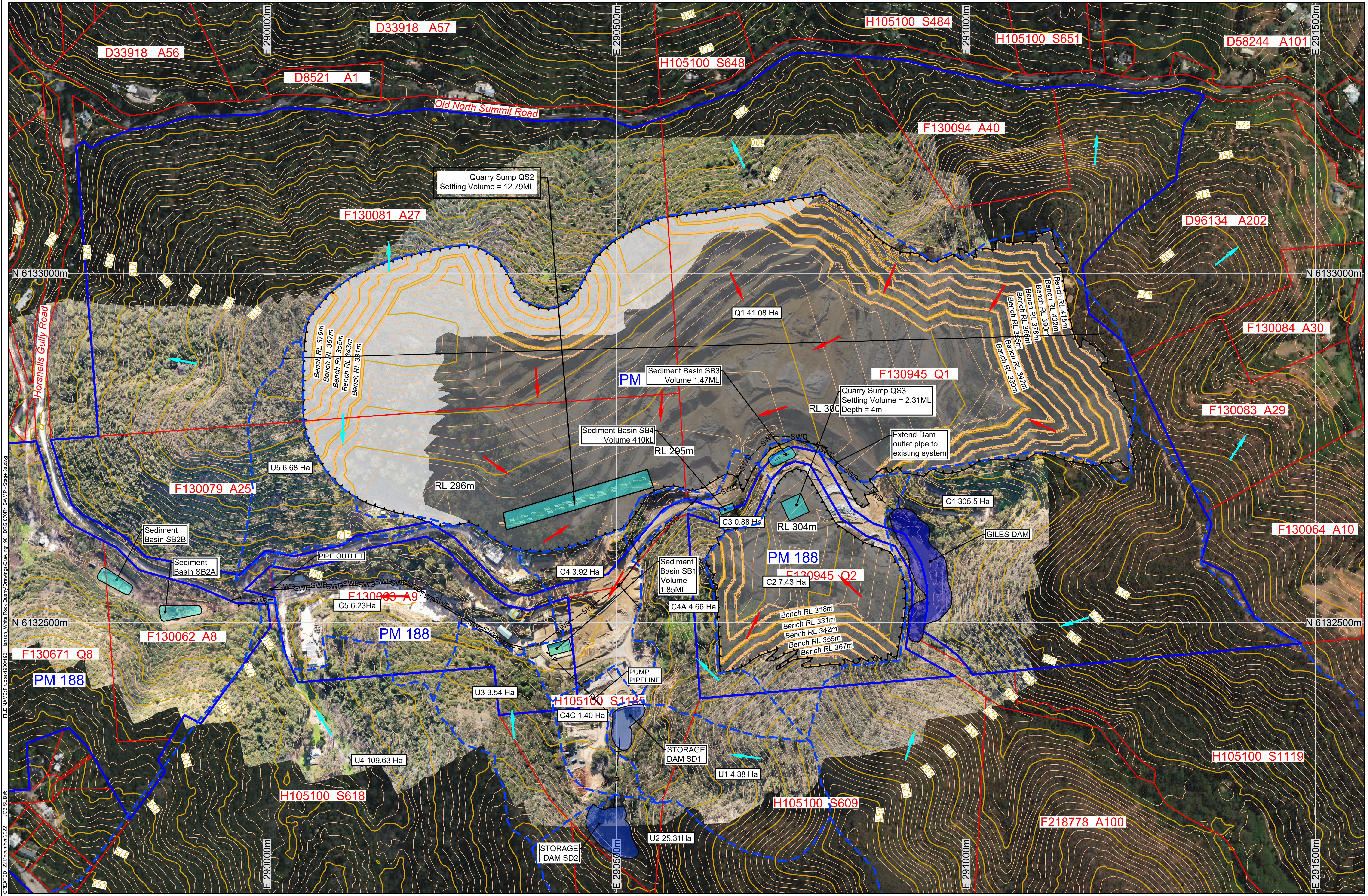

REV	DESCRIPTION	DATE	BY
1	Progressive Rehabilitation Modified to Avoid Road Reserve	10-08-20	JHV
2	Pit and Rehabilitation Modified	04-12-20	JHV

Data Sources:
Photography: Groundwork Plus Pty Ltd UAV Photogrammetry, 2020-03-26; 2019-11-19
Topography: LiDAR Sruvey (By Others), 2019-12-06
Cadastre: © The Government of South Australia (DPTI) 2020
Ecosystem:
Other:

Legend:
- Cadastral Boundary
- High Voltage Transmission Cables
- Plant Location
- Catchment Boundary
- Clean Surface Water Flow
- Dirty Surface Water Flow
- —DB— Diversion Bund
- —DC— Diversion Channel
- —P— — Pumped Stormwater
- -SWD- — Underground Pipe

PROJECT: White Rock Quarry

TITLE: Stormwater Management Plan - (Stage 3A)

CLIENT: Hanson Construction Materials Pty Ltd

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SCALE: 1:5,000 When Printed On A3 (0 – 100m)	DRAWING NUMBER: 1901.DRG.070	REVISION: 4
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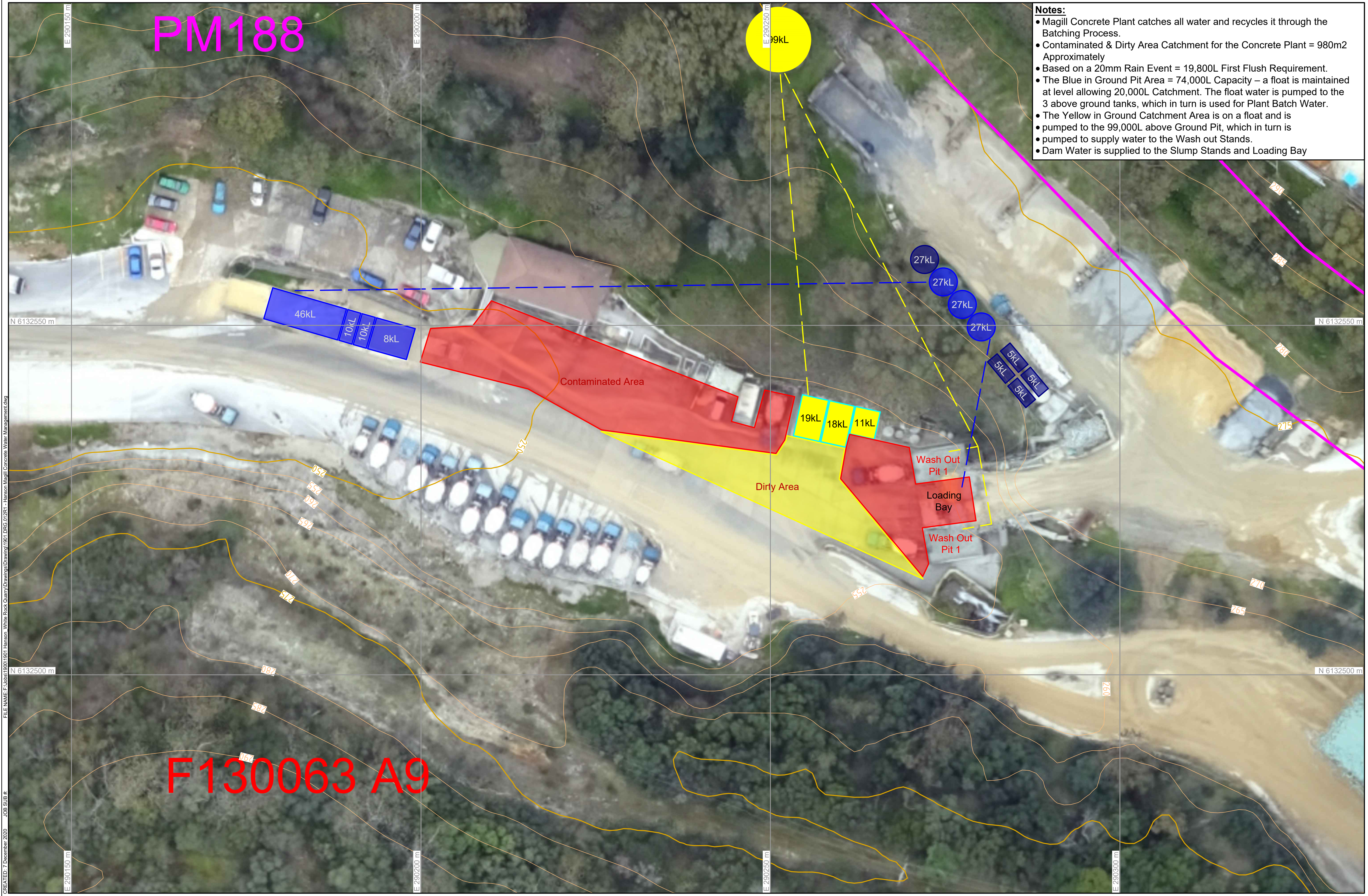

Notes:

- Magill Concrete Plant catches all water and recycles it through the Batching Process.
- Contaminated & Dirty Area Catchment for the Concrete Plant = 980m2 Approximately
- Based on a 20mm Rain Event = 19,800L First Flush Requirement.
- The Blue in Ground Pit Area = 74,000L Capacity – a float is maintained at level allowing 20,000L Catchment. The float water is pumped to the 3 above ground tanks, which in turn is used for Plant Batch Water.
- The Yellow in Ground Catchment Area is on a float and is
- pumped to the 99,000L above Ground Pit, which in turn is
- pumped to supply water to the Wash out Stands.
- Dam Water is supplied to the Slump Stands and Loading Bay

CREATED: 7 December 2020 JOB SUB #:

REV	DESCRIPTION	DATE	BY
1	Additional Water Storage Tanks Added	07-12-2020	JHV

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

Legend:
Private Mine Boundary
Cadastral Boundary

PROJECT: White Rock Quarry

TITLE: Hanson Magill Concrete Water Management Plan

CLIENT: Hanson Construction Materials Pty Ltd

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:500 When Printed On A3 (0 – 10m)	DRAWING NUMBER: 1901.DRG.012	REVISION: 1
DATE: 7 December 2020 / DRAWN: JHV	DATUM: HORIZONTAL / VERTICAL / ZONE	
PRINTED: 7 December 2020 / CHECKED: MJ	MGA / AHD / 54	

Attachment 1

Hanson White Rock Quarry Water Quality Monitoring Plan




Hanson Construction Materials

White Rock Quarry

Water Quality Monitoring Plan

November 2021

Licence Number: EPA 12714

Responsible Person(s):

Simon Kitson (Quarry Manager)

Angie Garzon Gutierrez (Environmental Compliance & Planning Officer)



Water Data Services Pty Ltd

www.waterdata.com.au

1 Erudina Avenue
Edwardstown
SA 5039

P 08 8374 3522

Date: Monday 1st November 2021

Document Identification:

Title: White Rock Quarry Water Quality Monitoring Plan

Licence Number: EPA 12714

Name of Site: Hanson White Rock Quarry

Address of Site: Horsnell Gully Road, Horsnell Gully

Prepared by: Brad Nicholson, Water Data Services

Date of Submission: 1st November 2021

Version Number: v6.0

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Table of Contents

List of Tables

List of Figures

1. Introduction

The EPA Licence (Licence Number EPA 12714) identifies Hanson Construction Material's obligations and requirements related to water quality discharge monitoring at the White Rock Quarry site.

In 2017 an Environmental Protection Order was issued by EPA SA which stipulated the requirement for Hanson to submit an Environmental Improvement Programme (EIP) to the EPA for review. After a review and consultation process, the Environmental Improvement Programme was approved by the EPA on 29th September 2017 which included additional flow and water quality monitoring and reporting requirements for the site.

A letter was issued by the EPA on 24th September 2021 in relation to the EIP which stipulated as part of this correspondence, a number of further changes to the flow and water quality monitoring and reporting requirements for the White Rock Quarry site.

This Monitoring Plan has been developed using the EPA guidelines *'Regulatory monitoring and testing – Monitoring plans requirements' (EPA 2006)* and addresses all monitoring objectives and requirements associated with Hanson's original EPA Licence (12714) and all additional monitoring and reporting requirements associated with the EIP.

2. Monitoring Objectives

In 2015, a monitoring plan was developed, issued and approved (*WDS 2015*) which addressed all aspects of the EPA Licence requirements and specified the water quality and quantity monitoring and reporting requirements for stormwater leaving the White Rock Quarry site, including:

- The location for undertaking flow and water quality monitoring activities,
- The methodology for monitoring flow and water quality
- The sampling, testing and analysis procedures
- The trigger value for water quality exceedances
- The method for determining sediment loads from the site; and
- Annual flow and water quality reporting requirements.

In September 2017, a number of additional assessment and reporting requirements and initiatives were implemented to support and inform the actions specified in the White Rock Quarry Environmental Improvement Programme (Hanson 2017) and included:

- Daily assessment of telemetered flow and water quality discharge data
- Investigations into identified water quality exceedances
- Quarterly reporting against the EIP which included a flow and water quality report card

On 24th September 2021, a letter was issued to Hanson in relation to the EPA licence and subsequent EIP in place for the site, and as part of this correspondence, specified a number of revisions to the water quality monitoring and reporting requirements for the site, including:

- Provision for Water Quality monitoring at the outfall to SB2
- Implementation of management strategies to mitigate turbidity sensor obstruction and fouling.
- Standardisation of water quality exceedance reporting to summarise the total number of days in a reporting period in which the 24-hour average turbidity exceeds ANZECC Fresh and Marine Water Quality Guidelines (50 NTU)
- Revision of the 2015 Monitoring Plan to align with all aspects of the EPA Licence, EIP and subsequent directives by 1st November 2021.

This Monitoring Plan builds upon the 2015 Monitoring Plan and addresses all additional monitoring and reporting requirements referenced above.

A reference table showing where specific objectives are addressed in this Monitoring Plan is presented in Table 2-1 below.

Table 2-1 : Summary of Monitoring Plan Objectives

Monitoring Plan Objective	Relevant Section(s)
Location for undertaking flow and water quality monitoring activities	Section 4.1.1, Section 4.1.2
Flow and water quality monitoring methodology	Section 4, Section 4.1.3
Sampling, testing and analysis procedures	Section 4.2
Trigger value for water quality exceedances	Section 4.2.1, Table 4-3
Sediment load determination methodology	Section 4.2, Section 4.2.2
Annual reporting requirements	Section 5, Table 5-1, Section 5.1
Quarterly reporting requirements	Section 5, Table 5-1
Use of telemetry data and investigations into identified exceedances	Table 5-1
Future monitoring requirements for SB2	Section 4.1.2
Turbidity sensor obstruction and fouling mitigation strategies	Section 4.2
Standardisation of water quality exceedance reporting.	Section 5, Table 5-1, Section 5.1

.

3. Background Information

Hanson are one of the largest producers of aggregates (crushed rock, sand and gravel) and one of the largest producers of concrete products and concrete in the world. Hanson operate a number of sites across the Adelaide Region including the White Rock Quarry located at Horsnell Gully.

Primary site activities at Hanson’s White Rock Quarry include drilling, blasting, extraction, loading, crushing and processing of rock materials and transportation of processed product from the site.

White Rock Quarry is situated within the Horsnell Gully Catchment – A major tributary to Third Creek. The quarry is adjacent to the Horsnell Gully Conservation Park and below Giles Conservation Park.

Streamflow from Giles Conservation Park enters a large dam upstream of the Quarry and proceeds to flow through a section of modified swales before entering a closed pipe system. A series of continuous bunds have been installed along the full alignment of the modified swale section meaning that surface runoff from all operational surfaces and haul roads throughout the quarry are isolated from the clean runoff sources originating from the Giles Conservation Park. The clean runoff from the Horsnell Gully Conservation Park is also diverted into the closed pipe system in similar manner. Clean surface water runoff from both upstream conservation parks exits the close pipe system on the western boundary of the quarry where it flows through to a concrete weir downstream of the silt dam before finally discharging into Third Creek.

Sediment-laden runoff from haul roads and operational surfaces is diverted through a series of collection, storage and treatment systems. A large sedimentation basin (SB1) which was designed and installed as a major element of the EIP, captures and stores runoff from the majority of the site’s operational surfaces. Runoff from operational surfaces west of SB1 including overflow from the concrete washout area is captured by a grid trench at the main gate where it is diverted into a series of sedimentation basins approximately 200m downstream of the main gate. Overflow from these sedimentation basins can enter a grated overflow pit where it discharges into the weir pool upstream of the concrete weir.

4. Monitoring Methodology

Water Data Services has installed and currently operates a flow and water quality monitoring station downstream of the silt dam at the point where over-flow from the silt dam converges with clean water from the Giles and Horsnell Gully Conservation Parks.

The station comprises the following components:

- Stepped concrete weir (installed by Hanson)
- Campbell Scientific Pressure Sensor
- Observator Analyte NEP5000 Turbidity Sensor
- Campbell Scientific CR850 data logger with custom WDS programming
- NextG Telemetry system
- Push data telemetry uploading to www.waterdata.com.au

The station collects data in real-time for the following parameters:

- Turbidity (NTU)
- Water Level (m)
- Flow Rate (m^3/s)
- Flow Volume (ML)

In addition to real-time monitoring, operation also includes the collection of routine grab samples that are analysed for the following parameters:

- Turbidity (NTU)
- Suspended Solids

The following chapters outline current monitoring methodologies and procedures in reference to Monitoring Plan requirements recommended by the EPA.

4.1 Sampling Location, Frequency and Analytes

4.1.1 Established Flow and Water Quality Monitoring Location

The primary monitoring and telemetry station for flow and water quality monitoring is to be undertaken at the established monitoring station located at the following coordinates:

Zone: 54

Easting: 289756 m E

Northing: 61325945 m S

A photograph of the weir is shown in Figure 5-1 below.

Figure 5-1 : Concrete Step Weir

When the operational surfaces of the quarry were not effectively isolated from the clean conservation park runoff, monitoring at the concrete step weir (installed by Hanson to improve monitoring accuracy) was the only way to measure the total sediment load from the site. As a result, flow and water quality monitoring has been undertaken at the concrete step weir since March 2011, meaning that a mature dataset is available for non-parametric trend analyses capable of removing seasonality from the dataset and revealing the underlying flow and water quality trends at the site.

4.1.2 Future Monitoring Locations

Although long-term flow and water quality monitoring has traditionally only been undertaken at the concrete step weir, the isolation of the clean water sources from the Giles and Horsnell Gully Conservations Parks means that the water arriving at the weir via the natural channel is now largely unaffected by Quarry operations.

This means that lower-quality stormwater discharge from the adjacent SB2 (during periods of overflow) can be diluted by the clean water which bypasses the quarry.

To address this, a secondary turbidity monitoring location is to be established at the outfall of SB2, to measure the undiluted turbidity at the point of discharge of the basin.

The outfall structure of the existing silt dam is not currently suitable for the installation of monitoring instrumentation, however the upgrade of SB2 which will replace the existing silt dams at this location presents an opportunity to design and integrate an outfall structure suitable for turbidity (and potentially flow) monitoring at this location.

Hanson has already purchased instrumentation for installation at this location, and the additional sensors will be integrated into the existing datalogger and telemetry system upon completion of the SB2 upgrade works.

It is recommended that flow and water quality monitoring continue to be undertaken at the concrete step weir in conjunction with the new SB2 outfall monitoring for the medium-term, until the dataset available for the outfall of SB2 matures enough to facilitate meaningful non-parametric trend analysis (typically 4-6 years).

4.1.3 Analytes and Frequency

The frequency and methodology for analysis of real-time parameters is described in Table 4-1 below.

Defined recording frequencies are to be achieved using the Campbell Scientific CR800 data logger, and data should be uploaded in real-time to the WDS website (www.waterdata.com.au) .

Table 4-1 : Real-time Data Parameters and Recording Frequency

Parameter	Units	Frequency	Method
Water Level	m (Gauge Datum)	10 minutes	Direct measurement via Pressure Sensor
Flow Rate	m^3/s	10 minutes	Derived from water level using calibrated stage-discharge relationship
Flow Volume	ML	As-required	Derived from 10-minute flow rate data
Turbidity	NTU	10 minutes	Direct measurement using Observator Analyte NEP 5000 Turbidity Sensor
Suspended Solids	mg/L	10 minutes	Derived via site-specific, calibrated relationship between Turbidity and Suspended Solids
Total Suspended Solids Load	kg	As-required	Derived using real-time suspended solids time series and flow volume.

In addition to the real-time data collection, the parameters and frequencies for collection of calibration and verification data collection are outlined in Table 4-2.

Table 4-2 : Calibration Parameters

Parameter	Units	Frequency	Method
Flow Rate	m^3/s	Opportunistic	Direct measurement of flow using a suitable flow gauging method to be undertaken opportunistically during periods of high flow (low to medium flows are well calibrated).
Turbidity	NTU	12 times per year during comprehensive site visits with flow.	Grab sample of stormwater at concrete step weir with laboratory testing undertaken in a NATA accredited laboratory. Used to verify calibration of NTU-Suspended Solids relationship.
Suspended Solids	mg/L	12 times per year during comprehensive site visits with flow.	Grab sample of stormwater at concrete step weir with laboratory testing undertaken in a NATA accredited laboratory. Used to verify calibration of NTU-Suspended Solids relationship.

4.2 Sampling and Testing Procedures

All data collection, sampling and analysis should be undertaken within the framework of the following specifications:

- Comprehensive site visits shall be undertaken 12 times per year on a monthly basis. These comprehensive visits shall ensure all instruments are serviced, tested and calibrated and to undertake general site maintenance.
- Out-of-cycle maintenance visits shall be undertaken by suitably trained Hanson operators on an as-required basis (determined via daily telemetry assessments) to address sensor bio-fouling detected via telemetry. The date, time and photographic evidence of bio-fouling at the time of cleaning shall be recorded for data verification purposes.
- Comprehensive Visits and in-situ instrument calibration verification shall be undertaken in accordance with Water Data Services' Field Work and Instrument Calibration work instructions. These documents are part of the Water Data Services Quality Management System (QMS) which is BSI certified to ISO9001:2015.

- Grab samples shall be collected at each of the 12 Comprehensive Visits but only if the site is flowing through the concrete step weir. These samples shall be collected in accordance with the Water Data Services work instruction for Sample Collection, which is ISO9001:2015 certified.
- Grab samples shall be analysed by a NATA accredited laboratory for Turbidity and Suspended Solids.
- Flow gaugings shall be undertaken on an opportunistic basis during periods of high flow in accordance with the Water Data Services ISO9001:2015 work instructions for Flow Gauging.
- Flow gaugings should be processed upon completion and reviewed within the context of the calibrated stage-discharge relationship for derivation of flow from water level. A rating review shall be undertaken if a new gauging is outside of the confidence interval of the rating. Any calibration changes shall be discussed and presented into the annual report.
- Grab sample data shall be collated and reviewed within the context of the calibrated NTU-SS relationship derived using historical data. The statistical correlation (R^2) of the relationship shall be calculated annually and incorporated into the annual report (See Section 4.2.1).
- If the statistical correlation (R^2) of the Turbidity-Suspended Solids relationship for the site drops below 0.8, a review of the Monitoring Plan shall be triggered.
- Flow and Water Quality data shall be processed, archived and stored in accordance with the Water Data Services Data Processing work instructions which are also certified to ISO9001:2015.

4.2.1 Water Quality Trigger Values

Table 4-3 below summarises the water quality trigger values which shall be adopted for determination of water quality exceedances.

Table 4-3 : Water Quality Trigger Values

Parameter	Units	Aggregation	Trigger Value
Turbidity	NTU	24-hour average	**50**

4.2.2 Calibrated Turbidity – Suspended Solids Relationship

Historical laboratory data collected at the site since 2011 has been used to derive a relationship between recorded (in-situ) Turbidity and the concentration of Suspended Solids.

Additional regression analyses should be undertaken on an annual basis as part of the Annual Reporting process which uses all available laboratory results for the monitoring station, which allows for the derivation of a calibrated relationship.

Regression analysis undertaken on the existing data set prior to the development of this monitoring plan allowed for the derivation of the following formula, which has a statistical correlation (R2) of 0.9416 (indicating a high degree of certainty) (WDS 2021).

$$TSS = 0.7831 \times NTU$$

The regression curve is shown in Figure 5-2.

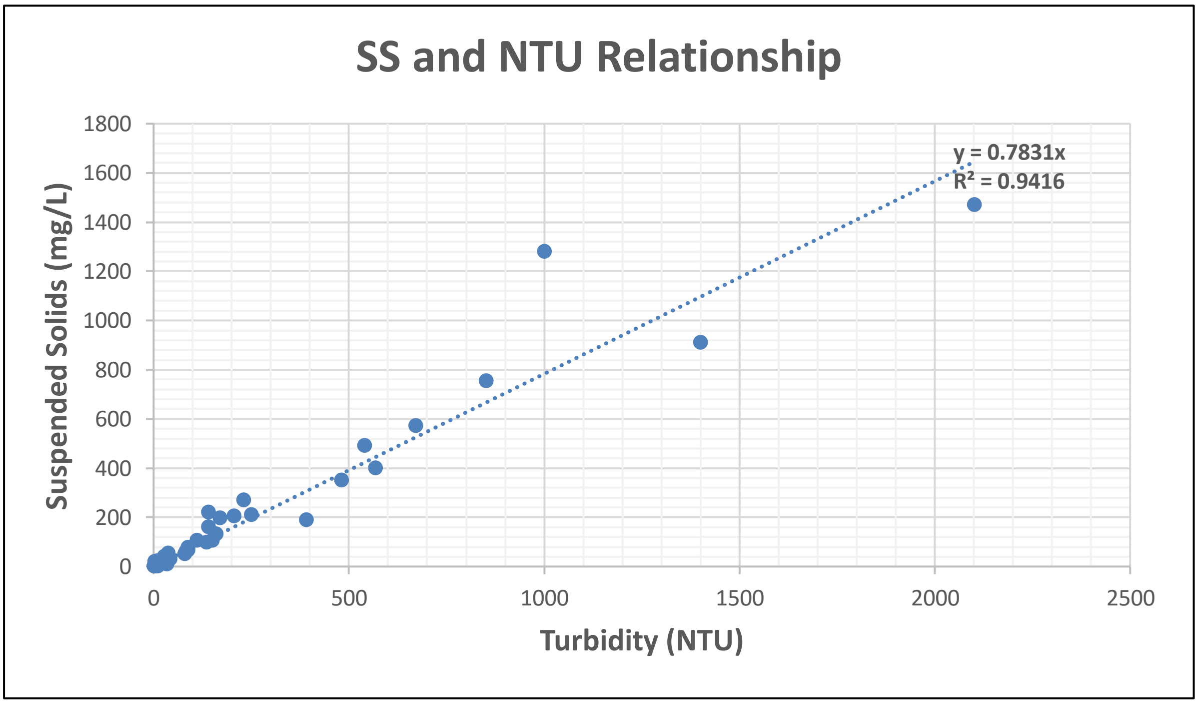

Figure 5-2 : Turbidity - Suspended Solids Regression Analysis

This relationship should be adopted upon implementation of this Monitoring Plan and should be used to derive suspended solids using real-time data until the next annual report.

The regression analysis should be reviewed annually as part of the annual reporting process and should incorporate all available (historical and new) data.

If the R^2 value of the regression analysis is observed to drop below 0.8 at the completion of a regression analysis review, this should trigger a review of the Monitoring Plan.

5. Reporting

Internal and External reporting should be undertaken in accordance with the requirements specified in Table 5-1.

Table 5-1 : Reporting Frequency

Reporting Component	Reporting Frequency	Method	Comment
Real-time Data	Hourly	www.waterdata.com.au Secure data provision portal	Real-time (unverified) data displayed on the website as it arrives. This data shall be used by Hanson operators to track and respond to discharge events and water quality exceedances in real-time.
Verified/Processed Data	Within 2 weeks of Comprehensive Visits	www.waterdata.com.au Secure data provision portal	Processed, verified and archived data which has all instrument errors removed representing the long-term site record.
Quarterly Reports	Quarterly	Submission via email to EPA	Verified data should be used to summarise the total number of days in a reporting period where the 24-hour average turbidity has exceeded 50 NTU.

Reporting Component	Reporting Frequency	Method	Comment
Annual Report	Annually by 31st March	PDF provided to Hanson for review, and submitted to EPA by Hanson	Annual report provided by Water Data Services which summarises all monitoring undertaken in accordance with this Monitoring Plan and associated monitoring objectives as specified in Section 5.1.

5.1 Annual Reporting Requirements

The annual report should contain the following minimum information:

- Assessment of the total number of days where the 24-hour average turbidity exceeds ANZECC Fresh and Marine Water Quality Guidelines (50 NTU)
- Comparison of continuous turbidity sensor measurements with turbidity measurements obtained from grab samples.
- The suspended solids-turbidity calibration curve with associated R^2 value.
- Assessment of the recorded data for isolation of discrete flow events.
- A summary table with data on the discrete stormwater events showing:
  - Event discharge volume.
  - Event average, median, maximum and 80th percentile turbidity.
  - Classification of events relative to applicable trigger levels (24-hour average turbidity).
  - Event suspended solids load
- The annual suspended solids load discharged from the quarry
- Further analysis and/or comments applicable to reporting criteria.

6. References

- EPA 2006, *Regulatory monitoring and testing – Monitoring plans requirements*, Issued December 2006, Updated August 2013
- EPA 2015, *Environment Protection (Water Quality) Policy,* Issued 2015, Version 1.7.2020
- Hanson 2017, White Rock Quarry Environment Improvement Programme, 29 September 2017
- Water Data Services 2015, *White Rock Quarry Water Quality Monitoring Plan 2016, Issued December 2015*
- Water Data Services 2021, *2020 White Rock Quarry Water Quality Verification Report*, 5th March 2021

Attachment 2

White Rock Quarry - Surface Water Management Trigger Action Response Plan (TARP)

White Rock Quarry

Surface Water Management Trigger Action Response Plan (TARP)

Date issued: 01 July 2022

Issue	***Description***	***Date***	***Author***	***Reviewer***
0	White Rock Quarry Surface Water Management Trigger Action and Response Plan (TARP)	31 March 2022	A. Garzon Gutierrez	S. Seal
1	Updates in response to EPA comments	01 July 2022	A. Garzon Gutierrez	S. Seal

Table of Contents

1. Scope

This Trigger Action and Response Plan (TARP) applies to the Hanson Construction Materials Pty Ltd (Hanson) White Rock Quarry including but not limited to Private Mine (PM) 188 located on Horsnells Gully Road.

The site has a number of surface water catchment areas, sediment basins and dams that have been installed to manage surface water. An overview of the surface water catchments and associated sediment basins and dams is provided below in figure 1 – Surface water catchment layout.

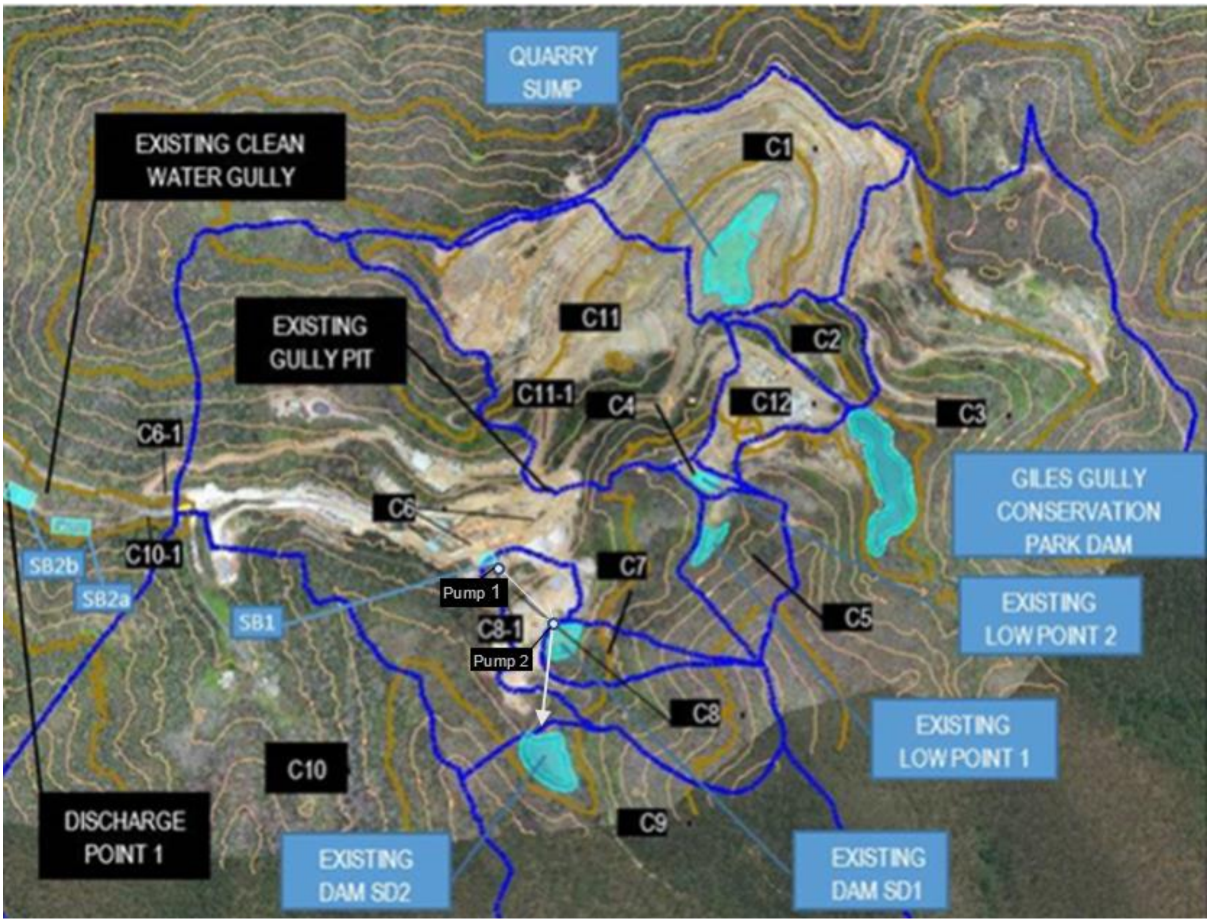

Figure 1 – Surface water catchment layout

The purpose of TARP is to determine the management measures required to mitigate potential impacts on environmental values relating to surface water quality relevant to the site. **Table 1 – Indicative management option for each TARP trigger level** describes the required actions for each TARP trigger level.

Table 1 – Indicative management option for each TARP trigger level

Trigger Level	Site Conditions	Description
Normal State	Clear day, no rainfall forecast within next 5 working days or/and less than 30 NTU	Manage by routine procedures, unlikely to need specific application of resources.
Level 1	Clear day, with rainfall forecast up to 20mm within next 5 working days or/and between 30 and 39 NTU	Manage by implementing specific operational procedures in preparation of forecast rainfall.
Level 2	Rain day forecast between 20 mm and 46mm forecast or/and between 40 and 50 NTU	Manage by implementing site management procedures, specific monitoring and design controls.
Level 3	Rain day with greater than 46mm forecast and/or measured or/and more than 50 NTU	Manage by implementing site management and emergency procedures, design controls and regular monitoring.

2. Communication and Training

The TARP shall be communicated to all workers at the Quarry via daily toolbox meetings and prestart meetings and reiterated through site notice boards and other formal communication channels used onsite.

A hard copy of this document shall be kept onsite at the Quarry Managers and supervisor’s office and a separate hard copy accessible to workers and visitors.

3. Weather forecast predictions

Weather forecast information shall be sources from the following Bureau of Meteorology (BoM) Weather stations

Mount Lofty – Station No. 23842

Adelaide Kent Town - Station No. 23000

If there are two (2) conflicting weather predictions then the prediction/forecast that provides the highest rainfall level of protection to the environment, personnel and the community shall be adopted.

4. Document review and amendments

The TARP shall be reviewed annually or as required for the following circumstances.

- monitoring and surveillance shows that the control measures applied at the site are not effective to control the risk,
- prior to a change at the workplace that is likely to give rise to a new or different risk that the measure may not effectively control,
- a new or relevant risk is identified,
- the result of consultation indicates that a review is necessary,
- In response to a request from a Regulator such as the Department for Energy and Mining (DEM), the Environment Protection Authority (EPA) or the Department for Environment and Water (DEW) or
- Internal Hanson management requests a review.

Reviews shall be undertaken by Hanson quarry management, contractor representatives, subject matter experts and other participants where required.

5. Monitoring and Inspection

Water quality monitoring shall be undertaken in accordance with the White Rock Water Quality Monitoring Plan. Real time water quality monitoring data is collected from the v notch weir located adjacent to Sediment Basin 2B (SB2B), and email alters for NTU trigger values will be sent to the management team.

Sediment Basin 2A (SB2A) will have a floating-decant as the primary outlet which 'skims' water from the top of the water column and allows the basin to be largely emptied between events, it will incorporate telemetry data to be able to record and demonstrate compliance with the water quality requirements, similar email alerts for NTU trigger values will be sent to the management team. Additionally, SB2A will have a spillway outlet to SB2B, as contingency measure in case the water quality requirements are not satisfied, allowing further treatment or/and settlement time before water releases.

Monitoring and inspection of the surface water management infrastructure will be undertaken in accordance with the requirements of Section 6.

Currently, where water quality measurements recorded at the v notch weir measured trigger values (NTUs), additional inspections of the site shall be undertaken by the responsible personnel as outlined Section 5.1. Roles and Responsibilities to review the condition of the surface water management devices within the site as soon as practicable including;

- Checking surface water drains are diverting water into the sediment basins
- Checking sediment basins to ensure that they are functioning correctly
- Checking diversion bunds and silt sock (where required) are in place and performing as per design
- Checking for any other sources of sediment water that is not being directed into a sediment basin.

In the event that a water quality trigger occurs while the site is unattended, an inspection of the site will be undertaken as soon as practicable following the trigger occurrence.

Records of inspection shall include photographs and checklists used in accordance with site protocols.

5.1 Roles and Responsibilities

Table 2 – Roles and Responsibilities outlines the roles and responsibilities of the Quarry Manager (or Delegate), Operational Personnel and Contractors at the site. It is intended that there is always a Quarry Manager or delegate onsite whilst the site is operational during extractive and processing operations to manage the TARP and associated levels of response.

Table 2 – Roles and Responsibilities

Role	Responsibility
Quarry Manager or Delegate	• Provide a daily weather forecast and a five-day outlook forecast summary at the site office or alternative location that is readily accessible by all staff, to inform the following at a minimum: - Temperature (°C) - Rainfall (mm) • Induct all staff and contractors at the Site on the requirements of the TARP and the surface water control strategies and management measures that are to be used. • Monitor the five (5) day forecast of meteorological conditions as per Section 3. Weather forecast predictions • Ensure equipment is readily available to all operational Personnel and Contractors to allow implementation of the TARP. • Undertake monitoring and surveillance of the surface water management controls during wet weather events. • Undertake investigations and response when trigger levels are exceeded to ensure that all surface water controls remain operational and identify corrective actions where required. • Maintain records of TARP responses for reporting to the Regulator upon request • Respond to any complaints alleging surface water nuisance within 48 hours of receipt.
Operational Personnel and Contractors	• Notify the Quarry Manager or delegate immediately upon becoming aware of a trigger event (e.g. five (5) day forecast shows predicted rainfall indicating wet weather conditions to enable operations to be adapted accordingly.) or complaint alleging surface water nuisance. • During operations undertake continual visual subjective assessment of all potential sediment laden surface water generating sources / activities. • Implement control and management strategies in line with the TARP. • Follow all instructions of the Quarry Manager or delegate in relation to surface water management measures to be implemented.

6. Trigger Action and Response Plan

To guide operations and responding to surface water management, the following Trigger Action Response Plan (TARP) have been prepared. The TARP identifies controls and responses to different aspects of surface water management risk at the site. Refer to **Table 2 – Surface Water Management Trigger Action and Response Plan (TARP)** for details.

Table 2 – Surface Water Management Trigger Action and Response Plan (TARP)

Water Management System	Monitoring Location	Monitoring Type / Frequency	Parameters	Site Conditions	Trigger Level	Action and Response
Sediment Basin SB1	Discharge monitoring via overflow spillway channel	Visual inspection / during discharge (or as soon as accessible)	Visible evidence of turbidity	Clear day, no rainfall forecast within next 5 days or/and less than 30 NTU	**Normal State**	- Undertake daily inspection of SB1 to monitor sediment build up to inform desilting requirements. - When water level at SB1 is low, the pump to SD1 is turned off, to allow water level to rise until ¾ level of SB1, allowing sediment to settle and pump back to SD1 cleaner water.
				Clear day, with rainfall forecast up to 20mm within next five (5) days or/and between 30 and 39 NTU	**Level 1**	- Inform all quarry site personnel and contractors of the TARP level - Inspection of SD2 dam to check freeboard capacity. Check freeboard marker. The target freeboard is to be maintained at 0.2m below the freeboard marker (overflow point 2m). If water is overpassing the 0.2m, test water quality within SD2 prior to releases, using Turbidimeter. NTU results documented in the Turbidity Register. Check telemetry NTUs measures. - Check SB1 and SD1 pumps (see pump 1 and 2 respectively in figure 1) are operational - Undertake daily inspection of SB1 to monitor sediment build up to inform desilting requirements. - When water level at SB1 is low, the pump to SD1 is turned off, to allow water level to rise until ½ level of SB1, allowing sediment to settle and pump back to SD1 cleaner water. Leave pump on during the weekend.
				Rain day forecast between 20 and 46mm predicted to occur within a day or/and between 40 and 50 NTU	**Level 2**	- Inform all quarry site personnel and contractors of the TARP level - Check five (5) day forecast daily to determine predicted rain events. - Check that spoon drain is effective for diverting water into SB1. Additional controls will be put in place to divert water to SB1 if spoon drain is ineffective (e.g., additional diversion block to be installed and slow down water). - Check Haul Road drainage is not entering third creek, if it is site management must implement an immediate solution depending on the location, an investigation for a fix lasting solution will be undertaken if required. - Check all SB1 and SD1 pumps are operational - Operate pumping system as required to restore freeboard during and following rainfall event as required - Undertake inspection of SB1 following rainfall event to monitor sediment build up and arrange desilting as required - Check freeboard marker. The target freeboard is to be maintained at 0.2m below the freeboard marker (overflow point 2m). If water is overpassing the 0.2m, test water quality within SD2 prior to releases, using Turbidimeter. NTU results documented in the Turbidity Register. Check telemetry NTUs measures. - Undertake regular monitoring of rainfall data from BoM sites to monitor intensity of rainfall events - Leave SB1 and SD1 pumps on prior to and during rainfall events
				Rain day with greater than 46mm forecast and/or measured to occur within a day or/and more than 50 NTU	**Level 3**	- Inform all quarry site personnel and contractors of the TARP level - Check five (5) day forecast daily to determine predicted rain events. - Check that spoon drain is effective for diverting water into SB1, during rainfall events. Additional controls will be put in place to divert water to SB1 if spoon drain is ineffective (e.g., additional diversion block to be installed and slow down water). - Check Haul Road drainage is not entering third creek, if it is site management must implement an immediate solution depending on the location, an investigation for a fix lasting solution will be undertaken if required. - Check all SB1 and SD1 pumps are operational - Undertake inspection of water quality within SD2 between rainfall events, check water quality with a Turbidimeter, and document in the Turbidity Register if water is released.

						- Operate pumping system as required to restore freeboard during and following rainfall event as required - Undertake inspection of SB1 following/during rainfall event to monitor sediment build up and undertake desilting as required. - Leave SB1 and SD1 pumps on prior to and during rainfall events - If SB1 is overflowing site management will attempt to slow water flow down and overflow will be directed to SB2
Sediment Basin SB2A* Under development* Subject to future changes after commissioning	Site Discharge outlet structure Location at TBC Easting: x Northing: x	WQ Monitoring Station / real-time continuous	Turbidity (NTU)	Clear day, no rainfall forecast within next 5 days or/and less than 30 NTU	**Normal State**	- Undertake daily inspection of SB2A to monitor sediment build up to inform desilting requirements. - Check freeboard availability if any TBC
				Clear day, with rainfall forecast up to 20mm within next five (5) days or/and between 30 and 39 NTU	**Level 1**	- Inform all quarry site personnel and contractors of the TARP level - Inspect that SB2A is working as per design, and implement any corrective actions if required (e.g., changing flocculant/coagulant IBC) (future) - Undertake inspection of sediment basin and forebay following rainfall events to monitor sediment build up and undertake desilting as required.
				Rain day forecast between 20 and 46mm predicted to occur within a day or/and between 40 and 50 NTU	**Level 2**	- Inform all quarry site personnel and contractors of the TARP level - Following rainfall events, inspect that SB2A is working as per design, and implement any corrective actions if required (e.g., changing flocculant/coagulant IBC) (future) - Follow up email alerts, and if required double check there is not discharge of water to the creek over 50 NTU.
				Rain day with greater than 46mm forecast and/or measured to occur within a day or/and more than 50 NTU	**Level 3**	- Inform all quarry site personnel and contractors of the TARP level - Following rainfall events, inspect that SB2A is working as per design, and implement any corrective actions if required (e.g., changing flocculant/coagulant IBC) (future) - Follow up email alerts, and if required double check there is not discharge of water to the creek over 50 NTU (discharge outlet). - Undertake regular monitoring of rainfall data from BoM sites listed in **Section 3 Weather forecast predictions** to monitor intensity of rainfall events to inform TARP level changes. - Active treatment programmed to stop when the discharge outlet is shutdown, verified working as per design. - Inspection of spillway from SB2A to SB2B to ensure that spillway is working effectively (future), if issues are found, corrective actions will be implemented.
Sediment Basin SB2B	Site Discharge Location at Weir notch downstream of SB2B Easting: 289756 Northing: 61325945	WQ Monitoring Station / real-time continuous	Turbidity (NTU)	Clear day, no rainfall forecast within next 5 days or/and less than 30 NTU	**Normal State**	- Undertake daily inspection of SB2B to monitor sediment build up to inform desilting requirements. - When water level at SB2B is high and it is not satisfying less than 50 NTU, recirculate it to SB2A for further treatment (Future). Before any release, check NTU with a Turbidimeter, NTU results documented in the Turbidity Register. Check telemetry NTUs measures.
				Clear day, with rainfall forecast up to 20mm within next five (5) days or/and between 30 and 39 NTU	**Level 1**	- Inform all quarry site personnel and contractors of the TARP level - When water level at SB2B is high and it is not satisfying less than 50 NTU, recirculate it to SB2A for further treatment (Future). Before any release, check NTU with a Turbidimeter, NTU results documented in the Turbidity Register. Check telemetry NTUs measures. - Keep water below the grid to maintain retention capacity after rainfall events, pumping water out. - Inspection of spillway from SB2A to SB2B to ensure that spillway is working effectively (future), if issues are found, corrective actions will be implemented.
				Rain day forecast between 20 and 46mm predicted to	**Level 2**	- Inform all quarry site personnel and contractors of the TARP level - Check five (5) day forecast daily to determine predicted rain events. - Following/during rainfall events, inspection of SB2B to ensure that adequate freeboard is available. When water level at SB2B is high and it is not satisfying less than 50 NTU,

				occur within a day or/and between 40 and 50 NTU		recirculate it to SB2A for further treatment (Future). Before any release, check NTU with a Turbidimeter, NTU results documented in the Turbidity Register. Check telemetry NTUs measures. - Undertake regular monitoring of rainfall data from BoM sites listed in **Section 3 Weather forecast predictions** to monitor intensity of rainfall events to inform TARP level changes.
				Rain day with greater than 46mm forecast and/or measured to occur within a day or/and more than 50 NTU	**Level 3**	- Inform all quarry site personnel and contractors of the TARP level - Following/during rainfall events, inspection of SB2B to ensure that adequate freeboard is available. When water level at SB2B is high and it is not satisfying less than 50 NTU, recirculate it to SB2A for further treatment. (Future). Before any release, check NTU with a Turbidimeter, NTU results documented in the Turbidity Register. Check telemetry NTUs measures. - Undertake regular monitoring of rainfall data from BoM sites listed in **Section 3 Weather forecast predictions** to monitor intensity of rainfall events.
Natural Stream and Clean water Diversion System	Natural Stream at pipe exit, approximately 100m upstream of Weir notch	Visual inspection / Hand-held NTU metre during rainfall event (or as soon as accessible)	Turbidity (NTU)	Clear day, no rainfall forecast within next 5 days or/and less than 30 NTU	**Normal State**	- Undertake daily inspections of clean water drain and clear debris / maintain as required prior to rainfall events
				Clear day, with rainfall forecast up to 20mm within next five (5) days or/and between 30 and 39 NTU	**Level 1**	- Inform all quarry site personnel and contractors of the TARP level - Undertake inspection of Giles Conservation Park Dam to establish freeboard - Check five (5) day forecast daily to determine predicted rain events. - Undertake daily inspections of clean water drain and clear debris / maintain as required prior to rainfall events - Check that siphon system is operational to maintain freeboard prior to rainfall events occurring
				Rain day forecast between 20 and 46mm predicted to occur within a day or/and between 40 and 50 NTU	**Level 2**	- Inform all quarry site personnel and contractors of the TARP level - Undertake inspection of Giles Conservation Park Dam after rainfall events following level two (2) trigger. - Undertake routine inspections and clear debris / maintain as required following rainfall events
				Rain day with greater than 46mm forecast and/or measured to occur within a day or/and more than 50 NTU	**Level 3**	- Inform all quarry site personnel and contractors of the TARP level - Undertake inspections during the rainfall event and investigate any potential source of sediment. If any sourced identified, site management must implement an immediate solution depending on the location, an investigation for a fix lasting solution will be undertaken if required.
Site stormwater drainage	Stormwater drainage within the site	Visual inspection / during rainfall event (or as soon as accessible)	Visual inspection for surface water flow paths	Clear day, no rainfall forecast within next five (5) days or/and less than 30 NTU	**Normal State**	- Daily inspection of site stormwater drainage, undertake works to improve drainage on site as required. - Check that siphon system is operational to maintain freeboard prior to rainfall events occurring
				Clear day, with rainfall forecast up to 20mm within next five (5) days or/and between 30 and 39 NTU	**Level 1**	- Inform all quarry site personnel and contractors of the TARP level - Undertake daily, and following rainfall events, inspection of site stormwater drainage, undertake works to improve drainage on site as required. - Check five (5) day forecast daily to determine predicted rain events. - Use siphon system to maintain freeboard prior to rainfall events occurring - Undertake inspection of Giles Conservation Park Dam to establish freeboard - Check open watercourse creek within the quarry boundaries to ensure that there is no discharge of surface water into the Third Creek. In case of an uncontrolled discharged, site management must implement an immediate solution depending on the location, an investigation for a fix lasting solution will be undertaken if required.

						- Undertake inspections during the rainfall event and monitor for any uncontrolled water release to be rectify accordingly.
				Rain day forecast between 20 and 46mm predicted to occur within a day or/and between 40 and 50 NTU	**Level 2**	- Inform all quarry site personnel and contractors of the TARP level - Check five (5) day forecast daily to determine predicted rain events. - Check open watercourse creek within the quarry boundaries to ensure that there is no discharge of surface water into the Third Creek. In case of an uncontrolled discharged, site management must implement an immediate solution depending on the location, an investigation for a fix lasting solution will be undertaken if required. - Check site drainage for SB2 catchment is functioning as per design - Undertake inspections during the rainfall event and monitor for any uncontrolled water release to be rectify accordingly.
				Rain day with greater than 46mm forecast and/or measured to occur within a day or/and more than 50 NTU	**Level 3**	- Inform all quarry site personnel and contractors of the TARP level - Undertake inspections during the rainfall event and monitor for any uncontrolled water release to be rectify accordingly. - Check open watercourse creek within the quarry boundaries to ensure that there is no discharge of surface water into the Third Creek. In case of an uncontrolled discharged, site management must implement an immediate solution depending on the location, an investigation for a fix lasting solution will be undertaken if required. - Operate pumping system as required to restore freeboard during and following rainfall event as required - Undertake inspections during the rainfall event and monitor for any overflows occurring from the clean water diversion system. If the clean water diversion system overflows, it will be an emergency, and site operation will cease. Depending on the overflow location, site management will work to reduce the environmental impact.

7. Table of Definition

Concepts	Definitions
TARP	Surface Water Management Trigger Action Response Plan (TARP)
EPA	The Environmental Protection Authority (EPA) of South Australia
SB1	Sediment Basin 1 current
SB2	Sediment Basin 2 current
SB2B	Sediment Basin 2 current
SB2A	New Sediment Basin 2A in construction
NTU	Nephelometric Turbidity Unit
SD1	Sediment Dam 1
SD2	Sediment Dam 2
DAILY	Monday to Friday
TBC	To be confirmed
CREEK	Third Creek
TURBIDIMETER	Hand held Turbidity meter

Attachment 3

Water Balance Assessment Results

Year	Month	Day	Daily Recorded Rainfall (mm)	Inputs	Outputs		FFT Available Capacity (m^3)	Predicted Frequency of Event Discharge from Sediment Dam	Overtop from FFT to Sediment Dam (m^3)	Water Recycled (m^3)	Days Tank is empty	Overflow events
				Overland Flow CBP (m^3)	Evaporation (m^3)	Water Used in Operations (m^3)						
1999	1	1	0	0	0	46.75	19.8	0	0	0	1	
1999	1	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	3	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	4	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	6	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	7	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	1	8	16	15.68	0	46.75	19.8	0	0	0	1	0
1999	1	9	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	10	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	11	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	12	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	13	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	14	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	15	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	16	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	17	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	18	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	19	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	20	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	21	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	22	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	23	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	24	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	25	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	26	0.8	0.784	0	46.75	19.8	0	0	0	1	0
1999	1	27	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	28	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	29	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	1	30	0	0	0	46.75	19.8	0	0	0	1	0
1999	1	31	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	2	1	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	3	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	4	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	6	0.8	0.784	0	46.75	19.8	0	0	0	1	0
1999	2	7	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	8	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	9	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	10	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	11	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	2	12	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	13	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	14	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	15	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	16	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	17	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	18	3.4	3.332	0	46.75	19.8	0	0	0	1	0
1999	2	19	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	20	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	21	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	22	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	23	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	24	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	25	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	26	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	27	0	0	0	46.75	19.8	0	0	0	1	0
1999	2	28	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	1	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	3	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	4	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	6	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	7	19.6	19.208	0	46.75	19.8	0	0	0	1	0
1999	3	8	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	3	9	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	10	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	11	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	12	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	13	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	14	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	15	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	16	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	17	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	18	11	10.78	0	46.75	19.8	0	0	0	1	0
1999	3	19	1.6	1.568	0	46.75	19.8	0	0	0	1	0
1999	3	20	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	21	48	47.04	0	46.75	19.51	0	0	0.29	0	1
1999	3	22	2.6	2.548	0	46.75	19.8	0	0	0	1	0
1999	3	23	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	24	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	25	11	10.78	0	46.75	19.8	0	0	0	1	0
1999	3	26	2.8	2.744	0	46.75	19.8	0	0	0	1	0
1999	3	27	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	28	4.6	4.508	0	46.75	19.8	0	0	0	1	0
1999	3	29	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	30	0	0	0	46.75	19.8	0	0	0	1	0
1999	3	31	1.8	1.764	0	46.75	19.8	0	0	0	1	0
1999	4	1	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	3	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	4	1.2	1.176	0	46.75	19.8	0	0	0	1	0
1999	4	5	3.2	3.136	0	46.75	19.8	0	0	0	1	0
1999	4	6	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	7	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	8	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	9	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	10	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	11	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	12	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	13	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	14	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	15	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	16	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	17	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	18	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	19	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	20	6.8	6.664	0	46.75	19.8	0	0	0	1	0
1999	4	21	4.2	4.116	0	46.75	19.8	0	0	0	1	0
1999	4	22	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	23	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	24	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	25	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	26	0	0	0	46.75	19.8	0	0	0	1	0
1999	4	27	1.2	1.176	0	46.75	19.8	0	0	0	1	0
1999	4	28	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	4	29	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	4	30	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	1	0	0	0	46.75	19.8	0	0	0	1	0

1999	5	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	3	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	4	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	6	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	7	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	8	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	9	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	10	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	5	11	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	12	11.6	11.368	0	46.75	19.8	0	0	0	1	0
1999	5	13	30.4	29.792	0	46.75	19.8	0	0	0	1	1
1999	5	14	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	5	15	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	16	42.8	41.944	0	46.75	19.8	0	0	0	1	1
1999	5	17	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	18	0.8	0.784	0	46.75	19.8	0	0	0	1	0
1999	5	19	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	20	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	21	6.4	6.272	0	46.75	19.8	0	0	0	1	0
1999	5	22	5.2	5.096	0	46.75	19.8	0	0	0	1	0
1999	5	23	44.2	43.316	0	46.75	19.8	0	0	0	1	1
1999	5	24	15.8	15.484	0	46.75	19.8	0	0	0	1	0
1999	5	25	78	76.44	0	46.75	0	1	9.89	0	0	0
1999	5	26	11.4	11.172	0	46.75	19.8	0	0	0	1	1
1999	5	27	1.6	1.568	0	46.75	19.8	0	0	0	1	0
1999	5	28	0	0	0	46.75	19.8	0	0	0	1	0
1999	5	29	14	13.72	0	46.75	19.8	0	0	0	1	0
1999	5	30	10.4	10.192	0	46.75	19.8	0	0	0	1	0
1999	5	31	13.2	12.936	0	46.75	19.8	0	0	0	1	0
1999	6	1	0	0	0	46.75	19.8	0	0	0	1	0
1999	6	2	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	6	3	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	6	4	0	0	0	46.75	19.8	0	0	0	1	0
1999	6	5	12.8	12.544	0	46.75	19.8	0	0	0	1	0
1999	6	6	1.4	1.372	0	46.75	19.8	0	0	0	1	0
1999	6	7	8.2	8.036	0	46.75	19.8	0	0	0	1	0
1999	6	8	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	6	9	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	6	10	7.2	7.056	0	46.75	19.8	0	0	0	1	0
1999	6	11	0	0	0	46.75	19.8	0	0	0	1	0
1999	6	12	0	0	0	46.75	19.8	0	0	0	1	0
1999	6	13	36.2	35.476	0	46.75	19.8	0	0	0	1	1
1999	6	14	0	0	0	46.75	19.8	0	0	0	1	0
1999	6	15	16.6	16.268	0	46.75	19.8	0	0	0	1	0
1999	6	16	5	4.9	0	46.75	19.8	0	0	0	1	0
1999	6	17	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	6	18	14.8	14.504	0	46.75	19.8	0	0	0	1	0
1999	6	19	2.4	2.352	0	46.75	19.8	0	0	0	1	0
1999	6	20	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	6	21	4.4	4.312	0	46.75	19.8	0	0	0	1	0
1999	6	22	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	6	23	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	6	24	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	6	25	7.6	7.448	0	46.75	19.8	0	0	0	1	0
1999	6	26	3.8	3.724	0	46.75	19.8	0	0	0	1	0
1999	6	27	0	0	0	46.75	19.8	0	0	0	1	0
1999	6	28	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	6	29	0	0	0	46.75	19.8	0	0	0	1	0
1999	6	30	16.2	15.876	0	46.75	19.8	0	0	0	1	0
1999	7	1	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	7	2	4.8	4.704	0	46.75	19.8	0	0	0	1	0
1999	7	3	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	7	4	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	6	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	7	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	8	2	1.96	0	46.75	19.8	0	0	0	1	0
1999	7	9	18.6	18.228	0	46.75	19.8	0	0	0	1	0
1999	7	10	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	11	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	12	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	7	13	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	7	14	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	7	15	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	7	16	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	17	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	18	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	19	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	20	30.2	29.596	0	46.75	19.8	0	0	0	1	1
1999	7	21	5.8	5.684	0	46.75	19.8	0	0	0	1	0
1999	7	22	5.8	5.684	0	46.75	19.8	0	0	0	1	0
1999	7	23	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	24	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	25	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	26	0.8	0.784	0	46.75	19.8	0	0	0	1	0
1999	7	27	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	28	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	29	0	0	0	46.75	19.8	0	0	0	1	0
1999	7	30	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	7	31	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	8	1	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	3	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	4	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	6	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	7	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	8	21	20.58	0	46.75	19.8	0	0	0	1	0
1999	8	9	24	23.52	0	46.75	19.8	0	0	0	1	1
1999	8	10	4	3.92	0	46.75	19.8	0	0	0	1	0
1999	8	11	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	12	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	8	13	1.2	1.176	0	46.75	19.8	0	0	0	1	0
1999	8	14	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	15	5	4.9	0	46.75	19.8	0	0	0	1	0
1999	8	16	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	17	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	8	18	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	19	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	20	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	21	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	22	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	23	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	24	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	8	25	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	26	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	8	27	4.6	4.508	0	46.75	19.8	0	0	0	1	0
1999	8	28	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	29	0	0	0	46.75	19.8	0	0	0	1	0
1999	8	30	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	8	31	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	1	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	3	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	4	36.2	35.476	0	46.75	19.8	0	0	0	1	1

1999	9	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	6	10.8	10.584	0	46.75	19.8	0	0	0	1	0
1999	9	7	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	9	8	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	9	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	10	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	11	4.6	4.508	0	46.75	19.8	0	0	0	1	0
1999	9	12	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	9	13	2.2	2.156	0	46.75	19.8	0	0	0	1	0
1999	9	14	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	15	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	9	16	13.8	13.524	0	46.75	19.8	0	0	0	1	0
1999	9	17	26.8	26.264	0	46.75	19.8	0	0	0	1	1
1999	9	18	2	1.96	0	46.75	19.8	0	0	0	1	0
1999	9	19	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	20	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	9	21	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	22	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	23	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	24	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	25	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	26	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	27	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	28	0	0	0	46.75	19.8	0	0	0	1	0
1999	9	29	16.8	16.464	0	46.75	19.8	0	0	0	1	0
1999	9	30	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	1	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	3	21.4	20.972	0	46.75	19.8	0	0	0	1	1
1999	10	4	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	6	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	7	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	8	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	9	0.8	0.784	0	46.75	19.8	0	0	0	1	0
1999	10	10	20.6	20.188	0	46.75	19.8	0	0	0	1	1
1999	10	11	15.8	15.484	0	46.75	19.8	0	0	0	1	0
1999	10	12	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	10	13	9.2	9.016	0	46.75	19.8	0	0	0	1	0
1999	10	14	7.4	7.252	0	46.75	19.8	0	0	0	1	0
1999	10	15	1	0.98	0	46.75	19.8	0	0	0	1	0
1999	10	16	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	17	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	18	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	10	19	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	10	20	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	10	21	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	22	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	10	23	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	24	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	10	25	1.2	1.176	0	46.75	19.8	0	0	0	1	0
1999	10	26	1.2	1.176	0	46.75	19.8	0	0	0	1	0
1999	10	27	3	2.94	0	46.75	19.8	0	0	0	1	0
1999	10	28	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	10	29	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	30	0	0	0	46.75	19.8	0	0	0	1	0
1999	10	31	4.6	4.508	0	46.75	19.8	0	0	0	1	0
1999	11	1	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	3	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	4	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	11	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	6	10.4	10.192	0	46.75	19.8	0	0	0	1	0
1999	11	7	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	8	5.2	5.096	0	46.75	19.8	0	0	0	1	0
1999	11	9	4.4	4.312	0	46.75	19.8	0	0	0	1	0
1999	11	10	2.8	2.744	0	46.75	19.8	0	0	0	1	0
1999	11	11	1.4	1.372	0	46.75	19.8	0	0	0	1	0
1999	11	12	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	11	13	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	14	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	15	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	16	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	17	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	18	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	19	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	20	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	11	21	7.2	7.056	0	46.75	19.8	0	0	0	1	0
1999	11	22	12.2	11.956	0	46.75	19.8	0	0	0	1	0
1999	11	23	0.4	0.392	0	46.75	19.8	0	0	0	1	0
1999	11	24	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	25	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	26	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	27	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	28	0	0	0	46.75	19.8	0	0	0	1	0
1999	11	29	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	11	30	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	1	2.8	2.744	0	46.75	19.8	0	0	0	1	0
1999	12	2	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	3	23.4	22.932	0	46.75	19.8	0	0	0	1	1
1999	12	4	0.6	0.588	0	46.75	19.8	0	0	0	1	0
1999	12	5	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	6	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	7	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	8	1.6	1.568	0	46.75	19.8	0	0	0	1	0
1999	12	9	8	7.84	0	46.75	19.8	0	0	0	1	0
1999	12	10	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	12	11	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	12	1.2	1.176	0	46.75	19.8	0	0	0	1	0
1999	12	13	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	14	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	15	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	16	4.6	4.508	0	46.75	19.8	0	0	0	1	0
1999	12	17	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	18	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	19	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	20	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	21	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	22	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	23	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	24	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	25	1.2	1.176	0	46.75	19.8	0	0	0	1	0
1999	12	26	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	27	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	12	28	1.8	1.764	0	46.75	19.8	0	0	0	1	0
1999	12	29	0.2	0.196	0	46.75	19.8	0	0	0	1	0
1999	12	30	0	0	0	46.75	19.8	0	0	0	1	0
1999	12	31	2	1.96	0	46.75	19.8	0	0	0	1	0
			997.8	977.844	0	17063.75			9.89	0.29	363	13

Month	Day	Daily Recorded Rainfall (mm)	Mean Daily Evaporation (mm)	Runoff Coefficient Cv	Catchment Area - SB1 (m²)	Inputs: Overland Flow Quarry (m³)	Outputs: Evaporation (m³)	Outputs: Water Used in Operations (m³)	Adjusted Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
1	1	0	6.4	0	39200	0	3.84	110.5714286	1000	0	0	1000	0	
1	2	0	6.4	0	39200	0	3.84	110.5714286	1114.411429	0	0	735.5885714	0	0
1	3	0	6.4	0	39200	0	3.84	110.5714286	1228.822857	0	0	621.1771429	0	0
1	4	0	6.4	0	39200	0	3.84	110.5714286	1343.234286	0	0	506.7657143	0	0
1	5	0	6.4	0	39200	0	3.84	110.5714286	1457.645714	0	0	392.3542857	0	0
1	6	0	6.4	0	39200	0	3.84	110.5714286	1572.057143	0	0	277.9428571	0	0
1	7	0.4	6.4	0	39200	0	3.84	110.5714286	1686.468571	0	0	163.5314286	0	0
1	8	16	6.4	0.43	39200	269.696	3.84	110.5714286	1531.184	0	0	318.816	0	0
1	9	0	6.4	0	39200	0	3.84	110.5714286	1645.595429	0	0	204.4045714	0	0
1	10	0	6.4	0	39200	0	3.84	110.5714286	1760.006857	0	0	89.99314286	0	0
1	11	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	12	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	13	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	14	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	15	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	16	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	17	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	18	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	19	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	20	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	21	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	22	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	23	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	24	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	25	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	26	0.8	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	27	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	28	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	29	0.2	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	30	0	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
1	31	0.6	6.4	0	39200	0	3.84	110.5714286	1850	0	0	0	1	0
2	1	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	2	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	3	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	4	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	5	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	6	0.8	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	7	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	8	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	9	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	10	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	11	0.4	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	12	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	13	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	14	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	15	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	16	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	17	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	18	3.4	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	19	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	20	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	21	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	22	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	23	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	24	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	25	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	26	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	27	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
2	28	0	5.68	0	39200	0	3.408	110.5714286	1850	0	0	0	1	0
3	1	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	2	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	3	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	4	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	5	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	6	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	7	19.6	4.64	0.43	39200	330.3776	2.784	110.5714286	1632.977829	0	0	217.0221714	0	0
3	8	0.2	4.64	0	39200	0	2.784	110.5714286	1746.333257	0	0	103.6667429	0	0
3	9	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	10	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	11	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	12	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	13	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	14	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	15	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	16	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	17	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	18	11	4.64	0.43	39200	185.416	2.784	110.5714286	1777.939429	0	0	72.06057143	0	0
3	19	1.6	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	20	0	4.64	0	39200	0	2.784	110.5714286	1850	0	0	0	1	0
3	21	48	4.64	0.74	39200	1392.384	2.784	110.5714286	570.9714286	0	0	1279.028571	0	0
3	22	2.6	4.64	0	39200	0	2.784	110.5714286	684.3268571	0	0	1165.673143	0	0
3	23	0	4.64	0	39200	0	2.784	110.5714286	797.6822857	0	0	1052.317714	0	0
3	24	0	4.64	0	39200	0	2.784	110.5714286	911.0377143	0	0	938.9622857	0	0
3	25	11	4.64	0.43	39200	185.416	2.784	110.5714286	838.9771429	0	0	1011.022857	0	0
3	26	2.8	4.64	0	39200	0	2.784	110.5714286	952.3325714	0	0	897.6674286	0	0
3	27	0	4.64	0	39200	0	2.784	110.5714286	1065.688	0	0	784.312	0	0
3	28	4.6	4.64	0	39200	0	2.784	110.5714286	1179.043429	0	0	670.9565714	0	0
3	29	0	4.64	0	39200	0	2.784	110.5714286	1292.398857	0	0	557.6011429	0	0
3	30	0	4.64	0	39200	0	2.784	110.5714286	1405.754286	0	0	444.2457143	0	0
3	31	1.8	4.64	0	39200	0	2.784	110.5714286	1519.109714	0	0	330.8902857	0	0
4	1	0	2.96	0	39200	0	1.776	110.5714286	1631.457143	0	0	218.5428571	0	0
4	2	0	2.96	0	39200	0	1.776	110.5714286	1743.804571	0	0	106.1954286	0	0
4	3	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	4	1.2	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	5	3.2	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	6	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	7	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	8	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	9	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	10	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	11	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	12	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	13	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	14	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	15	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	16	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	17	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	18	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	19	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	20	6.8	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	21	4.2	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	22	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	23	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	24	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	25	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	26	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	27	1.2	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	28	0.6	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	29	0.2	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
4	30	0	2.96	0	39200	0	1.776	110.5714286	1850	0	0	0	1	0
5	1	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	2	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	3	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	4	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	5	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	6	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	7	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	8	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	9	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	10	0.4	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	11	0	1.92	0	39200	0	1.152	110.5714286	1850	0	0	0	1	0
5	12	11.6	1.92	0.43	39200	195.5296	1.152	110.5714286	1766.193829	0	0	83.80617143	0	0
5	13	30.4	1.92	0.69	39200	822.2592	1.152	110.5714286	1055.658057	0	0	794.3419429	0	0
5	14	0.6	1.92	0	39200	0	1.152	110.5714286	1167.381486	0	0	682.6185143	0	0
5	15	0	1.92	0	39200	0	1.152	110.5714286	1279.104914	0	0	570.8950857	0	0
5	16	42.8	1.92	0.74	39200	1241.5424	1.152	110.5714286	149.2859429	0	0	1700.714057	0	0
5	17	0	1.92	0	39200	0	1.152	110.5714286	261.0093714	0	0	1588.990629	0	0
5	18	0.8	1.92	0	39200	0	1.152	110.5714286	372.7328	0	0	1477.2672	0	0

5	19	0	1.92	0	39200	0	1.152	110.5714286	484.4562286	0	0	1365.543771	0	0
5	20	0	1.92	0	39200	0	1.152	110.5714286	596.1796571	0	0	1253.820343	0	0
5	21	6.4	1.92	0	39200	0	1.152	110.5714286	707.9030857	0	0	1142.096914	0	0
5	22	5.2	1.92	0	39200	0	1.152	110.5714286	819.6265143	0	0	1030.373486	0	0
5	23	44.2	1.92	0.74	39200	1282.1536	1.152	110.5714286	0	350.8036571	0	1850	0	0
5	24	15.8	1.92	0.43	39200	266.3248	1.152	110.5714286	0	154.6013714	0	1850	0	0
5	25	78	1.92	0.81	39200	2476.656	1.152	110.5714286	0	2364.932571	0	1850	0	0
5	26	11.4	1.92	0.43	39200	192.1584	1.152	110.5714286	0	80.43497143	0	1850	0	0
5	27	1.6	1.92	0	39200	0	1.152	110.5714286	111.7234286	0	0	1738.276571	0	1
5	28	0	1.92	0	39200	0	1.152	110.5714286	223.4468571	0	0	1626.553143	0	0
5	29	14	1.92	0.43	39200	235.984	1.152	110.5714286	99.18628571	0	0	1750.813714	0	0
5	30	10.4	1.92	0.43	39200	175.3024	1.152	110.5714286	35.60731429	0	0	1814.392686	0	0
5	31	13.2	1.92	0.43	39200	222.4992	1.152	110.5714286	0	75.16845714	0	1850	0	0
6	1	0	1.44	0	39200	0	0.864	110.5714286	111.4354286	0	0	1738.564571	0	1
6	2	0.2	1.44	0	39200	0	0.864	110.5714286	222.8708571	0	0	1627.129143	0	0
6	3	0.2	1.44	0	39200	0	0.864	110.5714286	334.3062857	0	0	1515.693714	0	0
6	4	0	1.44	0	39200	0	0.864	110.5714286	445.7417143	0	0	1404.258286	0	0
6	5	12.8	1.44	0.43	39200	215.7568	0.864	110.5714286	341.4203429	0	0	1508.579657	0	0
6	6	1.4	1.44	0	39200	0	0.864	110.5714286	452.8557714	0	0	1397.144229	0	0
6	7	8.2	1.44	0	39200	0	0.864	110.5714286	564.2912	0	0	1285.7088	0	0
6	8	0.2	1.44	0	39200	0	0.864	110.5714286	675.7266286	0	0	1174.273371	0	0
6	9	0.2	1.44	0	39200	0	0.864	110.5714286	787.1620571	0	0	1062.837943	0	0
6	10	7.2	1.44	0	39200	0	0.864	110.5714286	898.5974857	0	0	951.4025143	0	0
6	11	0	1.44	0	39200	0	0.864	110.5714286	1010.032914	0	0	839.9670857	0	0
6	12	0	1.44	0	39200	0	0.864	110.5714286	1121.468343	0	0	728.5316571	0	0
6	13	36.2	1.44	0.69	39200	979.1376	0.864	110.5714286	253.7661714	0	0	1596.233829	0	0
6	14	0	1.44	0	39200	0	0.864	110.5714286	365.2016	0	0	1484.7984	0	0
6	15	16.6	1.44	0.43	39200	279.8096	0.864	110.5714286	196.8274286	0	0	1653.172571	0	0
6	16	5	1.44	0	39200	0	0.864	110.5714286	308.2628571	0	0	1541.737143	0	0
6	17	0.4	1.44	0	39200	0	0.864	110.5714286	419.6982857	0	0	1430.301714	0	0
6	18	14.8	1.44	0.43	39200	249.4688	0.864	110.5714286	281.6649143	0	0	1568.335086	0	0
6	19	2.4	1.44	0	39200	0	0.864	110.5714286	393.1003429	0	0	1456.899657	0	0
6	20	0.2	1.44	0	39200	0	0.864	110.5714286	504.5357714	0	0	1345.464229	0	0
6	21	4.4	1.44	0	39200	0	0.864	110.5714286	615.9712	0	0	1234.0288	0	0
6	22	0.6	1.44	0	39200	0	0.864	110.5714286	727.4066286	0	0	1122.593371	0	0
6	23	0.4	1.44	0	39200	0	0.864	110.5714286	838.8420571	0	0	1011.157943	0	0
6	24	0.2	1.44	0	39200	0	0.864	110.5714286	950.2774857	0	0	899.7225143	0	0
6	25	7.6	1.44	0	39200	0	0.864	110.5714286	1061.712914	0	0	788.2870857	0	0
6	26	3.8	1.44	0	39200	0	0.864	110.5714286	1173.148343	0	0	676.8516571	0	0
6	27	0	1.44	0	39200	0	0.864	110.5714286	1284.583771	0	0	565.4162286	0	0
6	28	0.2	1.44	0	39200	0	0.864	110.5714286	1396.0192	0	0	453.9808	0	0
6	29	0	1.44	0	39200	0	0.864	110.5714286	1507.454629	0	0	342.5453714	0	0
6	30	16.2	1.44	0.43	39200	273.0672	0.864	110.5714286	1345.822857	0	0	504.1771429	0	0
7	1	0.6	1.36	0	39200	0	0.816	110.5714286	1457.210286	0	0	392.7897143	0	0
7	2	4.8	1.36	0	39200	0	0.816	110.5714286	1568.597714	0	0	281.4022857	0	0
7	3	0.4	1.36	0	39200	0	0.816	110.5714286	1679.985143	0	0	170.0148571	0	0
7	4	0	1.36	0	39200	0	0.816	110.5714286	1791.372571	0	0	58.62742857	0	0
7	5	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	6	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	7	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	8	2	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	9	18.6	1.36	0.43	39200	313.5216	0.816	110.5714286	1647.865829	0	0	202.1341714	0	0
7	10	0	1.36	0	39200	0	0.816	110.5714286	1759.253257	0	0	90.74674286	0	0
7	11	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	12	0.4	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	13	0.4	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	14	0.4	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	15	0.2	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	16	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	17	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	18	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	19	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	20	30.2	1.36	0.69	39200	816.8496	0.816	110.5714286	1144.537829	0	0	705.4621714	0	0
7	21	5.8	1.36	0	39200	0	0.816	110.5714286	1255.925257	0	0	594.0747429	0	0
7	22	5.8	1.36	0	39200	0	0.816	110.5714286	1367.312686	0	0	482.6873143	0	0
7	23	0	1.36	0	39200	0	0.816	110.5714286	1478.700114	0	0	371.2998857	0	0
7	24	0	1.36	0	39200	0	0.816	110.5714286	1590.087543	0	0	259.9124571	0	0
7	25	0	1.36	0	39200	0	0.816	110.5714286	1701.474971	0	0	148.5250286	0	0
7	26	0.8	1.36	0	39200	0	0.816	110.5714286	1812.8624	0	0	37.1376	0	0
7	27	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	28	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	29	0	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	30	0.2	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
7	31	0.6	1.36	0	39200	0	0.816	110.5714286	1850	0	0	0	1	0
8	1	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	2	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	3	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	4	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	5	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	6	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	7	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	8	21	1.84	0.56	39200	460.992	1.104	110.5714286	1500.683429	0	0	349.3165714	0	0
8	9	24	1.84	0.56	39200	526.848	1.104	110.5714286	1085.510857	0	0	764.4891429	0	0
8	10	4	1.84	0	39200	0	1.104	110.5714286	1197.186286	0	0	652.8137143	0	0
8	11	0	1.84	0	39200	0	1.104	110.5714286	1308.861714	0	0	541.1382857	0	0
8	12	0.6	1.84	0	39200	0	1.104	110.5714286	1420.537143	0	0	429.4628571	0	0
8	13	1.2	1.84	0	39200	0	1.104	110.5714286	1532.212571	0	0	317.7874286	0	0
8	14	0	1.84	0	39200	0	1.104	110.5714286	1643.888	0	0	206.112	0	0
8	15	5	1.84	0	39200	0	1.104	110.5714286	1755.563429	0	0	94.43657143	0	0
8	16	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	17	0.2	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	18	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	19	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	20	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	21	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	22	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	23	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	24	0.2	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	25	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	26	0.6	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	27	4.6	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	28	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	29	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	30	0.4	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
8	31	0	1.84	0	39200	0	1.104	110.5714286	1850	0	0	0	1	0
9	1	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	2	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	3	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	4	36.2	2.72	0.69	39200	979.1376	1.632	110.5714286	983.0658286	0	0	866.9341714	0	0
9	5	0	2.72	0	39200	0	1.632	110.5714286	1095.269257	0	0	754.7307429	0	0
9	6	10.8	2.72	0.43	39200	182.0448	1.632	110.5714286	1025.427886	0	0	824.5721143	0	0
9	7	0.4	2.72	0	39200	0	1.632	110.5714286	1137.631314	0	0	712.3686857	0	0
9	8	0	2.72	0	39200	0	1.632	110.5714286	1249.834743	0	0	600.1652571	0	0
9	9	0	2.72	0	39200	0	1.632	110.5714286	1362.038171	0	0	487.9618286	0	0
9	10	0	2.72	0	39200	0	1.632	110.5714286	1474.2416	0	0	375.7584	0	0
9	11	4.6	2.72	0	39200	0	1.632	110.5714286	1586.445029	0	0	263.5549714	0	0
9	12	0.4	2.72	0	39200	0	1.632	110.5714286	1698.648457	0	0	151.3515429	0	0
9	13	2.2	2.72	0	39200	0	1.632	110.5714286	1810.851886	0	0	39.14811429	0	0
9	14	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	15	0.2	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	16	13.8	2.72	0.43	39200	232.6128	1.632	110.5714286	1729.590629	0	0	120.4093714	0	0
9	17	26.8	2.72	0.56	39200	588.3136	1.632	110.5714286	1253.480457	0	0	596.5195429	0	0
9	18	2	2.72	0	39200	0	1.632	110.5714286	1365.683886	0	0	484.3161143	0	0
9	19	0	2.72	0	39200	0	1.632	110.5714286	1477.887314	0	0	372.1126857	0	0
9	20	0.2	2.72	0	39200	0	1.632	110.5714286	1590.090743	0	0	259.9092571	0	0
9	21	0	2.72	0	39200	0	1.632	110.5714286	1702.294171	0	0	147.7058286	0	0
9	22	0	2.72	0	39200	0	1.632	110.5714286	1814.4976	0	0	35.5024	0	0
9	23	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	24	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	25	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	26	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	27	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	28	0	2.72	0	39200	0	1.632	110.5714286	1850	0	0	0	1	0
9	29	16.8	2.72	0.43	39200	283.1808	1.632	110.5714286	1679.022629	0	0	170.9773714	0	0
9	30	0	2.72	0	39200	0	1.632	110.5714286	1791.226057	0	0	58.77394286	0	0
10	1	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	2	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	3	21.4	3.76	0.56	39200	469.7728	2.256	110.5714286	1493.054629	0	0	356.9453714	0	0
10	4	0	3.76	0	39200	0	2.256	110.5714286	1605.882057	0	0	244.1179429	0	0
10	5	0	3.76	0	39200	0	2.256	110.5714286	1718.709486	0	0	131.2905143	0	0
10	6	0	3.76	0	39200	0	2.256	110.5714286	1831.536914	0	0	18.46308571	0	0
10	7	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	8	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0

10	9	0.8	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	10	20.6	3.76	0.56	39200	452.2112	2.256	110.5714286	1510.616229	0	0	339.3837714	0	0
10	11	15.8	3.76	0.43	39200	266.3248	2.256	110.5714286	1357.118857	0	0	492.8811429	0	0
10	12	0.4	3.76	0	39200	0	2.256	110.5714286	1469.946286	0	0	380.0537143	0	0
10	13	9.2	3.76	0	39200	0	2.256	110.5714286	1582.773714	0	0	267.2262857	0	0
10	14	7.4	3.76	0	39200	0	2.256	110.5714286	1695.601143	0	0	154.3988571	0	0
10	15	1	3.76	0	39200	0	2.256	110.5714286	1808.428571	0	0	41.57142857	0	0
10	16	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	17	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	18	0.4	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	19	0.2	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	20	0.2	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	21	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	22	0.6	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	23	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	24	0.2	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	25	1.2	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	26	1.2	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	27	3	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	28	0.2	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	29	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	30	0	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
10	31	4.6	3.76	0	39200	0	2.256	110.5714286	1850	0	0	0	1	0
11	1	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	2	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	3	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	4	0.2	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	5	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	6	10.4	4.8	0.43	39200	175.3024	2.88	110.5714286	1788.149029	0	0	61.85097143	0	0
11	7	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	8	5.2	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	9	4.4	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	10	2.8	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	11	1.4	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	12	0.2	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	13	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	14	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	15	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	16	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	17	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	18	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	19	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	20	0.2	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	21	7.2	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	22	12.2	4.8	0.43	39200	205.6432	2.88	110.5714286	1757.808229	0	0	92.19177143	0	0
11	23	0.4	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	24	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	25	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	26	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	27	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	28	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	29	0.2	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
11	30	0	4.8	0	39200	0	2.88	110.5714286	1850	0	0	0	1	0
12	1	2.8	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	2	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	3	23.4	5.76	0.56	39200	513.6768	3.456	110.5714286	1450.350629	0	0	399.6493714	0	0
12	4	0.6	5.76	0	39200	0	3.456	110.5714286	1564.378057	0	0	285.6219429	0	0
12	5	0	5.76	0	39200	0	3.456	110.5714286	1678.405486	0	0	171.5945143	0	0
12	6	0	5.76	0	39200	0	3.456	110.5714286	1792.432914	0	0	57.56708571	0	0
12	7	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	8	1.6	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	9	8	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	10	0.2	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	11	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	12	1.2	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	13	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	14	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	15	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	16	4.6	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	17	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	18	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	19	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	20	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	21	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	22	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	23	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	24	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	25	1.2	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	26	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	27	0.2	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	28	1.8	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	29	0.2	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	30	0	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
12	31	2	5.76	0	39200	0	3.456	110.5714286	1850	0	0	0	1	0
		997.8				17937.3712	787.632	40358.57143		3025.941029	0		233	2

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient Cv	Inputs Overland Flow Quarry (m³)	Outputs Evaporation (m³)	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Volume of Controlled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
1999	1	1	0	0	0	7.68	2840	0	0	0	2200	0	
1999	1	2	0	0	0	7.68	2847.68	0	0	0	794.32	0	0
1999	1	3	0	0	0	7.68	2855.36	0	0	0	786.64	0	0
1999	1	4	0	0	0	7.68	2863.04	0	0	0	778.96	0	0
1999	1	5	0	0	0	7.68	2870.72	0	-20.72	0	771.28	0	0
1999	1	6	0	0	0	7.68	2878.4	0	-28.4	0	763.6	0	0
1999	1	7	0.4	0	0	7.68	2886.08	0	-36.08	0	755.92	0	0
1999	1	8	16	0.43	677.68	7.68	2216.08	0	633.92	633.92	1425.92	0	0
1999	1	9	0	0	0	7.68	2857.68	0	-7.68	0	784.32	0	0
1999	1	10	0	0	0	7.68	2865.36	0	-15.36	0	776.64	0	0
1999	1	11	0	0	0	7.68	2873.04	0	-23.04	0	768.96	0	0
1999	1	12	0	0	0	7.68	2880.72	0	-30.72	0	761.28	0	0
1999	1	13	0	0	0	7.68	2888.4	0	-38.4	0	753.6	0	0
1999	1	14	0	0	0	7.68	2896.08	0	-46.08	0	745.92	0	0
1999	1	15	0	0	0	7.68	2903.76	0	-53.76	0	738.24	0	0
1999	1	16	0	0	0	7.68	2911.44	0	-61.44	0	730.56	0	0
1999	1	17	0	0	0	7.68	2919.12	0	-69.12	0	722.88	0	0
1999	1	18	0	0	0	7.68	2926.8	0	-76.8	0	715.2	0	0
1999	1	19	0	0	0	7.68	2934.48	0	-84.48	0	707.52	0	0
1999	1	20	0	0	0	7.68	2942.16	0	-92.16	0	699.84	0	0
1999	1	21	0	0	0	7.68	2949.84	0	-99.84	0	692.16	0	0
1999	1	22	0	0	0	7.68	2957.52	0	-107.52	0	684.48	0	0
1999	1	23	0	0	0	7.68	2965.2	0	-115.2	0	676.8	0	0
1999	1	24	0	0	0	7.68	2972.88	0	-122.88	0	669.12	0	0
1999	1	25	0	0	0	7.68	2980.56	0	-130.56	0	661.44	0	0
1999	1	26	0.8	0	0	7.68	2988.24	0	-138.24	0	653.76	0	0
1999	1	27	0	0	0	7.68	2995.92	0	-145.92	0	646.08	0	0
1999	1	28	0	0	0	7.68	3003.6	0	-153.6	0	638.4	0	0
1999	1	29	0.2	0	0	7.68	3011.28	0	-161.28	0	630.72	0	0
1999	1	30	0	0	0	7.68	3018.96	0	-168.96	0	623.04	0	0
1999	1	31	0.6	0	0	7.68	3026.64	0	-176.64	0	615.36	0	0
1999	2	1	0	0	0	6.816	3033.456	0	-183.456	0	608.544	0	0
1999	2	2	0	0	0	6.816	3040.272	0	-190.272	0	601.728	0	0
1999	2	3	0	0	0	6.816	3047.088	0	-197.088	0	594.912	0	0
1999	2	4	0	0	0	6.816	3053.904	0	-203.904	0	588.096	0	0
1999	2	5	0	0	0	6.816	3060.72	0	-210.72	0	581.28	0	0
1999	2	6	0.8	0	0	6.816	3067.536	0	-217.536	0	574.464	0	0
1999	2	7	0	0	0	6.816	3074.352	0	-224.352	0	567.648	0	0
1999	2	8	0	0	0	6.816	3081.168	0	-231.168	0	560.832	0	0
1999	2	9	0	0	0	6.816	3087.984	0	-237.984	0	554.016	0	0
1999	2	10	0	0	0	6.816	3094.8	0	-244.8	0	547.2	0	0
1999	2	11	0.4	0	0	6.816	3101.616	0	-251.616	0	540.384	0	0
1999	2	12	0	0	0	6.816	3108.432	0	-258.432	0	533.568	0	0
1999	2	13	0	0	0	6.816	3115.248	0	-265.248	0	526.752	0	0
1999	2	14	0	0	0	6.816	3122.064	0	-272.064	0	519.936	0	0
1999	2	15	0	0	0	6.816	3128.88	0	-278.88	0	513.12	0	0
1999	2	16	0	0	0	6.816	3135.696	0	-285.696	0	506.304	0	0
1999	2	17	0	0	0	6.816	3142.512	0	-292.512	0	499.488	0	0
1999	2	18	3.4	0	0	6.816	3149.328	0	-299.328	0	492.672	0	0
1999	2	19	0	0	0	6.816	3156.144	0	-306.144	0	485.856	0	0
1999	2	20	0	0	0	6.816	3162.96	0	-312.96	0	479.04	0	0
1999	2	21	0	0	0	6.816	3169.776	0	-319.776	0	472.224	0	0
1999	2	22	0	0	0	6.816	3176.592	0	-326.592	0	465.408	0	0
1999	2	23	0	0	0	6.816	3183.408	0	-333.408	0	458.592	0	0
1999	2	24	0	0	0	6.816	3190.224	0	-340.224	0	451.776	0	0
1999	2	25	0	0	0	6.816	3197.04	0	-347.04	0	444.96	0	0
1999	2	26	0	0	0	6.816	3203.856	0	-353.856	0	438.144	0	0
1999	2	27	0	0	0	6.816	3210.672	0	-360.672	0	431.328	0	0
1999	2	28	0	0	0	6.816	3217.488	0	-367.488	0	424.512	0	0
1999	3	1	0	0	0	5.568	3223.056	0	-373.056	0	418.944	0	0
1999	3	2	0	0	0	5.568	3228.624	0	-378.624	0	413.376	0	0
1999	3	3	0	0	0	5.568	3234.192	0	-384.192	0	407.808	0	0
1999	3	4	0	0	0	5.568	3239.76	0	-389.76	0	402.24	0	0
1999	3	5	0	0	0	5.568	3245.328	0	-395.328	0	396.672	0	0
1999	3	6	0	0	0	5.568	3250.896	0	-400.896	0	391.104	0	0
1999	3	7	19.6	0.43	830.158	5.568	2426.306	0	423.694	423.694	1215.694	0	0
1999	3	8	0.2	0	0	5.568	2855.568	0	-5.568	0	786.432	0	0
1999	3	9	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	10	0	0	0	5.568	2866.704	0	-16.704	0	775.296	0	0
1999	3	11	0	0	0	5.568	2872.272	0	-22.272	0	769.728	0	0
1999	3	12	0	0	0	5.568	2877.84	0	-27.84	0	764.16	0	0
1999	3	13	0	0	0	5.568	2883.408	0	-33.408	0	758.592	0	0
1999	3	14	0	0	0	5.568	2888.976	0	-38.976	0	753.024	0	0
1999	3	15	0	0	0	5.568	2894.544	0	-44.544	0	747.456	0	0
1999	3	16	0	0	0	5.568	2900.112	0	-50.112	0	741.888	0	0
1999	3	17	0	0	0	5.568	2905.68	0	-55.68	0	736.32	0	0
1999	3	18	11	0.43	465.905	5.568	2445.343	0	404.657	404.657	1196.657	0	0
1999	3	19	1.6	0	0	5.568	2855.568	0	-5.568	0	786.432	0	0
1999	3	20	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	21	48	0.74	3498.72	5.568	-632.016	632.016	2850	2850	3642	0	0
1999	3	22	2.6	0	0	5.568	2855.568	0	-5.568	0	786.432	0	1
1999	3	23	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	24	0	0	0	5.568	2866.704	0	-16.704	0	775.296	0	0
1999	3	25	11	0.43	465.905	5.568	2406.367	0	443.633	443.633	1235.633	0	0
1999	3	26	2.8	0	0	5.568	2855.568	0	-5.568	0	786.432	0	0
1999	3	27	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	28	4.6	0	0	5.568	2866.704	0	-16.704	0	775.296	0	0
1999	3	29	0	0	0	5.568	2872.272	0	-22.272	0	769.728	0	0
1999	3	30	0	0	0	5.568	2877.84	0	-27.84	0	764.16	0	0
1999	3	31	1.8	0	0	5.568	2883.408	0	-33.408	0	758.592	0	0
1999	4	1	0	0	0	3.552	2886.96	0	-36.96	0	755.04	0	0
1999	4	2	0	0	0	3.552	2890.512	0	-40.512	0	751.488	0	0
1999	4	3	0	0	0	3.552	2894.064	0	-44.064	0	747.936	0	0
1999	4	4	1.2	0	0	3.552	2897.616	0	-47.616	0	744.384	0	0
1999	4	5	3.2	0	0	3.552	2901.168	0	-51.168	0	740.832	0	0
1999	4	6	0	0	0	3.552	2904.72	0	-54.72	0	737.28	0	0
1999	4	7	0	0	0	3.552	2908.272	0	-58.272	0	733.728	0	0
1999	4	8	0	0	0	3.552	2911.824	0	-61.824	0	730.176	0	0
1999	4	9	0	0	0	3.552	2915.376	0	-65.376	0	726.624	0	0
1999	4	10	0	0	0	3.552	2918.928	0	-68.928	0	723.072	0	0
1999	4	11	0	0	0	3.552	2922.48	0	-72.48	0	719.52	0	0
1999	4	12	0	0	0	3.552	2926.032	0	-76.032	0	715.968	0	0
1999	4	13	0	0	0	3.552	2929.584	0	-79.584	0	712.416	0	0
1999	4	14	0	0	0	3.552	2933.136	0	-83.136	0	708.864	0	0
1999	4	15	0	0	0	3.552	2936.688	0	-86.688	0	705.312	0	0
1999	4	16	0	0	0	3.552	2940.24	0	-90.24	0	701.76	0	0
1999	4	17	0	0	0	3.552	2943.792	0	-93.792	0	698.208	0	0
1999	4	18	0	0	0	3.552	2947.344	0	-97.344	0	694.656	0	0
1999	4	19	0	0	0	3.552	2950.896	0	-100.896	0	691.104	0	0
1999	4	20	6.8	0	0	3.552	2954.448	0	-104.448	0	687.552	0	0
1999	4	21	4.2	0	0	3.552	2958	0	-108	0	684	0	0
1999	4	22	0	0	0	3.552	2961.552	0	-111.552	0	680.448	0	0
1999	4	23	0	0	0	3.552	2965.104	0	-115.104	0	676.896	0	0
1999	4	24	0	0	0	3.552	2968.656	0	-118.656	0	673.344	0	0
1999	4	25	0	0	0	3.552	2972.208	0	-122.208	0	669.792	0	0
1999	4	26	0	0	0	3.552	2975.76	0	-125.76	0	666.24	0	0
1999	4	27	1.2	0	0	3.552	2979.312	0	-129.312	0	662.688	0	0
1999	4	28	0.6	0	0	3.552	2982.864	0	-132.864	0	659.136	0	0
1999	4	29	0.2	0	0	3.552	2986.416	0	-136.416	0	655.584	0	0
1999	4	30	0	0	0	3.552	2989.968	0	-139.968	0	652.032	0	0
1999	5	1	0	0	0	2.304	2992.272	0	-142.272	0	649.728	0	0
1999	5	2	0	0	0	2.304	2994.576	0	-144.576	0	647.424	0	0
1999	5	3	0	0	0	2.304	2996.88	0	-146.88	0	645.12	0	0
1999	5	4	0	0	0	2.304	2999.184	0	-149.184	0	642.816	0	0
1999	5	5	0	0	0	2.304	3001.488	0	-151.488	0	640.512	0	0

1999	5	6	0	0	0	2.304	3003.792	0	-153.792	0	638.208	0	0
1999	5	7	0	0	0	2.304	3006.096	0	-156.096	0	635.904	0	0
1999	5	8	0	0	0	2.304	3008.4	0	-158.4	0	633.6	0	0
1999	5	9	0	0	0	2.304	3010.704	0	-160.704	0	631.296	0	0
1999	5	10	0.4	0	0	2.304	3013.008	0	-163.008	0	628.992	0	0
1999	5	11	0	0	0	2.304	3015.312	0	-165.312	0	626.688	0	0
1999	5	12	11.6	0.43	491.318	2.304	2526.298	0	323.702	323.702	1115.702	0	0
1999	5	13	30.4	0.69	2066.136	2.304	786.168	0	2063.832	2063.832	2855.832	0	0
1999	5	14	0.6	0	0	2.304	2852.304	0	-2.304	0	789.696	0	0
1999	5	15	0	0	0	2.304	2854.608	0	-4.608	0	787.392	0	0
1999	5	16	42.8	0.74	3119.692	2.304	-262.78	262.78	2850	2850	3642	0	0
1999	5	17	0	0	0	2.304	2852.304	0	-2.304	0	789.696	0	1
1999	5	18	0.8	0	0	2.304	2854.608	0	-4.608	0	787.392	0	0
1999	5	19	0	0	0	2.304	2856.912	0	-6.912	0	785.088	0	0
1999	5	20	0	0	0	2.304	2859.216	0	-9.216	0	782.784	0	0
1999	5	21	6.4	0	0	2.304	2861.52	0	-11.52	0	780.48	0	0
1999	5	22	5.2	0	0	2.304	2863.824	0	-13.824	0	778.176	0	0
1999	5	23	44.2	0.74	3221.738	2.304	-355.61	355.61	2850	2850	3642	0	0
1999	5	24	15.8	0.43	669.209	2.304	2183.095	0	0	0	1458.905	0	0
1999	5	25	78	0.81	6223.23	2.304	-4037.831	4037.831	0	0	3642	0	0
1999	5	26	11.4	0.43	482.847	2.304	-480.543	480.543	0	0	3642	0	0
1999	5	27	1.6	0	0	2.304	2.304	0	0	0	3639.696	0	1
1999	5	28	0	0	0	2.304	4.608	0	2845.392	2845.392	3637.392	0	0
1999	5	29	14	0.43	592.97	2.304	2259.334	0	590.666	590.666	1382.666	0	1
1999	5	30	10.4	0.43	440.492	2.304	2411.812	0	438.188	438.188	1230.188	0	0
1999	5	31	13.2	0.43	559.086	2.304	2293.218	0	556.782	556.782	1348.782	0	0
1999	6	1	0	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	2	0.2	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	3	0.2	0	0	1.728	2855.184	0	-5.184	0	786.816	0	0
1999	6	4	0	0	0	1.728	2856.912	0	-6.912	0	785.088	0	0
1999	6	5	12.8	0.43	542.144	1.728	2316.496	0	533.504	533.504	1325.504	0	0
1999	6	6	1.4	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	7	8.2	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	8	0.2	0	0	1.728	2855.184	0	0	0	786.816	0	0
1999	6	9	0.2	0	0	1.728	2856.912	0	0	0	785.088	0	0
1999	6	10	7.2	0	0	1.728	2858.64	0	0	0	783.36	0	0
1999	6	11	0	0	0	1.728	2860.368	0	-10.368	0	781.632	0	0
1999	6	12	0	0	0	1.728	2862.096	0	-12.096	0	779.904	0	0
1999	6	13	36.2	0.69	2460.333	1.728	403.491	0	2446.509	2446.509	3238.509	0	0
1999	6	14	0	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	15	16.6	0.43	703.093	1.728	2150.363	0	699.637	699.637	1491.637	0	0
1999	6	16	5	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	17	0.4	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	18	14.8	0.43	626.854	1.728	2228.33	0	0	0	1413.67	0	0
1999	6	19	2.4	0	0	1.728	2230.058	0	0	0	1411.942	0	0
1999	6	20	0.2	0	0	1.728	2231.786	0	0	0	1410.214	0	0
1999	6	21	4.4	0	0	1.728	2233.514	0	0	0	1408.486	0	0
1999	6	22	0.6	0	0	1.728	2235.242	0	0	0	1406.758	0	0
1999	6	23	0.4	0	0	1.728	2236.97	0	0	0	1405.03	0	0
1999	6	24	0.2	0	0	1.728	2238.698	0	0	0	1403.302	0	0
1999	6	25	7.6	0	0	1.728	2240.426	0	0	0	1401.574	0	0
1999	6	26	3.8	0	0	1.728	2242.154	0	0	0	1399.846	0	0
1999	6	27	0	0	0	1.728	2243.882	0	606.118	606.118	1398.118	0	0
1999	6	28	0.2	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	29	0	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	30	16.2	0.43	686.151	1.728	2169.033	0	680.967	680.967	1472.967	0	0
1999	7	1	0.6	0	0	1.632	2851.632	0	-1.632	0	790.368	0	0
1999	7	2	4.8	0	0	1.632	2853.264	0	-3.264	0	788.736	0	0
1999	7	3	0.4	0	0	1.632	2854.896	0	0	0	787.104	0	0
1999	7	4	0	0	0	1.632	2856.528	0	-6.528	0	785.472	0	0
1999	7	5	0	0	0	1.632	2858.16	0	-8.16	0	783.84	0	0
1999	7	6	0	0	0	1.632	2859.792	0	-9.792	0	782.208	0	0
1999	7	7	0	0	0	1.632	2861.424	0	-11.424	0	780.576	0	0
1999	7	8	2	0	0	1.632	2863.056	0	-13.056	0	778.944	0	0
1999	7	9	18.6	0.43	787.803	1.632	2076.885	0	773.115	773.115	1565.115	0	0
1999	7	10	0	0	0	1.632	2851.632	0	-1.632	0	790.368	0	0
1999	7	11	0	0	0	1.632	2853.264	0	-3.264	0	788.736	0	0
1999	7	12	0.4	0	0	1.632	2854.896	0	-4.896	0	787.104	0	0
1999	7	13	0.4	0	0	1.632	2856.528	0	-6.528	0	785.472	0	0
1999	7	14	0.4	0	0	1.632	2858.16	0	-8.16	0	783.84	0	0
1999	7	15	0.2	0	0	1.632	2859.792	0	0	0	782.208	0	0
1999	7	16	0	0	0	1.632	2861.424	0	-11.424	0	780.576	0	0
1999	7	17	0	0	0	1.632	2863.056	0	-13.056	0	778.944	0	0
1999	7	18	0	0	0	1.632	2864.688	0	-14.688	0	777.312	0	0
1999	7	19	0	0	0	1.632	2866.32	0	-16.32	0	775.68	0	0
1999	7	20	30.2	0.69	2052.543	1.632	815.409	0	2034.591	2034.591	2826.591	0	0
1999	7	21	5.8	0	0	1.632	2851.632	0	-1.632	0	790.368	0	0
1999	7	22	5.8	0	0	1.632	2853.264	0	-3.264	0	788.736	0	0
1999	7	23	0	0	0	1.632	2854.896	0	-4.896	0	787.104	0	0
1999	7	24	0	0	0	1.632	2856.528	0	-6.528	0	785.472	0	0
1999	7	25	0	0	0	1.632	2858.16	0	-8.16	0	783.84	0	0
1999	7	26	0.8	0	0	1.632	2859.792	0	-9.792	0	782.208	0	0
1999	7	27	0	0	0	1.632	2861.424	0	-11.424	0	780.576	0	0
1999	7	28	0	0	0	1.632	2863.056	0	-13.056	0	778.944	0	0
1999	7	29	0	0	0	1.632	2864.688	0	-14.688	0	777.312	0	0
1999	7	30	0.2	0	0	1.632	2866.32	0	-16.32	0	775.68	0	0
1999	7	31	0.6	0	0	1.632	2867.952	0	-17.952	0	774.048	0	0
1999	8	1	0	0	0	2.208	2870.16	0	-20.16	0	771.84	0	0
1999	8	2	0	0	0	2.208	2872.368	0	-22.368	0	769.632	0	0
1999	8	3	0	0	0	2.208	2874.576	0	-24.576	0	767.424	0	0
1999	8	4	0	0	0	2.208	2876.784	0	-26.784	0	765.216	0	0
1999	8	5	0	0	0	2.208	2878.992	0	-28.992	0	763.008	0	0
1999	8	6	0	0	0	2.208	2881.2	0	-31.2	0	760.8	0	0
1999	8	7	0	0	0	2.208	2883.408	0	-33.408	0	758.592	0	0
1999	8	8	21	0.56	1158.36	2.208	1727.256	0	1122.744	1122.744	1914.744	0	0
1999	8	9	24	0.56	1323.84	2.208	1528.368	0	1321.632	1321.632	2113.632	0	0
1999	8	10	4	0	0	2.208	2852.208	0	-2.208	0	789.792	0	0
1999	8	11	0	0	0	2.208	2854.416	0	-4.416	0	787.584	0	0
1999	8	12	0.6	0	0	2.208	2856.624	0	-6.624	0	785.376	0	0
1999	8	13	1.2	0	0	2.208	2858.832	0	-8.832	0	783.168	0	0
1999	8	14	0	0	0	2.208	2861.04	0	-11.04	0	780.96	0	0
1999	8	15	5	0	0	2.208	2863.248	0	-13.248	0	778.752	0	0
1999	8	16	0	0	0	2.208	2865.456	0	-15.456	0	776.544	0	0
1999	8	17	0.2	0	0	2.208	2867.664	0	-17.664	0	774.336	0	0
1999	8	18	0	0	0	2.208	2869.872	0	-19.872	0	772.128	0	0
1999	8	19	0	0	0	2.208	2872.08	0	-22.08	0	769.92	0	0
1999	8	20	0	0	0	2.208	2874.288	0	-24.288	0	767.712	0	0
1999	8	21	0	0	0	2.208	2876.496	0	-26.496	0	765.504	0	0
1999	8	22	0	0	0	2.208	2878.704	0	-28.704	0	763.296	0	0
1999	8	23	0	0	0	2.208	2880.912	0	-30.912	0	761.088	0	0
1999	8	24	0.2	0	0	2.208	2883.12	0	-33.12	0	758.88	0	0
1999	8	25	0	0	0	2.208	2885.328	0	-35.328	0	756.672	0	0
1999	8	26	0.6	0	0	2.208	2887.536	0	-37.536	0	754.464	0	0
1999	8	27	4.6	0	0	2.208	2889.744	0	-39.744	0	752.256	0	0
1999	8	28	0	0	0	2.208	2891.952	0	-41.952	0	750.048	0	0
1999	8	29	0	0	0	2.208	2894.16	0	-44.16	0	747.84	0	0
1999	8	30	0.4	0	0	2.208	2896.368	0	-46.368	0	745.632	0	0
1999	8	31	0	0	0	2.208	2898.576	0	-48.576	0	743.424	0	0
1999	9	1	0	0	0	3.264	2901.84	0	-51.84	0	740.16	0	0
1999	9	2	0	0	0	3.264	2905.104	0	-55.104	0	736.896	0	0
1999	9	3	0	0	0	3.264	2908.368	0	-58.368	0	733.632	0	0
1999	9	4	36.2	0.69	2460.333	3.264	451.299	0	2398.701	2398.701	3190.701	0	0
1999	9	5	0	0	0	3.264	2853.264	0	-3.264	0	788.736	0	0
1999	9	6	10.8	0.43	457.434	3.264	2399.094	0	450.906	450.906	1242.906	0	0
1999	9	7	0.4	0	0	3.264	2853.264	0	-3.264	0	788.736	0	0
1999	9	8	0	0	0	3.264	2856.528	0	-6.528	0	785.472	0	0
1999	9	9	0	0	0	3.264	2859.792	0	-9.792	0	782.208	0	0
1999	9	10	0	0	0	3.264	2863.056	0	-13.056	0	778.944	0	0
1999	9	11	4.6	0	0	3.264	2866.32	0	-16.32	0	775.68	0	0
1999	9	12	0.4	0	0	3.264	2869.584	0	-19.584	0	772.416	0	0

1999	9	13	2.2	0	0	3.264	2872.848	0	-22.848	0	769.152	0	0
1999	9	14	0	0	0	3.264	2876.112	0	-26.112	0	765.888	0	0
1999	9	15	0.2	0	0	3.264	2879.376	0	-29.376	0	762.624	0	0
1999	9	16	13.8	0.43	584.499	3.264	2298.141	0	551.859	551.859	1343.859	0	0
1999	9	17	26.8	0.56	1478.288	3.264	1374.976	0	1475.024	1475.024	2267.024	0	0
1999	9	18	2	0	0	3.264	2853.264	0	0	0	788.736	0	0
1999	9	19	0	0	0	3.264	2856.528	0	-6.528	0	785.472	0	0
1999	9	20	0.2	0	0	3.264	2859.792	0	-9.792	0	782.208	0	0
1999	9	21	0	0	0	3.264	2863.056	0	-13.056	0	778.944	0	0
1999	9	22	0	0	0	3.264	2866.32	0	-16.32	0	775.68	0	0
1999	9	23	0	0	0	3.264	2869.584	0	-19.584	0	772.416	0	0
1999	9	24	0	0	0	3.264	2872.848	0	-22.848	0	769.152	0	0
1999	9	25	0	0	0	3.264	2876.112	0	-26.112	0	765.888	0	0
1999	9	26	0	0	0	3.264	2879.376	0	-29.376	0	762.624	0	0
1999	9	27	0	0	0	3.264	2882.64	0	-32.64	0	759.36	0	0
1999	9	28	0	0	0	3.264	2885.904	0	-35.904	0	756.096	0	0
1999	9	29	16.8	0.43	711.564	3.264	2177.604	0	672.396	672.396	1464.396	0	0
1999	9	30	0	0	0	3.264	2853.264	0	-3.264	0	788.736	0	0
1999	10	1	0	0	0	4.512	2857.776	0	-7.776	0	784.224	0	0
1999	10	2	0	0	0	4.512	2862.288	0	-12.288	0	779.712	0	0
1999	10	3	21.4	0.56	1180.424	4.512	1686.376	0	1163.624	1163.624	1955.624	0	0
1999	10	4	0	0	0	4.512	2854.512	0	-4.512	0	787.488	0	0
1999	10	5	0	0	0	4.512	2859.024	0	-9.024	0	782.976	0	0
1999	10	6	0	0	0	4.512	2863.536	0	-13.536	0	778.464	0	0
1999	10	7	0	0	0	4.512	2868.048	0	-18.048	0	773.952	0	0
1999	10	8	0	0	0	4.512	2872.56	0	-22.56	0	769.44	0	0
1999	10	9	0.8	0	0	4.512	2877.072	0	-27.072	0	764.928	0	0
1999	10	10	20.6	0.56	1136.296	4.512	1745.288	0	1104.712	1104.712	1896.712	0	0
1999	10	11	15.8	0.43	669.209	4.512	2185.303	0	664.697	664.697	1456.697	0	0
1999	10	12	0.4	0	0	4.512	2854.512	0	0	0	787.488	0	0
1999	10	13	9.2	0	0	4.512	2859.024	0	0	0	782.976	0	0
1999	10	14	7.4	0	0	4.512	2863.536	0	0	0	778.464	0	0
1999	10	15	1	0	0	4.512	2868.048	0	0	0	773.952	0	0
1999	10	16	0	0	0	4.512	2872.56	0	-22.56	0	769.44	0	0
1999	10	17	0	0	0	4.512	2877.072	0	-27.072	0	764.928	0	0
1999	10	18	0.4	0	0	4.512	2881.584	0	-31.584	0	760.416	0	0
1999	10	19	0.2	0	0	4.512	2886.096	0	-36.096	0	755.904	0	0
1999	10	20	0.2	0	0	4.512	2890.608	0	-40.608	0	751.392	0	0
1999	10	21	0	0	0	4.512	2895.12	0	-45.12	0	746.88	0	0
1999	10	22	0.6	0	0	4.512	2899.632	0	-49.632	0	742.368	0	0
1999	10	23	0	0	0	4.512	2904.144	0	-54.144	0	737.856	0	0
1999	10	24	0.2	0	0	4.512	2908.656	0	-58.656	0	733.344	0	0
1999	10	25	1.2	0	0	4.512	2913.168	0	-63.168	0	728.832	0	0
1999	10	26	1.2	0	0	4.512	2917.68	0	-67.68	0	724.32	0	0
1999	10	27	3	0	0	4.512	2922.192	0	0	0	719.808	0	0
1999	10	28	0.2	0	0	4.512	2926.704	0	0	0	715.296	0	0
1999	10	29	0	0	0	4.512	2931.216	0	-81.216	0	710.784	0	0
1999	10	30	0	0	0	4.512	2935.728	0	-85.728	0	706.272	0	0
1999	10	31	4.6	0	0	4.512	2940.24	0	-90.24	0	701.76	0	0
1999	11	1	0	0	0	5.76	2946	0	-96	0	696	0	0
1999	11	2	0	0	0	5.76	2951.76	0	-101.76	0	690.24	0	0
1999	11	3	0	0	0	5.76	2957.52	0	-107.52	0	684.48	0	0
1999	11	4	0.2	0	0	5.76	2963.28	0	-113.28	0	678.72	0	0
1999	11	5	0	0	0	5.76	2969.04	0	-119.04	0	672.96	0	0
1999	11	6	10.4	0.43	440.492	5.76	2534.308	0	315.692	315.692	1107.692	0	0
1999	11	7	0	0	0	5.76	2855.76	0	-5.76	0	786.24	0	0
1999	11	8	5.2	0	0	5.76	2861.52	0	-11.52	0	780.48	0	0
1999	11	9	4.4	0	0	5.76	2867.28	0	-17.28	0	774.72	0	0
1999	11	10	2.8	0	0	5.76	2873.04	0	-23.04	0	768.96	0	0
1999	11	11	1.4	0	0	5.76	2878.8	0	0	0	763.2	0	0
1999	11	12	0.2	0	0	5.76	2884.56	0	0	0	757.44	0	0
1999	11	13	0	0	0	5.76	2890.32	0	-40.32	0	751.68	0	0
1999	11	14	0	0	0	5.76	2896.08	0	-46.08	0	745.92	0	0
1999	11	15	0	0	0	5.76	2901.84	0	-51.84	0	740.16	0	0
1999	11	16	0	0	0	5.76	2907.6	0	-57.6	0	734.4	0	0
1999	11	17	0	0	0	5.76	2913.36	0	-63.36	0	728.64	0	0
1999	11	18	0	0	0	5.76	2919.12	0	-69.12	0	722.88	0	0
1999	11	19	0	0	0	5.76	2924.88	0	-74.88	0	717.12	0	0
1999	11	20	0.2	0	0	5.76	2930.64	0	-80.64	0	711.36	0	0
1999	11	21	7.2	0	0	5.76	2936.4	0	-86.4	0	705.6	0	0
1999	11	22	12.2	0.43	516.731	5.76	2425.429	0	424.571	424.571	1216.571	0	0
1999	11	23	0.4	0	0	5.76	2855.76	0	0	0	786.24	0	0
1999	11	24	0	0	0	5.76	2861.52	0	-11.52	0	780.48	0	0
1999	11	25	0	0	0	5.76	2867.28	0	-17.28	0	774.72	0	0
1999	11	26	0	0	0	5.76	2873.04	0	-23.04	0	768.96	0	0
1999	11	27	0	0	0	5.76	2878.8	0	-28.8	0	763.2	0	0
1999	11	28	0	0	0	5.76	2884.56	0	-34.56	0	757.44	0	0
1999	11	29	0.2	0	0	5.76	2890.32	0	-40.32	0	751.68	0	0
1999	11	30	0	0	0	5.76	2896.08	0	-46.08	0	745.92	0	0
1999	12	1	2.8	0	0	6.912	2902.992	0	-52.992	0	739.008	0	0
1999	12	2	0	0	0	6.912	2909.904	0	-59.904	0	732.096	0	0
1999	12	3	23.4	0.56	1290.744	6.912	1626.072	0	1223.928	1223.928	2015.928	0	0
1999	12	4	0.6	0	0	6.912	2856.912	0	-6.912	0	785.088	0	0
1999	12	5	0	0	0	6.912	2863.824	0	-13.824	0	778.176	0	0
1999	12	6	0	0	0	6.912	2870.736	0	-20.736	0	771.264	0	0
1999	12	7	0	0	0	6.912	2877.648	0	-27.648	0	764.352	0	0
1999	12	8	1.6	0	0	6.912	2884.56	0	-34.56	0	757.44	0	0
1999	12	9	8	0	0	6.912	2891.472	0	-41.472	0	750.528	0	0
1999	12	10	0.2	0	0	6.912	2898.384	0	-48.384	0	743.616	0	0
1999	12	11	0	0	0	6.912	2905.296	0	-55.296	0	736.704	0	0
1999	12	12	1.2	0	0	6.912	2912.208	0	-62.208	0	729.792	0	0
1999	12	13	0	0	0	6.912	2919.12	0	-69.12	0	722.88	0	0
1999	12	14	0	0	0	6.912	2926.032	0	-76.032	0	715.968	0	0
1999	12	15	0	0	0	6.912	2932.944	0	-82.944	0	709.056	0	0
1999	12	16	4.6	0	0	6.912	2939.856	0	-89.856	0	702.144	0	0
1999	12	17	0	0	0	6.912	2946.768	0	-96.768	0	695.232	0	0
1999	12	18	0	0	0	6.912	2953.68	0	-103.68	0	688.32	0	0
1999	12	19	0	0	0	6.912	2960.592	0	-110.592	0	681.408	0	0
1999	12	20	0	0	0	6.912	2967.504	0	-117.504	0	674.496	0	0
1999	12	21	0	0	0	6.912	2974.416	0	-124.416	0	667.584	0	0
1999	12	22	0	0	0	6.912	2981.328	0	-131.328	0	660.672	0	0
1999	12	23	0	0	0	6.912	2988.24	0	-138.24	0	653.76	0	0
1999	12	24	0	0	0	6.912	2995.152	0	-145.152	0	646.848	0	0
1999	12	25	1.2	0	0	6.912	3002.064	0	-152.064	0	639.936	0	0
1999	12	26	0	0	0	6.912	3008.976	0	-158.976	0	633.024	0	0
1999	12	27	0.2	0	0	6.912	3015.888	0	-165.888	0	626.112	0	0
1999	12	28	1.8	0	0	6.912	3022.8	0	-172.8	0	619.2	0	0
1999	12	29	0.2	0	0	6.912	3029.712	0	-179.712	0	612.288	0	0
1999	12	30	0	0	0	6.912	3036.624	0	-186.624	0	605.376	0	0
1999	12	31	2	0	0	6.912	3043.536	0	-193.536	0	598.464	0	0
			997.8		45072.221	1575.264		5768.78		37939.393		0	4

Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs		Adjusted Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
			Clean	Overland Flow Clean Dam (m³)	Evaporation (m³)	Water Used in Operations (m³)					
1	1	0	0	0	7.68	70	4000	0	2200	0	
1	2	0	0	0	7.68	70	4077.68	0	5922.32	0	0
1	3	0	0	0	7.68	70	4155.36	0	5844.64	0	0
1	4	0	0	0	7.68	70	4233.04	0	5766.96	0	0
1	5	0	0	0	7.68	70	4310.72	0	5689.28	0	0
1	6	0	0	0	7.68	70	4388.4	0	5611.6	0	0
1	7	0.4	0	0	7.68	70	4466.08	0	5533.92	0	0
1	8	16	0.02	95.008	7.68	70	4448.752	0	5551.248	0	0
1	9	0	0	0	7.68	70	4526.432	0	5473.568	0	0
1	10	0	0	0	7.68	70	4604.112	0	5395.888	0	0
1	11	0	0	0	7.68	70	4681.792	0	5318.208	0	0
1	12	0	0	0	7.68	70	4759.472	0	5240.528	0	0
1	13	0	0	0	7.68	70	4837.152	0	5162.848	0	0
1	14	0	0	0	7.68	70	4914.832	0	5085.168	0	0
1	15	0	0	0	7.68	70	4992.512	0	5007.488	0	0
1	16	0	0	0	7.68	70	5070.192	0	4929.808	0	0
1	17	0	0	0	7.68	70	5147.872	0	4852.128	0	0
1	18	0	0	0	7.68	70	5225.552	0	4774.448	0	0
1	19	0	0	0	7.68	70	5303.232	0	4696.768	0	0
1	20	0	0	0	7.68	70	5380.912	0	4619.088	0	0
1	21	0	0	0	7.68	70	5458.592	0	4541.408	0	0
1	22	0	0	0	7.68	70	5536.272	0	4463.728	0	0
1	23	0	0	0	7.68	70	5613.952	0	4386.048	0	0
1	24	0	0	0	7.68	70	5691.632	0	4308.368	0	0
1	25	0	0	0	7.68	70	5769.312	0	4230.688	0	0
1	26	0.8	0	0	7.68	70	5846.992	0	4153.008	0	0
1	27	0	0	0	7.68	70	5924.672	0	4075.328	0	0
1	28	0	0	0	7.68	70	6002.352	0	3997.648	0	0
1	29	0.2	0	0	7.68	70	6080.032	0	3919.968	0	0
1	30	0	0	0	7.68	70	6157.712	0	3842.288	0	0
1	31	0.6	0	0	7.68	70	6235.392	0	3764.608	0	0
2	1	0	0	0	6.816	70	6312.208	0	3687.792	0	0
2	2	0	0	0	6.816	70	6389.024	0	3610.976	0	0
2	3	0	0	0	6.816	70	6465.84	0	3534.16	0	0
2	4	0	0	0	6.816	70	6542.656	0	3457.344	0	0
2	5	0	0	0	6.816	70	6619.472	0	3380.528	0	0
2	6	0.8	0	0	6.816	70	6696.288	0	3303.712	0	0
2	7	0	0	0	6.816	70	6773.104	0	3226.896	0	0
2	8	0	0	0	6.816	70	6849.92	0	3150.08	0	0
2	9	0	0	0	6.816	70	6926.736	0	3073.264	0	0
2	10	0	0	0	6.816	70	7003.552	0	2996.448	0	0
2	11	0.4	0	0	6.816	70	7080.368	0	2919.632	0	0
2	12	0	0	0	6.816	70	7157.184	0	2842.816	0	0
2	13	0	0	0	6.816	70	7234	0	2766	0	0
2	14	0	0	0	6.816	70	7310.816	0	2689.184	0	0
2	15	0	0	0	6.816	70	7387.632	0	2612.368	0	0
2	16	0	0	0	6.816	70	7464.448	0	2535.552	0	0
2	17	0	0	0	6.816	70	7541.264	0	2458.736	0	0
2	18	3.4	0	0	6.816	70	7618.08	0	2381.92	0	0
2	19	0	0	0	6.816	70	7694.896	0	2305.104	0	0
2	20	0	0	0	6.816	70	7771.712	0	2228.288	0	0
2	21	0	0	0	6.816	70	7848.528	0	2151.472	0	0
2	22	0	0	0	6.816	70	7925.344	0	2074.656	0	0
2	23	0	0	0	6.816	70	8002.16	0	1997.84	0	0
2	24	0	0	0	6.816	70	8078.976	0	1921.024	0	0
2	25	0	0	0	6.816	70	8155.792	0	1844.208	0	0
2	26	0	0	0	6.816	70	8232.608	0	1767.392	0	0
2	27	0	0	0	6.816	70	8309.424	0	1690.576	0	0
2	28	0	0	0	6.816	70	8386.24	0	1613.76	0	0
3	1	0	0	0	5.568	70	8461.808	0	1538.192	0	0
3	2	0	0	0	5.568	70	8537.376	0	1462.624	0	0
3	3	0	0	0	5.568	70	8612.944	0	1387.056	0	0
3	4	0	0	0	5.568	70	8688.512	0	1311.488	0	0
3	5	0	0	0	5.568	70	8764.08	0	1235.92	0	0
3	6	0	0	0	5.568	70	8839.648	0	1160.352	0	0
3	7	19.6	0.02	116.3848	5.568	70	8798.8312	0	1201.1688	0	0
3	8	0.2	0	0	5.568	70	8874.3992	0	1125.6008	0	0
3	9	0	0	0	5.568	70	8949.9672	0	1050.0328	0	0
3	10	0	0	0	5.568	70	9025.5352	0	974.4648	0	0
3	11	0	0	0	5.568	70	9101.1032	0	898.8968	0	0
3	12	0	0	0	5.568	70	9176.6712	0	823.3288	0	0
3	13	0	0	0	5.568	70	9252.2392	0	747.7608	0	0
3	14	0	0	0	5.568	70	9327.8072	0	672.1928	0	0
3	15	0	0	0	5.568	70	9403.3752	0	596.6248	0	0
3	16	0	0	0	5.568	70	9478.9432	0	521.0568	0	0
3	17	0	0	0	5.568	70	9554.5112	0	445.4888	0	0
3	18	11	0.02	65.318	5.568	70	9564.7612	0	435.2388	0	0
3	19	1.6	0	0	5.568	70	9640.3292	0	359.6708	0	0
3	20	0	0	0	5.568	70	9715.8972	0	284.1028	0	0
3	21	48	0.28	3990.336	5.568	70	5801.1292	0	4198.8708	0	0
3	22	2.6	0	0	5.568	70	5876.6972	0	4123.3028	0	0
3	23	0	0	0	5.568	70	5952.2652	0	4047.7348	0	0
3	24	0	0	0	5.568	70	6027.8332	0	3972.1668	0	0
3	25	11	0.02	65.318	5.568	70	6038.0832	0	3961.9168	0	0
3	26	2.8	0	0	5.568	70	6113.6512	0	3886.3488	0	0
3	27	0	0	0	5.568	70	6189.2192	0	3810.7808	0	0
3	28	4.6	0	0	5.568	70	6264.7872	0	3735.2128	0	0
3	29	0	0	0	5.568	70	6340.3552	0	3659.6448	0	0
3	30	0	0	0	5.568	70	6415.9232	0	3584.0768	0	0
3	31	1.8	0	0	5.568	70	6491.4912	0	3508.5088	0	0
4	1	0	0	0	3.552	70	6565.0432	0	3434.9568	0	0
4	2	0	0	0	3.552	70	6638.5952	0	3361.4048	0	0
4	3	0	0	0	3.552	70	6712.1472	0	3287.8528	0	0
4	4	1.2	0	0	3.552	70	6785.6992	0	3214.3008	0	0
4	5	3.2	0	0	3.552	70	6859.2512	0	3140.7488	0	0
4	6	0	0	0	3.552	70	6932.8032	0	3067.1968	0	0
4	7	0	0	0	3.552	70	7006.3552	0	2993.6448	0	0
4	8	0	0	0	3.552	70	7079.9072	0	2920.0928	0	0
4	9	0	0	0	3.552	70	7153.4592	0	2846.5408	0	0
4	10	0	0	0	3.552	70	7227.0112	0	2772.9888	0	0
4	11	0	0	0	3.552	70	7300.5632	0	2699.4368	0	0
4	12	0	0	0	3.552	70	7374.1152	0	2625.8848	0	0
4	13	0	0	0	3.552	70	7447.6672	0	2552.3328	0	0
4	14	0	0	0	3.552	70	7521.2192	0	2478.7808	0	0
4	15	0	0	0	3.552	70	7594.7712	0	2405.2288	0	0
4	16	0	0	0	3.552	70	7668.3232	0	2331.6768	0	0
4	17	0	0	0	3.552	70	7741.8752	0	2258.1248	0	0
4	18	0	0	0	3.552	70	7815.4272	0	2184.5728	0	0
4	19	0	0	0	3.552	70	7888.9792	0	2111.0208	0	0
4	20	6.8	0	0	3.552	70	7962.5312	0	2037.4688	0	0

4	21	4.2	0	0	3.552	70	8036.0832	0	1963.9168	0	0
4	22	0	0	0	3.552	70	8109.6352	0	1890.3648	0	0
4	23	0	0	0	3.552	70	8183.1872	0	1816.8128	0	0
4	24	0	0	0	3.552	70	8256.7392	0	1743.2608	0	0
4	25	0	0	0	3.552	70	8330.2912	0	1669.7088	0	0
4	26	0	0	0	3.552	70	8403.8432	0	1596.1568	0	0
4	27	1.2	0	0	3.552	70	8477.3952	0	1522.6048	0	0
4	28	0.6	0	0	3.552	70	8550.9472	0	1449.0528	0	0
4	29	0.2	0	0	3.552	70	8624.4992	0	1375.5008	0	0
4	30	0	0	0	3.552	70	8698.0512	0	1301.9488	0	0
5	1	0	0	0	2.304	70	8770.3552	0	1229.6448	0	0
5	2	0	0	0	2.304	70	8842.6592	0	1157.3408	0	0
5	3	0	0	0	2.304	70	8914.9632	0	1085.0368	0	0
5	4	0	0	0	2.304	70	8987.2672	0	1012.7328	0	0
5	5	0	0	0	2.304	70	9059.5712	0	940.4288	0	0
5	6	0	0	0	2.304	70	9131.8752	0	868.1248	0	0
5	7	0	0	0	2.304	70	9204.1792	0	795.8208	0	0
5	8	0	0	0	2.304	70	9276.4832	0	723.5168	0	0
5	9	0	0	0	2.304	70	9348.7872	0	651.2128	0	0
5	10	0.4	0	0	2.304	70	9421.0912	0	578.9088	0	0
5	11	0	0	0	2.304	70	9493.3952	0	506.6048	0	0
5	12	11.6	0.02	68.8808	2.304	70	9496.8184	0	503.1816	0	0
5	13	30.4	0.22	1985.6672	2.304	70	7583.4552	0	2416.5448	0	0
5	14	0.6	0	0	2.304	70	7655.7592	0	2344.2408	0	0
5	15	0	0	0	2.304	70	7728.0632	0	2271.9368	0	0
5	16	42.8	0.28	3558.0496	2.304	70	4242.3176	0	5757.6824	0	0
5	17	0	0	0	2.304	70	4314.6216	0	5685.3784	0	0
5	18	0.8	0	0	2.304	70	4386.9256	0	5613.0744	0	0
5	19	0	0	0	2.304	70	4459.2296	0	5540.7704	0	0
5	20	0	0	0	2.304	70	4531.5336	0	5468.4664	0	0
5	21	6.4	0	0	2.304	70	4603.8376	0	5396.1624	0	0
5	22	5.2	0	0	2.304	70	4676.1416	0	5323.8584	0	0
5	23	44.2	0.28	3674.4344	2.304	70	1074.0112	0	8925.9888	0	0
5	24	15.8	0.02	93.8204	2.304	70	1052.4948	0	8947.5052	0	0
5	25	78	0.41	9494.862	2.304	70	0	8370.0632	10000	0	0
5	26	11.4	0.02	67.6932	2.304	70	4.6108	0	9995.3892	0	1
5	27	1.6	0	0	2.304	70	76.9148	0	9923.0852	0	0
5	28	0	0	0	2.304	70	149.2188	0	9850.7812	0	0
5	29	14	0.02	83.132	2.304	70	138.3908	0	9861.6092	0	0
5	30	10.4	0.02	61.7552	2.304	70	148.9396	0	9851.0604	0	0
5	31	13.2	0.02	78.3816	2.304	70	142.862	0	9857.138	0	0
6	1	0	0	0	1.728	70	214.59	0	9785.41	0	0
6	2	0.2	0	0	1.728	70	286.318	0	9713.682	0	0
6	3	0.2	0	0	1.728	70	358.046	0	9641.954	0	0
6	4	0	0	0	1.728	70	429.774	0	9570.226	0	0
6	5	12.8	0.02	76.0064	1.728	70	425.4956	0	9574.5044	0	0
6	6	1.4	0	0	1.728	70	497.2236	0	9502.7764	0	0
6	7	8.2	0	0	1.728	70	568.9516	0	9431.0484	0	0
6	8	0.2	0	0	1.728	70	640.6796	0	9359.3204	0	0
6	9	0.2	0	0	1.728	70	712.4076	0	9287.5924	0	0
6	10	7.2	0	0	1.728	70	784.1356	0	9215.8644	0	0
6	11	0	0	0	1.728	70	855.8636	0	9144.1364	0	0
6	12	0	0	0	1.728	70	927.5916	0	9072.4084	0	0
6	13	36.2	0.22	2364.5116	1.728	70	0	1365.192	10000	0	0
6	14	0	0	0	1.728	70	71.728	0	9928.272	0	0
6	15	16.6	0.02	98.5708	1.728	70	44.8852	0	9955.1148	0	1
6	16	5	0	0	1.728	70	116.6132	0	9883.3868	0	0
6	17	0.4	0	0	1.728	70	188.3412	0	9811.6588	0	0
6	18	14.8	0.02	87.8824	1.728	70	172.1868	0	9827.8132	0	0
6	19	2.4	0	0	1.728	70	243.9148	0	9756.0852	0	0
6	20	0.2	0	0	1.728	70	315.6428	0	9684.3572	0	0
6	21	4.4	0	0	1.728	70	387.3708	0	9612.6292	0	0
6	22	0.6	0	0	1.728	70	459.0988	0	9540.9012	0	0
6	23	0.4	0	0	1.728	70	530.8268	0	9469.1732	0	0
6	24	0.2	0	0	1.728	70	602.5548	0	9397.4452	0	0
6	25	7.6	0	0	1.728	70	674.2828	0	9325.7172	0	0
6	26	3.8	0	0	1.728	70	746.0108	0	9253.9892	0	0
6	27	0	0	0	1.728	70	817.7388	0	9182.2612	0	0
6	28	0.2	0	0	1.728	70	889.4668	0	9110.5332	0	0
6	29	0	0	0	1.728	70	961.1948	0	9038.8052	0	0
6	30	16.2	0.02	96.1956	1.728	70	936.7272	0	9063.2728	0	0
7	1	0.6	0	0	1.632	70	1008.3592	0	8991.6408	0	0
7	2	4.8	0	0	1.632	70	1079.9912	0	8920.0088	0	0
7	3	0.4	0	0	1.632	70	1151.6232	0	8848.3768	0	0
7	4	0	0	0	1.632	70	1223.2552	0	8776.7448	0	0
7	5	0	0	0	1.632	70	1294.8872	0	8705.1128	0	0
7	6	0	0	0	1.632	70	1366.5192	0	8633.4808	0	0
7	7	0	0	0	1.632	70	1438.1512	0	8561.8488	0	0
7	8	2	0	0	1.632	70	4071.632	0	5928.368	0	0
7	9	18.6	0.02	110.4468	1.632	70	4032.8172	0	5967.1828	0	0
7	10	0	0	0	1.632	70	4104.4492	0	5895.5508	0	0
7	11	0	0	0	1.632	70	4176.0812	0	5823.9188	0	0
7	12	0.4	0	0	1.632	70	4247.7132	0	5752.2868	0	0
7	13	0.4	0	0	1.632	70	4319.3452	0	5680.6548	0	0
7	14	0.4	0	0	1.632	70	4390.9772	0	5609.0228	0	0
7	15	0.2	0	0	1.632	70	4462.6092	0	5537.3908	0	0
7	16	0	0	0	1.632	70	4534.2412	0	5465.7588	0	0
7	17	0	0	0	1.632	70	4605.8732	0	5394.1268	0	0
7	18	0	0	0	1.632	70	4677.5052	0	5322.4948	0	0
7	19	0	0	0	1.632	70	4749.1372	0	5250.8628	0	0
7	20	30.2	0.22	1972.6036	1.632	70	2848.1656	0	7151.8344	0	0
7	21	5.8	0	0	1.632	70	2919.7976	0	7080.2024	0	0
7	22	5.8	0	0	1.632	70	2991.4296	0	7008.5704	0	0
7	23	0	0	0	1.632	70	3063.0616	0	6936.9384	0	0
7	24	0	0	0	1.632	70	3134.6936	0	6865.3064	0	0
7	25	0	0	0	1.632	70	3206.3256	0	6793.6744	0	0
7	26	0.8	0	0	1.632	70	3277.9576	0	6722.0424	0	0
7	27	0	0	0	1.632	70	3349.5896	0	6650.4104	0	0
7	28	0	0	0	1.632	70	3421.2216	0	6578.7784	0	0
7	29	0	0	0	1.632	70	3492.8536	0	6507.1464	0	0
7	30	0.2	0	0	1.632	70	3564.4856	0	6435.5144	0	0
7	31	0.6	0	0	1.632	70	3636.1176	0	6363.8824	0	0
8	1	0	0	0	2.208	70	3708.3256	0	6291.6744	0	0
8	2	0	0	0	2.208	70	3780.5336	0	6219.4664	0	0
8	3	0	0	0	2.208	70	3852.7416	0	6147.2584	0	0
8	4	0	0	0	2.208	70	3924.9496	0	6075.0504	0	0
8	5	0	0	0	2.208	70	4072.208	0	5927.792	0	0
8	6	0	0	0	2.208	70	4144.416	0	5855.584	0	0
8	7	0	0	0	2.208	70	4216.624	0	5783.376	0	0
8	8	21	0.08	498.792	2.208	70	3790.04	0	6209.96	0	0
8	9	24	0.08	570.048	2.208	70	3292.2	0	6707.8	0	0
8	10	4	0	0	2.208	70	3364.408	0	6635.592	0	0
8	11	0	0	0	2.208	70	3436.616	0	6563.384	0	0
8	12	0.6	0	0	2.208	70	3508.824	0	6491.176	0	0
8	13	1.2	0	0	2.208	70	3581.032	0	6418.968	0	0

8	14	0	0	0	2.208	70	3653.24	0	6346.76	0	0
8	15	5	0	0	2.208	70	3725.448	0	6274.552	0	0
8	16	0	0	0	2.208	70	3797.656	0	6202.344	0	0
8	17	0.2	0	0	2.208	70	3869.864	0	6130.136	0	0
8	18	0	0	0	2.208	70	3942.072	0	6057.928	0	0
8	19	0	0	0	2.208	70	4014.28	0	5985.72	0	0
8	20	0	0	0	2.208	70	4086.488	0	5913.512	0	0
8	21	0	0	0	2.208	70	4158.696	0	5841.304	0	0
8	22	0	0	0	2.208	70	4230.904	0	5769.096	0	0
8	23	0	0	0	2.208	70	4303.112	0	5696.888	0	0
8	24	0.2	0	0	2.208	70	4375.32	0	5624.68	0	0
8	25	0	0	0	2.208	70	4447.528	0	5552.472	0	0
8	26	0.6	0	0	2.208	70	4519.736	0	5480.264	0	0
8	27	4.6	0	0	2.208	70	4591.944	0	5408.056	0	0
8	28	0	0	0	2.208	70	4664.152	0	5335.848	0	0
8	29	0	0	0	2.208	70	4736.36	0	5263.64	0	0
8	30	0.4	0	0	2.208	70	4808.568	0	5191.432	0	0
8	31	0	0	0	2.208	70	4880.776	0	5119.224	0	0
9	1	0	0	0	3.264	70	4954.04	0	5045.96	0	0
9	2	0	0	0	3.264	70	5027.304	0	4972.696	0	0
9	3	0	0	0	3.264	70	5100.568	0	4899.432	0	0
9	4	36.2	0.22	2364.5116	3.264	70	2809.3204	0	7190.6796	0	0
9	5	0	0	0	3.264	70	2882.5844	0	7117.4156	0	0
9	6	10.8	0.02	64.1304	3.264	70	2891.718	0	7108.282	0	0
9	7	0.4	0	0	3.264	70	2964.982	0	7035.018	0	0
9	8	0	0	0	3.264	70	3038.246	0	6961.754	0	0
9	9	0	0	0	3.264	70	3111.51	0	6888.49	0	0
9	10	0	0	0	3.264	70	3184.774	0	6815.226	0	0
9	11	4.6	0	0	3.264	70	3258.038	0	6741.962	0	0
9	12	0.4	0	0	3.264	70	3331.302	0	6668.698	0	0
9	13	2.2	0	0	3.264	70	3404.566	0	6595.434	0	0
9	14	0	0	0	3.264	70	3477.83	0	6522.17	0	0
9	15	0.2	0	0	3.264	70	3551.094	0	6448.906	0	0
9	16	13.8	0.02	81.9444	3.264	70	3542.4136	0	6457.5864	0	0
9	17	26.8	0.08	636.5536	3.264	70	2979.124	0	7020.876	0	0
9	18	2	0	0	3.264	70	3052.388	0	6947.612	0	0
9	19	0	0	0	3.264	70	3125.652	0	6874.348	0	0
9	20	0.2	0	0	3.264	70	3198.916	0	6801.084	0	0
9	21	0	0	0	3.264	70	3272.18	0	6727.82	0	0
9	22	0	0	0	3.264	70	3345.444	0	6654.556	0	0
9	23	0	0	0	3.264	70	3418.708	0	6581.292	0	0
9	24	0	0	0	3.264	70	3491.972	0	6508.028	0	0
9	25	0	0	0	3.264	70	4073.264	0	5926.736	0	0
9	26	0	0	0	3.264	70	4146.528	0	5853.472	0	0
9	27	0	0	0	3.264	70	4219.792	0	5780.208	0	0
9	28	0	0	0	3.264	70	4293.056	0	5706.944	0	0
9	29	16.8	0.02	99.7584	3.264	70	4266.5616	0	5733.4384	0	0
9	30	0	0	0	3.264	70	4339.8256	0	5660.1744	0	0
10	1	0	0	0	4.512	70	4414.3376	0	5585.6624	0	0
10	2	0	0	0	4.512	70	4488.8496	0	5511.1504	0	0
10	3	21.4	0.08	508.2928	4.512	70	4055.0688	0	5944.9312	0	0
10	4	0	0	0	4.512	70	4129.5808	0	5870.4192	0	0
10	5	0	0	0	4.512	70	4204.0928	0	5795.9072	0	0
10	6	0	0	0	4.512	70	4278.6048	0	5721.3952	0	0
10	7	0	0	0	4.512	70	4353.1168	0	5646.8832	0	0
10	8	0	0	0	4.512	70	4427.6288	0	5572.3712	0	0
10	9	0.8	0	0	4.512	70	4502.1408	0	5497.8592	0	0
10	10	20.6	0.08	489.2912	4.512	70	4087.3616	0	5912.6384	0	0
10	11	15.8	0.02	93.8204	4.512	70	4068.0532	0	5931.9468	0	0
10	12	0.4	0	0	4.512	70	4142.5652	0	5857.4348	0	0
10	13	9.2	0	0	4.512	70	4217.0772	0	5782.9228	0	0
10	14	7.4	0	0	4.512	70	4291.5892	0	5708.4108	0	0
10	15	1	0	0	4.512	70	4366.1012	0	5633.8988	0	0
10	16	0	0	0	4.512	70	4440.6132	0	5559.3868	0	0
10	17	0	0	0	4.512	70	4515.1252	0	5484.8748	0	0
10	18	0.4	0	0	4.512	70	4589.6372	0	5410.3628	0	0
10	19	0.2	0	0	4.512	70	4664.1492	0	5335.8508	0	0
10	20	0.2	0	0	4.512	70	4738.6612	0	5261.3388	0	0
10	21	0	0	0	4.512	70	4813.1732	0	5186.8268	0	0
10	22	0.6	0	0	4.512	70	4887.6852	0	5112.3148	0	0
10	23	0	0	0	4.512	70	4962.1972	0	5037.8028	0	0
10	24	0.2	0	0	4.512	70	5036.7092	0	4963.2908	0	0
10	25	1.2	0	0	4.512	70	5111.2212	0	4888.7788	0	0
10	26	1.2	0	0	4.512	70	5185.7332	0	4814.2668	0	0
10	27	3	0	0	4.512	70	5260.2452	0	4739.7548	0	0
10	28	0.2	0	0	4.512	70	5334.7572	0	4665.2428	0	0
10	29	0	0	0	4.512	70	5409.2692	0	4590.7308	0	0
10	30	0	0	0	4.512	70	5483.7812	0	4516.2188	0	0
10	31	4.6	0	0	4.512	70	5558.2932	0	4441.7068	0	0
11	1	0	0	0	5.76	70	5634.0532	0	4365.9468	0	0
11	2	0	0	0	5.76	70	5709.8132	0	4290.1868	0	0
11	3	0	0	0	5.76	70	5785.5732	0	4214.4268	0	0
11	4	0.2	0	0	5.76	70	5861.3332	0	4138.6668	0	0
11	5	0	0	0	5.76	70	5937.0932	0	4062.9068	0	0
11	6	10.4	0.02	61.7552	5.76	70	5951.098	0	4048.902	0	0
11	7	0	0	0	5.76	70	6026.858	0	3973.142	0	0
11	8	5.2	0	0	5.76	70	6102.618	0	3897.382	0	0
11	9	4.4	0	0	5.76	70	6178.378	0	3821.622	0	0
11	10	2.8	0	0	5.76	70	6254.138	0	3745.862	0	0
11	11	1.4	0	0	5.76	70	6329.898	0	3670.102	0	0
11	12	0.2	0	0	5.76	70	6405.658	0	3594.342	0	0
11	13	0	0	0	5.76	70	6481.418	0	3518.582	0	0
11	14	0	0	0	5.76	70	6557.178	0	3442.822	0	0
11	15	0	0	0	5.76	70	6632.938	0	3367.062	0	0
11	16	0	0	0	5.76	70	6708.698	0	3291.302	0	0
11	17	0	0	0	5.76	70	6784.458	0	3215.542	0	0
11	18	0	0	0	5.76	70	6860.218	0	3139.782	0	0
11	19	0	0	0	5.76	70	6935.978	0	3064.022	0	0
11	20	0.2	0	0	5.76	70	7011.738	0	2988.262	0	0
11	21	7.2	0	0	5.76	70	7087.498	0	2912.502	0	0
11	22	12.2	0.02	72.4436	5.76	70	7090.8144	0	2909.1856	0	0
11	23	0.4	0	0	5.76	70	7166.5744	0	2833.4256	0	0
11	24	0	0	0	5.76	70	7242.3344	0	2757.6656	0	0
11	25	0	0	0	5.76	70	7318.0944	0	2681.9056	0	0
11	26	0	0	0	5.76	70	7393.8544	0	2606.1456	0	0
11	27	0	0	0	5.76	70	7469.6144	0	2530.3856	0	0
11	28	0	0	0	5.76	70	7545.3744	0	2454.6256	0	0
11	29	0.2	0	0	5.76	70	7621.1344	0	2378.8656	0	0
11	30	0	0	0	5.76	70	7696.8944	0	2303.1056	0	0
12	1	2.8	0	0	6.912	70	7773.8064	0	2226.1936	0	0
12	2	0	0	0	6.912	70	7850.7184	0	2149.2816	0	0
12	3	23.4	0.08	555.7968	6.912	70	7371.8336	0	2628.1664	0	0
12	4	0.6	0	0	6.912	70	7448.7456	0	2551.2544	0	0
12	5	0	0	0	6.912	70	7525.6576	0	2474.3424	0	0
12	6	0	0	0	6.912	70	7602.5696	0	2397.4304	0	0

12	7	0	0	0	6.912	70	7679.4816	0	2320.5184	0	0
12	8	1.6	0	0	6.912	70	7756.3936	0	2243.6064	0	0
12	9	8	0	0	6.912	70	7833.3056	0	2166.6944	0	0
12	10	0.2	0	0	6.912	70	7910.2176	0	2089.7824	0	0
12	11	0	0	0	6.912	70	7987.1296	0	2012.8704	0	0
12	12	1.2	0	0	6.912	70	8064.0416	0	1935.9584	0	0
12	13	0	0	0	6.912	70	8140.9536	0	1859.0464	0	0
12	14	0	0	0	6.912	70	8217.8656	0	1782.1344	0	0
12	15	0	0	0	6.912	70	8294.7776	0	1705.2224	0	0
12	16	4.6	0	0	6.912	70	8371.6896	0	1628.3104	0	0
12	17	0	0	0	6.912	70	8448.6016	0	1551.3984	0	0
12	18	0	0	0	6.912	70	8525.5136	0	1474.4864	0	0
12	19	0	0	0	6.912	70	8602.4256	0	1397.5744	0	0
12	20	0	0	0	6.912	70	8679.3376	0	1320.6624	0	0
12	21	0	0	0	6.912	70	8756.2496	0	1243.7504	0	0
12	22	0	0	0	6.912	70	8833.1616	0	1166.8384	0	0
12	23	0	0	0	6.912	70	8910.0736	0	1089.9264	0	0
12	24	0	0	0	6.912	70	8986.9856	0	1013.0144	0	0
12	25	1.2	0	0	6.912	70	9063.8976	0	936.1024	0	0
12	26	0	0	0	6.912	70	9140.8096	0	859.1904	0	0
12	27	0.2	0	0	6.912	70	9217.7216	0	782.2784	0	0
12	28	1.8	0	0	6.912	70	9294.6336	0	705.3664	0	0
12	29	0.2	0	0	6.912	70	9371.5456	0	628.4544	0	0
12	30	0	0	0	6.912	70	9448.4576	0	551.5424	0	0
12	31	2	0	0	6.912	70	9525.3696	0	474.6304	0	0
		997.8		34402.3968	1575.264	25550		9735.2552		0	2

Month	Day	Daily Recorded Rainfall (mm)	Mean Daily Evaporation (mm)	Runoff Coefficient Cv	Catchment Area - QS1 (m²)	Inputs: Overland Flow Quarry (m³)	Outputs: Evaporation (m³)	Outputs: Water Used in Operations (m³)
1	1	0	6.4	0	265000	0	12.8	0
1	2	0	6.4	0	265000	0	12.8	0
1	3	0	6.4	0	265000	0	12.8	0
1	4	0	6.4	0	265000	0	12.8	0
1	5	0	6.4	0	265000	0	12.8	0
1	6	0	6.4	0	265000	0	12.8	0
1	7	0.4	6.4	0	265000	0	12.8	0
1	8	16	6.4	0.02	265000	84.8	12.8	0
1	9	0	6.4	0	265000	0	12.8	0
1	10	0	6.4	0	265000	0	12.8	0
1	11	0	6.4	0	265000	0	12.8	0
1	12	0	6.4	0	265000	0	12.8	0
1	13	0	6.4	0	265000	0	12.8	0
1	14	0	6.4	0	265000	0	12.8	0
1	15	0	6.4	0	265000	0	12.8	0
1	16	0	6.4	0	265000	0	12.8	0
1	17	0	6.4	0	265000	0	12.8	0
1	18	0	6.4	0	265000	0	12.8	0
1	19	0	6.4	0	265000	0	12.8	0
1	20	0	6.4	0	265000	0	12.8	0
1	21	0	6.4	0	265000	0	12.8	0
1	22	0	6.4	0	265000	0	12.8	0
1	23	0	6.4	0	265000	0	12.8	0
1	24	0	6.4	0	265000	0	12.8	0
1	25	0	6.4	0	265000	0	12.8	0
1	26	0.8	6.4	0	265000	0	12.8	0
1	27	0	6.4	0	265000	0	12.8	0
1	28	0	6.4	0	265000	0	12.8	0
1	29	0.2	6.4	0	265000	0	12.8	0
1	30	0	6.4	0	265000	0	12.8	0
1	31	0.6	6.4	0	265000	0	12.8	0
2	1	0	5.68	0	265000	0	11.36	0
2	2	0	5.68	0	265000	0	11.36	0
2	3	0	5.68	0	265000	0	11.36	0
2	4	0	5.68	0	265000	0	11.36	0
2	5	0	5.68	0	265000	0	11.36	0
2	6	0.8	5.68	0	265000	0	11.36	0
2	7	0	5.68	0	265000	0	11.36	0
2	8	0	5.68	0	265000	0	11.36	0
2	9	0	5.68	0	265000	0	11.36	0
2	10	0	5.68	0	265000	0	11.36	0
2	11	0.4	5.68	0	265000	0	11.36	0
2	12	0	5.68	0	265000	0	11.36	0
2	13	0	5.68	0	265000	0	11.36	0
2	14	0	5.68	0	265000	0	11.36	0
2	15	0	5.68	0	265000	0	11.36	0
2	16	0	5.68	0	265000	0	11.36	0
2	17	0	5.68	0	265000	0	11.36	0
2	18	3.4	5.68	0	265000	0	11.36	0
2	19	0	5.68	0	265000	0	11.36	0
2	20	0	5.68	0	265000	0	11.36	0
2	21	0	5.68	0	265000	0	11.36	0
2	22	0	5.68	0	265000	0	11.36	0
2	23	0	5.68	0	265000	0	11.36	0
2	24	0	5.68	0	265000	0	11.36	0
2	25	0	5.68	0	265000	0	11.36	0
2	26	0	5.68	0	265000	0	11.36	0
2	27	0	5.68	0	265000	0	11.36	0
2	28	0	5.68	0	265000	0	11.36	0
3	1	0	4.64	0	265000	0	9.28	0
3	2	0	4.64	0	265000	0	9.28	0
3	3	0	4.64	0	265000	0	9.28	0
3	4	0	4.64	0	265000	0	9.28	0
3	5	0	4.64	0	265000	0	9.28	0
3	6	0	4.64	0	265000	0	9.28	0
3	7	19.6	4.64	0.02	265000	103.88	9.28	0
3	8	0.2	4.64	0	265000	0	9.28	0
3	9	0	4.64	0	265000	0	9.28	0
3	10	0	4.64	0	265000	0	9.28	0
3	11	0	4.64	0	265000	0	9.28	0
3	12	0	4.64	0	265000	0	9.28	0
3	13	0	4.64	0	265000	0	9.28	0
3	14	0	4.64	0	265000	0	9.28	0
3	15	0	4.64	0	265000	0	9.28	0
3	16	0	4.64	0	265000	0	9.28	0
3	17	0	4.64	0	265000	0	9.28	0
3	18	11	4.64	0.02	265000	58.3	9.28	0
3	19	1.6	4.64	0	265000	0	9.28	0
3	20	0	4.64	0	265000	0	9.28	0
3	21	48	4.64	0.28	265000	3561.6	9.28	0
3	22	2.6	4.64	0	265000	0	9.28	0
3	23	0	4.64	0	265000	0	9.28	0

3	24	0	4.64	0	265000	0	9.28	0
3	25	11	4.64	0.02	265000	58.3	9.28	0
3	26	2.8	4.64	0	265000	0	9.28	0
3	27	0	4.64	0	265000	0	9.28	0
3	28	4.6	4.64	0	265000	0	9.28	0
3	29	0	4.64	0	265000	0	9.28	0
3	30	0	4.64	0	265000	0	9.28	0
3	31	1.8	4.64	0	265000	0	9.28	0
4	1	0	2.96	0	265000	0	5.92	0
4	2	0	2.96	0	265000	0	5.92	0
4	3	0	2.96	0	265000	0	5.92	0
4	4	1.2	2.96	0	265000	0	5.92	0
4	5	3.2	2.96	0	265000	0	5.92	0
4	6	0	2.96	0	265000	0	5.92	0
4	7	0	2.96	0	265000	0	5.92	0
4	8	0	2.96	0	265000	0	5.92	0
4	9	0	2.96	0	265000	0	5.92	0
4	10	0	2.96	0	265000	0	5.92	0
4	11	0	2.96	0	265000	0	5.92	0
4	12	0	2.96	0	265000	0	5.92	0
4	13	0	2.96	0	265000	0	5.92	0
4	14	0	2.96	0	265000	0	5.92	0
4	15	0	2.96	0	265000	0	5.92	0
4	16	0	2.96	0	265000	0	5.92	0
4	17	0	2.96	0	265000	0	5.92	0
4	18	0	2.96	0	265000	0	5.92	0
4	19	0	2.96	0	265000	0	5.92	0
4	20	6.8	2.96	0	265000	0	5.92	0
4	21	4.2	2.96	0	265000	0	5.92	0
4	22	0	2.96	0	265000	0	5.92	0
4	23	0	2.96	0	265000	0	5.92	0
4	24	0	2.96	0	265000	0	5.92	0
4	25	0	2.96	0	265000	0	5.92	0
4	26	0	2.96	0	265000	0	5.92	0
4	27	1.2	2.96	0	265000	0	5.92	0
4	28	0.6	2.96	0	265000	0	5.92	0
4	29	0.2	2.96	0	265000	0	5.92	0
4	30	0	2.96	0	265000	0	5.92	0
5	1	0	1.92	0	265000	0	3.84	0
5	2	0	1.92	0	265000	0	3.84	0
5	3	0	1.92	0	265000	0	3.84	0
5	4	0	1.92	0	265000	0	3.84	0
5	5	0	1.92	0	265000	0	3.84	0
5	6	0	1.92	0	265000	0	3.84	0
5	7	0	1.92	0	265000	0	3.84	0
5	8	0	1.92	0	265000	0	3.84	0
5	9	0	1.92	0	265000	0	3.84	0
5	10	0.4	1.92	0	265000	0	3.84	0
5	11	0	1.92	0	265000	0	3.84	0
5	12	11.6	1.92	0.02	265000	61.48	3.84	0
5	13	30.4	1.92	0.22	265000	1772.32	3.84	0
5	14	0.6	1.92	0	265000	0	3.84	0
5	15	0	1.92	0	265000	0	3.84	0
5	16	42.8	1.92	0.28	265000	3175.76	3.84	0
5	17	0	1.92	0	265000	0	3.84	0
5	18	0.8	1.92	0	265000	0	3.84	0
5	19	0	1.92	0	265000	0	3.84	0
5	20	0	1.92	0	265000	0	3.84	0
5	21	6.4	1.92	0	265000	0	3.84	0
5	22	5.2	1.92	0	265000	0	3.84	0
5	23	44.2	1.92	0.28	265000	3279.64	3.84	0
5	24	15.8	1.92	0.02	265000	83.74	3.84	0
5	25	78	1.92	0.41	265000	8474.7	3.84	0
5	26	11.4	1.92	0.02	265000	60.42	3.84	0
5	27	1.6	1.92	0	265000	0	3.84	0
5	28	0	1.92	0	265000	0	3.84	0
5	29	14	1.92	0.02	265000	74.2	3.84	0
5	30	10.4	1.92	0.02	265000	55.12	3.84	0
5	31	13.2	1.92	0.02	265000	69.96	3.84	0
6	1	0	1.44	0	265000	0	2.88	0
6	2	0.2	1.44	0	265000	0	2.88	0
6	3	0.2	1.44	0	265000	0	2.88	0
6	4	0	1.44	0	265000	0	2.88	0
6	5	12.8	1.44	0.02	265000	67.84	2.88	0
6	6	1.4	1.44	0	265000	0	2.88	0
6	7	8.2	1.44	0	265000	0	2.88	0
6	8	0.2	1.44	0	265000	0	2.88	0
6	9	0.2	1.44	0	265000	0	2.88	0
6	10	7.2	1.44	0	265000	0	2.88	0
6	11	0	1.44	0	265000	0	2.88	0
6	12	0	1.44	0	265000	0	2.88	0
6	13	36.2	1.44	0.22	265000	2110.46	2.88	0
6	14	0	1.44	0	265000	0	2.88	0
6	15	16.6	1.44	0.02	265000	87.98	2.88	0
6	16	5	1.44	0	265000	0	2.88	0
6	17	0.4	1.44	0	265000	0	2.88	0
6	18	14.8	1.44	0.02	265000	78.44	2.88	0

6	19	2.4	1.44	0	265000	0	2.88	0
6	20	0.2	1.44	0	265000	0	2.88	0
6	21	4.4	1.44	0	265000	0	2.88	0
6	22	0.6	1.44	0	265000	0	2.88	0
6	23	0.4	1.44	0	265000	0	2.88	0
6	24	0.2	1.44	0	265000	0	2.88	0
6	25	7.6	1.44	0	265000	0	2.88	0
6	26	3.8	1.44	0	265000	0	2.88	0
6	27	0	1.44	0	265000	0	2.88	0
6	28	0.2	1.44	0	265000	0	2.88	0
6	29	0	1.44	0	265000	0	2.88	0
6	30	16.2	1.44	0.02	265000	85.86	2.88	0
7	1	0.6	1.36	0	265000	0	2.72	0
7	2	4.8	1.36	0	265000	0	2.72	0
7	3	0.4	1.36	0	265000	0	2.72	0
7	4	0	1.36	0	265000	0	2.72	0
7	5	0	1.36	0	265000	0	2.72	0
7	6	0	1.36	0	265000	0	2.72	0
7	7	0	1.36	0	265000	0	2.72	0
7	8	2	1.36	0	265000	0	2.72	0
7	9	18.6	1.36	0.02	265000	98.58	2.72	0
7	10	0	1.36	0	265000	0	2.72	0
7	11	0	1.36	0	265000	0	2.72	0
7	12	0.4	1.36	0	265000	0	2.72	0
7	13	0.4	1.36	0	265000	0	2.72	0
7	14	0.4	1.36	0	265000	0	2.72	0
7	15	0.2	1.36	0	265000	0	2.72	0
7	16	0	1.36	0	265000	0	2.72	0
7	17	0	1.36	0	265000	0	2.72	0
7	18	0	1.36	0	265000	0	2.72	0
7	19	0	1.36	0	265000	0	2.72	0
7	20	30.2	1.36	0.22	265000	1760.66	2.72	0
7	21	5.8	1.36	0	265000	0	2.72	0
7	22	5.8	1.36	0	265000	0	2.72	0
7	23	0	1.36	0	265000	0	2.72	0
7	24	0	1.36	0	265000	0	2.72	0
7	25	0	1.36	0	265000	0	2.72	0
7	26	0.8	1.36	0	265000	0	2.72	0
7	27	0	1.36	0	265000	0	2.72	0
7	28	0	1.36	0	265000	0	2.72	0
7	29	0	1.36	0	265000	0	2.72	0
7	30	0.2	1.36	0	265000	0	2.72	0
7	31	0.6	1.36	0	265000	0	2.72	0
8	1	0	1.84	0	265000	0	3.68	0
8	2	0	1.84	0	265000	0	3.68	0
8	3	0	1.84	0	265000	0	3.68	0
8	4	0	1.84	0	265000	0	3.68	0
8	5	0	1.84	0	265000	0	3.68	0
8	6	0	1.84	0	265000	0	3.68	0
8	7	0	1.84	0	265000	0	3.68	0
8	8	21	1.84	0.08	265000	445.2	3.68	0
8	9	24	1.84	0.08	265000	508.8	3.68	0
8	10	4	1.84	0	265000	0	3.68	0
8	11	0	1.84	0	265000	0	3.68	0
8	12	0.6	1.84	0	265000	0	3.68	0
8	13	1.2	1.84	0	265000	0	3.68	0
8	14	0	1.84	0	265000	0	3.68	0
8	15	5	1.84	0	265000	0	3.68	0
8	16	0	1.84	0	265000	0	3.68	0
8	17	0.2	1.84	0	265000	0	3.68	0
8	18	0	1.84	0	265000	0	3.68	0
8	19	0	1.84	0	265000	0	3.68	0
8	20	0	1.84	0	265000	0	3.68	0
8	21	0	1.84	0	265000	0	3.68	0
8	22	0	1.84	0	265000	0	3.68	0
8	23	0	1.84	0	265000	0	3.68	0
8	24	0.2	1.84	0	265000	0	3.68	0
8	25	0	1.84	0	265000	0	3.68	0
8	26	0.6	1.84	0	265000	0	3.68	0
8	27	4.6	1.84	0	265000	0	3.68	0
8	28	0	1.84	0	265000	0	3.68	0
8	29	0	1.84	0	265000	0	3.68	0
8	30	0.4	1.84	0	265000	0	3.68	0
8	31	0	1.84	0	265000	0	3.68	0
9	1	0	2.72	0	265000	0	5.44	0
9	2	0	2.72	0	265000	0	5.44	0
9	3	0	2.72	0	265000	0	5.44	0
9	4	36.2	2.72	0.22	265000	2110.46	5.44	0
9	5	0	2.72	0	265000	0	5.44	0
9	6	10.8	2.72	0.02	265000	57.24	5.44	0
9	7	0.4	2.72	0	265000	0	5.44	0
9	8	0	2.72	0	265000	0	5.44	0
9	9	0	2.72	0	265000	0	5.44	0
9	10	0	2.72	0	265000	0	5.44	0
9	11	4.6	2.72	0	265000	0	5.44	0
9	12	0.4	2.72	0	265000	0	5.44	0
9	13	2.2	2.72	0	265000	0	5.44	0

9	14	0	2.72	0	265000	0	5.44	0
9	15	0.2	2.72	0	265000	0	5.44	0
9	16	13.8	2.72	0.02	265000	73.14	5.44	0
9	17	26.8	2.72	0.08	265000	568.16	5.44	0
9	18	2	2.72	0	265000	0	5.44	0
9	19	0	2.72	0	265000	0	5.44	0
9	20	0.2	2.72	0	265000	0	5.44	0
9	21	0	2.72	0	265000	0	5.44	0
9	22	0	2.72	0	265000	0	5.44	0
9	23	0	2.72	0	265000	0	5.44	0
9	24	0	2.72	0	265000	0	5.44	0
9	25	0	2.72	0	265000	0	5.44	0
9	26	0	2.72	0	265000	0	5.44	0
9	27	0	2.72	0	265000	0	5.44	0
9	28	0	2.72	0	265000	0	5.44	0
9	29	16.8	2.72	0.02	265000	89.04	5.44	0
9	30	0	2.72	0	265000	0	5.44	0
10	1	0	3.76	0	265000	0	7.52	0
10	2	0	3.76	0	265000	0	7.52	0
10	3	21.4	3.76	0.08	265000	453.68	7.52	0
10	4	0	3.76	0	265000	0	7.52	0
10	5	0	3.76	0	265000	0	7.52	0
10	6	0	3.76	0	265000	0	7.52	0
10	7	0	3.76	0	265000	0	7.52	0
10	8	0	3.76	0	265000	0	7.52	0
10	9	0.8	3.76	0	265000	0	7.52	0
10	10	20.6	3.76	0.08	265000	436.72	7.52	0
10	11	15.8	3.76	0.02	265000	83.74	7.52	0
10	12	0.4	3.76	0	265000	0	7.52	0
10	13	9.2	3.76	0	265000	0	7.52	0
10	14	7.4	3.76	0	265000	0	7.52	0
10	15	1	3.76	0	265000	0	7.52	0
10	16	0	3.76	0	265000	0	7.52	0
10	17	0	3.76	0	265000	0	7.52	0
10	18	0.4	3.76	0	265000	0	7.52	0
10	19	0.2	3.76	0	265000	0	7.52	0
10	20	0.2	3.76	0	265000	0	7.52	0
10	21	0	3.76	0	265000	0	7.52	0
10	22	0.6	3.76	0	265000	0	7.52	0
10	23	0	3.76	0	265000	0	7.52	0
10	24	0.2	3.76	0	265000	0	7.52	0
10	25	1.2	3.76	0	265000	0	7.52	0
10	26	1.2	3.76	0	265000	0	7.52	0
10	27	3	3.76	0	265000	0	7.52	0
10	28	0.2	3.76	0	265000	0	7.52	0
10	29	0	3.76	0	265000	0	7.52	0
10	30	0	3.76	0	265000	0	7.52	0
10	31	4.6	3.76	0	265000	0	7.52	0
11	1	0	4.8	0	265000	0	9.6	0
11	2	0	4.8	0	265000	0	9.6	0
11	3	0	4.8	0	265000	0	9.6	0
11	4	0.2	4.8	0	265000	0	9.6	0
11	5	0	4.8	0	265000	0	9.6	0
11	6	10.4	4.8	0.02	265000	55.12	9.6	0
11	7	0	4.8	0	265000	0	9.6	0
11	8	5.2	4.8	0	265000	0	9.6	0
11	9	4.4	4.8	0	265000	0	9.6	0
11	10	2.8	4.8	0	265000	0	9.6	0
11	11	1.4	4.8	0	265000	0	9.6	0
11	12	0.2	4.8	0	265000	0	9.6	0
11	13	0	4.8	0	265000	0	9.6	0
11	14	0	4.8	0	265000	0	9.6	0
11	15	0	4.8	0	265000	0	9.6	0
11	16	0	4.8	0	265000	0	9.6	0
11	17	0	4.8	0	265000	0	9.6	0
11	18	0	4.8	0	265000	0	9.6	0
11	19	0	4.8	0	265000	0	9.6	0
11	20	0.2	4.8	0	265000	0	9.6	0
11	21	7.2	4.8	0	265000	0	9.6	0
11	22	12.2	4.8	0.02	265000	64.66	9.6	0
11	23	0.4	4.8	0	265000	0	9.6	0
11	24	0	4.8	0	265000	0	9.6	0
11	25	0	4.8	0	265000	0	9.6	0
11	26	0	4.8	0	265000	0	9.6	0
11	27	0	4.8	0	265000	0	9.6	0
11	28	0	4.8	0	265000	0	9.6	0
11	29	0.2	4.8	0	265000	0	9.6	0
11	30	0	4.8	0	265000	0	9.6	0
12	1	2.8	5.76	0	265000	0	11.52	0
12	2	0	5.76	0	265000	0	11.52	0
12	3	23.4	5.76	0.08	265000	496.08	11.52	0
12	4	0.6	5.76	0	265000	0	11.52	0
12	5	0	5.76	0	265000	0	11.52	0
12	6	0	5.76	0	265000	0	11.52	0
12	7	0	5.76	0	265000	0	11.52	0
12	8	1.6	5.76	0	265000	0	11.52	0
12	9	8	5.76	0	265000	0	11.52	0

12	10	0.2	5.76	0	265000	0	11.52	0
12	11	0	5.76	0	265000	0	11.52	0
12	12	1.2	5.76	0	265000	0	11.52	0
12	13	0	5.76	0	265000	0	11.52	0
12	14	0	5.76	0	265000	0	11.52	0
12	15	0	5.76	0	265000	0	11.52	0
12	16	4.6	5.76	0	265000	0	11.52	0
12	17	0	5.76	0	265000	0	11.52	0
12	18	0	5.76	0	265000	0	11.52	0
12	19	0	5.76	0	265000	0	11.52	0
12	20	0	5.76	0	265000	0	11.52	0
12	21	0	5.76	0	265000	0	11.52	0
12	22	0	5.76	0	265000	0	11.52	0
12	23	0	5.76	0	265000	0	11.52	0
12	24	0	5.76	0	265000	0	11.52	0
12	25	1.2	5.76	0	265000	0	11.52	0
12	26	0	5.76	0	265000	0	11.52	0
12	27	0.2	5.76	0	265000	0	11.52	0
12	28	1.8	5.76	0	265000	0	11.52	0
12	29	0.2	5.76	0	265000	0	11.52	0
12	30	0	5.76	0	265000	0	11.52	0
12	31	2	5.76	0	265000	0	11.52	0
		997.8				30706.08	2625.44	0

Month	Day	Daily Recorded Rainfall (mm)	Mean Daily Evaporation (mm)	Runoff Coefficient	Catchment Area - QS1 (m²)	Inputs	Outputs	
				Cv		Overland Flow Quarry (m³)	Evaporation (m³)	Water Used in Operations (m³)
1	1	0	6.4	0	315700	0	22.4	0
1	2	0	6.4	0	315700	0	22.4	0
1	3	0	6.4	0	315700	0	22.4	0
1	4	0	6.4	0	315700	0	22.4	0
1	5	0	6.4	0	315700	0	22.4	0
1	6	0	6.4	0	315700	0	22.4	0
1	7	0.4	6.4	0	315700	0	22.4	0
1	8	16	6.4	0.02	315700	101.024	22.4	0
1	9	0	6.4	0	315700	0	22.4	0
1	10	0	6.4	0	315700	0	22.4	0
1	11	0	6.4	0	315700	0	22.4	0
1	12	0	6.4	0	315700	0	22.4	0
1	13	0	6.4	0	315700	0	22.4	0
1	14	0	6.4	0	315700	0	22.4	0
1	15	0	6.4	0	315700	0	22.4	0
1	16	0	6.4	0	315700	0	22.4	0
1	17	0	6.4	0	315700	0	22.4	0
1	18	0	6.4	0	315700	0	22.4	0
1	19	0	6.4	0	315700	0	22.4	0
1	20	0	6.4	0	315700	0	22.4	0
1	21	0	6.4	0	315700	0	22.4	0
1	22	0	6.4	0	315700	0	22.4	0
1	23	0	6.4	0	315700	0	22.4	0
1	24	0	6.4	0	315700	0	22.4	0
1	25	0	6.4	0	315700	0	22.4	0
1	26	0.8	6.4	0	315700	0	22.4	0
1	27	0	6.4	0	315700	0	22.4	0
1	28	0	6.4	0	315700	0	22.4	0
1	29	0.2	6.4	0	315700	0	22.4	0
1	30	0	6.4	0	315700	0	22.4	0
1	31	0.6	6.4	0	315700	0	22.4	0
2	1	0	5.68	0	315700	0	19.88	0
2	2	0	5.68	0	315700	0	19.88	0
2	3	0	5.68	0	315700	0	19.88	0
2	4	0	5.68	0	315700	0	19.88	0
2	5	0	5.68	0	315700	0	19.88	0
2	6	0.8	5.68	0	315700	0	19.88	0
2	7	0	5.68	0	315700	0	19.88	0
2	8	0	5.68	0	315700	0	19.88	0
2	9	0	5.68	0	315700	0	19.88	0
2	10	0	5.68	0	315700	0	19.88	0
2	11	0.4	5.68	0	315700	0	19.88	0
2	12	0	5.68	0	315700	0	19.88	0
2	13	0	5.68	0	315700	0	19.88	0
2	14	0	5.68	0	315700	0	19.88	0
2	15	0	5.68	0	315700	0	19.88	0
2	16	0	5.68	0	315700	0	19.88	0
2	17	0	5.68	0	315700	0	19.88	0
2	18	3.4	5.68	0	315700	0	19.88	0
2	19	0	5.68	0	315700	0	19.88	0
2	20	0	5.68	0	315700	0	19.88	0
2	21	0	5.68	0	315700	0	19.88	0
2	22	0	5.68	0	315700	0	19.88	0
2	23	0	5.68	0	315700	0	19.88	0
2	24	0	5.68	0	315700	0	19.88	0
2	25	0	5.68	0	315700	0	19.88	0
2	26	0	5.68	0	315700	0	19.88	0
2	27	0	5.68	0	315700	0	19.88	0
2	28	0	5.68	0	315700	0	19.88	0
3	1	0	4.64	0	315700	0	16.24	0
3	2	0	4.64	0	315700	0	16.24	0
3	3	0	4.64	0	315700	0	16.24	0
3	4	0	4.64	0	315700	0	16.24	0
3	5	0	4.64	0	315700	0	16.24	0
3	6	0	4.64	0	315700	0	16.24	0
3	7	19.6	4.64	0.02	315700	123.7544	16.24	0
3	8	0.2	4.64	0	315700	0	16.24	0
3	9	0	4.64	0	315700	0	16.24	0
3	10	0	4.64	0	315700	0	16.24	0
3	11	0	4.64	0	315700	0	16.24	0
3	12	0	4.64	0	315700	0	16.24	0
3	13	0	4.64	0	315700	0	16.24	0
3	14	0	4.64	0	315700	0	16.24	0
3	15	0	4.64	0	315700	0	16.24	0
3	16	0	4.64	0	315700	0	16.24	0
3	17	0	4.64	0	315700	0	16.24	0
3	18	11	4.64	0.02	315700	69.454	16.24	0
3	19	1.6	4.64	0	315700	0	16.24	0
3	20	0	4.64	0	315700	0	16.24	0
3	21	48	4.64	0.28	315700	4243.008	16.24	0
3	22	2.6	4.64	0	315700	0	16.24	0
3	23	0	4.64	0	315700	0	16.24	0

3	24	0	4.64	0	315700	0	16.24	0
3	25	11	4.64	0.02	315700	69.454	16.24	0
3	26	2.8	4.64	0	315700	0	16.24	0
3	27	0	4.64	0	315700	0	16.24	0
3	28	4.6	4.64	0	315700	0	16.24	0
3	29	0	4.64	0	315700	0	16.24	0
3	30	0	4.64	0	315700	0	16.24	0
3	31	1.8	4.64	0	315700	0	16.24	0
4	1	0	2.96	0	315700	0	10.36	0
4	2	0	2.96	0	315700	0	10.36	0
4	3	0	2.96	0	315700	0	10.36	0
4	4	1.2	2.96	0	315700	0	10.36	0
4	5	3.2	2.96	0	315700	0	10.36	0
4	6	0	2.96	0	315700	0	10.36	0
4	7	0	2.96	0	315700	0	10.36	0
4	8	0	2.96	0	315700	0	10.36	0
4	9	0	2.96	0	315700	0	10.36	0
4	10	0	2.96	0	315700	0	10.36	0
4	11	0	2.96	0	315700	0	10.36	0
4	12	0	2.96	0	315700	0	10.36	0
4	13	0	2.96	0	315700	0	10.36	0
4	14	0	2.96	0	315700	0	10.36	0
4	15	0	2.96	0	315700	0	10.36	0
4	16	0	2.96	0	315700	0	10.36	0
4	17	0	2.96	0	315700	0	10.36	0
4	18	0	2.96	0	315700	0	10.36	0
4	19	0	2.96	0	315700	0	10.36	0
4	20	6.8	2.96	0	315700	0	10.36	0
4	21	4.2	2.96	0	315700	0	10.36	0
4	22	0	2.96	0	315700	0	10.36	0
4	23	0	2.96	0	315700	0	10.36	0
4	24	0	2.96	0	315700	0	10.36	0
4	25	0	2.96	0	315700	0	10.36	0
4	26	0	2.96	0	315700	0	10.36	0
4	27	1.2	2.96	0	315700	0	10.36	0
4	28	0.6	2.96	0	315700	0	10.36	0
4	29	0.2	2.96	0	315700	0	10.36	0
4	30	0	2.96	0	315700	0	10.36	0
5	1	0	1.92	0	315700	0	6.72	0
5	2	0	1.92	0	315700	0	6.72	0
5	3	0	1.92	0	315700	0	6.72	0
5	4	0	1.92	0	315700	0	6.72	0
5	5	0	1.92	0	315700	0	6.72	0
5	6	0	1.92	0	315700	0	6.72	0
5	7	0	1.92	0	315700	0	6.72	0
5	8	0	1.92	0	315700	0	6.72	0
5	9	0	1.92	0	315700	0	6.72	0
5	10	0.4	1.92	0	315700	0	6.72	0
5	11	0	1.92	0	315700	0	6.72	0
5	12	11.6	1.92	0.02	315700	73.2424	6.72	0
5	13	30.4	1.92	0.22	315700	2111.4016	6.72	0
5	14	0.6	1.92	0	315700	0	6.72	0
5	15	0	1.92	0	315700	0	6.72	0
5	16	42.8	1.92	0.28	315700	3783.3488	6.72	0
5	17	0	1.92	0	315700	0	6.72	0
5	18	0.8	1.92	0	315700	0	6.72	0
5	19	0	1.92	0	315700	0	6.72	0
5	20	0	1.92	0	315700	0	6.72	0
5	21	6.4	1.92	0	315700	0	6.72	0
5	22	5.2	1.92	0	315700	0	6.72	0
5	23	44.2	1.92	0.28	315700	3907.1032	6.72	0
5	24	15.8	1.92	0.02	315700	99.7612	6.72	0
5	25	78	1.92	0.41	315700	10096.086	6.72	0
5	26	11.4	1.92	0.02	315700	71.9796	6.72	0
5	27	1.6	1.92	0	315700	0	6.72	0
5	28	0	1.92	0	315700	0	6.72	0
5	29	14	1.92	0.02	315700	88.396	6.72	0
5	30	10.4	1.92	0.02	315700	65.6656	6.72	0
5	31	13.2	1.92	0.02	315700	83.3448	6.72	0
6	1	0	1.44	0	315700	0	5.04	0
6	2	0.2	1.44	0	315700	0	5.04	0
6	3	0.2	1.44	0	315700	0	5.04	0
6	4	0	1.44	0	315700	0	5.04	0
6	5	12.8	1.44	0.02	315700	80.8192	5.04	0
6	6	1.4	1.44	0	315700	0	5.04	0
6	7	8.2	1.44	0	315700	0	5.04	0
6	8	0.2	1.44	0	315700	0	5.04	0
6	9	0.2	1.44	0	315700	0	5.04	0
6	10	7.2	1.44	0	315700	0	5.04	0
6	11	0	1.44	0	315700	0	5.04	0
6	12	0	1.44	0	315700	0	5.04	0
6	13	36.2	1.44	0.22	315700	2514.2348	5.04	0
6	14	0	1.44	0	315700	0	5.04	0
6	15	16.6	1.44	0.02	315700	104.8124	5.04	0
6	16	5	1.44	0	315700	0	5.04	0
6	17	0.4	1.44	0	315700	0	5.04	0
6	18	14.8	1.44	0.02	315700	93.4472	5.04	0

6	19	2.4	1.44	0	315700	0	5.04	0
6	20	0.2	1.44	0	315700	0	5.04	0
6	21	4.4	1.44	0	315700	0	5.04	0
6	22	0.6	1.44	0	315700	0	5.04	0
6	23	0.4	1.44	0	315700	0	5.04	0
6	24	0.2	1.44	0	315700	0	5.04	0
6	25	7.6	1.44	0	315700	0	5.04	0
6	26	3.8	1.44	0	315700	0	5.04	0
6	27	0	1.44	0	315700	0	5.04	0
6	28	0.2	1.44	0	315700	0	5.04	0
6	29	0	1.44	0	315700	0	5.04	0
6	30	16.2	1.44	0.02	315700	102.2868	5.04	0
7	1	0.6	1.36	0	315700	0	4.76	0
7	2	4.8	1.36	0	315700	0	4.76	0
7	3	0.4	1.36	0	315700	0	4.76	0
7	4	0	1.36	0	315700	0	4.76	0
7	5	0	1.36	0	315700	0	4.76	0
7	6	0	1.36	0	315700	0	4.76	0
7	7	0	1.36	0	315700	0	4.76	0
7	8	2	1.36	0	315700	0	4.76	0
7	9	18.6	1.36	0.02	315700	117.4404	4.76	0
7	10	0	1.36	0	315700	0	4.76	0
7	11	0	1.36	0	315700	0	4.76	0
7	12	0.4	1.36	0	315700	0	4.76	0
7	13	0.4	1.36	0	315700	0	4.76	0
7	14	0.4	1.36	0	315700	0	4.76	0
7	15	0.2	1.36	0	315700	0	4.76	0
7	16	0	1.36	0	315700	0	4.76	0
7	17	0	1.36	0	315700	0	4.76	0
7	18	0	1.36	0	315700	0	4.76	0
7	19	0	1.36	0	315700	0	4.76	0
7	20	30.2	1.36	0.22	315700	2097.5108	4.76	0
7	21	5.8	1.36	0	315700	0	4.76	0
7	22	5.8	1.36	0	315700	0	4.76	0
7	23	0	1.36	0	315700	0	4.76	0
7	24	0	1.36	0	315700	0	4.76	0
7	25	0	1.36	0	315700	0	4.76	0
7	26	0.8	1.36	0	315700	0	4.76	0
7	27	0	1.36	0	315700	0	4.76	0
7	28	0	1.36	0	315700	0	4.76	0
7	29	0	1.36	0	315700	0	4.76	0
7	30	0.2	1.36	0	315700	0	4.76	0
7	31	0.6	1.36	0	315700	0	4.76	0
8	1	0	1.84	0	315700	0	6.44	0
8	2	0	1.84	0	315700	0	6.44	0
8	3	0	1.84	0	315700	0	6.44	0
8	4	0	1.84	0	315700	0	6.44	0
8	5	0	1.84	0	315700	0	6.44	0
8	6	0	1.84	0	315700	0	6.44	0
8	7	0	1.84	0	315700	0	6.44	0
8	8	21	1.84	0.08	315700	530.376	6.44	0
8	9	24	1.84	0.08	315700	606.144	6.44	0
8	10	4	1.84	0	315700	0	6.44	0
8	11	0	1.84	0	315700	0	6.44	0
8	12	0.6	1.84	0	315700	0	6.44	0
8	13	1.2	1.84	0	315700	0	6.44	0
8	14	0	1.84	0	315700	0	6.44	0
8	15	5	1.84	0	315700	0	6.44	0
8	16	0	1.84	0	315700	0	6.44	0
8	17	0.2	1.84	0	315700	0	6.44	0
8	18	0	1.84	0	315700	0	6.44	0
8	19	0	1.84	0	315700	0	6.44	0
8	20	0	1.84	0	315700	0	6.44	0
8	21	0	1.84	0	315700	0	6.44	0
8	22	0	1.84	0	315700	0	6.44	0
8	23	0	1.84	0	315700	0	6.44	0
8	24	0.2	1.84	0	315700	0	6.44	0
8	25	0	1.84	0	315700	0	6.44	0
8	26	0.6	1.84	0	315700	0	6.44	0
8	27	4.6	1.84	0	315700	0	6.44	0
8	28	0	1.84	0	315700	0	6.44	0
8	29	0	1.84	0	315700	0	6.44	0
8	30	0.4	1.84	0	315700	0	6.44	0
8	31	0	1.84	0	315700	0	6.44	0
9	1	0	2.72	0	315700	0	9.52	0
9	2	0	2.72	0	315700	0	9.52	0
9	3	0	2.72	0	315700	0	9.52	0
9	4	36.2	2.72	0.22	315700	2514.2348	9.52	0
9	5	0	2.72	0	315700	0	9.52	0
9	6	10.8	2.72	0.02	315700	68.1912	9.52	0
9	7	0.4	2.72	0	315700	0	9.52	0
9	8	0	2.72	0	315700	0	9.52	0
9	9	0	2.72	0	315700	0	9.52	0
9	10	0	2.72	0	315700	0	9.52	0
9	11	4.6	2.72	0	315700	0	9.52	0
9	12	0.4	2.72	0	315700	0	9.52	0
9	13	2.2	2.72	0	315700	0	9.52	0

9	14	0	2.72	0	315700	0	9.52	0
9	15	0.2	2.72	0	315700	0	9.52	0
9	16	13.8	2.72	0.02	315700	87.1332	9.52	0
9	17	26.8	2.72	0.08	315700	676.8608	9.52	0
9	18	2	2.72	0	315700	0	9.52	0
9	19	0	2.72	0	315700	0	9.52	0
9	20	0.2	2.72	0	315700	0	9.52	0
9	21	0	2.72	0	315700	0	9.52	0
9	22	0	2.72	0	315700	0	9.52	0
9	23	0	2.72	0	315700	0	9.52	0
9	24	0	2.72	0	315700	0	9.52	0
9	25	0	2.72	0	315700	0	9.52	0
9	26	0	2.72	0	315700	0	9.52	0
9	27	0	2.72	0	315700	0	9.52	0
9	28	0	2.72	0	315700	0	9.52	0
9	29	16.8	2.72	0.02	315700	106.0752	9.52	0
9	30	0	2.72	0	315700	0	9.52	0
10	1	0	3.76	0	315700	0	13.16	0
10	2	0	3.76	0	315700	0	13.16	0
10	3	21.4	3.76	0.08	315700	540.4784	13.16	0
10	4	0	3.76	0	315700	0	13.16	0
10	5	0	3.76	0	315700	0	13.16	0
10	6	0	3.76	0	315700	0	13.16	0
10	7	0	3.76	0	315700	0	13.16	0
10	8	0	3.76	0	315700	0	13.16	0
10	9	0.8	3.76	0	315700	0	13.16	0
10	10	20.6	3.76	0.08	315700	520.2736	13.16	0
10	11	15.8	3.76	0.02	315700	99.7612	13.16	0
10	12	0.4	3.76	0	315700	0	13.16	0
10	13	9.2	3.76	0	315700	0	13.16	0
10	14	7.4	3.76	0	315700	0	13.16	0
10	15	1	3.76	0	315700	0	13.16	0
10	16	0	3.76	0	315700	0	13.16	0
10	17	0	3.76	0	315700	0	13.16	0
10	18	0.4	3.76	0	315700	0	13.16	0
10	19	0.2	3.76	0	315700	0	13.16	0
10	20	0.2	3.76	0	315700	0	13.16	0
10	21	0	3.76	0	315700	0	13.16	0
10	22	0.6	3.76	0	315700	0	13.16	0
10	23	0	3.76	0	315700	0	13.16	0
10	24	0.2	3.76	0	315700	0	13.16	0
10	25	1.2	3.76	0	315700	0	13.16	0
10	26	1.2	3.76	0	315700	0	13.16	0
10	27	3	3.76	0	315700	0	13.16	0
10	28	0.2	3.76	0	315700	0	13.16	0
10	29	0	3.76	0	315700	0	13.16	0
10	30	0	3.76	0	315700	0	13.16	0
10	31	4.6	3.76	0	315700	0	13.16	0
11	1	0	4.8	0	315700	0	16.8	0
11	2	0	4.8	0	315700	0	16.8	0
11	3	0	4.8	0	315700	0	16.8	0
11	4	0.2	4.8	0	315700	0	16.8	0
11	5	0	4.8	0	315700	0	16.8	0
11	6	10.4	4.8	0.02	315700	65.6656	16.8	0
11	7	0	4.8	0	315700	0	16.8	0
11	8	5.2	4.8	0	315700	0	16.8	0
11	9	4.4	4.8	0	315700	0	16.8	0
11	10	2.8	4.8	0	315700	0	16.8	0
11	11	1.4	4.8	0	315700	0	16.8	0
11	12	0.2	4.8	0	315700	0	16.8	0
11	13	0	4.8	0	315700	0	16.8	0
11	14	0	4.8	0	315700	0	16.8	0
11	15	0	4.8	0	315700	0	16.8	0
11	16	0	4.8	0	315700	0	16.8	0
11	17	0	4.8	0	315700	0	16.8	0
11	18	0	4.8	0	315700	0	16.8	0
11	19	0	4.8	0	315700	0	16.8	0
11	20	0.2	4.8	0	315700	0	16.8	0
11	21	7.2	4.8	0	315700	0	16.8	0
11	22	12.2	4.8	0.02	315700	77.0308	16.8	0
11	23	0.4	4.8	0	315700	0	16.8	0
11	24	0	4.8	0	315700	0	16.8	0
11	25	0	4.8	0	315700	0	16.8	0
11	26	0	4.8	0	315700	0	16.8	0
11	27	0	4.8	0	315700	0	16.8	0
11	28	0	4.8	0	315700	0	16.8	0
11	29	0.2	4.8	0	315700	0	16.8	0
11	30	0	4.8	0	315700	0	16.8	0
12	1	2.8	5.76	0	315700	0	20.16	0
12	2	0	5.76	0	315700	0	20.16	0
12	3	23.4	5.76	0.08	315700	590.9904	20.16	0
12	4	0.6	5.76	0	315700	0	20.16	0
12	5	0	5.76	0	315700	0	20.16	0
12	6	0	5.76	0	315700	0	20.16	0
12	7	0	5.76	0	315700	0	20.16	0
12	8	1.6	5.76	0	315700	0	20.16	0
12	9	8	5.76	0	315700	0	20.16	0

12	10	0.2	5.76	0	315700	0	20.16	0
12	11	0	5.76	0	315700	0	20.16	0
12	12	1.2	5.76	0	315700	0	20.16	0
12	13	0	5.76	0	315700	0	20.16	0
12	14	0	5.76	0	315700	0	20.16	0
12	15	0	5.76	0	315700	0	20.16	0
12	16	4.6	5.76	0	315700	0	20.16	0
12	17	0	5.76	0	315700	0	20.16	0
12	18	0	5.76	0	315700	0	20.16	0
12	19	0	5.76	0	315700	0	20.16	0
12	20	0	5.76	0	315700	0	20.16	0
12	21	0	5.76	0	315700	0	20.16	0
12	22	0	5.76	0	315700	0	20.16	0
12	23	0	5.76	0	315700	0	20.16	0
12	24	0	5.76	0	315700	0	20.16	0
12	25	1.2	5.76	0	315700	0	20.16	0
12	26	0	5.76	0	315700	0	20.16	0
12	27	0.2	5.76	0	315700	0	20.16	0
12	28	1.8	5.76	0	315700	0	20.16	0
12	29	0.2	5.76	0	315700	0	20.16	0
12	30	0	5.76	0	315700	0	20.16	0
12	31	2	5.76	0	315700	0	20.16	0
		997.8				36580.7904	4594.52	0

Month	Day	Daily Recorded Rainfall (mm)	Mean Daily Evaporation (mm)	Runoff Coefficient	Catchment Area - QS1 (m²)	Inputs	Outputs	
				Cv		Overland Flow Quarry (m³)	Evaporation (m³)	Water Used in Operations (m³)
1	1	0	6.4	0	410800	0	28.8	0
1	2	0	6.4	0	410800	0	28.8	0
1	3	0	6.4	0	410800	0	28.8	0
1	4	0	6.4	0	410800	0	28.8	0
1	5	0	6.4	0	410800	0	28.8	0
1	6	0	6.4	0	410800	0	28.8	0
1	7	0.4	6.4	0	410800	0	28.8	0
1	8	16	6.4	0.02	410800	131.456	28.8	0
1	9	0	6.4	0	410800	0	28.8	0
1	10	0	6.4	0	410800	0	28.8	0
1	11	0	6.4	0	410800	0	28.8	0
1	12	0	6.4	0	410800	0	28.8	0
1	13	0	6.4	0	410800	0	28.8	0
1	14	0	6.4	0	410800	0	28.8	0
1	15	0	6.4	0	410800	0	28.8	0
1	16	0	6.4	0	410800	0	28.8	0
1	17	0	6.4	0	410800	0	28.8	0
1	18	0	6.4	0	410800	0	28.8	0
1	19	0	6.4	0	410800	0	28.8	0
1	20	0	6.4	0	410800	0	28.8	0
1	21	0	6.4	0	410800	0	28.8	0
1	22	0	6.4	0	410800	0	28.8	0
1	23	0	6.4	0	410800	0	28.8	0
1	24	0	6.4	0	410800	0	28.8	0
1	25	0	6.4	0	410800	0	28.8	0
1	26	0.8	6.4	0	410800	0	28.8	0
1	27	0	6.4	0	410800	0	28.8	0
1	28	0	6.4	0	410800	0	28.8	0
1	29	0.2	6.4	0	410800	0	28.8	0
1	30	0	6.4	0	410800	0	28.8	0
1	31	0.6	6.4	0	410800	0	28.8	0
2	1	0	5.68	0	410800	0	25.56	0
2	2	0	5.68	0	410800	0	25.56	0
2	3	0	5.68	0	410800	0	25.56	0
2	4	0	5.68	0	410800	0	25.56	0
2	5	0	5.68	0	410800	0	25.56	0
2	6	0.8	5.68	0	410800	0	25.56	0
2	7	0	5.68	0	410800	0	25.56	0
2	8	0	5.68	0	410800	0	25.56	0
2	9	0	5.68	0	410800	0	25.56	0
2	10	0	5.68	0	410800	0	25.56	0
2	11	0.4	5.68	0	410800	0	25.56	0
2	12	0	5.68	0	410800	0	25.56	0
2	13	0	5.68	0	410800	0	25.56	0
2	14	0	5.68	0	410800	0	25.56	0
2	15	0	5.68	0	410800	0	25.56	0
2	16	0	5.68	0	410800	0	25.56	0
2	17	0	5.68	0	410800	0	25.56	0
2	18	3.4	5.68	0	410800	0	25.56	0
2	19	0	5.68	0	410800	0	25.56	0
2	20	0	5.68	0	410800	0	25.56	0
2	21	0	5.68	0	410800	0	25.56	0
2	22	0	5.68	0	410800	0	25.56	0
2	23	0	5.68	0	410800	0	25.56	0
2	24	0	5.68	0	410800	0	25.56	0
2	25	0	5.68	0	410800	0	25.56	0
2	26	0	5.68	0	410800	0	25.56	0
2	27	0	5.68	0	410800	0	25.56	0
2	28	0	5.68	0	410800	0	25.56	0
3	1	0	4.64	0	410800	0	20.88	0
3	2	0	4.64	0	410800	0	20.88	0
3	3	0	4.64	0	410800	0	20.88	0
3	4	0	4.64	0	410800	0	20.88	0
3	5	0	4.64	0	410800	0	20.88	0
3	6	0	4.64	0	410800	0	20.88	0
3	7	19.6	4.64	0.02	410800	161.0336	20.88	0
3	8	0.2	4.64	0	410800	0	20.88	0
3	9	0	4.64	0	410800	0	20.88	0
3	10	0	4.64	0	410800	0	20.88	0
3	11	0	4.64	0	410800	0	20.88	0
3	12	0	4.64	0	410800	0	20.88	0
3	13	0	4.64	0	410800	0	20.88	0
3	14	0	4.64	0	410800	0	20.88	0
3	15	0	4.64	0	410800	0	20.88	0
3	16	0	4.64	0	410800	0	20.88	0
3	17	0	4.64	0	410800	0	20.88	0
3	18	11	4.64	0.02	410800	90.376	20.88	0
3	19	1.6	4.64	0	410800	0	20.88	0
3	20	0	4.64	0	410800	0	20.88	0
3	21	48	4.64	0.28	410800	5521.152	20.88	0
3	22	2.6	4.64	0	410800	0	20.88	0
3	23	0	4.64	0	410800	0	20.88	0

3	24	0	4.64	0	410800	0	20.88	0
3	25	11	4.64	0.02	410800	90.376	20.88	0
3	26	2.8	4.64	0	410800	0	20.88	0
3	27	0	4.64	0	410800	0	20.88	0
3	28	4.6	4.64	0	410800	0	20.88	0
3	29	0	4.64	0	410800	0	20.88	0
3	30	0	4.64	0	410800	0	20.88	0
3	31	1.8	4.64	0	410800	0	20.88	0
4	1	0	2.96	0	410800	0	13.32	0
4	2	0	2.96	0	410800	0	13.32	0
4	3	0	2.96	0	410800	0	13.32	0
4	4	1.2	2.96	0	410800	0	13.32	0
4	5	3.2	2.96	0	410800	0	13.32	0
4	6	0	2.96	0	410800	0	13.32	0
4	7	0	2.96	0	410800	0	13.32	0
4	8	0	2.96	0	410800	0	13.32	0
4	9	0	2.96	0	410800	0	13.32	0
4	10	0	2.96	0	410800	0	13.32	0
4	11	0	2.96	0	410800	0	13.32	0
4	12	0	2.96	0	410800	0	13.32	0
4	13	0	2.96	0	410800	0	13.32	0
4	14	0	2.96	0	410800	0	13.32	0
4	15	0	2.96	0	410800	0	13.32	0
4	16	0	2.96	0	410800	0	13.32	0
4	17	0	2.96	0	410800	0	13.32	0
4	18	0	2.96	0	410800	0	13.32	0
4	19	0	2.96	0	410800	0	13.32	0
4	20	6.8	2.96	0	410800	0	13.32	0
4	21	4.2	2.96	0	410800	0	13.32	0
4	22	0	2.96	0	410800	0	13.32	0
4	23	0	2.96	0	410800	0	13.32	0
4	24	0	2.96	0	410800	0	13.32	0
4	25	0	2.96	0	410800	0	13.32	0
4	26	0	2.96	0	410800	0	13.32	0
4	27	1.2	2.96	0	410800	0	13.32	0
4	28	0.6	2.96	0	410800	0	13.32	0
4	29	0.2	2.96	0	410800	0	13.32	0
4	30	0	2.96	0	410800	0	13.32	0
5	1	0	1.92	0	410800	0	8.64	0
5	2	0	1.92	0	410800	0	8.64	0
5	3	0	1.92	0	410800	0	8.64	0
5	4	0	1.92	0	410800	0	8.64	0
5	5	0	1.92	0	410800	0	8.64	0
5	6	0	1.92	0	410800	0	8.64	0
5	7	0	1.92	0	410800	0	8.64	0
5	8	0	1.92	0	410800	0	8.64	0
5	9	0	1.92	0	410800	0	8.64	0
5	10	0.4	1.92	0	410800	0	8.64	0
5	11	0	1.92	0	410800	0	8.64	0
5	12	11.6	1.92	0.02	410800	95.3056	8.64	0
5	13	30.4	1.92	0.22	410800	2747.4304	8.64	0
5	14	0.6	1.92	0	410800	0	8.64	0
5	15	0	1.92	0	410800	0	8.64	0
5	16	42.8	1.92	0.28	410800	4923.0272	8.64	0
5	17	0	1.92	0	410800	0	8.64	0
5	18	0.8	1.92	0	410800	0	8.64	0
5	19	0	1.92	0	410800	0	8.64	0
5	20	0	1.92	0	410800	0	8.64	0
5	21	6.4	1.92	0	410800	0	8.64	0
5	22	5.2	1.92	0	410800	0	8.64	0
5	23	44.2	1.92	0.28	410800	5084.0608	8.64	0
5	24	15.8	1.92	0.02	410800	129.8128	8.64	0
5	25	78	1.92	0.41	410800	13137.384	8.64	0
5	26	11.4	1.92	0.02	410800	93.6624	8.64	0
5	27	1.6	1.92	0	410800	0	8.64	0
5	28	0	1.92	0	410800	0	8.64	0
5	29	14	1.92	0.02	410800	115.024	8.64	0
5	30	10.4	1.92	0.02	410800	85.4464	8.64	0
5	31	13.2	1.92	0.02	410800	108.4512	8.64	0
6	1	0	1.44	0	410800	0	6.48	0
6	2	0.2	1.44	0	410800	0	6.48	0
6	3	0.2	1.44	0	410800	0	6.48	0
6	4	0	1.44	0	410800	0	6.48	0
6	5	12.8	1.44	0.02	410800	105.1648	6.48	0
6	6	1.4	1.44	0	410800	0	6.48	0
6	7	8.2	1.44	0	410800	0	6.48	0
6	8	0.2	1.44	0	410800	0	6.48	0
6	9	0.2	1.44	0	410800	0	6.48	0
6	10	7.2	1.44	0	410800	0	6.48	0
6	11	0	1.44	0	410800	0	6.48	0
6	12	0	1.44	0	410800	0	6.48	0
6	13	36.2	1.44	0.22	410800	3271.6112	6.48	0
6	14	0	1.44	0	410800	0	6.48	0
6	15	16.6	1.44	0.02	410800	136.3856	6.48	0
6	16	5	1.44	0	410800	0	6.48	0
6	17	0.4	1.44	0	410800	0	6.48	0
6	18	14.8	1.44	0.02	410800	121.5968	6.48	0

6	19	2.4	1.44	0	410800	0	6.48	0
6	20	0.2	1.44	0	410800	0	6.48	0
6	21	4.4	1.44	0	410800	0	6.48	0
6	22	0.6	1.44	0	410800	0	6.48	0
6	23	0.4	1.44	0	410800	0	6.48	0
6	24	0.2	1.44	0	410800	0	6.48	0
6	25	7.6	1.44	0	410800	0	6.48	0
6	26	3.8	1.44	0	410800	0	6.48	0
6	27	0	1.44	0	410800	0	6.48	0
6	28	0.2	1.44	0	410800	0	6.48	0
6	29	0	1.44	0	410800	0	6.48	0
6	30	16.2	1.44	0.02	410800	133.0992	6.48	0
7	1	0.6	1.36	0	410800	0	6.12	0
7	2	4.8	1.36	0	410800	0	6.12	0
7	3	0.4	1.36	0	410800	0	6.12	0
7	4	0	1.36	0	410800	0	6.12	0
7	5	0	1.36	0	410800	0	6.12	0
7	6	0	1.36	0	410800	0	6.12	0
7	7	0	1.36	0	410800	0	6.12	0
7	8	2	1.36	0	410800	0	6.12	0
7	9	18.6	1.36	0.02	410800	152.8176	6.12	0
7	10	0	1.36	0	410800	0	6.12	0
7	11	0	1.36	0	410800	0	6.12	0
7	12	0.4	1.36	0	410800	0	6.12	0
7	13	0.4	1.36	0	410800	0	6.12	0
7	14	0.4	1.36	0	410800	0	6.12	0
7	15	0.2	1.36	0	410800	0	6.12	0
7	16	0	1.36	0	410800	0	6.12	0
7	17	0	1.36	0	410800	0	6.12	0
7	18	0	1.36	0	410800	0	6.12	0
7	19	0	1.36	0	410800	0	6.12	0
7	20	30.2	1.36	0.22	410800	2729.3552	6.12	0
7	21	5.8	1.36	0	410800	0	6.12	0
7	22	5.8	1.36	0	410800	0	6.12	0
7	23	0	1.36	0	410800	0	6.12	0
7	24	0	1.36	0	410800	0	6.12	0
7	25	0	1.36	0	410800	0	6.12	0
7	26	0.8	1.36	0	410800	0	6.12	0
7	27	0	1.36	0	410800	0	6.12	0
7	28	0	1.36	0	410800	0	6.12	0
7	29	0	1.36	0	410800	0	6.12	0
7	30	0.2	1.36	0	410800	0	6.12	0
7	31	0.6	1.36	0	410800	0	6.12	0
8	1	0	1.84	0	410800	0	8.28	0
8	2	0	1.84	0	410800	0	8.28	0
8	3	0	1.84	0	410800	0	8.28	0
8	4	0	1.84	0	410800	0	8.28	0
8	5	0	1.84	0	410800	0	8.28	0
8	6	0	1.84	0	410800	0	8.28	0
8	7	0	1.84	0	410800	0	8.28	0
8	8	21	1.84	0.08	410800	690.144	8.28	0
8	9	24	1.84	0.08	410800	788.736	8.28	0
8	10	4	1.84	0	410800	0	8.28	0
8	11	0	1.84	0	410800	0	8.28	0
8	12	0.6	1.84	0	410800	0	8.28	0
8	13	1.2	1.84	0	410800	0	8.28	0
8	14	0	1.84	0	410800	0	8.28	0
8	15	5	1.84	0	410800	0	8.28	0
8	16	0	1.84	0	410800	0	8.28	0
8	17	0.2	1.84	0	410800	0	8.28	0
8	18	0	1.84	0	410800	0	8.28	0
8	19	0	1.84	0	410800	0	8.28	0
8	20	0	1.84	0	410800	0	8.28	0
8	21	0	1.84	0	410800	0	8.28	0
8	22	0	1.84	0	410800	0	8.28	0
8	23	0	1.84	0	410800	0	8.28	0
8	24	0.2	1.84	0	410800	0	8.28	0
8	25	0	1.84	0	410800	0	8.28	0
8	26	0.6	1.84	0	410800	0	8.28	0
8	27	4.6	1.84	0	410800	0	8.28	0
8	28	0	1.84	0	410800	0	8.28	0
8	29	0	1.84	0	410800	0	8.28	0
8	30	0.4	1.84	0	410800	0	8.28	0
8	31	0	1.84	0	410800	0	8.28	0
9	1	0	2.72	0	410800	0	12.24	0
9	2	0	2.72	0	410800	0	12.24	0
9	3	0	2.72	0	410800	0	12.24	0
9	4	36.2	2.72	0.22	410800	3271.6112	12.24	0
9	5	0	2.72	0	410800	0	12.24	0
9	6	10.8	2.72	0.02	410800	88.7328	12.24	0
9	7	0.4	2.72	0	410800	0	12.24	0
9	8	0	2.72	0	410800	0	12.24	0
9	9	0	2.72	0	410800	0	12.24	0
9	10	0	2.72	0	410800	0	12.24	0
9	11	4.6	2.72	0	410800	0	12.24	0
9	12	0.4	2.72	0	410800	0	12.24	0
9	13	2.2	2.72	0	410800	0	12.24	0

9	14	0	2.72	0	410800	0	12.24	0
9	15	0.2	2.72	0	410800	0	12.24	0
9	16	13.8	2.72	0.02	410800	113.3808	12.24	0
9	17	26.8	2.72	0.08	410800	880.7552	12.24	0
9	18	2	2.72	0	410800	0	12.24	0
9	19	0	2.72	0	410800	0	12.24	0
9	20	0.2	2.72	0	410800	0	12.24	0
9	21	0	2.72	0	410800	0	12.24	0
9	22	0	2.72	0	410800	0	12.24	0
9	23	0	2.72	0	410800	0	12.24	0
9	24	0	2.72	0	410800	0	12.24	0
9	25	0	2.72	0	410800	0	12.24	0
9	26	0	2.72	0	410800	0	12.24	0
9	27	0	2.72	0	410800	0	12.24	0
9	28	0	2.72	0	410800	0	12.24	0
9	29	16.8	2.72	0.02	410800	138.0288	12.24	0
9	30	0	2.72	0	410800	0	12.24	0
10	1	0	3.76	0	410800	0	16.92	0
10	2	0	3.76	0	410800	0	16.92	0
10	3	21.4	3.76	0.08	410800	703.2896	16.92	0
10	4	0	3.76	0	410800	0	16.92	0
10	5	0	3.76	0	410800	0	16.92	0
10	6	0	3.76	0	410800	0	16.92	0
10	7	0	3.76	0	410800	0	16.92	0
10	8	0	3.76	0	410800	0	16.92	0
10	9	0.8	3.76	0	410800	0	16.92	0
10	10	20.6	3.76	0.08	410800	676.9984	16.92	0
10	11	15.8	3.76	0.02	410800	129.8128	16.92	0
10	12	0.4	3.76	0	410800	0	16.92	0
10	13	9.2	3.76	0	410800	0	16.92	0
10	14	7.4	3.76	0	410800	0	16.92	0
10	15	1	3.76	0	410800	0	16.92	0
10	16	0	3.76	0	410800	0	16.92	0
10	17	0	3.76	0	410800	0	16.92	0
10	18	0.4	3.76	0	410800	0	16.92	0
10	19	0.2	3.76	0	410800	0	16.92	0
10	20	0.2	3.76	0	410800	0	16.92	0
10	21	0	3.76	0	410800	0	16.92	0
10	22	0.6	3.76	0	410800	0	16.92	0
10	23	0	3.76	0	410800	0	16.92	0
10	24	0.2	3.76	0	410800	0	16.92	0
10	25	1.2	3.76	0	410800	0	16.92	0
10	26	1.2	3.76	0	410800	0	16.92	0
10	27	3	3.76	0	410800	0	16.92	0
10	28	0.2	3.76	0	410800	0	16.92	0
10	29	0	3.76	0	410800	0	16.92	0
10	30	0	3.76	0	410800	0	16.92	0
10	31	4.6	3.76	0	410800	0	16.92	0
11	1	0	4.8	0	410800	0	21.6	0
11	2	0	4.8	0	410800	0	21.6	0
11	3	0	4.8	0	410800	0	21.6	0
11	4	0.2	4.8	0	410800	0	21.6	0
11	5	0	4.8	0	410800	0	21.6	0
11	6	10.4	4.8	0.02	410800	85.4464	21.6	0
11	7	0	4.8	0	410800	0	21.6	0
11	8	5.2	4.8	0	410800	0	21.6	0
11	9	4.4	4.8	0	410800	0	21.6	0
11	10	2.8	4.8	0	410800	0	21.6	0
11	11	1.4	4.8	0	410800	0	21.6	0
11	12	0.2	4.8	0	410800	0	21.6	0
11	13	0	4.8	0	410800	0	21.6	0
11	14	0	4.8	0	410800	0	21.6	0
11	15	0	4.8	0	410800	0	21.6	0
11	16	0	4.8	0	410800	0	21.6	0
11	17	0	4.8	0	410800	0	21.6	0
11	18	0	4.8	0	410800	0	21.6	0
11	19	0	4.8	0	410800	0	21.6	0
11	20	0.2	4.8	0	410800	0	21.6	0
11	21	7.2	4.8	0	410800	0	21.6	0
11	22	12.2	4.8	0.02	410800	100.2352	21.6	0
11	23	0.4	4.8	0	410800	0	21.6	0
11	24	0	4.8	0	410800	0	21.6	0
11	25	0	4.8	0	410800	0	21.6	0
11	26	0	4.8	0	410800	0	21.6	0
11	27	0	4.8	0	410800	0	21.6	0
11	28	0	4.8	0	410800	0	21.6	0
11	29	0.2	4.8	0	410800	0	21.6	0
11	30	0	4.8	0	410800	0	21.6	0
12	1	2.8	5.76	0	410800	0	25.92	0
12	2	0	5.76	0	410800	0	25.92	0
12	3	23.4	5.76	0.08	410800	769.0176	25.92	0
12	4	0.6	5.76	0	410800	0	25.92	0
12	5	0	5.76	0	410800	0	25.92	0
12	6	0	5.76	0	410800	0	25.92	0
12	7	0	5.76	0	410800	0	25.92	0
12	8	1.6	5.76	0	410800	0	25.92	0
12	9	8	5.76	0	410800	0	25.92	0

12	10	0.2	5.76	0	410800	0	25.92	0
12	11	0	5.76	0	410800	0	25.92	0
12	12	1.2	5.76	0	410800	0	25.92	0
12	13	0	5.76	0	410800	0	25.92	0
12	14	0	5.76	0	410800	0	25.92	0
12	15	0	5.76	0	410800	0	25.92	0
12	16	4.6	5.76	0	410800	0	25.92	0
12	17	0	5.76	0	410800	0	25.92	0
12	18	0	5.76	0	410800	0	25.92	0
12	19	0	5.76	0	410800	0	25.92	0
12	20	0	5.76	0	410800	0	25.92	0
12	21	0	5.76	0	410800	0	25.92	0
12	22	0	5.76	0	410800	0	25.92	0
12	23	0	5.76	0	410800	0	25.92	0
12	24	0	5.76	0	410800	0	25.92	0
12	25	1.2	5.76	0	410800	0	25.92	0
12	26	0	5.76	0	410800	0	25.92	0
12	27	0.2	5.76	0	410800	0	25.92	0
12	28	1.8	5.76	0	410800	0	25.92	0
12	29	0.2	5.76	0	410800	0	25.92	0
12	30	0	5.76	0	410800	0	25.92	0
12	31	2	5.76	0	410800	0	25.92	0
		997.8				47600.2176	5907.24	0

Attachment 12

Sediment Basin - Options Review

GROUNDWORK plus

WHITE ROCK QUARRY
SEDIMENT BASIN 2 – OPTIONS REVIEW

Prepared for:
Hanson Construction Materials Pty Ltd

Date:
October 2021

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1901.810.002

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Table of Contents

DRAWINGS

ATTACHMENTS

1. Introduction

1.1 Project Overview

Groundwork Plus Pty Ltd ('Groundwork Plus') has been commissioned by Hanson Construction Materials Pty Ltd (Hanson) to undertake a Sediment Basin options analysis of Sediment Basin 2 as part of the ongoing water management strategy for the operations of the White Rock Quarry located within Private Mine (PM) 188 located on Horsnells Gully Road (the Site).

An initial surface water assessment was undertaken for the Site in September 2017 to review the catchment hydrology of the Site and the surrounding external catchments and inform the required sediment basin water storage volumes required within the Site to manage surface water in accordance with the International *Erosion Control Association (IECA) 2008 Best Practice Erosion and Sediment Control (BPESC)* Guidelines.

Hydraulic modelling and Sediment Basin design within the Site has been undertaken in accordance with the criteria of the IECA 2008 BPESC guidelines and formed part of the Environment Improvement Program (EIP) for the Site, approved by the Environment Protection Authority (EPA) in 2017. Subsequently the IECA BPESC guidelines were updated in 2018 incorporating updated Sediment Basin design options.

Construction of Sediment Basin 1 (SB1) was undertaken as part of the EIP during 2019 of which considerable investment was undertaken by Hanson in order to manage the geotechnical instability issues associated with the basin location while also achieving the required sediment basin volume in accordance with the 2008 IECA criteria. While there has been recorded sediment load reduction reported from the Site following the implementation of SB1, the volume of the existing Sediment Basin 2 (SB2) remains lower than the required 2008 IECA criteria.

Initial volume calculations for SB2 have previously been provided within the hydraulic modelling and assessment for the Site in 2017, however a review of the SB2 design has been undertaken against the updated 2018 IECA design practice in response to a request from the EPA to ensure that best available technologies are considered and reasonable and practicable measures are adopted by Hanson to achieve the Water Quality criteria for the Site.

1.2 Scope of Assessment

The scope of the report includes the following items:

- A detailed Site water balance assessment for SB2 contributing catchments, to inform upgrade design options analysis in accordance with the 2018 IECA design criteria, including considerations for 1 in 20 Annual Recurrence Interval (ARI) and 1 in 100 ARI retention options;
- Undertake an annual water balance for the reuse for the stormwater harvesting system associated with SB1, in order to inform on feasibility for utilising captured surface water from SB2 for reuse in operations;
- Identify the estimated frequency of discharge events from the quarry for each proposed SB2 upgrade scenarios
- Provide a summary of considerations for the sediment basin design options analysis in consideration of the IECA design criteria and 1:20 ARI and 1:100 ARI storm events.

1.3 Site Location

The White Rock Quarry is situated within Private Mine (PM) 188 located on Horsnells Gully Road, Horsnell Gully SA 5141. SB2 is located on the southern side of a fourth order water course approximately 200m west of the Site access gate.

1.4 Site Catchments and Topography

The topography of the Site has been mapped utilising Unmanned Aerial Vehicle (UAV) survey with topography of the surrounding area mapped with LiDAR (Geoscience Australia). Catchment areas of the Site and the surrounding catchments feeding surface water into the Site have been reviewed and outlined within **Drawing No. 1901.SK01.R1 - Surface Water Catchment Areas**.

The topography within the Site varies from the upper northern reaches of the quarry RL 390 metres Australian Height Datum (mAHD), with the extraction sump at around RL 300m AHD. The quarry haul roads and infrastructure areas grade towards the quarry entrance via a series of stormwater treatment devices, with the Site discharge location being monitored at the SB2, at RL approximately 230.0mAHD.

The surface water catchments comprise of a series of clean catchment areas that bypass the quarry via an existing underground pipe network, as depicted by the green areas. The Giles Gully conservation dam is depicted by the blue catchment area, and the remaining quarry catchments are shown in yellow (operational areas) and red (quarry pit).

The catchment that contributes directly into SB2 is denoted catchment C5, with a contributing area of 9.85 hectares. A clean water catchment diversion is currently being investigated for catchment U5, in order to prevent inflows into the SB2 drainage system. Presently, a piped system at the quarry entrance receives all runoff from catchment C5, and then discharges to SB2 via a concrete channel.

1.4.1 Hydrologic / Hydraulic Modelling

A hydrologic / hydraulic model was established in order to simulate the quarry over a range of design storm events, as shown in **Diagram 1 – DRAINS model schematic.**

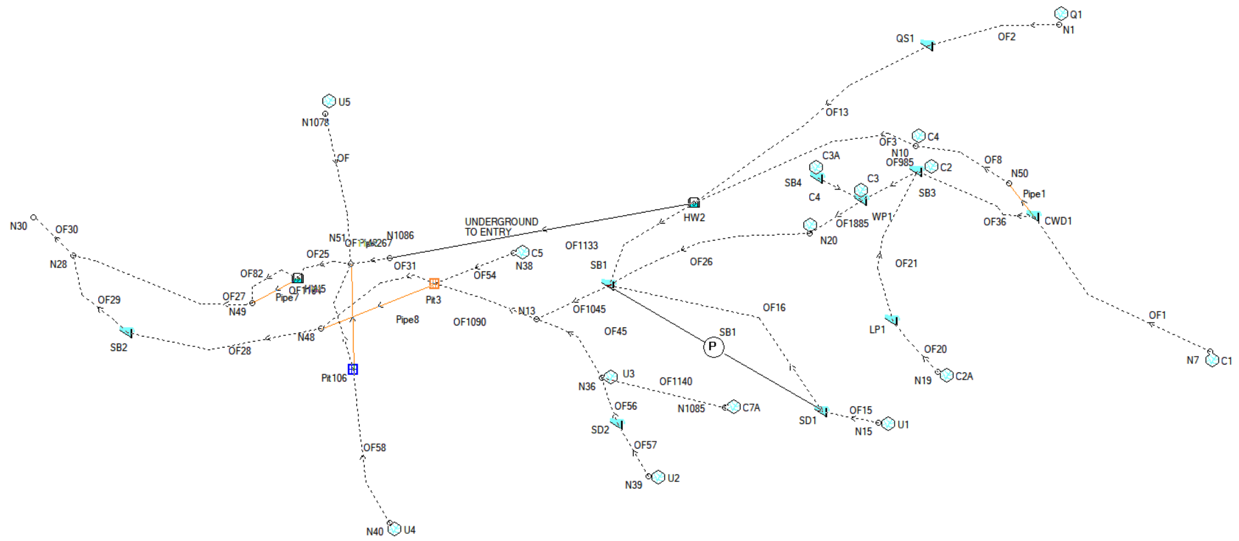


Diagram 1 – DRAINS model schematic

1.4.2 Soil Characteristics

A Particle Size Distribution (PSD) analysis was undertaken at SB2, at the location shown in **Diagram 2 – SB2 PSD soil sample location**. The results are shown in **Diagram 3 – SB2 PSD analysis**, indicating that approximately 80% of the material is finer than one (1) millimetre (mm). An earlier sample taken by Water Science upstream of SB2 is shown in **Diagram 4 – Upstream PSD soil sample results**, indicating approximately 90% of cumulative volume being finer than 0.02mm, inferring that material contributing to SB2 is likely to include significant volumes of clay / silt. Consideration of suitable coagulants and/or flocculants has been ongoing in order to identify the optimum treatment method for dewatering of SB2. The outcome for the most suitable application will be confirmed as part of the detailed design of the SB2 upgrade.

Diagram 2 – PSD SB2 soil sample location

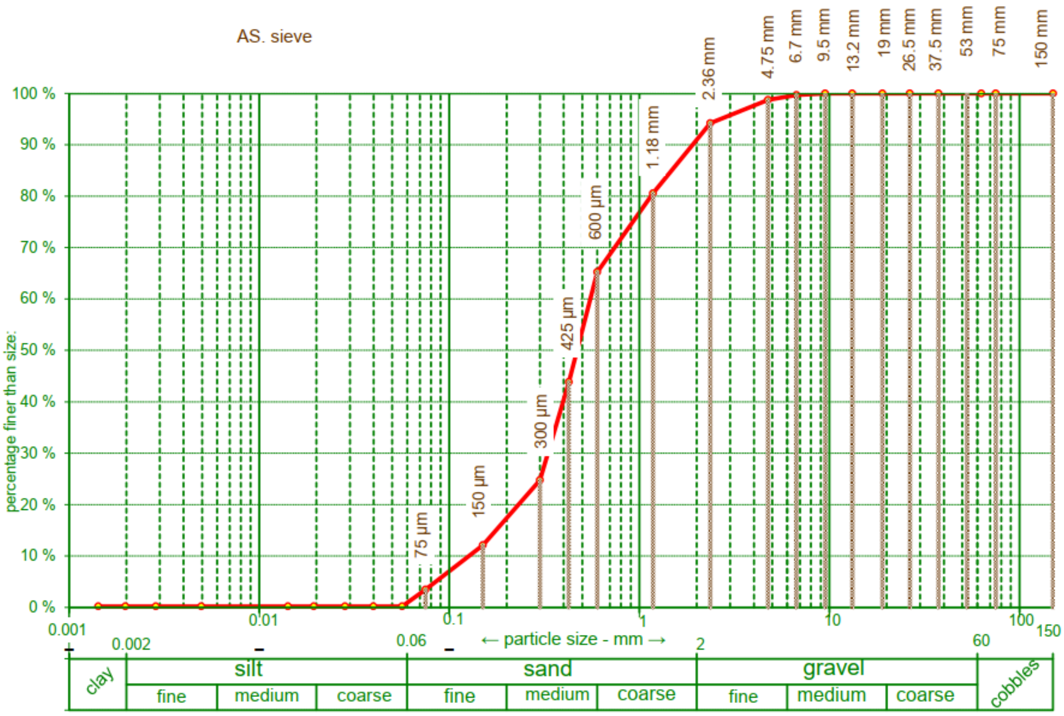
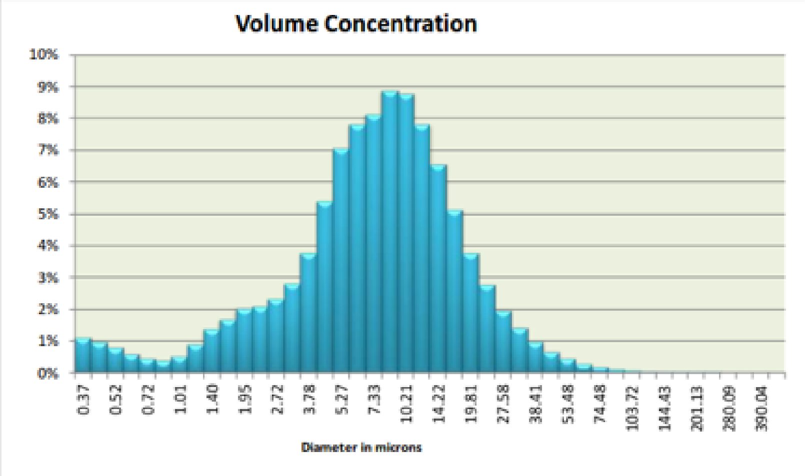
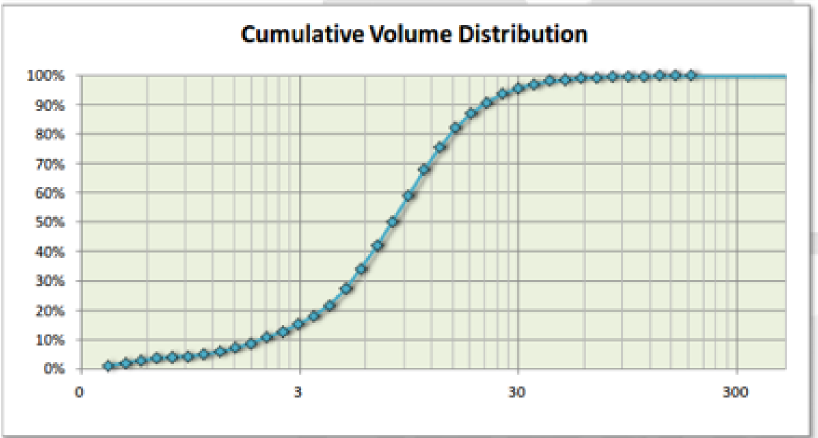


Diagram 3 – PSD sample analysis

LISST-Portable|XR Size Distribution Report

Sample Number to Display:	1
Operator:	WATER SCIENCE
Sample Notes:	White Rock Quarry Sed. Basin Upstream
SOP Name:	WATER SCIENCE
SOP Note:	5142085





Median Size (microns)	Volume Conc (%)	Cumulative Volume
0.37	1%	1.12%
0.44	1%	2.09%
0.52	1%	2.89%
0.61	1%	3.49%
0.72	0%	3.94%
0.85	0%	4.34%
1.01	1%	4.86%
1.19	1%	5.76%
1.40	1%	7.12%
1.65	2%	8.81%
1.95	2%	10.82%
2.30	2%	12.91%
2.72	2%	15.22%
3.20	3%	18.03%
3.78	4%	21.80%
4.46	5%	27.18%
5.27	7%	34.23%
6.21	8%	42.06%
7.33	8%	50.18%
8.65	9%	59.05%
10.21	9%	67.82%
12.05	8%	75.62%
14.22	7%	82.17%
16.78	5%	87.29%
19.81	4%	91.04%
23.37	3%	93.80%
27.58	2%	95.77%
32.55	1%	97.18%
38.41	1%	98.15%
45.32	1%	98.80%
53.48	0%	99.25%
63.11	0%	99.53%
74.48	0%	99.72%
87.89	0%	99.84%
103.72	0%	99.91%
122.39	0%	99.95%
144.43	0%	99.98%
170.44	0%	99.99%
201.13	0%	100.00%
237.35	0%	100.01%
280.09	0%	100.01%
330.52	0%	100.01%
390.04	0%	100.01%
460.27	0%	100.01%

Computed Statistics		
Process Date	10/18/2017	MM/DD/YYYY
Process Time	09:07:38	HH:MM:SS
Optical Transmission	77.8	%
Total Volume Conc	59.5	ul/l
Total Mass Conc	62.4	mg/l
Mean Size	7.1	microns
Standard Deviation	11.3	microns
Optical Model	Polystyrene	No units
Index of Refraction	[1.590-0.100i]	[real imag]
Effective Density	1.050	g/cm^3
Mixer Speed	20	%
Mixer Duration	-1	sec
Ultrasonic Power	-1	%
Ultrasonic Duration	-1	sec
Average Duration	20	sec
Sample Prep Control	Manual	No units

Computed Statistics		
D5	1.12	microns
D10	1.98	microns
D16	3.09	microns
D25	4.53	microns
D50	7.94	microns
D60	9.57	microns
D75	12.92	microns
D84	16.39	microns
D90	20.55	microns
D95	28.10	microns
D60/D10	4.83	No units
Surface Area	1.45	m^2/l
Silt Ratio	0.01	No units
Silt Volume	0.67	ul/l

Analysis performed using laser diffraction techniques as described in AWWA Standard No. 2560D and ISO-13320-1. Instrumentation verified using NIST traceable standard particles. Rev. 4/5/2013.

SEQUOIA
Sequoia Scientific, Inc
www.SequoiaSci.com

Diagram 4 – Upstream PSD soil sample results

2. Water Balance Assessment

2.1 Assessment Objectives and Criteria

The water balance assessment was considered for both the catchments contributing to Sediment Basin SB2 and SB1 to inform the viability of dewatering from SB2 into SB1 for future reuse within the Site's operations.

2.1.1 Sediment Basin SB2 water balance assessment objectives

The objectives of the water balance assessment for SB2 was to inform the design options analysis and provide recommendations for the most suitable sediment basin design option, with consideration to the following:

- Overall water volume and area required;
- Site area constraints
- Cost to implement and maintain;
- Changes to the hydraulic regime for downstream users
- Effectiveness to prevent uncontrolled sediment releases occurring; and
- Adoption of Industry standards and best practice, with reference to the Site licence conditions and permits

2.1.2 Sediment Basin SB1 water balance assessment objectives

The objectives of the water balance assessment for SB1 was to conduct a water budget to determine annual surface water inputs and compare against the Site water usage requirements, in order to understand if there are any surplus or shortfalls and consider the feasibility of additional harvesting from the SB2 treatment system.

2.2 Climate Data

Rainfall data was sourced from the Bureau of Meteorology (BoM) for Mount Lofty (023810) for the water balance, which is 4.86 kilometres (km) from the Site. To inform the calculations of the water balance daily rainfall records were downloaded and used for a higher degree of accuracy.

2.2.1 Average Rainfall

The year 1999 was selected for examining an 'average rainfall' scenario, with an annual rainfall depth of 997mm recorded, which is comparable to the mean rainfall of 972mm (within 3% difference based on annual total).

2.2.2 Mean Daily Evaporation

Mean Daily Evaporation data was sourced from BoM for Adelaide West Terrace Station (023000) as it was the closest available (approximately 12.0 km away). A coefficient of 0.8 was applied to the mean pan evaporation rates to take into account the high shading effect experienced at the quarry. The adopted values are shown below in **Table 1 – Mean Daily Evaporation (adopted).**

Table 1 – Mean Daily Evaporation (adopted)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
mm	6.4	5.68	4.64	2.96	1.92	1.44	1.36	1.84	2.72	3.76	4.8	5.76

2.2.3 Groundwater exfiltration

There is no anticipated interception with the groundwater table as the sediment basins are either impervious, or located above the groundwater.

2.3 Sediment Basin SB2

2.3.1 Runoff coefficients

The water balance assessment for SB2 was estimated based on the hydrological parameters shown in **Table 2 – SB2 Catchment Runoff Coefficients**.

Table 2 – SB2 Catchment Runoff Coefficients

Rainfall (mm)	10	20	30	40	50	60	70	80	90	100
Runoff Coefficient	0	0.43	0.56	0.63	0.69	0.74	0.77	0.79	0.81	0.83

The runoff coefficients assume an initial loss for rainfall up to 20mm (i.e no runoff), and then 'clay type' conditions for rainfall of equal or greater than 20mm for the contributing catchment.

2.3.2 Sediment Basin SB2 Retention Volume Upgrade Options

A number of sediment basin retention volume design options were considered in order to inform the design options analysis for the upgrade of SB2. The respective design criteria and associated total volumes are shown below in **Table 3 – Sediment Basin SB2 retention basin upgrade scenarios.** Refer to each drawing reference for layout plan details.

Table 3 – Sediment Basin SB2 retention basin upgrade scenarios

Design Criteria	IECA 2008	1 in 5 year	1 in 10 year	1 in 20 year	1 in 100 year
Rainfall retention (mm)	45.8	78.2	88.3	102.7	139.4
Upper Settling Volume (kL)	2,840	5,390	6,440	7,380	10,990
Total Volume required (kL)	4,260	8,090	9,660	11,080	16,480
Drawing Reference	1901.SK02.R2	1901.SK03.R1	1901.SK04.R1	1901.SK05.R1	1901.SK06.R1

Each of the retention basin options require dewatering following a rainfall event (typically within five (5) days) with suitable treating (flocculants and/or coagulants) being applied manually, or with a dewatering system being installed and operated that provides suitable treatment concurrently (such as a silt buster or wastewater treatment system). The dewatering of the sediment basin following each rainfall event must be undertaken to restore the upper settling volume so that the basin has adequate storage available for consecutive rain events. The required upper settling volumes are as detailed in **Table 3 - Sediment Basin SB2 retention basin upgrade scenarios**, and would typically be managed within the sediment basin by installing a freeboard marker.

2.3.3 Sediment Basin SB2 High Efficiency Sediment (HES) Basin Upgrade Options

A number of High Efficiency Sediment (HES) basin design options were also considered in order to inform the design options analysis for the upgrade of SB2. The respective design criteria and associated total volumes are shown below in **Table 4 – Sediment Basin SB2 HES upgrade scenarios.**

Table 4 – Sediment Basin SB2 HES upgrade scenarios

Design Criteria	1 in 1 year	1 in 5 year
Total Volume (kL)	1,566	3,640
Low Flow Decant Rate (kL/d)	3,404	3,404
Drawing Reference	1901.SK07.R1	1901.SK08.R1

Each of the HES basins provide an automatic dosing system that can treat all inflows while a rainfall event is occurring. This provides a significant advantage to a traditional retention basin system, particularly during days of consecutive rainfall, as the retention volume can be restored for additional treatment while a rainfall event occurs. Additionally, if a HES basin overtops, any outflows would have been dosed with flocculants and/or coagulants and will result in a significantly improved discharge quality when compared to an uncontrolled release from a traditional retention system. A HES basin also requires a smaller footprint compared to a traditional retention basin when comparing a respective ARI design criteria.

It is noted however that HES basins are limited to the dosing application rates of the installed system. For example, a standard automatic dosing system would be expected to dose at a maximum inflow rate of 1,000L/s, therefore larger ARI events cannot be expected to be adequately treated prior to a possible overtopping event. Larger ARI events (exceeding 1 in 5 year) are not recommended in a HES system due to the likelihood of scour or 'lifting' of settled sediments.

Telemetry systems can also be integrated into a HES basin, including automated monitoring systems to close an outlet if water quality does not meet the required indicators. This provides an additional advantage to a traditional retention system that can also be retrofitted if required.

2.3.4 Sediment Basin SB2 Water Balance Assessment Results

The water balance assessment results for the modelling of the SB2 design options are shown in **Table 5 – Sediment Basin SB2 Water Balance Assessment Results**. The modelling is based on a daily time step over the course of an average rainfall year, and assumes the following:

- *Uncontrolled releases* refer to events where the basin overtops with no ability or limited ability for onsite treatment. The count refers to events, not days (i.e if a discharge occurs over three (3) consecutive days, it remains considered as one (1) event with a three (3) day duration, not three (3) events). Note for a HES basin, water quality treatment will still occur in an overtopping event, however compliance with required water quality indicators is not certain.
- *Controlled releases* refer to events where the basin has been dewatered to restore upper settling volume with water quality suitable for discharge (i.e suitable treatment has occurred achieving the Site Water Quality criteria). For HES basins, controlled releases include treated (i.e compliant) discharges during rainfall events;
- For retention basins it is assumed that treatment can only occur after four (4) consecutive days of no rainfall occurring, with the dewatering occurring on the 5th day per industry standards (IECA 2008). If rainfall occurs within the four (4) day window, then the water balance assumes the water in the system remains.

Table 5 – Sediment Basin SB2 Water Balance Assessment Results

Design Criteria	Retention Basins					HES Basins	
	IECA 2008	1 in 5 year	1 in 10 year	1 in 20 year	1 in 100 yr	1 in 1 year	1 in 5 year
Annual Rainfall (mm)	997.8	997.8	997.8	997.8	997.8	997.8	997.8
Total inflow (kL)	45,072	45,072	45,072	45,072	45,072	45,072	45,072
Total evaporation (kL)	1,575	2,362	2,362	2,362	2,887	1,575	1,575
Controlled Release volume per annum (kL)	20,152	28,186	30,286	32,166	30,805	31,553	37,939
Uncontrolled Release volume per annum (kL)	23,428	17,198	16,148	15,208	11,532	13,700	5,768
Number of uncontrolled releases per annum	***11***	***7***	***6***	***6***	***6***	***11***	***4***

Refer to **Attachment 2 – Detailed Water Balance Assessment Results** for the full water balance modelling results. It is noted that while the Retention Basin volume significantly increases from a 1 in 5 year ARI to a 1 in 100 year ARI retention volume, however, the number of uncontrolled releases do not vary significantly. This is due to rainfall being continuous in the wetter months of the year, which limits the ability for the quarry to treat captured rainfall prior to discharge.

As also shown in **Attachment 1 – SB2 Upgrade Options**, there are significant problems arising relating to the feasibility of constructing Retention Basins with retention volumes greater than the IECA 2008 standard. The footprints shown for the 1 in 10 ARI (**Drawing No. 1901.SK04R1 – Sediment Basin SB2 1 in 10y Retention Pond Layout**), 1 in 20 ARI (**Drawing No. 1901.SK05R1 – Sediment Basin SB2 1 in 20y Retention Pond Layout**) and 1 in 100 ARI (**Drawing No. 1901.SK06R1 – Sediment Basin SB2 1 in 100y Retention Pond Layout**) basins are significantly larger than the basin footprints for the IECA basin designs. Due to the constraints of the basin location with the existing watercourse, and steep topography these basins would not be viable based on prior geotechnical engineering investigations already undertaken, with concerns being raised for undermining the existing road and slope stability of the southern escarpments. Additionally, further considerations would also be required for the access to these basins for maintenance which would require further encroachment into the water course and the southern escarpments.

A clean water diversion drain is also required to divert the gully that drains from the southern direction behind the existing dwelling, and the sediment basins design footprints needed for the larger systems will not allow for this additional surface water catchment. Access to the area is also limited as shown on the plans.

2.4 Sediment Basin SB1

2.4.1 Runoff coefficients

The water balance assessment for SB1 was estimated based on the hydrological parameters shown in **Table 6 – SB1 Runoff Coefficients**. The coefficients take into account the quarry area and also the upstream catchments that inflow directly into the clean water storage dams (including the turkey nest dam used for water supply).

Table 6 – SB1 Runoff Coefficients

Rainfall (mm)	10	20	30	40	50	60	70	80	90	100
Runoff Coefficient (Quarry)	0	0.43	0.56	0.63	0.69	0.74	0.77	0.79	0.81	0.83
Runoff Coefficient (Clean)	0	0.02	0.08	0.16	0.22	0.28	0.33	0.36	0.41	0.45

The runoff coefficients assume an initial loss for rainfall up to 20mm (i.e no runoff), and then 'clay type' conditions for rainfall of equal or greater than 20mm for the contributing catchment within the quarry area.

2.4.2 Water Balance Input and Usage Assumptions

The water balance input and usage assumptions for the assessment are shown below in **Table 7 – SB1 Input and Usage Assumptions**. The daily usage was based on the following assumptions supplied by Hanson:

- Water demand for dust suppression in summer is 120 kilolitres (kL) per day, and 60 kL per week in winter (average daily usage is 87kL over the year)
- Water demand for other processes in quarry (i.e pug mill) is 3kL per day
- Quarry operating hours 12 hours - 5 days per week, 10 hours Saturdays
- 20kL per day is assumed for concrete batching
- Total usage estimated 110kL per day, average over the year
- All harvested water from SB1 is pumped to turkey nest dam for reuse

Table 7 – SB1 Input and Usage Assumptions

Parameter	Value	Unit
Catchment Area (Sediment Basin SB1)	39,200	m^2
Clean water catchment (Clean Water Dams)	296,900	m^2
Sediment Basin capacity	1,850	m^3
Clean Water Dam capacity	8,150	m^3
Daily Usage in Quarry (operational days)	110	kL

2.4.3 Water Balance Assessment Results

Refer to **Attachment 2 – Detailed Water Balance Assessment Results** for a comprehensive daily breakdown of the water balance assessment. A summary of the results for the SB1 system is shown in **Table 8 – Water Balance Assessment Results**.

Table 8 – Water Balance Assessment Results

Annual Rainfall (mm)	Inflow into SB1 (kL)	Inflow into clean water dams (ML)	Total inflows (kL)	Total usage (incl. evaporation) (kL)	Surplus (kL)
997.8	17,937	34,402	52,339	41,933	10,406

As identified in the water balance for SB1, there is a surplus of available surface water within the catchment for reuse in the quarry operations. Therefore, it would not provide any additional benefit to the quarry to harvest additional water from the SB2 catchment for the purpose of reuse.

3. Design Options Analysis and Recommendations

The design options analysis for the upgrades to Sediment Basin SB2 are summarised in **Table 8 – Design Options Analysis**. As already discussed in **Section 2 – Water Balance Assessment**, it is not expected to be beneficial to implement a pumping system to harvest additional surface water from SB2 and pump to SB1 for reuse. This is because a surplus of water supply is already anticipated for the SB1 contributing catchments, and additional water pumped from SB2 would not provide any additional operational reuse potential.

Table 8 – Design Options Analysis

Design Criteria	Retention Basins					HES Basins	
	Type D IECA 2008	1 in 5 year (retention)	1 in 10 year (retention)	1 in 20 year (retention)	1 in 100 yr (retention)	Type A (1 in 1 year)	Type A (1 in 5 year)
Estimated Size (kL)	4,260	8,090	9,660	11,080	16,480	1,644	2,850
Estimated Cost ($)	~$520,000*	~$1M+	~$1.5M+	~$1.5M+	~$1.5M+	~$550,000	~$600,000
Available Area?	Yes	No	No	No	No	Yes	Yes
Allows Access?	Yes	No	No	No	No	Yes	Yes
Allows clean water diversion?	Yes	No	No	No	No	Yes	Yes
Treatment System (Auto / Manual)	Manual	Manual	Manual	Manual	Manual	Auto	Auto
Volume of treated surface water per annum (kL)	20,152	28,186	30,286	32,166	30,805	31,553	37,939

As shown in the design options analysis, the HES basins provide not only the smallest footprint but also much improved treatment efficiency, being able to treat during events and also not being impacted by consecutive rainfall days, which is currently a significant problem for the existing treatment system. The IECA 2018 guideline does not outline HES basins above a 1 in 5 year ARI, due to the likelihood of scour or 'lifting' of settled sediments, combined with a typical maximum inflow treatment rate of around 1000 L/s. Therefore, a Type A basin is recommended not to exceed the IECA 2018 recommendations of 1 in 5 ARI capacity.

The most significant improvement to efficiency from a traditional retention volume system appears to be gained from a 1 in 5 year ARI retention system, improving from eleven (11) uncontrolled events to approximately seven (7) per year. There is little to no gained efficiency by further upgrading to a 1 in 20 year or up to a 1 in 100 year ARI retention system, because of the continuous rainfall received at the site during the wetter months of the year, hindering the ability to treat the retained water prior to discharging. The application of a 1 in 5 year ARI IECA Type A basin could further reduce the number of uncontrolled events to approximately four (4) per year.

Overall, the 1 in 5 year Type A HES basin presents the greatest anticipated benefits (refer **Drawing No. 1901.SK08R1 – Sediment Basin SB2 TYPE A (5 Year ARI)**), apart from requiring a slightly larger footprint and cost to a 1 in 1 year Type A HES basin (refer **Drawing No. 1901.SK07R1 – Sediment Basin SB2 TYPE A (1 year ARI)**). The revised IECA (2018) guidelines recommends a 1 in 5 year Type A for permanent disturbance areas including quarries, and is recommended for this application.

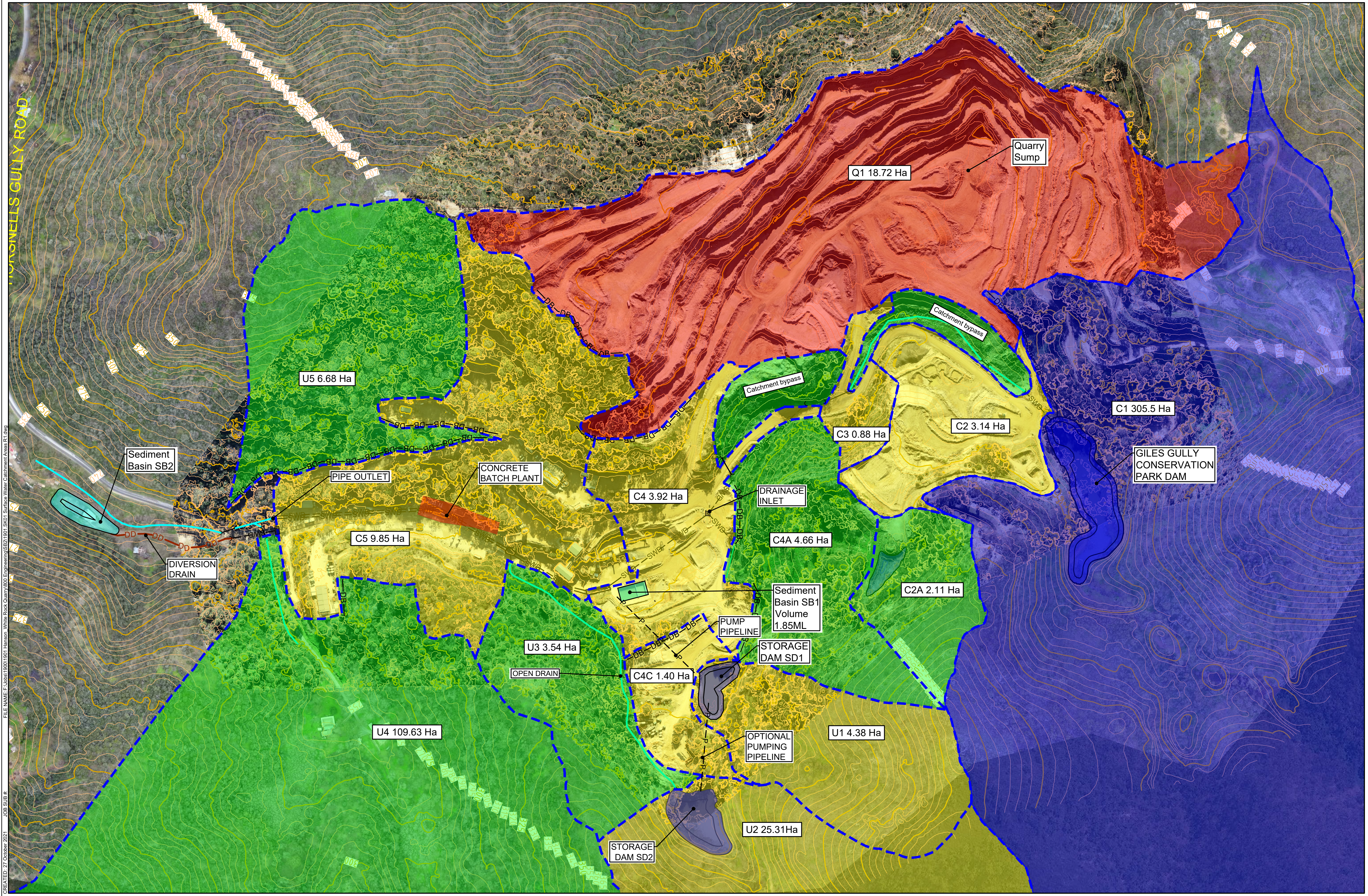
Due to the presence of clay / silt particles within the surface waters requiring treatment by the basin a flocculation / coagulant dosing system is likely to be required for either a retention basin or HES basin. Given the lack of ability to treat during rainfall events, a traditional retention system is compromised significantly once full, especially given the continuous nature of rainfall over winter. Contingency measures are also advantageous with a HES basin, with additional telemetry being able to be installed and retrofitted in the future to further improve performance and monitoring effectiveness if required.

Based on the requirements of the EPA licence and industry best practice, it is recommended that a HES basin system (1 in 5 year ARI) is adopted at the Site as outlined within **Drawing No. 1901.SK08R1 – Sediment Basin SB2 Type A (5 year ARI)** in order to provide the most optimum solution for the quarry.

attachments

Attachment 1

Sediment Basin Upgrade Options



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Data Sources:
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Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

Legend:

- GILES DAM CATCHMENT
- UNDISTURBED AREAS
- QUARRY PIT AREA
- OPERATIONAL AREAS
- CLEAN SURFACE WATER FLOW
- DIRTY SURFACE WATER FLOW
- DD — DIVERSION DRAIN
- DB — DIVERSION BUND
- WATERCOURSE
- SWD — UNDERGROUND PIPE
- P — PUMPED STORMWATER
- CATCHMENT BOUNDARY

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Surface Water Catchment Areas

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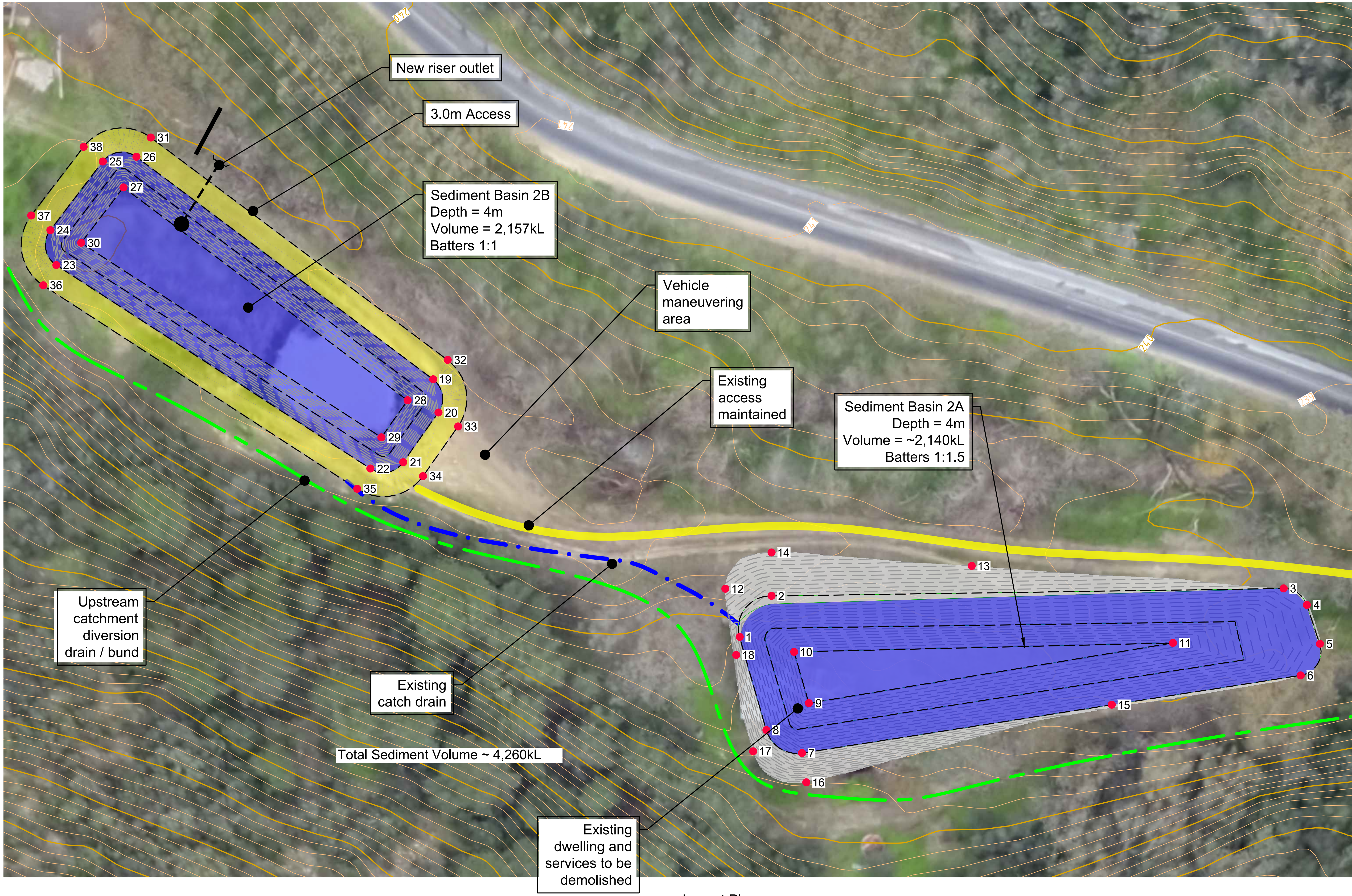

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GPS Setout Points [GDA94 / MGA54]

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3	289914.053	6132524.450	235.2
4	289916.941	6132522.403	235.2
5	289918.562	6132517.566	235.2
6	289916.179	6132513.649	235.2
7	289854.223	6132503.993	235.2
8	289849.794	6132506.846	235.2
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10	289853.249	6132516.568	231.2
11	289900.304	6132517.675	231.2
12	289844.704	6132524.413	233.4
13	289875.294	6132527.241	233.5
14	289850.439	6132528.928	232.5
15	289892.713	6132509.992	235.2
16	289854.760	6132500.358	238.9
17	289848.145	6132504.208	237.8
18	289846.045	6132516.185	236.2
19	289808.391	6132550.451	231.0
20	289809.042	6132546.321	231.0
21	289804.677	6132540.139	231.0
22	289800.595	6132539.352	231.0
23	289761.583	6132564.643	231.0
24	289760.830	6132568.980	231.0
25	289767.345	6132577.520	231.0
26	289771.531	6132578.100	231.0
27	289769.924	6132574.305	227.0
28	289805.214	6132547.835	227.0
29	289801.964	6132543.232	227.0
30	289764.665	6132567.412	227.0
31	289773.331	6132580.500	230.5
32	289810.191	6132552.851	230.9
33	289811.493	6132544.591	231.3
34	289807.128	6132538.409	231.3
35	289798.963	6132536.835	231.6
36	289759.951	6132562.126	231.2
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CREATED: 4 August 2021

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 IECA 2008

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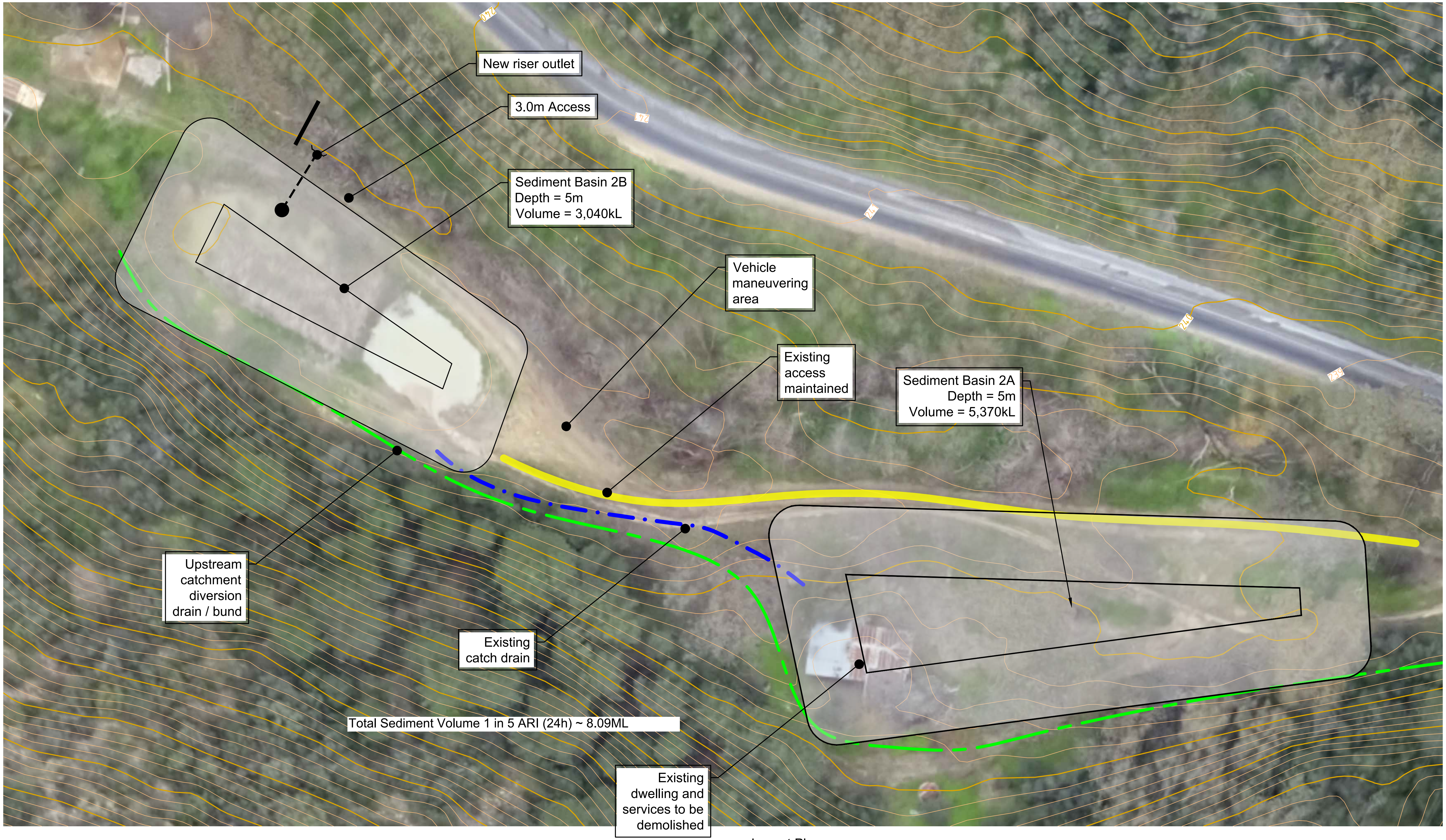

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Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

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PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 1 in 5y Retention Pond Layout

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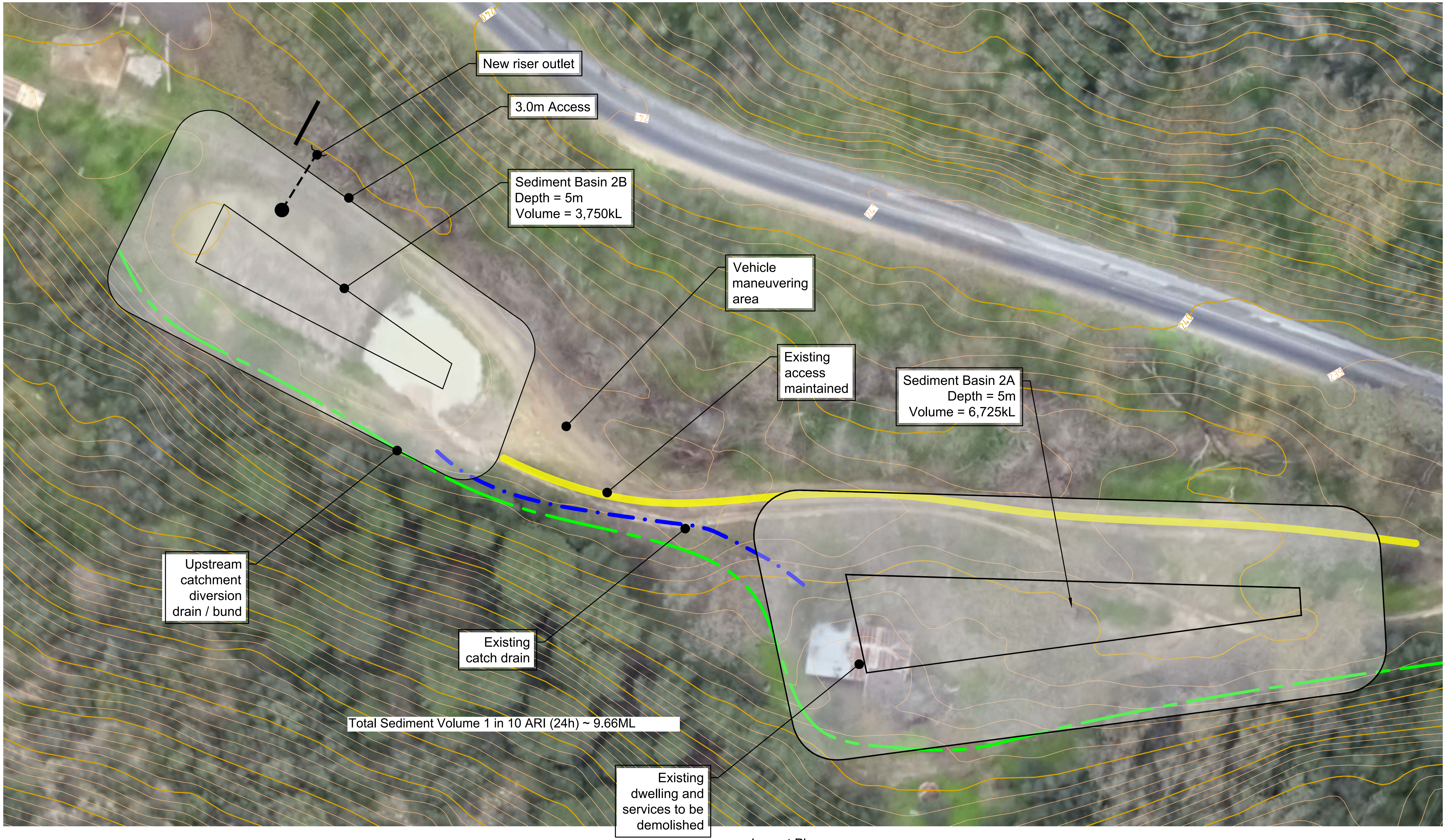

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Data Sources:
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Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 1 in 10y Retention Pond Layout

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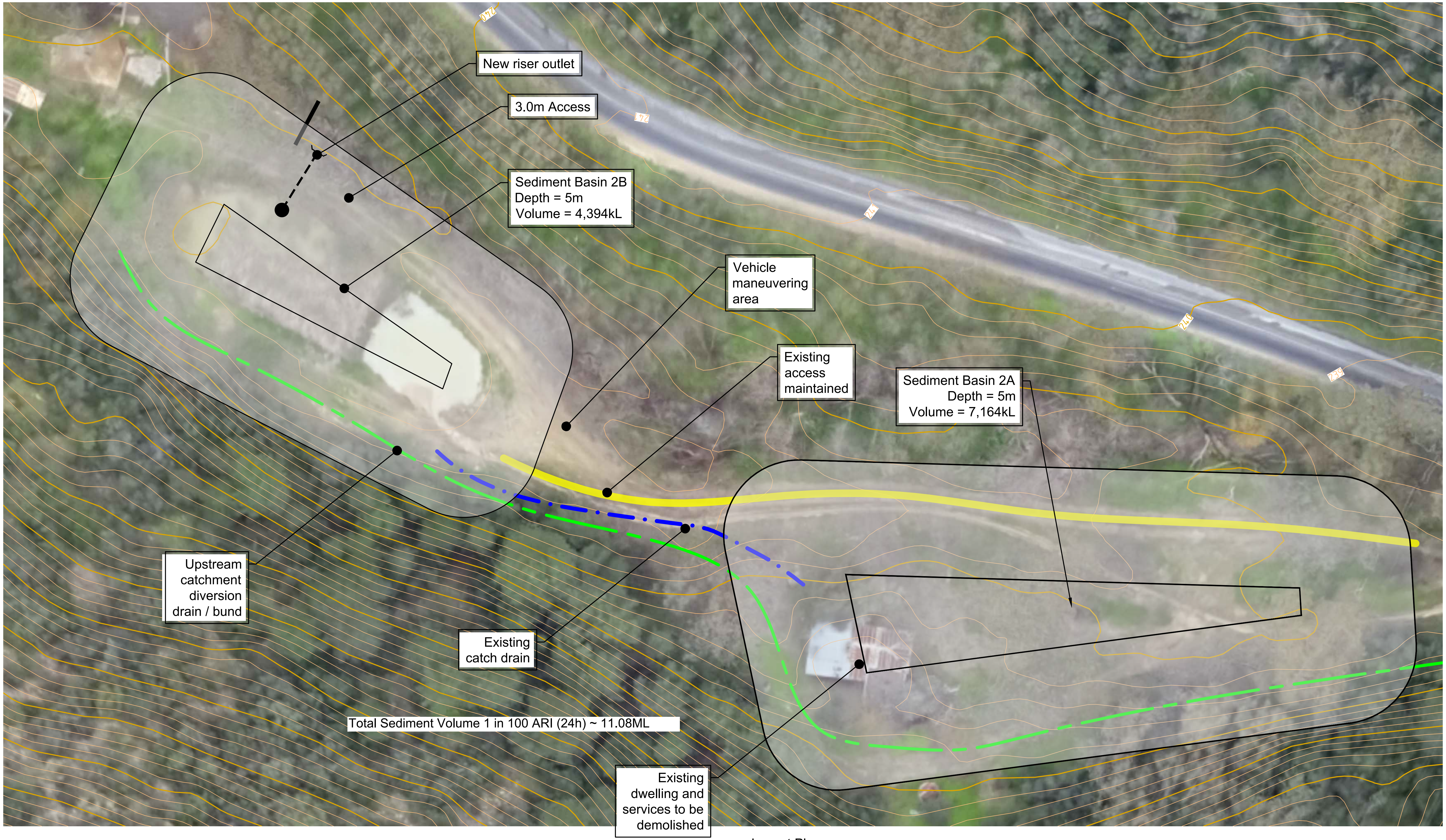

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Data Sources:
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Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 1 in 20y Retention Pond Layout

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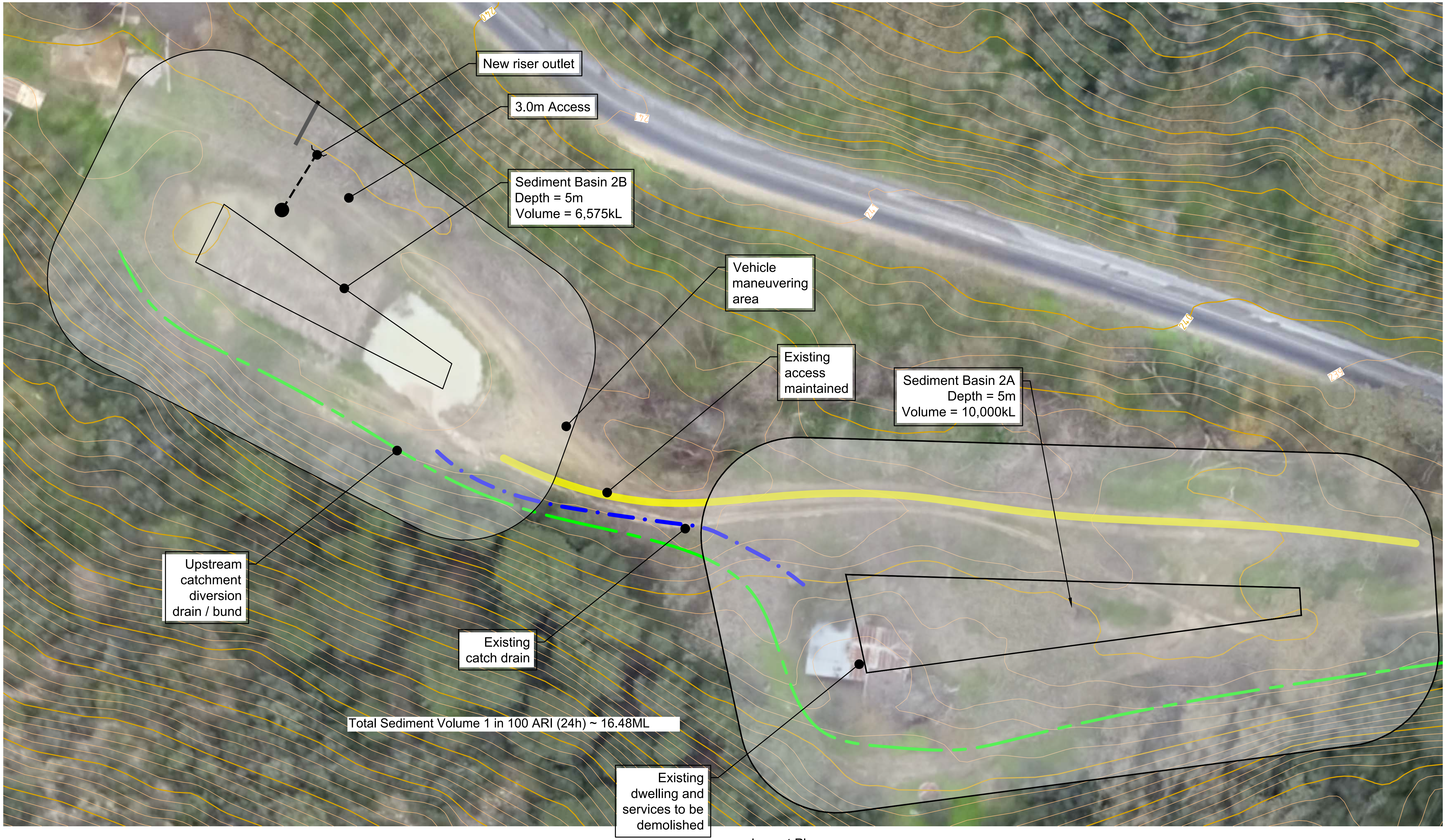

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Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 1 in 100y Retention Pond Layout

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SCALE: 1:400 When Printed On A3 — 0 8m

DRAWING NUMBER: 1901.SK06
REVISION: 1

DATE: 21 October 2021
PRINTED: 22 October 2021
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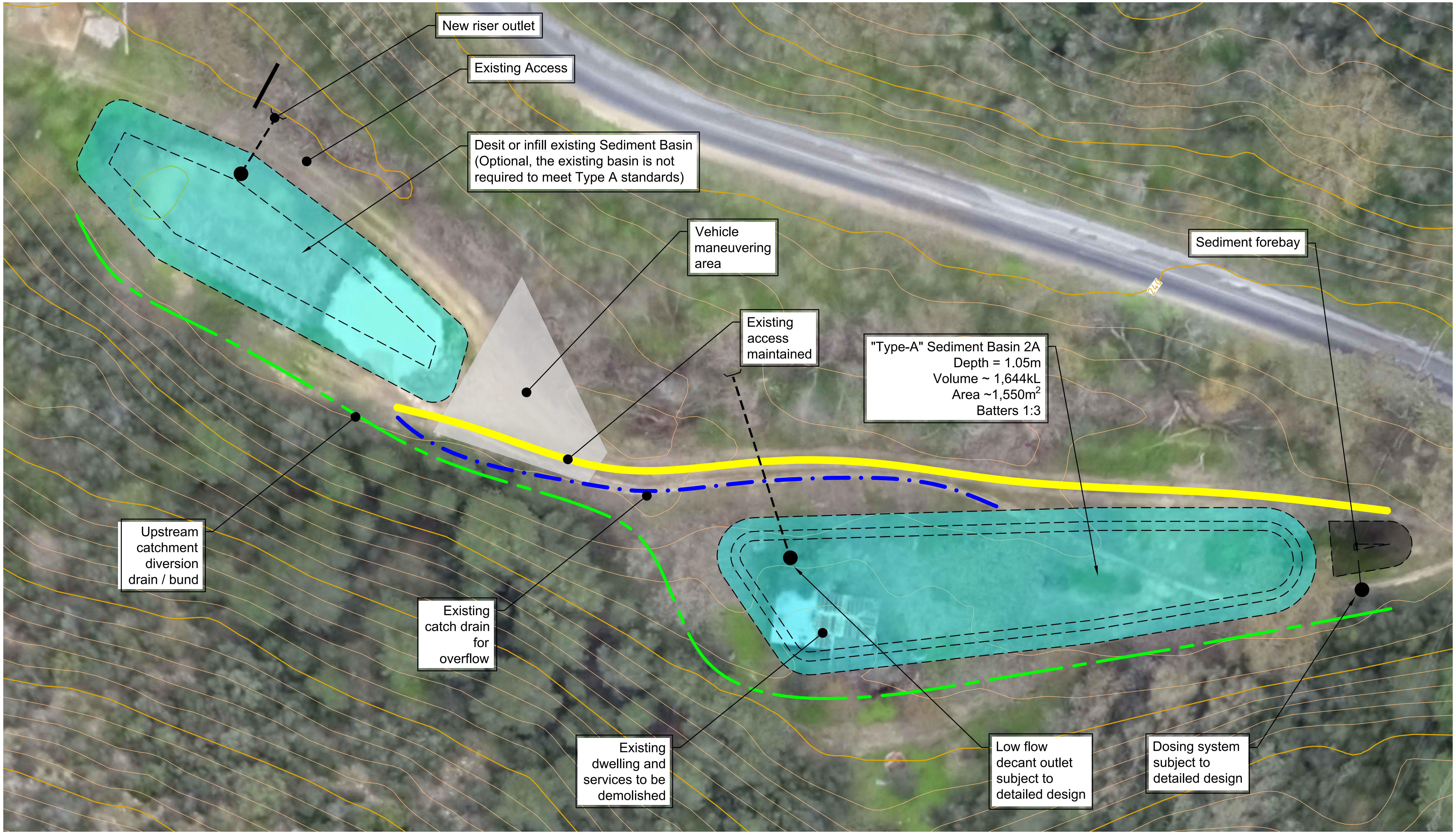

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Data Sources:
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Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 TYPE A (1 year ARI)

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SCALE: 1:400 When Printed On A3 — 0 8m

DRAWING NUMBER: 1901.SK07

REVISION: 1

DATE: 27 October 2021

PRINTED: 1 November 2021

DRAWN: JHV

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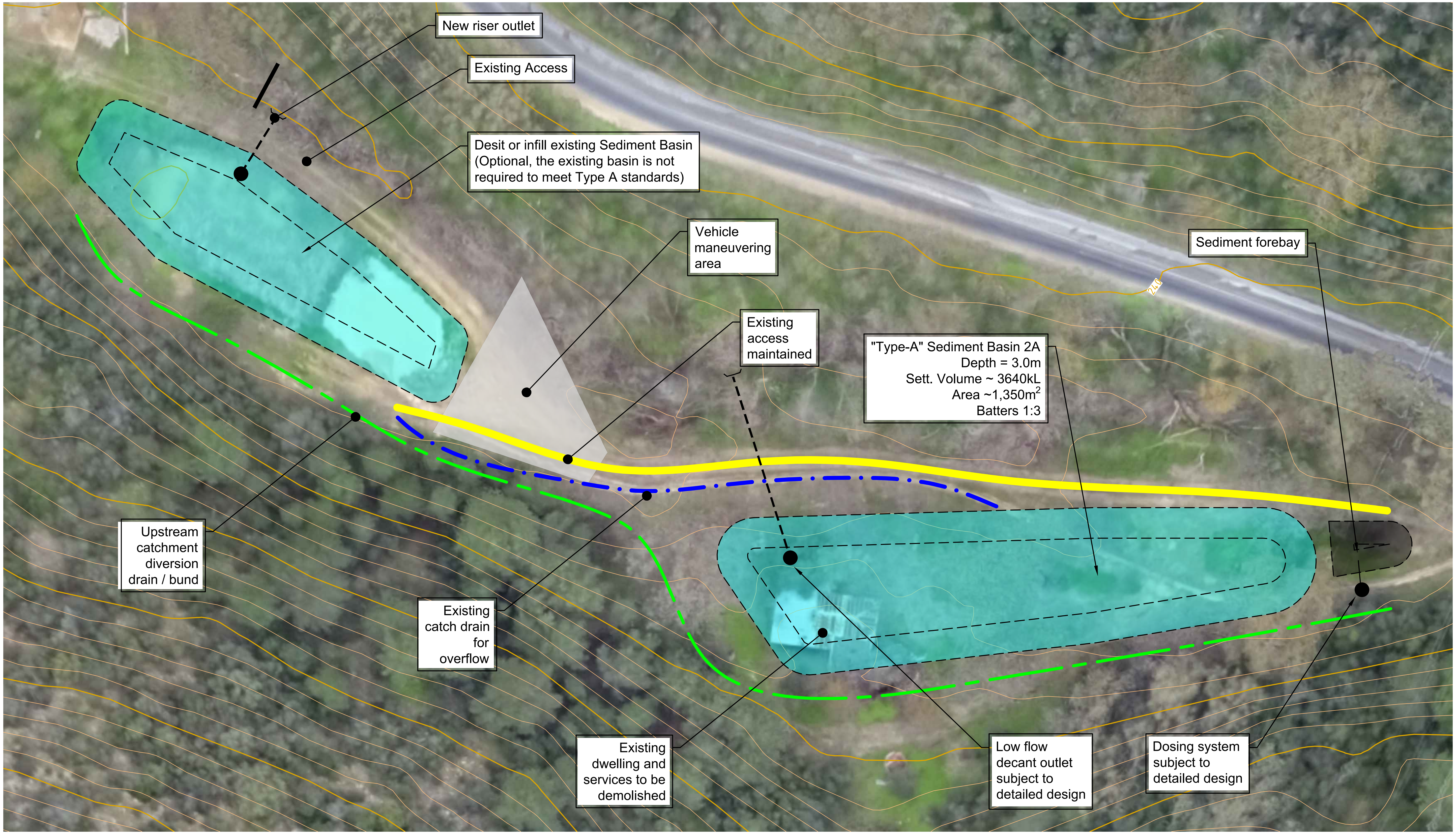

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Data Sources:
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Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 TYPE A (5 Year ARI)

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SCALE:	1:400 When Printed On A3	DRAWING NUMBER: 1901.SK08	REVISION: 1
DATE: 27 October 2021	DRAWN: JHV	DATUM: HORIZONTAL / VERTICAL / ZONE	
PRINTED: 1 November 2021	CHECKED: MF	GDA94 / MGA / AHD / 54	

Attachment 2

Detailed Water Balance Assessment Results

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient Cv	Runoff Coefficient Clean	Catchment Area - Quarry (m²)	Catchment Area - Clean (m²)	Inputs: Overland Flow Quarry (m³)	Inputs: Overland Flow Clean Dam (m³)	Outputs: Evaporation (m³)	Outputs: Water Used in Operations (m³)	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
1999	1	1	0	0	0	39200	296900	0	0	7.68	120	2840	0	0	2200	0	
1999	1	2	0	0	0	39200	296900	0	0	7.68	120	2967.68	0	0	2032.32	0	0
1999	1	3	0	0	0	39200	296900	0	0	7.68	120	3095.36	0	0	1904.64	0	0
1999	1	4	0	0	0	39200	296900	0	0	7.68	120	3223.04	0	0	1776.96	0	0
1999	1	5	0	0	0	39200	296900	0	0	7.68	120	3350.72	0	0	1649.28	0	0
1999	1	6	0	0	0	39200	296900	0	0	7.68	120	3478.4	0	0	1521.6	0	0
1999	1	7	0.4	0	0	39200	296900	0	0	7.68	120	3606.08	0	0	1393.92	0	0
1999	1	8	16	0.43	0.02	39200	296900	269.696	95.008	7.68	120	3369.056	0	0	1630.944	0	0
1999	1	9	0	0	0	39200	296900	0	0	7.68	120	3496.736	0	0	1503.264	0	0
1999	1	10	0	0	0	39200	296900	0	0	7.68	120	3624.416	0	0	1375.584	0	0
1999	1	11	0	0	0	39200	296900	0	0	7.68	120	3752.096	0	0	1247.904	0	0
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1999	1	19	0	0	0	39200	296900	0	0	7.68	120	4773.536	0	0	226.464	0	0
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1999	1	21	0	0	0	39200	296900	0	0	7.68	120	5028.896	0	0	0	1	0
1999	1	22	0	0	0	39200	296900	0	0	7.68	120	5127.68	0	0	0	1	0
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1999	1	29	0.2	0	0	39200	296900	0	0	7.68	120	5127.68	0	0	0	1	0
1999	1	30	0	0	0	39200	296900	0	0	7.68	120	5127.68	0	0	0	1	0
1999	1	31	0.6	0	0	39200	296900	0	0	7.68	120	5127.68	0	0	0	1	0
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1999	2	2	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
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1999	2	5	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	6	0.8	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	7	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	8	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	9	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	10	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	11	0.4	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	12	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	13	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	14	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	15	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	16	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	17	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	18	3.4	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	19	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	20	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	21	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	22	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	23	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	24	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	25	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	26	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	27	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	2	28	0	0	0	39200	296900	0	0	6.816	120	5126.816	0	0	0	1	0
1999	3	1	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	2	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	3	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	4	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	5	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	6	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	7	19.6	0.43	0.02	39200	296900	330.3776	116.3848	5.568	120	4678.8056	0	0	321.1944	0	0
1999	3	8	0.2	0	0	39200	296900	0	0	5.568	120	4804.3736	0	0	195.6264	0	0
1999	3	9	0	0	0	39200	296900	0	0	5.568	120	4929.9416	0	0	70.0584	0	0
1999	3	10	0	0	0	39200	296900	0	0	5.568	120	5055.5096	0	0	0	1	0
1999	3	11	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	12	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	13	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	14	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	15	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	16	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	17	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	18	11	0.43	0.02	39200	296900	185.416	65.318	5.568	120	4874.834	0	0	125.166	0	0
1999	3	19	1.6	0	0	39200	296900	0	0	5.568	120	5000.402	0	0	0	1	0
1999	3	20	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	21	48	0.74	0.28	39200	296900	1392.384	3990.336	5.568	120	-257.152	257.152	0	5000	0	0
1999	3	22	2.6	0	0	39200	296900	0	0	5.568	120	125.568	0	0	4874.432	0	1
1999	3	23	0	0	0	39200	296900	0	0	5.568	120	251.136	0	0	4748.864	0	0
1999	3	24	0	0	0	39200	296900	0	0	5.568	120	376.704	0	0	4623.296	0	0
1999	3	25	11	0.43	0.02	39200	296900	185.416	65.318	5.568	120	251.538	0	0	4748.462	0	0
1999	3	26	2.8	0	0	39200	296900	0	0	5.568	120	377.106	0	0	4622.894	0	0
1999	3	27	0	0	0	39200	296900	0	0	5.568	120	502.674	0	0	4497.326	0	0
1999	3	28	4.6	0	0	39200	296900	0	0	5.568	120	628.242	0	0	4371.758	0	0
1999	3	29	0	0	0	39200	296900	0	0	5.568	120	753.81	0	0	4246.19	0	0
1999	3	30	0	0	0	39200	296900	0	0	5.568	120	879.378	0	0	4120.622	0	0
1999	3	31	1.8	0	0	39200	296900	0	0	5.568	120	1004.946	0	0	3995.054	0	0
1999	4	1	0	0	0	39200	296900	0	0	3.552	120	1128.498	0	0	3871.502	0	0
1999	4	2	0	0	0	39200	296900	0	0	3.552	120	1252.05	0	0	3747.95	0	0
1999	4	3	0	0	0	39200	296900	0	0	3.552	120	1375.602	0	0	3624.398	0	0
1999	4	4	1.2	0	0	39200	296900	0	0	3.552	120	1499.154	0	0	3500.846	0	0
1999	4	5	3.2	0	0	39200	296900	0	0	3.552	120	1622.706	0	0	3377.294	0	0
1999	4	6	0	0	0	39200	296900	0	0	3.552	120	1746.258	0	0	3253.742	0	0
1999	4	7	0	0	0	39200	296900	0	0	3.552	120	1869.81	0	0	3130.19	0	0
1999	4	8	0	0	0	39200	296900	0	0	3.552	120	1993.362	0	0	3006.638	0	0
1999	4	9	0	0	0	39200	296900	0	0	3.552	120	2116.914	0	723.086	2883.086	0	0
1999	4	10	0	0	0	39200	296900	0	0	3.552	120	2963.552	0	0	2036.448	0	0
1999	4	11	0	0	0	39200	296900	0	0	3.552	120	3087.104	0	0	1912.896	0	0
1999	4	12	0	0	0	39200	296900	0	0	3.552	120	3210.656	0	0	1789.344	0	0
1999	4	13	0	0	0	39200	296900	0	0	3.552	120	3334.208	0	0	1665.792	0	0
1999	4	14	0	0	0	39200	296900	0	0	3.552	120	3457.76	0	0	1542.24	0	0
1999	4	15	0	0	0	39200	296900	0	0	3.552	120	3581.312	0	0	1418.688	0	0
1999	4	16	0	0	0	39200	296900	0	0	3.552	120	3704.864	0	0	1295.136	0	0
1999	4	17	0	0	0	39200	296900	0	0	3.552	120	3828.416	0	0	1171.584	0	0
1999	4	18	0	0	0	39200	296900	0	0	3.552	120	3951.968	0	0	1048.032	0	0
1999	4	19	0	0	0	39200	296900	0	0	3.552	120	4075.52	0	0	924.48	0	0
1999	4	20	6.8	0	0	39200	296900	0	0	3.552	120	4199.072	0	0	800.928	0	0
1999	4	21	4.2	0	0	39200	296900	0	0	3.552	120	4322.624	0	0	677.376	0	0
1999	4	22	0	0	0	39200	296900	0	0	3.552	120	4446.176	0	0	553.824	0	0
1999	4	23	0	0	0	39200	296900	0	0	3.552	120	4569.728	0	0	430.272	0	0
1999	4	24	0	0	0	39200	296900	0	0	3.552	120	4693.28	0	0	306.72	0	0
1999	4	25	0	0	0	39200	296900	0	0	3.552	120	4816.832	0	0	183.168	0	0
1999	4	26	0	0	0	39200	296900	0	0	3.552	120	4940.384	0	0	59.616	0	0
1999	4	27	1.2	0	0	39200	296900	0	0	3.552	120	5063.936	0	0	0	1	0
1999	4	28	0.6	0	0	39200	296900	0	0	3.552	120	5123.552	0	0	0	1	0
1999	4	29	0.2	0	0	39200	296900	0	0	3.552	120	5123.552	0	0	0	1	0
1999	4	30	0	0	0	39200	296900	0	0	3.552	120	5123.552	0	0	0	1	0
1999	5	1	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	2	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	3	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	4	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	5	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	6	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	7	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	8	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	9	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	10	0.4	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	11	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	12	11.6	0.43	0.02	39200	296900	195.5296	68.8808	2.304	120	4857.8936	0	0	142.1064	0	0
1999	5	13	30.4	0.69	0.22	39200	296900	822.2592	1985.6672	2.304	120	2172.2712	0	0	2827.7288	0	0
1999	5	14	0.6	0	0	39200	296900	0	0	2.304	120	2294.5752	0	0	2705.4248	0	0
1999	5	15	0	0	0	39200	296900	0	0	2.304	120	2416.8792	0	0	2583.1208	0	0
1999	5	16	42.8	0.74	0.28	39200	296900	1241.5424	3558.0496	2.304	120	-2260.4088	2260.4088	0	5000	0	0
1999	5	17	0	0	0	39200	296900	0	0	2.304	120	122.304	0	0	4877.696	0	1
1999	5	18	0.8	0	0	39200	296900	0	0	2.304	120	244.608	0	0	4755.392	0	0
1999	5	19	0	0	0	39200	296900	0	0	2.304	120	366.912	0	0	4633.088	0	0
1999	5	20	0	0	0	39200	296900	0	0	2.304	120	489.216	0	0	4510.784	0	0
1999	5	21	6.4	0	0	39200	296900	0	0	2.304	120	611.52	0	0	4388.48	0	0
1999	5	22	5.2	0	0	39200	296900	0	0	2.304	120	733.824	0	0	4266.176	0	0
1999	5	23	44.2	0.74	0.28	39200	296900	1282.1536	3674.4344	2.304	120	-4100.46	4100.46	0	5000	0	0
1999	5	24	15.8	0.43	0.02	39200	296900	266.3248	93.8204	2.304	120	-237.8412	237.8412	0	5000	0	0
1999	5	25	78	0.81	0.41	39200	296900	2476.656	9494.862	2.304	120	-11849.214	11849.214	0	5000	0	0
1999	5	26	11.4	0.43	0.02	39200	296900	192.1584	67.6932	2.304	120	-137.5476	137.5476	0	5000	0	0
1999	5	27	1.6	0	0	39200	296900	0	0	2.304	120	122.304	0	0	4877.696	0	1
1999	5	28	0	0	0	39200	296900	0	0	2.304	120	244.608	0	0	4755.392	0	0
1999	5	29	14	0.43	0.02	39200	296900	235.984	83.132	2.304	120	47.796	0	0	4952.204	0	0
1999	5	30	10.4	0.43	0.02	39200	296900	175.3024	61.7552	2.304	120	-66.9576	66.9576	0	5000	0	0
1999	5	31	13.2	0.43	0.02	39200	296900	222.4992	78.3816	2.304	120	-178.5768	178.5768	0	5000	0	0
1999	6	1	0	0	0	39200	296900	0	0	1.728	120	121.728	0	0	4878.272	0	1
1999	6	2	0.2	0	0	39200	296900	0	0	1.728	120	243.456	0	0	4756.544	0	0
1999	6	3	0.2	0	0	39200	296900	0	0	1.728	120	365.184	0	0	4634.816	0	0
1999	6	4	0	0	0	39200	296900	0	0	1.728	120	486.912	0	0	4513.088	0	0
1999	6	5	12.8	0.43	0.02	39200	296900	215.7568	76.0064	1.728	120	316.8768	0	0	4683.1232	0	0
1999	6	6	1.4	0	0	39200	296900	0	0	1.728	120	438.6048	0	0	4561.3952	0	0
1999	6	7	8.2	0	0	39200	296900	0	0	1.728	120	560.3328	0	0	4439.6672	0	0

1999	6	8	0.2	0	0	39200	296900	0	0	1.728	120	682.0608	0	0	4317.9392	0	0
1999	6	9	0.2	0	0	39200	296900	0	0	1.728	120	803.7888	0	0	4196.2112	0	0
1999	6	10	7.2	0	0	39200	296900	0	0	1.728	120	925.5168	0	0	4074.4832	0	0
1999	6	11	0	0	0	39200	296900	0	0	1.728	120	1047.2448	0	0	3952.7552	0	0
1999	6	12	0	0	0	39200	296900	0	0	1.728	120	1168.9728	0	0	3831.0272	0	0
1999	6	13	36.2	0.69	0.22	39200	296900	979.1376	2364.5116	1.728	120	-2052.9484	2052.9484	0	5000	0	0
1999	6	14	0	0	0	39200	296900	0	0	1.728	120	121.728	0	0	4878.272	0	0
1999	6	15	16.6	0.43	0.02	39200	296900	279.8096	98.5708	1.728	120	-134.9244	134.9244	0	5000	0	0
1999	6	16	5	0	0	39200	296900	0	0	1.728	120	121.728	0	0	4878.272	0	1
1999	6	17	0.4	0	0	39200	296900	0	0	1.728	120	243.456	0	0	4756.544	0	0
1999	6	18	14.8	0.43	0.02	39200	296900	249.4688	87.8824	1.728	120	27.8328	0	0	4972.1672	0	1
1999	6	19	2.4	0	0	39200	296900	0	0	1.728	120	149.5608	0	0	4850.4392	0	0
1999	6	20	0.2	0	0	39200	296900	0	0	1.728	120	271.2888	0	0	4728.7112	0	0
1999	6	21	4.4	0	0	39200	296900	0	0	1.728	120	393.0168	0	0	4606.9832	0	0
1999	6	22	0.6	0	0	39200	296900	0	0	1.728	120	514.7448	0	0	4485.2552	0	0
1999	6	23	0.4	0	0	39200	296900	0	0	1.728	120	636.4728	0	0	4363.5272	0	0
1999	6	24	0.2	0	0	39200	296900	0	0	1.728	120	758.2008	0	0	4241.7992	0	0
1999	6	25	7.6	0	0	39200	296900	0	0	1.728	120	879.9288	0	0	4120.0712	0	0
1999	6	26	3.8	0	0	39200	296900	0	0	1.728	120	1001.6568	0	0	3998.3432	0	0
1999	6	27	0	0	0	39200	296900	0	0	1.728	120	1123.3848	0	0	3876.6152	0	0
1999	6	28	0.2	0	0	39200	296900	0	0	1.728	120	1245.1128	0	0	3754.8872	0	0
1999	6	29	0	0	0	39200	296900	0	0	1.728	120	1366.8408	0	0	3633.1592	0	0
1999	6	30	16.2	0.43	0.02	39200	296900	273.0672	96.1956	1.728	120	1119.306	0	0	3880.694	0	0
1999	7	1	0.6	0	0	39200	296900	0	0	1.632	120	1240.938	0	0	3759.062	0	0
1999	7	2	4.8	0	0	39200	296900	0	0	1.632	120	1362.57	0	0	3637.43	0	0
1999	7	3	0.4	0	0	39200	296900	0	0	1.632	120	1484.202	0	0	3515.798	0	0
1999	7	4	0	0	0	39200	296900	0	0	1.632	120	1605.834	0	0	3394.166	0	0
1999	7	5	0	0	0	39200	296900	0	0	1.632	120	1727.466	0	0	3272.534	0	0
1999	7	6	0	0	0	39200	296900	0	0	1.632	120	1849.098	0	0	3150.902	0	0
1999	7	7	0	0	0	39200	296900	0	0	1.632	120	1970.73	0	869.27	3029.27	0	0
1999	7	8	2	0	0	39200	296900	0	0	1.632	120	2961.632	0	0	2038.368	0	0
1999	7	9	18.6	0.43	0.02	39200	296900	313.5216	110.4468	1.632	120	2659.2956	0	0	2340.7044	0	0
1999	7	10	0	0	0	39200	296900	0	0	1.632	120	2780.9276	0	0	2219.0724	0	0
1999	7	11	0	0	0	39200	296900	0	0	1.632	120	2902.5596	0	0	2097.4404	0	0
1999	7	12	0.4	0	0	39200	296900	0	0	1.632	120	3024.1916	0	0	1975.8084	0	0
1999	7	13	0.4	0	0	39200	296900	0	0	1.632	120	3145.8236	0	0	1854.1764	0	0
1999	7	14	0.4	0	0	39200	296900	0	0	1.632	120	3267.4556	0	0	1732.5444	0	0
1999	7	15	0.2	0	0	39200	296900	0	0	1.632	120	3389.0876	0	0	1610.9124	0	0
1999	7	16	0	0	0	39200	296900	0	0	1.632	120	3510.7196	0	0	1489.2804	0	0
1999	7	17	0	0	0	39200	296900	0	0	1.632	120	3632.3516	0	0	1367.6484	0	0
1999	7	18	0	0	0	39200	296900	0	0	1.632	120	3753.9836	0	0	1246.0164	0	0
1999	7	19	0	0	0	39200	296900	0	0	1.632	120	3875.6156	0	0	1124.3844	0	0
1999	7	20	30.2	0.69	0.22	39200	296900	816.8496	1972.6036	1.632	120	1207.7944	0	0	3792.2056	0	0
1999	7	21	5.8	0	0	39200	296900	0	0	1.632	120	1329.4264	0	0	3670.5736	0	0
1999	7	22	5.8	0	0	39200	296900	0	0	1.632	120	1451.0584	0	0	3548.9416	0	0
1999	7	23	0	0	0	39200	296900	0	0	1.632	120	1572.6904	0	0	3427.3096	0	0
1999	7	24	0	0	0	39200	296900	0	0	1.632	120	1694.3224	0	0	3305.6776	0	0
1999	7	25	0	0	0	39200	296900	0	0	1.632	120	1815.9544	0	0	3184.0456	0	0
1999	7	26	0.8	0	0	39200	296900	0	0	1.632	120	1937.5864	0	0	3062.4136	0	0
1999	7	27	0	0	0	39200	296900	0	0	1.632	120	2059.2184	0	0	2940.7816	0	0
1999	7	28	0	0	0	39200	296900	0	0	1.632	120	2180.8504	0	0	2819.1496	0	0
1999	7	29	0	0	0	39200	296900	0	0	1.632	120	2302.4824	0	0	2697.5176	0	0
1999	7	30	0.2	0	0	39200	296900	0	0	1.632	120	2424.1144	0	0	2575.8856	0	0
1999	7	31	0.6	0	0	39200	296900	0	0	1.632	120	2545.7464	0	0	2454.2536	0	0
1999	8	1	0	0	0	39200	296900	0	0	2.208	120	2667.9544	0	0	2332.0456	0	0
1999	8	2	0	0	0	39200	296900	0	0	2.208	120	2790.1624	0	0	2209.8376	0	0
1999	8	3	0	0	0	39200	296900	0	0	2.208	120	2912.3704	0	0	2087.6296	0	0
1999	8	4	0	0	0	39200	296900	0	0	2.208	120	3034.5784	0	0	1965.4216	0	0
1999	8	5	0	0	0	39200	296900	0	0	2.208	120	3156.7864	0	0	1843.2136	0	0
1999	8	6	0	0	0	39200	296900	0	0	2.208	120	3278.9944	0	0	1721.0056	0	0
1999	8	7	0	0	0	39200	296900	0	0	2.208	120	3401.2024	0	0	1598.7976	0	0
1999	8	8	21	0.56	0.08	39200	296900	460.992	498.792	2.208	120	2563.6264	0	0	2436.3736	0	0
1999	8	9	24	0.56	0.08	39200	296900	526.848	570.048	2.208	120	1588.9384	0	0	3411.0616	0	0
1999	8	10	4	0	0	39200	296900	0	0	2.208	120	1711.1464	0	0	3288.8536	0	0
1999	8	11	0	0	0	39200	296900	0	0	2.208	120	1833.3544	0	0	3166.6456	0	0
1999	8	12	0.6	0	0	39200	296900	0	0	2.208	120	1955.5624	0	0	3044.4376	0	0
1999	8	13	1.2	0	0	39200	296900	0	0	2.208	120	2077.7704	0	0	2922.2296	0	0
1999	8	14	0	0	0	39200	296900	0	0	2.208	120	2199.9784	0	0	2800.0216	0	0
1999	8	15	5	0	0	39200	296900	0	0	2.208	120	2322.1864	0	0	2677.8136	0	0
1999	8	16	0	0	0	39200	296900	0	0	2.208	120	2444.3944	0	0	2555.6056	0	0
1999	8	17	0.2	0	0	39200	296900	0	0	2.208	120	2566.6024	0	0	2433.3976	0	0
1999	8	18	0	0	0	39200	296900	0	0	2.208	120	2688.8104	0	0	2311.1896	0	0
1999	8	19	0	0	0	39200	296900	0	0	2.208	120	2811.0184	0	0	2188.9816	0	0
1999	8	20	0	0	0	39200	296900	0	0	2.208	120	2933.2264	0	0	2066.7736	0	0
1999	8	21	0	0	0	39200	296900	0	0	2.208	120	3055.4344	0	0	1944.5656	0	0
1999	8	22	0	0	0	39200	296900	0	0	2.208	120	3177.6424	0	0	1822.3576	0	0
1999	8	23	0	0	0	39200	296900	0	0	2.208	120	3299.8504	0	0	1700.1496	0	0
1999	8	24	0.2	0	0	39200	296900	0	0	2.208	120	3422.0584	0	0	1577.9416	0	0
1999	8	25	0	0	0	39200	296900	0	0	2.208	120	3544.2664	0	0	1455.7336	0	0
1999	8	26	0.6	0	0	39200	296900	0	0	2.208	120	3666.4744	0	0	1333.5256	0	0
1999	8	27	4.6	0	0	39200	296900	0	0	2.208	120	3788.6824	0	0	1211.3176	0	0
1999	8	28	0	0	0	39200	296900	0	0	2.208	120	3910.8904	0	0	1089.1096	0	0
1999	8	29	0	0	0	39200	296900	0	0	2.208	120	4033.0984	0	0	966.9016	0	0
1999	8	30	0.4	0	0	39200	296900	0	0	2.208	120	4155.3064	0	0	844.6936	0	0
1999	8	31	0	0	0	39200	296900	0	0	2.208	120	4277.5144	0	0	722.4856	0	0
1999	9	1	0	0	0	39200	296900	0	0	3.264	120	4400.7784	0	0	599.2216	0	0
1999	9	2	0	0	0	39200	296900	0	0	3.264	120	4524.0424	0	0	475.9576	0	0
1999	9	3	0	0	0	39200	296900	0	0	3.264	120	4647.3064	0	0	352.6936	0	0
1999	9	4	36.2	0.69	0.22	39200	296900	979.1376	2364.5116	3.264	120	1426.9212	0	0	3573.0788	0	0
1999	9	5	0	0	0	39200	296900	0	0	3.264	120	1550.1852	0	0	3449.8148	0	0
1999	9	6	10.8	0.43	0.02	39200	296900	182.0448	64.1304	3.264	120	1427.274	0	0	3572.726	0	0
1999	9	7	0.4	0	0	39200	296900	0	0	3.264	120	1550.538	0	0	3449.462	0	0
1999	9	8	0	0	0	39200	296900	0	0	3.264	120	1673.802	0	0	3326.198	0	0
1999	9	9	0	0	0	39200	296900	0	0	3.264	120	1797.066	0	0	3202.934	0	0
1999	9	10	0	0	0	39200	296900	0	0	3.264	120	1920.33	0	0	3079.67	0	0
1999	9	11	4.6	0	0	39200	296900	0	0	3.264	120	2043.594	0	0	2956.406	0	0
1999	9	12	0.4	0	0	39200	296900	0	0	3.264	120	2166.858	0	0	2833.142	0	0
1999	9	13	2.2	0	0	39200	296900	0	0	3.264	120	2290.122	0	0	2709.878	0	0
1999	9	14	0	0	0	39200	296900	0	0	3.264	120	2413.386	0	0	2586.614	0	0
1999	9	15	0.2	0	0	39200	296900	0	0	3.264	120	2536.65	0	0	2463.35	0	0
1999	9	16	13.8	0.43	0.02	39200	296900	232.6128	81.9444	3.264	120	2345.3568	0	0	2654.6432	0	0
1999	9	17	26.8	0.56	0.08	39200	296900	588.3136	636.5536	3.264	120	1243.7536	0	0	3756.2464	0	0
1999	9	18	2	0	0	39200	296900	0	0	3.264	120	1367.0176	0	0	3632.9824	0	0
1999	9	19	0	0	0	39200	296900	0	0	3.264	120	1490.2816	0	0	3509.7184	0	0
1999	9	20	0.2	0	0	39200	296900	0	0	3.264	120	1613.5456	0	0	3386.4544	0	0
1999	9	21	0	0	0	39200	296900	0	0	3.264	120	1736.8096	0	0	3263.1904	0	0
1999	9	22	0	0	0	39200	296900	0	0	3.264	120	1860.0736	0	0	3139.9264	0	0
1999	9	23	0	0	0	39200	296900	0	0	3.264	120	1983.3376	0	0	3016.6624	0	0
1999	9	24	0	0	0	39200	296900	0	0	3.264	120	2106.6016	0	733.3984	2893.3984	0	0
1999	9	25	0	0	0	39200	296900	0	0	3.264	120	2963.264	0	0	2036.736	0	0
1999	9	26	0	0	0	39200	296900	0	0	3.264	120	3086.528	0	0	1913.472	0	0
1999	9	27	0	0	0	39200	296900	0	0	3.264	120	3209.792	0	0	1790.208	0	0
1999	9	28	0	0	0	39200	296900	0	0	3.264	120	3333.056	0	0	1666.944	0	0
1999	9	29	16.8	0.43	0.02	39200	296900	283.1808	99.7584	3.264	120	3073.3808	0	0	1926.6192	0	0
1999	9	30	0	0	0	39200	296900	0	0	3.264	120	3196.6448	0	0	1803.3552	0	0
1999	10	1	0	0	0	39200	296900	0	0	4.512	120	3321.1568	0	0	1678.8432	0	0
1999	10	2	0	0	0	39200	296900	0	0	4.512	120	3445.6688	0	0	1554.3312	0	0
1999	10	3	21.4	0.56	0.08	39200	296900	469.7728	508.2928	4.512	120	2592.1152	0	0	2407.8848	0	0
1999	10	4	0	0	0	39200	296900	0	0	4.512	120	2716.6272	0	0	2283.3728	0	0
1999	10	5	0	0	0	39200	296900	0	0	4.512	120	2841.1392	0	0	2158.8608	0	0
1999	10	6	0	0	0	39200	296900	0	0	4.512	120	2965.6512	0	0	2034.3488	0	0
1999	10	7	0	0	0	39200	296900	0	0	4.512	120	3090.1632	0	0	1909.8368	0	0
1999	10	8	0	0	0	39200	296900	0	0	4.512	120	3214.6752	0	0	1785.3248	0	0
1999	10	9	0.8	0	0	39200	296900	0	0	4.512	120	3339.1872	0	0	1660.8128	0	0
1999	10	10	20.6	0.56	0.08	39200	296900	452.2112	489.2912	4.512	120	2522.1968	0	0	2477.8032	0	0
1999	10	11	15.8	0.43	0.02	39200	296900	266.3248	93.8204	4.512	120	2286.5636	0	0	2713.4364	0	0
1999	10	12	0.4	0	0	39200	296900	0	0	4.512	120	2411.0756	0	0	2588.9244	0	0
1999	10	13	9.2	0	0	39200	296900	0	0	4.512	120	2535.5876	0	0	2464.4124	0	0
1999	10	14	7.4	0	0	39200	296900	0	0	4.512	120	2660.0996	0	0	2339.9004	0	0
1999	10	15	1	0	0	39200	296900	0	0	4.512	120	2784.6116	0	0	2215.3884	0	0
1999	10	16	0	0	0	39200	296900	0	0	4.512	120	2909.1236	0	0	2090.8764	0	0
1999	10	17	0	0	0	39200	296900	0	0	4.512	120	3033.6356	0	0	1966.3644	0	0
1999	10	18	0.4	0	0	39200	296900	0	0	4.512	120	3158.1476	0	0	1841.8524	0	0
1999	10	19	0.2	0	0	39200	296900	0	0	4.512	120	3282.6596	0	0	1717.3404	0	0
1999	10	20	0.2	0	0	39200	296900	0	0	4.512	120	3407.1716	0	0	1592.8284	0	0
1999	10	21	0	0	0	39200	296900	0	0	4.512	120	3531.6836	0	0	1468.3164	0	0
1999	10	22	0.6	0	0	39200	296900	0	0	4.512	120	3656.1956	0	0	1343.8044	0	0
1999	10	23	0	0	0	39200	296900	0	0	4.512	120	3780.7076	0	0	1219.2924	0	0
1999	10	24	0.2	0	0	39200	296900	0	0	4.512	120	3905.2196	0	0	1094.7804	0	0
1999	10	25	1.2	0	0	39200	296900	0	0	4.512	120	4029.7316	0	0	970.2684	0	0
1999	10	26	1.2	0	0	39200	296900	0	0	4.512	120	4154.2436	0	0	845.7564	0	0
1999	10	27	3	0	0	39200	296900	0	0	4.512	120	4278.7556	0	0	721.2444	0	0
1999	10	28	0.2	0	0	39200	296900	0	0	4.512	120	4403.2676	0	0	596.7324	0	0
1999	10	29	0	0	0	39200	296900	0	0	4.512	120	4527.7796	0	0	472.2204	0	0
1999	10	30	0	0	0	39200	296900	0	0	4.512	120	4652.2916	0	0	347.7084	0	0
1999	10	31	4.6	0	0	39200	296900	0	0	4.512	120	4776.8036	0	0	223.1964	0	0
1999	11	1	0	0	0	39200	296900	0	0	5.76	120	4902.5636	0	0	97.4364	0	0
1999	11	2	0	0	0	39200	296900	0	0	5.76	120	5028.3236	0	0	0	1	0
1999	11	3	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	4	0.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	5	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	6	10.4	0.43	0.02	39200	296900	175.3024	61.7552	5.76	120	4888.7024	0	0	111.2976	0	0
1999	11	7	0	0	0	39200	296900	0	0	5.76	120	5014.4624	0	0	0	1	0
1999	11	8	5.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	9	4.4	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	10	2.8	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	11	1.4	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	12	0.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	13	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	14	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	15	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	16	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	17	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0

1999	11	18	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	19	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	20	0.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	21	7.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	22	12.2	0.43	0.02	39200	296900	205.6432	72.4436	5.76	120	4847.6732	0	0	152.3268	0	0
1999	11	23	0.4	0	0	39200	296900	0	0	5.76	120	4973.4332	0	0	26.5668	0	0
1999	11	24	0	0	0	39200	296900	0	0	5.76	120	5099.1932	0	0	0	1	0
1999	11	25	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	26	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	27	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	28	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	29	0.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	30	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	12	1	2.8	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	2	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	3	23.4	0.56	0.08	39200	296900	513.6768	555.7968	6.912	120	4057.4384	0	0	942.5616	0	0
1999	12	4	0.6	0	0	39200	296900	0	0	6.912	120	4184.3504	0	0	815.6496	0	0
1999	12	5	0	0	0	39200	296900	0	0	6.912	120	4311.2624	0	0	688.7376	0	0
1999	12	6	0	0	0	39200	296900	0	0	6.912	120	4438.1744	0	0	561.8256	0	0
1999	12	7	0	0	0	39200	296900	0	0	6.912	120	4565.0864	0	0	434.9136	0	0
1999	12	8	1.6	0	0	39200	296900	0	0	6.912	120	4691.9984	0	0	308.0016	0	0
1999	12	9	8	0	0	39200	296900	0	0	6.912	120	4818.9104	0	0	181.0896	0	0
1999	12	10	0.2	0	0	39200	296900	0	0	6.912	120	4945.8224	0	0	54.1776	0	0
1999	12	11	0	0	0	39200	296900	0	0	6.912	120	5072.7344	0	0	0	1	0
1999	12	12	1.2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	13	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	14	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	15	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	16	4.6	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	17	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	18	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	19	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	20	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	21	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	22	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	23	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	24	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	25	1.2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	26	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	27	0.2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	28	1.8	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	29	0.2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	30	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	31	2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
			997.8					17937.3712	34402.3968	1575.264	43800		21276.0308	2325.7544		119	6

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m³)	Evaporation (m³)						
1999	1	1	0	0	0	11.52	2840	0	0	2200	0	
1999	1	2	0	0	0	11.52	2851.52	0	0	5238.48	0	0
1999	1	3	0	0	0	11.52	2863.04	0	0	5226.96	0	0
1999	1	4	0	0	0	11.52	2874.56	0	0	5215.44	0	0
1999	1	5	0	0	0	11.52	2886.08	0	2503.92	5203.92	0	0
1999	1	6	0	0	0	11.52	5401.52	0	0	2688.48	0	0
1999	1	7	0.4	0	0	11.52	5413.04	0	0	2676.96	0	0
1999	1	8	16	0.43	677.68	11.52	4746.88	0	0	3343.12	0	0
1999	1	9	0	0	0	11.52	4758.4	0	0	3331.6	0	0
1999	1	10	0	0	0	11.52	4769.92	0	0	3320.08	0	0
1999	1	11	0	0	0	11.52	4781.44	0	0	3308.56	0	0
1999	1	12	0	0	0	11.52	4792.96	0	597.04	3297.04	0	0
1999	1	13	0	0	0	11.52	5401.52	0	0	2688.48	0	0
1999	1	14	0	0	0	11.52	5413.04	0	0	2676.96	0	0
1999	1	15	0	0	0	11.52	5424.56	0	0	2665.44	0	0
1999	1	16	0	0	0	11.52	5436.08	0	0	2653.92	0	0
1999	1	17	0	0	0	11.52	5447.6	0	0	2642.4	0	0
1999	1	18	0	0	0	11.52	5459.12	0	0	2630.88	0	0
1999	1	19	0	0	0	11.52	5470.64	0	0	2619.36	0	0
1999	1	20	0	0	0	11.52	5482.16	0	0	2607.84	0	0
1999	1	21	0	0	0	11.52	5493.68	0	0	2596.32	0	0
1999	1	22	0	0	0	11.52	5505.2	0	0	2584.8	0	0
1999	1	23	0	0	0	11.52	5516.72	0	0	2573.28	0	0
1999	1	24	0	0	0	11.52	5528.24	0	0	2561.76	0	0
1999	1	25	0	0	0	11.52	5539.76	0	0	2550.24	0	0
1999	1	26	0.8	0	0	11.52	5551.28	0	0	2538.72	0	0
1999	1	27	0	0	0	11.52	5562.8	0	0	2527.2	0	0
1999	1	28	0	0	0	11.52	5574.32	0	0	2515.68	0	0
1999	1	29	0.2	0	0	11.52	5585.84	0	0	2504.16	0	0
1999	1	30	0	0	0	11.52	5597.36	0	0	2492.64	0	0
1999	1	31	0.6	0	0	11.52	5608.88	0	0	2481.12	0	0
1999	2	1	0	0	0	10.224	5619.104	0	0	2470.896	0	0
1999	2	2	0	0	0	10.224	5629.328	0	0	2460.672	0	0
1999	2	3	0	0	0	10.224	5639.552	0	0	2450.448	0	0
1999	2	4	0	0	0	10.224	5649.776	0	0	2440.224	0	0
1999	2	5	0	0	0	10.224	5660	0	0	2430	0	0
1999	2	6	0.8	0	0	10.224	5670.224	0	0	2419.776	0	0
1999	2	7	0	0	0	10.224	5680.448	0	0	2409.552	0	0
1999	2	8	0	0	0	10.224	5690.672	0	0	2399.328	0	0
1999	2	9	0	0	0	10.224	5700.896	0	0	2389.104	0	0
1999	2	10	0	0	0	10.224	5711.12	0	0	2378.88	0	0
1999	2	11	0.4	0	0	10.224	5721.344	0	0	2368.656	0	0
1999	2	12	0	0	0	10.224	5731.568	0	0	2358.432	0	0
1999	2	13	0	0	0	10.224	5741.792	0	0	2348.208	0	0
1999	2	14	0	0	0	10.224	5752.016	0	0	2337.984	0	0
1999	2	15	0	0	0	10.224	5762.24	0	0	2327.76	0	0
1999	2	16	0	0	0	10.224	5772.464	0	0	2317.536	0	0
1999	2	17	0	0	0	10.224	5782.688	0	0	2307.312	0	0
1999	2	18	3.4	0	0	10.224	5792.912	0	0	2297.088	0	0
1999	2	19	0	0	0	10.224	5803.136	0	0	2286.864	0	0
1999	2	20	0	0	0	10.224	5813.36	0	0	2276.64	0	0
1999	2	21	0	0	0	10.224	5823.584	0	0	2266.416	0	0
1999	2	22	0	0	0	10.224	5833.808	0	0	2256.192	0	0
1999	2	23	0	0	0	10.224	5844.032	0	0	2245.968	0	0
1999	2	24	0	0	0	10.224	5854.256	0	0	2235.744	0	0
1999	2	25	0	0	0	10.224	5864.48	0	0	2225.52	0	0
1999	2	26	0	0	0	10.224	5874.704	0	0	2215.296	0	0
1999	2	27	0	0	0	10.224	5884.928	0	0	2205.072	0	0
1999	2	28	0	0	0	10.224	5895.152	0	0	2194.848	0	0
1999	3	1	0	0	0	8.352	5903.504	0	0	2186.496	0	0
1999	3	2	0	0	0	8.352	5911.856	0	0	2178.144	0	0
1999	3	3	0	0	0	8.352	5920.208	0	0	2169.792	0	0
1999	3	4	0	0	0	8.352	5928.56	0	0	2161.44	0	0
1999	3	5	0	0	0	8.352	5936.912	0	0	2153.088	0	0
1999	3	6	0	0	0	8.352	5945.264	0	0	2144.736	0	0
1999	3	7	19.6	0.43	830.158	8.352	5123.458	0	0	2966.542	0	0
1999	3	8	0.2	0	0	8.352	5131.81	0	0	2958.19	0	0
1999	3	9	0	0	0	8.352	5140.162	0	0	2949.838	0	0
1999	3	10	0	0	0	8.352	5148.514	0	0	2941.486	0	0
1999	3	11	0	0	0	8.352	5156.866	0	0	2933.134	0	0
1999	3	12	0	0	0	8.352	5165.218	0	224.782	2924.782	0	0
1999	3	13	0	0	0	8.352	5398.352	0	0	2691.648	0	0
1999	3	14	0	0	0	8.352	5406.704	0	0	2683.296	0	0
1999	3	15	0	0	0	8.352	5415.056	0	0	2674.944	0	0
1999	3	16	0	0	0	8.352	5423.408	0	0	2666.592	0	0
1999	3	17	0	0	0	8.352	5431.76	0	0	2658.24	0	0
1999	3	18	11	0.43	465.905	8.352	4974.207	0	0	3115.793	0	0
1999	3	19	1.6	0	0	8.352	4982.559	0	0	3107.441	0	0
1999	3	20	0	0	0	8.352	4990.911	0	0	3099.089	0	0
1999	3	21	48	0.74	3498.72	8.352	1500.543	0	0	6589.457	0	0
1999	3	22	2.6	0	0	8.352	1508.895	0	0	6581.105	0	0
1999	3	23	0	0	0	8.352	1517.247	0	0	6572.753	0	0
1999	3	24	0	0	0	8.352	1525.599	0	0	6564.401	0	0
1999	3	25	11	0.43	465.905	8.352	1068.046	0	0	7021.954	0	0
1999	3	26	2.8	0	0	8.352	1076.398	0	0	7013.602	0	0
1999	3	27	0	0	0	8.352	1084.75	0	0	7005.25	0	0
1999	3	28	4.6	0	0	8.352	1093.102	0	0	6996.898	0	0
1999	3	29	0	0	0	8.352	1101.454	0	0	6988.546	0	0
1999	3	30	0	0	0	8.352	1109.806	0	0	6980.194	0	0
1999	3	31	1.8	0	0	8.352	1118.158	0	0	6971.842	0	0
1999	4	1	0	0	0	5.328	1123.486	0	0	6966.514	0	0
1999	4	2	0	0	0	5.328	1128.814	0	0	6961.186	0	0
1999	4	3	0	0	0	5.328	1134.142	0	0	6955.858	0	0
1999	4	4	1.2	0	0	5.328	1139.47	0	0	6950.53	0	0
1999	4	5	3.2	0	0	5.328	1144.798	0	0	6945.202	0	0
1999	4	6	0	0	0	5.328	1150.126	0	0	6939.874	0	0
1999	4	7	0	0	0	5.328	1155.454	0	0	6934.546	0	0
1999	4	8	0	0	0	5.328	1160.782	0	0	6929.218	0	0
1999	4	9	0	0	0	5.328	1166.11	0	4223.89	6923.89	0	0
1999	4	10	0	0	0	5.328	5395.328	0	0	2694.672	0	0
1999	4	11	0	0	0	5.328	5400.656	0	0	2689.344	0	0
1999	4	12	0	0	0	5.328	5405.984	0	0	2684.016	0	0
1999	4	13	0	0	0	5.328	5411.312	0	0	2678.688	0	0
1999	4	14	0	0	0	5.328	5416.64	0	0	2673.36	0	0
1999	4	15	0	0	0	5.328	5421.968	0	0	2668.032	0	0
1999	4	16	0	0	0	5.328	5427.296	0	0	2662.704	0	0
1999	4	17	0	0	0	5.328	5432.624	0	0	2657.376	0	0
1999	4	18	0	0	0	5.328	5437.952	0	0	2652.048	0	0
1999	4	19	0	0	0	5.328	5443.28	0	0	2646.72	0	0
1999	4	20	6.8	0	0	5.328	5448.608	0	0	2641.392	0	0
1999	4	21	4.2	0	0	5.328	5453.936	0	0	2636.064	0	0
1999	4	22	0	0	0	5.328	5459.264	0	0	2630.736	0	0
1999	4	23	0	0	0	5.328	5464.592	0	0	2625.408	0	0
1999	4	24	0	0	0	5.328	5469.92	0	0	2620.08	0	0
1999	4	25	0	0	0	5.328	5475.248	0	0	2614.752	0	0

1999	4	26	0	0	0	5.328	5480.576	0	0	2609.424	0	0
1999	4	27	1.2	0	0	5.328	5485.904	0	0	2604.096	0	0
1999	4	28	0.6	0	0	5.328	5491.232	0	0	2598.768	0	0
1999	4	29	0.2	0	0	5.328	5496.56	0	0	2593.44	0	0
1999	4	30	0	0	0	5.328	5501.888	0	0	2588.112	0	0
1999	5	1	0	0	0	3.456	5505.344	0	0	2584.656	0	0
1999	5	2	0	0	0	3.456	5508.8	0	0	2581.2	0	0
1999	5	3	0	0	0	3.456	5512.256	0	0	2577.744	0	0
1999	5	4	0	0	0	3.456	5515.712	0	0	2574.288	0	0
1999	5	5	0	0	0	3.456	5519.168	0	0	2570.832	0	0
1999	5	6	0	0	0	3.456	5522.624	0	0	2567.376	0	0
1999	5	7	0	0	0	3.456	5526.08	0	0	2563.92	0	0
1999	5	8	0	0	0	3.456	5529.536	0	0	2560.464	0	0
1999	5	9	0	0	0	3.456	5532.992	0	0	2557.008	0	0
1999	5	10	0.4	0	0	3.456	5536.448	0	0	2553.552	0	0
1999	5	11	0	0	0	3.456	5539.904	0	0	2550.096	0	0
1999	5	12	11.6	0.43	491.318	3.456	5052.042	0	0	3037.958	0	0
1999	5	13	30.4	0.69	2066.136	3.456	2989.362	0	0	5100.638	0	0
1999	5	14	0.6	0	0	3.456	2992.818	0	0	5097.182	0	0
1999	5	15	0	0	0	3.456	2996.274	0	0	5093.726	0	0
1999	5	16	42.8	0.74	3119.692	3.456	-119.962	119.962	0	8090	0	0
1999	5	17	0	0	0	3.456	3.456	0	0	8086.544	0	1
1999	5	18	0.8	0	0	3.456	6.912	0	0	8083.088	0	0
1999	5	19	0	0	0	3.456	10.368	0	0	8079.632	0	0
1999	5	20	0	0	0	3.456	13.824	0	0	8076.176	0	0
1999	5	21	6.4	0	0	3.456	17.28	0	0	8072.72	0	0
1999	5	22	5.2	0	0	3.456	20.736	0	0	8069.264	0	0
1999	5	23	44.2	0.74	3221.738	3.456	-3197.546	3197.546	0	8090	0	0
1999	5	24	15.8	0.43	669.209	3.456	-665.753	665.753	0	8090	0	0
1999	5	25	78	0.81	6223.23	3.456	-6219.774	6219.774	0	8090	0	0
1999	5	26	11.4	0.43	482.847	3.456	-479.391	479.391	0	8090	0	0
1999	5	27	1.6	0	0	3.456	3.456	0	0	8086.544	0	1
1999	5	28	0	0	0	3.456	6.912	0	0	8083.088	0	0
1999	5	29	14	0.43	592.97	3.456	-582.602	582.602	0	8090	0	0
1999	5	30	10.4	0.43	440.492	3.456	-437.036	437.036	0	8090	0	0
1999	5	31	13.2	0.43	559.086	3.456	-555.63	555.63	0	8090	0	0
1999	6	1	0	0	0	2.592	2.592	0	0	8087.408	0	1
1999	6	2	0.2	0	0	2.592	5.184	0	0	8084.816	0	0
1999	6	3	0.2	0	0	2.592	7.776	0	0	8082.224	0	0
1999	6	4	0	0	0	2.592	10.368	0	0	8079.632	0	0
1999	6	5	12.8	0.43	542.144	2.592	-529.184	529.184	0	8090	0	0
1999	6	6	1.4	0	0	2.592	2.592	0	0	8087.408	0	1
1999	6	7	8.2	0	0	2.592	5.184	0	0	8084.816	0	0
1999	6	8	0.2	0	0	2.592	7.776	0	0	8082.224	0	0
1999	6	9	0.2	0	0	2.592	10.368	0	0	8079.632	0	0
1999	6	10	7.2	0	0	2.592	12.96	0	0	8077.04	0	0
1999	6	11	0	0	0	2.592	15.552	0	0	8074.448	0	0
1999	6	12	0	0	0	2.592	18.144	0	0	8071.856	0	0
1999	6	13	36.2	0.69	2460.333	2.592	-2439.597	2439.597	0	8090	0	0
1999	6	14	0	0	0	2.592	2.592	0	0	8087.408	0	0
1999	6	15	16.6	0.43	703.093	2.592	-697.909	697.909	0	8090	0	0
1999	6	16	5	0	0	2.592	2.592	0	0	8087.408	0	1
1999	6	17	0.4	0	0	2.592	5.184	0	0	8084.816	0	0
1999	6	18	14.8	0.43	626.854	2.592	-619.078	619.078	0	8090	0	0
1999	6	19	2.4	0	0	2.592	2.592	0	0	8087.408	0	1
1999	6	20	0.2	0	0	2.592	5.184	0	0	8084.816	0	0
1999	6	21	4.4	0	0	2.592	7.776	0	0	8082.224	0	0
1999	6	22	0.6	0	0	2.592	10.368	0	0	8079.632	0	0
1999	6	23	0.4	0	0	2.592	12.96	0	0	8077.04	0	0
1999	6	24	0.2	0	0	2.592	15.552	0	0	8074.448	0	0
1999	6	25	7.6	0	0	2.592	18.144	0	0	8071.856	0	0
1999	6	26	3.8	0	0	2.592	20.736	0	0	8069.264	0	0
1999	6	27	0	0	0	2.592	23.328	0	0	8066.672	0	0
1999	6	28	0.2	0	0	2.592	25.92	0	0	8064.08	0	0
1999	6	29	0	0	0	2.592	28.512	0	0	8061.488	0	0
1999	6	30	16.2	0.43	686.151	2.592	-655.047	655.047	0	8090	0	0
1999	7	1	0.6	0	0	2.448	2.448	0	0	8087.552	0	1
1999	7	2	4.8	0	0	2.448	4.896	0	0	8085.104	0	0
1999	7	3	0.4	0	0	2.448	7.344	0	0	8082.656	0	0
1999	7	4	0	0	0	2.448	9.792	0	0	8080.208	0	0
1999	7	5	0	0	0	2.448	12.24	0	0	8077.76	0	0
1999	7	6	0	0	0	2.448	14.688	0	0	8075.312	0	0
1999	7	7	0	0	0	2.448	17.136	0	5372.864	8072.864	0	0
1999	7	8	2	0	0	2.448	5392.448	0	0	2697.552	0	0
1999	7	9	18.6	0.43	787.803	2.448	4607.093	0	0	3482.907	0	0
1999	7	10	0	0	0	2.448	4609.541	0	0	3480.459	0	0
1999	7	11	0	0	0	2.448	4611.989	0	0	3478.011	0	0
1999	7	12	0.4	0	0	2.448	4614.437	0	0	3475.563	0	0
1999	7	13	0.4	0	0	2.448	4616.885	0	0	3473.115	0	0
1999	7	14	0.4	0	0	2.448	4619.333	0	0	3470.667	0	0
1999	7	15	0.2	0	0	2.448	4621.781	0	0	3468.219	0	0
1999	7	16	0	0	0	2.448	4624.229	0	0	3465.771	0	0
1999	7	17	0	0	0	2.448	4626.677	0	0	3463.323	0	0
1999	7	18	0	0	0	2.448	4629.125	0	0	3460.875	0	0
1999	7	19	0	0	0	2.448	4631.573	0	758.427	3458.427	0	0
1999	7	20	30.2	0.69	2052.543	2.448	3339.905	0	0	4750.095	0	0
1999	7	21	5.8	0	0	2.448	3342.353	0	0	4747.647	0	0
1999	7	22	5.8	0	0	2.448	3344.801	0	0	4745.199	0	0
1999	7	23	0	0	0	2.448	3347.249	0	0	4742.751	0	0
1999	7	24	0	0	0	2.448	3349.697	0	0	4740.303	0	0
1999	7	25	0	0	0	2.448	3352.145	0	0	4737.855	0	0
1999	7	26	0.8	0	0	2.448	3354.593	0	0	4735.407	0	0
1999	7	27	0	0	0	2.448	3357.041	0	0	4732.959	0	0
1999	7	28	0	0	0	2.448	3359.489	0	0	4730.511	0	0
1999	7	29	0	0	0	2.448	3361.937	0	0	4728.063	0	0
1999	7	30	0.2	0	0	2.448	3364.385	0	0	4725.615	0	0
1999	7	31	0.6	0	0	2.448	3366.833	0	0	4723.167	0	0
1999	8	1	0	0	0	3.312	3370.145	0	0	4719.855	0	0
1999	8	2	0	0	0	3.312	3373.457	0	0	4716.543	0	0
1999	8	3	0	0	0	3.312	3376.769	0	0	4713.231	0	0
1999	8	4	0	0	0	3.312	3380.081	0	2009.919	4709.919	0	0
1999	8	5	0	0	0	3.312	5393.312	0	0	2696.688	0	0
1999	8	6	0	0	0	3.312	5396.624	0	0	2693.376	0	0
1999	8	7	0	0	0	3.312	5399.936	0	0	2690.064	0	0
1999	8	8	21	0.56	1158.36	3.312	4244.888	0	0	3845.112	0	0
1999	8	9	24	0.56	1323.84	3.312	2924.36	0	0	5165.64	0	0
1999	8	10	4	0	0	3.312	2927.672	0	0	5162.328	0	0
1999	8	11	0	0	0	3.312	2930.984	0	0	5159.016	0	0
1999	8	12	0.6	0	0	3.312	2934.296	0	0	5155.704	0	0
1999	8	13	1.2	0	0	3.312	2937.608	0	0	5152.392	0	0
1999	8	14	0	0	0	3.312	2940.92	0	0	5149.08	0	0
1999	8	15	5	0	0	3.312	2944.232	0	0	5145.768	0	0
1999	8	16	0	0	0	3.312	2947.544	0	0	5142.456	0	0
1999	8	17	0.2	0	0	3.312	2950.856	0	0	5139.144	0	0
1999	8	18	0	0	0	3.312	2954.168	0	0	5135.832	0	0
1999	8	19	0	0	0	3.312	2957.48	0	0	5132.52	0	0
1999	8	20	0	0	0	3.312	2960.792	0	0	5129.208	0	0
1999	8	21	0	0	0	3.312	2964.104	0	2425.896	5125.896	0	0
1999	8	22	0	0	0	3.312	5393.312	0	0	2696.688	0	0
1999	8	23	0	0	0	3.312	5396.624	0	0	2693.376	0	0

1999	8	24	0.2	0	0	3.312	5399.936	0	0	2690.064	0	0
1999	8	25	0	0	0	3.312	5403.248	0	0	2686.752	0	0
1999	8	26	0.6	0	0	3.312	5406.56	0	0	2683.44	0	0
1999	8	27	4.6	0	0	3.312	5409.872	0	0	2680.128	0	0
1999	8	28	0	0	0	3.312	5413.184	0	0	2676.816	0	0
1999	8	29	0	0	0	3.312	5416.496	0	0	2673.504	0	0
1999	8	30	0.4	0	0	3.312	5419.808	0	0	2670.192	0	0
1999	8	31	0	0	0	3.312	5423.12	0	0	2666.88	0	0
1999	9	1	0	0	0	4.896	5428.016	0	0	2661.984	0	0
1999	9	2	0	0	0	4.896	5432.912	0	0	2657.088	0	0
1999	9	3	0	0	0	4.896	5437.808	0	0	2652.192	0	0
1999	9	4	36.2	0.69	2460.333	4.896	2982.371	0	0	5107.629	0	0
1999	9	5	0	0	0	4.896	2987.267	0	0	5102.733	0	0
1999	9	6	10.8	0.43	457.434	4.896	2534.729	0	0	5555.271	0	0
1999	9	7	0.4	0	0	4.896	2539.625	0	0	5550.375	0	0
1999	9	8	0	0	0	4.896	2544.521	0	0	5545.479	0	0
1999	9	9	0	0	0	4.896	2549.417	0	0	5540.583	0	0
1999	9	10	0	0	0	4.896	2554.313	0	0	5535.687	0	0
1999	9	11	4.6	0	0	4.896	2559.209	0	0	5530.791	0	0
1999	9	12	0.4	0	0	4.896	2564.105	0	0	5525.895	0	0
1999	9	13	2.2	0	0	4.896	2569.001	0	0	5520.999	0	0
1999	9	14	0	0	0	4.896	2573.897	0	0	5516.103	0	0
1999	9	15	0.2	0	0	4.896	2578.793	0	0	5511.207	0	0
1999	9	16	13.8	0.43	584.499	4.896	1999.19	0	0	6090.81	0	0
1999	9	17	26.8	0.56	1478.288	4.896	525.798	0	0	7564.202	0	0
1999	9	18	2	0	0	4.896	530.694	0	0	7559.306	0	0
1999	9	19	0	0	0	4.896	535.59	0	0	7554.41	0	0
1999	9	20	0.2	0	0	4.896	540.486	0	0	7549.514	0	0
1999	9	21	0	0	0	4.896	545.382	0	0	7544.618	0	0
1999	9	22	0	0	0	4.896	550.278	0	0	7539.722	0	0
1999	9	23	0	0	0	4.896	555.174	0	0	7534.826	0	0
1999	9	24	0	0	0	4.896	560.07	0	4829.93	7529.93	0	0
1999	9	25	0	0	0	4.896	5394.896	0	0	2695.104	0	0
1999	9	26	0	0	0	4.896	5399.792	0	0	2690.208	0	0
1999	9	27	0	0	0	4.896	5404.688	0	0	2685.312	0	0
1999	9	28	0	0	0	4.896	5409.584	0	0	2680.416	0	0
1999	9	29	16.8	0.43	711.564	4.896	4702.916	0	0	3387.084	0	0
1999	9	30	0	0	0	4.896	4707.812	0	0	3382.188	0	0
1999	10	1	0	0	0	6.768	4714.58	0	0	3375.42	0	0
1999	10	2	0	0	0	6.768	4721.348	0	0	3368.652	0	0
1999	10	3	21.4	0.56	1180.424	6.768	3547.692	0	0	4542.308	0	0
1999	10	4	0	0	0	6.768	3554.46	0	0	4535.54	0	0
1999	10	5	0	0	0	6.768	3561.228	0	0	4528.772	0	0
1999	10	6	0	0	0	6.768	3567.996	0	0	4522.004	0	0
1999	10	7	0	0	0	6.768	3574.764	0	1815.236	4515.236	0	0
1999	10	8	0	0	0	6.768	5396.768	0	0	2693.232	0	0
1999	10	9	0.8	0	0	6.768	5403.536	0	0	2686.464	0	0
1999	10	10	20.6	0.56	1136.296	6.768	4274.008	0	0	3815.992	0	0
1999	10	11	15.8	0.43	669.209	6.768	3611.567	0	0	4478.433	0	0
1999	10	12	0.4	0	0	6.768	3618.335	0	0	4471.665	0	0
1999	10	13	9.2	0	0	6.768	3625.103	0	0	4464.897	0	0
1999	10	14	7.4	0	0	6.768	3631.871	0	0	4458.129	0	0
1999	10	15	1	0	0	6.768	3638.639	0	0	4451.361	0	0
1999	10	16	0	0	0	6.768	3645.407	0	0	4444.593	0	0
1999	10	17	0	0	0	6.768	3652.175	0	0	4437.825	0	0
1999	10	18	0.4	0	0	6.768	3658.943	0	0	4431.057	0	0
1999	10	19	0.2	0	0	6.768	3665.711	0	0	4424.289	0	0
1999	10	20	0.2	0	0	6.768	3672.479	0	0	4417.521	0	0
1999	10	21	0	0	0	6.768	3679.247	0	0	4410.753	0	0
1999	10	22	0.6	0	0	6.768	3686.015	0	0	4403.985	0	0
1999	10	23	0	0	0	6.768	3692.783	0	0	4397.217	0	0
1999	10	24	0.2	0	0	6.768	3699.551	0	0	4390.449	0	0
1999	10	25	1.2	0	0	6.768	3706.319	0	0	4383.681	0	0
1999	10	26	1.2	0	0	6.768	3713.087	0	0	4376.913	0	0
1999	10	27	3	0	0	6.768	3719.855	0	0	4370.145	0	0
1999	10	28	0.2	0	0	6.768	3726.623	0	0	4363.377	0	0
1999	10	29	0	0	0	6.768	3733.391	0	0	4356.609	0	0
1999	10	30	0	0	0	6.768	3740.159	0	0	4349.841	0	0
1999	10	31	4.6	0	0	6.768	3746.927	0	0	4343.073	0	0
1999	11	1	0	0	0	8.64	3755.567	0	0	4334.433	0	0
1999	11	2	0	0	0	8.64	3764.207	0	0	4325.793	0	0
1999	11	3	0	0	0	8.64	3772.847	0	0	4317.153	0	0
1999	11	4	0.2	0	0	8.64	3781.487	0	0	4308.513	0	0
1999	11	5	0	0	0	8.64	3790.127	0	0	4299.873	0	0
1999	11	6	10.4	0.43	440.492	8.64	3358.275	0	0	4731.725	0	0
1999	11	7	0	0	0	8.64	3366.915	0	0	4723.085	0	0

1999	11	8	5.2	0	0	8.64	3375.555	0	0	4714.445	0	0
1999	11	9	4.4	0	0	8.64	3384.195	0	0	4705.805	0	0
1999	11	10	2.8	0	0	8.64	3392.835	0	0	4697.165	0	0
1999	11	11	1.4	0	0	8.64	3401.475	0	0	4688.525	0	0
1999	11	12	0.2	0	0	8.64	3410.115	0	0	4679.885	0	0
1999	11	13	0	0	0	8.64	3418.755	0	0	4671.245	0	0
1999	11	14	0	0	0	8.64	3427.395	0	0	4662.605	0	0
1999	11	15	0	0	0	8.64	3436.035	0	0	4653.965	0	0
1999	11	16	0	0	0	8.64	3444.675	0	1945.325	4645.325	0	0
1999	11	17	0	0	0	8.64	5398.64	0	0	2691.36	0	0
1999	11	18	0	0	0	8.64	5407.28	0	0	2682.72	0	0
1999	11	19	0	0	0	8.64	5415.92	0	0	2674.08	0	0
1999	11	20	0.2	0	0	8.64	5424.56	0	0	2665.44	0	0
1999	11	21	7.2	0	0	8.64	5433.2	0	0	2656.8	0	0
1999	11	22	12.2	0.43	516.731	8.64	4925.109	0	0	3164.891	0	0
1999	11	23	0.4	0	0	8.64	4933.749	0	0	3156.251	0	0
1999	11	24	0	0	0	8.64	4942.389	0	0	3147.611	0	0
1999	11	25	0	0	0	8.64	4951.029	0	0	3138.971	0	0
1999	11	26	0	0	0	8.64	4959.669	0	0	3130.331	0	0
1999	11	27	0	0	0	8.64	4968.309	0	421.691	3121.691	0	0
1999	11	28	0	0	0	8.64	5398.64	0	0	2691.36	0	0
1999	11	29	0.2	0	0	8.64	5407.28	0	0	2682.72	0	0
1999	11	30	0	0	0	8.64	5415.92	0	0	2674.08	0	0
1999	12	1	2.8	0	0	10.368	5426.288	0	0	2663.712	0	0
1999	12	2	0	0	0	10.368	5436.656	0	0	2653.344	0	0
1999	12	3	23.4	0.56	1290.744	10.368	4156.28	0	0	3933.72	0	0
1999	12	4	0.6	0	0	10.368	4166.648	0	0	3923.352	0	0
1999	12	5	0	0	0	10.368	4177.016	0	0	3912.984	0	0
1999	12	6	0	0	0	10.368	4187.384	0	0	3902.616	0	0
1999	12	7	0	0	0	10.368	4197.752	0	0	3892.248	0	0
1999	12	8	1.6	0	0	10.368	4208.12	0	0	3881.88	0	0
1999	12	9	8	0	0	10.368	4218.488	0	0	3871.512	0	0
1999	12	10	0.2	0	0	10.368	4228.856	0	0	3861.144	0	0
1999	12	11	0	0	0	10.368	4239.224	0	0	3850.776	0	0
1999	12	12	1.2	0	0	10.368	4249.592	0	0	3840.408	0	0
1999	12	13	0	0	0	10.368	4259.96	0	0	3830.04	0	0
1999	12	14	0	0	0	10.368	4270.328	0	0	3819.672	0	0
1999	12	15	0	0	0	10.368	4280.696	0	0	3809.304	0	0
1999	12	16	4.6	0	0	10.368	4291.064	0	0	3798.936	0	0
1999	12	17	0	0	0	10.368	4301.432	0	0	3788.568	0	0
1999	12	18	0	0	0	10.368	4311.8	0	0	3778.2	0	0
1999	12	19	0	0	0	10.368	4322.168	0	0	3767.832	0	0
1999	12	20	0	0	0	10.368	4332.536	0	1057.464	3757.464	0	0
1999	12	21	0	0	0	10.368	5400.368	0	0	2689.632	0	0
1999	12	22	0	0	0	10.368	5410.736	0	0	2679.264	0	0
1999	12	23	0	0	0	10.368	5421.104	0	0	2668.896	0	0
1999	12	24	0	0	0	10.368	5431.472	0	0	2658.528	0	0
1999	12	25	1.2	0	0	10.368	5441.84	0	0	2648.16	0	0
1999	12	26	0	0	0	10.368	5452.208	0	0	2637.792	0	0
1999	12	27	0.2	0	0	10.368	5462.576	0	0	2627.424	0	0
1999	12	28	1.8	0	0	10.368	5472.944	0	0	2617.056	0	0
1999	12	29	0.2	0	0	10.368	5483.312	0	0	2606.688	0	0
1999	12	30	0	0	0	10.368	5493.68	0	0	2596.32	0	0
1999	12	31	2	0	0	10.368	5504.048	0	0	2585.952	0	0
			997.8		45072.221	2362.896		17198.509	28186.384		0	7

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient Cv	Inputs Overland Flow Quarry (m³)	Outputs Evaporation (m³)	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
1999	1	1	0	0	0	11.52	2840	0	0	2200	0	
1999	1	2	0	0	0	11.52	2851.52	0	0	6808.48	0	0
1999	1	3	0	0	0	11.52	2863.04	0	0	6796.96	0	0
1999	1	4	0	0	0	11.52	2874.56	0	0	6785.44	0	0
1999	1	5	0	0	0	11.52	2886.08	0	3553.92	6773.92	0	0
1999	1	6	0	0	0	11.52	6451.52	0	0	3208.48	0	0
1999	1	7	0.4	0	0	11.52	6463.04	0	0	3196.96	0	0
1999	1	8	16	0.43	677.68	11.52	5796.88	0	0	3863.12	0	0
1999	1	9	0	0	0	11.52	5808.4	0	0	3851.6	0	0
1999	1	10	0	0	0	11.52	5819.92	0	0	3840.08	0	0
1999	1	11	0	0	0	11.52	5831.44	0	0	3828.56	0	0
1999	1	12	0	0	0	11.52	5842.96	0	597.04	3817.04	0	0
1999	1	13	0	0	0	11.52	6451.52	0	0	3208.48	0	0
1999	1	14	0	0	0	11.52	6463.04	0	0	3196.96	0	0
1999	1	15	0	0	0	11.52	6474.56	0	0	3185.44	0	0
1999	1	16	0	0	0	11.52	6486.08	0	0	3173.92	0	0
1999	1	17	0	0	0	11.52	6497.6	0	0	3162.4	0	0
1999	1	18	0	0	0	11.52	6509.12	0	0	3150.88	0	0
1999	1	19	0	0	0	11.52	6520.64	0	0	3139.36	0	0
1999	1	20	0	0	0	11.52	6532.16	0	0	3127.84	0	0
1999	1	21	0	0	0	11.52	6543.68	0	0	3116.32	0	0
1999	1	22	0	0	0	11.52	6555.2	0	0	3104.8	0	0
1999	1	23	0	0	0	11.52	6566.72	0	0	3093.28	0	0
1999	1	24	0	0	0	11.52	6578.24	0	0	3081.76	0	0
1999	1	25	0	0	0	11.52	6589.76	0	0	3070.24	0	0
1999	1	26	0.8	0	0	11.52	6601.28	0	0	3058.72	0	0
1999	1	27	0	0	0	11.52	6612.8	0	0	3047.2	0	0
1999	1	28	0	0	0	11.52	6624.32	0	0	3035.68	0	0
1999	1	29	0.2	0	0	11.52	6635.84	0	0	3024.16	0	0
1999	1	30	0	0	0	11.52	6647.36	0	0	3012.64	0	0
1999	1	31	0.6	0	0	11.52	6658.88	0	0	3001.12	0	0
1999	2	1	0	0	0	10.224	6669.104	0	0	2990.896	0	0
1999	2	2	0	0	0	10.224	6679.328	0	0	2980.672	0	0
1999	2	3	0	0	0	10.224	6689.552	0	0	2970.448	0	0
1999	2	4	0	0	0	10.224	6699.776	0	0	2960.224	0	0
1999	2	5	0	0	0	10.224	6710	0	0	2950	0	0
1999	2	6	0.8	0	0	10.224	6720.224	0	0	2939.776	0	0
1999	2	7	0	0	0	10.224	6730.448	0	0	2929.552	0	0
1999	2	8	0	0	0	10.224	6740.672	0	0	2919.328	0	0
1999	2	9	0	0	0	10.224	6750.896	0	0	2909.104	0	0
1999	2	10	0	0	0	10.224	6761.12	0	0	2898.88	0	0
1999	2	11	0.4	0	0	10.224	6771.344	0	0	2888.656	0	0
1999	2	12	0	0	0	10.224	6781.568	0	0	2878.432	0	0
1999	2	13	0	0	0	10.224	6791.792	0	0	2868.208	0	0
1999	2	14	0	0	0	10.224	6802.016	0	0	2857.984	0	0
1999	2	15	0	0	0	10.224	6812.24	0	0	2847.76	0	0
1999	2	16	0	0	0	10.224	6822.464	0	0	2837.536	0	0
1999	2	17	0	0	0	10.224	6832.688	0	0	2827.312	0	0
1999	2	18	3.4	0	0	10.224	6842.912	0	0	2817.088	0	0
1999	2	19	0	0	0	10.224	6853.136	0	0	2806.864	0	0
1999	2	20	0	0	0	10.224	6863.36	0	0	2796.64	0	0
1999	2	21	0	0	0	10.224	6873.584	0	0	2786.416	0	0
1999	2	22	0	0	0	10.224	6883.808	0	0	2776.192	0	0
1999	2	23	0	0	0	10.224	6894.032	0	0	2765.968	0	0
1999	2	24	0	0	0	10.224	6904.256	0	0	2755.744	0	0
1999	2	25	0	0	0	10.224	6914.48	0	0	2745.52	0	0
1999	2	26	0	0	0	10.224	6924.704	0	0	2735.296	0	0
1999	2	27	0	0	0	10.224	6934.928	0	0	2725.072	0	0
1999	2	28	0	0	0	10.224	6945.152	0	0	2714.848	0	0
1999	3	1	0	0	0	8.352	6953.504	0	0	2706.496	0	0
1999	3	2	0	0	0	8.352	6961.856	0	0	2698.144	0	0
1999	3	3	0	0	0	8.352	6970.208	0	0	2689.792	0	0
1999	3	4	0	0	0	8.352	6978.56	0	0	2681.44	0	0
1999	3	5	0	0	0	8.352	6986.912	0	0	2673.088	0	0
1999	3	6	0	0	0	8.352	6995.264	0	0	2664.736	0	0
1999	3	7	19.6	0.43	830.158	8.352	6173.458	0	0	3486.542	0	0
1999	3	8	0.2	0	0	8.352	6181.81	0	0	3478.19	0	0
1999	3	9	0	0	0	8.352	6190.162	0	0	3469.838	0	0
1999	3	10	0	0	0	8.352	6198.514	0	0	3461.486	0	0
1999	3	11	0	0	0	8.352	6206.866	0	0	3453.134	0	0
1999	3	12	0	0	0	8.352	6215.218	0	224.782	3444.782	0	0
1999	3	13	0	0	0	8.352	6448.352	0	0	3211.648	0	0
1999	3	14	0	0	0	8.352	6456.704	0	0	3203.296	0	0
1999	3	15	0	0	0	8.352	6465.056	0	0	3194.944	0	0
1999	3	16	0	0	0	8.352	6473.408	0	0	3186.592	0	0
1999	3	17	0	0	0	8.352	6481.76	0	0	3178.24	0	0
1999	3	18	11	0.43	465.905	8.352	6024.207	0	0	3635.793	0	0
1999	3	19	1.6	0	0	8.352	6032.559	0	0	3627.441	0	0
1999	3	20	0	0	0	8.352	6040.911	0	0	3619.089	0	0
1999	3	21	48	0.74	3498.72	8.352	2550.543	0	0	7109.457	0	0
1999	3	22	2.6	0	0	8.352	2558.895	0	0	7101.105	0	0
1999	3	23	0	0	0	8.352	2567.247	0	0	7092.753	0	0
1999	3	24	0	0	0	8.352	2575.599	0	0	7084.401	0	0
1999	3	25	11	0.43	465.905	8.352	2118.046	0	0	7541.954	0	0
1999	3	26	2.8	0	0	8.352	2126.398	0	0	7533.602	0	0
1999	3	27	0	0	0	8.352	2134.75	0	0	7525.25	0	0
1999	3	28	4.6	0	0	8.352	2143.102	0	0	7516.898	0	0
1999	3	29	0	0	0	8.352	2151.454	0	0	7508.546	0	0
1999	3	30	0	0	0	8.352	2159.806	0	0	7500.194	0	0
1999	3	31	1.8	0	0	8.352	2168.158	0	0	7491.842	0	0
1999	4	1	0	0	0	5.328	2173.486	0	0	7486.514	0	0
1999	4	2	0	0	0	5.328	2178.814	0	0	7481.186	0	0
1999	4	3	0	0	0	5.328	2184.142	0	0	7475.858	0	0
1999	4	4	1.2	0	0	5.328	2189.47	0	0	7470.53	0	0
1999	4	5	3.2	0	0	5.328	2194.798	0	0	7465.202	0	0
1999	4	6	0	0	0	5.328	2200.126	0	0	7459.874	0	0
1999	4	7	0	0	0	5.328	2205.454	0	0	7454.546	0	0
1999	4	8	0	0	0	5.328	2210.782	0	0	7449.218	0	0
1999	4	9	0	0	0	5.328	2216.11	0	4223.89	7443.89	0	0
1999	4	10	0	0	0	5.328	6445.328	0	0	3214.672	0	0
1999	4	11	0	0	0	5.328	6450.656	0	0	3209.344	0	0
1999	4	12	0	0	0	5.328	6455.984	0	0	3204.016	0	0
1999	4	13	0	0	0	5.328	6461.312	0	0	3198.688	0	0
1999	4	14	0	0	0	5.328	6466.64	0	0	3193.36	0	0
1999	4	15	0	0	0	5.328	6471.968	0	0	3188.032	0	0
1999	4	16	0	0	0	5.328	6477.296	0	0	3182.704	0	0
1999	4	17	0	0	0	5.328	6482.624	0	0	3177.376	0	0
1999	4	18	0	0	0	5.328	6487.952	0	0	3172.048	0	0
1999	4	19	0	0	0	5.328	6493.28	0	0	3166.72	0	0
1999	4	20	6.8	0	0	5.328	6498.608	0	0	3161.392	0	0
1999	4	21	4.2	0	0	5.328	6503.936	0	0	3156.064	0	0
1999	4	22	0	0	0	5.328	6509.264	0	0	3150.736	0	0
1999	4	23	0	0	0	5.328	6514.592	0	0	3145.408	0	0
1999	4	24	0	0	0	5.328	6519.92	0	0	3140.08	0	0
1999	4	25	0	0	0	5.328	6525.248	0	0	3134.752	0	0

1999	4	26	0	0	0	5.328	6530.576	0	0	3129.424	0	0
1999	4	27	1.2	0	0	5.328	6535.904	0	0	3124.096	0	0
1999	4	28	0.6	0	0	5.328	6541.232	0	0	3118.768	0	0
1999	4	29	0.2	0	0	5.328	6546.56	0	0	3113.44	0	0
1999	4	30	0	0	0	5.328	6551.888	0	0	3108.112	0	0
1999	5	1	0	0	0	3.456	6555.344	0	0	3104.656	0	0
1999	5	2	0	0	0	3.456	6558.8	0	0	3101.2	0	0
1999	5	3	0	0	0	3.456	6562.256	0	0	3097.744	0	0
1999	5	4	0	0	0	3.456	6565.712	0	0	3094.288	0	0
1999	5	5	0	0	0	3.456	6569.168	0	0	3090.832	0	0
1999	5	6	0	0	0	3.456	6572.624	0	0	3087.376	0	0
1999	5	7	0	0	0	3.456	6576.08	0	0	3083.92	0	0
1999	5	8	0	0	0	3.456	6579.536	0	0	3080.464	0	0
1999	5	9	0	0	0	3.456	6582.992	0	0	3077.008	0	0
1999	5	10	0.4	0	0	3.456	6586.448	0	0	3073.552	0	0
1999	5	11	0	0	0	3.456	6589.904	0	0	3070.096	0	0
1999	5	12	11.6	0.43	491.318	3.456	6102.042	0	0	3557.958	0	0
1999	5	13	30.4	0.69	2066.136	3.456	4039.362	0	0	5620.638	0	0
1999	5	14	0.6	0	0	3.456	4042.818	0	0	5617.182	0	0
1999	5	15	0	0	0	3.456	4046.274	0	0	5613.726	0	0
1999	5	16	42.8	0.74	3119.692	3.456	930.038	0	0	8729.962	0	0
1999	5	17	0	0	0	3.456	933.494	0	0	8726.506	0	0
1999	5	18	0.8	0	0	3.456	936.95	0	0	8723.05	0	0
1999	5	19	0	0	0	3.456	940.406	0	0	8719.594	0	0
1999	5	20	0	0	0	3.456	943.862	0	0	8716.138	0	0
1999	5	21	6.4	0	0	3.456	947.318	0	0	8712.682	0	0
1999	5	22	5.2	0	0	3.456	950.774	0	0	8709.226	0	0
1999	5	23	44.2	0.74	3221.738	3.456	-2267.508	2267.508	0	9660	0	0
1999	5	24	15.8	0.43	669.209	3.456	-665.753	665.753	0	9660	0	0
1999	5	25	78	0.81	6223.23	3.456	-6219.774	6219.774	0	9660	0	0
1999	5	26	11.4	0.43	482.847	3.456	-479.391	479.391	0	9660	0	0
1999	5	27	1.6	0	0	3.456	3.456	0	0	9656.544	0	1
1999	5	28	0	0	0	3.456	6.912	0	0	9653.088	0	0
1999	5	29	14	0.43	592.97	3.456	-582.602	582.602	0	9660	0	0
1999	5	30	10.4	0.43	440.492	3.456	-437.036	437.036	0	9660	0	0
1999	5	31	13.2	0.43	559.086	3.456	-555.63	555.63	0	9660	0	0
1999	6	1	0	0	0	2.592	2.592	0	0	9657.408	0	1
1999	6	2	0.2	0	0	2.592	5.184	0	0	9654.816	0	0
1999	6	3	0.2	0	0	2.592	7.776	0	0	9652.224	0	0
1999	6	4	0	0	0	2.592	10.368	0	0	9649.632	0	0
1999	6	5	12.8	0.43	542.144	2.592	-529.184	529.184	0	9660	0	0
1999	6	6	1.4	0	0	2.592	2.592	0	0	9657.408	0	1
1999	6	7	8.2	0	0	2.592	5.184	0	0	9654.816	0	0
1999	6	8	0.2	0	0	2.592	7.776	0	0	9652.224	0	0
1999	6	9	0.2	0	0	2.592	10.368	0	0	9649.632	0	0
1999	6	10	7.2	0	0	2.592	12.96	0	0	9647.04	0	0
1999	6	11	0	0	0	2.592	15.552	0	0	9644.448	0	0
1999	6	12	0	0	0	2.592	18.144	0	0	9641.856	0	0
1999	6	13	36.2	0.69	2460.333	2.592	-2439.597	2439.597	0	9660	0	0
1999	6	14	0	0	0	2.592	2.592	0	0	9657.408	0	0
1999	6	15	16.6	0.43	703.093	2.592	-697.909	697.909	0	9660	0	0
1999	6	16	5	0	0	2.592	2.592	0	0	9657.408	0	1
1999	6	17	0.4	0	0	2.592	5.184	0	0	9654.816	0	0
1999	6	18	14.8	0.43	626.854	2.592	-619.078	619.078	0	9660	0	0
1999	6	19	2.4	0	0	2.592	2.592	0	0	9657.408	0	1
1999	6	20	0.2	0	0	2.592	5.184	0	0	9654.816	0	0
1999	6	21	4.4	0	0	2.592	7.776	0	0	9652.224	0	0
1999	6	22	0.6	0	0	2.592	10.368	0	0	9649.632	0	0
1999	6	23	0.4	0	0	2.592	12.96	0	0	9647.04	0	0
1999	6	24	0.2	0	0	2.592	15.552	0	0	9644.448	0	0
1999	6	25	7.6	0	0	2.592	18.144	0	0	9641.856	0	0
1999	6	26	3.8	0	0	2.592	20.736	0	0	9639.264	0	0
1999	6	27	0	0	0	2.592	23.328	0	0	9636.672	0	0
1999	6	28	0.2	0	0	2.592	25.92	0	0	9634.08	0	0
1999	6	29	0	0	0	2.592	28.512	0	0	9631.488	0	0
1999	6	30	16.2	0.43	686.151	2.592	-655.047	655.047	0	9660	0	0
1999	7	1	0.6	0	0	2.448	2.448	0	0	9657.552	0	1
1999	7	2	4.8	0	0	2.448	4.896	0	0	9655.104	0	0
1999	7	3	0.4	0	0	2.448	7.344	0	0	9652.656	0	0
1999	7	4	0	0	0	2.448	9.792	0	0	9650.208	0	0
1999	7	5	0	0	0	2.448	12.24	0	0	9647.76	0	0
1999	7	6	0	0	0	2.448	14.688	0	0	9645.312	0	0
1999	7	7	0	0	0	2.448	17.136	0	6422.864	9642.864	0	0
1999	7	8	2	0	0	2.448	6442.448	0	0	3217.552	0	0
1999	7	9	18.6	0.43	787.803	2.448	5657.093	0	0	4002.907	0	0
1999	7	10	0	0	0	2.448	5659.541	0	0	4000.459	0	0
1999	7	11	0	0	0	2.448	5661.989	0	0	3998.011	0	0
1999	7	12	0.4	0	0	2.448	5664.437	0	0	3995.563	0	0
1999	7	13	0.4	0	0	2.448	5666.885	0	0	3993.115	0	0
1999	7	14	0.4	0	0	2.448	5669.333	0	0	3990.667	0	0
1999	7	15	0.2	0	0	2.448	5671.781	0	0	3988.219	0	0
1999	7	16	0	0	0	2.448	5674.229	0	0	3985.771	0	0
1999	7	17	0	0	0	2.448	5676.677	0	0	3983.323	0	0
1999	7	18	0	0	0	2.448	5679.125	0	0	3980.875	0	0
1999	7	19	0	0	0	2.448	5681.573	0	758.427	3978.427	0	0
1999	7	20	30.2	0.69	2052.543	2.448	4389.905	0	0	5270.095	0	0
1999	7	21	5.8	0	0	2.448	4392.353	0	0	5267.647	0	0
1999	7	22	5.8	0	0	2.448	4394.801	0	0	5265.199	0	0
1999	7	23	0	0	0	2.448	4397.249	0	0	5262.751	0	0
1999	7	24	0	0	0	2.448	4399.697	0	0	5260.303	0	0
1999	7	25	0	0	0	2.448	4402.145	0	0	5257.855	0	0
1999	7	26	0.8	0	0	2.448	4404.593	0	0	5255.407	0	0
1999	7	27	0	0	0	2.448	4407.041	0	0	5252.959	0	0
1999	7	28	0	0	0	2.448	4409.489	0	0	5250.511	0	0
1999	7	29	0	0	0	2.448	4411.937	0	0	5248.063	0	0
1999	7	30	0.2	0	0	2.448	4414.385	0	0	5245.615	0	0
1999	7	31	0.6	0	0	2.448	4416.833	0	0	5243.167	0	0
1999	8	1	0	0	0	3.312	4420.145	0	0	5239.855	0	0
1999	8	2	0	0	0	3.312	4423.457	0	0	5236.543	0	0
1999	8	3	0	0	0	3.312	4426.769	0	0	5233.231	0	0
1999	8	4	0	0	0	3.312	4430.081	0	2009.919	5229.919	0	0
1999	8	5	0	0	0	3.312	6443.312	0	0	3216.688	0	0
1999	8	6	0	0	0	3.312	6446.624	0	0	3213.376	0	0
1999	8	7	0	0	0	3.312	6449.936	0	0	3210.064	0	0
1999	8	8	21	0.56	1158.36	3.312	5294.888	0	0	4365.112	0	0
1999	8	9	24	0.56	1323.84	3.312	3974.36	0	0	5685.64	0	0
1999	8	10	4	0	0	3.312	3977.672	0	0	5682.328	0	0
1999	8	11	0	0	0	3.312	3980.984	0	0	5679.016	0	0
1999	8	12	0.6	0	0	3.312	3984.296	0	0	5675.704	0	0
1999	8	13	1.2	0	0	3.312	3987.608	0	0	5672.392	0	0
1999	8	14	0	0	0	3.312	3990.92	0	0	5669.08	0	0
1999	8	15	5	0	0	3.312	3994.232	0	0	5665.768	0	0
1999	8	16	0	0	0	3.312	3997.544	0	0	5662.456	0	0
1999	8	17	0.2	0	0	3.312	4000.856	0	0	5659.144	0	0
1999	8	18	0	0	0	3.312	4004.168	0	0	5655.832	0	0
1999	8	19	0	0	0	3.312	4007.48	0	0	5652.52	0	0
1999	8	20	0	0	0	3.312	4010.792	0	0	5649.208	0	0
1999	8	21	0	0	0	3.312	4014.104	0	2425.896	5645.896	0	0
1999	8	22	0	0	0	3.312	6443.312	0	0	3216.688	0	0
1999	8	23	0	0	0	3.312	6446.624	0	0	3213.376	0	0

1999	8	24	0.2	0	0	3.312	6449.936	0	0	3210.064	0	0
1999	8	25	0	0	0	3.312	6453.248	0	0	3206.752	0	0
1999	8	26	0.6	0	0	3.312	6456.56	0	0	3203.44	0	0
1999	8	27	4.6	0	0	3.312	6459.872	0	0	3200.128	0	0
1999	8	28	0	0	0	3.312	6463.184	0	0	3196.816	0	0
1999	8	29	0	0	0	3.312	6466.496	0	0	3193.504	0	0
1999	8	30	0.4	0	0	3.312	6469.808	0	0	3190.192	0	0
1999	8	31	0	0	0	3.312	6473.12	0	0	3186.88	0	0
1999	9	1	0	0	0	4.896	6478.016	0	0	3181.984	0	0
1999	9	2	0	0	0	4.896	6482.912	0	0	3177.088	0	0
1999	9	3	0	0	0	4.896	6487.808	0	0	3172.192	0	0
1999	9	4	36.2	0.69	2460.333	4.896	4032.371	0	0	5627.629	0	0
1999	9	5	0	0	0	4.896	4037.267	0	0	5622.733	0	0
1999	9	6	10.8	0.43	457.434	4.896	3584.729	0	0	6075.271	0	0
1999	9	7	0.4	0	0	4.896	3589.625	0	0	6070.375	0	0
1999	9	8	0	0	0	4.896	3594.521	0	0	6065.479	0	0
1999	9	9	0	0	0	4.896	3599.417	0	0	6060.583	0	0
1999	9	10	0	0	0	4.896	3604.313	0	0	6055.687	0	0
1999	9	11	4.6	0	0	4.896	3609.209	0	0	6050.791	0	0
1999	9	12	0.4	0	0	4.896	3614.105	0	0	6045.895	0	0
1999	9	13	2.2	0	0	4.896	3619.001	0	0	6040.999	0	0
1999	9	14	0	0	0	4.896	3623.897	0	0	6036.103	0	0
1999	9	15	0.2	0	0	4.896	3628.793	0	0	6031.207	0	0
1999	9	16	13.8	0.43	584.499	4.896	3049.19	0	0	6610.81	0	0
1999	9	17	26.8	0.56	1478.288	4.896	1575.798	0	0	8084.202	0	0
1999	9	18	2	0	0	4.896	1580.694	0	0	8079.306	0	0
1999	9	19	0	0	0	4.896	1585.59	0	0	8074.41	0	0
1999	9	20	0.2	0	0	4.896	1590.486	0	0	8069.514	0	0
1999	9	21	0	0	0	4.896	1595.382	0	0	8064.618	0	0
1999	9	22	0	0	0	4.896	1600.278	0	0	8059.722	0	0
1999	9	23	0	0	0	4.896	1605.174	0	0	8054.826	0	0
1999	9	24	0	0	0	4.896	1610.07	0	4829.93	8049.93	0	0
1999	9	25	0	0	0	4.896	6444.896	0	0	3215.104	0	0
1999	9	26	0	0	0	4.896	6449.792	0	0	3210.208	0	0
1999	9	27	0	0	0	4.896	6454.688	0	0	3205.312	0	0
1999	9	28	0	0	0	4.896	6459.584	0	0	3200.416	0	0
1999	9	29	16.8	0.43	711.564	4.896	5752.916	0	0	3907.084	0	0
1999	9	30	0	0	0	4.896	5757.812	0	0	3902.188	0	0
1999	10	1	0	0	0	6.768	5764.58	0	0	3895.42	0	0
1999	10	2	0	0	0	6.768	5771.348	0	0	3888.652	0	0
1999	10	3	21.4	0.56	1180.424	6.768	4597.692	0	0	5062.308	0	0
1999	10	4	0	0	0	6.768	4604.46	0	0	5055.54	0	0
1999	10	5	0	0	0	6.768	4611.228	0	0	5048.772	0	0
1999	10	6	0	0	0	6.768	4617.996	0	0	5042.004	0	0
1999	10	7	0	0	0	6.768	4624.764	0	1815.236	5035.236	0	0
1999	10	8	0	0	0	6.768	6446.768	0	0	3213.232	0	0
1999	10	9	0.8	0	0	6.768	6453.536	0	0	3206.464	0	0
1999	10	10	20.6	0.56	1136.296	6.768	5324.008	0	0	4335.992	0	0
1999	10	11	15.8	0.43	669.209	6.768	4661.567	0	0	4998.433	0	0
1999	10	12	0.4	0	0	6.768	4668.335	0	0	4991.665	0	0
1999	10	13	9.2	0	0	6.768	4675.103	0	0	4984.897	0	0
1999	10	14	7.4	0	0	6.768	4681.871	0	0	4978.129	0	0
1999	10	15	1	0	0	6.768	4688.639	0	0	4971.361	0	0
1999	10	16	0	0	0	6.768	4695.407	0	0	4964.593	0	0
1999	10	17	0	0	0	6.768	4702.175	0	0	4957.825	0	0
1999	10	18	0.4	0	0	6.768	4708.943	0	0	4951.057	0	0
1999	10	19	0.2	0	0	6.768	4715.711	0	0	4944.289	0	0
1999	10	20	0.2	0	0	6.768	4722.479	0	0	4937.521	0	0
1999	10	21	0	0	0	6.768	4729.247	0	0	4930.753	0	0
1999	10	22	0.6	0	0	6.768	4736.015	0	0	4923.985	0	0
1999	10	23	0	0	0	6.768	4742.783	0	0	4917.217	0	0
1999	10	24	0.2	0	0	6.768	4749.551	0	0	4910.449	0	0
1999	10	25	1.2	0	0	6.768	4756.319	0	0	4903.681	0	0
1999	10	26	1.2	0	0	6.768	4763.087	0	0	4896.913	0	0
1999	10	27	3	0	0	6.768	4769.855	0	0	4890.145	0	0
1999	10	28	0.2	0	0	6.768	4776.623	0	0	4883.377	0	0
1999	10	29	0	0	0	6.768	4783.391	0	0	4876.609	0	0
1999	10	30	0	0	0	6.768	4790.159	0	0	4869.841	0	0
1999	10	31	4.6	0	0	6.768	4796.927	0	0	4863.073	0	0
1999	11	1	0	0	0	8.64	4805.567	0	0	4854.433	0	0
1999	11	2	0	0	0	8.64	4814.207	0	0	4845.793	0	0
1999	11	3	0	0	0	8.64	4822.847	0	0	4837.153	0	0
1999	11	4	0.2	0	0	8.64	4831.487	0	0	4828.513	0	0
1999	11	5	0	0	0	8.64	4840.127	0	0	4819.873	0	0
1999	11	6	10.4	0.43	440.492	8.64	4408.275	0	0	5251.725	0	0
1999	11	7	0	0	0	8.64	4416.915	0	0	5243.085	0	0

1999	11	8	5.2	0	0	8.64	4425.555	0	0	5234.445	0	0
1999	11	9	4.4	0	0	8.64	4434.195	0	0	5225.805	0	0
1999	11	10	2.8	0	0	8.64	4442.835	0	0	5217.165	0	0
1999	11	11	1.4	0	0	8.64	4451.475	0	0	5208.525	0	0
1999	11	12	0.2	0	0	8.64	4460.115	0	0	5199.885	0	0
1999	11	13	0	0	0	8.64	4468.755	0	0	5191.245	0	0
1999	11	14	0	0	0	8.64	4477.395	0	0	5182.605	0	0
1999	11	15	0	0	0	8.64	4486.035	0	0	5173.965	0	0
1999	11	16	0	0	0	8.64	4494.675	0	1945.325	5165.325	0	0
1999	11	17	0	0	0	8.64	6448.64	0	0	3211.36	0	0
1999	11	18	0	0	0	8.64	6457.28	0	0	3202.72	0	0
1999	11	19	0	0	0	8.64	6465.92	0	0	3194.08	0	0
1999	11	20	0.2	0	0	8.64	6474.56	0	0	3185.44	0	0
1999	11	21	7.2	0	0	8.64	6483.2	0	0	3176.8	0	0
1999	11	22	12.2	0.43	516.731	8.64	5975.109	0	0	3684.891	0	0
1999	11	23	0.4	0	0	8.64	5983.749	0	0	3676.251	0	0
1999	11	24	0	0	0	8.64	5992.389	0	0	3667.611	0	0
1999	11	25	0	0	0	8.64	6001.029	0	0	3658.971	0	0
1999	11	26	0	0	0	8.64	6009.669	0	0	3650.331	0	0
1999	11	27	0	0	0	8.64	6018.309	0	421.691	3641.691	0	0
1999	11	28	0	0	0	8.64	6448.64	0	0	3211.36	0	0
1999	11	29	0.2	0	0	8.64	6457.28	0	0	3202.72	0	0
1999	11	30	0	0	0	8.64	6465.92	0	0	3194.08	0	0
1999	12	1	2.8	0	0	10.368	6476.288	0	0	3183.712	0	0
1999	12	2	0	0	0	10.368	6486.656	0	0	3173.344	0	0
1999	12	3	23.4	0.56	1290.744	10.368	5206.28	0	0	4453.72	0	0
1999	12	4	0.6	0	0	10.368	5216.648	0	0	4443.352	0	0
1999	12	5	0	0	0	10.368	5227.016	0	0	4432.984	0	0
1999	12	6	0	0	0	10.368	5237.384	0	0	4422.616	0	0
1999	12	7	0	0	0	10.368	5247.752	0	0	4412.248	0	0
1999	12	8	1.6	0	0	10.368	5258.12	0	0	4401.88	0	0
1999	12	9	8	0	0	10.368	5268.488	0	0	4391.512	0	0
1999	12	10	0.2	0	0	10.368	5278.856	0	0	4381.144	0	0
1999	12	11	0	0	0	10.368	5289.224	0	0	4370.776	0	0
1999	12	12	1.2	0	0	10.368	5299.592	0	0	4360.408	0	0
1999	12	13	0	0	0	10.368	5309.96	0	0	4350.04	0	0
1999	12	14	0	0	0	10.368	5320.328	0	0	4339.672	0	0
1999	12	15	0	0	0	10.368	5330.696	0	0	4329.304	0	0
1999	12	16	4.6	0	0	10.368	5341.064	0	0	4318.936	0	0
1999	12	17	0	0	0	10.368	5351.432	0	0	4308.568	0	0
1999	12	18	0	0	0	10.368	5361.8	0	0	4298.2	0	0
1999	12	19	0	0	0	10.368	5372.168	0	0	4287.832	0	0
1999	12	20	0	0	0	10.368	5382.536	0	1057.464	4277.464	0	0
1999	12	21	0	0	0	10.368	6450.368	0	0	3209.632	0	0
1999	12	22	0	0	0	10.368	6460.736	0	0	3199.264	0	0
1999	12	23	0	0	0	10.368	6471.104	0	0	3188.896	0	0
1999	12	24	0	0	0	10.368	6481.472	0	0	3178.528	0	0
1999	12	25	1.2	0	0	10.368	6491.84	0	0	3168.16	0	0
1999	12	26	0	0	0	10.368	6502.208	0	0	3157.792	0	0
1999	12	27	0.2	0	0	10.368	6512.576	0	0	3147.424	0	0
1999	12	28	1.8	0	0	10.368	6522.944	0	0	3137.056	0	0
1999	12	29	0.2	0	0	10.368	6533.312	0	0	3126.688	0	0
1999	12	30	0	0	0	10.368	6543.68	0	0	3116.32	0	0
1999	12	31	2	0	0	10.368	6554.048	0	0	3105.952	0	0
			997.8		45072.221	2362.896		16148.509	30286.384		0	6

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m³)	Evaporation (m³)						
1999	1	1	0	0	0	11.52	2840	0	0	2200	0	
1999	1	2	0	0	0	11.52	2851.52	0	0	8228.48	0	0
1999	1	3	0	0	0	11.52	2863.04	0	0	8216.96	0	0
1999	1	4	0	0	0	11.52	2874.56	0	0	8205.44	0	0
1999	1	5	0	0	0	11.52	2886.08	0	4493.92	8193.92	0	0
1999	1	6	0	0	0	11.52	7391.52	0	0	3688.48	0	0
1999	1	7	0.4	0	0	11.52	7403.04	0	0	3676.96	0	0
1999	1	8	16	0.43	677.68	11.52	6736.88	0	0	4343.12	0	0
1999	1	9	0	0	0	11.52	6748.4	0	0	4331.6	0	0
1999	1	10	0	0	0	11.52	6759.92	0	0	4320.08	0	0
1999	1	11	0	0	0	11.52	6771.44	0	0	4308.56	0	0
1999	1	12	0	0	0	11.52	6782.96	0	597.04	4297.04	0	0
1999	1	13	0	0	0	11.52	7391.52	0	0	3688.48	0	0
1999	1	14	0	0	0	11.52	7403.04	0	0	3676.96	0	0
1999	1	15	0	0	0	11.52	7414.56	0	0	3665.44	0	0
1999	1	16	0	0	0	11.52	7426.08	0	0	3653.92	0	0
1999	1	17	0	0	0	11.52	7437.6	0	0	3642.4	0	0
1999	1	18	0	0	0	11.52	7449.12	0	0	3630.88	0	0
1999	1	19	0	0	0	11.52	7460.64	0	0	3619.36	0	0
1999	1	20	0	0	0	11.52	7472.16	0	0	3607.84	0	0
1999	1	21	0	0	0	11.52	7483.68	0	0	3596.32	0	0
1999	1	22	0	0	0	11.52	7495.2	0	0	3584.8	0	0
1999	1	23	0	0	0	11.52	7506.72	0	0	3573.28	0	0
1999	1	24	0	0	0	11.52	7518.24	0	0	3561.76	0	0
1999	1	25	0	0	0	11.52	7529.76	0	0	3550.24	0	0
1999	1	26	0.8	0	0	11.52	7541.28	0	0	3538.72	0	0
1999	1	27	0	0	0	11.52	7552.8	0	0	3527.2	0	0
1999	1	28	0	0	0	11.52	7564.32	0	0	3515.68	0	0
1999	1	29	0.2	0	0	11.52	7575.84	0	0	3504.16	0	0
1999	1	30	0	0	0	11.52	7587.36	0	0	3492.64	0	0
1999	1	31	0.6	0	0	11.52	7598.88	0	0	3481.12	0	0
1999	2	1	0	0	0	10.224	7609.104	0	0	3470.896	0	0
1999	2	2	0	0	0	10.224	7619.328	0	0	3460.672	0	0
1999	2	3	0	0	0	10.224	7629.552	0	0	3450.448	0	0
1999	2	4	0	0	0	10.224	7639.776	0	0	3440.224	0	0
1999	2	5	0	0	0	10.224	7650	0	0	3430	0	0
1999	2	6	0.8	0	0	10.224	7660.224	0	0	3419.776	0	0
1999	2	7	0	0	0	10.224	7670.448	0	0	3409.552	0	0
1999	2	8	0	0	0	10.224	7680.672	0	0	3399.328	0	0
1999	2	9	0	0	0	10.224	7690.896	0	0	3389.104	0	0
1999	2	10	0	0	0	10.224	7701.12	0	0	3378.88	0	0
1999	2	11	0.4	0	0	10.224	7711.344	0	0	3368.656	0	0
1999	2	12	0	0	0	10.224	7721.568	0	0	3358.432	0	0
1999	2	13	0	0	0	10.224	7731.792	0	0	3348.208	0	0
1999	2	14	0	0	0	10.224	7742.016	0	0	3337.984	0	0
1999	2	15	0	0	0	10.224	7752.24	0	0	3327.76	0	0
1999	2	16	0	0	0	10.224	7762.464	0	0	3317.536	0	0
1999	2	17	0	0	0	10.224	7772.688	0	0	3307.312	0	0
1999	2	18	3.4	0	0	10.224	7782.912	0	0	3297.088	0	0
1999	2	19	0	0	0	10.224	7793.136	0	0	3286.864	0	0
1999	2	20	0	0	0	10.224	7803.36	0	0	3276.64	0	0
1999	2	21	0	0	0	10.224	7813.584	0	0	3266.416	0	0
1999	2	22	0	0	0	10.224	7823.808	0	0	3256.192	0	0
1999	2	23	0	0	0	10.224	7834.032	0	0	3245.968	0	0
1999	2	24	0	0	0	10.224	7844.256	0	0	3235.744	0	0
1999	2	25	0	0	0	10.224	7854.48	0	0	3225.52	0	0
1999	2	26	0	0	0	10.224	7864.704	0	0	3215.296	0	0
1999	2	27	0	0	0	10.224	7874.928	0	0	3205.072	0	0
1999	2	28	0	0	0	10.224	7885.152	0	0	3194.848	0	0
1999	3	1	0	0	0	8.352	7893.504	0	0	3186.496	0	0
1999	3	2	0	0	0	8.352	7901.856	0	0	3178.144	0	0
1999	3	3	0	0	0	8.352	7910.208	0	0	3169.792	0	0
1999	3	4	0	0	0	8.352	7918.56	0	0	3161.44	0	0
1999	3	5	0	0	0	8.352	7926.912	0	0	3153.088	0	0
1999	3	6	0	0	0	8.352	7935.264	0	0	3144.736	0	0
1999	3	7	19.6	0.43	830.158	8.352	7113.458	0	0	3966.542	0	0
1999	3	8	0.2	0	0	8.352	7121.81	0	0	3958.19	0	0
1999	3	9	0	0	0	8.352	7130.162	0	0	3949.838	0	0
1999	3	10	0	0	0	8.352	7138.514	0	0	3941.486	0	0
1999	3	11	0	0	0	8.352	7146.866	0	0	3933.134	0	0
1999	3	12	0	0	0	8.352	7155.218	0	224.782	3924.782	0	0
1999	3	13	0	0	0	8.352	7388.352	0	0	3691.648	0	0
1999	3	14	0	0	0	8.352	7396.704	0	0	3683.296	0	0
1999	3	15	0	0	0	8.352	7405.056	0	0	3674.944	0	0
1999	3	16	0	0	0	8.352	7413.408	0	0	3666.592	0	0
1999	3	17	0	0	0	8.352	7421.76	0	0	3658.24	0	0
1999	3	18	11	0.43	465.905	8.352	6964.207	0	0	4115.793	0	0
1999	3	19	1.6	0	0	8.352	6972.559	0	0	4107.441	0	0
1999	3	20	0	0	0	8.352	6980.911	0	0	4099.089	0	0
1999	3	21	48	0.74	3498.72	8.352	3490.543	0	0	7589.457	0	0
1999	3	22	2.6	0	0	8.352	3498.895	0	0	7581.105	0	0
1999	3	23	0	0	0	8.352	3507.247	0	0	7572.753	0	0
1999	3	24	0	0	0	8.352	3515.599	0	0	7564.401	0	0
1999	3	25	11	0.43	465.905	8.352	3058.046	0	0	8021.954	0	0
1999	3	26	2.8	0	0	8.352	3066.398	0	0	8013.602	0	0
1999	3	27	0	0	0	8.352	3074.75	0	0	8005.25	0	0
1999	3	28	4.6	0	0	8.352	3083.102	0	0	7996.898	0	0
1999	3	29	0	0	0	8.352	3091.454	0	0	7988.546	0	0
1999	3	30	0	0	0	8.352	3099.806	0	0	7980.194	0	0
1999	3	31	1.8	0	0	8.352	3108.158	0	0	7971.842	0	0
1999	4	1	0	0	0	5.328	3113.486	0	0	7966.514	0	0
1999	4	2	0	0	0	5.328	3118.814	0	0	7961.186	0	0
1999	4	3	0	0	0	5.328	3124.142	0	0	7955.858	0	0
1999	4	4	1.2	0	0	5.328	3129.47	0	0	7950.53	0	0
1999	4	5	3.2	0	0	5.328	3134.798	0	0	7945.202	0	0
1999	4	6	0	0	0	5.328	3140.126	0	0	7939.874	0	0
1999	4	7	0	0	0	5.328	3145.454	0	0	7934.546	0	0
1999	4	8	0	0	0	5.328	3150.782	0	0	7929.218	0	0
1999	4	9	0	0	0	5.328	3156.11	0	4223.89	7923.89	0	0
1999	4	10	0	0	0	5.328	7385.328	0	0	3694.672	0	0
1999	4	11	0	0	0	5.328	7390.656	0	0	3689.344	0	0
1999	4	12	0	0	0	5.328	7395.984	0	0	3684.016	0	0
1999	4	13	0	0	0	5.328	7401.312	0	0	3678.688	0	0
1999	4	14	0	0	0	5.328	7406.64	0	0	3673.36	0	0
1999	4	15	0	0	0	5.328	7411.968	0	0	3668.032	0	0
1999	4	16	0	0	0	5.328	7417.296	0	0	3662.704	0	0
1999	4	17	0	0	0	5.328	7422.624	0	0	3657.376	0	0
1999	4	18	0	0	0	5.328	7427.952	0	0	3652.048	0	0
1999	4	19	0	0	0	5.328	7433.28	0	0	3646.72	0	0
1999	4	20	6.8	0	0	5.328	7438.608	0	0	3641.392	0	0
1999	4	21	4.2	0	0	5.328	7443.936	0	0	3636.064	0	0
1999	4	22	0	0	0	5.328	7449.264	0	0	3630.736	0	0
1999	4	23	0	0	0	5.328	7454.592	0	0	3625.408	0	0
1999	4	24	0	0	0	5.328	7459.92	0	0	3620.08	0	0
1999	4	25	0	0	0	5.328	7465.248	0	0	3614.752	0	0

1999	4	26	0	0	0	5.328	7470.576	0	0	3609.424	0	0
1999	4	27	1.2	0	0	5.328	7475.904	0	0	3604.096	0	0
1999	4	28	0.6	0	0	5.328	7481.232	0	0	3598.768	0	0
1999	4	29	0.2	0	0	5.328	7486.56	0	0	3593.44	0	0
1999	4	30	0	0	0	5.328	7491.888	0	0	3588.112	0	0
1999	5	1	0	0	0	3.456	7495.344	0	0	3584.656	0	0
1999	5	2	0	0	0	3.456	7498.8	0	0	3581.2	0	0
1999	5	3	0	0	0	3.456	7502.256	0	0	3577.744	0	0
1999	5	4	0	0	0	3.456	7505.712	0	0	3574.288	0	0
1999	5	5	0	0	0	3.456	7509.168	0	0	3570.832	0	0
1999	5	6	0	0	0	3.456	7512.624	0	0	3567.376	0	0
1999	5	7	0	0	0	3.456	7516.08	0	0	3563.92	0	0
1999	5	8	0	0	0	3.456	7519.536	0	0	3560.464	0	0
1999	5	9	0	0	0	3.456	7522.992	0	0	3557.008	0	0
1999	5	10	0.4	0	0	3.456	7526.448	0	0	3553.552	0	0
1999	5	11	0	0	0	3.456	7529.904	0	0	3550.096	0	0
1999	5	12	11.6	0.43	491.318	3.456	7042.042	0	0	4037.958	0	0
1999	5	13	30.4	0.69	2066.136	3.456	4979.362	0	0	6100.638	0	0
1999	5	14	0.6	0	0	3.456	4982.818	0	0	6097.182	0	0
1999	5	15	0	0	0	3.456	4986.274	0	0	6093.726	0	0
1999	5	16	42.8	0.74	3119.692	3.456	1870.038	0	0	9209.962	0	0
1999	5	17	0	0	0	3.456	1873.494	0	0	9206.506	0	0
1999	5	18	0.8	0	0	3.456	1876.95	0	0	9203.05	0	0
1999	5	19	0	0	0	3.456	1880.406	0	0	9199.594	0	0
1999	5	20	0	0	0	3.456	1883.862	0	0	9196.138	0	0
1999	5	21	6.4	0	0	3.456	1887.318	0	0	9192.682	0	0
1999	5	22	5.2	0	0	3.456	1890.774	0	0	9189.226	0	0
1999	5	23	44.2	0.74	3221.738	3.456	-1327.508	1327.508	0	11080	0	0
1999	5	24	15.8	0.43	669.209	3.456	-665.753	665.753	0	11080	0	0
1999	5	25	78	0.81	6223.23	3.456	-6219.774	6219.774	0	11080	0	0
1999	5	26	11.4	0.43	482.847	3.456	-479.391	479.391	0	11080	0	0
1999	5	27	1.6	0	0	3.456	3.456	0	0	11076.544	0	1
1999	5	28	0	0	0	3.456	6.912	0	0	11073.088	0	0
1999	5	29	14	0.43	592.97	3.456	-582.602	582.602	0	11080	0	0
1999	5	30	10.4	0.43	440.492	3.456	-437.036	437.036	0	11080	0	0
1999	5	31	13.2	0.43	559.086	3.456	-555.63	555.63	0	11080	0	0
1999	6	1	0	0	0	2.592	2.592	0	0	11077.408	0	1
1999	6	2	0.2	0	0	2.592	5.184	0	0	11074.816	0	0
1999	6	3	0.2	0	0	2.592	7.776	0	0	11072.224	0	0
1999	6	4	0	0	0	2.592	10.368	0	0	11069.632	0	0
1999	6	5	12.8	0.43	542.144	2.592	-529.184	529.184	0	11080	0	0
1999	6	6	1.4	0	0	2.592	2.592	0	0	11077.408	0	1
1999	6	7	8.2	0	0	2.592	5.184	0	0	11074.816	0	0
1999	6	8	0.2	0	0	2.592	7.776	0	0	11072.224	0	0
1999	6	9	0.2	0	0	2.592	10.368	0	0	11069.632	0	0
1999	6	10	7.2	0	0	2.592	12.96	0	0	11067.04	0	0
1999	6	11	0	0	0	2.592	15.552	0	0	11064.448	0	0
1999	6	12	0	0	0	2.592	18.144	0	0	11061.856	0	0
1999	6	13	36.2	0.69	2460.333	2.592	-2439.597	2439.597	0	11080	0	0
1999	6	14	0	0	0	2.592	2.592	0	0	11077.408	0	0
1999	6	15	16.6	0.43	703.093	2.592	-697.909	697.909	0	11080	0	0
1999	6	16	5	0	0	2.592	2.592	0	0	11077.408	0	1
1999	6	17	0.4	0	0	2.592	5.184	0	0	11074.816	0	0
1999	6	18	14.8	0.43	626.854	2.592	-619.078	619.078	0	11080	0	0
1999	6	19	2.4	0	0	2.592	2.592	0	0	11077.408	0	1
1999	6	20	0.2	0	0	2.592	5.184	0	0	11074.816	0	0
1999	6	21	4.4	0	0	2.592	7.776	0	0	11072.224	0	0
1999	6	22	0.6	0	0	2.592	10.368	0	0	11069.632	0	0
1999	6	23	0.4	0	0	2.592	12.96	0	0	11067.04	0	0
1999	6	24	0.2	0	0	2.592	15.552	0	0	11064.448	0	0
1999	6	25	7.6	0	0	2.592	18.144	0	0	11061.856	0	0
1999	6	26	3.8	0	0	2.592	20.736	0	0	11059.264	0	0
1999	6	27	0	0	0	2.592	23.328	0	0	11056.672	0	0
1999	6	28	0.2	0	0	2.592	25.92	0	0	11054.08	0	0
1999	6	29	0	0	0	2.592	28.512	0	0	11051.488	0	0
1999	6	30	16.2	0.43	686.151	2.592	-655.047	655.047	0	11080	0	0
1999	7	1	0.6	0	0	2.448	2.448	0	0	11077.552	0	1
1999	7	2	4.8	0	0	2.448	4.896	0	0	11075.104	0	0
1999	7	3	0.4	0	0	2.448	7.344	0	0	11072.656	0	0
1999	7	4	0	0	0	2.448	9.792	0	0	11070.208	0	0
1999	7	5	0	0	0	2.448	12.24	0	0	11067.76	0	0
1999	7	6	0	0	0	2.448	14.688	0	0	11065.312	0	0
1999	7	7	0	0	0	2.448	17.136	0	7362.864	11062.864	0	0
1999	7	8	2	0	0	2.448	7382.448	0	0	3697.552	0	0
1999	7	9	18.6	0.43	787.803	2.448	6597.093	0	0	4482.907	0	0
1999	7	10	0	0	0	2.448	6599.541	0	0	4480.459	0	0
1999	7	11	0	0	0	2.448	6601.989	0	0	4478.011	0	0
1999	7	12	0.4	0	0	2.448	6604.437	0	0	4475.563	0	0
1999	7	13	0.4	0	0	2.448	6606.885	0	0	4473.115	0	0
1999	7	14	0.4	0	0	2.448	6609.333	0	0	4470.667	0	0
1999	7	15	0.2	0	0	2.448	6611.781	0	0	4468.219	0	0
1999	7	16	0	0	0	2.448	6614.229	0	0	4465.771	0	0
1999	7	17	0	0	0	2.448	6616.677	0	0	4463.323	0	0
1999	7	18	0	0	0	2.448	6619.125	0	0	4460.875	0	0
1999	7	19	0	0	0	2.448	6621.573	0	758.427	4458.427	0	0
1999	7	20	30.2	0.69	2052.543	2.448	5329.905	0	0	5750.095	0	0
1999	7	21	5.8	0	0	2.448	5332.353	0	0	5747.647	0	0
1999	7	22	5.8	0	0	2.448	5334.801	0	0	5745.199	0	0
1999	7	23	0	0	0	2.448	5337.249	0	0	5742.751	0	0
1999	7	24	0	0	0	2.448	5339.697	0	0	5740.303	0	0
1999	7	25	0	0	0	2.448	5342.145	0	0	5737.855	0	0
1999	7	26	0.8	0	0	2.448	5344.593	0	0	5735.407	0	0
1999	7	27	0	0	0	2.448	5347.041	0	0	5732.959	0	0
1999	7	28	0	0	0	2.448	5349.489	0	0	5730.511	0	0
1999	7	29	0	0	0	2.448	5351.937	0	0	5728.063	0	0
1999	7	30	0.2	0	0	2.448	5354.385	0	0	5725.615	0	0
1999	7	31	0.6	0	0	2.448	5356.833	0	0	5723.167	0	0
1999	8	1	0	0	0	3.312	5360.145	0	0	5719.855	0	0
1999	8	2	0	0	0	3.312	5363.457	0	0	5716.543	0	0
1999	8	3	0	0	0	3.312	5366.769	0	0	5713.231	0	0
1999	8	4	0	0	0	3.312	5370.081	0	2009.919	5709.919	0	0
1999	8	5	0	0	0	3.312	7383.312	0	0	3696.688	0	0
1999	8	6	0	0	0	3.312	7386.624	0	0	3693.376	0	0
1999	8	7	0	0	0	3.312	7389.936	0	0	3690.064	0	0
1999	8	8	21	0.56	1158.36	3.312	6234.888	0	0	4845.112	0	0
1999	8	9	24	0.56	1323.84	3.312	4914.36	0	0	6165.64	0	0
1999	8	10	4	0	0	3.312	4917.672	0	0	6162.328	0	0
1999	8	11	0	0	0	3.312	4920.984	0	0	6159.016	0	0
1999	8	12	0.6	0	0	3.312	4924.296	0	0	6155.704	0	0
1999	8	13	1.2	0	0	3.312	4927.608	0	0	6152.392	0	0
1999	8	14	0	0	0	3.312	4930.92	0	0	6149.08	0	0
1999	8	15	5	0	0	3.312	4934.232	0	0	6145.768	0	0
1999	8	16	0	0	0	3.312	4937.544	0	0	6142.456	0	0
1999	8	17	0.2	0	0	3.312	4940.856	0	0	6139.144	0	0
1999	8	18	0	0	0	3.312	4944.168	0	0	6135.832	0	0
1999	8	19	0	0	0	3.312	4947.48	0	0	6132.52	0	0
1999	8	20	0	0	0	3.312	4950.792	0	0	6129.208	0	0
1999	8	21	0	0	0	3.312	4954.104	0	2425.896	6125.896	0	0
1999	8	22	0	0	0	3.312	7383.312	0	0	3696.688	0	0
1999	8	23	0	0	0	3.312	7386.624	0	0	3693.376	0	0

1999	8	24	0.2	0	0	3.312	7389.936	0	0	3690.064	0	0
1999	8	25	0	0	0	3.312	7393.248	0	0	3686.752	0	0
1999	8	26	0.6	0	0	3.312	7396.56	0	0	3683.44	0	0
1999	8	27	4.6	0	0	3.312	7399.872	0	0	3680.128	0	0
1999	8	28	0	0	0	3.312	7403.184	0	0	3676.816	0	0
1999	8	29	0	0	0	3.312	7406.496	0	0	3673.504	0	0
1999	8	30	0.4	0	0	3.312	7409.808	0	0	3670.192	0	0
1999	8	31	0	0	0	3.312	7413.12	0	0	3666.88	0	0
1999	9	1	0	0	0	4.896	7418.016	0	0	3661.984	0	0
1999	9	2	0	0	0	4.896	7422.912	0	0	3657.088	0	0
1999	9	3	0	0	0	4.896	7427.808	0	0	3652.192	0	0
1999	9	4	36.2	0.69	2460.333	4.896	4972.371	0	0	6107.629	0	0
1999	9	5	0	0	0	4.896	4977.267	0	0	6102.733	0	0
1999	9	6	10.8	0.43	457.434	4.896	4524.729	0	0	6555.271	0	0
1999	9	7	0.4	0	0	4.896	4529.625	0	0	6550.375	0	0
1999	9	8	0	0	0	4.896	4534.521	0	0	6545.479	0	0
1999	9	9	0	0	0	4.896	4539.417	0	0	6540.583	0	0
1999	9	10	0	0	0	4.896	4544.313	0	0	6535.687	0	0
1999	9	11	4.6	0	0	4.896	4549.209	0	0	6530.791	0	0
1999	9	12	0.4	0	0	4.896	4554.105	0	0	6525.895	0	0
1999	9	13	2.2	0	0	4.896	4559.001	0	0	6520.999	0	0
1999	9	14	0	0	0	4.896	4563.897	0	0	6516.103	0	0
1999	9	15	0.2	0	0	4.896	4568.793	0	0	6511.207	0	0
1999	9	16	13.8	0.43	584.499	4.896	3989.19	0	0	7090.81	0	0
1999	9	17	26.8	0.56	1478.288	4.896	2515.798	0	0	8564.202	0	0
1999	9	18	2	0	0	4.896	2520.694	0	0	8559.306	0	0
1999	9	19	0	0	0	4.896	2525.59	0	0	8554.41	0	0
1999	9	20	0.2	0	0	4.896	2530.486	0	0	8549.514	0	0
1999	9	21	0	0	0	4.896	2535.382	0	0	8544.618	0	0
1999	9	22	0	0	0	4.896	2540.278	0	0	8539.722	0	0
1999	9	23	0	0	0	4.896	2545.174	0	0	8534.826	0	0
1999	9	24	0	0	0	4.896	2550.07	0	4829.93	8529.93	0	0
1999	9	25	0	0	0	4.896	7384.896	0	0	3695.104	0	0
1999	9	26	0	0	0	4.896	7389.792	0	0	3690.208	0	0
1999	9	27	0	0	0	4.896	7394.688	0	0	3685.312	0	0
1999	9	28	0	0	0	4.896	7399.584	0	0	3680.416	0	0
1999	9	29	16.8	0.43	711.564	4.896	6692.916	0	0	4387.084	0	0
1999	9	30	0	0	0	4.896	6697.812	0	0	4382.188	0	0
1999	10	1	0	0	0	6.768	6704.58	0	0	4375.42	0	0
1999	10	2	0	0	0	6.768	6711.348	0	0	4368.652	0	0
1999	10	3	21.4	0.56	1180.424	6.768	5537.692	0	0	5542.308	0	0
1999	10	4	0	0	0	6.768	5544.46	0	0	5535.54	0	0
1999	10	5	0	0	0	6.768	5551.228	0	0	5528.772	0	0
1999	10	6	0	0	0	6.768	5557.996	0	0	5522.004	0	0
1999	10	7	0	0	0	6.768	5564.764	0	1815.236	5515.236	0	0
1999	10	8	0	0	0	6.768	7386.768	0	0	3693.232	0	0
1999	10	9	0.8	0	0	6.768	7393.536	0	0	3686.464	0	0
1999	10	10	20.6	0.56	1136.296	6.768	6264.008	0	0	4815.992	0	0
1999	10	11	15.8	0.43	669.209	6.768	5601.567	0	0	5478.433	0	0
1999	10	12	0.4	0	0	6.768	5608.335	0	0	5471.665	0	0
1999	10	13	9.2	0	0	6.768	5615.103	0	0	5464.897	0	0
1999	10	14	7.4	0	0	6.768	5621.871	0	0	5458.129	0	0
1999	10	15	1	0	0	6.768	5628.639	0	0	5451.361	0	0
1999	10	16	0	0	0	6.768	5635.407	0	0	5444.593	0	0
1999	10	17	0	0	0	6.768	5642.175	0	0	5437.825	0	0
1999	10	18	0.4	0	0	6.768	5648.943	0	0	5431.057	0	0
1999	10	19	0.2	0	0	6.768	5655.711	0	0	5424.289	0	0
1999	10	20	0.2	0	0	6.768	5662.479	0	0	5417.521	0	0
1999	10	21	0	0	0	6.768	5669.247	0	0	5410.753	0	0
1999	10	22	0.6	0	0	6.768	5676.015	0	0	5403.985	0	0
1999	10	23	0	0	0	6.768	5682.783	0	0	5397.217	0	0
1999	10	24	0.2	0	0	6.768	5689.551	0	0	5390.449	0	0
1999	10	25	1.2	0	0	6.768	5696.319	0	0	5383.681	0	0
1999	10	26	1.2	0	0	6.768	5703.087	0	0	5376.913	0	0
1999	10	27	3	0	0	6.768	5709.855	0	0	5370.145	0	0
1999	10	28	0.2	0	0	6.768	5716.623	0	0	5363.377	0	0
1999	10	29	0	0	0	6.768	5723.391	0	0	5356.609	0	0
1999	10	30	0	0	0	6.768	5730.159	0	0	5349.841	0	0
1999	10	31	4.6	0	0	6.768	5736.927	0	0	5343.073	0	0
1999	11	1	0	0	0	8.64	5745.567	0	0	5334.433	0	0
1999	11	2	0	0	0	8.64	5754.207	0	0	5325.793	0	0
1999	11	3	0	0	0	8.64	5762.847	0	0	5317.153	0	0
1999	11	4	0.2	0	0	8.64	5771.487	0	0	5308.513	0	0
1999	11	5	0	0	0	8.64	5780.127	0	0	5299.873	0	0
1999	11	6	10.4	0.43	440.492	8.64	5348.275	0	0	5731.725	0	0
1999	11	7	0	0	0	8.64	5356.915	0	0	5723.085	0	0

1999	11	8	5.2	0	0	8.64	5365.555	0	0	5714.445	0	0
1999	11	9	4.4	0	0	8.64	5374.195	0	0	5705.805	0	0
1999	11	10	2.8	0	0	8.64	5382.835	0	0	5697.165	0	0
1999	11	11	1.4	0	0	8.64	5391.475	0	0	5688.525	0	0
1999	11	12	0.2	0	0	8.64	5400.115	0	0	5679.885	0	0
1999	11	13	0	0	0	8.64	5408.755	0	0	5671.245	0	0
1999	11	14	0	0	0	8.64	5417.395	0	0	5662.605	0	0
1999	11	15	0	0	0	8.64	5426.035	0	0	5653.965	0	0
1999	11	16	0	0	0	8.64	5434.675	0	1945.325	5645.325	0	0
1999	11	17	0	0	0	8.64	7388.64	0	0	3691.36	0	0
1999	11	18	0	0	0	8.64	7397.28	0	0	3682.72	0	0
1999	11	19	0	0	0	8.64	7405.92	0	0	3674.08	0	0
1999	11	20	0.2	0	0	8.64	7414.56	0	0	3665.44	0	0
1999	11	21	7.2	0	0	8.64	7423.2	0	0	3656.8	0	0
1999	11	22	12.2	0.43	516.731	8.64	6915.109	0	0	4164.891	0	0
1999	11	23	0.4	0	0	8.64	6923.749	0	0	4156.251	0	0
1999	11	24	0	0	0	8.64	6932.389	0	0	4147.611	0	0
1999	11	25	0	0	0	8.64	6941.029	0	0	4138.971	0	0
1999	11	26	0	0	0	8.64	6949.669	0	0	4130.331	0	0
1999	11	27	0	0	0	8.64	6958.309	0	421.691	4121.691	0	0
1999	11	28	0	0	0	8.64	7388.64	0	0	3691.36	0	0
1999	11	29	0.2	0	0	8.64	7397.28	0	0	3682.72	0	0
1999	11	30	0	0	0	8.64	7405.92	0	0	3674.08	0	0
1999	12	1	2.8	0	0	10.368	7416.288	0	0	3663.712	0	0
1999	12	2	0	0	0	10.368	7426.656	0	0	3653.344	0	0
1999	12	3	23.4	0.56	1290.744	10.368	6146.28	0	0	4933.72	0	0
1999	12	4	0.6	0	0	10.368	6156.648	0	0	4923.352	0	0
1999	12	5	0	0	0	10.368	6167.016	0	0	4912.984	0	0
1999	12	6	0	0	0	10.368	6177.384	0	0	4902.616	0	0
1999	12	7	0	0	0	10.368	6187.752	0	0	4892.248	0	0
1999	12	8	1.6	0	0	10.368	6198.12	0	0	4881.88	0	0
1999	12	9	8	0	0	10.368	6208.488	0	0	4871.512	0	0
1999	12	10	0.2	0	0	10.368	6218.856	0	0	4861.144	0	0
1999	12	11	0	0	0	10.368	6229.224	0	0	4850.776	0	0
1999	12	12	1.2	0	0	10.368	6239.592	0	0	4840.408	0	0
1999	12	13	0	0	0	10.368	6249.96	0	0	4830.04	0	0
1999	12	14	0	0	0	10.368	6260.328	0	0	4819.672	0	0
1999	12	15	0	0	0	10.368	6270.696	0	0	4809.304	0	0
1999	12	16	4.6	0	0	10.368	6281.064	0	0	4798.936	0	0
1999	12	17	0	0	0	10.368	6291.432	0	0	4788.568	0	0
1999	12	18	0	0	0	10.368	6301.8	0	0	4778.2	0	0
1999	12	19	0	0	0	10.368	6312.168	0	0	4767.832	0	0
1999	12	20	0	0	0	10.368	6322.536	0	1057.464	4757.464	0	0
1999	12	21	0	0	0	10.368	7390.368	0	0	3689.632	0	0
1999	12	22	0	0	0	10.368	7400.736	0	0	3679.264	0	0
1999	12	23	0	0	0	10.368	7411.104	0	0	3668.896	0	0
1999	12	24	0	0	0	10.368	7421.472	0	0	3658.528	0	0
1999	12	25	1.2	0	0	10.368	7431.84	0	0	3648.16	0	0
1999	12	26	0	0	0	10.368	7442.208	0	0	3637.792	0	0
1999	12	27	0.2	0	0	10.368	7452.576	0	0	3627.424	0	0
1999	12	28	1.8	0	0	10.368	7462.944	0	0	3617.056	0	0
1999	12	29	0.2	0	0	10.368	7473.312	0	0	3606.688	0	0
1999	12	30	0	0	0	10.368	7483.68	0	0	3596.32	0	0
1999	12	31	2	0	0	10.368	7494.048	0	0	3585.952	0	0
			997.8		45072.221	2362.896		15208.509	32166.384		0	6

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient Cv	Inputs Overland Flow Quarry (m^3)	Outputs Evaporation (m^3)	Estimated Sediment Dam Available Capacity (m^3)	Adjusted Sediment Dam Available Capacity (m^3)	Predicted Frequency of Event Discharge from Sediment Dam	Uncontrolled Flow Discharged from Sediment Dam (m^3)	Volume of Controlled Flow Discharged from Sediment Dam (m^3)	Controlled Flow Discharged from Sediment Dam (m^3)	Volume of Sediment Water Remaining (m^3)	Days Basin is empty	Predicted Frequency of Uncontrolled Discharge	Overflow events
1999	1	1	0	0	0	11.52	10990	10990	0	0	0	0	10990	0	0	
1999	1	2	0	0	0	11.52	11001.52	11001.52	0	0	0	0	5478.48	0	0	0
1999	1	3	0	0	0	11.52	11013.04	11013.04	0	0	0	0	5466.96	0	0	0
1999	1	4	0	0	0	11.52	11024.56	11024.56	0	0	0	0	5455.44	0	0	0
1999	1	5	0	0	0	11.52	11036.08	11036.08	0	0	-46.08	0	5443.92	0	0	0
1999	1	6	0	0	0	11.52	11047.6	11047.6	0	0	-57.6	0	5432.4	0	0	0
1999	1	7	0.4	0	0	11.52	11059.12	11059.12	0	0	0	0	5420.88	0	0	0
1999	1	8	16	0.43	677.68	11.52	10392.96	10392.96	0	0	0	0	6087.04	0	0	0
1999	1	9	0	0	0	11.52	10404.48	10404.48	0	0	0	0	6075.52	0	0	0
1999	1	10	0	0	0	11.52	10416	10416	0	0	0	0	6064	0	0	0
1999	1	11	0	0	0	11.52	10427.52	10427.52	0	0	0	0	6052.48	0	0	0
1999	1	12	0	0	0	11.52	10439.04	10439.04	0	0	550.96	550.96	6040.96	0	0	0
1999	1	13	0	0	0	11.52	11001.52	11001.52	0	0	-11.52	0	5478.48	0	0	0
1999	1	14	0	0	0	11.52	11013.04	11013.04	0	0	-23.04	0	5466.96	0	0	0
1999	1	15	0	0	0	11.52	11024.56	11024.56	0	0	-34.56	0	5455.44	0	0	0
1999	1	16	0	0	0	11.52	11036.08	11036.08	0	0	-46.08	0	5443.92	0	0	0
1999	1	17	0	0	0	11.52	11047.6	11047.6	0	0	-57.6	0	5432.4	0	0	0
1999	1	18	0	0	0	11.52	11059.12	11059.12	0	0	-69.12	0	5420.88	0	0	0
1999	1	19	0	0	0	11.52	11070.64	11070.64	0	0	-80.64	0	5409.36	0	0	0
1999	1	20	0	0	0	11.52	11082.16	11082.16	0	0	-92.16	0	5397.84	0	0	0
1999	1	21	0	0	0	11.52	11093.68	11093.68	0	0	-103.68	0	5386.32	0	0	0
1999	1	22	0	0	0	11.52	11105.2	11105.2	0	0	-115.2	0	5374.8	0	0	0
1999	1	23	0	0	0	11.52	11116.72	11116.72	0	0	-126.72	0	5363.28	0	0	0
1999	1	24	0	0	0	11.52	11128.24	11128.24	0	0	-138.24	0	5351.76	0	0	0
1999	1	25	0	0	0	11.52	11139.76	11139.76	0	0	-149.76	0	5340.24	0	0	0
1999	1	26	0.8	0	0	11.52	11151.28	11151.28	0	0	0	0	5328.72	0	0	0
1999	1	27	0	0	0	11.52	11162.8	11162.8	0	0	0	0	5317.2	0	0	0
1999	1	28	0	0	0	11.52	11174.32	11174.32	0	0	0	0	5305.68	0	0	0
1999	1	29	0.2	0	0	11.52	11185.84	11185.84	0	0	0	0	5294.16	0	0	0
1999	1	30	0	0	0	11.52	11197.36	11197.36	0	0	0	0	5282.64	0	0	0
1999	1	31	0.6	0	0	11.52	11208.88	11208.88	0	0	0	0	5271.12	0	0	0
1999	2	1	0	0	0	10.224	11219.104	11219.104	0	0	0	0	5260.896	0	0	0
1999	2	2	0	0	0	10.224	11229.328	11229.328	0	0	0	0	5250.672	0	0	0
1999	2	3	0	0	0	10.224	11239.552	11239.552	0	0	0	0	5240.448	0	0	0
1999	2	4	0	0	0	10.224	11249.776	11249.776	0	0	-259.776	0	5230.224	0	0	0
1999	2	5	0	0	0	10.224	11260	11260	0	0	-270	0	5220	0	0	0
1999	2	6	0.8	0	0	10.224	11270.224	11270.224	0	0	0	0	5209.776	0	0	0
1999	2	7	0	0	0	10.224	11280.448	11280.448	0	0	0	0	5199.552	0	0	0
1999	2	8	0	0	0	10.224	11290.672	11290.672	0	0	0	0	5189.328	0	0	0
1999	2	9	0	0	0	10.224	11300.896	11300.896	0	0	0	0	5179.104	0	0	0
1999	2	10	0	0	0	10.224	11311.12	11311.12	0	0	-321.12	0	5168.88	0	0	0
1999	2	11	0.4	0	0	10.224	11321.344	11321.344	0	0	0	0	5158.656	0	0	0
1999	2	12	0	0	0	10.224	11331.568	11331.568	0	0	0	0	5148.432	0	0	0
1999	2	13	0	0	0	10.224	11341.792	11341.792	0	0	0	0	5138.208	0	0	0
1999	2	14	0	0	0	10.224	11352.016	11352.016	0	0	0	0	5127.984	0	0	0
1999	2	15	0	0	0	10.224	11362.24	11362.24	0	0	-372.24	0	5117.76	0	0	0
1999	2	16	0	0	0	10.224	11372.464	11372.464	0	0	-382.464	0	5107.536	0	0	0
1999	2	17	0	0	0	10.224	11382.688	11382.688	0	0	-392.688	0	5097.312	0	0	0
1999	2	18	3.4	0	0	10.224	11392.912	11392.912	0	0	0	0	5087.088	0	0	0
1999	2	19	0	0	0	10.224	11403.136	11403.136	0	0	0	0	5076.864	0	0	0
1999	2	20	0	0	0	10.224	11413.36	11413.36	0	0	0	0	5066.64	0	0	0
1999	2	21	0	0	0	10.224	11423.584	11423.584	0	0	0	0	5056.416	0	0	0
1999	2	22	0	0	0	10.224	11433.808	11433.808	0	0	-443.808	0	5046.192	0	0	0
1999	2	23	0	0	0	10.224	11444.032	11444.032	0	0	-454.032	0	5035.968	0	0	0
1999	2	24	0	0	0	10.224	11454.256	11454.256	0	0	-464.256	0	5025.744	0	0	0
1999	2	25	0	0	0	10.224	11464.48	11464.48	0	0	-474.48	0	5015.52	0	0	0
1999	2	26	0	0	0	10.224	11474.704	11474.704	0	0	-484.704	0	5005.296	0	0	0
1999	2	27	0	0	0	10.224	11484.928	11484.928	0	0	-494.928	0	4995.072	0	0	0
1999	2	28	0	0	0	10.224	11495.152	11495.152	0	0	-505.152	0	4984.848	0	0	0
1999	3	1	0	0	0	8.352	11503.504	11503.504	0	0	-513.504	0	4976.496	0	0	0
1999	3	2	0	0	0	8.352	11511.856	11511.856	0	0	-521.856	0	4968.144	0	0	0
1999	3	3	0	0	0	8.352	11520.208	11520.208	0	0	-530.208	0	4959.792	0	0	0
1999	3	4	0	0	0	8.352	11528.56	11528.56	0	0	-538.56	0	4951.44	0	0	0
1999	3	5	0	0	0	8.352	11536.912	11536.912	0	0	-546.912	0	4943.088	0	0	0
1999	3	6	0	0	0	8.352	11545.264	11545.264	0	0	-555.264	0	4934.736	0	0	0
1999	3	7	19.6	0.43	830.158	8.352	10723.458	10723.458	0	0	0	0	5756.542	0	0	0
1999	3	8	0.2	0	0	8.352	10731.81	10731.81	0	0	0	0	5748.19	0	0	0
1999	3	9	0	0	0	8.352	10740.162	10740.162	0	0	0	0	5739.838	0	0	0
1999	3	10	0	0	0	8.352	10748.514	10748.514	0	0	0	0	5731.486	0	0	0
1999	3	11	0	0	0	8.352	10756.866	10756.866	0	0	0	0	5723.134	0	0	0
1999	3	12	0	0	0	8.352	10765.218	10765.218	0	0	224.782	224.782	5714.782	0	0	0
1999	3	13	0	0	0	8.352	10998.352	10998.352	0	0	-8.352	0	5481.648	0	0	0
1999	3	14	0	0	0	8.352	11006.704	11006.704	0	0	-16.704	0	5473.296	0	0	0
1999	3	15	0	0	0	8.352	11015.056	11015.056	0	0	-25.056	0	5464.944	0	0	0
1999	3	16	0	0	0	8.352	11023.408	11023.408	0	0	-33.408	0	5456.592	0	0	0
1999	3	17	0	0	0	8.352	11031.76	11031.76	0	0	-41.76	0	5448.24	0	0	0
1999	3	18	11	0.43	465.905	8.352	10574.207	10574.207	0	0	0	0	5905.793	0	0	0
1999	3	19	1.6	0	0	8.352	10582.559	10582.559	0	0	0	0	5897.441	0	0	0
1999	3	20	0	0	0	8.352	10590.911	10590.911	0	0	0	0	5889.089	0	0	0
1999	3	21	48	0.74	3498.72	8.352	7100.543	7100.543	0	0	0	0	9379.457	0	0	0
1999	3	22	2.6	0	0	8.352	7108.895	7108.895	0	0	0	0	9371.105	0	0	0
1999	3	23	0	0	0	8.352	7117.247	7117.247	0	0	0	0	9362.753	0	0	0
1999	3	24	0	0	0	8.352	7125.599	7125.599	0	0	0	0	9354.401	0	0	0
1999	3	25	11	0.43	465.905	8.352	6668.046	6668.046	0	0	0	0	9811.954	0	0	0
1999	3	26	2.8	0	0	8.352	6676.398	6676.398	0	0	0	0	9803.602	0	0	0
1999	3	27	0	0	0	8.352	6684.75	6684.75	0	0	0	0	9795.25	0	0	0
1999	3	28	4.6	0	0	8.352	6693.102	6693.102	0	0	0	0	9786.898	0	0	0
1999	3	29	0	0	0	8.352	6701.454	6701.454	0	0	0	0	9778.546	0	0	0
1999	3	30	0	0	0	8.352	6709.806	6709.806	0	0	0	0	9770.194	0	0	0
1999	3	31	1.8	0	0	8.352	6718.158	6718.158	0	0	0	0	9761.842	0	0	0
1999	4	1	0	0	0	5.328	6723.486	6723.486	0	0	0	0	9756.514	0	0	0
1999	4	2	0	0	0	5.328	6728.814	6728.814	0	0	0	0	9751.186	0	0	0
1999	4	3	0	0	0	5.328	6734.142	6734.142	0	0	0	0	9745.858	0	0	0
1999	4	4	1.2	0	0	5.328	6739.47	6739.47	0	0	0	0	9740.53	0	0	0
1999	4	5	3.2	0	0	5.328	6744.798	6744.798	0	0	0	0	9735.202	0	0	0
1999	4	6	0	0	0	5.328	6750.126	6750.126	0	0	0	0	9729.874	0	0	0
1999	4	7	0	0	0	5.328	6755.454	6755.454	0	0	0	0	9724.546	0	0	0
1999	4	8	0	0	0	5.328	6760.782	6760.782	0	0	0	0	9719.218	0	0	0
1999	4	9	0	0	0	5.328	6766.11	6766.11	0	0	4223.89	4223.89	9713.89	0	0	0
1999	4	10	0	0	0	5.328	10995.328	10995.328	0	0	-5.328	0	5484.672	0	0	0
1999	4	11	0	0	0	5.328	11000.656	11000.656	0	0	-10.656	0	5479.344	0	0	0
1999	4	12	0	0	0	5.328	11005.984	11005.984	0	0	-15.984	0	5474.016	0	0	0
1999	4	13	0	0	0	5.328	11011.312	11011.312	0	0	-21.312	0	5468.688	0	0	0
1999	4	14	0	0	0	5.328	11016.64	11016.64	0	0	-26.64	0	5463.36	0	0	0
1999	4	15	0	0	0	5.328	11021.968	11021.968	0	0	-31.968	0	5458.032	0	0	0
1999	4	16	0	0	0	5.328	11027.296	11027.296	0	0	-37.296	0	5452.704	0	0	0
1999	4	17	0	0	0	5.328	11032.624	11032.624	0	0	-42.624	0	5447.376	0	0	0
1999	4	18	0	0	0	5.328	11037.952	11037.952	0	0	-47.952	0	5442.048	0	0	0
1999	4	19	0	0	0	5.328	11043.28	11043.28	0	0	-53.28	0	5436.72	0	0	0
1999	4	20	6.8	0	0	5.328	11048.608	11048.608	0	0	0	0	5431.392	0	0	0
1999	4	21	4.2	0	0	5.328	11053.936	11053.936	0	0	0	0	5426.064	0	0	0
1999	4	22	0	0	0	5.328	11059.264	11059.264	0	0	0	0	5420.736	0	0	0
1999	4	23	0	0	0	5.328	11064.592	11064.592	0	0	0	0	5415.408	0	0	0
1999	4	24	0	0	0	5.328	11069.92	11069.92	0	0	0	0	5410.08	0	0	0
1999	4	25	0	0	0	5.328	11075.248	11075.248	0	0	-85.248	0	5404.752	0	0	0
1999	4	26	0	0	0	5.328	11080.576	11080.576	0	0	-90.576	0	5399.424	0	0	0
1999	4	27	1.2	0	0	5.328	11085.904	11085.904	0	0	0	0	5394.096	0	0	0
1999	4	28	0.6	0	0	5.328	11091.232	11091.232	0	0	0	0	5388.768	0	0	0
1999	4	29	0.2	0	0	5.328	11096.56	11096.56	0	0	0	0	5383.44	0	0	0
1999	4	30	0	0	0	5.328	11101.888	11101.888	0	0	0	0	5378.112	0	0	0
1999	5	1	0	0	0	3.456	11105.344	11105.344	0	0	0	0	5374.656	0	0	0
1999	5	2	0	0	0	3.456	11108.8	11108.8	0	0	0	0	5371.2	0	0	0
1999	5	3	0	0	0	3.456	11112.256	11112.256	0	0	-122.256	0	5367.744	0	0	0
1999	5	4	0	0	0	3.456	11115.712	11115.712	0	0	-125.712	0	5364.288	0	0	0
1999	5	5	0	0	0	3.456	11119.168	11119.168	0	0	-129.168	0	5360.832	0	0	0
1999	5	6	0	0	0	3.456	11122.624	11122.624	0	0	-132.624	0	5357.376	0	0	0
1999	5	7	0	0	0	3.456	11126.08	11126.08	0	0	-136.08	0	5353.92	0	0	0
1999	5	8	0	0	0	3.456	11129.536	11129.536	0	0	-139.536	0	5350.464	0	0	0
1999	5	9	0	0	0	3.456	11132.992	11132.992	0	0	-142.992	0	5347.008	0	0	0
1999	5	10	0.4	0	0	3.456	11136.448	11136.448	0	0	0	0	5343.552	0	0	0
1999	5	11	0	0	0	3.456	11139.904	11139.904	0	0	0	0	5340.096	0	0	0
1999	5	12	11.6	0.43	491.318	3.456	10652.042	10652.042	0	0	0	0	5827.958	0	0	0
1999	5	13	30.4	0.69	2066.136	3.456	8589.362	8589.362	0	0	0	0	7890.638	0	0	0
1999	5	14	0.6	0	0	3.456	8592.818	8592.818	0	0	0	0	7887.182	0	0	0
1999	5	15	0	0	0	3.456	8596.274	8596.274	0	0	0	0	7883.726	0	0	0
1999	5	16	42.8	0.74	3119.692	3.456	5480.038	5480.038	0	0	0	0	10999.962	0	0	0
1999	5	17	0	0	0	3.456	5483.494	5483.494	0	0	0	0	10996.506	0	0	0
1999	5	18	0.8	0	0	3.456	5486.95	5486.95	0	0	0	0	10993.05	0	0	0
1999	5	19	0	0	0	3.456	5490.406	5490.406	0	0	0	0	10989.594	0	0	0
1999	5	20	0	0	0	3.456	5493.862	5493.862	0	0	0	0	10986.138	0	0	0
1999	5	21	6.4	0	0	3.456	5497.318	5497.318	0	0	0	0	10982.682	0	0	0
1999	5	22	5.2	0	0	3.456	5500.774	5500.774	0	0	0	0	10979.226	0	0	0
1999	5	23	44.2	0.74	3221.738	3.456	2282.492	2282.492	0	0	0	0	14197.508	0	0	0
1999	5	24	15.8	0.43	669.209	3.456	1616.739	1616.739	0	0	0	0	14863.261	0	0	0
1999	5	25	78	0.81	6223.23	3.456	-4603.035	0	1	4603.035	0	0	16480	0	1	0
1999	5	26	11.4	0.43	482.847	3.456	-479.391	0	1	479.391	0	0	16480	0	1	0
1999	5	27	1.6	0	0	3.456	3.456	3.456	0	0	0	0	16476.544	0	1	1
1999	5	28	0	0	0	3.456	6.912	6.912	0	0	0	0	16473.088	0	0	0
1999	5	29	14	0.43	592.97	3.456	-582.602	0	1	582.602	0	0	16480	0	1	0
1999	5	30	10.4	0.43	440.492	3.456	-437.036	0	1	437.036	0	0	16480	0	1	0
1999	5	31	13.2	0.43	559.086	3.456	-555.63	0	1	555.63	0	0	16480	0	1	0
1999	6	1	0	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	1
1999	6	2	0.2	0	0	2.592	5.184	5.184	0	0	0	0	16474.816	0	0	0
1999	6	3	0.2	0	0	2.592	7.776	7.776	0	0	0	0	16472.224	0	0	0
1999	6	4	0	0	0	2.592	10.368	10.368	0	0	0	0	16469.632	0	0	0
1999	6	5	12.8	0.43	542.144	2.592	-529.184	0	1	529.184	0	0	16480	0	1	0
1999	6	6	1.4	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	1
1999	6	7	8.2	0	0	2.592	5.184	5.184	0	0	0	0	16474.816	0	0	0

1999	6	8	0.2	0	0	2.592	7.776	7.776	0	0	0	0	16472.224	0	0	0
1999	6	9	0.2	0	0	2.592	10.368	10.368	0	0	0	0	16469.632	0	0	0
1999	6	10	7.2	0	0	2.592	12.96	12.96	0	0	0	0	16467.04	0	0	0
1999	6	11	0	0	0	2.592	15.552	15.552	0	0	0	0	16464.448	0	0	0
1999	6	12	0	0	0	2.592	18.144	18.144	0	0	0	0	16461.856	0	0	0
1999	6	13	36.2	0.69	2460.333	2.592	-2439.597	0	1	2439.597	0	0	16480	0	1	0
1999	6	14	0	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	0
1999	6	15	16.6	0.43	703.093	2.592	-697.909	0	1	697.909	0	0	16480	0	1	0
1999	6	16	5	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	1
1999	6	17	0.4	0	0	2.592	5.184	5.184	0	0	0	0	16474.816	0	0	0
1999	6	18	14.8	0.43	626.854	2.592	-619.078	0	1	619.078	0	0	16480	0	1	0
1999	6	19	2.4	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	1
1999	6	20	0.2	0	0	2.592	5.184	5.184	0	0	0	0	16474.816	0	0	0
1999	6	21	4.4	0	0	2.592	7.776	7.776	0	0	0	0	16472.224	0	0	0
1999	6	22	0.6	0	0	2.592	10.368	10.368	0	0	0	0	16469.632	0	0	0
1999	6	23	0.4	0	0	2.592	12.96	12.96	0	0	0	0	16467.04	0	0	0
1999	6	24	0.2	0	0	2.592	15.552	15.552	0	0	0	0	16464.448	0	0	0
1999	6	25	7.6	0	0	2.592	18.144	18.144	0	0	0	0	16461.856	0	0	0
1999	6	26	3.8	0	0	2.592	20.736	20.736	0	0	0	0	16459.264	0	0	0
1999	6	27	0	0	0	2.592	23.328	23.328	0	0	0	0	16456.672	0	0	0
1999	6	28	0.2	0	0	2.592	25.92	25.92	0	0	0	0	16454.08	0	0	0
1999	6	29	0	0	0	2.592	28.512	28.512	0	0	0	0	16451.488	0	0	0
1999	6	30	16.2	0.43	686.151	2.592	-655.047	0	1	655.047	0	0	16480	0	1	0
1999	7	1	0.6	0	0	2.448	2.448	2.448	0	0	0	0	16477.552	0	1	1
1999	7	2	4.8	0	0	2.448	4.896	4.896	0	0	0	0	16475.104	0	0	0
1999	7	3	0.4	0	0	2.448	7.344	7.344	0	0	0	0	16472.656	0	0	0
1999	7	4	0	0	0	2.448	9.792	9.792	0	0	0	0	16470.208	0	0	0
1999	7	5	0	0	0	2.448	12.24	12.24	0	0	0	0	16467.76	0	0	0
1999	7	6	0	0	0	2.448	14.688	14.688	0	0	0	0	16465.312	0	0	0
1999	7	7	0	0	0	2.448	17.136	17.136	0	0	10972.864	10972.864	16462.864	0	0	0
1999	7	8	2	0	0	2.448	10992.448	10992.448	0	0	0	0	5487.552	0	0	0
1999	7	9	18.6	0.43	787.803	2.448	10207.093	10207.093	0	0	0	0	6272.907	0	0	0
1999	7	10	0	0	0	2.448	10209.541	10209.541	0	0	0	0	6270.459	0	0	0
1999	7	11	0	0	0	2.448	10211.989	10211.989	0	0	0	0	6268.011	0	0	0
1999	7	12	0.4	0	0	2.448	10214.437	10214.437	0	0	0	0	6265.563	0	0	0
1999	7	13	0.4	0	0	2.448	10216.885	10216.885	0	0	0	0	6263.115	0	0	0
1999	7	14	0.4	0	0	2.448	10219.333	10219.333	0	0	0	0	6260.667	0	0	0
1999	7	15	0.2	0	0	2.448	10221.781	10221.781	0	0	0	0	6258.219	0	0	0
1999	7	16	0	0	0	2.448	10224.229	10224.229	0	0	0	0	6255.771	0	0	0
1999	7	17	0	0	0	2.448	10226.677	10226.677	0	0	0	0	6253.323	0	0	0
1999	7	18	0	0	0	2.448	10229.125	10229.125	0	0	0	0	6250.875	0	0	0
1999	7	19	0	0	0	2.448	10231.573	10231.573	0	0	758.427	758.427	6248.427	0	0	0
1999	7	20	30.2	0.69	2052.543	2.448	8939.905	8939.905	0	0	0	0	7540.095	0	0	0
1999	7	21	5.8	0	0	2.448	8942.353	8942.353	0	0	0	0	7537.647	0	0	0
1999	7	22	5.8	0	0	2.448	8944.801	8944.801	0	0	0	0	7535.199	0	0	0
1999	7	23	0	0	0	2.448	8947.249	8947.249	0	0	0	0	7532.751	0	0	0
1999	7	24	0	0	0	2.448	8949.697	8949.697	0	0	0	0	7530.303	0	0	0
1999	7	25	0	0	0	2.448	8952.145	8952.145	0	0	0	0	7527.855	0	0	0
1999	7	26	0.8	0	0	2.448	8954.593	8954.593	0	0	0	0	7525.407	0	0	0
1999	7	27	0	0	0	2.448	8957.041	8957.041	0	0	0	0	7522.959	0	0	0
1999	7	28	0	0	0	2.448	8959.489	8959.489	0	0	0	0	7520.511	0	0	0
1999	7	29	0	0	0	2.448	8961.937	8961.937	0	0	0	0	7518.063	0	0	0
1999	7	30	0.2	0	0	2.448	8964.385	8964.385	0	0	0	0	7515.615	0	0	0
1999	7	31	0.6	0	0	2.448	8966.833	8966.833	0	0	0	0	7513.167	0	0	0
1999	8	1	0	0	0	3.312	8970.145	8970.145	0	0	0	0	7509.855	0	0	0
1999	8	2	0	0	0	3.312	8973.457	8973.457	0	0	0	0	7506.543	0	0	0
1999	8	3	0	0	0	3.312	8976.769	8976.769	0	0	0	0	7503.231	0	0	0
1999	8	4	0	0	0	3.312	8980.081	8980.081	0	0	2009.919	2009.919	7499.919	0	0	0
1999	8	5	0	0	0	3.312	10993.312	10993.312	0	0	-3.312	0	5486.688	0	0	0
1999	8	6	0	0	0	3.312	10996.624	10996.624	0	0	-6.624	0	5483.376	0	0	0
1999	8	7	0	0	0	3.312	10999.936	10999.936	0	0	-9.936	0	5480.064	0	0	0
1999	8	8	21	0.56	1158.36	3.312	9844.888	9844.888	0	0	0	0	6635.112	0	0	0
1999	8	9	24	0.56	1323.84	3.312	8524.36	8524.36	0	0	0	0	7955.64	0	0	0
1999	8	10	4	0	0	3.312	8527.672	8527.672	0	0	0	0	7952.328	0	0	0
1999	8	11	0	0	0	3.312	8530.984	8530.984	0	0	0	0	7949.016	0	0	0
1999	8	12	0.6	0	0	3.312	8534.296	8534.296	0	0	0	0	7945.704	0	0	0
1999	8	13	1.2	0	0	3.312	8537.608	8537.608	0	0	0	0	7942.392	0	0	0
1999	8	14	0	0	0	3.312	8540.92	8540.92	0	0	0	0	7939.08	0	0	0
1999	8	15	5	0	0	3.312	8544.232	8544.232	0	0	0	0	7935.768	0	0	0
1999	8	16	0	0	0	3.312	8547.544	8547.544	0	0	0	0	7932.456	0	0	0
1999	8	17	0.2	0	0	3.312	8550.856	8550.856	0	0	0	0	7929.144	0	0	0
1999	8	18	0	0	0	3.312	8554.168	8554.168	0	0	0	0	7925.832	0	0	0
1999	8	19	0	0	0	3.312	8557.48	8557.48	0	0	0	0	7922.52	0	0	0
1999	8	20	0	0	0	3.312	8560.792	8560.792	0	0	0	0	7919.208	0	0	0
1999	8	21	0	0	0	3.312	8564.104	8564.104	0	0	2425.896	2425.896	7915.896	0	0	0
1999	8	22	0	0	0	3.312	10993.312	10993.312	0	0	-3.312	0	5486.688	0	0	0
1999	8	23	0	0	0	3.312	10996.624	10996.624	0	0	-6.624	0	5483.376	0	0	0
1999	8	24	0.2	0	0	3.312	10999.936	10999.936	0	0	0	0	5480.064	0	0	0
1999	8	25	0	0	0	3.312	11003.248	11003.248	0	0	0	0	5476.752	0	0	0
1999	8	26	0.6	0	0	3.312	11006.56	11006.56	0	0	0	0	5473.44	0	0	0
1999	8	27	4.6	0	0	3.312	11009.872	11009.872	0	0	0	0	5470.128	0	0	0
1999	8	28	0	0	0	3.312	11013.184	11013.184	0	0	0	0	5466.816	0	0	0
1999	8	29	0	0	0	3.312	11016.496	11016.496	0	0	0	0	5463.504	0	0	0
1999	8	30	0.4	0	0	3.312	11019.808	11019.808	0	0	0	0	5460.192	0	0	0
1999	8	31	0	0	0	3.312	11023.12	11023.12	0	0	0	0	5456.88	0	0	0
1999	9	1	0	0	0	4.896	11028.016	11028.016	0	0	0	0	5451.984	0	0	0
1999	9	2	0	0	0	4.896	11032.912	11032.912	0	0	0	0	5447.088	0	0	0
1999	9	3	0	0	0	4.896	11037.808	11037.808	0	0	-47.808	0	5442.192	0	0	0
1999	9	4	36.2	0.69	2460.333	4.896	8582.371	8582.371	0	0	0	0	7897.629	0	0	0
1999	9	5	0	0	0	4.896	8587.267	8587.267	0	0	0	0	7892.733	0	0	0
1999	9	6	10.8	0.43	457.434	4.896	8134.729	8134.729	0	0	0	0	8345.271	0	0	0
1999	9	7	0.4	0	0	4.896	8139.625	8139.625	0	0	0	0	8340.375	0	0	0
1999	9	8	0	0	0	4.896	8144.521	8144.521	0	0	0	0	8335.479	0	0	0
1999	9	9	0	0	0	4.896	8149.417	8149.417	0	0	0	0	8330.583	0	0	0
1999	9	10	0	0	0	4.896	8154.313	8154.313	0	0	0	0	8325.687	0	0	0
1999	9	11	4.6	0	0	4.896	8159.209	8159.209	0	0	0	0	8320.791	0	0	0
1999	9	12	0.4	0	0	4.896	8164.105	8164.105	0	0	0	0	8315.895	0	0	0
1999	9	13	2.2	0	0	4.896	8169.001	8169.001	0	0	0	0	8310.999	0	0	0
1999	9	14	0	0	0	4.896	8173.897	8173.897	0	0	0	0	8306.103	0	0	0
1999	9	15	0.2	0	0	4.896	8178.793	8178.793	0	0	0	0	8301.207	0	0	0
1999	9	16	13.8	0.43	584.499	4.896	7599.19	7599.19	0	0	0	0	8880.81	0	0	0
1999	9	17	26.8	0.56	1478.288	4.896	6125.798	6125.798	0	0	0	0	10354.202	0	0	0
1999	9	18	2	0	0	4.896	6130.694	6130.694	0	0	0	0	10349.306	0	0	0
1999	9	19	0	0	0	4.896	6135.59	6135.59	0	0	0	0	10344.41	0	0	0
1999	9	20	0.2	0	0	4.896	6140.486	6140.486	0	0	0	0	10339.514	0	0	0
1999	9	21	0	0	0	4.896	6145.382	6145.382	0	0	0	0	10334.618	0	0	0
1999	9	22	0	0	0	4.896	6150.278	6150.278	0	0	0	0	10329.722	0	0	0
1999	9	23	0	0	0	4.896	6155.174	6155.174	0	0	0	0	10324.826	0	0	0
1999	9	24	0	0	0	4.896	6160.07	6160.07	0	0	4829.93	4829.93	10319.93	0	0	0
1999	9	25	0	0	0	4.896	10994.896	10994.896	0	0	-4.896	0	5485.104	0	0	0
1999	9	26	0	0	0	4.896	10999.792	10999.792	0	0	-9.792	0	5480.208	0	0	0
1999	9	27	0	0	0	4.896	11004.688	11004.688	0	0	-14.688	0	5475.312	0	0	0
1999	9	28	0	0	0	4.896	11009.584	11009.584	0	0	-19.584	0	5470.416	0	0	0
1999	9	29	16.8	0.43	711.564	4.896	10302.916	10302.916	0	0	0	0	6177.084	0	0	0
1999	9	30	0	0	0	4.896	10307.812	10307.812	0	0	0	0	6172.188	0	0	0
1999	10	1	0	0	0	6.768	10314.58	10314.58	0	0	0	0	6165.42	0	0	0
1999	10	2	0	0	0	6.768	10321.348	10321.348	0	0	0	0	6158.652	0	0	0
1999	10	3	21.4	0.56	1180.424	6.768	9147.692	9147.692	0	0	0	0	7332.308	0	0	0
1999	10	4	0	0	0	6.768	9154.46	9154.46	0	0	0	0	7325.54	0	0	0
1999	10	5	0	0	0	6.768	9161.228	9161.228	0	0	0	0	7318.772	0	0	0
1999	10	6	0	0	0	6.768	9167.996	9167.996	0	0	0	0	7312.004	0	0	0
1999	10	7	0	0	0	6.768	9174.764	9174.764	0	0	1815.236	1815.236	7305.236	0	0	0
1999	10	8	0	0	0	6.768	10996.768	10996.768	0	0	-6.768	0	5483.232	0	0	0
1999	10	9	0.8	0	0	6.768	11003.536	11003.536	0	0	0	0	5476.464	0	0	0
1999	10	10	20.6	0.56	1136.296	6.768	9874.008	9874.008	0	0	0	0	6605.992	0	0	0
1999	10	11	15.8	0.43	669.209	6.768	9211.567	9211.567	0	0	0	0	7268.433	0	0	0
1999	10	12	0.4	0	0	6.768	9218.335	9218.335	0	0	0	0	7261.665	0	0	0
1999	10	13	9.2	0	0	6.768	9225.103	9225.103	0	0	0	0	7254.897	0	0	0
1999	10	14	7.4	0	0	6.768	9231.871	9231.871	0	0	0	0	7248.129	0	0	0
1999	10	15	1	0	0	6.768	9238.639	9238.639	0	0	0	0	7241.361	0	0	0
1999	10	16	0	0	0	6.768	9245.407	9245.407	0	0	0	0	7234.593	0	0	0
1999	10	17	0	0	0	6.768	9252.175	9252.175	0	0	0	0	7227.825	0	0	0
1999	10	18	0.4	0	0	6.768	9258.943	9258.943	0	0	0	0	7221.057	0	0	0
1999	10	19	0.2	0	0	6.768	9265.711	9265.711	0	0	0	0	7214.289	0	0	0
1999	10	20	0.2	0	0	6.768	9272.479	9272.479	0	0	0	0	7207.521	0	0	0
1999	10	21	0	0	0	6.768	9279.247	9279.247	0	0	0	0	7200.753	0	0	0
1999	10	22	0.6	0	0	6.768	9286.015	9286.015	0	0	0	0	7193.985	0	0	0
1999	10	23	0	0	0	6.768	9292.783	9292.783	0	0	0	0	7187.217	0	0	0
1999	10	24	0.2	0	0	6.768	9299.551	9299.551	0	0	0	0	7180.449	0	0	0
1999	10	25	1.2	0	0	6.768	9306.319	9306.319	0	0	0	0	7173.681	0	0	0
1999	10	26	1.2	0	0	6.768	9313.087	9313.087	0	0	0	0	7166.913	0	0	0
1999	10	27	3	0	0	6.768	9319.855	9319.855	0	0	0	0	7160.145	0	0	0
1999	10	28	0.2	0	0	6.768	9326.623	9326.623	0	0	0	0	7153.377	0	0	0
1999	10	29	0	0	0	6.768	9333.391	9333.391	0	0	0	0	7146.609	0	0	0
1999	10	30	0	0	0	6.768	9340.159	9340.159	0	0	0	0	7139.841	0	0	0
1999	10	31	4.6	0	0	6.768	9346.927	9346.927	0	0	0	0	7133.073	0	0	0
1999	11	1	0	0	0	8.64	9355.567	9355.567	0	0	0	0	7124.433	0	0	0
1999	11	2	0	0	0	8.64	9364.207	9364.207	0	0	0	0	7115.793	0	0	0
1999	11	3	0	0	0	8.64	9372.847	9372.847	0	0	0	0	7107.153	0	0	0
1999	11	4	0.2	0	0	8.64	9381.487	9381.487	0	0	0	0	7098.513	0	0	0
1999	11	5	0	0	0	8.64	9390.127	9390.127	0	0	0	0	7089.873	0	0	0
1999	11	6	10.4	0.43	440.492	8.64	8958.275	8958.275	0	0	0	0	7521.725	0	0	0
1999	11	7	0	0	0	8.64	8966.915	8966.915	0	0	0	0	7513.085	0	0	0
1999	11	8	5.2	0	0	8.64	8975.555	8975.555	0	0	0	0	7504.445	0	0	0
1999	11	9	4.4	0	0	8.64	8984.195	8984.195	0	0	0	0	7495.805	0	0	0
1999	11	10	2.8	0	0	8.64	8992.835	8992.835	0	0	0	0	7487.165	0	0	0
1999	11	11	1.4	0	0	8.64	9001.475	9001.475	0	0	0	0	7478.525	0	0	0
1999	11	12	0.2	0	0	8.64	9010.115	9010.115	0	0	0	0	7469.885	0	0	0
1999	11	13	0	0	0	8.64	9018.755	9018.755	0	0	0	0	7461.245	0	0	0
1999	11	14	0	0	0	8.64	9027.395	9027.395	0	0	0	0	7452.605	0	0	0
1999	11	15	0	0	0	8.64	9036.035	9036.035	0	0	0	0	7443.965	0	0	0
1999	11	16	0	0	0	8.64	9044.675	9044.675	0	0	1945.325	1945.325	7435.325	0	0	0
1999	11	17	0	0	0	8.64	10998.64	10998.64	0	0	-8.64	0	5481.36	0	0	0

1999	11	18	0	0	0	8.64	11007.28	11007.28	0	0	-17.28	0	5472.72	0	0	0
1999	11	19	0	0	0	8.64	11015.92	11015.92	0	0	-25.92	0	5464.08	0	0	0
1999	11	20	0.2	0	0	8.64	11024.56	11024.56	0	0	0	0	5455.44	0	0	0
1999	11	21	7.2	0	0	8.64	11033.2	11033.2	0	0	0	0	5446.8	0	0	0
1999	11	22	12.2	0.43	516.731	8.64	10525.109	10525.109	0	0	0	0	5954.891	0	0	0
1999	11	23	0.4	0	0	8.64	10533.749	10533.749	0	0	0	0	5946.251	0	0	0
1999	11	24	0	0	0	8.64	10542.389	10542.389	0	0	0	0	5937.611	0	0	0
1999	11	25	0	0	0	8.64	10551.029	10551.029	0	0	0	0	5928.971	0	0	0
1999	11	26	0	0	0	8.64	10559.669	10559.669	0	0	0	0	5920.331	0	0	0
1999	11	27	0	0	0	8.64	10568.309	10568.309	0	0	421.691	421.691	5911.691	0	0	0
1999	11	28	0	0	0	8.64	10998.64	10998.64	0	0	-8.64	0	5481.36	0	0	0
1999	11	29	0.2	0	0	8.64	11007.28	11007.28	0	0	0	0	5472.72	0	0	0
1999	11	30	0	0	0	8.64	11015.92	11015.92	0	0	0	0	5464.08	0	0	0
1999	12	1	2.8	0	0	10.368	11026.288	11026.288	0	0	0	0	5453.712	0	0	0
1999	12	2	0	0	0	10.368	11036.656	11036.656	0	0	0	0	5443.344	0	0	0
1999	12	3	23.4	0.56	1290.744	10.368	9756.28	9756.28	0	0	0	0	6723.72	0	0	0
1999	12	4	0.6	0	0	10.368	9766.648	9766.648	0	0	0	0	6713.352	0	0	0
1999	12	5	0	0	0	10.368	9777.016	9777.016	0	0	0	0	6702.984	0	0	0
1999	12	6	0	0	0	10.368	9787.384	9787.384	0	0	0	0	6692.616	0	0	0
1999	12	7	0	0	0	10.368	9797.752	9797.752	0	0	0	0	6682.248	0	0	0
1999	12	8	1.6	0	0	10.368	9808.12	9808.12	0	0	0	0	6671.88	0	0	0
1999	12	9	8	0	0	10.368	9818.488	9818.488	0	0	0	0	6661.512	0	0	0
1999	12	10	0.2	0	0	10.368	9828.856	9828.856	0	0	0	0	6651.144	0	0	0
1999	12	11	0	0	0	10.368	9839.224	9839.224	0	0	0	0	6640.776	0	0	0
1999	12	12	1.2	0	0	10.368	9849.592	9849.592	0	0	0	0	6630.408	0	0	0
1999	12	13	0	0	0	10.368	9859.96	9859.96	0	0	0	0	6620.04	0	0	0
1999	12	14	0	0	0	10.368	9870.328	9870.328	0	0	0	0	6609.672	0	0	0
1999	12	15	0	0	0	10.368	9880.696	9880.696	0	0	0	0	6599.304	0	0	0
1999	12	16	4.6	0	0	10.368	9891.064	9891.064	0	0	0	0	6588.936	0	0	0
1999	12	17	0	0	0	10.368	9901.432	9901.432	0	0	0	0	6578.568	0	0	0
1999	12	18	0	0	0	10.368	9911.8	9911.8	0	0	0	0	6568.2	0	0	0
1999	12	19	0	0	0	10.368	9922.168	9922.168	0	0	0	0	6557.832	0	0	0
1999	12	20	0	0	0	10.368	9932.536	9932.536	0	0	1057.464	1057.464	6547.464	0	0	0
1999	12	21	0	0	0	10.368	11000.368	11000.368	0	0	-10.368	0	5479.632	0	0	0
1999	12	22	0	0	0	10.368	11010.736	11010.736	0	0	-20.736	0	5469.264	0	0	0
1999	12	23	0	0	0	10.368	11021.104	11021.104	0	0	-31.104	0	5458.896	0	0	0
1999	12	24	0	0	0	10.368	11031.472	11031.472	0	0	-41.472	0	5448.528	0	0	0
1999	12	25	1.2	0	0	10.368	11041.84	11041.84	0	0	0	0	5438.16	0	0	0
1999	12	26	0	0	0	10.368	11052.208	11052.208	0	0	0	0	5427.792	0	0	0
1999	12	27	0.2	0	0	10.368	11062.576	11062.576	0	0	0	0	5417.424	0	0	0
1999	12	28	1.8	0	0	10.368	11072.944	11072.944	0	0	0	0	5407.056	0	0	0
1999	12	29	0.2	0	0	10.368	11083.312	11083.312	0	0	0	0	5396.688	0	0	0
1999	12	30	0	0	0	10.368	11093.68	11093.68	0	0	0	0	5386.32	0	0	0
1999	12	31	2	0	0	10.368	11104.048	11104.048	0	0	0	0	5375.952	0	0	0
			997.8		45072.221	2362.896				11598.509		31236.384		0	17	6

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m³)	Evaporation (m³)						
2009	1	1	0	0	0	5.12	1	0	0	2200	0	
2009	1	2	0	0	0	5.12	6.12	0	0	2224.88	0	0
2009	1	3	0	0	0	5.12	11.24	0	0	2219.76	0	0
2009	1	4	0	0	0	5.12	16.36	0	0	2214.64	0	0
2009	1	5	0	0	0	5.12	21.48	0	0	2209.52	0	0
2009	1	6	0	0	0	5.12	26.6	0	0	2204.4	0	0
2009	1	7	0	0	0	5.12	31.72	0	0	2199.28	0	0
2009	1	8	0	0	0	5.12	36.84	0	0	2194.16	0	0
2009	1	9	0	0	0	5.12	41.96	0	0	2189.04	0	0
2009	1	10	0	0	0	5.12	47.08	0	0	2183.92	0	0
2009	1	11	0	0	0	5.12	52.2	0	0	2178.8	0	0
2009	1	12	0	0	0	5.12	57.32	0	0	2173.68	0	0
2009	1	13	0	0	0	5.12	62.44	0	0	2168.56	0	0
2009	1	14	0	0	0	5.12	67.56	0	0	2163.44	0	0
2009	1	15	0	0	0	5.12	72.68	0	0	2158.32	0	0
2009	1	16	0	0	0	5.12	77.8	0	0	2153.2	0	0
2009	1	17	0	0	0	5.12	82.92	0	0	2148.08	0	0
2009	1	18	0	0	0	5.12	88.04	0	0	2142.96	0	0
2009	1	19	0	0	0	5.12	93.16	0	0	2137.84	0	0
2009	1	20	0	0	0	5.12	98.28	0	0	2132.72	0	0
2009	1	21	0	0	0	5.12	103.4	0	0	2127.6	0	0
2009	1	22	0	0	0	5.12	108.52	0	0	2122.48	0	0
2009	1	23	0	0	0	5.12	113.64	0	0	2117.36	0	0
2009	1	24	0.6	0	0	5.12	118.76	0	0	2112.24	0	0
2009	1	25	0	0	0	5.12	123.88	0	0	2107.12	0	0
2009	1	26	0	0	0	5.12	129	0	0	2102	0	0
2009	1	27	0	0	0	5.12	134.12	0	0	2096.88	0	0
2009	1	28	0	0	0	5.12	139.24	0	0	2091.76	0	0
2009	1	29	0	0	0	5.12	144.36	0	0	2086.64	0	0
2009	1	30	0	0	0	5.12	149.48	0	0	2081.52	0	0
2009	1	31	0	0	0	5.12	154.6	0	0	2076.4	0	0
2009	2	1	0	0	0	4.544	159.144	0	0	2071.856	0	0
2009	2	2	0	0	0	4.544	163.688	0	0	2067.312	0	0
2009	2	3	0	0	0	4.544	168.232	0	0	2062.768	0	0
2009	2	4	0	0	0	4.544	172.776	0	0	2058.224	0	0
2009	2	5	0	0	0	4.544	177.32	0	0	2053.68	0	0
2009	2	6	0	0	0	4.544	181.864	0	0	2049.136	0	0
2009	2	7	0	0	0	4.544	186.408	0	0	2044.592	0	0
2009	2	8	0.6	0	0	4.544	190.952	0	0	2040.048	0	0
2009	2	9	0	0	0	4.544	195.496	0	0	2035.504	0	0
2009	2	10	0	0	0	4.544	200.04	0	0	2030.96	0	0
2009	2	11	0	0	0	4.544	204.584	0	0	2026.416	0	0
2009	2	12	0	0	0	4.544	209.128	0	0	2021.872	0	0
2009	2	13	0	0	0	4.544	213.672	0	0	2017.328	0	0
2009	2	14	0	0	0	4.544	218.216	0	0	2012.784	0	0
2009	2	15	0	0	0	4.544	222.76	0	0	2008.24	0	0
2009	2	16	0	0	0	4.544	227.304	0	0	2003.696	0	0
2009	2	17	0	0	0	4.544	231.848	0	0	1999.152	0	0
2009	2	18	0	0	0	4.544	236.392	0	0	1994.608	0	0
2009	2	19	0	0	0	4.544	240.936	0	0	1990.064	0	0
2009	2	20	0	0	0	4.544	245.48	0	0	1985.52	0	0
2009	2	21	0	0	0	4.544	250.024	0	0	1980.976	0	0
2009	2	22	0	0	0	4.544	254.568	0	0	1976.432	0	0
2009	2	23	0	0	0	4.544	259.112	0	0	1971.888	0	0
2009	2	24	0	0	0	4.544	263.656	0	0	1967.344	0	0
2009	2	25	0	0	0	4.544	268.2	0	0	1962.8	0	0
2009	2	26	0	0	0	4.544	272.744	0	0	1958.256	0	0
2009	2	27	0	0	0	4.544	277.288	0	0	1953.712	0	0
2009	2	28	0	0	0	4.544	281.832	0	0	1949.168	0	0
2009	3	1	0	0	0	3.712	285.544	0	0	1945.456	0	0
2009	3	2	0	0	0	3.712	289.256	0	0	1941.744	0	0
2009	3	3	0	0	0	3.712	292.968	0	0	1938.032	0	0
2009	3	4	31.6	0.69	2575.0524	3.712	-2278.3724	2278.3724	0	2231	0	0
2009	3	5	0.8	0	0	3.712	3.712	0	0	2227.288	0	1
2009	3	6	0.4	0	0	3.712	7.424	0	0	2223.576	0	0
2009	3	7	0	0	0	3.712	11.136	0	0	2219.864	0	0
2009	3	8	0	0	0	3.712	14.848	0	0	2216.152	0	0
2009	3	9	0	0	0	3.712	18.56	0	0	2212.44	0	0
2009	3	10	0	0	0	3.712	22.272	0	0	2208.728	0	0
2009	3	11	0	0	0	3.712	25.984	0	0	2205.016	0	0
2009	3	12	0	0	0	3.712	29.696	0	0	2201.304	0	0
2009	3	13	0	0	0	3.712	33.408	0	0	2197.592	0	0
2009	3	14	0	0	0	3.712	37.12	0	0	2193.88	0	0
2009	3	15	0	0	0	3.712	40.832	0	0	2190.168	0	0
2009	3	16	8	0	0	3.712	44.544	0	0	2186.456	0	0
2009	3	17	0.8	0	0	3.712	48.256	0	0	2182.744	0	0
2009	3	18	0	0	0	3.712	51.968	0	0	2179.032	0	0
2009	3	19	0	0	0	3.712	55.68	0	0	2175.32	0	0
2009	3	20	0	0	0	3.712	59.392	0	0	2171.608	0	0
2009	3	21	0.2	0	0	3.712	63.104	0	0	2167.896	0	0
2009	3	22	0	0	0	3.712	66.816	0	0	2164.184	0	0
2009	3	23	0	0	0	3.712	70.528	0	0	2160.472	0	0
2009	3	24	0	0	0	3.712	74.24	0	0	2156.76	0	0
2009	3	25	3.4	0	0	3.712	77.952	0	0	2153.048	0	0
2009	3	26	0	0	0	3.712	81.664	0	0	2149.336	0	0
2009	3	27	0	0	0	3.712	85.376	0	0	2145.624	0	0
2009	3	28	0	0	0	3.712	89.088	0	0	2141.912	0	0
2009	3	29	0	0	0	3.712	92.8	0	0	2138.2	0	0
2009	3	30	0	0	0	3.712	96.512	0	0	2134.488	0	1
2009	3	31	0	0	0	3.712	100.224	0	0	2130.776	0	0
2009	4	1	0	0	0	2.368	102.592	0	0	2128.408	0	0
2009	4	2	0	0	0	2.368	104.96	0	0	2126.04	0	0
2009	4	3	0	0	0	2.368	107.328	0	0	2123.672	0	0
2009	4	4	0	0	0	2.368	109.696	0	0	2121.304	0	0
2009	4	5	0	0	0	2.368	112.064	0	0	2118.936	0	0
2009	4	6	3.2	0	0	2.368	114.432	0	0	2116.568	0	0
2009	4	7	0.2	0	0	2.368	116.8	0	0	2114.2	0	0
2009	4	8	0	0	0	2.368	119.168	0	0	2111.832	0	0
2009	4	9	0	0	0	2.368	121.536	0	0	2109.464	0	0
2009	4	10	0	0	0	2.368	123.904	0	0	2107.096	0	0
2009	4	11	0	0	0	2.368	126.272	0	0	2104.728	0	0
2009	4	12	0	0	0	2.368	128.64	0	0	2102.36	0	0
2009	4	13	0	0	0	2.368	131.008	0	0	2099.992	0	0
2009	4	14	0	0	0	2.368	133.376	0	0	2097.624	0	0
2009	4	15	0	0	0	2.368	135.744	0	0	2095.256	0	0
2009	4	16	0	0	0	2.368	138.112	0	0	2092.888	0	0
2009	4	17	3.6	0	0	2.368	140.48	0	0	2090.52	0	0
2009	4	18	0	0	0	2.368	142.848	0	0	2088.152	0	0
2009	4	19	0	0	0	2.368	145.216	0	0	2085.784	0	0
2009	4	20	0.4	0	0	2.368	147.584	0	0	2083.416	0	0
2009	4	21	0	0	0	2.368	149.952	0	0	2081.048	0	0
2009	4	22	0	0	0	2.368	152.32	0	0	2078.68	0	0
2009	4	23	0	0	0	2.368	154.688	0	0	2076.312	0	0
2009	4	24	31.15	0.69	2538.38235	2.368	-2381.32635	2381.32635	0	2231	0	0
2009	4	25	31.15	0.69	2538.38235	2.368	-2536.01435	2536.01435	0	2231	0	0

2009	4	26	31.15	0.69	2538.38235	2.368	-2536.01435	2536.01435	0	2231	0	0
2009	4	27	31.15	0.69	2538.38235	2.368	-2536.01435	2536.01435	0	2231	0	0
2009	4	28	3.2	0	0	2.368	2.368	0	0	2228.632	0	1
2009	4	29	0	0	0	2.368	4.736	0	0	2226.264	0	0
2009	4	30	0	0	0	2.368	7.104	0	0	2223.896	0	0
2009	5	1	0	0	0	1.536	8.64	0	0	2222.36	0	0
2009	5	2	14.2	0.43	721.1186	1.536	-710.9426	710.9426	0	2231	0	0
2009	5	3	0	0	0	1.536	1.536	0	0	2229.464	0	1
2009	5	4	0	0	0	1.536	3.072	0	0	2227.928	0	0
2009	5	5	0.2	0	0	1.536	4.608	0	0	2226.392	0	0
2009	5	6	0	0	0	1.536	6.144	0	0	2224.856	0	0
2009	5	7	2.2	0	0	1.536	7.68	0	0	2223.32	0	0
2009	5	8	0.8	0	0	1.536	9.216	0	0	2221.784	0	0
2009	5	9	0	0	0	1.536	10.752	0	0	2220.248	0	0
2009	5	10	0	0	0	1.536	12.288	0	0	2218.712	0	0
2009	5	11	0.4	0	0	1.536	13.824	0	0	2217.176	0	0
2009	5	12	0.2	0	0	1.536	15.36	0	0	2215.64	0	0
2009	5	13	0	0	0	1.536	16.896	0	0	2214.104	0	0
2009	5	14	6.8	0	0	1.536	18.432	0	0	2212.568	0	0
2009	5	15	2.8	0	0	1.536	19.968	0	0	2211.032	0	0
2009	5	16	0	0	0	1.536	21.504	0	0	2209.496	0	0
2009	5	17	0	0	0	1.536	23.04	0	0	2207.96	0	0
2009	5	18	40.6	0.74	3548.1964	1.536	-3523.6204	3523.6204	0	2231	0	0
2009	5	19	0	0	0	1.536	1.536	0	0	2229.464	0	1
2009	5	20	0	0	0	1.536	3.072	0	0	2227.928	0	0
2009	5	21	0	0	0	1.536	4.608	0	0	2226.392	0	0
2009	5	22	0.2	0	0	1.536	6.144	0	0	2224.856	0	0
2009	5	23	0	0	0	1.536	7.68	0	0	2223.32	0	0
2009	5	24	0	0	0	1.536	9.216	0	0	2221.784	0	0
2009	5	25	29.6	0.56	1957.6256	1.536	-1946.8736	1946.8736	0	2231	0	0
2009	5	26	8.4	0	0	1.536	1.536	0	0	2229.464	0	1
2009	5	27	0.2	0	0	1.536	3.072	0	0	2227.928	0	0
2009	5	28	3.2	0	0	1.536	4.608	0	0	2226.392	0	0
2009	5	29	0	0	0	1.536	6.144	0	0	2224.856	0	0
2009	5	30	0	0	0	1.536	7.68	0	0	2223.32	0	0
2009	5	31	0	0	0	1.536	9.216	0	0	2221.784	0	0
2009	6	1	0.2	0	0	1.152	10.368	0	0	2220.632	0	0
2009	6	2	0.8	0	0	1.152	11.52	0	0	2219.48	0	0
2009	6	3	2.4	0	0	1.152	12.672	0	0	2218.328	0	0
2009	6	4	0.2	0	0	1.152	13.824	0	0	2217.176	0	0
2009	6	5	0	0	0	1.152	14.976	0	0	2216.024	0	0
2009	6	6	0	0	0	1.152	16.128	0	0	2214.872	0	0
2009	6	7	0	0	0	1.152	17.28	0	0	2213.72	0	0
2009	6	8	0	0	0	1.152	18.432	0	0	2212.568	0	0
2009	6	9	76.4	0.81	7308.5004	1.152	-7288.9164	7288.9164	0	2231	0	0
2009	6	10	0.4	0	0	1.152	1.152	0	0	2229.848	0	1
2009	6	11	0	0	0	1.152	2.304	0	0	2228.696	0	0
2009	6	12	0	0	0	1.152	3.456	0	0	2227.544	0	0
2009	6	13	0	0	0	1.152	4.608	0	0	2226.392	0	0
2009	6	14	0	0	0	1.152	5.76	0	0	2225.24	0	0
2009	6	15	21	0.56	1388.856	1.152	-1381.944	1381.944	0	2231	0	0
2009	6	16	0.2	0	0	1.152	1.152	0	0	2229.848	0	1
2009	6	17	0.2	0	0	1.152	2.304	0	0	2228.696	0	0
2009	6	18	0	0	0	1.152	3.456	0	0	2227.544	0	0
2009	6	19	0	0	0	1.152	4.608	0	0	2226.392	0	0
2009	6	20	0	0	0	1.152	5.76	0	0	2225.24	0	0
2009	6	21	2	0	0	1.152	6.912	0	0	2224.088	0	0
2009	6	22	0	0	0	1.152	8.064	0	0	2222.936	0	0
2009	6	23	0.4	0	0	1.152	9.216	0	0	2221.784	0	0
2009	6	24	5	0	0	1.152	10.368	0	0	2220.632	0	0
2009	6	25	0.2	0	0	1.152	11.52	0	0	2219.48	0	0
2009	6	26	5.8	0	0	1.152	12.672	0	0	2218.328	0	0
2009	6	27	2	0	0	1.152	13.824	0	0	2217.176	0	0
2009	6	28	0	0	0	1.152	14.976	0	0	2216.024	0	0
2009	6	29	0	0	0	1.152	16.128	0	0	2214.872	0	0
2009	6	30	0	0	0	1.152	17.28	0	0	2213.72	0	0
2009	7	1	20.2	0.56	1335.9472	1.088	-1317.5792	1317.5792	0	2231	0	0
2009	7	2	23.4	0.56	1547.5824	1.088	-1546.4944	1546.4944	0	2231	0	0
2009	7	3	11.8	0.43	599.2394	1.088	-598.1514	598.1514	0	2231	0	0
2009	7	4	0	0	0	1.088	1.088	0	0	2229.912	0	1
2009	7	5	0	0	0	1.088	2.176	0	0	2228.824	0	0
2009	7	6	4.6	0	0	1.088	3.264	0	0	2227.736	0	0
2009	7	7	0	0	0	1.088	4.352	0	0	2226.648	0	0
2009	7	8	0	0	0	1.088	5.44	0	0	2225.56	0	0
2009	7	9	0	0	0	1.088	6.528	0	0	2224.472	0	0
2009	7	10	1.6	0	0	1.088	7.616	0	0	2223.384	0	0
2009	7	11	0	0	0	1.088	8.704	0	0	2222.296	0	0
2009	7	12	0	0	0	1.088	9.792	0	0	2221.208	0	0
2009	7	13	26.8	0.56	1772.4448	1.088	-1761.5648	1761.5648	0	2231	0	0
2009	7	14	17.4	0.43	883.6242	1.088	-882.5362	882.5362	0	2231	0	0
2009	7	15	21	0.56	1388.856	1.088	-1387.768	1387.768	0	2231	0	0
2009	7	16	11	0.43	558.613	1.088	-557.525	557.525	0	2231	0	0
2009	7	17	0.4	0	0	1.088	1.088	0	0	2229.912	0	1
2009	7	18	0	0	0	1.088	2.176	0	0	2228.824	0	0
2009	7	19	0	0	0	1.088	3.264	0	0	2227.736	0	0
2009	7	20	0	0	0	1.088	4.352	0	0	2226.648	0	0
2009	7	21	0	0	0	1.088	5.44	0	0	2225.56	0	0
2009	7	22	1	0	0	1.088	6.528	0	0	2224.472	0	0
2009	7	23	8	0	0	1.088	7.616	0	0	2223.384	0	0
2009	7	24	0	0	0	1.088	8.704	0	0	2222.296	0	0
2009	7	25	0	0	0	1.088	9.792	0	0	2221.208	0	0
2009	7	26	0	0	0	1.088	10.88	0	0	2220.12	0	0
2009	7	27	3.6	0	0	1.088	11.968	0	0	2219.032	0	0
2009	7	28	33.8	0.69	2754.3282	1.088	-2741.2722	2741.2722	0	2231	0	0
2009	7	29	16.2	0.43	822.6846	1.088	-821.5966	821.5966	0	2231	0	0
2009	7	30	19.2	0.43	975.0336	1.088	-973.9456	973.9456	0	2231	0	0
2009	7	31	8.4	0	0	1.088	1.088	0	0	2229.912	0	1
2009	8	1	0	0	0	1.472	2.56	0	0	2228.44	0	0
2009	8	2	0	0	0	1.472	4.032	0	0	2226.968	0	0
2009	8	3	9	0	0	1.472	5.504	0	0	2225.496	0	0
2009	8	4	2	0	0	1.472	6.976	0	0	2224.024	0	0
2009	8	5	4.4	0	0	1.472	8.448	0	0	2222.552	0	0
2009	8	6	0	0	0	1.472	9.92	0	0	2221.08	0	0
2009	8	7	5.6	0	0	1.472	11.392	0	0	2219.608	0	0
2009	8	8	0	0	0	1.472	12.864	0	0	2218.136	0	0
2009	8	9	0	0	0	1.472	14.336	0	0	2216.664	0	0
2009	8	10	0.8	0	0	1.472	15.808	0	0	2215.192	0	0
2009	8	11	4.4	0	0	1.472	17.28	0	0	2213.72	0	0
2009	8	12	2.2	0	0	1.472	18.752	0	0	2212.248	0	0
2009	8	13	0.2	0	0	1.472	20.224	0	0	2210.776	0	0
2009	8	14	0	0	0	1.472	21.696	0	0	2209.304	0	0
2009	8	15	0	0	0	1.472	23.168	0	0	2207.832	0	0
2009	8	16	0	0	0	1.472	24.64	0	0	2206.36	0	0
2009	8	17	9.2	0	0	1.472	26.112	0	0	2204.888	0	0
2009	8	18	0.4	0	0	1.472	27.584	0	0	2203.416	0	0
2009	8	19	0	0	0	1.472	29.056	0	0	2201.944	0	0
2009	8	20	0	0	0	1.472	30.528	0	0	2200.472	0	0
2009	8	21	0	0	0	1.472	32	0	0	2199	0	0
2009	8	22	0	0	0	1.472	33.472	0	0	2197.528	0	0
2009	8	23	0	0	0	1.472	34.944	0	0	2196.056	0	0

2009	8	24	11.8	0.43	599.2394	1.472	-562.8234	562.8234	0	2231	0	0
2009	8	25	14.8	0.43	751.5884	1.472	-750.1164	750.1164	0	2231	0	1
2009	8	26	16.6	0.43	842.9978	1.472	-841.5258	841.5258	0	2231	0	0
2009	8	27	0	0	0	1.472	1.472	0	0	2229.528	0	1
2009	8	28	0	0	0	1.472	2.944	0	0	2228.056	0	0
2009	8	29	0	0	0	1.472	4.416	0	0	2226.584	0	0
2009	8	30	0	0	0	1.472	5.888	0	0	2225.112	0	0
2009	8	31	37.4	0.69	3047.6886	1.472	-3040.3286	3040.3286	0	2231	0	0
2009	9	1	4.8	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	2	0	0	0	2.176	4.352	0	0	2226.648	0	0
2009	9	3	1	0	0	2.176	6.528	0	0	2224.472	0	0
2009	9	4	4.4	0	0	2.176	8.704	0	0	2222.296	0	0
2009	9	5	0	0	0	2.176	10.88	0	0	2220.12	0	0
2009	9	6	0	0	0	2.176	13.056	0	0	2217.944	0	0
2009	9	7	13.4	0.43	680.4922	2.176	-665.2602	665.2602	0	2231	0	0
2009	9	8	6.6	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	9	0	0	0	2.176	4.352	0	0	2226.648	0	0
2009	9	10	0	0	0	2.176	6.528	0	0	2224.472	0	0
2009	9	11	0	0	0	2.176	8.704	0	0	2222.296	0	0
2009	9	12	0	0	0	2.176	10.88	0	0	2220.12	0	0
2009	9	13	0	0	0	2.176	13.056	0	0	2217.944	0	0
2009	9	14	1.8	0	0	2.176	15.232	0	0	2215.768	0	0
2009	9	15	0	0	0	2.176	17.408	0	0	2213.592	0	0
2009	9	16	0	0	0	2.176	19.584	0	0	2211.416	0	0
2009	9	17	22.6	0.56	1494.6736	2.176	-1472.9136	1472.9136	0	2231	0	0
2009	9	18	0.8	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	19	1.2	0	0	2.176	4.352	0	0	2226.648	0	0
2009	9	20	0	0	0	2.176	6.528	0	0	2224.472	0	0
2009	9	21	0	0	0	2.176	8.704	0	0	2222.296	0	0
2009	9	22	26	0.56	1719.536	2.176	-1708.656	1708.656	0	2231	0	0
2009	9	23	10	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	24	1.4	0	0	2.176	4.352	0	0	2226.648	0	0
2009	9	25	4.2	0	0	2.176	6.528	0	0	2224.472	0	0
2009	9	26	0	0	0	2.176	8.704	0	0	2222.296	0	0
2009	9	27	0	0	0	2.176	10.88	0	0	2220.12	0	0
2009	9	28	30.2	0.69	2460.9678	2.176	-2447.9118	2447.9118	0	2231	0	0
2009	9	29	0	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	30	0	0	0	2.176	4.352	0	0	2226.648	0	0
2009	10	1	1	0	0	3.008	7.36	0	0	2223.64	0	0
2009	10	2	0.8	0	0	3.008	10.368	0	0	2220.632	0	0
2009	10	3	3	0	0	3.008	13.376	0	0	2217.624	0	0
2009	10	4	0	0	0	3.008	16.384	0	0	2214.616	0	0
2009	10	5	0	0	0	3.008	19.392	0	0	2211.608	0	0
2009	10	6	0	0	0	3.008	22.4	0	0	2208.6	0	0
2009	10	7	0	0	0	3.008	25.408	0	0	2205.592	0	0
2009	10	8	0	0	0	3.008	28.416	0	0	2202.584	0	0
2009	10	9	0	0	0	3.008	31.424	0	0	2199.576	0	0
2009	10	10	0	0	0	3.008	34.432	0	0	2196.568	0	0
2009	10	11	0	0	0	3.008	37.44	0	0	2193.56	0	0
2009	10	12	5.8	0	0	3.008	40.448	0	0	2190.552	0	0
2009	10	13	17.8	0.43	903.9374	3.008	-860.4814	860.4814	0	2231	0	0
2009	10	14	16	0.43	812.528	3.008	-809.52	809.52	0	2231	0	0
2009	10	15	8.4	0	0	3.008	3.008	0	0	2227.992	0	1
2009	10	16	3.6	0	0	3.008	6.016	0	0	2224.984	0	0
2009	10	17	0	0	0	3.008	9.024	0	0	2221.976	0	0
2009	10	18	0	0	0	3.008	12.032	0	0	2218.968	0	0
2009	10	19	0.8	0	0	3.008	15.04	0	0	2215.96	0	0
2009	10	20	0	0	0	3.008	18.048	0	0	2212.952	0	0
2009	10	21	0	0	0	3.008	21.056	0	0	2209.944	0	0
2009	10	22	0	0	0	3.008	24.064	0	0	2206.936	0	0
2009	10	23	0	0	0	3.008	27.072	0	0	2203.928	0	0
2009	10	24	0	0	0	3.008	30.08	0	0	2200.92	0	0
2009	10	25	0	0	0	3.008	33.088	0	0	2197.912	0	0
2009	10	26	0.2	0	0	3.008	36.096	0	0	2194.904	0	0
2009	10	27	0	0	0	3.008	39.104	0	0	2191.896	0	0
2009	10	28	0	0	0	3.008	42.112	0	0	2188.888	0	0
2009	10	29	0	0	0	3.008	45.12	0	0	2185.88	0	0
2009	10	30	0	0	0	3.008	48.128	0	0	2182.872	0	0
2009	10	31	0	0	0	3.008	51.136	0	0	2179.864	0	0
2009	11	1	0	0	0	3.84	54.976	0	0	2176.024	0	0
2009	11	2	0	0	0	3.84	58.816	0	0	2172.184	0	0
2009	11	3	1.2	0	0	3.84	62.656	0	0	2168.344	0	0
2009	11	4	0.8	0	0	3.84	66.496	0	0	2164.504	0	0
2009	11	5	0.6	0	0	3.84	70.336	0	0	2160.664	0	0
2009	11	6	0	0	0	3.84	74.176	0	0	2156.824	0	0
2009	11	7	0	0	0	3.84	78.016	0	0	2152.984	0	0
2009	11	8	0	0	0	3.84	81.856	0	0	2149.144	0	0
2009	11	9	0	0	0	3.84	85.696	0	0	2145.304	0	0
2009	11	10	0	0	0	3.84	89.536	0	0	2141.464	0	0
2009	11	11	0	0	0	3.84	93.376	0	0	2137.624	0	0
2009	11	12	0	0	0	3.84	97.216	0	0	2133.784	0	0
2009	11	13	0	0	0	3.84	101.056	0	0	2129.944	0	0
2009	11	14	0	0	0	3.84	104.896	0	0	2126.104	0	0
2009	11	15	0	0	0	3.84	108.736	0	0	2122.264	0	0
2009	11	16	0	0	0	3.84	112.576	0	0	2118.424	0	0
2009	11	17	0	0	0	3.84	116.416	0	0	2114.584	0	0
2009	11	18	0	0	0	3.84	120.256	0	0	2110.744	0	0
2009	11	19	0	0	0	3.84	124.096	0	0	2106.904	0	0
2009	11	20	0.4	0	0	3.84	127.936	0	0	2103.064	0	0
2009	11	21	0	0	0	3.84	131.776	0	0	2099.224	0	0
2009	11	22	0	0	0	3.84	135.616	0	0	2095.384	0	0
2009	11	23	12.6	0.43	639.8658	3.84	-500.4098	500.4098	0	2231	0	0
2009	11	24	0	0	0	3.84	3.84	0	0	2227.16	0	1
2009	11	25	0	0	0	3.84	7.68	0	0	2223.32	0	0
2009	11	26	3.8	0	0	3.84	11.52	0	0	2219.48	0	0
2009	11	27	0	0	0	3.84	15.36	0	0	2215.64	0	0
2009	11	28	16.6	0.43	842.9978	3.84	-823.7978	823.7978	0	2231	0	0
2009	11	29	0	0	0	3.84	3.84	0	0	2227.16	0	0
2009	11	30	28.8	0.56	1904.7168	3.84	-1897.0368	1897.0368	0	2231	0	0
2009	12	1	0.4	0	0	4.608	4.608	0	0	2226.392	0	1
2009	12	2	0	0	0	4.608	9.216	0	0	2221.784	0	0
2009	12	3	0	0	0	4.608	13.824	0	0	2217.176	0	0
2009	12	4	0	0	0	4.608	18.432	0	0	2212.568	0	0
2009	12	5	0	0	0	4.608	23.04	0	0	2207.96	0	0
2009	12	6	0	0	0	4.608	27.648	0	0	2203.352	0	0
2009	12	7	0	0	0	4.608	32.256	0	0	2198.744	0	0
2009	12	8	6.2	0	0	4.608	36.864	0	0	2194.136	0	0
2009	12	9	0.6	0	0	4.608	41.472	0	0	2189.528	0	0
2009	12	10	3	0	0	4.608	46.08	0	0	2184.92	0	0
2009	12	11	1.8	0	0	4.608	50.688	0	0	2180.312	0	0
2009	12	12	0	0	0	4.608	55.296	0	0	2175.704	0	0
2009	12	13	0	0	0	4.608	59.904	0	0	2171.096	0	0
2009	12	14	0	0	0	4.608	64.512	0	0	2166.488	0	0
2009	12	15	0	0	0	4.608	69.12	0	0	2161.88	0	1
2009	12	16	0	0	0	4.608	73.728	0	0	2157.272	0	0
2009	12	17	0	0	0	4.608	78.336	0	0	2152.664	0	0
2009	12	18	11.4	0.43	578.9262	4.608	-495.9822	495.9822	0	2231	0	0
2009	12	19	0	0	0	4.608	4.608	0	0	2226.392	0	1
2009	12	20	0	0	0	4.608	9.216	0	0	2221.784	0	0
2009	12	21	0	0	0	4.608	13.824	0	0	2217.176	0	0

2009	12	22	0	0	0	4.608	18.432	0	0	2212.568	0	0
2009	12	23	0	0	0	4.608	23.04	0	0	2207.96	0	0
2009	12	24	0.2	0	0	4.608	27.648	0	0	2203.352	0	0
2009	12	25	0	0	0	4.608	32.256	0	0	2198.744	0	0
2009	12	26	0	0	0	4.608	36.864	0	0	2194.136	0	0
2009	12	27	0	0	0	4.608	41.472	0	0	2189.528	0	0
2009	12	28	0	0	0	4.608	46.08	0	0	2184.92	0	0
2009	12	29	0	0	0	4.608	50.688	0	0	2180.312	0	0
2009	12	30	0	0	0	4.608	55.296	0	0	2175.704	0	0
2009	12	31	0	0	0	4.608	59.904	0	0	2171.096	0	0
			1029		57571.388	1050.176		56585.236	0		0	23

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Adjusted Sediment Dam Available Capacity (m^3)	Uncontrolled Flow Discharged from Sediment Dam (m^3)	Controlled Flow Discharged from Sediment Dam (m^3)	Volume of Sediment Water Remaining (m^3)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m^3)	Evaporation (m^3)						
1999	1	1	0	0	0	7.68	1200	0	0	0	0	
1999	1	2	0	0	0	7.68	1207.68	0	0	358.32	0	0
1999	1	3	0	0	0	7.68	1215.36	0	0	350.64	0	0
1999	1	4	0	0	0	7.68	1223.04	0	0	342.96	0	0
1999	1	5	0	0	0	7.68	1230.72	0	0	335.28	0	0
1999	1	6	0	0	0	7.68	1238.4	0	0	327.6	0	0
1999	1	7	0.4	0	0	7.68	1246.08	0	0	319.92	0	0
1999	1	8	16	0.43	677.68	7.68	576.08	0	989.92	989.92	0	0
1999	1	9	0	0	0	7.68	1566	0	0	0	1	0
1999	1	10	0	0	0	7.68	1566	0	0	0	1	0
1999	1	11	0	0	0	7.68	1566	0	0	0	1	0
1999	1	12	0	0	0	7.68	1566	0	0	0	1	0
1999	1	13	0	0	0	7.68	1566	0	0	0	1	0
1999	1	14	0	0	0	7.68	1566	0	0	0	1	0
1999	1	15	0	0	0	7.68	1566	0	0	0	1	0
1999	1	16	0	0	0	7.68	1566	0	0	0	1	0
1999	1	17	0	0	0	7.68	1566	0	0	0	1	0
1999	1	18	0	0	0	7.68	1566	0	0	0	1	0
1999	1	19	0	0	0	7.68	1566	0	0	0	1	0
1999	1	20	0	0	0	7.68	1566	0	0	0	1	0
1999	1	21	0	0	0	7.68	1566	0	0	0	1	0
1999	1	22	0	0	0	7.68	1566	0	0	0	1	0
1999	1	23	0	0	0	7.68	1566	0	0	0	1	0
1999	1	24	0	0	0	7.68	1566	0	0	0	1	0
1999	1	25	0	0	0	7.68	1566	0	0	0	1	0
1999	1	26	0.8	0	0	7.68	1566	0	0	0	1	0
1999	1	27	0	0	0	7.68	1566	0	0	0	1	0
1999	1	28	0	0	0	7.68	1566	0	0	0	1	0
1999	1	29	0.2	0	0	7.68	1566	0	0	0	1	0
1999	1	30	0	0	0	7.68	1566	0	0	0	1	0
1999	1	31	0.6	0	0	7.68	1566	0	0	0	1	0
1999	2	1	0	0	0	6.816	1566	0	0	0	1	0
1999	2	2	0	0	0	6.816	1566	0	0	0	1	0
1999	2	3	0	0	0	6.816	1566	0	0	0	1	0
1999	2	4	0	0	0	6.816	1566	0	0	0	1	0
1999	2	5	0	0	0	6.816	1566	0	0	0	1	0
1999	2	6	0.8	0	0	6.816	1566	0	0	0	1	0
1999	2	7	0	0	0	6.816	1566	0	0	0	1	0
1999	2	8	0	0	0	6.816	1566	0	0	0	1	0
1999	2	9	0	0	0	6.816	1566	0	0	0	1	0
1999	2	10	0	0	0	6.816	1566	0	0	0	1	0
1999	2	11	0.4	0	0	6.816	1566	0	0	0	1	0
1999	2	12	0	0	0	6.816	1566	0	0	0	1	0
1999	2	13	0	0	0	6.816	1566	0	0	0	1	0
1999	2	14	0	0	0	6.816	1566	0	0	0	1	0
1999	2	15	0	0	0	6.816	1566	0	0	0	1	0
1999	2	16	0	0	0	6.816	1566	0	0	0	1	0
1999	2	17	0	0	0	6.816	1566	0	0	0	1	0
1999	2	18	3.4	0	0	6.816	1566	0	0	0	1	0
1999	2	19	0	0	0	6.816	1566	0	0	0	1	0
1999	2	20	0	0	0	6.816	1566	0	0	0	1	0
1999	2	21	0	0	0	6.816	1566	0	0	0	1	0
1999	2	22	0	0	0	6.816	1566	0	0	0	1	0
1999	2	23	0	0	0	6.816	1566	0	0	0	1	0
1999	2	24	0	0	0	6.816	1566	0	0	0	1	0
1999	2	25	0	0	0	6.816	1566	0	0	0	1	0
1999	2	26	0	0	0	6.816	1566	0	0	0	1	0
1999	2	27	0	0	0	6.816	1566	0	0	0	1	0
1999	2	28	0	0	0	6.816	1566	0	0	0	1	0
1999	3	1	0	0	0	5.568	1566	0	0	0	1	0
1999	3	2	0	0	0	5.568	1566	0	0	0	1	0
1999	3	3	0	0	0	5.568	1566	0	0	0	1	0
1999	3	4	0	0	0	5.568	1566	0	0	0	1	0
1999	3	5	0	0	0	5.568	1566	0	0	0	1	0
1999	3	6	0	0	0	5.568	1566	0	0	0	1	0
1999	3	7	19.6	0.43	830.158	5.568	741.41	0	824.59	824.59	0	0
1999	3	8	0.2	0	0	5.568	1566	0	0	0	1	0
1999	3	9	0	0	0	5.568	1566	0	0	0	1	0
1999	3	10	0	0	0	5.568	1566	0	0	0	1	0
1999	3	11	0	0	0	5.568	1566	0	0	0	1	0
1999	3	12	0	0	0	5.568	1566	0	0	0	1	0
1999	3	13	0	0	0	5.568	1566	0	0	0	1	0
1999	3	14	0	0	0	5.568	1566	0	0	0	1	0
1999	3	15	0	0	0	5.568	1566	0	0	0	1	0
1999	3	16	0	0	0	5.568	1566	0	0	0	1	0
1999	3	17	0	0	0	5.568	1566	0	0	0	1	0
1999	3	18	11	0.43	465.905	5.568	1105.663	0	460.337	460.337	0	0
1999	3	19	1.6	0	0	5.568	1566	0	0	0	1	0
1999	3	20	0	0	0	5.568	1566	0	0	0	1	0
1999	3	21	48	0.74	3498.72	5.568	0	1927.152	1566	1566	0	0
1999	3	22	2.6	0	0	5.568	1566	0	0	0	1	1
1999	3	23	0	0	0	5.568	1566	0	0	0	1	0
1999	3	24	0	0	0	5.568	1566	0	0	0	1	0
1999	3	25	11	0.43	465.905	5.568	1105.663	0	460.337	460.337	0	0
1999	3	26	2.8	0	0	5.568	1566	0	0	0	1	0
1999	3	27	0	0	0	5.568	1566	0	0	0	1	0
1999	3	28	4.6	0	0	5.568	1566	0	0	0	1	0
1999	3	29	0	0	0	5.568	1566	0	0	0	1	0
1999	3	30	0	0	0	5.568	1566	0	0	0	1	0
1999	3	31	1.8	0	0	5.568	1566	0	0	0	1	0
1999	4	1	0	0	0	3.552	1566	0	0	0	1	0
1999	4	2	0	0	0	3.552	1566	0	0	0	1	0
1999	4	3	0	0	0	3.552	1566	0	0	0	1	0
1999	4	4	1.2	0	0	3.552	1566	0	0	0	1	0
1999	4	5	3.2	0	0	3.552	1566	0	0	0	1	0
1999	4	6	0	0	0	3.552	1566	0	0	0	1	0
1999	4	7	0	0	0	3.552	1566	0	0	0	1	0
1999	4	8	0	0	0	3.552	1566	0	0	0	1	0
1999	4	9	0	0	0	3.552	1566	0	0	0	1	0
1999	4	10	0	0	0	3.552	1566	0	0	0	1	0
1999	4	11	0	0	0	3.552	1566	0	0	0	1	0
1999	4	12	0	0	0	3.552	1566	0	0	0	1	0
1999	4	13	0	0	0	3.552	1566	0	0	0	1	0
1999	4	14	0	0	0	3.552	1566	0	0	0	1	0
1999	4	15	0	0	0	3.552	1566	0	0	0	1	0
1999	4	16	0	0	0	3.552	1566	0	0	0	1	0
1999	4	17	0	0	0	3.552	1566	0	0	0	1	0
1999	4	18	0	0	0	3.552	1566	0	0	0	1	0
1999	4	19	0	0	0	3.552	1566	0	0	0	1	0
1999	4	20	6.8	0	0	3.552	1566	0	0	0	1	0
1999	4	21	4.2	0	0	3.552	1566	0	0	0	1	0
1999	4	22	0	0	0	3.552	1566	0	0	0	1	0
1999	4	23	0	0	0	3.552	1566	0	0	0	1	0
1999	4	24	0	0	0	3.552	1566	0	0	0	1	0
1999	4	25	0	0	0	3.552	1566	0	0	0	1	0
1999	4	26	0	0	0	3.552	1566	0	0	0	1	0

1999	4	27	1.2	0	0	3.552	1566	0	0	0	1	0
1999	4	28	0.6	0	0	3.552	1566	0	0	0	1	0
1999	4	29	0.2	0	0	3.552	1566	0	0	0	1	0
1999	4	30	0	0	0	3.552	1566	0	0	0	1	0
1999	5	1	0	0	0	2.304	1566	0	0	0	1	0
1999	5	2	0	0	0	2.304	1566	0	0	0	1	0
1999	5	3	0	0	0	2.304	1566	0	0	0	1	0
1999	5	4	0	0	0	2.304	1566	0	0	0	1	0
1999	5	5	0	0	0	2.304	1566	0	0	0	1	0
1999	5	6	0	0	0	2.304	1566	0	0	0	1	0
1999	5	7	0	0	0	2.304	1566	0	0	0	1	0
1999	5	8	0	0	0	2.304	1566	0	0	0	1	0
1999	5	9	0	0	0	2.304	1566	0	0	0	1	0
1999	5	10	0.4	0	0	2.304	1566	0	0	0	1	0
1999	5	11	0	0	0	2.304	1566	0	0	0	1	0
1999	5	12	11.6	0.43	491.318	2.304	1076.986	0	489.014	489.014	0	0
1999	5	13	30.4	0.69	2066.136	2.304	0	497.832	1566	1566	0	0
1999	5	14	0.6	0	0	2.304	1566	0	0	0	1	1
1999	5	15	0	0	0	2.304	1566	0	0	0	1	0
1999	5	16	42.8	0.74	3119.692	2.304	0	1551.388	1566	1566	0	0
1999	5	17	0	0	0	2.304	1566	0	0	0	1	1
1999	5	18	0.8	0	0	2.304	1566	0	0	0	1	0
1999	5	19	0	0	0	2.304	1566	0	0	0	1	0
1999	5	20	0	0	0	2.304	1566	0	0	0	1	0
1999	5	21	6.4	0	0	2.304	1566	0	0	0	1	0
1999	5	22	5.2	0	0	2.304	1566	0	0	0	1	0
1999	5	23	44.2	0.74	3221.738	2.304	0	1653.434	1566	1566	0	0
1999	5	24	15.8	0.43	669.209	2.304	899.095	0	0	666.905	0	0
1999	5	25	78	0.81	6223.23	2.304	0	5321.831	0	1566	0	0
1999	5	26	11.4	0.43	482.847	2.304	0	480.543	0	1566	0	0
1999	5	27	1.6	0	0	2.304	2.304	0	0	1563.696	0	1
1999	5	28	0	0	0	2.304	4.608	0	1561.392	1561.392	0	0
1999	5	29	14	0.43	592.97	2.304	975.334	0	590.666	590.666	0	1
1999	5	30	10.4	0.43	440.492	2.304	1127.812	0	438.188	438.188	0	0
1999	5	31	13.2	0.43	559.086	2.304	1009.218	0	556.782	556.782	0	0
1999	6	1	0	0	0	1.728	1566	0	0	0	1	0
1999	6	2	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	3	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	4	0	0	0	1.728	1566	0	0	0	1	0
1999	6	5	12.8	0.43	542.144	1.728	1025.584	0	540.416	540.416	0	0
1999	6	6	1.4	0	0	1.728	1566	0	0	0	1	0
1999	6	7	8.2	0	0	1.728	1566	0	0	0	1	0
1999	6	8	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	9	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	10	7.2	0	0	1.728	1566	0	0	0	1	0
1999	6	11	0	0	0	1.728	1566	0	0	0	1	0
1999	6	12	0	0	0	1.728	1566	0	0	0	1	0
1999	6	13	36.2	0.69	2460.333	1.728	0	892.605	1566	1566	0	0
1999	6	14	0	0	0	1.728	1566	0	0	0	1	1
1999	6	15	16.6	0.43	703.093	1.728	864.635	0	701.365	701.365	0	0
1999	6	16	5	0	0	1.728	1566	0	0	0	1	0
1999	6	17	0.4	0	0	1.728	1566	0	0	0	1	0
1999	6	18	14.8	0.43	626.854	1.728	940.874	0	0	625.126	0	0
1999	6	19	2.4	0	0	1.728	942.602	0	0	623.398	0	0
1999	6	20	0.2	0	0	1.728	944.33	0	0	621.67	0	0
1999	6	21	4.4	0	0	1.728	946.058	0	0	619.942	0	0
1999	6	22	0.6	0	0	1.728	947.786	0	0	618.214	0	0
1999	6	23	0.4	0	0	1.728	949.514	0	0	616.486	0	0
1999	6	24	0.2	0	0	1.728	951.242	0	0	614.758	0	0
1999	6	25	7.6	0	0	1.728	952.97	0	0	613.03	0	0
1999	6	26	3.8	0	0	1.728	954.698	0	0	611.302	0	0
1999	6	27	0	0	0	1.728	956.426	0	609.574	609.574	0	0
1999	6	28	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	29	0	0	0	1.728	1566	0	0	0	1	0
1999	6	30	16.2	0.43	686.151	1.728	881.577	0	684.423	684.423	0	0
1999	7	1	0.6	0	0	1.632	1566	0	0	0	1	0
1999	7	2	4.8	0	0	1.632	1566	0	0	0	1	0
1999	7	3	0.4	0	0	1.632	1566	0	0	0	1	0
1999	7	4	0	0	0	1.632	1566	0	0	0	1	0
1999	7	5	0	0	0	1.632	1566	0	0	0	1	0
1999	7	6	0	0	0	1.632	1566	0	0	0	1	0
1999	7	7	0	0	0	1.632	1566	0	0	0	1	0
1999	7	8	2	0	0	1.632	1566	0	0	0	1	0
1999	7	9	18.6	0.43	787.803	1.632	779.829	0	786.171	786.171	0	0
1999	7	10	0	0	0	1.632	1566	0	0	0	1	0
1999	7	11	0	0	0	1.632	1566	0	0	0	1	0
1999	7	12	0.4	0	0	1.632	1566	0	0	0	1	0
1999	7	13	0.4	0	0	1.632	1566	0	0	0	1	0
1999	7	14	0.4	0	0	1.632	1566	0	0	0	1	0
1999	7	15	0.2	0	0	1.632	1566	0	0	0	1	0
1999	7	16	0	0	0	1.632	1566	0	0	0	1	0
1999	7	17	0	0	0	1.632	1566	0	0	0	1	0
1999	7	18	0	0	0	1.632	1566	0	0	0	1	0
1999	7	19	0	0	0	1.632	1566	0	0	0	1	0
1999	7	20	30.2	0.69	2052.543	1.632	0	484.911	1566	1566	0	0
1999	7	21	5.8	0	0	1.632	1566	0	0	0	1	1
1999	7	22	5.8	0	0	1.632	1566	0	0	0	1	0
1999	7	23	0	0	0	1.632	1566	0	0	0	1	0
1999	7	24	0	0	0	1.632	1566	0	0	0	1	0
1999	7	25	0	0	0	1.632	1566	0	0	0	1	0
1999	7	26	0.8	0	0	1.632	1566	0	0	0	1	0
1999	7	27	0	0	0	1.632	1566	0	0	0	1	0
1999	7	28	0	0	0	1.632	1566	0	0	0	1	0
1999	7	29	0	0	0	1.632	1566	0	0	0	1	0
1999	7	30	0.2	0	0	1.632	1566	0	0	0	1	0
1999	7	31	0.6	0	0	1.632	1566	0	0	0	1	0
1999	8	1	0	0	0	2.208	1566	0	0	0	1	0
1999	8	2	0	0	0	2.208	1566	0	0	0	1	0
1999	8	3	0	0	0	2.208	1566	0	0	0	1	0
1999	8	4	0	0	0	2.208	1566	0	0	0	1	0
1999	8	5	0	0	0	2.208	1566	0	0	0	1	0
1999	8	6	0	0	0	2.208	1566	0	0	0	1	0
1999	8	7	0	0	0	2.208	1566	0	0	0	1	0
1999	8	8	21	0.56	1158.36	2.208	409.848	0	1156.152	1156.152	0	0
1999	8	9	24	0.56	1323.84	2.208	244.368	0	1321.632	1321.632	0	1
1999	8	10	4	0	0	2.208	1566	0	0	0	1	0
1999	8	11	0	0	0	2.208	1566	0	0	0	1	0
1999	8	12	0.6	0	0	2.208	1566	0	0	0	1	0
1999	8	13	1.2	0	0	2.208	1566	0	0	0	1	0
1999	8	14	0	0	0	2.208	1566	0	0	0	1	0
1999	8	15	5	0	0	2.208	1566	0	0	0	1	0
1999	8	16	0	0	0	2.208	1566	0	0	0	1	0
1999	8	17	0.2	0	0	2.208	1566	0	0	0	1	0
1999	8	18	0	0	0	2.208	1566	0	0	0	1	0
1999	8	19	0	0	0	2.208	1566	0	0	0	1	0
1999	8	20	0	0	0	2.208	1566	0	0	0	1	0
1999	8	21	0	0	0	2.208	1566	0	0	0	1	0
1999	8	22	0	0	0	2.208	1566	0	0	0	1	0
1999	8	23	0	0	0	2.208	1566	0	0	0	1	0
1999	8	24	0.2	0	0	2.208	1566	0	0	0	1	0
1999	8	25	0	0	0	2.208	1566	0	0	0	1	0

1999	8	26	0.6	0	0	2.208	1566	0	0	0	1	0
1999	8	27	4.6	0	0	2.208	1566	0	0	0	1	0
1999	8	28	0	0	0	2.208	1566	0	0	0	1	0
1999	8	29	0	0	0	2.208	1566	0	0	0	1	0
1999	8	30	0.4	0	0	2.208	1566	0	0	0	1	0
1999	8	31	0	0	0	2.208	1566	0	0	0	1	0
1999	9	1	0	0	0	3.264	1566	0	0	0	1	0
1999	9	2	0	0	0	3.264	1566	0	0	0	1	0
1999	9	3	0	0	0	3.264	1566	0	0	0	1	0
1999	9	4	36.2	0.69	2460.333	3.264	0	891.069	1566	1566	0	0
1999	9	5	0	0	0	3.264	1566	0	0	0	1	1
1999	9	6	10.8	0.43	457.434	3.264	1111.83	0	454.17	454.17	0	0
1999	9	7	0.4	0	0	3.264	1566	0	0	0	1	0
1999	9	8	0	0	0	3.264	1566	0	0	0	1	0
1999	9	9	0	0	0	3.264	1566	0	0	0	1	0
1999	9	10	0	0	0	3.264	1566	0	0	0	1	0
1999	9	11	4.6	0	0	3.264	1566	0	0	0	1	0
1999	9	12	0.4	0	0	3.264	1566	0	0	0	1	0
1999	9	13	2.2	0	0	3.264	1566	0	0	0	1	0
1999	9	14	0	0	0	3.264	1566	0	0	0	1	0
1999	9	15	0.2	0	0	3.264	1566	0	0	0	1	0
1999	9	16	13.8	0.43	584.499	3.264	984.765	0	581.235	581.235	0	0
1999	9	17	26.8	0.56	1478.288	3.264	90.976	0	1475.024	1475.024	0	1
1999	9	18	2	0	0	3.264	1566	0	0	0	1	0
1999	9	19	0	0	0	3.264	1566	0	0	0	1	0
1999	9	20	0.2	0	0	3.264	1566	0	0	0	1	0
1999	9	21	0	0	0	3.264	1566	0	0	0	1	0
1999	9	22	0	0	0	3.264	1566	0	0	0	1	0
1999	9	23	0	0	0	3.264	1566	0	0	0	1	0
1999	9	24	0	0	0	3.264	1566	0	0	0	1	0
1999	9	25	0	0	0	3.264	1566	0	0	0	1	0
1999	9	26	0	0	0	3.264	1566	0	0	0	1	0
1999	9	27	0	0	0	3.264	1566	0	0	0	1	0
1999	9	28	0	0	0	3.264	1566	0	0	0	1	0
1999	9	29	16.8	0.43	711.564	3.264	857.7	0	708.3	708.3	0	0
1999	9	30	0	0	0	3.264	1566	0	0	0	1	0
1999	10	1	0	0	0	4.512	1566	0	0	0	1	0
1999	10	2	0	0	0	4.512	1566	0	0	0	1	0
1999	10	3	21.4	0.56	1180.424	4.512	390.088	0	1175.912	1175.912	0	0
1999	10	4	0	0	0	4.512	1566	0	0	0	1	0
1999	10	5	0	0	0	4.512	1566	0	0	0	1	0
1999	10	6	0	0	0	4.512	1566	0	0	0	1	0
1999	10	7	0	0	0	4.512	1566	0	0	0	1	0
1999	10	8	0	0	0	4.512	1566	0	0	0	1	0
1999	10	9	0.8	0	0	4.512	1566	0	0	0	1	0
1999	10	10	20.6	0.56	1136.296	4.512	434.216	0	1131.784	1131.784	0	0
1999	10	11	15.8	0.43	669.209	4.512	901.303	0	664.697	664.697	0	1
1999	10	12	0.4	0	0	4.512	1566	0	0	0	1	0
1999	10	13	9.2	0	0	4.512	1566	0	0	0	1	0
1999	10	14	7.4	0	0	4.512	1566	0	0	0	1	0
1999	10	15	1	0	0	4.512	1566	0	0	0	1	0
1999	10	16	0	0	0	4.512	1566	0	0	0	1	0
1999	10	17	0	0	0	4.512	1566	0	0	0	1	0
1999	10	18	0.4	0	0	4.512	1566	0	0	0	1	0
1999	10	19	0.2	0	0	4.512	1566	0	0	0	1	0
1999	10	20	0.2	0	0	4.512	1566	0	0	0	1	0
1999	10	21	0	0	0	4.512	1566	0	0	0	1	0
1999	10	22	0.6	0	0	4.512	1566	0	0	0	1	0
1999	10	23	0	0	0	4.512	1566	0	0	0	1	0
1999	10	24	0.2	0	0	4.512	1566	0	0	0	1	0
1999	10	25	1.2	0	0	4.512	1566	0	0	0	1	0
1999	10	26	1.2	0	0	4.512	1566	0	0	0	1	0
1999	10	27	3	0	0	4.512	1566	0	0	0	1	0
1999	10	28	0.2	0	0	4.512	1566	0	0	0	1	0
1999	10	29	0	0	0	4.512	1566	0	0	0	1	0
1999	10	30	0	0	0	4.512	1566	0	0	0	1	0
1999	10	31	4.6	0	0	4.512	1566	0	0	0	1	0
1999	11	1	0	0	0	5.76	1566	0	0	0	1	0
1999	11	2	0	0	0	5.76	1566	0	0	0	1	0
1999	11	3	0	0	0	5.76	1566	0	0	0	1	0
1999	11	4	0.2	0	0	5.76	1566	0	0	0	1	0
1999	11	5	0	0	0	5.76	1566	0	0	0	1	0
1999	11	6	10.4	0.43	440.492	5.76	1131.268	0	434.732	434.732	0	0
1999	11	7	0	0	0	5.76	1566	0	0	0	1	0
1999	11	8	5.2	0	0	5.76	1566	0	0	0	1	0
1999	11	9	4.4	0	0	5.76	1566	0	0	0	1	0
1999	11	10	2.8	0	0	5.76	1566	0	0	0	1	0
1999	11	11	1.4	0	0	5.76	1566	0	0	0	1	0
1999	11	12	0.2	0	0	5.76	1566	0	0	0	1	0
1999	11	13	0	0	0	5.76	1566	0	0	0	1	0
1999	11	14	0	0	0	5.76	1566	0	0	0	1	0
1999	11	15	0	0	0	5.76	1566	0	0	0	1	0
1999	11	16	0	0	0	5.76	1566	0	0	0	1	0
1999	11	17	0	0	0	5.76	1566	0	0	0	1	0
1999	11	18	0	0	0	5.76	1566	0	0	0	1	0
1999	11	19	0	0	0	5.76	1566	0	0	0	1	0
1999	11	20	0.2	0	0	5.76	1566	0	0	0	1	0
1999	11	21	7.2	0	0	5.76	1566	0	0	0	1	0
1999	11	22	12.2	0.43	516.731	5.76	1055.029	0	510.971	510.971	0	0
1999	11	23	0.4	0	0	5.76	1566	0	0	0	1	0
1999	11	24	0	0	0	5.76	1566	0	0	0	1	0
1999	11	25	0	0	0	5.76	1566	0	0	0	1	0
1999	11	26	0	0	0	5.76	1566	0	0	0	1	0
1999	11	27	0	0	0	5.76	1566	0	0	0	1	0
1999	11	28	0	0	0	5.76	1566	0	0	0	1	0
1999	11	29	0.2	0	0	5.76	1566	0	0	0	1	0
1999	11	30	0	0	0	5.76	1566	0	0	0	1	0
1999	12	1	2.8	0	0	6.912	1566	0	0	0	1	0
1999	12	2	0	0	0	6.912	1566	0	0	0	1	0
1999	12	3	23.4	0.56	1290.744	6.912	282.168	0	1283.832	1283.832	0	0
1999	12	4	0.6	0	0	6.912	1566	0	0	0	1	0
1999	12	5	0	0	0	6.912	1566	0	0	0	1	0
1999	12	6	0	0	0	6.912	1566	0	0	0	1	0
1999	12	7	0	0	0	6.912	1566	0	0	0	1	0
1999	12	8	1.6	0	0	6.912	1566	0	0	0	1	0
1999	12	9	8	0	0	6.912	1566	0	0	0	1	0
1999	12	10	0.2	0	0	6.912	1566	0	0	0	1	0
1999	12	11	0	0	0	6.912	1566	0	0	0	1	0
1999	12	12	1.2	0	0	6.912	1566	0	0	0	1	0
1999	12	13	0	0	0	6.912	1566	0	0	0	1	0
1999	12	14	0	0	0	6.912	1566	0	0	0	1	0
1999	12	15	0	0	0	6.912	1566	0	0	0	1	0
1999	12	16	4.6	0	0	6.912	1566	0	0	0	1	0
1999	12	17	0	0	0	6.912	1566	0	0	0	1	0
1999	12	18	0	0	0	6.912	1566	0	0	0	1	0
1999	12	19	0	0	0	6.912	1566	0	0	0	1	0
1999	12	20	0	0	0	6.912	1566	0	0	0	1	0
1999	12	21	0	0	0	6.912	1566	0	0	0	1	0
1999	12	22	0	0	0	6.912	1566	0	0	0	1	0
1999	12	23	0	0	0	6.912	1566	0	0	0	1	0
1999	12	24	0	0	0	6.912	1566	0	0	0	1	0

1999	12	25	1.2	0	0	6.912	1566	0	0	0	1	0
1999	12	26	0	0	0	6.912	1566	0	0	0	1	0
1999	12	27	0.2	0	0	6.912	1566	0	0	0	1	0
1999	12	28	1.8	0	0	6.912	1566	0	0	0	1	0
1999	12	29	0.2	0	0	6.912	1566	0	0	0	1	0
1999	12	30	0	0	0	6.912	1566	0	0	0	1	0
1999	12	31	2	0	0	6.912	1566	0	0	0	1	0
			997.8		45072.221	1575.264		13700.765	31553.616		312	11

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Volume of Controlled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m³)	Evaporation (m³)							
1999	1	1	0	0	0	7.68	2840	0	0	0	2200	0	
1999	1	2	0	0	0	7.68	2847.68	0	0	0	794.32	0	0
1999	1	3	0	0	0	7.68	2855.36	0	0	0	786.64	0	0
1999	1	4	0	0	0	7.68	2863.04	0	0	0	778.96	0	0
1999	1	5	0	0	0	7.68	2870.72	0	-20.72	0	771.28	0	0
1999	1	6	0	0	0	7.68	2878.4	0	-28.4	0	763.6	0	0
1999	1	7	0.4	0	0	7.68	2886.08	0	-36.08	0	755.92	0	0
1999	1	8	16	0.43	677.68	7.68	2216.08	0	633.92	633.92	1425.92	0	0
1999	1	9	0	0	0	7.68	2857.68	0	-7.68	0	784.32	0	0
1999	1	10	0	0	0	7.68	2865.36	0	-15.36	0	776.64	0	0
1999	1	11	0	0	0	7.68	2873.04	0	-23.04	0	768.96	0	0
1999	1	12	0	0	0	7.68	2880.72	0	-30.72	0	761.28	0	0
1999	1	13	0	0	0	7.68	2888.4	0	-38.4	0	753.6	0	0
1999	1	14	0	0	0	7.68	2896.08	0	-46.08	0	745.92	0	0
1999	1	15	0	0	0	7.68	2903.76	0	-53.76	0	738.24	0	0
1999	1	16	0	0	0	7.68	2911.44	0	-61.44	0	730.56	0	0
1999	1	17	0	0	0	7.68	2919.12	0	-69.12	0	722.88	0	0
1999	1	18	0	0	0	7.68	2926.8	0	-76.8	0	715.2	0	0
1999	1	19	0	0	0	7.68	2934.48	0	-84.48	0	707.52	0	0
1999	1	20	0	0	0	7.68	2942.16	0	-92.16	0	699.84	0	0
1999	1	21	0	0	0	7.68	2949.84	0	-99.84	0	692.16	0	0
1999	1	22	0	0	0	7.68	2957.52	0	-107.52	0	684.48	0	0
1999	1	23	0	0	0	7.68	2965.2	0	-115.2	0	676.8	0	0
1999	1	24	0	0	0	7.68	2972.88	0	-122.88	0	669.12	0	0
1999	1	25	0	0	0	7.68	2980.56	0	-130.56	0	661.44	0	0
1999	1	26	0.8	0	0	7.68	2988.24	0	-138.24	0	653.76	0	0
1999	1	27	0	0	0	7.68	2995.92	0	-145.92	0	646.08	0	0
1999	1	28	0	0	0	7.68	3003.6	0	-153.6	0	638.4	0	0
1999	1	29	0.2	0	0	7.68	3011.28	0	-161.28	0	630.72	0	0
1999	1	30	0	0	0	7.68	3018.96	0	-168.96	0	623.04	0	0
1999	1	31	0.6	0	0	7.68	3026.64	0	-176.64	0	615.36	0	0
1999	2	1	0	0	0	6.816	3033.456	0	-183.456	0	608.544	0	0
1999	2	2	0	0	0	6.816	3040.272	0	-190.272	0	601.728	0	0
1999	2	3	0	0	0	6.816	3047.088	0	-197.088	0	594.912	0	0
1999	2	4	0	0	0	6.816	3053.904	0	-203.904	0	588.096	0	0
1999	2	5	0	0	0	6.816	3060.72	0	-210.72	0	581.28	0	0
1999	2	6	0.8	0	0	6.816	3067.536	0	-217.536	0	574.464	0	0
1999	2	7	0	0	0	6.816	3074.352	0	-224.352	0	567.648	0	0
1999	2	8	0	0	0	6.816	3081.168	0	-231.168	0	560.832	0	0
1999	2	9	0	0	0	6.816	3087.984	0	-237.984	0	554.016	0	0
1999	2	10	0	0	0	6.816	3094.8	0	-244.8	0	547.2	0	0
1999	2	11	0.4	0	0	6.816	3101.616	0	-251.616	0	540.384	0	0
1999	2	12	0	0	0	6.816	3108.432	0	-258.432	0	533.568	0	0
1999	2	13	0	0	0	6.816	3115.248	0	-265.248	0	526.752	0	0
1999	2	14	0	0	0	6.816	3122.064	0	-272.064	0	519.936	0	0
1999	2	15	0	0	0	6.816	3128.88	0	-278.88	0	513.12	0	0
1999	2	16	0	0	0	6.816	3135.696	0	-285.696	0	506.304	0	0
1999	2	17	0	0	0	6.816	3142.512	0	-292.512	0	499.488	0	0
1999	2	18	3.4	0	0	6.816	3149.328	0	-299.328	0	492.672	0	0
1999	2	19	0	0	0	6.816	3156.144	0	-306.144	0	485.856	0	0
1999	2	20	0	0	0	6.816	3162.96	0	-312.96	0	479.04	0	0
1999	2	21	0	0	0	6.816	3169.776	0	-319.776	0	472.224	0	0
1999	2	22	0	0	0	6.816	3176.592	0	-326.592	0	465.408	0	0
1999	2	23	0	0	0	6.816	3183.408	0	-333.408	0	458.592	0	0
1999	2	24	0	0	0	6.816	3190.224	0	-340.224	0	451.776	0	0
1999	2	25	0	0	0	6.816	3197.04	0	-347.04	0	444.96	0	0
1999	2	26	0	0	0	6.816	3203.856	0	-353.856	0	438.144	0	0
1999	2	27	0	0	0	6.816	3210.672	0	-360.672	0	431.328	0	0
1999	2	28	0	0	0	6.816	3217.488	0	-367.488	0	424.512	0	0
1999	3	1	0	0	0	5.568	3223.056	0	-373.056	0	418.944	0	0
1999	3	2	0	0	0	5.568	3228.624	0	-378.624	0	413.376	0	0
1999	3	3	0	0	0	5.568	3234.192	0	-384.192	0	407.808	0	0
1999	3	4	0	0	0	5.568	3239.76	0	-389.76	0	402.24	0	0
1999	3	5	0	0	0	5.568	3245.328	0	-395.328	0	396.672	0	0
1999	3	6	0	0	0	5.568	3250.896	0	-400.896	0	391.104	0	0
1999	3	7	19.6	0.43	830.158	5.568	2426.306	0	423.694	423.694	1215.694	0	0
1999	3	8	0.2	0	0	5.568	2855.568	0	-5.568	0	786.432	0	0
1999	3	9	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	10	0	0	0	5.568	2866.704	0	-16.704	0	775.296	0	0
1999	3	11	0	0	0	5.568	2872.272	0	-22.272	0	769.728	0	0
1999	3	12	0	0	0	5.568	2877.84	0	-27.84	0	764.16	0	0
1999	3	13	0	0	0	5.568	2883.408	0	-33.408	0	758.592	0	0
1999	3	14	0	0	0	5.568	2888.976	0	-38.976	0	753.024	0	0
1999	3	15	0	0	0	5.568	2894.544	0	-44.544	0	747.456	0	0
1999	3	16	0	0	0	5.568	2900.112	0	-50.112	0	741.888	0	0
1999	3	17	0	0	0	5.568	2905.68	0	-55.68	0	736.32	0	0
1999	3	18	11	0.43	465.905	5.568	2445.343	0	404.657	404.657	1196.657	0	0
1999	3	19	1.6	0	0	5.568	2855.568	0	-5.568	0	786.432	0	0
1999	3	20	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	21	48	0.74	3498.72	5.568	-632.016	632.016	2850	2850	3642	0	0
1999	3	22	2.6	0	0	5.568	2855.568	0	-5.568	0	786.432	0	1
1999	3	23	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	24	0	0	0	5.568	2866.704	0	-16.704	0	775.296	0	0
1999	3	25	11	0.43	465.905	5.568	2406.367	0	443.633	443.633	1235.633	0	0
1999	3	26	2.8	0	0	5.568	2855.568	0	-5.568	0	786.432	0	0
1999	3	27	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	28	4.6	0	0	5.568	2866.704	0	-16.704	0	775.296	0	0
1999	3	29	0	0	0	5.568	2872.272	0	-22.272	0	769.728	0	0
1999	3	30	0	0	0	5.568	2877.84	0	-27.84	0	764.16	0	0
1999	3	31	1.8	0	0	5.568	2883.408	0	-33.408	0	758.592	0	0
1999	4	1	0	0	0	3.552	2886.96	0	-36.96	0	755.04	0	0
1999	4	2	0	0	0	3.552	2890.512	0	-40.512	0	751.488	0	0
1999	4	3	0	0	0	3.552	2894.064	0	-44.064	0	747.936	0	0
1999	4	4	1.2	0	0	3.552	2897.616	0	-47.616	0	744.384	0	0
1999	4	5	3.2	0	0	3.552	2901.168	0	-51.168	0	740.832	0	0
1999	4	6	0	0	0	3.552	2904.72	0	-54.72	0	737.28	0	0
1999	4	7	0	0	0	3.552	2908.272	0	-58.272	0	733.728	0	0
1999	4	8	0	0	0	3.552	2911.824	0	-61.824	0	730.176	0	0
1999	4	9	0	0	0	3.552	2915.376	0	-65.376	0	726.624	0	0
1999	4	10	0	0	0	3.552	2918.928	0	-68.928	0	723.072	0	0
1999	4	11	0	0	0	3.552	2922.48	0	-72.48	0	719.52	0	0
1999	4	12	0	0	0	3.552	2926.032	0	-76.032	0	715.968	0	0
1999	4	13	0	0	0	3.552	2929.584	0	-79.584	0	712.416	0	0
1999	4	14	0	0	0	3.552	2933.136	0	-83.136	0	708.864	0	0
1999	4	15	0	0	0	3.552	2936.688	0	-86.688	0	705.312	0	0
1999	4	16	0	0	0	3.552	2940.24	0	-90.24	0	701.76	0	0
1999	4	17	0	0	0	3.552	2943.792	0	-93.792	0	698.208	0	0
1999	4	18	0	0	0	3.552	2947.344	0	-97.344	0	694.656	0	0
1999	4	19	0	0	0	3.552	2950.896	0	-100.896	0	691.104	0	0
1999	4	20	6.8	0	0	3.552	2954.448	0	-104.448	0	687.552	0	0
1999	4	21	4.2	0	0	3.552	2958	0	-108	0	684	0	0
1999	4	22	0	0	0	3.552	2961.552	0	-111.552	0	680.448	0	0
1999	4	23	0	0	0	3.552	2965.104	0	-115.104	0	676.896	0	0
1999	4	24	0	0	0	3.552	2968.656	0	-118.656	0	673.344	0	0
1999	4	25	0	0	0	3.552	2972.208	0	-122.208	0	669.792	0	0
1999	4	26	0	0	0	3.552	2975.76	0	-125.76	0	666.24	0	0
1999	4	27	1.2	0	0	3.552	2979.312	0	-129.312	0	662.688	0	0
1999	4	28	0.6	0	0	3.552	2982.864	0	-132.864	0	659.136	0	0
1999	4	29	0.2	0	0	3.552	2986.416	0	-136.416	0	655.584	0	0
1999	4	30	0	0	0	3.552	2989.968	0	-139.968	0	652.032	0	0
1999	5	1	0	0	0	2.304	2992.272	0	-142.272	0	649.728	0	0
1999	5	2	0	0	0	2.304	2994.576	0	-144.576	0	647.424	0	0
1999	5	3	0	0	0	2.304	2996.88	0	-146.88	0	645.12	0	0
1999	5	4	0	0	0	2.304	2999.184	0	-149.184	0	642.816	0	0
1999	5	5	0	0	0	2.304	3001.488	0	-151.488	0	640.512	0	0

1999	5	6	0	0	0	2.304	3003.792	0	-153.792	0	638.208	0	0
1999	5	7	0	0	0	2.304	3006.096	0	-156.096	0	635.904	0	0
1999	5	8	0	0	0	2.304	3008.4	0	-158.4	0	633.6	0	0
1999	5	9	0	0	0	2.304	3010.704	0	-160.704	0	631.296	0	0
1999	5	10	0.4	0	0	2.304	3013.008	0	-163.008	0	628.992	0	0
1999	5	11	0	0	0	2.304	3015.312	0	-165.312	0	626.688	0	0
1999	5	12	11.6	0.43	491.318	2.304	2526.298	0	323.702	323.702	1115.702	0	0
1999	5	13	30.4	0.69	2066.136	2.304	786.168	0	2063.832	2063.832	2855.832	0	0
1999	5	14	0.6	0	0	2.304	2852.304	0	-2.304	0	789.696	0	0
1999	5	15	0	0	0	2.304	2854.608	0	-4.608	0	787.392	0	0
1999	5	16	42.8	0.74	3119.692	2.304	-262.78	262.78	2850	2850	3642	0	0
1999	5	17	0	0	0	2.304	2852.304	0	-2.304	0	789.696	0	1
1999	5	18	0.8	0	0	2.304	2854.608	0	-4.608	0	787.392	0	0
1999	5	19	0	0	0	2.304	2856.912	0	-6.912	0	785.088	0	0
1999	5	20	0	0	0	2.304	2859.216	0	-9.216	0	782.784	0	0
1999	5	21	6.4	0	0	2.304	2861.52	0	-11.52	0	780.48	0	0
1999	5	22	5.2	0	0	2.304	2863.824	0	-13.824	0	778.176	0	0
1999	5	23	44.2	0.74	3221.738	2.304	-355.61	355.61	2850	2850	3642	0	0
1999	5	24	15.8	0.43	669.209	2.304	2183.095	0	0	0	1458.905	0	0
1999	5	25	78	0.81	6223.23	2.304	-4037.831	4037.831	0	0	3642	0	0
1999	5	26	11.4	0.43	482.847	2.304	-480.543	480.543	0	0	3642	0	0
1999	5	27	1.6	0	0	2.304	2.304	0	0	0	3639.696	0	1
1999	5	28	0	0	0	2.304	4.608	0	2845.392	2845.392	3637.392	0	0
1999	5	29	14	0.43	592.97	2.304	2259.334	0	590.666	590.666	1382.666	0	1
1999	5	30	10.4	0.43	440.492	2.304	2411.812	0	438.188	438.188	1230.188	0	0
1999	5	31	13.2	0.43	559.086	2.304	2293.218	0	556.782	556.782	1348.782	0	0
1999	6	1	0	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	2	0.2	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	3	0.2	0	0	1.728	2855.184	0	-5.184	0	786.816	0	0
1999	6	4	0	0	0	1.728	2856.912	0	-6.912	0	785.088	0	0
1999	6	5	12.8	0.43	542.144	1.728	2316.496	0	533.504	533.504	1325.504	0	0
1999	6	6	1.4	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	7	8.2	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	8	0.2	0	0	1.728	2855.184	0	0	0	786.816	0	0
1999	6	9	0.2	0	0	1.728	2856.912	0	0	0	785.088	0	0
1999	6	10	7.2	0	0	1.728	2858.64	0	0	0	783.36	0	0
1999	6	11	0	0	0	1.728	2860.368	0	-10.368	0	781.632	0	0
1999	6	12	0	0	0	1.728	2862.096	0	-12.096	0	779.904	0	0
1999	6	13	36.2	0.69	2460.333	1.728	403.491	0	2446.509	2446.509	3238.509	0	0
1999	6	14	0	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	15	16.6	0.43	703.093	1.728	2150.363	0	699.637	699.637	1491.637	0	0
1999	6	16	5	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	17	0.4	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	18	14.8	0.43	626.854	1.728	2228.33	0	0	0	1413.67	0	0
1999	6	19	2.4	0	0	1.728	2230.058	0	0	0	1411.942	0	0
1999	6	20	0.2	0	0	1.728	2231.786	0	0	0	1410.214	0	0
1999	6	21	4.4	0	0	1.728	2233.514	0	0	0	1408.486	0	0
1999	6	22	0.6	0	0	1.728	2235.242	0	0	0	1406.758	0	0
1999	6	23	0.4	0	0	1.728	2236.97	0	0	0	1405.03	0	0
1999	6	24	0.2	0	0	1.728	2238.698	0	0	0	1403.302	0	0
1999	6	25	7.6	0	0	1.728	2240.426	0	0	0	1401.574	0	0
1999	6	26	3.8	0	0	1.728	2242.154	0	0	0	1399.846	0	0
1999	6	27	0	0	0	1.728	2243.882	0	606.118	606.118	1398.118	0	0
1999	6	28	0.2	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	29	0	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	30	16.2	0.43	686.151	1.728	2169.033	0	680.967	680.967	1472.967	0	0
1999	7	1	0.6	0	0	1.632	2851.632	0	-1.632	0	790.368	0	0
1999	7	2	4.8	0	0	1.632	2853.264	0	-3.264	0	788.736	0	0
1999	7	3	0.4	0	0	1.632	2854.896	0	0	0	787.104	0	0
1999	7	4	0	0	0	1.632	2856.528	0	-6.528	0	785.472	0	0
1999	7	5	0	0	0	1.632	2858.16	0	-8.16	0	783.84	0	0
1999	7	6	0	0	0	1.632	2859.792	0	-9.792	0	782.208	0	0
1999	7	7	0	0	0	1.632	2861.424	0	-11.424	0	780.576	0	0
1999	7	8	2	0	0	1.632	2863.056	0	-13.056	0	778.944	0	0
1999	7	9	18.6	0.43	787.803	1.632	2076.885	0	773.115	773.115	1565.115	0	0
1999	7	10	0	0	0	1.632	2851.632	0	-1.632	0	790.368	0	0
1999	7	11	0	0	0	1.632	2853.264	0	-3.264	0	788.736	0	0
1999	7	12	0.4	0	0	1.632	2854.896	0	-4.896	0	787.104	0	0
1999	7	13	0.4	0	0	1.632	2856.528	0	-6.528	0	785.472	0	0
1999	7	14	0.4	0	0	1.632	2858.16	0	-8.16	0	783.84	0	0
1999	7	15	0.2	0	0	1.632	2859.792	0	0	0	782.208	0	0
1999	7	16	0	0	0	1.632	2861.424	0	-11.424	0	780.576	0	0
1999	7	17	0	0	0	1.632	2863.056	0	-13.056	0	778.944	0	0
1999	7	18	0	0	0	1.632	2864.688	0	-14.688	0	777.312	0	0
1999	7	19	0	0	0	1.632	2866.32	0	-16.32	0	775.68	0	0
1999	7	20	30.2	0.69	2052.543	1.632	815.409	0	2034.591	2034.591	2826.591	0	0
1999	7	21	5.8	0	0	1.632	2851.632	0	-1.632	0	790.368	0	0
1999	7	22	5.8	0	0	1.632	2853.264	0	-3.264	0	788.736	0	0
1999	7	23	0	0	0	1.632	2854.896	0	-4.896	0	787.104	0	0
1999	7	24	0	0	0	1.632	2856.528	0	-6.528	0	785.472	0	0
1999	7	25	0	0	0	1.632	2858.16	0	-8.16	0	783.84	0	0
1999	7	26	0.8	0	0	1.632	2859.792	0	-9.792	0	782.208	0	0
1999	7	27	0	0	0	1.632	2861.424	0	-11.424	0	780.576	0	0
1999	7	28	0	0	0	1.632	2863.056	0	-13.056	0	778.944	0	0
1999	7	29	0	0	0	1.632	2864.688	0	-14.688	0	777.312	0	0
1999	7	30	0.2	0	0	1.632	2866.32	0	-16.32	0	775.68	0	0
1999	7	31	0.6	0	0	1.632	2867.952	0	-17.952	0	774.048	0	0
1999	8	1	0	0	0	2.208	2870.16	0	-20.16	0	771.84	0	0
1999	8	2	0	0	0	2.208	2872.368	0	-22.368	0	769.632	0	0
1999	8	3	0	0	0	2.208	2874.576	0	-24.576	0	767.424	0	0
1999	8	4	0	0	0	2.208	2876.784	0	-26.784	0	765.216	0	0
1999	8	5	0	0	0	2.208	2878.992	0	-28.992	0	763.008	0	0
1999	8	6	0	0	0	2.208	2881.2	0	-31.2	0	760.8	0	0
1999	8	7	0	0	0	2.208	2883.408	0	-33.408	0	758.592	0	0
1999	8	8	21	0.56	1158.36	2.208	1727.256	0	1122.744	1122.744	1914.744	0	0
1999	8	9	24	0.56	1323.84	2.208	1528.368	0	1321.632	1321.632	2113.632	0	0
1999	8	10	4	0	0	2.208	2852.208	0	-2.208	0	789.792	0	0
1999	8	11	0	0	0	2.208	2854.416	0	-4.416	0	787.584	0	0
1999	8	12	0.6	0	0	2.208	2856.624	0	-6.624	0	785.376	0	0
1999	8	13	1.2	0	0	2.208	2858.832	0	-8.832	0	783.168	0	0
1999	8	14	0	0	0	2.208	2861.04	0	-11.04	0	780.96	0	0
1999	8	15	5	0	0	2.208	2863.248	0	-13.248	0	778.752	0	0
1999	8	16	0	0	0	2.208	2865.456	0	-15.456	0	776.544	0	0
1999	8	17	0.2	0	0	2.208	2867.664	0	-17.664	0	774.336	0	0
1999	8	18	0	0	0	2.208	2869.872	0	-19.872	0	772.128	0	0
1999	8	19	0	0	0	2.208	2872.08	0	-22.08	0	769.92	0	0
1999	8	20	0	0	0	2.208	2874.288	0	-24.288	0	767.712	0	0
1999	8	21	0	0	0	2.208	2876.496	0	-26.496	0	765.504	0	0
1999	8	22	0	0	0	2.208	2878.704	0	-28.704	0	763.296	0	0
1999	8	23	0	0	0	2.208	2880.912	0	-30.912	0	761.088	0	0
1999	8	24	0.2	0	0	2.208	2883.12	0	-33.12	0	758.88	0	0
1999	8	25	0	0	0	2.208	2885.328	0	-35.328	0	756.672	0	0
1999	8	26	0.6	0	0	2.208	2887.536	0	-37.536	0	754.464	0	0
1999	8	27	4.6	0	0	2.208	2889.744	0	-39.744	0	752.256	0	0
1999	8	28	0	0	0	2.208	2891.952	0	-41.952	0	750.048	0	0
1999	8	29	0	0	0	2.208	2894.16	0	-44.16	0	747.84	0	0
1999	8	30	0.4	0	0	2.208	2896.368	0	-46.368	0	745.632	0	0
1999	8	31	0	0	0	2.208	2898.576	0	-48.576	0	743.424	0	0
1999	9	1	0	0	0	3.264	2901.84	0	-51.84	0	740.16	0	0
1999	9	2	0	0	0	3.264	2905.104	0	-55.104	0	736.896	0	0
1999	9	3	0	0	0	3.264	2908.368	0	-58.368	0	733.632	0	0
1999	9	4	36.2	0.69	2460.333	3.264	451.299	0	2398.701	2398.701	3190.701	0	0
1999	9	5	0	0	0	3.264	2853.264	0	-3.264	0	788.736	0	0
1999	9	6	10.8	0.43	457.434	3.264	2399.094	0	450.906	450.906	1242.906	0	0
1999	9	7	0.4	0	0	3.264	2853.264	0	-3.264	0	788.736	0	0
1999	9	8	0	0	0	3.264	2856.528	0	-6.528	0	785.472	0	0
1999	9	9	0	0	0	3.264	2859.792	0	-9.792	0	782.208	0	0
1999	9	10	0	0	0	3.264	2863.056	0	-13.056	0	778.944	0	0
1999	9	11	4.6	0	0	3.264	2866.32	0	-16.32	0	775.68	0	0
1999	9	12	0.4	0	0	3.264	2869.584	0	-19.584	0	772.416	0	0

1999	9	13	2.2	0	0	3.264	2872.848	0	-22.848	0	769.152	0	0
1999	9	14	0	0	0	3.264	2876.112	0	-26.112	0	765.888	0	0
1999	9	15	0.2	0	0	3.264	2879.376	0	-29.376	0	762.624	0	0
1999	9	16	13.8	0.43	584.499	3.264	2298.141	0	551.859	551.859	1343.859	0	0
1999	9	17	26.8	0.56	1478.288	3.264	1374.976	0	1475.024	1475.024	2267.024	0	0
1999	9	18	2	0	0	3.264	2853.264	0	0	0	788.736	0	0
1999	9	19	0	0	0	3.264	2856.528	0	-6.528	0	785.472	0	0
1999	9	20	0.2	0	0	3.264	2859.792	0	-9.792	0	782.208	0	0
1999	9	21	0	0	0	3.264	2863.056	0	-13.056	0	778.944	0	0
1999	9	22	0	0	0	3.264	2866.32	0	-16.32	0	775.68	0	0
1999	9	23	0	0	0	3.264	2869.584	0	-19.584	0	772.416	0	0
1999	9	24	0	0	0	3.264	2872.848	0	-22.848	0	769.152	0	0
1999	9	25	0	0	0	3.264	2876.112	0	-26.112	0	765.888	0	0
1999	9	26	0	0	0	3.264	2879.376	0	-29.376	0	762.624	0	0
1999	9	27	0	0	0	3.264	2882.64	0	-32.64	0	759.36	0	0
1999	9	28	0	0	0	3.264	2885.904	0	-35.904	0	756.096	0	0
1999	9	29	16.8	0.43	711.564	3.264	2177.604	0	672.396	672.396	1464.396	0	0
1999	9	30	0	0	0	3.264	2853.264	0	-3.264	0	788.736	0	0
1999	10	1	0	0	0	4.512	2857.776	0	-7.776	0	784.224	0	0
1999	10	2	0	0	0	4.512	2862.288	0	-12.288	0	779.712	0	0
1999	10	3	21.4	0.56	1180.424	4.512	1686.376	0	1163.624	1163.624	1955.624	0	0
1999	10	4	0	0	0	4.512	2854.512	0	-4.512	0	787.488	0	0
1999	10	5	0	0	0	4.512	2859.024	0	-9.024	0	782.976	0	0
1999	10	6	0	0	0	4.512	2863.536	0	-13.536	0	778.464	0	0
1999	10	7	0	0	0	4.512	2868.048	0	-18.048	0	773.952	0	0
1999	10	8	0	0	0	4.512	2872.56	0	-22.56	0	769.44	0	0
1999	10	9	0.8	0	0	4.512	2877.072	0	-27.072	0	764.928	0	0
1999	10	10	20.6	0.56	1136.296	4.512	1745.288	0	1104.712	1104.712	1896.712	0	0
1999	10	11	15.8	0.43	669.209	4.512	2185.303	0	664.697	664.697	1456.697	0	0
1999	10	12	0.4	0	0	4.512	2854.512	0	0	0	787.488	0	0
1999	10	13	9.2	0	0	4.512	2859.024	0	0	0	782.976	0	0
1999	10	14	7.4	0	0	4.512	2863.536	0	0	0	778.464	0	0
1999	10	15	1	0	0	4.512	2868.048	0	0	0	773.952	0	0
1999	10	16	0	0	0	4.512	2872.56	0	-22.56	0	769.44	0	0
1999	10	17	0	0	0	4.512	2877.072	0	-27.072	0	764.928	0	0
1999	10	18	0.4	0	0	4.512	2881.584	0	-31.584	0	760.416	0	0
1999	10	19	0.2	0	0	4.512	2886.096	0	-36.096	0	755.904	0	0
1999	10	20	0.2	0	0	4.512	2890.608	0	-40.608	0	751.392	0	0
1999	10	21	0	0	0	4.512	2895.12	0	-45.12	0	746.88	0	0
1999	10	22	0.6	0	0	4.512	2899.632	0	-49.632	0	742.368	0	0
1999	10	23	0	0	0	4.512	2904.144	0	-54.144	0	737.856	0	0
1999	10	24	0.2	0	0	4.512	2908.656	0	-58.656	0	733.344	0	0
1999	10	25	1.2	0	0	4.512	2913.168	0	-63.168	0	728.832	0	0
1999	10	26	1.2	0	0	4.512	2917.68	0	-67.68	0	724.32	0	0
1999	10	27	3	0	0	4.512	2922.192	0	0	0	719.808	0	0
1999	10	28	0.2	0	0	4.512	2926.704	0	0	0	715.296	0	0
1999	10	29	0	0	0	4.512	2931.216	0	-81.216	0	710.784	0	0
1999	10	30	0	0	0	4.512	2935.728	0	-85.728	0	706.272	0	0
1999	10	31	4.6	0	0	4.512	2940.24	0	-90.24	0	701.76	0	0
1999	11	1	0	0	0	5.76	2946	0	-96	0	696	0	0
1999	11	2	0	0	0	5.76	2951.76	0	-101.76	0	690.24	0	0
1999	11	3	0	0	0	5.76	2957.52	0	-107.52	0	684.48	0	0
1999	11	4	0.2	0	0	5.76	2963.28	0	-113.28	0	678.72	0	0
1999	11	5	0	0	0	5.76	2969.04	0	-119.04	0	672.96	0	0
1999	11	6	10.4	0.43	440.492	5.76	2534.308	0	315.692	315.692	1107.692	0	0
1999	11	7	0	0	0	5.76	2855.76	0	-5.76	0	786.24	0	0
1999	11	8	5.2	0	0	5.76	2861.52	0	-11.52	0	780.48	0	0
1999	11	9	4.4	0	0	5.76	2867.28	0	-17.28	0	774.72	0	0
1999	11	10	2.8	0	0	5.76	2873.04	0	-23.04	0	768.96	0	0
1999	11	11	1.4	0	0	5.76	2878.8	0	0	0	763.2	0	0
1999	11	12	0.2	0	0	5.76	2884.56	0	0	0	757.44	0	0
1999	11	13	0	0	0	5.76	2890.32	0	-40.32	0	751.68	0	0
1999	11	14	0	0	0	5.76	2896.08	0	-46.08	0	745.92	0	0
1999	11	15	0	0	0	5.76	2901.84	0	-51.84	0	740.16	0	0
1999	11	16	0	0	0	5.76	2907.6	0	-57.6	0	734.4	0	0
1999	11	17	0	0	0	5.76	2913.36	0	-63.36	0	728.64	0	0
1999	11	18	0	0	0	5.76	2919.12	0	-69.12	0	722.88	0	0
1999	11	19	0	0	0	5.76	2924.88	0	-74.88	0	717.12	0	0
1999	11	20	0.2	0	0	5.76	2930.64	0	-80.64	0	711.36	0	0
1999	11	21	7.2	0	0	5.76	2936.4	0	-86.4	0	705.6	0	0
1999	11	22	12.2	0.43	516.731	5.76	2425.429	0	424.571	424.571	1216.571	0	0
1999	11	23	0.4	0	0	5.76	2855.76	0	0	0	786.24	0	0
1999	11	24	0	0	0	5.76	2861.52	0	-11.52	0	780.48	0	0
1999	11	25	0	0	0	5.76	2867.28	0	-17.28	0	774.72	0	0
1999	11	26	0	0	0	5.76	2873.04	0	-23.04	0	768.96	0	0
1999	11	27	0	0	0	5.76	2878.8	0	-28.8	0	763.2	0	0
1999	11	28	0	0	0	5.76	2884.56	0	-34.56	0	757.44	0	0
1999	11	29	0.2	0	0	5.76	2890.32	0	-40.32	0	751.68	0	0
1999	11	30	0	0	0	5.76	2896.08	0	-46.08	0	745.92	0	0
1999	12	1	2.8	0	0	6.912	2902.992	0	-52.992	0	739.008	0	0
1999	12	2	0	0	0	6.912	2909.904	0	-59.904	0	732.096	0	0
1999	12	3	23.4	0.56	1290.744	6.912	1626.072	0	1223.928	1223.928	2015.928	0	0
1999	12	4	0.6	0	0	6.912	2856.912	0	-6.912	0	785.088	0	0
1999	12	5	0	0	0	6.912	2863.824	0	-13.824	0	778.176	0	0
1999	12	6	0	0	0	6.912	2870.736	0	-20.736	0	771.264	0	0
1999	12	7	0	0	0	6.912	2877.648	0	-27.648	0	764.352	0	0
1999	12	8	1.6	0	0	6.912	2884.56	0	-34.56	0	757.44	0	0
1999	12	9	8	0	0	6.912	2891.472	0	-41.472	0	750.528	0	0
1999	12	10	0.2	0	0	6.912	2898.384	0	-48.384	0	743.616	0	0
1999	12	11	0	0	0	6.912	2905.296	0	-55.296	0	736.704	0	0
1999	12	12	1.2	0	0	6.912	2912.208	0	-62.208	0	729.792	0	0
1999	12	13	0	0	0	6.912	2919.12	0	-69.12	0	722.88	0	0
1999	12	14	0	0	0	6.912	2926.032	0	-76.032	0	715.968	0	0
1999	12	15	0	0	0	6.912	2932.944	0	-82.944	0	709.056	0	0
1999	12	16	4.6	0	0	6.912	2939.856	0	-89.856	0	702.144	0	0
1999	12	17	0	0	0	6.912	2946.768	0	-96.768	0	695.232	0	0
1999	12	18	0	0	0	6.912	2953.68	0	-103.68	0	688.32	0	0
1999	12	19	0	0	0	6.912	2960.592	0	-110.592	0	681.408	0	0
1999	12	20	0	0	0	6.912	2967.504	0	-117.504	0	674.496	0	0
1999	12	21	0	0	0	6.912	2974.416	0	-124.416	0	667.584	0	0
1999	12	22	0	0	0	6.912	2981.328	0	-131.328	0	660.672	0	0
1999	12	23	0	0	0	6.912	2988.24	0	-138.24	0	653.76	0	0
1999	12	24	0	0	0	6.912	2995.152	0	-145.152	0	646.848	0	0
1999	12	25	1.2	0	0	6.912	3002.064	0	-152.064	0	639.936	0	0
1999	12	26	0	0	0	6.912	3008.976	0	-158.976	0	633.024	0	0
1999	12	27	0.2	0	0	6.912	3015.888	0	-165.888	0	626.112	0	0
1999	12	28	1.8	0	0	6.912	3022.8	0	-172.8	0	619.2	0	0
1999	12	29	0.2	0	0	6.912	3029.712	0	-179.712	0	612.288	0	0
1999	12	30	0	0	0	6.912	3036.624	0	-186.624	0	605.376	0	0
1999	12	31	2	0	0	6.912	3043.536	0	-193.536	0	598.464	0	0
			997.8		45072.221	1575.264		5768.78		37939.393		0	4

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient Cv	Inputs Overland Flow Quarry (m³)	Outputs Evaporation (m³)	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
1999	1	1	0	0	0	7.68	2840	0	0	2200	0	
1999	1	2	0	0	0	7.68	2847.68	0	0	1412.32	0	0
1999	1	3	0	0	0	7.68	2855.36	0	0	1404.64	0	0
1999	1	4	0	0	0	7.68	2863.04	0	0	1396.96	0	0
1999	1	5	0	0	0	7.68	2870.72	0	0	1389.28	0	0
1999	1	6	0	0	0	7.68	2878.4	0	0	1381.6	0	0
1999	1	7	0.4	0	0	7.68	2886.08	0	0	1373.92	0	0
1999	1	8	16	0.43	677.68	7.68	2216.08	0	0	2043.92	0	0
1999	1	9	0	0	0	7.68	2223.76	0	0	2036.24	0	0
1999	1	10	0	0	0	7.68	2231.44	0	0	2028.56	0	0
1999	1	11	0	0	0	7.68	2239.12	0	0	2020.88	0	0
1999	1	12	0	0	0	7.68	2246.8	0	593.2	2013.2	0	0
1999	1	13	0	0	0	7.68	2847.68	0	0	1412.32	0	0
1999	1	14	0	0	0	7.68	2855.36	0	0	1404.64	0	0
1999	1	15	0	0	0	7.68	2863.04	0	0	1396.96	0	0
1999	1	16	0	0	0	7.68	2870.72	0	0	1389.28	0	0
1999	1	17	0	0	0	7.68	2878.4	0	0	1381.6	0	0
1999	1	18	0	0	0	7.68	2886.08	0	0	1373.92	0	0
1999	1	19	0	0	0	7.68	2893.76	0	0	1366.24	0	0
1999	1	20	0	0	0	7.68	2901.44	0	0	1358.56	0	0
1999	1	21	0	0	0	7.68	2909.12	0	0	1350.88	0	0
1999	1	22	0	0	0	7.68	2916.8	0	0	1343.2	0	0
1999	1	23	0	0	0	7.68	2924.48	0	0	1335.52	0	0
1999	1	24	0	0	0	7.68	2932.16	0	0	1327.84	0	0
1999	1	25	0	0	0	7.68	2939.84	0	0	1320.16	0	0
1999	1	26	0.8	0	0	7.68	2947.52	0	0	1312.48	0	0
1999	1	27	0	0	0	7.68	2955.2	0	0	1304.8	0	0
1999	1	28	0	0	0	7.68	2962.88	0	0	1297.12	0	0
1999	1	29	0.2	0	0	7.68	2970.56	0	0	1289.44	0	0
1999	1	30	0	0	0	7.68	2978.24	0	0	1281.76	0	0
1999	1	31	0.6	0	0	7.68	2985.92	0	0	1274.08	0	0
1999	2	1	0	0	0	6.816	2992.736	0	0	1267.264	0	0
1999	2	2	0	0	0	6.816	2999.552	0	0	1260.448	0	0
1999	2	3	0	0	0	6.816	3006.368	0	0	1253.632	0	0
1999	2	4	0	0	0	6.816	3013.184	0	0	1246.816	0	0
1999	2	5	0	0	0	6.816	3020	0	0	1240	0	0
1999	2	6	0.8	0	0	6.816	3026.816	0	0	1233.184	0	0
1999	2	7	0	0	0	6.816	3033.632	0	0	1226.368	0	0
1999	2	8	0	0	0	6.816	3040.448	0	0	1219.552	0	0
1999	2	9	0	0	0	6.816	3047.264	0	0	1212.736	0	0
1999	2	10	0	0	0	6.816	3054.08	0	0	1205.92	0	0
1999	2	11	0.4	0	0	6.816	3060.896	0	0	1199.104	0	0
1999	2	12	0	0	0	6.816	3067.712	0	0	1192.288	0	0
1999	2	13	0	0	0	6.816	3074.528	0	0	1185.472	0	0
1999	2	14	0	0	0	6.816	3081.344	0	0	1178.656	0	0
1999	2	15	0	0	0	6.816	3088.16	0	0	1171.84	0	0
1999	2	16	0	0	0	6.816	3094.976	0	0	1165.024	0	0
1999	2	17	0	0	0	6.816	3101.792	0	0	1158.208	0	0
1999	2	18	3.4	0	0	6.816	3108.608	0	0	1151.392	0	0
1999	2	19	0	0	0	6.816	3115.424	0	0	1144.576	0	0
1999	2	20	0	0	0	6.816	3122.24	0	0	1137.76	0	0
1999	2	21	0	0	0	6.816	3129.056	0	0	1130.944	0	0
1999	2	22	0	0	0	6.816	3135.872	0	0	1124.128	0	0
1999	2	23	0	0	0	6.816	3142.688	0	0	1117.312	0	0
1999	2	24	0	0	0	6.816	3149.504	0	0	1110.496	0	0
1999	2	25	0	0	0	6.816	3156.32	0	0	1103.68	0	0
1999	2	26	0	0	0	6.816	3163.136	0	0	1096.864	0	0
1999	2	27	0	0	0	6.816	3169.952	0	0	1090.048	0	0
1999	2	28	0	0	0	6.816	3176.768	0	0	1083.232	0	0
1999	3	1	0	0	0	5.568	3182.336	0	0	1077.664	0	0
1999	3	2	0	0	0	5.568	3187.904	0	0	1072.096	0	0
1999	3	3	0	0	0	5.568	3193.472	0	0	1066.528	0	0
1999	3	4	0	0	0	5.568	3199.04	0	0	1060.96	0	0
1999	3	5	0	0	0	5.568	3204.608	0	0	1055.392	0	0
1999	3	6	0	0	0	5.568	3210.176	0	0	1049.824	0	0
1999	3	7	19.6	0.43	830.158	5.568	2385.586	0	0	1874.414	0	0
1999	3	8	0.2	0	0	5.568	2391.154	0	0	1868.846	0	0
1999	3	9	0	0	0	5.568	2396.722	0	0	1863.278	0	0
1999	3	10	0	0	0	5.568	2402.29	0	0	1857.71	0	0
1999	3	11	0	0	0	5.568	2407.858	0	0	1852.142	0	0
1999	3	12	0	0	0	5.568	2413.426	0	426.574	1846.574	0	0
1999	3	13	0	0	0	5.568	2845.568	0	0	1414.432	0	0
1999	3	14	0	0	0	5.568	2851.136	0	0	1408.864	0	0
1999	3	15	0	0	0	5.568	2856.704	0	0	1403.296	0	0
1999	3	16	0	0	0	5.568	2862.272	0	0	1397.728	0	0
1999	3	17	0	0	0	5.568	2867.84	0	0	1392.16	0	0
1999	3	18	11	0.43	465.905	5.568	2407.503	0	0	1852.497	0	0
1999	3	19	1.6	0	0	5.568	2413.071	0	0	1846.929	0	0
1999	3	20	0	0	0	5.568	2418.639	0	0	1841.361	0	0
1999	3	21	48	0.74	3498.72	5.568	-1074.513	1074.513	0	4260	0	0
1999	3	22	2.6	0	0	5.568	5.568	0	0	4254.432	0	1
1999	3	23	0	0	0	5.568	11.136	0	0	4248.864	0	0
1999	3	24	0	0	0	5.568	16.704	0	0	4243.296	0	0
1999	3	25	11	0.43	465.905	5.568	-443.633	443.633	0	4260	0	0
1999	3	26	2.8	0	0	5.568	5.568	0	0	4254.432	0	1
1999	3	27	0	0	0	5.568	11.136	0	0	4248.864	0	0
1999	3	28	4.6	0	0	5.568	16.704	0	0	4243.296	0	0
1999	3	29	0	0	0	5.568	22.272	0	0	4237.728	0	0
1999	3	30	0	0	0	5.568	27.84	0	0	4232.16	0	0
1999	3	31	1.8	0	0	5.568	33.408	0	0	4226.592	0	0
1999	4	1	0	0	0	3.552	36.96	0	0	4223.04	0	0
1999	4	2	0	0	0	3.552	40.512	0	0	4219.488	0	0
1999	4	3	0	0	0	3.552	44.064	0	0	4215.936	0	0
1999	4	4	1.2	0	0	3.552	47.616	0	0	4212.384	0	0
1999	4	5	3.2	0	0	3.552	51.168	0	0	4208.832	0	0
1999	4	6	0	0	0	3.552	54.72	0	0	4205.28	0	0
1999	4	7	0	0	0	3.552	58.272	0	0	4201.728	0	0
1999	4	8	0	0	0	3.552	61.824	0	0	4198.176	0	0
1999	4	9	0	0	0	3.552	65.376	0	2774.624	4194.624	0	0
1999	4	10	0	0	0	3.552	2843.552	0	0	1416.448	0	0
1999	4	11	0	0	0	3.552	2847.104	0	0	1412.896	0	0
1999	4	12	0	0	0	3.552	2850.656	0	0	1409.344	0	0
1999	4	13	0	0	0	3.552	2854.208	0	0	1405.792	0	0
1999	4	14	0	0	0	3.552	2857.76	0	0	1402.24	0	0
1999	4	15	0	0	0	3.552	2861.312	0	0	1398.688	0	0
1999	4	16	0	0	0	3.552	2864.864	0	0	1395.136	0	0
1999	4	17	0	0	0	3.552	2868.416	0	0	1391.584	0	0
1999	4	18	0	0	0	3.552	2871.968	0	0	1388.032	0	0
1999	4	19	0	0	0	3.552	2875.52	0	0	1384.48	0	0
1999	4	20	6.8	0	0	3.552	2879.072	0	0	1380.928	0	0
1999	4	21	4.2	0	0	3.552	2882.624	0	0	1377.376	0	0
1999	4	22	0	0	0	3.552	2886.176	0	0	1373.824	0	0
1999	4	23	0	0	0	3.552	2889.728	0	0	1370.272	0	0
1999	4	24	0	0	0	3.552	2893.28	0	0	1366.72	0	0
1999	4	25	0	0	0	3.552	2896.832	0	0	1363.168	0	0

1999	4	26	0	0	0	3.552	2900.384	0	0	1359.616	0	0
1999	4	27	1.2	0	0	3.552	2903.936	0	0	1356.064	0	0
1999	4	28	0.6	0	0	3.552	2907.488	0	0	1352.512	0	0
1999	4	29	0.2	0	0	3.552	2911.04	0	0	1348.96	0	0
1999	4	30	0	0	0	3.552	2914.592	0	0	1345.408	0	0
1999	5	1	0	0	0	2.304	2916.896	0	0	1343.104	0	0
1999	5	2	0	0	0	2.304	2919.2	0	0	1340.8	0	0
1999	5	3	0	0	0	2.304	2921.504	0	0	1338.496	0	0
1999	5	4	0	0	0	2.304	2923.808	0	0	1336.192	0	0
1999	5	5	0	0	0	2.304	2926.112	0	0	1333.888	0	0
1999	5	6	0	0	0	2.304	2928.416	0	0	1331.584	0	0
1999	5	7	0	0	0	2.304	2930.72	0	0	1329.28	0	0
1999	5	8	0	0	0	2.304	2933.024	0	0	1326.976	0	0
1999	5	9	0	0	0	2.304	2935.328	0	0	1324.672	0	0
1999	5	10	0.4	0	0	2.304	2937.632	0	0	1322.368	0	0
1999	5	11	0	0	0	2.304	2939.936	0	0	1320.064	0	0
1999	5	12	11.6	0.43	491.318	2.304	2450.922	0	0	1809.078	0	0
1999	5	13	30.4	0.69	2066.136	2.304	387.09	0	0	3872.91	0	0
1999	5	14	0.6	0	0	2.304	389.394	0	0	3870.606	0	0
1999	5	15	0	0	0	2.304	391.698	0	0	3868.302	0	0
1999	5	16	42.8	0.74	3119.692	2.304	-2725.69	2725.69	0	4260	0	0
1999	5	17	0	0	0	2.304	2.304	0	0	4257.696	0	1
1999	5	18	0.8	0	0	2.304	4.608	0	0	4255.392	0	0
1999	5	19	0	0	0	2.304	6.912	0	0	4253.088	0	0
1999	5	20	0	0	0	2.304	9.216	0	0	4250.784	0	0
1999	5	21	6.4	0	0	2.304	11.52	0	0	4248.48	0	0
1999	5	22	5.2	0	0	2.304	13.824	0	0	4246.176	0	0
1999	5	23	44.2	0.74	3221.738	2.304	-3205.61	3205.61	0	4260	0	0
1999	5	24	15.8	0.43	669.209	2.304	-666.905	666.905	0	4260	0	0
1999	5	25	78	0.81	6223.23	2.304	-6220.926	6220.926	0	4260	0	0
1999	5	26	11.4	0.43	482.847	2.304	-480.543	480.543	0	4260	0	0
1999	5	27	1.6	0	0	2.304	2.304	0	0	4257.696	0	1
1999	5	28	0	0	0	2.304	4.608	0	0	4255.392	0	0
1999	5	29	14	0.43	592.97	2.304	-586.058	586.058	0	4260	0	0
1999	5	30	10.4	0.43	440.492	2.304	-438.188	438.188	0	4260	0	0
1999	5	31	13.2	0.43	559.086	2.304	-556.782	556.782	0	4260	0	0
1999	6	1	0	0	0	1.728	1.728	0	0	4258.272	0	1
1999	6	2	0.2	0	0	1.728	3.456	0	0	4256.544	0	0
1999	6	3	0.2	0	0	1.728	5.184	0	0	4254.816	0	0
1999	6	4	0	0	0	1.728	6.912	0	0	4253.088	0	0
1999	6	5	12.8	0.43	542.144	1.728	-533.504	533.504	0	4260	0	0
1999	6	6	1.4	0	0	1.728	1.728	0	0	4258.272	0	1
1999	6	7	8.2	0	0	1.728	3.456	0	0	4256.544	0	0
1999	6	8	0.2	0	0	1.728	5.184	0	0	4254.816	0	0
1999	6	9	0.2	0	0	1.728	6.912	0	0	4253.088	0	0
1999	6	10	7.2	0	0	1.728	8.64	0	0	4251.36	0	0
1999	6	11	0	0	0	1.728	10.368	0	0	4249.632	0	0
1999	6	12	0	0	0	1.728	12.096	0	0	4247.904	0	0
1999	6	13	36.2	0.69	2460.333	1.728	-2446.509	2446.509	0	4260	0	0
1999	6	14	0	0	0	1.728	1.728	0	0	4258.272	0	0
1999	6	15	16.6	0.43	703.093	1.728	-699.637	699.637	0	4260	0	0
1999	6	16	5	0	0	1.728	1.728	0	0	4258.272	0	1
1999	6	17	0.4	0	0	1.728	3.456	0	0	4256.544	0	0
1999	6	18	14.8	0.43	626.854	1.728	-621.67	621.67	0	4260	0	0
1999	6	19	2.4	0	0	1.728	1.728	0	0	4258.272	0	1
1999	6	20	0.2	0	0	1.728	3.456	0	0	4256.544	0	0
1999	6	21	4.4	0	0	1.728	5.184	0	0	4254.816	0	0
1999	6	22	0.6	0	0	1.728	6.912	0	0	4253.088	0	0
1999	6	23	0.4	0	0	1.728	8.64	0	0	4251.36	0	0
1999	6	24	0.2	0	0	1.728	10.368	0	0	4249.632	0	0
1999	6	25	7.6	0	0	1.728	12.096	0	0	4247.904	0	0
1999	6	26	3.8	0	0	1.728	13.824	0	0	4246.176	0	0
1999	6	27	0	0	0	1.728	15.552	0	0	4244.448	0	0
1999	6	28	0.2	0	0	1.728	17.28	0	0	4242.72	0	0
1999	6	29	0	0	0	1.728	19.008	0	0	4240.992	0	0
1999	6	30	16.2	0.43	686.151	1.728	-665.415	665.415	0	4260	0	0
1999	7	1	0.6	0	0	1.632	1.632	0	0	4258.368	0	1
1999	7	2	4.8	0	0	1.632	3.264	0	0	4256.736	0	0
1999	7	3	0.4	0	0	1.632	4.896	0	0	4255.104	0	0
1999	7	4	0	0	0	1.632	6.528	0	0	4253.472	0	0
1999	7	5	0	0	0	1.632	8.16	0	0	4251.84	0	0
1999	7	6	0	0	0	1.632	9.792	0	0	4250.208	0	0
1999	7	7	0	0	0	1.632	11.424	0	2828.576	4248.576	0	0
1999	7	8	2	0	0	1.632	2841.632	0	0	1418.368	0	0
1999	7	9	18.6	0.43	787.803	1.632	2055.461	0	0	2204.539	0	0
1999	7	10	0	0	0	1.632	2057.093	0	0	2202.907	0	0
1999	7	11	0	0	0	1.632	2058.725	0	0	2201.275	0	0
1999	7	12	0.4	0	0	1.632	2060.357	0	0	2199.643	0	0
1999	7	13	0.4	0	0	1.632	2061.989	0	0	2198.011	0	0
1999	7	14	0.4	0	0	1.632	2063.621	0	0	2196.379	0	0
1999	7	15	0.2	0	0	1.632	2065.253	0	0	2194.747	0	0
1999	7	16	0	0	0	1.632	2066.885	0	0	2193.115	0	0
1999	7	17	0	0	0	1.632	2068.517	0	0	2191.483	0	0
1999	7	18	0	0	0	1.632	2070.149	0	0	2189.851	0	0
1999	7	19	0	0	0	1.632	2071.781	0	768.219	2188.219	0	0
1999	7	20	30.2	0.69	2052.543	1.632	789.089	0	0	3470.911	0	0
1999	7	21	5.8	0	0	1.632	790.721	0	0	3469.279	0	0
1999	7	22	5.8	0	0	1.632	792.353	0	0	3467.647	0	0
1999	7	23	0	0	0	1.632	793.985	0	0	3466.015	0	0
1999	7	24	0	0	0	1.632	795.617	0	0	3464.383	0	0
1999	7	25	0	0	0	1.632	797.249	0	0	3462.751	0	0
1999	7	26	0.8	0	0	1.632	798.881	0	0	3461.119	0	0
1999	7	27	0	0	0	1.632	800.513	0	0	3459.487	0	0
1999	7	28	0	0	0	1.632	802.145	0	0	3457.855	0	0
1999	7	29	0	0	0	1.632	803.777	0	0	3456.223	0	0
1999	7	30	0.2	0	0	1.632	805.409	0	0	3454.591	0	0
1999	7	31	0.6	0	0	1.632	807.041	0	0	3452.959	0	0
1999	8	1	0	0	0	2.208	809.249	0	0	3450.751	0	0
1999	8	2	0	0	0	2.208	811.457	0	0	3448.543	0	0
1999	8	3	0	0	0	2.208	813.665	0	0	3446.335	0	0
1999	8	4	0	0	0	2.208	815.873	0	2024.127	3444.127	0	0
1999	8	5	0	0	0	2.208	2842.208	0	0	1417.792	0	0
1999	8	6	0	0	0	2.208	2844.416	0	0	1415.584	0	0
1999	8	7	0	0	0	2.208	2846.624	0	0	1413.376	0	0
1999	8	8	21	0.56	1158.36	2.208	1690.472	0	0	2569.528	0	0
1999	8	9	24	0.56	1323.84	2.208	368.84	0	0	3891.16	0	0
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1999	8	12	0.6	0	0	2.208	375.464	0	0	3884.536	0	0
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1999	8	17	0.2	0	0	2.208	386.504	0	0	3873.496	0	0
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1999	8	19	0	0	0	2.208	390.92	0	0	3869.08	0	0
1999	8	20	0	0	0	2.208	393.128	0	0	3866.872	0	0
1999	8	21	0	0	0	2.208	395.336	0	2444.664	3864.664	0	0
1999	8	22	0	0	0	2.208	2842.208	0	0	1417.792	0	0
1999	8	23	0	0	0	2.208	2844.416	0	0	1415.584	0	0

1999	8	24	0.2	0	0	2.208	2846.624	0	0	1413.376	0	0
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1999	9	3	0	0	0	3.264	2871.872	0	0	1388.128	0	0
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1999	9	17	26.8	0.56	1478.288	3.264	-1475.024	1475.024	0	4260	0	0
1999	9	18	2	0	0	3.264	3.264	0	0	4256.736	0	1
1999	9	19	0	0	0	3.264	6.528	0	0	4253.472	0	0
1999	9	20	0.2	0	0	3.264	9.792	0	0	4250.208	0	0
1999	9	21	0	0	0	3.264	13.056	0	0	4246.944	0	0
1999	9	22	0	0	0	3.264	16.32	0	0	4243.68	0	0
1999	9	23	0	0	0	3.264	19.584	0	0	4240.416	0	0
1999	9	24	0	0	0	3.264	22.848	0	2817.152	4237.152	0	0
1999	9	25	0	0	0	3.264	2843.264	0	0	1416.736	0	0
1999	9	26	0	0	0	3.264	2846.528	0	0	1413.472	0	0
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1999	11	17	0	0	0	5.76	2845.76	0	0	1414.24	0	0
1999	11	18	0	0	0	5.76	2851.52	0	0	1408.48	0	0
1999	11	19	0	0	0	5.76	2857.28	0	0	1402.72	0	0
1999	11	20	0.2	0	0	5.76	2863.04	0	0	1396.96	0	0
1999	11	21	7.2	0	0	5.76	2868.8	0	0	1391.2	0	0
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1999	11	23	0.4	0	0	5.76	2363.589	0	0	1896.411	0	0
1999	11	24	0	0	0	5.76	2369.349	0	0	1890.651	0	0
1999	11	25	0	0	0	5.76	2375.109	0	0	1884.891	0	0
1999	11	26	0	0	0	5.76	2380.869	0	0	1879.131	0	0
1999	11	27	0	0	0	5.76	2386.629	0	453.371	1873.371	0	0
1999	11	28	0	0	0	5.76	2845.76	0	0	1414.24	0	0
1999	11	29	0.2	0	0	5.76	2851.52	0	0	1408.48	0	0
1999	11	30	0	0	0	5.76	2857.28	0	0	1402.72	0	0
1999	12	1	2.8	0	0	6.912	2864.192	0	0	1395.808	0	0
1999	12	2	0	0	0	6.912	2871.104	0	0	1388.896	0	0
1999	12	3	23.4	0.56	1290.744	6.912	1587.272	0	0	2672.728	0	0
1999	12	4	0.6	0	0	6.912	1594.184	0	0	2665.816	0	0
1999	12	5	0	0	0	6.912	1601.096	0	0	2658.904	0	0
1999	12	6	0	0	0	6.912	1608.008	0	0	2651.992	0	0
1999	12	7	0	0	0	6.912	1614.92	0	0	2645.08	0	0
1999	12	8	1.6	0	0	6.912	1621.832	0	0	2638.168	0	0
1999	12	9	8	0	0	6.912	1628.744	0	0	2631.256	0	0
1999	12	10	0.2	0	0	6.912	1635.656	0	0	2624.344	0	0
1999	12	11	0	0	0	6.912	1642.568	0	0	2617.432	0	0
1999	12	12	1.2	0	0	6.912	1649.48	0	0	2610.52	0	0
1999	12	13	0	0	0	6.912	1656.392	0	0	2603.608	0	0
1999	12	14	0	0	0	6.912	1663.304	0	0	2596.696	0	0
1999	12	15	0	0	0	6.912	1670.216	0	0	2589.784	0	0
1999	12	16	4.6	0	0	6.912	1677.128	0	0	2582.872	0	0
1999	12	17	0	0	0	6.912	1684.04	0	0	2575.96	0	0
1999	12	18	0	0	0	6.912	1690.952	0	0	2569.048	0	0
1999	12	19	0	0	0	6.912	1697.864	0	0	2562.136	0	0
1999	12	20	0	0	0	6.912	1704.776	0	1135.224	2555.224	0	0
1999	12	21	0	0	0	6.912	2846.912	0	0	1413.088	0	0

1999	12	22	0	0	0	6.912	2853.824	0	0	1406.176	0	0
1999	12	23	0	0	0	6.912	2860.736	0	0	1399.264	0	0
1999	12	24	0	0	0	6.912	2867.648	0	0	1392.352	0	0
1999	12	25	1.2	0	0	6.912	2874.56	0	0	1385.44	0	0
1999	12	26	0	0	0	6.912	2881.472	0	0	1378.528	0	0
1999	12	27	0.2	0	0	6.912	2888.384	0	0	1371.616	0	0
1999	12	28	1.8	0	0	6.912	2895.296	0	0	1364.704	0	0
1999	12	29	0.2	0	0	6.912	2902.208	0	0	1357.792	0	0
1999	12	30	0	0	0	6.912	2909.12	0	0	1350.88	0	0
1999	12	31	2	0	0	6.912	2916.032	0	0	1343.968	0	0
			997.8		45072.221	1575.264		23428.569	20152.1		0	11

Attachment 13

Sediment Basin - Use of Flocculants

GROUNDWORK plus

White Rock Quarry

Report in relation to impacts to sensitive receptors associated with mining operations at PM188 (use of flocculants)

Prepared for: Hanson Construction Materials Pty Ltd

Date: 9 June 2022

File Reference: 1901.620.006v1

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TABLE OF CONTENTS

TABLES

FIGURES

DRAWINGS

ATTACHMENTS

1 Introduction

Groundwork Plus (SA) Pty Ltd (Groundwork Plus) has been engaged by Hanson Construction Materials Pty Ltd (Hanson) to prepare a report pursuant to Section 90(2) and Section 90(3) of the *Mining Act (SA) 1971* in response to a Compliance Order issued on 20 May 2022 in regard to surface water quality issues arising from operations at the White Rock Quarry located within Private Mine (PM) 188 (the Site).

The scope of this report is to specially address the requirements of Requirement 2 and Annexure 'C' of the Compliance Order to verify whether the use of flocculants can occur in compliance with the *Mining Act 1971*, the *Environment Protection Act 1993* and the *Environment Protection (Water Quality) Policy 2015*.

In the preparation of this report, Groundwork Plus have compiled technical supporting information from industry experts in the following fields to inform the flocculant assessment report, refer to **Attachment 1 – Curriculum Vitae** for an overview of the technical qualifications.

Butch Uechtritz – Flocculation Specialist - Turbid

Ashley Moule – Contamination consultant – A M Environmental

Phil Barnet – Soil Scientist – ProAg Soil Management

Mark Folker – Stormwater Engineer – Groundwork Plus

Matthew Jones – Senior Environmental Consultant – Groundwork Plus

1.1 Background

Hanson operate the White Rock Quarry, located on Horsnells Gully Road, Horsnell Gully, South Australia (the Site). The Site entails the PM 188 which currently operates under the approved Mine Operation Plan (MOP) dated August 2004.

Drawing No. 1901.DRG.028 – Site Location provides an understanding of the locality of the Site in relation to Adelaide. **Drawing No. 1901.DRG.082R1 – Stormwater Management Plan - (Existing - Operations)** provides an overview of the surface water catchments within the Site and the location of sediment basins, quarry sump and surface water dams.

The Site has been highlighted by the State Government as a Strategic Resource Area (SRA) within the greater Adelaide region, that is of key economic value to South Australia due to the quantity and quality of construction materials that are extracted within the Site. In 2019, Hanson implemented a detailed resource investigation to further inform the resource potential within the Site and subsequently inform the proposed future Quarry Development Plans (QDP) which form part of a MOP review which is currently under assessment by the Department for Energy and Mining (DEM).

An overview of the PM details is summarised in **Table 1 – PM Detail Summary**.

Table 1 – PM Detail Summary

PM Holder / Operator	**Hanson Construction Materials Pty Ltd**
Registration Grant Date	04/10/1973
Expiry Date	Nil
Commodities	Quartzite
Legal Area Hectares (ha)	136.87
Commodity Categories	Construction Materials

(Source: SARIG,2022)

2 Surface Water Management

2.1 Hydrology

2.1.1 Existing Conditions

The Site is located within a portion of the upper reaches of the Third Creek catchment receiving surface waters from the Horsnell Gully and Giles Conservation Parks (CP). Situated at the bottom of Horsnell Gully. The Site consists of steep rocky hillslopes of Rockdale Hill to the South, Groye Hill (east) and Lane's Rock (north). From the crests of the hills, the hill foot slopes in a westerly direction. The elevations of the Site range between 240 and 420 metres Australian Height Datum (mAHD). Refer **Drawing No. 1901.DRG.081 – Topographic Plan**.

Along the eastern fringe of the Site there are two (2) constructed dammed water bodies comprised of Giles CP Dam and Horsnell Gully Dam that collect surface water from outside of the quarry footprint. Within the quarry footprint there are a number of constructed sediment basins and collection points within the Site to collect and treat surface waters from the quarry operations. Pooling of surface waters also occurs in low points such as the quarry pit and low points within the Site as outlined within **Drawing No. 1901.DRG.082R1 – Stormwater Management Plan – (Existing Operations)**.

The Site also comprises of a stream order class four (4) watercourse that intercepts the quarry area (east to west). The watercourse (part of the Third Creek Catchment) is located through the centre of the Site with inflows originating from the Giles CP and the Horsnell Gully CP. Clean water flows are prevented from mixing with the dirty water within the Site via a dedicated modified natural drainage line and underground pipe network which flows in a westerly direction toward Horsnell Gully Creek which returns to a modified natural drainage line near the entrance gate to the Site.

Overland flow from the quarry area flows into a series of sediment basins for treatment as outlined within **Drawing No. 1901.DRG.082R1 – Stormwater Management Plan – (Existing Operations)**. The lower portions of the Site are contained within the western catchment of the Site of which overland flows are directed into the existing Sediment Basin 2 (SB2) located approximately 215 metres (m) west of the Site. Overflow from this sediment basin converges with creek flows of the Horsnell Gully Creek via a V-notch weir. A portion of the SB2 catchment is associated with a sub catchment for the Hanson Magill Concrete Plant of which the surface water is managed via a series of gutters, diversions humps, spoon drains, water storage tanks and graded areas creating elevations for drainage systems into different flow paths segregating contaminated surface flows (pH affected) from dirty areas (sediment laden) as outlined within

Drawing No. 1901.DRG.012R1 – Hanson Magill Concrete Water Management Plan. However, dirty water from within this catchment is managed via a concrete wedge pit and water storage tanks intended to manage dirty surface water from the concrete batching operations.

Surface water management improvements have been undertaken by Hanson within the Site since 2017 to improve the operation of the surface water management infrastructure and the treatment of surface water within the Site. One (1) of the most significant investments undertaken within the improvements to the Site is comprised of a new highly engineered sediment basin constructed to receive surface water from the sales and processing yard known as Sediment Basin 1 (SB1). SB1 enables surface water from within the sales and processing areas to be diverted into a concrete sediment basin which is captured and recirculated for re use within the concrete and quarry operations within the Site. Since the commissioning of SB1 there has been a considerable reduction in sediment loads leaving the Site, providing evidence that the principles of the SB1 design and associated catchment analysis have been effective in reducing impacts to the downstream environments.

2.1.2 Third Creek

Third Creek has three (3) main tributaries in the hills near Norton Summit. It travels toward Magill and Tranmere through sections of concrete channel before entering the suburb of Firle through underground infrastructure into a narrow drainage reserve or concrete channel until it joins the Torrens in Felixstow.

Third Creek forms part of the central Torrens River catchment, with the Torrens River located approximately seven (7) Kilometres (km) downstream from the Site. A survey and management plan prepared for the Campbelltown City Council in March 2017 prepared by Miles Environmental Pty Ltd provides a comprehensive review of the existing condition, biodiversity and habitat values of the Creek system. The survey summarises Third Creek within the Council area as a very narrow reserve with occasional wider reserves. The vegetation along the creek is primarily dominated with exotic species with some remnant and emerging *Eucalyptus camaldulensis* (River Red Gum). Pockets of revegetation have also been undertaken within the wider portions of the reserve. There are some sections of the creek where the channel resembles a natural system, however, large portions of the creek have been subject to modification and disturbance including the establishment of urban stormwater culverts and channels. Due to the level of disturbance and urban stormwater infrastructure installed within the lower portions of the creek, Third Creek is effectively disconnected from the Torrens River, there is limited scope for the creek to function as riparian corridor for the movement of aquatic and terrestrial fauna (Miles 2017).

A search of the Bureau of Meteorology (BoM) Groundwater Dependent Atlas (GDE Atlas) via the South Australian Resources Information Gateway (SARIG) 2022 did not identify any aquatic Groundwater Dependent Ecosystems within or downstream from the Site. The GDE Atlas has identified that there are patches of terrestrial vegetation comprised of Eucalyptus leucoxylon species woodland that have a moderate Groundwater Dependent Ecosystem potential, however these areas are located within the higher portions of the topography and above the Horsnell Gully and Third Creek watercourses.

2.2 Hydrological Investigations

A Stormwater Management review (modelling assessment) conducted by Groundwork Plus in 2017 investigated catchment hydrology and contributing peak flows which have informed the recommendations for improvements of surface water drainage, overland flow diversions and treatment of contaminated surface flows to improve the surface water management for the Site in accordance with the 2008 International Erosion Control Association (IECA) (2008) Best Practice Erosion and Sediment

Control guidelines. One (1) of the outcomes of the analysis identified the requirement to upgrade an existing sediment basin located approximately 80 m west of the Site entrance gate, described as a Reticulation Dam in Map 3 – Current Conditions of the MOP 2004. Based upon the hydraulic analysis, the capacity of the existing sediment basin is required to be increased to improve surface water quality outcomes for the Site.

In response to an Environment Improvement Plan (EIP) under the *Environment Protection Act 1993*, new sediment basins for the Site were designed in accordance with IECA (2008) Best Practice Erosion and Sediment Control guidelines (retaining rainfall from all disturbed areas of the premises arising from up to a 45.78 millimetres (mm) (minimum 95th percentile five (5) day event duration event) including the design of a Type D/F SB1 and Sediment Basin 2 (SB2).

SB1 was constructed in 2020 based upon the provisions of the IECA 2008 Best Practice Erosion and Sediment Control guidelines, of which there have been no observations of uncontrolled releases occurring from the basin outlet since this time. Subsequently SB2 was also intended to be upgraded consistent with the design intent previously applied to SB1, however, in recognition of recommendations from the EPA in 2021, Hanson undertook a review of the SB2 design in consideration of the updated IECA Guidelines published in 2018. A noticeable change within the 2018 Best Practice Erosion and Sediment Control guidelines is the introduction of High Efficiency Sediment (HES) Basins. The 2018 IECA guidelines recognises HES Basins as effective in providing higher treatment efficiency and improved environmental outcomes where it is reasonable that active water quality treatment can be applied.

A detailed options analysis in consideration of the 2018 IECA guidelines and a range of larger Annual Recurrence Interval (ARI) scenarios was undertaken by Groundwork Plus in 2021, which indicated that the adoption of a Type A HES basin for SB2 would provide a higher treatment efficiency outcome for SB2 in comparison to standard Type D/F basins. Outcomes of the SB2 options analysis are provided within **Attachment 2 – Sediment Basin 2 – Options Review**.

Hydraulic analysis and IECA design requirements have defined the appropriate size for Type A HES basin which is larger than the space available within the location of the existing basin. Physical site constraints comprised of the existing watercourse and the slope stability of the adjacent landforms were also required to be considered in the location of the new SB2 basin. As such, the new basin is intended to be constructed within a new location approximately 20 m upstream of the existing sediment basin, enabling the existing basin to also be retained for additional surface water storage as a contingency measure if required during higher rainfall events. Both basins are located outside of the existing water course alignment and enable surface water from the Site to be separated from the main water course for treatment prior to release.

Details of the Type A HES basin are outlined within **Drawing No. 1901.DRG.093R2 – Sediment Basin SB2 TYPE-A 1 in 5y Layout Plan** and **Drawing 1901.DRG.093A – Cross Sections A-A to C-C** (Note: DEM have been provided with updated versions of these drawings prepared for construction purposes, but they contain no material difference to the drawings referred to in this paragraph and elsewhere within this report). Initial water quality treatment will occur within the forebay of the new SB2 basin referenced as SB2A, where coagulants / flocculants are proposed to be mixed within the surface water prior to flowing over a level spreader into the main sediment basin for settlement. The size and retention time of the basin has been designed in accordance with the design parameters of the IECA (2018) guidelines. The existing SB2 basin referenced as SB2B has also been retained within the design to provide additional water storage volume during higher rainfall events.

3 Active Surface Water Treatment Overview

3.1 Particle Size Distribution

Particle Size Distribution (PSD) analysis has been undertaken at SB2 at the inlet of the existing SB2 basin to help inform the planning and design of the upgraded sediment basin. The results of the PSD analysis are provided within **Attachment 2 – Sediment Basin 2 – Options Review** indicating that approximately 80 percent to 90 percent of the material is finer than one (1) mm. The results of the PSD analysis indicated that material contributing to SB2 is likely to include significant volumes of clay / silt which is likely to remain in suspension for long periods of time before naturally settling out and active treatment of the surface water would be required to reduce the turbidity of the water.

3.2 Treatment Product Selection

Water sampling and jar testing has been undertaken by Turbid Water Solutions (Turbid) to help inform the selection of the flocculant to be applied within SB2 and support the achievement of improved water quality treatment within the sediment basin.

The following treatment products were considered and tested with the source water from the Site.

Turbiclear - A high quality, environmentally friendly, rapid acting coagulant manufactured in Australia and extensively used throughout Australian construction and mining sites. It has played a major part in securing contractors throughout Australia with environmental awards due to its ability to treat highly turbid water

Turbifloc - A high-quality bio-polymer flocculant manufactured in Australia and used extensively throughout Australia and overseas on construction and mining sites. Turbifloc is based on the Chitosan compound (a large component of crustacean shells) and will biodegrade due to its 'simple sugar' complex. It has played a major part in securing contractors throughout Australia with environmental awards due to its ability to rapidly clarify highly turbid water.

Turbiclear Extra - Turbiclear Extra is a specially formulated blended product of the Turbiclear and the Turbifloc products giving it the preferred characteristics of both. Manufactured in Australia from the highest quality products and processes gives this product the added benefit of not just being highly effective but also environmentally friendly.

Turb Gyp - Turbi Gyp is a gypsum-based coagulant. The gypsum powder is sourced from South Australia and further milled in Queensland to produce a micronized product that will go into solution faster than traditional gypsum making it a better passive product for water treatment.

Ecotoxicity testing undertaken for the Turbiclear, Turbifloc and Turbiclear Extra products indicates that the products have no effect on the Australian freshwater flea or Eastern Rainbowfish at full concentration, and all products can be safely applied within the aquatic environment. Further ecological information provided within the Safety Datasheets provided within the appendices of **Attachment 3 – White Rock Quarry Treatment Product Assessment**.

A sample of the dirty inlet water from the existing SB2 basin was collected for use in undertaking water testing trails for each of the treatment products. Results of the jar testing are provided within

Attachment 3 – White Rock Quarry Treatment Product Assessment. Based upon the outcomes of the jar tests, Turbiclear has been recommended as the treatment product for application within SB2 in consideration of the source water of the Site. Turbiclear is a known product and has been extensively applied as an active water treatment product throughout New South Wales (NSW).

When added to water, Turbiclear rapidly hydrolyses to form Aluminium Hydroxide (a stable non-toxic form of aluminium) which settles out as part of the flocculated material leaving very little (if any) aluminium residual in the treated water (supernatant) when suspended solids content (TSS) is low and pH values are between 6.5 and 8.5.

Whilst Turbiclear is an aluminium based product, aluminium is one (1) of the most common elements on earth. Due to the natural abundance of aluminium, untreated and poorly treated water with high suspended solids content will generally contain much higher levels of aluminium than water treated effectively (low TSS concentration) with an aluminium based product. Ensuring that water leaving the sediment basin is as clear as possible with a general neutral pH minimising the risk of potential aluminium toxicity to the greatest extent.

Whole of effluent ecotoxicity testing of water samples collected from the outlet of a HES basin treated with Turbiclear has been previously carried out on the Eastern Rainbowfish and Australian water flea. The test results clearly demonstrate at full effluent concentration (i.e. no dilution by receiving waters) no ecotoxicity impact at all was measured.

3.3 Treatment Product Application

The following equipment has been incorporated into the SB2 design to support the application and management of the active treatment process.

1. Ifod FLOW dosing system – The ifod-FLOW provides accurate dosing of treatment products utilising flow metres inside or above pipes, open drains or weirs. It will measure water flow, either generated from rain events or pumping onsite, and accurately dose via a low voltage metering pump according to the runoff volume entering the basin. The ifod will be connected to water quality sensors for monitoring and control purposes and set up to send automatic notifications and alerts for equipment failure or water quality triggers.

2. Iqad -The iqad is a safety cut-off and monitoring system which utilises an internal microprocessor and logger to measure water quality parameters such as pH, turbidity, electrical conductivity and dissolved oxygen. The iqad is a telescopic post designed for light weight transportability and minimal storage and can be easily fixed to substrate. It is ideal for sites without easy access to power as the iqad will be equipped with a low voltage solar power plant for operation. It is also relocatable, so can be transferred to a different section of the Site as required.

The iqad will be attached to the discharge point of the basin and allows for the recording of the basin's discharges when occurring. The iqad will also control a power actuated butterfly valve installed on the discharge pipe to stop any water discharging that is not within required water quality trigger levels. Site staff will be notified when water quality levels have been triggered to inform investigations and corrective action as required.

Further details of the treatment product application are provided within **Attachment 4 – White Rock Quarry Sediment Basin 2 Flocculant and Coagulant – Active Treatment Management Plan**.

4 Recovered Sediment Management

Sediments retained within SB2 are intended to be used for direct reuse within the rehabilitation of the quarry landform through the establishment of soil batters established and stabilised with native vegetation to blend in with the surrounding environment.

Progressive rehabilitation strategies within the quarry development footprint will follow the path of quarrying activities once the terminal extraction limits have become realised. Temporary stockpiles of recovered sediments will be required during the initial period of Stage 1 at a location within the previously extracted areas of the quarry as outlined in **Figure 1 – Temporary Sediment Stockpile Location**. The location of the temporary Stockpile is located approximately 130 metres from the clean water diversion channel that enables clean water from the Giles CP Dam to travers east west through the Site. The stockpile location is located approximately 20m above the level of the water course.

Figure 1 – Temporary Sediment Stockpile Location

initial soil testing of the existing sediment removed from SB2 as well as the existing overburden products available within the Site have been undertaken to inform the development of a Recovered Products Plan RPP for the recover and reused of sediment from SB2, refer **Attachment 5 – Recovered Products Plan White Rock Quarry Sediment Basin (SB2)**.

Results of the initial soil testing confirm that the sediment material collected within SB2 were analysed for the broad South Australian EPA Waste Fill Screen, of which the results did not exceed the Waste Fill criteria or the National Environment Protection Measure (NEPM) limits and present low risk to Human health. Recovered sediments in their current form are not suitable for supporting plant growing medium, however, they are able to be incorporated into the lower fill portions of the rehabilitated batters within

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the Site and covered with suitable growing medium from other overburden materials within the Site. On this basis, the recovered sediments are intended to be temporarily stockpiled and directly reused within the establishment of the rehabilitated landform of the Site and managed in accordance with the provisions of **Attachment 5 – Recovered Products Plan White Rock Quarry Sediment Basin (SB2)**. Validation soil sampling of the recovered sediments within SB2A and SB2B will be undertaken prior to the removal of the sediments to ensure that they remain within acceptable quality for the intended use within the rehabilitation landform.

5 Environmental Impact Assessment

To facilitate the management of potential environmental impacts associated with the use of flocculants at the Site in an efficient and effective manner, an environmental impact assessment has been undertaken to inform the suitability of the use of flocculants in accordance with the provisions of the *Mining Act 1971*, *Environment Protection Act 1993* and the *Environment Protection (Water Quality) Policy 2015,* consistent with the approach and legislation applicable at the time of the MOP Review submission currently under assessment.

The environmental risk evaluation has been prepared to consider any potential environmental impacts and risks to the environment including an evaluation of the residual risk that may remain following the implementation of recomended environmental management strategies at the Site for each identified Environmental Impact ID defined in **Table 6 – Environmental Impact Assessment**.

The assessment of potential residual risk that has been adopted is a qualitative risk-based approach, designed to assess risk, based on:

- the likelihood of the impact or event occurring.
- the consequences of the occurrence on the completion activities.

The likelihood and consequences are scored between one (1) and five (5) for each potential impact or event. **Table 2 – Definitions of Likelihood** and **Table 3 – Definitions of Consequence** outline the identifiers and scores used in the risk assessment.

Table 2 – Definitions of Likelihood

Rating	Descriptor	Score
Rare	May occur only in exceptional circumstances	1
Unlikely	Could occur but doubtful	2
Possible	Might occur at some time in the future	3
Likely	Will probably occur	4
Almost Certain	Is expected to occur in most circumstances	5

Table 3 – Definitions of Consequence

Rating	Descriptor	Score
Negligible	Impacts not requiring any treatment or management action	1
Minor	Nuisance or insignificant environmental harm requiring minor management action	2
Moderate	Serious environmental impacts, readily manageable at low cost	3
Major	Substantial environmental impacts, manageable but at considerable cost and some disruption	4
Catastrophic	Severe environmental impacts with major consequent disruption and heavy cost	5

The consequence and likelihood scores are then plotted on the Risk Assessment Matrix, refer to **Table 4 – Risk Assessment Matrix**. The final risk level assigned is a product of the likelihood and consequence scores. The higher the risk score, the higher the priority is for management.

Table 4 – Risk Assessment Matrix

Likelihood		**Consequence**				
		Negligible	**Minor**	**Moderate**	**Major**	**Catastrophic**
		1	**2**	**3**	**4**	**5**
Almost Certain	**5**	5 Medium	10 High	15 High	20 Extreme	25 Extreme
Likely	**4**	4 Low	8 Medium	12 High	16 High	20 Extreme
Possible	**3**	3 Low	6 Medium	9 Medium	12 High	15 High
Unlikely	**2**	2 Low	4 Low	6 Medium	8 Medium	10 High
Rare	**1**	1 Low	2 Low	3 Low	4 Low	5 Medium

Table 5 – Indicative Management Option for Each Risk Assessment Rating describes the possible actions required for each risk assessment rating.

Table 5 – Indicative Management Option for Each Risk Assessment Rating

Risk Rating	Risk Rating Scores	Indicative Management Option
Extreme €	**16 – 25**	Manage by implementing Site management and emergency procedures, controls and regular monitoring
High (H)	**10 – 15**	Manage by implementing Site management and emergency procedures, specific monitoring and may require some controls
Medium (M)	**5 – 9**	Manage by implementing specific monitoring or response procedures
Low (L)	**1 – 4**	Manage by routine procedures, unlikely to need specific application of resources

Table 6 – Environmental Impact Assessment

Potential Impact Event	Impact Event ID	Source	Pathway	Onsite and Offsite Sensitive Receptors	Initial Risk Assessment Likelihood: Consequence, Risk	Control and Management Strategies	Residual Risk Likelihood: Consequence, Risk	Evaluation of Residual Risk	Justification for Acceptance of Residual Risk
Impacts to downstream environments through the use of chemical flocculants changing the water chemistry of downstream aquatic environments.	E1	Flocculation treatment products	Surface water discharge from SB2	Horsnell Gully Creek and Third Creek aquatic environment	(3,4) **High**	• Undertake application of flocculants in accordance with **Attachment 4 – White Rock Quarry Sediment Basin 2 Flocculant and Coagulant – Active Treatment Management Plan**. • Selection of chemical flocculants that have validated ecotoxicity assessments, Turbiclear or equivalent. • Undertake background water quality analysis to determine existing base line water quality of downstream environments, pH, EC, turbidity, Suspended Solids (SS) and metals. • Undertake jar testing to determine lowest practicable dosing rates to achieve required water quality turbidity criteria. • Install automatic shutoff valve at the outlet of SB2 and undertake real time pH and Turbidity monitoring to activate valve if water quality criteria is not achieved. • Automated notification to Site management when water quality criteria is not achieved, and investigated within of notification being received. • • Undertake monthly validation water quality grab samples from the outlet of SB 2 and test for pH, EC, turbidity, SS and metals during the first year of operation.	(2,3) **Low**	The risk associated with surface water quality impacts to downstream aquatic environments is low due to the nature of the receiving environment and the ecotoxicity of the recommended flocculants. The control and management strategies adopted are considered Best Practice within the industry and demonstrate reasonable and practicable measures to reduce the likelihood of the impact event occurring. Ensuring that water leaving the sediment basin is as clear as possible with a general neutral pH minimises the risk of potential aluminium toxicity to the greatest extent.	Risk reduced through ensuring that appropriate environmentally sensitive chemicals are applied at lowest practicable dosing rates in the flocculation of the waters within the sediments basin.

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Potential Impact Event	Impact Event ID	Source	Pathway	Onsite and Offsite Sensitive Receptors	Initial Risk Assessment Likelihood: Consequence, Risk	Control and Management Strategies	Residual Risk Likelihood: Consequence, Risk	Evaluation of Residual Risk	Justification for Acceptance of Residual Risk
Remobilisation of sediments within the sediment basin resulting in offsite discharge of sediment containing concentrated flocculant chemicals into downstream environments.	E2	Accumulated sediments within the forebay and settling pond of SB2A	Surface water discharge from SB2A	Horsnell Gully Creek and Third Creek aquatic environment	(3,3) **Medium**	• Undertake weekly inspection of the SB2 forebay and settling ponds to ensure adequate freeboard is maintained within SB2A and SB2B. • Install automatic shutoff valve at the outlet of SB2 and undertake real time pH and Turbidity monitoring to activate valve if water quality criteria is not achieved. • Retention of existing SB2 basin and connection to the new HES Type A Basin to capture additional water during high flow events. • Ensure that excessive sediment build up is removed from the sediment basin as soon as practicable.	(2,2) **Low**	The risk associated with surface water quality impacts to downstream aquatic environments is low due to the nature of the receiving environment and the ecotoxicity of the recommended flocculants.	Risk reduced through ensuring stormwater management devices are routinely monitored and maintained and overflow at the outlet of SB2A can be automatically shut off in the event that water quality does not meet the required turbidity water quality criteria.
Failure of the dosing system to automatically apply coagulants / flocculants to sediment basin resulting in discharge of sediment laden waters to downstream environments.	E3	Sediment laden waters exceeding water quality turbidity criteria	Surface water discharge from SB2A	Horsnell Gully Creek and Third Creek aquatic environment	(3,2) **Medium**	• Automated notification to Site staff of equipment failure, and investigated within 24hrs of a notification being received. • Install automatic shutoff valve at the outlet of SB2 and undertake real time pH and Turbidity monitoring to activate valve if water quality criteria is not achieved. • Automated notification to Site management when water quality criteria is not achieved, and investigated within 24 hrs of notification being received. • Undertake regular visual inspections of the discharge water during rainfall events when the Site is operational. • Undertake regular maintenance of the automated dosing system in accordance with manufacturers specifications.	(2,2) **Low**	The risk associated with surface water quality impacts to downstream aquatic environments is low due to the nature of the receiving environment. The control and management strategies adopted are considered Best Practice within the industry and demonstrate reasonable and practicable measures to reduce the likelihood of the impact event occurring.	Risk reduced through ensuring automated flocculation dosing devices are routinely monitored and maintained and overflow at the outlet of SB2A can be automatically shut off in the event that water quality does not meet the required turbidity water quality criteria.
Failure of the chemical dosing system resulting in overdosing of flocculants resulting in discharge of flocculation substances to downstream environments.	E4	Flocculant chemicals	Surface water discharge from SB2A	Horsnell Gully Creek and Third Creek aquatic environment	(3,4) **High**	• Selection of chemical flocculants that have validated ecotoxicity assessments, Turbiclear or equivalent. • Automated notification to Site staff of equipment failure and implementation of investigated within 24 hrs of a notification being received.	(1,3) **Low**	The risk associated with surface water quality impacts to downstream aquatic environments is low due to the nature of the receiving environment.	Risk reduced through ensuring automated flocculation dosing devices are routinely monitored and maintained and overflow at the outlet

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Potential Impact Event	Impact Event ID	Source	Pathway	Onsite and Offsite Sensitive Receptors	Initial Risk Assessment Likelihood: Consequence, Risk	Control and Management Strategies	Residual Risk Likelihood: Consequence, Risk	Evaluation of Residual Risk	Justification for Acceptance of Residual Risk
						• Install automatic shutoff valve at the outlet of SB2 and undertake real time pH and Turbidity monitoring to activate valve if water quality criteria is not achieved. • Automated notification to Site management when water quality criteria is not achieved and implantation of investigated within 24 hrs of a notification being received. • Undertake regular visual inspections of the discharge water during rainfall events when the Site is operational.		The control and management strategies adopted are considered Best Practice within the industry and demonstrate reasonable and practicable measures to reduce the likelihood of the impact event occurring.	of SB2A can be automatically shut off in the event that water quality does not meet the required turbidity water quality criteria.
Impacts to down stream environments due to changes to the pH of surface waters within the SB2 catchment.	E5	pH effected Surface water discharge from Magill Concrete Batch Plant	Surface water	Horsnell Gully Creek and Third Creek aquatic environment	(3,4) **High**	• Concrete yard surface flow shall be managed by a series of gutters, diversion humps, spoon drains and graded areas creating elevations to segregate surface flows (pH effected) from dirty areas (sediment laden) within the Site. • Process waste water generated through the washout of concrete bowls on returning to the plant from deliveries shall be directed into a series of wedge pits as defined by the yellow area within **Drawing No. 1901.DRG.012R1 – Hanson Magill Concrete Water Management Plan**. • All water management structures shall be regularly inspected and maintained at all times. • Sediment collected in wedge pits must be removed whenever the volume of the pit is reduced by 30 percent, or where a build-up of sediments has occurred or may occur around the outlet structure. • Diversion drains, hard stand grades or equivalent must be maintained to ensure surface waters from concrete batching processing areas, including operational or trafficable areas, are diverted to the sediment control system and reused within the concrete production operation. • Install automatic shutoff valve at the outlet of SB2 and undertake real time pH and Turbidity	(2,4) **Medium**	The risk associated with changes in pH effected surface waters entering the environment from the Hanson Concrete Batching Plant is medium due to the nature of the receiving environment, however, the control and management strategies adopted demonstrate reasonable and practicable measures to reduce the likelihood of the impact event occurring.	Risk reduced through ensuring that contaminated surface water from the Magill Concrete Batching Plant is appropriately diverted, stored, and managed within a waste water management system. In the event that surface water pH within the SB2A basin triggers water quality criteria the overflow outlet of SB2A can be automatically shut off to prevent pH affected water leaving the basin.

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Potential Impact Event	Impact Event ID	Source	Pathway	Onsite and Offsite Sensitive Receptors	Initial Risk Assessment Likelihood: Consequence, Risk	Control and Management Strategies	Residual Risk Likelihood: Consequence, Risk	Evaluation of Residual Risk	Justification for Acceptance of Residual Risk
						monitoring to activate valve if water quality criteria is not achieved. • Automated notification to Site management when water quality criteria is not achieved, and implementation of investigated within 24 hrs of a notification being received..			
Inappropriate removal and disposal of recovered sediments from within the sediment basins resulting in impacts to sensitive onsite and or offsite receptors.	E6	Recovered sediments from SB2A and SB2B	Land	Temporary stockpile locations and progressive rehabilitation areas	(3,3) **Medium**	• Undertake chemical validation testing for the SA EPA Waste Fill Screen for recovered sediments prior to the removal. • Located temporary stockpile locations away from watercourses and surface water infrastructure within the Site. • Direct surface water from temporary stockpile areas into sediment basins within the Site. • Ensure that placement of recovered sediment material is placed within the lower portions of the progressive rehabilitation fill batters within the Site and covered with at least 250 mm of suitable soil over the top to support plant growth.	(2,3) **Medium**	The risk associated with recovered sediment management is medium due to the nature of the receiving environment, however, the control and management strategies adopted demonstrate reasonable and practicable measures to reduce the likelihood of the impact event occurring.	Risk reduced through ensuring that materials capable of resulting in contaminated land are appropriately handled, stored and disposed of through beneficial reuse in rehabilitation.

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6 Conclusion

Review of impacts to onsite and offsite sensitive receptors associated with Mining Operations at PM 188 verify that reasonable and practicable measures are proposed to improve the management and quality of stormwater leaving the Site with the construction of a Type A HES sediment basin incorporating an active treatment flocculation system.

Assessment of environmental risks verify that the proposed application of flocculants are able to be undertaken with appropriate control and management strategies that are best practice for the extractive industry and provide improved environmental outcomes for the Site in accordance with the provisions of the *Mining Act 1971*, *Environment Protection Act 1993* and the *Environment Protection (Water Quality) Policy 2015*.

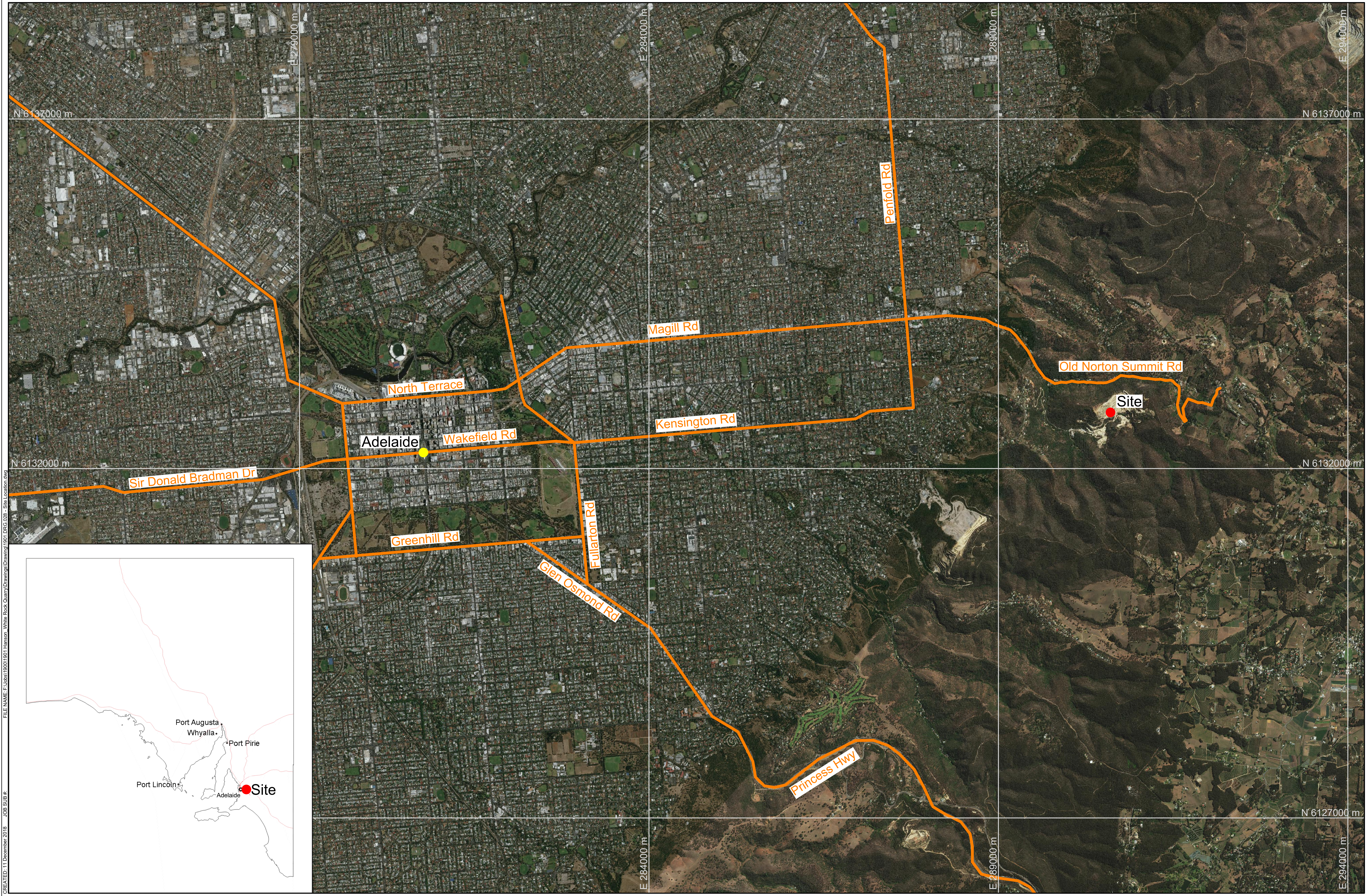
Application of coagulants and flocculation is consistent with the principles of the IECA guidelines and leading practice standards for active treatment of sediment laden waters. IECA guidelines has a preference for the Type A or B sediment basins unless it can be demonstrated that automatic chemical flocculation is not reasonable nor practicable. The outcomes of the Sediment Basin 2 Review identified that a Type A HES sediment basin can be implemented in a reasonable and practicable way within the constraints of the Site.

7 References

Miles, C 2017, *Third Creek Survey and Management Plan*, South Australia, Miles Environmental Pty Ltd

South Australian Resources Information Gateway, Department of Premier and Cabinet, South Australia Government viewed June 2022 <https://map.sarig.sa.gov.au/>

DRAWINGS



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JOB SUB #:

CREATED: 11 December 2018

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Photography: Digital Globe, Accessed 2018-12-10
Topography:
Cadastre:
Ecosystem:
Other:

Legend:
Main Roads

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Site Location

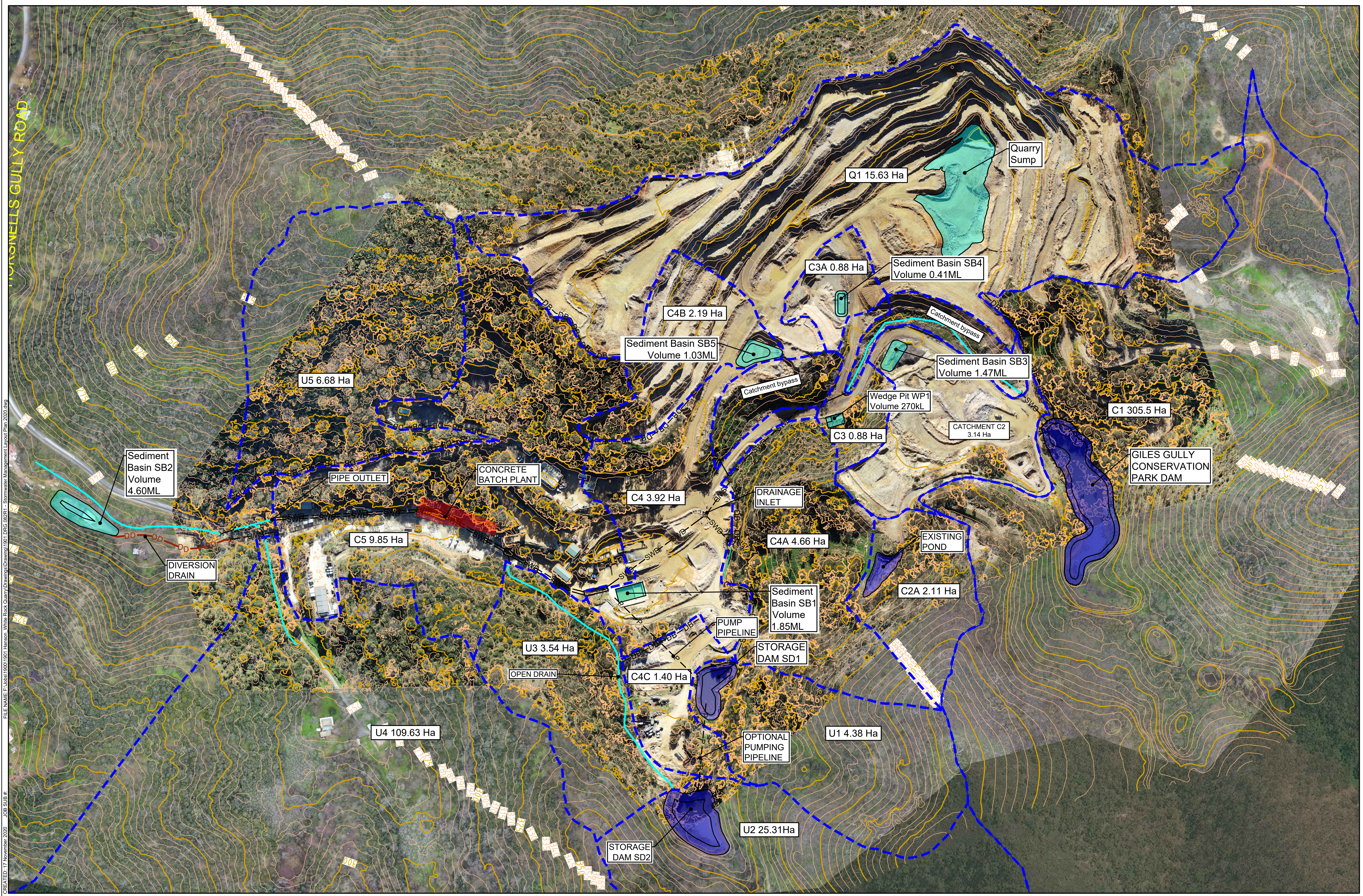
GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:50,000 When Printed On A3 (0 – 1km)

DATE: 11 December 2018
PRINTED: 11 December 2018
DRAWN: JHV
CHECKED: JR

DRAWING NUMBER: 1901.DRG.028
REVISION:

DATUM: HORIZONTAL / VERTICAL / ZONE
MGA / AHD / 54



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Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

Legend:
- CLEAN SURFACE WATER FLOW
- DIRTY SURFACE WATER FLOW
- DD — DIRTY WATER DRAIN
- DB — DIVERSION BUND
- WATERCOURSE
- SWB — UNDERGROUND PIPE
- P — PUMPED STORMWATER

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: STORMWATER MANAGEMENT PLAN - (EXISTING OPERATIONS)

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:2,500 When Printed On A3 | 0 — 50m
DRAWING NUMBER: 1901.DRG.082
REVISION: 1
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PRINTED: 17 November 2020
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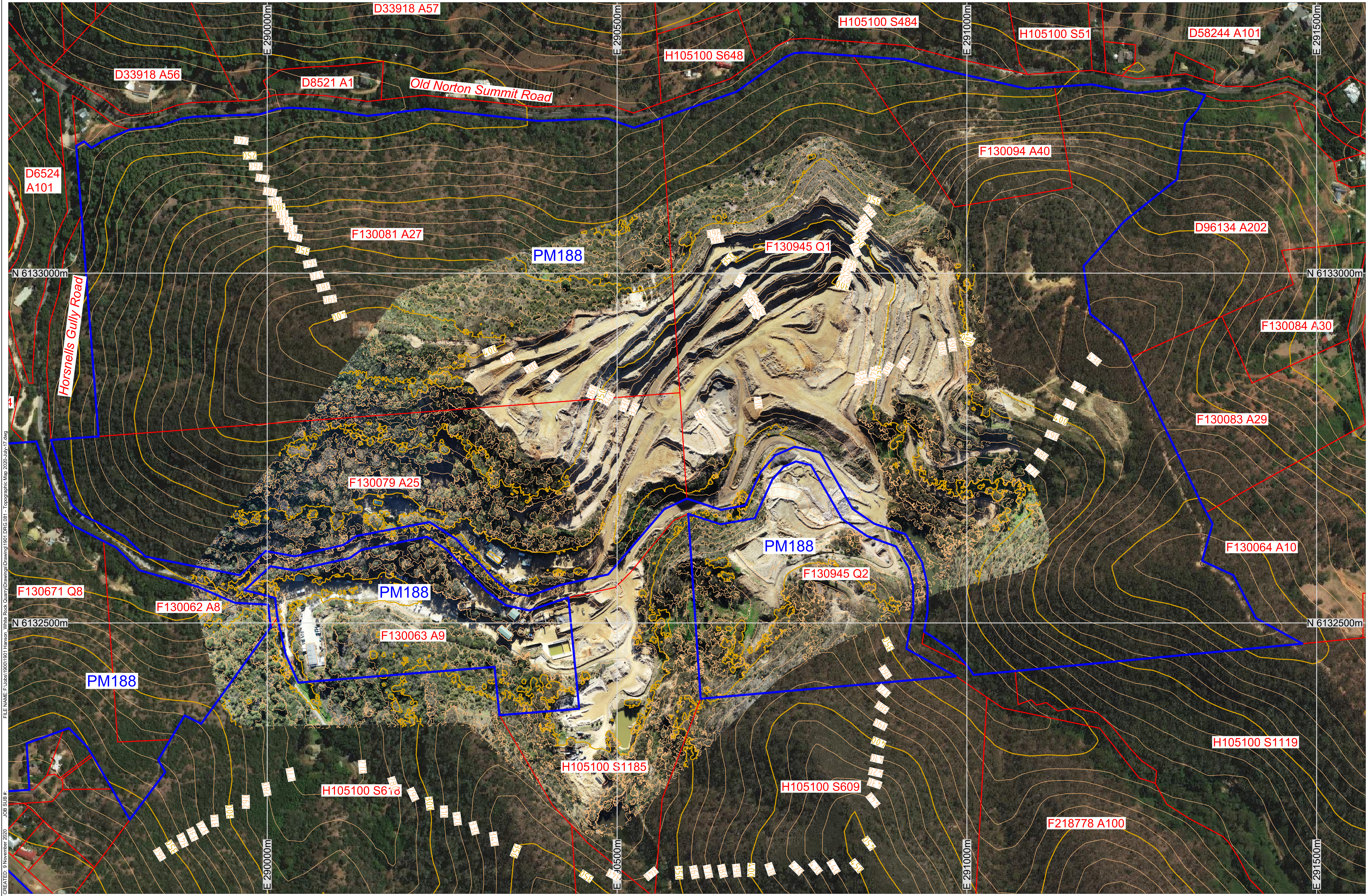

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: UAV Flyover 2020-Mar-26 & 2019-Nov-19
Topography: LiDar Data 2019-Dec-06
Cadastre: data.sa.gov.au
Ecosystem:
Other:

Legend:
- Cadastral
- Private Mine
- Major Countour
- Minor Contour

PROJECT: White Rock Quarry

TITLE: Topographic Plan

CLIENT: Hanson Construction Materials Pty Ltd

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:5,000 When Printed On A3 — 0 — 100m

DRAWING NUMBER: 1901.DRG.081

REVISION:

DATE: 9 November 2020 | DRAWN: MRescar
PRINTED: 8 December 2020 | CHECKED: JRowe

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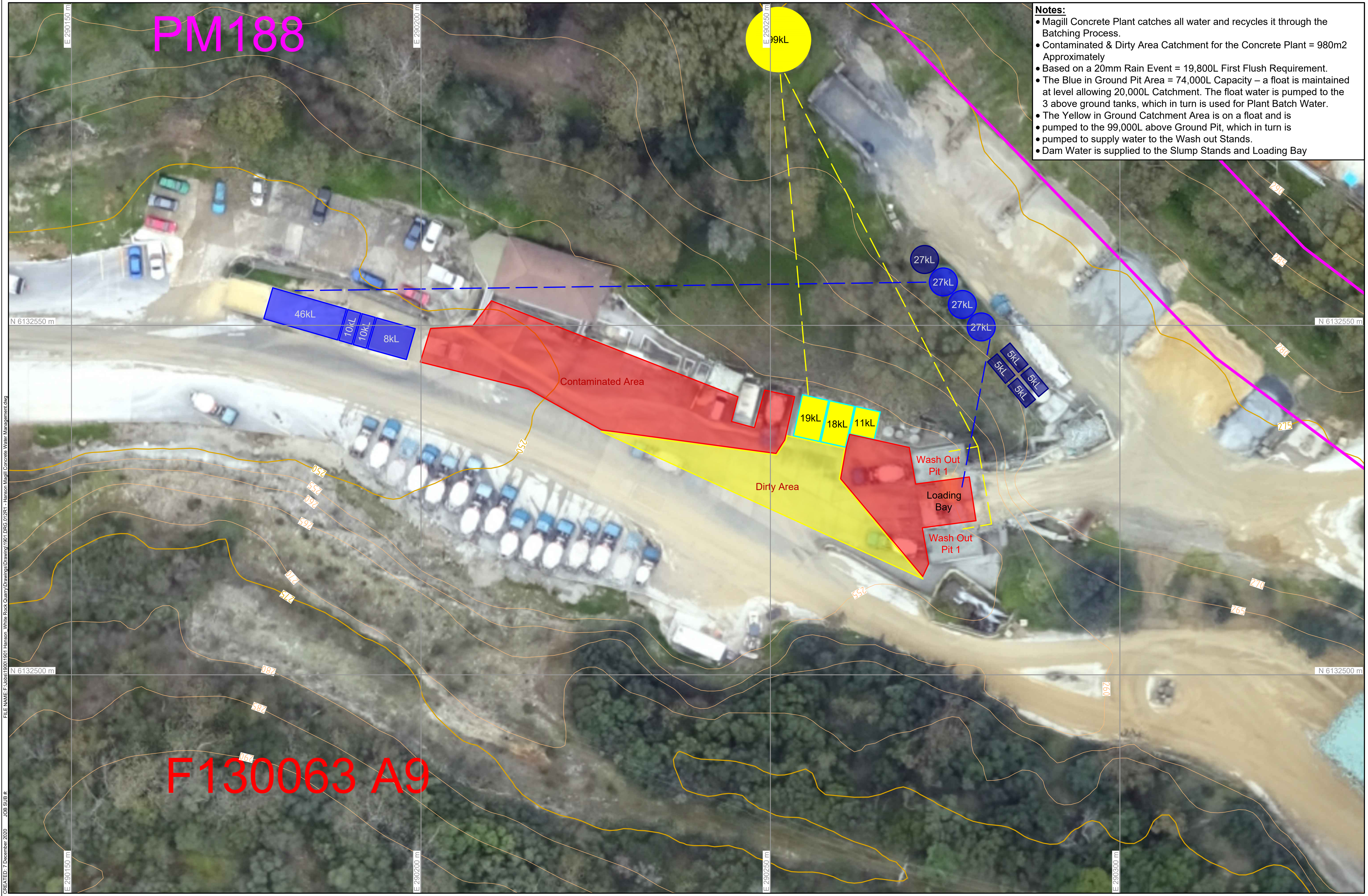
MGA / AHD / 54



REV	DESCRIPTION	DATE	BY
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Data Sources:
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Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

Legend:
Private Mine Boundary
Cadastral Boundary

PROJECT: White Rock Quarry

TITLE: Hanson Magill Concrete Water Management Plan

CLIENT: Hanson Construction Materials Pty Ltd

GROUNDWORK plus
PH: +61 7 3871 0411
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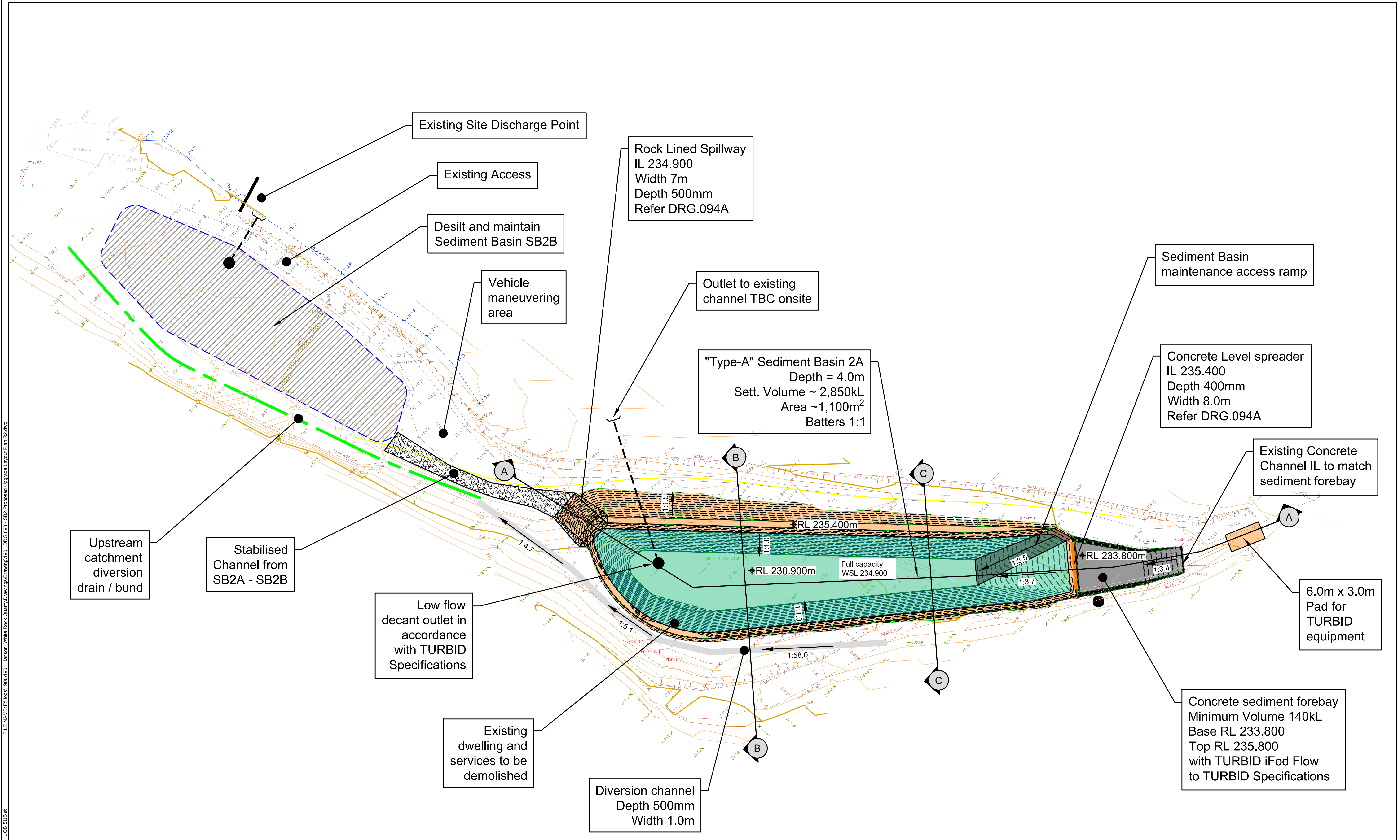

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FILE NAME: F:\Jobs\1900\1901 Hanson_White Rock Quarry\Drawings\Drawing\1901.DRG.093 - SB2 Proposed Upgrade Layout Plan R2.dwg

JOB SUB #:

CREATED: 22 December 2021

REV	DESCRIPTION	DATE	BY
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Topography: Hanson Ground Survey, Captured 2021-12-20 by John C Bested & Associates
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 TYPE-A 1 in 5y Layout Plan

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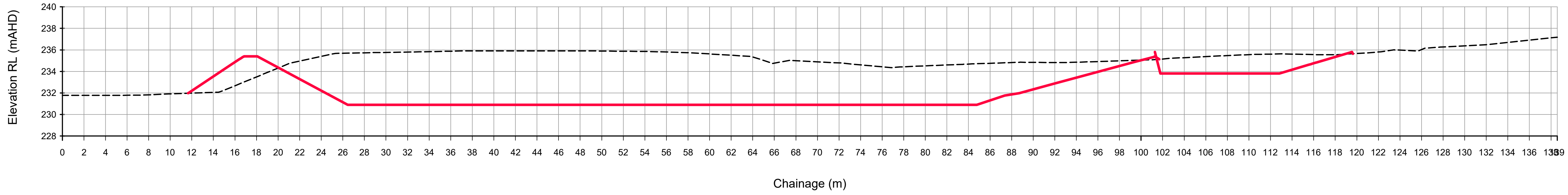

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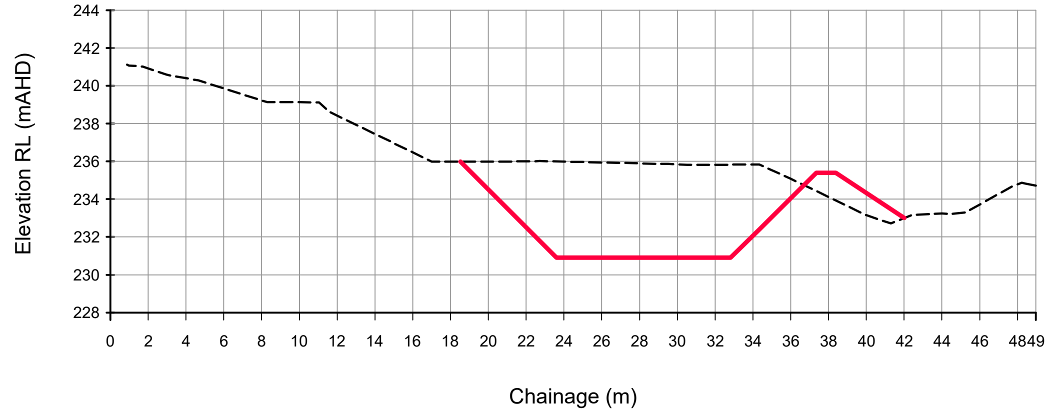
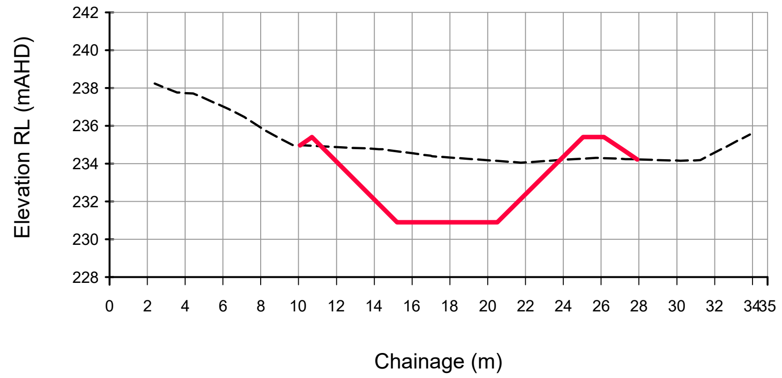


Section C - SB2



ISSUED FOR INFORMATION

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography: Hanson Ground Survey, Captured 2021-12-20 by John C Bested & Associates
Cadastre:
Ecosystem:
Other:

Legend:
- - - - Existing Ground Surface
—— Design Surface

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Cross Sections A-A to C-C

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PRINTED: 22 December 2021 | CHECKED: MF

DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54

CREATED: 22 December 2021 JOB SUB #: FILE NAME: F:\Jobs\1900\1901 Hanson_White Rock Quarry\Drawings\Drawing\1901.DRG.093 - SB2 Proposed Upgrade Layout Plan R2.dwg

ATTACHMENTS

Attachment 1

Curriculum Vitae

Attachment 2

Sediment Basin 2 – Options Review

WHITE ROCK QUARRY
SEDIMENT BASIN 2 – OPTIONS REVIEW

Prepared for:
Hanson Construction Materials Pty Ltd

Date:
October 2021

File Ref:
1901.810.002

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Principal Author:	M. Folker
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Table of Contents

DRAWINGS

ATTACHMENTS

1. Introduction

1.1 Project Overview

Groundwork Plus Pty Ltd ('Groundwork Plus') has been commissioned by Hanson Construction Materials Pty Ltd (Hanson) to undertake a Sediment Basin options analysis of Sediment Basin 2 as part of the ongoing water management strategy for the operations of the White Rock Quarry located within Private Mine (PM) 188 located on Horsnells Gully Road (the Site).

An initial surface water assessment was undertaken for the Site in September 2017 to review the catchment hydrology of the Site and the surrounding external catchments and inform the required sediment basin water storage volumes required within the Site to manage surface water in accordance with the International *Erosion Control Association (IECA) 2008 Best Practice Erosion and Sediment Control (BPESC)* Guidelines.

Hydraulic modelling and Sediment Basin design within the Site has been undertaken in accordance with the criteria of the IECA 2008 BPESC guidelines and formed part of the Environment Improvement Program (EIP) for the Site, approved by the Environment Protection Authority (EPA) in 2017. Subsequently the IECA BPESC guidelines were updated in 2018 incorporating updated Sediment Basin design options.

Construction of Sediment Basin 1 (SB1) was undertaken as part of the EIP during 2019 of which considerable investment was undertaken by Hanson in order to manage the geotechnical instability issues associated with the basin location while also achieving the required sediment basin volume in accordance with the 2008 IECA criteria. While there has been recorded sediment load reduction reported from the Site following the implementation of SB1, the volume of the existing Sediment Basin 2 (SB2) remains lower than the required 2008 IECA criteria.

Initial volume calculations for SB2 have previously been provided within the hydraulic modelling and assessment for the Site in 2017, however a review of the SB2 design has been undertaken against the updated 2018 IECA design practice in response to a request from the EPA to ensure that best available technologies are considered and reasonable and practicable measures are adopted by Hanson to achieve the Water Quality criteria for the Site.

1.2 Scope of Assessment

The scope of the report includes the following items:

- A detailed Site water balance assessment for SB2 contributing catchments, to inform upgrade design options analysis in accordance with the 2018 IECA design criteria, including considerations for 1 in 20 Annual Recurrence Interval (ARI) and 1 in 100 ARI retention options;
- Undertake an annual water balance for the reuse for the stormwater harvesting system associated with SB1, in order to inform on feasibility for utilising captured surface water from SB2 for reuse in operations;
- Identify the estimated frequency of discharge events from the quarry for each proposed SB2 upgrade scenarios
- Provide a summary of considerations for the sediment basin design options analysis in consideration of the IECA design criteria and 1:20 ARI and 1:100 ARI storm events.

1.3 Site Location

The White Rock Quarry is situated within Private Mine (PM) 188 located on Horsnells Gully Road, Horsnell Gully SA 5141. SB2 is located on the southern side of a fourth order water course approximately 200m west of the Site access gate.

1.4 Site Catchments and Topography

The topography of the Site has been mapped utilising Unmanned Aerial Vehicle (UAV) survey with topography of the surrounding area mapped with LiDAR (Geoscience Australia). Catchment areas of the Site and the surrounding catchments feeding surface water into the Site have been reviewed and outlined within **Drawing No. 1901.SK01.R1 - Surface Water Catchment Areas**.

The topography within the Site varies from the upper northern reaches of the quarry RL 390 metres Australian Height Datum (mAHD), with the extraction sump at around RL 300m AHD. The quarry haul roads and infrastructure areas grade towards the quarry entrance via a series of stormwater treatment devices, with the Site discharge location being monitored at the SB2, at RL approximately 230.0mAHD.

The surface water catchments comprise of a series of clean catchment areas that bypass the quarry via an existing underground pipe network, as depicted by the green areas. The Giles Gully conservation dam is depicted by the blue catchment area, and the remaining quarry catchments are shown in yellow (operational areas) and red (quarry pit).

The catchment that contributes directly into SB2 is denoted catchment C5, with a contributing area of 9.85 hectares. A clean water catchment diversion is currently being investigated for catchment U5, in order to prevent inflows into the SB2 drainage system. Presently, a piped system at the quarry entrance receives all runoff from catchment C5, and then discharges to SB2 via a concrete channel.

1.4.1 Hydrologic / Hydraulic Modelling

A hydrologic / hydraulic model was established in order to simulate the quarry over a range of design storm events, as shown in **Diagram 1 – DRAINS model schematic.**

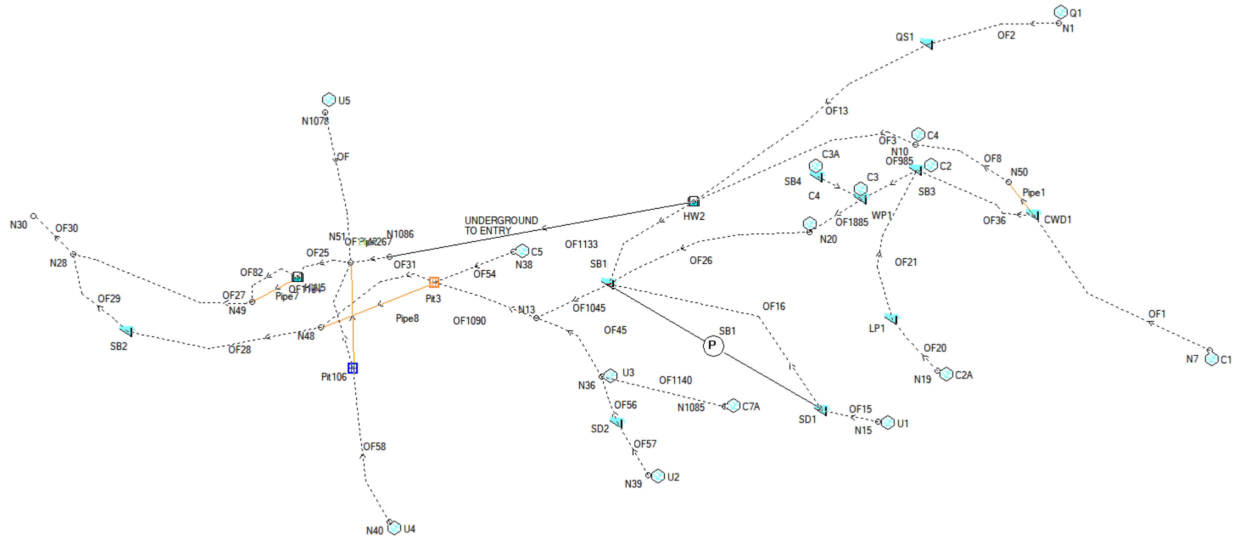


Diagram 1 – DRAINS model schematic

1.4.2 Soil Characteristics

A Particle Size Distribution (PSD) analysis was undertaken at SB2, at the location shown in **Diagram 2 – SB2 PSD soil sample location**. The results are shown in **Diagram 3 – SB2 PSD analysis**, indicating that approximately 80% of the material is finer than one (1) millimetre (mm). An earlier sample taken by Water Science upstream of SB2 is shown in **Diagram 4 – Upstream PSD soil sample results**, indicating approximately 90% of cumulative volume being finer than 0.02mm, inferring that material contributing to SB2 is likely to include significant volumes of clay / silt. Consideration of suitable coagulants and/or flocculants has been ongoing in order to identify the optimum treatment method for dewatering of SB2. The outcome for the most suitable application will be confirmed as part of the detailed design of the SB2 upgrade.

Diagram 2 – PSD SB2 soil sample location

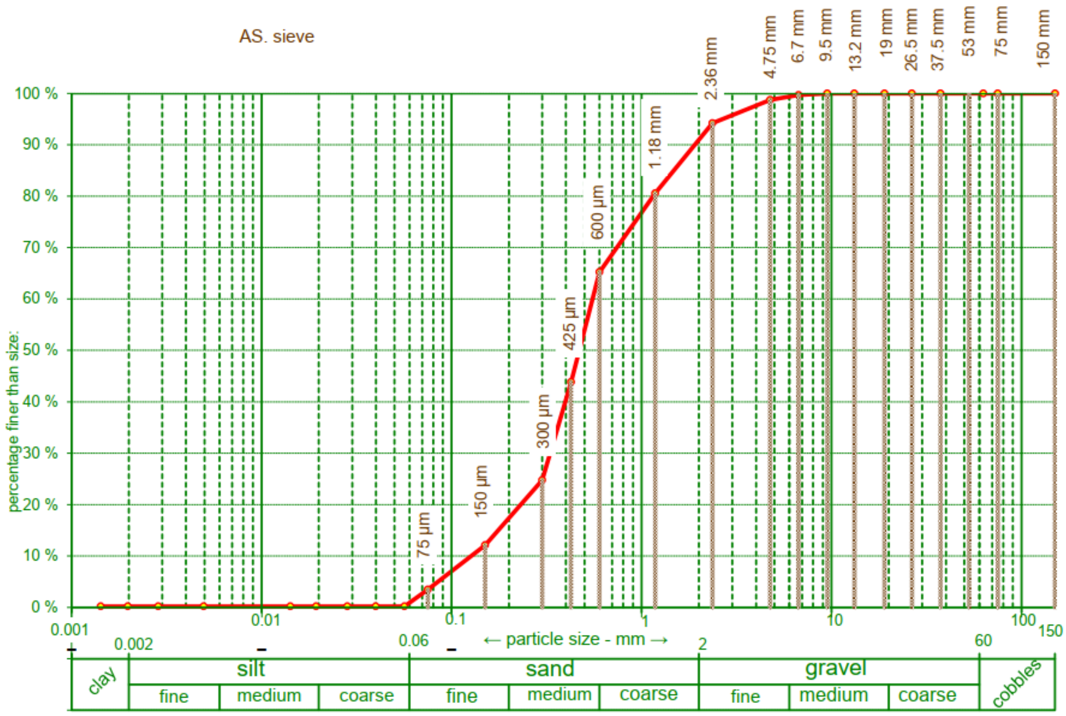
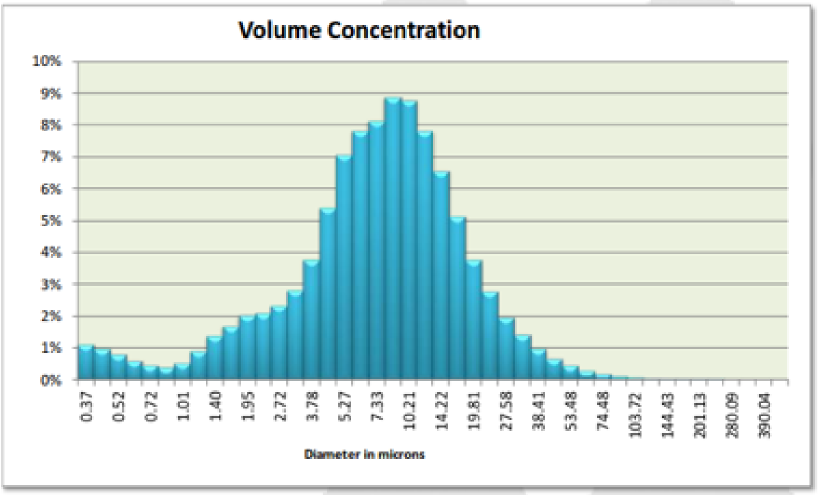
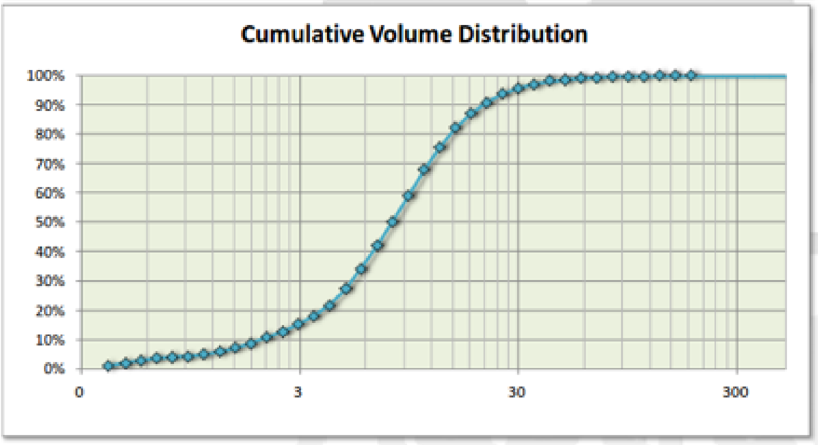


Diagram 3 – PSD sample analysis

LISST-Portable|XR Size Distribution Report

Sample Number to Display:	1
Operator:	WATER SCIENCE
Sample Notes:	White Rock Quarry Sed. Basin Upstream
SOP Name:	WATER SCIENCE
SOP Note:	5142085





Median Size (microns)	Volume Conc (%)	Cumulative Volume
0.37	1%	1.12%
0.44	1%	2.09%
0.52	1%	2.89%
0.61	1%	3.49%
0.72	0%	3.94%
0.85	0%	4.34%
1.01	1%	4.86%
1.19	1%	5.76%
1.40	1%	7.12%
1.65	2%	8.81%
1.95	2%	10.82%
2.30	2%	12.91%
2.72	2%	15.22%
3.20	3%	18.03%
3.78	4%	21.80%
4.46	5%	27.18%
5.27	7%	34.23%
6.21	8%	42.06%
7.33	8%	50.18%
8.65	9%	59.05%
10.21	9%	67.82%
12.05	8%	75.62%
14.22	7%	82.17%
16.78	5%	87.29%
19.81	4%	91.04%
23.37	3%	93.80%
27.58	2%	95.77%
32.55	1%	97.18%
38.41	1%	98.15%
45.32	1%	98.80%
53.48	0%	99.25%
63.11	0%	99.53%
74.48	0%	99.72%
87.89	0%	99.84%
103.72	0%	99.91%
122.39	0%	99.95%
144.43	0%	99.98%
170.44	0%	99.99%
201.13	0%	100.00%
237.35	0%	100.01%
280.09	0%	100.01%
330.52	0%	100.01%
390.04	0%	100.01%
460.27	0%	100.01%

Computed Statistics		
Process Date	10/18/2017	MM/DD/YYYY
Process Time	09:07:38	HH:MM:SS
Optical Transmission	77.8	%
Total Volume Conc	59.5	ul/l
Total Mass Conc	62.4	mg/l
Mean Size	7.1	microns
Standard Deviation	11.3	microns
Optical Model	Polystyrene	No units
Index of Refraction	[1.590-0.100i]	[real imag]
Effective Density	1.050	g/cm^3
Mixer Speed	20	%
Mixer Duration	-1	sec
Ultrasonic Power	-1	%
Ultrasonic Duration	-1	sec
Average Duration	20	sec
Sample Prep Control	Manual	No units

Computed Statistics		
D5	1.12	microns
D10	1.98	microns
D16	3.09	microns
D25	4.53	microns
D50	7.94	microns
D60	9.57	microns
D75	12.92	microns
D84	16.39	microns
D90	20.55	microns
D95	28.10	microns
D60/D10	4.83	No units
Surface Area	1.45	m^2/l
Silt Ratio	0.01	No units
Silt Volume	0.67	ul/l

Analysis performed using laser diffraction techniques as described in AWWA Standard No. 2560D and ISO-13320-1. Instrumentation verified using NIST traceable standard particles. Rev. 4/5/2013.

SEQUOIA
Sequoia Scientific, Inc
www.SequoiaSci.com

Diagram 4 – Upstream PSD soil sample results

2. Water Balance Assessment

2.1 Assessment Objectives and Criteria

The water balance assessment was considered for both the catchments contributing to Sediment Basin SB2 and SB1 to inform the viability of dewatering from SB2 into SB1 for future reuse within the Site's operations.

2.1.1 Sediment Basin SB2 water balance assessment objectives

The objectives of the water balance assessment for SB2 was to inform the design options analysis and provide recommendations for the most suitable sediment basin design option, with consideration to the following:

- Overall water volume and area required;
- Site area constraints
- Cost to implement and maintain;
- Changes to the hydraulic regime for downstream users
- Effectiveness to prevent uncontrolled sediment releases occurring; and
- Adoption of Industry standards and best practice, with reference to the Site licence conditions and permits

2.1.2 Sediment Basin SB1 water balance assessment objectives

The objectives of the water balance assessment for SB1 was to conduct a water budget to determine annual surface water inputs and compare against the Site water usage requirements, in order to understand if there are any surplus or shortfalls and consider the feasibility of additional harvesting from the SB2 treatment system.

2.2 Climate Data

Rainfall data was sourced from the Bureau of Meteorology (BoM) for Mount Lofty (023810) for the water balance, which is 4.86 kilometres (km) from the Site. To inform the calculations of the water balance daily rainfall records were downloaded and used for a higher degree of accuracy.

2.2.1 Average Rainfall

The year 1999 was selected for examining an 'average rainfall' scenario, with an annual rainfall depth of 997mm recorded, which is comparable to the mean rainfall of 972mm (within 3% difference based on annual total).

2.2.2 Mean Daily Evaporation

Mean Daily Evaporation data was sourced from BoM for Adelaide West Terrace Station (023000) as it was the closest available (approximately 12.0 km away). A coefficient of 0.8 was applied to the mean pan evaporation rates to take into account the high shading effect experienced at the quarry. The adopted values are shown below in **Table 1 – Mean Daily Evaporation (adopted).**

Table 1 – Mean Daily Evaporation (adopted)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
mm	6.4	5.68	4.64	2.96	1.92	1.44	1.36	1.84	2.72	3.76	4.8	5.76

2.2.3 Groundwater exfiltration

There is no anticipated interception with the groundwater table as the sediment basins are either impervious, or located above the groundwater.

2.3 Sediment Basin SB2

2.3.1 Runoff coefficients

The water balance assessment for SB2 was estimated based on the hydrological parameters shown in **Table 2 – SB2 Catchment Runoff Coefficients**.

Table 2 – SB2 Catchment Runoff Coefficients

Rainfall (mm)	10	20	30	40	50	60	70	80	90	100
Runoff Coefficient	0	0.43	0.56	0.63	0.69	0.74	0.77	0.79	0.81	0.83

The runoff coefficients assume an initial loss for rainfall up to 20mm (i.e no runoff), and then 'clay type' conditions for rainfall of equal or greater than 20mm for the contributing catchment.

2.3.2 Sediment Basin SB2 Retention Volume Upgrade Options

A number of sediment basin retention volume design options were considered in order to inform the design options analysis for the upgrade of SB2. The respective design criteria and associated total volumes are shown below in **Table 3 – Sediment Basin SB2 retention basin upgrade scenarios.** Refer to each drawing reference for layout plan details.

Table 3 – Sediment Basin SB2 retention basin upgrade scenarios

Design Criteria	IECA 2008	1 in 5 year	1 in 10 year	1 in 20 year	1 in 100 year
Rainfall retention (mm)	45.8	78.2	88.3	102.7	139.4
Upper Settling Volume (kL)	2,840	5,390	6,440	7,380	10,990
Total Volume required (kL)	4,260	8,090	9,660	11,080	16,480
Drawing Reference	1901.SK02.R2	1901.SK03.R1	1901.SK04.R1	1901.SK05.R1	1901.SK06.R1

Each of the retention basin options require dewatering following a rainfall event (typically within five (5) days) with suitable treating (flocculants and/or coagulants) being applied manually, or with a dewatering system being installed and operated that provides suitable treatment concurrently (such as a silt buster or wastewater treatment system). The dewatering of the sediment basin following each rainfall event must be undertaken to restore the upper settling volume so that the basin has adequate storage available for consecutive rain events. The required upper settling volumes are as detailed in **Table 3 - Sediment Basin SB2 retention basin upgrade scenarios**, and would typically be managed within the sediment basin by installing a freeboard marker.

2.3.3 Sediment Basin SB2 High Efficiency Sediment (HES) Basin Upgrade Options

A number of High Efficiency Sediment (HES) basin design options were also considered in order to inform the design options analysis for the upgrade of SB2. The respective design criteria and associated total volumes are shown below in **Table 4 – Sediment Basin SB2 HES upgrade scenarios.**

Table 4 – Sediment Basin SB2 HES upgrade scenarios

Design Criteria	1 in 1 year	1 in 5 year
Total Volume (kL)	1,566	3,640
Low Flow Decant Rate (kL/d)	3,404	3,404
Drawing Reference	1901.SK07.R1	1901.SK08.R1

Each of the HES basins provide an automatic dosing system that can treat all inflows while a rainfall event is occurring. This provides a significant advantage to a traditional retention basin system, particularly during days of consecutive rainfall, as the retention volume can be restored for additional treatment while a rainfall event occurs. Additionally, if a HES basin overtops, any outflows would have been dosed with flocculants and/or coagulants and will result in a significantly improved discharge quality when compared to an uncontrolled release from a traditional retention system. A HES basin also requires a smaller footprint compared to a traditional retention basin when comparing a respective ARI design criteria.

It is noted however that HES basins are limited to the dosing application rates of the installed system. For example, a standard automatic dosing system would be expected to dose at a maximum inflow rate of 1,000L/s, therefore larger ARI events cannot be expected to be adequately treated prior to a possible overtopping event. Larger ARI events (exceeding 1 in 5 year) are not recommended in a HES system due to the likelihood of scour or 'lifting' of settled sediments.

Telemetry systems can also be integrated into a HES basin, including automated monitoring systems to close an outlet if water quality does not meet the required indicators. This provides an additional advantage to a traditional retention system that can also be retrofitted if required.

2.3.4 Sediment Basin SB2 Water Balance Assessment Results

The water balance assessment results for the modelling of the SB2 design options are shown in **Table 5 – Sediment Basin SB2 Water Balance Assessment Results**. The modelling is based on a daily time step over the course of an average rainfall year, and assumes the following:

- *Uncontrolled releases* refer to events where the basin overtops with no ability or limited ability for onsite treatment. The count refers to events, not days (i.e if a discharge occurs over three (3) consecutive days, it remains considered as one (1) event with a three (3) day duration, not three (3) events). Note for a HES basin, water quality treatment will still occur in an overtopping event, however compliance with required water quality indicators is not certain.
- *Controlled releases* refer to events where the basin has been dewatered to restore upper settling volume with water quality suitable for discharge (i.e suitable treatment has occurred achieving the Site Water Quality criteria). For HES basins, controlled releases include treated (i.e compliant) discharges during rainfall events;
- For retention basins it is assumed that treatment can only occur after four (4) consecutive days of no rainfall occurring, with the dewatering occurring on the 5th day per industry standards (IECA 2008). If rainfall occurs within the four (4) day window, then the water balance assumes the water in the system remains.

Table 5 – Sediment Basin SB2 Water Balance Assessment Results

Design Criteria	Retention Basins					HES Basins	
	IECA 2008	1 in 5 year	1 in 10 year	1 in 20 year	1 in 100 yr	1 in 1 year	1 in 5 year
Annual Rainfall (mm)	997.8	997.8	997.8	997.8	997.8	997.8	997.8
Total inflow (kL)	45,072	45,072	45,072	45,072	45,072	45,072	45,072
Total evaporation (kL)	1,575	2,362	2,362	2,362	2,887	1,575	1,575
Controlled Release volume per annum (kL)	20,152	28,186	30,286	32,166	30,805	31,553	37,939
Uncontrolled Release volume per annum (kL)	23,428	17,198	16,148	15,208	11,532	13,700	5,768
Number of uncontrolled releases per annum	***11***	***7***	***6***	***6***	***6***	***11***	***4***

Refer to **Attachment 2 – Detailed Water Balance Assessment Results** for the full water balance modelling results. It is noted that while the Retention Basin volume significantly increases from a 1 in 5 year ARI to a 1 in 100 year ARI retention volume, however, the number of uncontrolled releases do not vary significantly. This is due to rainfall being continuous in the wetter months of the year, which limits the ability for the quarry to treat captured rainfall prior to discharge.

As also shown in **Attachment 1 – SB2 Upgrade Options**, there are significant problems arising relating to the feasibility of constructing Retention Basins with retention volumes greater than the IECA 2008 standard. The footprints shown for the 1 in 10 ARI (**Drawing No. 1901.SK04R1 – Sediment Basin SB2 1 in 10y Retention Pond Layout**), 1 in 20 ARI (**Drawing No. 1901.SK05R1 – Sediment Basin SB2 1 in 20y Retention Pond Layout**) and 1 in 100 ARI (**Drawing No. 1901.SK06R1 – Sediment Basin SB2 1 in 100y Retention Pond Layout**) basins are significantly larger than the basin footprints for the IECA basin designs. Due to the constraints of the basin location with the existing watercourse, and steep topography these basins would not be viable based on prior geotechnical engineering investigations already undertaken, with concerns being raised for undermining the existing road and slope stability of the southern escarpments. Additionally, further considerations would also be required for the access to these basins for maintenance which would require further encroachment into the water course and the southern escarpments.

A clean water diversion drain is also required to divert the gully that drains from the southern direction behind the existing dwelling, and the sediment basins design footprints needed for the larger systems will not allow for this additional surface water catchment. Access to the area is also limited as shown on the plans.

2.4 Sediment Basin SB1

2.4.1 Runoff coefficients

The water balance assessment for SB1 was estimated based on the hydrological parameters shown in **Table 6 – SB1 Runoff Coefficients**. The coefficients take into account the quarry area and also the upstream catchments that inflow directly into the clean water storage dams (including the turkey nest dam used for water supply).

Table 6 – SB1 Runoff Coefficients

Rainfall (mm)	10	20	30	40	50	60	70	80	90	100
Runoff Coefficient (Quarry)	0	0.43	0.56	0.63	0.69	0.74	0.77	0.79	0.81	0.83
Runoff Coefficient (Clean)	0	0.02	0.08	0.16	0.22	0.28	0.33	0.36	0.41	0.45

The runoff coefficients assume an initial loss for rainfall up to 20mm (i.e no runoff), and then 'clay type' conditions for rainfall of equal or greater than 20mm for the contributing catchment within the quarry area.

2.4.2 Water Balance Input and Usage Assumptions

The water balance input and usage assumptions for the assessment are shown below in **Table 7 – SB1 Input and Usage Assumptions**. The daily usage was based on the following assumptions supplied by Hanson:

- Water demand for dust suppression in summer is 120 kilolitres (kL) per day, and 60 kL per week in winter (average daily usage is 87kL over the year)
- Water demand for other processes in quarry (i.e pug mill) is 3kL per day
- Quarry operating hours 12 hours - 5 days per week, 10 hours Saturdays
- 20kL per day is assumed for concrete batching
- Total usage estimated 110kL per day, average over the year
- All harvested water from SB1 is pumped to turkey nest dam for reuse

Table 7 – SB1 Input and Usage Assumptions

Parameter	Value	Unit
Catchment Area (Sediment Basin SB1)	39,200	m^2
Clean water catchment (Clean Water Dams)	296,900	m^2
Sediment Basin capacity	1,850	m^3
Clean Water Dam capacity	8,150	m^3
Daily Usage in Quarry (operational days)	110	kL

2.4.3 Water Balance Assessment Results

Refer to **Attachment 2 – Detailed Water Balance Assessment Results** for a comprehensive daily breakdown of the water balance assessment. A summary of the results for the SB1 system is shown in **Table 8 – Water Balance Assessment Results**.

Table 8 – Water Balance Assessment Results

Annual Rainfall (mm)	Inflow into SB1 (kL)	Inflow into clean water dams (ML)	Total inflows (kL)	Total usage (incl. evaporation) (kL)	Surplus (kL)
997.8	17,937	34,402	52,339	41,933	10,406

As identified in the water balance for SB1, there is a surplus of available surface water within the catchment for reuse in the quarry operations. Therefore, it would not provide any additional benefit to the quarry to harvest additional water from the SB2 catchment for the purpose of reuse.

3. Design Options Analysis and Recommendations

The design options analysis for the upgrades to Sediment Basin SB2 are summarised in **Table 8 – Design Options Analysis**. As already discussed in **Section 2 – Water Balance Assessment**, it is not expected to be beneficial to implement a pumping system to harvest additional surface water from SB2 and pump to SB1 for reuse. This is because a surplus of water supply is already anticipated for the SB1 contributing catchments, and additional water pumped from SB2 would not provide any additional operational reuse potential.

Table 8 – Design Options Analysis

Design Criteria	Retention Basins					HES Basins	
	Type D IECA 2008	1 in 5 year (retention)	1 in 10 year (retention)	1 in 20 year (retention)	1 in 100 yr (retention)	Type A (1 in 1 year)	Type A (1 in 5 year)
Estimated Size (kL)	4,260	8,090	9,660	11,080	16,480	1,644	2,850
Estimated Cost ($)	~$520,000*	~$1M+	~$1.5M+	~$1.5M+	~$1.5M+	~$550,000	~$600,000
Available Area?	Yes	No	No	No	No	Yes	Yes
Allows Access?	Yes	No	No	No	No	Yes	Yes
Allows clean water diversion?	Yes	No	No	No	No	Yes	Yes
Treatment System (Auto / Manual)	Manual	Manual	Manual	Manual	Manual	Auto	Auto
Volume of treated surface water per annum (kL)	20,152	28,186	30,286	32,166	30,805	31,553	37,939

As shown in the design options analysis, the HES basins provide not only the smallest footprint but also much improved treatment efficiency, being able to treat during events and also not being impacted by consecutive rainfall days, which is currently a significant problem for the existing treatment system. The IECA 2018 guideline does not outline HES basins above a 1 in 5 year ARI, due to the likelihood of scour or 'lifting' of settled sediments, combined with a typical maximum inflow treatment rate of around 1000 L/s. Therefore, a Type A basin is recommended not to exceed the IECA 2018 recommendations of 1 in 5 ARI capacity.

The most significant improvement to efficiency from a traditional retention volume system appears to be gained from a 1 in 5 year ARI retention system, improving from eleven (11) uncontrolled events to approximately seven (7) per year. There is little to no gained efficiency by further upgrading to a 1 in 20 year or up to a 1 in 100 year ARI retention system, because of the continuous rainfall received at the site during the wetter months of the year, hindering the ability to treat the retained water prior to discharging. The application of a 1 in 5 year ARI IECA Type A basin could further reduce the number of uncontrolled events to approximately four (4) per year.

Overall, the 1 in 5 year Type A HES basin presents the greatest anticipated benefits (refer **Drawing No. 1901.SK08R1 – Sediment Basin SB2 TYPE A (5 Year ARI)**), apart from requiring a slightly larger footprint and cost to a 1 in 1 year Type A HES basin (refer **Drawing No. 1901.SK07R1 – Sediment Basin SB2 TYPE A (1 year ARI)**). The revised IECA (2018) guidelines recommends a 1 in 5 year Type A for permanent disturbance areas including quarries, and is recommended for this application.

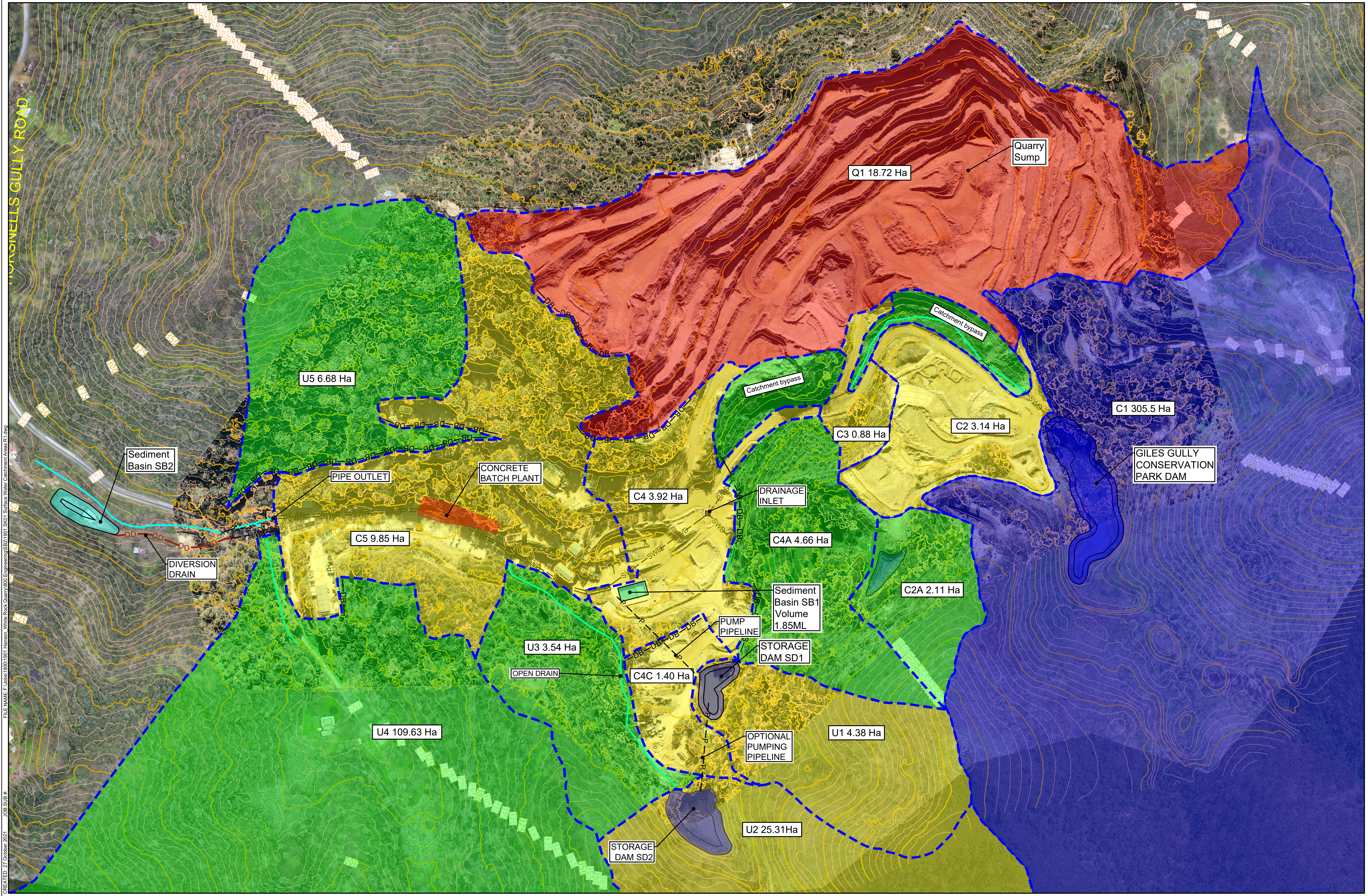
Due to the presence of clay / silt particles within the surface waters requiring treatment by the basin a flocculation / coagulant dosing system is likely to be required for either a retention basin or HES basin. Given the lack of ability to treat during rainfall events, a traditional retention system is compromised significantly once full, especially given the continuous nature of rainfall over winter. Contingency measures are also advantageous with a HES basin, with additional telemetry being able to be installed and retrofitted in the future to further improve performance and monitoring effectiveness if required.

Based on the requirements of the EPA licence and industry best practice, it is recommended that a HES basin system (1 in 5 year ARI) is adopted at the Site as outlined within **Drawing No. 1901.SK08R1 – Sediment Basin SB2 Type A (5 year ARI)** in order to provide the most optimum solution for the quarry.

attachments

Attachment 1

Sediment Basin Upgrade Options



REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

Legend:
- GILES DAM CATCHMENT
- UNDISTURBED AREAS
- QUARRY PIT AREA
- OPERATIONAL AREAS
- CLEAN SURFACE WATER FLOW
- DIRTY SURFACE WATER FLOW
- DD DIVERSION DRAIN
- DB DIVERSION BUND
- WATERCOURSE
- SWD UNDERGROUND PIPE
- P PUMPED STORMWATER
- CATCHMENT BOUNDARY

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Surface Water Catchment Areas

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SCALE: 1:2,500 When Printed On A3 — 0 50m

DRAWING NUMBER: 1901.SK01

REVISION: 1

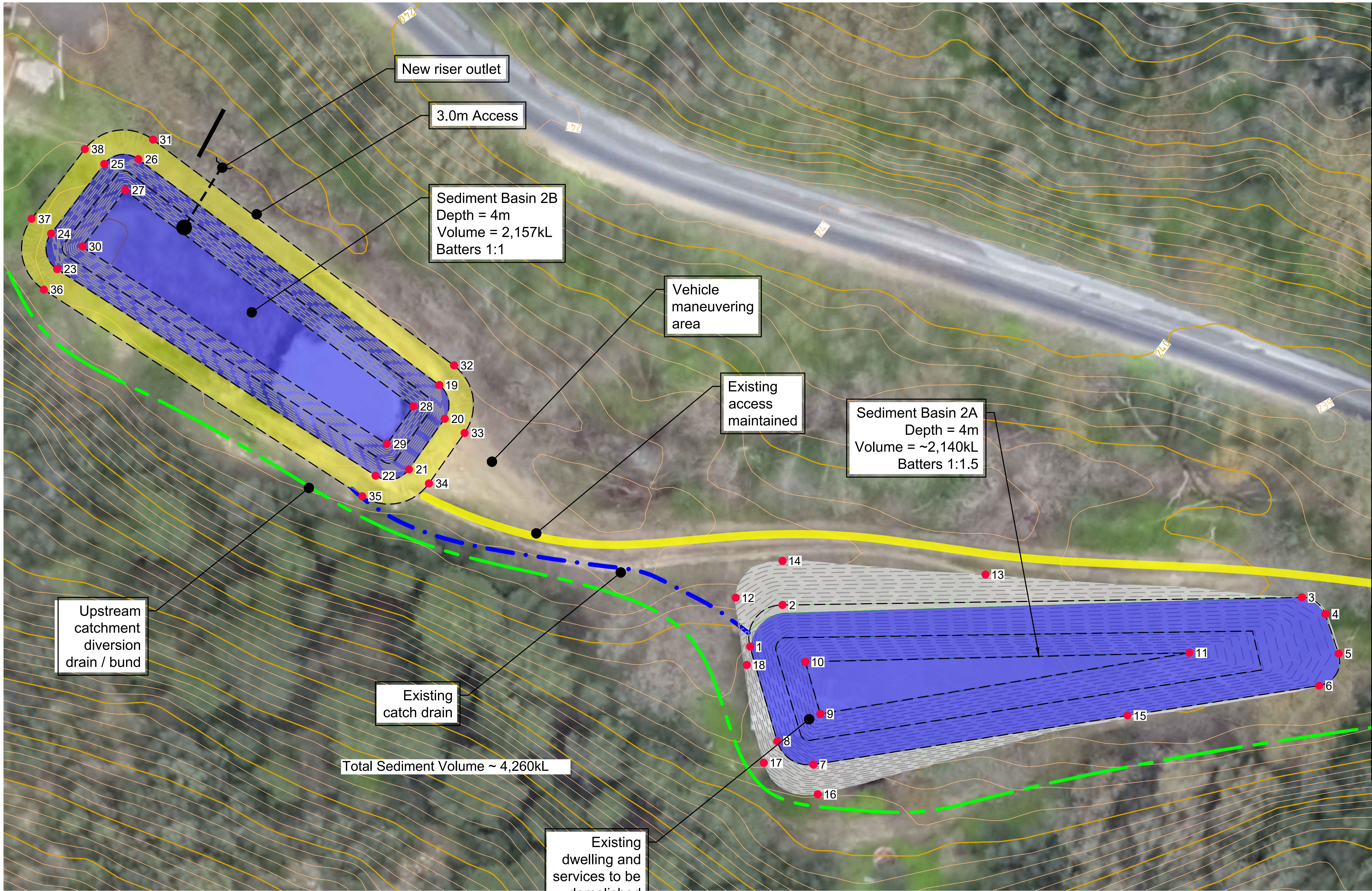
DATE: 27 October 2021

PRINTED: 28 October 2021

DRAWN: JS

CHECKED:

DATUM: HORIZONTAL / VERTICAL / ZONE MGA / AHD / 54



GPS Setout Points [GDA94 / MGA54]

ID	Easting	Northing	RL (m)
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2	289850.427	6132523.523	235.2
3	289914.053	6132524.450	235.2
4	289916.941	6132522.403	235.2
5	289918.562	6132517.566	235.2
6	289916.179	6132513.649	235.2
7	289854.223	6132503.993	235.2
8	289849.794	6132506.846	235.2
9	289855.074	6132510.198	231.2
10	289853.249	6132516.568	231.2
11	289900.304	6132517.675	231.2
12	289844.704	6132524.413	233.4
13	289875.294	6132527.241	233.5
14	289850.439	6132528.928	232.5
15	289892.713	6132509.992	235.2
16	289854.760	6132500.358	238.9
17	289848.145	6132504.208	237.8
18	289846.045	6132516.185	236.2
19	289808.391	6132550.451	231.0
20	289809.042	6132546.321	231.0
21	289804.677	6132540.139	231.0
22	289800.595	6132539.352	231.0
23	289761.583	6132564.643	231.0
24	289760.830	6132568.980	231.0
25	289767.345	6132577.520	231.0
26	289771.531	6132578.100	231.0
27	289769.924	6132574.305	227.0
28	289805.214	6132547.835	227.0
29	289801.964	6132543.232	227.0
30	289764.665	6132567.412	227.0
31	289773.331	6132580.500	230.5
32	289810.191	6132552.851	230.9
33	289811.493	6132544.591	231.3
34	289807.128	6132538.409	231.3
35	289798.963	6132536.835	231.6
36	289759.951	6132562.126	231.2
37	289758.444	6132570.800	231.2
38	289764.960	6132579.340	231.0

Layout Plan
Scale 1:500

CREATED: 4 August 2021 JOB SUB #: FILE NAME: F:\Jobs\1900\1901 Hanson_White Rock Quarry\800 Engineering\SB2\1901.SK02 R2.dwg

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 IECA 2008

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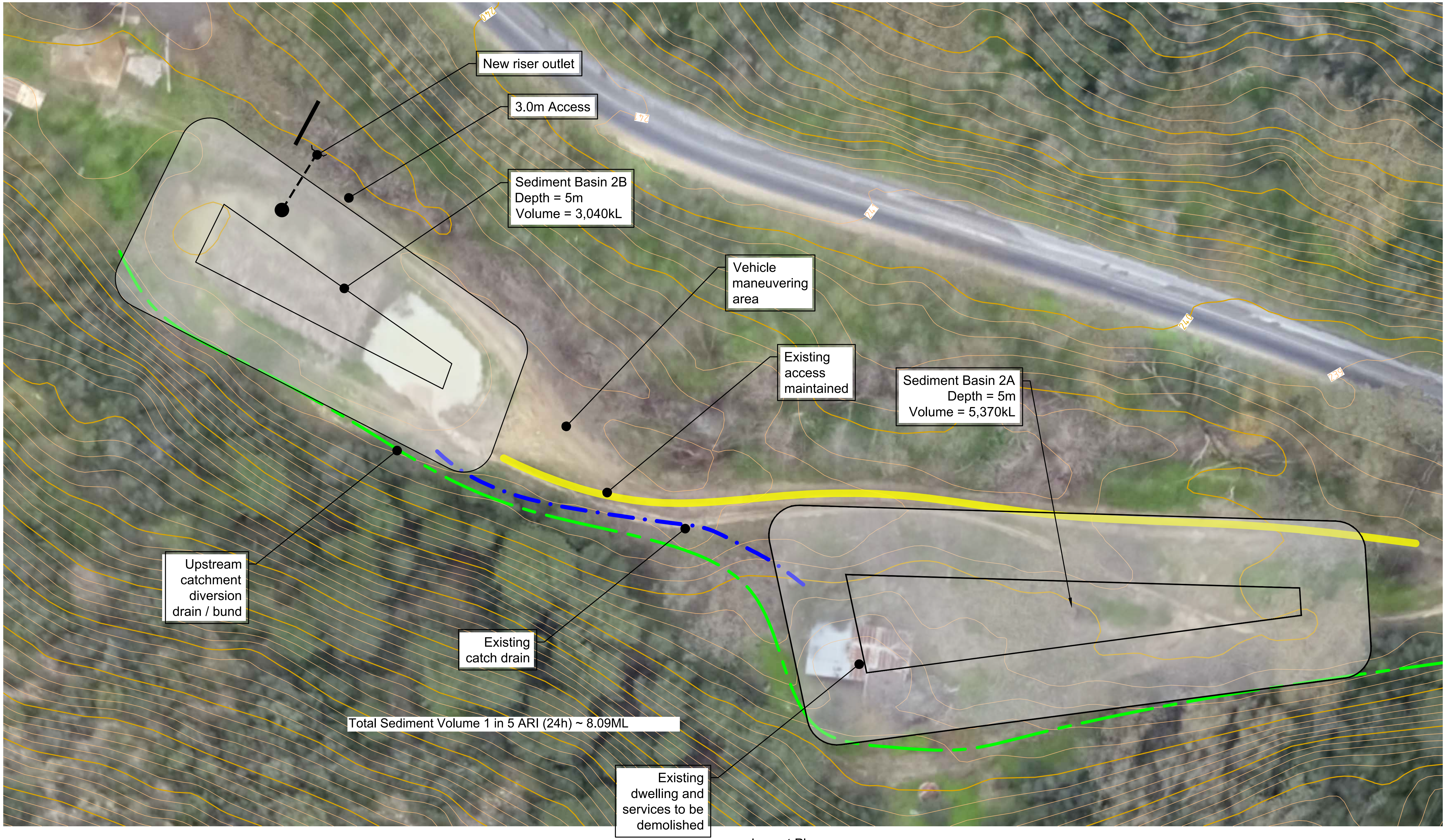
SCALE: 1:400 When Printed On A3 — 0 — 8m

DRAWING NUMBER: 1901.SK02

REVISION: 2

DATE: 4 August 2021
PRINTED: 27 October 2021
DRAWN: JHV
CHECKED: MF

DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54



Layout Plan
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FILE NAME: F:\Jobs\1900\1901 Hanson_White Rock Quarry\800 Engineering\SB2\1901.SK02 R5 1 In 5 Year Pond Size.dwg

JOB SUB #:

CREATED: 22 October 2021

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 1 in 5y Retention Pond Layout

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SCALE: 1:400 When Printed On A3 — 0 8m

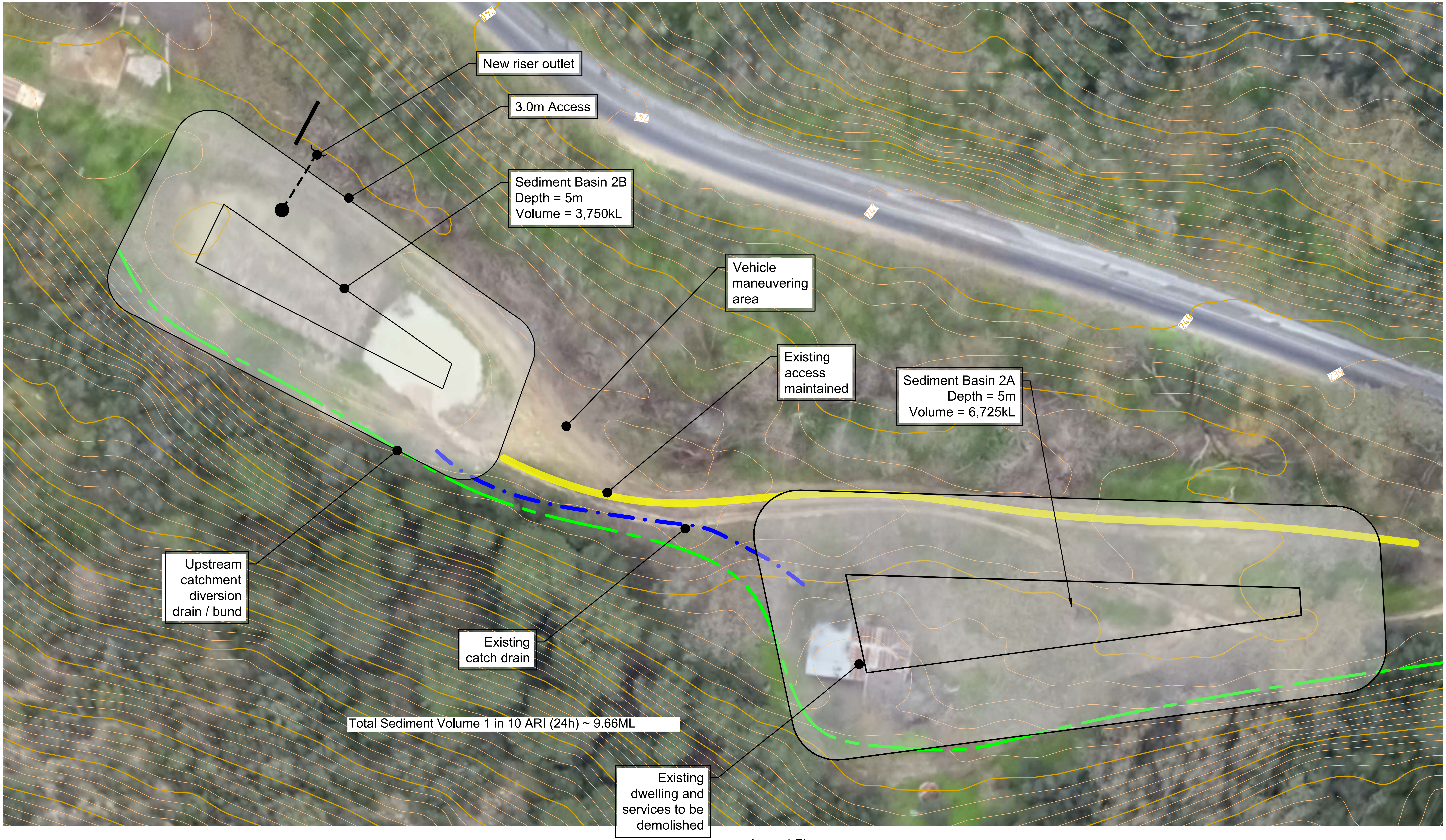
DRAWING NUMBER: 1901.SK03

REVISION: 1

DATE: 22 October 2021 | DRAWN: JHV

PRINTED: 22 October 2021 | CHECKED: MF

DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54



Layout Plan
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REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 1 in 10y Retention Pond Layout

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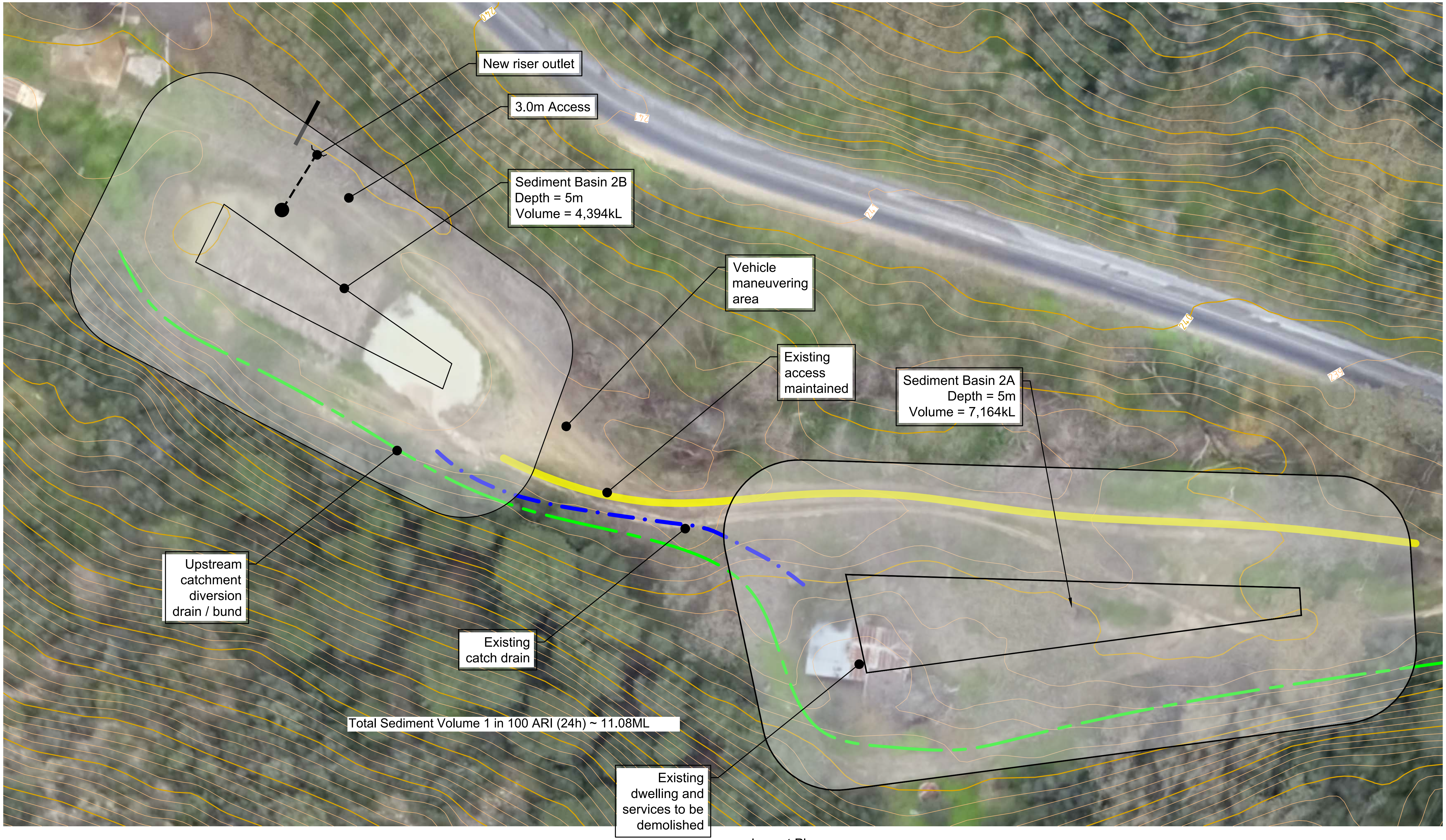
DRAWING NUMBER: 1901.SK04
REVISION: 1

DATE: 22 October 2021
PRINTED: 22 October 2021
DRAWN: JHV
CHECKED: MF
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54

CREATED: 22 October 2021
JOB SUB #:
FILE NAME: F:\Jobs\1900\1901 Hanson_White Rock Quarry\800 Engineering\SB2\1901.SK02 RS 1 in 10 Year Pond Size.dwg



Layout Plan
Scale 1:500

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 1 in 20y Retention Pond Layout

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SCALE: 1:400 When Printed On A3 — 0 8m

DRAWING NUMBER: 1901.SK05

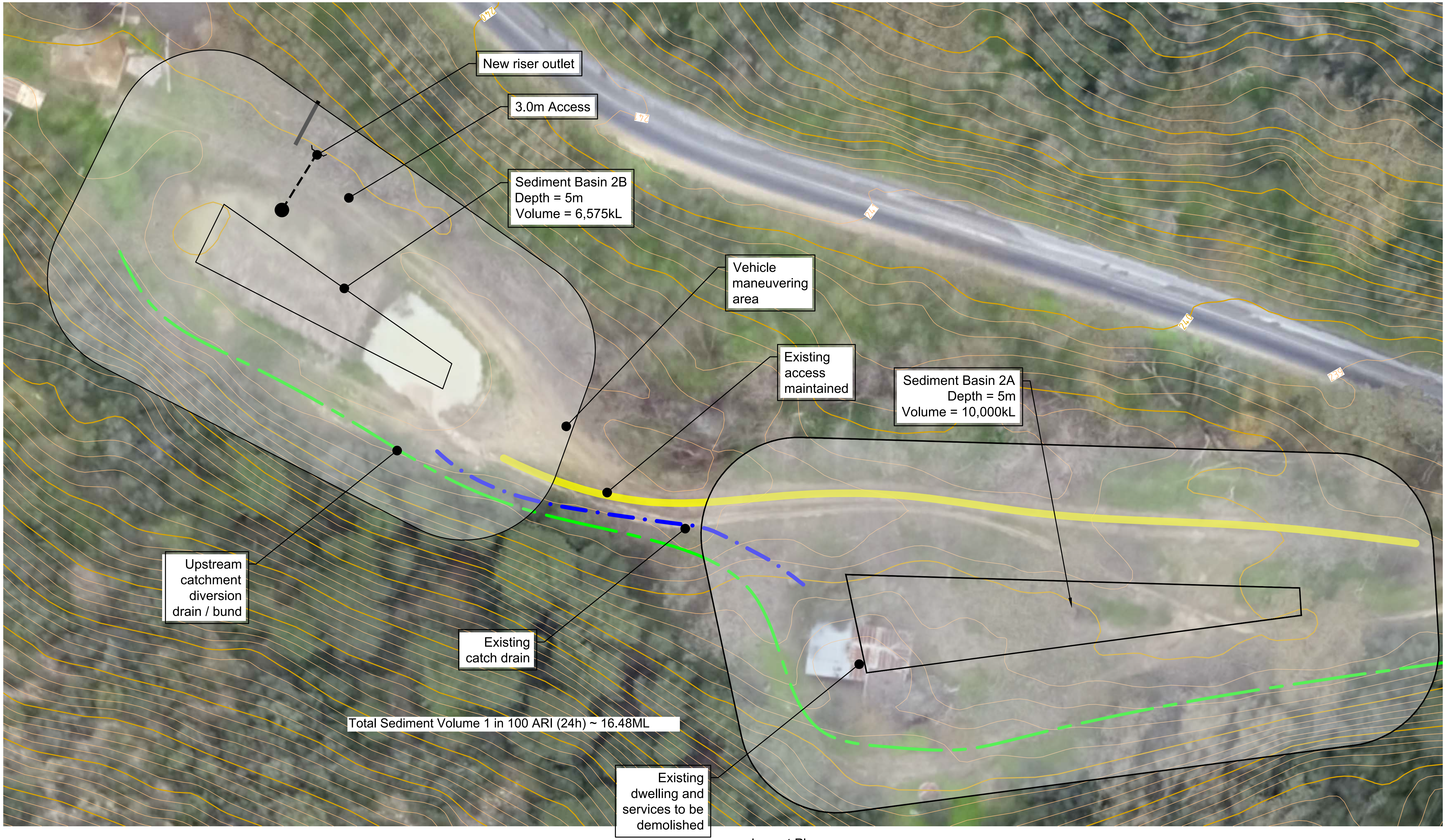
REVISION: 1

DATE: 22 October 2021 | DRAWN: JHV

PRINTED: 22 October 2021 | CHECKED: MF

DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54

CREATED: 22 October 2021



Layout Plan
Scale 1:500

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JOB SUB #:

CREATED: 21 October 2021

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 1 in 100y Retention Pond Layout

GROUNDWORK plus
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SCALE: 1:400 When Printed On A3 — 0 — 8m

DRAWING NUMBER: 1901.SK06

REVISION: 1

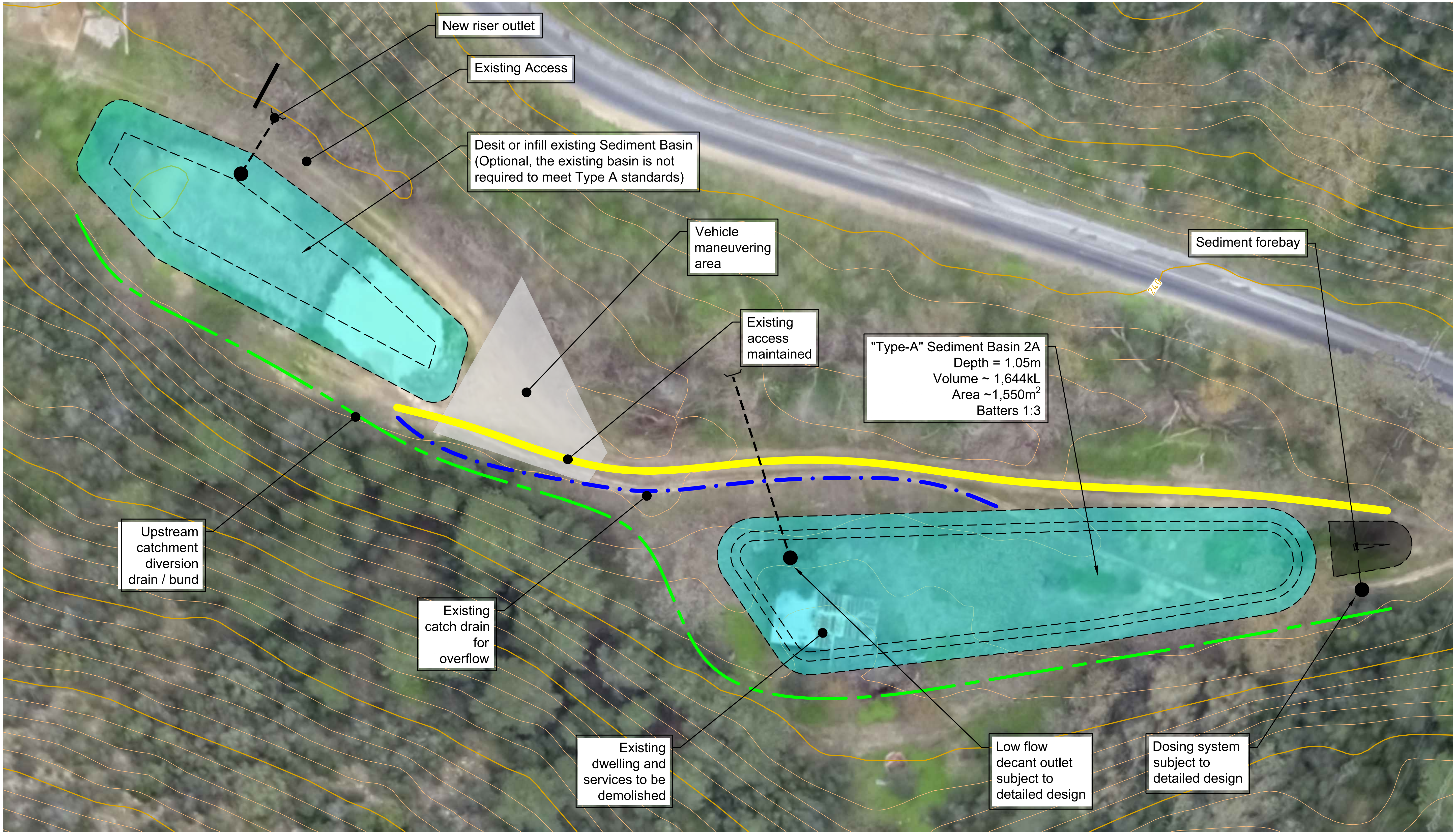
DATE: 21 October 2021

PRINTED: 22 October 2021

DRAWN: JHV

CHECKED: MF

DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54



Layout Plan
Scale 1:500

CREATED: 27 October 2021 JOB SUB #: FILE NAME: F:\Jobs\1900\1901 Hanson_White Rock Quarry\800 Engineering\SB2\1901.SK03 R1.dwg

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 TYPE A (1 year ARI)

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PH: +61 7 3871 0411
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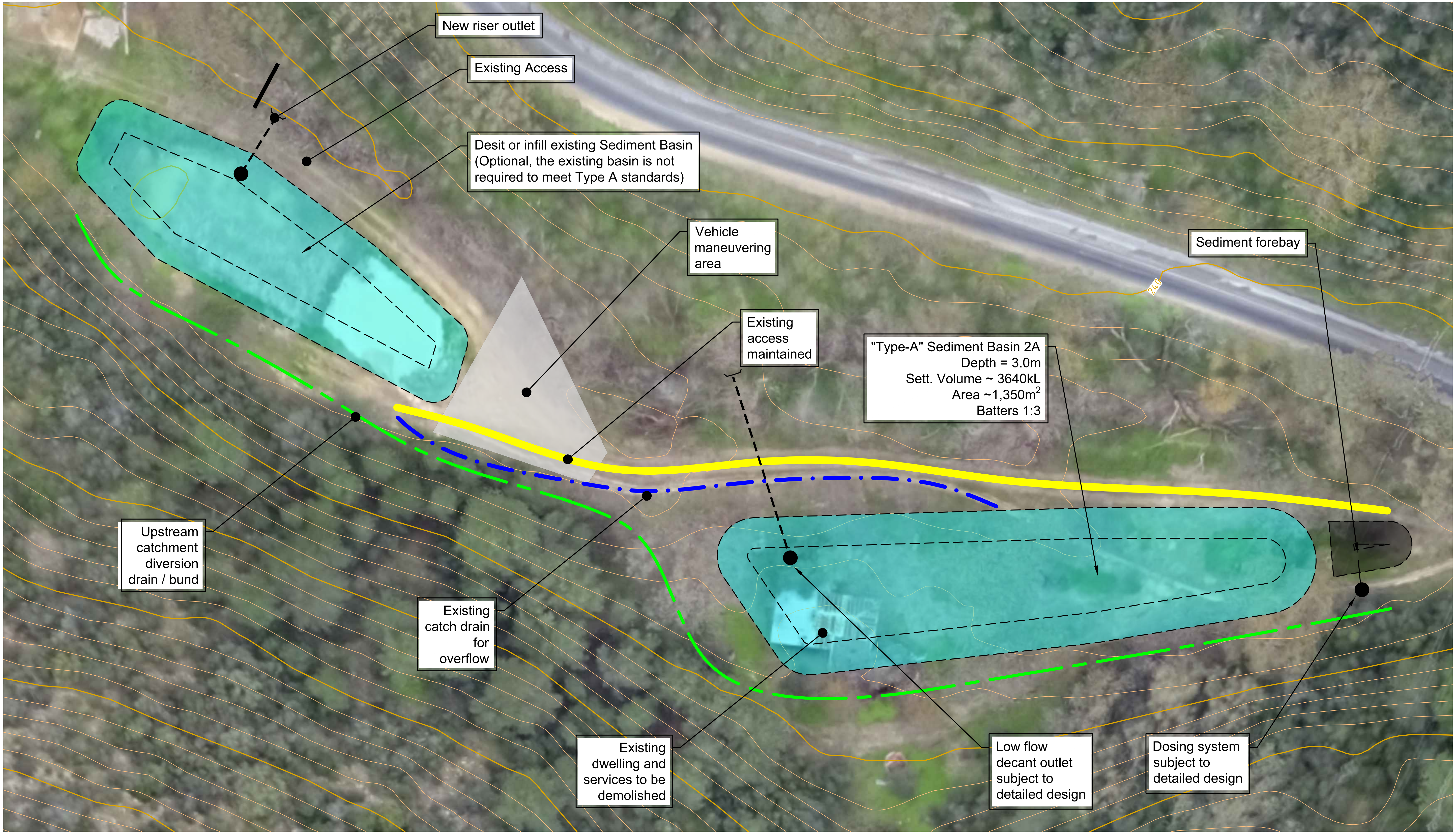
SCALE: 1:400 When Printed On A3 0 8m

DRAWING NUMBER: 1901.SK07
REVISION: 1

DATE: 27 October 2021
PRINTED: 1 November 2021
DRAWN: JHV
CHECKED: MF

DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54



Layout Plan

Scale 1:500

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Aerial Survey 2016-08-04
Topography: Aerial Survey 2016-08-04 (GNSS)
Cadastre:
Ecosystem:
Other:

N

PROJECT: White Rock Quarry

CLIENT: Hanson Construction Materials Pty Ltd

TITLE: Sediment Basin SB2 TYPE A (5 Year ARI)

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SCALE:	DRAWING NUMBER:	REVISION:
1:400 When Printed On A3 (0 – 8m)	1901.SK08	1

DATE: 27 October 2021	DRAWN: JHV	DATUM: HORIZONTAL / VERTICAL / ZONE
PRINTED: 1 November 2021	CHECKED: MF	GDA94 / MGA / AHD / 54

FILE NAME: F:\Jobs\1900\1901 Hanson_White Rock Quarry\800 Engineering\SB2\1901.SK03 R1 Type A 1 in 5 Year.dwg

JOB SUB #:

CREATED: 27 October 2021

Attachment 2

Detailed Water Balance Assessment Results

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient		Catchment Area - Quarry (m²)	Catchment Area - Clean (m²)	Inputs		Outputs		Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
				Cv	Clean			Overland Flow Quarry (m³)	Overland Flow Clean Dam (m³)	Evaporation (m³)	Water Used in Operations (m³)						
1999	1	1	0	0	0	39200	296900	0	0	7.68	120	2840	0	0	2200	0	
1999	1	2	0	0	0	39200	296900	0	0	7.68	120	2967.68	0	0	2032.32	0	0
1999	1	3	0	0	0	39200	296900	0	0	7.68	120	3095.36	0	0	1904.64	0	0
1999	1	4	0	0	0	39200	296900	0	0	7.68	120	3223.04	0	0	1776.96	0	0
1999	1	5	0	0	0	39200	296900	0	0	7.68	120	3350.72	0	0	1649.28	0	0
1999	1	6	0	0	0	39200	296900	0	0	7.68	120	3478.4	0	0	1521.6	0	0
1999	1	7	0.4	0	0	39200	296900	0	0	7.68	120	3606.08	0	0	1393.92	0	0
1999	1	8	16	0.43	0.02	39200	296900	269.696	95.008	7.68	120	3369.056	0	0	1630.944	0	0
1999	1	9	0	0	0	39200	296900	0	0	7.68	120	3496.736	0	0	1503.264	0	0
1999	1	10	0	0	0	39200	296900	0	0	7.68	120	3624.416	0	0	1375.584	0	0
1999	1	11	0	0	0	39200	296900	0	0	7.68	120	3752.096	0	0	1247.904	0	0
1999	1	12	0	0	0	39200	296900	0	0	7.68	120	3879.776	0	0	1120.224	0	0
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1999	3	2	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
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1999	3	4	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
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1999	3	8	0.2	0	0	39200	296900	0	0	5.568	120	4804.3736	0	0	195.6264	0	0
1999	3	9	0	0	0	39200	296900	0	0	5.568	120	4929.9416	0	0	70.0584	0	0
1999	3	10	0	0	0	39200	296900	0	0	5.568	120	5055.5096	0	0	0	1	0
1999	3	11	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	12	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	13	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	14	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	15	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	16	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	17	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	18	11	0.43	0.02	39200	296900	185.416	65.318	5.568	120	4874.834	0	0	125.166	0	0
1999	3	19	1.6	0	0	39200	296900	0	0	5.568	120	5000.402	0	0	0	1	0
1999	3	20	0	0	0	39200	296900	0	0	5.568	120	5125.568	0	0	0	1	0
1999	3	21	48	0.74	0.28	39200	296900	1392.384	3990.336	5.568	120	-257.152	257.152	0	5000	0	0
1999	3	22	2.6	0	0	39200	296900	0	0	5.568	120	125.568	0	0	4874.432	0	1
1999	3	23	0	0	0	39200	296900	0	0	5.568	120	251.136	0	0	4748.864	0	0
1999	3	24	0	0	0	39200	296900	0	0	5.568	120	376.704	0	0	4623.296	0	0
1999	3	25	11	0.43	0.02	39200	296900	185.416	65.318	5.568	120	251.538	0	0	4748.462	0	0
1999	3	26	2.8	0	0	39200	296900	0	0	5.568	120	377.106	0	0	4622.894	0	0
1999	3	27	0	0	0	39200	296900	0	0	5.568	120	502.674	0	0	4497.326	0	0
1999	3	28	4.6	0	0	39200	296900	0	0	5.568	120	628.242	0	0	4371.758	0	0
1999	3	29	0	0	0	39200	296900	0	0	5.568	120	753.81	0	0	4246.19	0	0
1999	3	30	0	0	0	39200	296900	0	0	5.568	120	879.378	0	0	4120.622	0	0
1999	3	31	1.8	0	0	39200	296900	0	0	5.568	120	1004.946	0	0	3995.054	0	0
1999	4	1	0	0	0	39200	296900	0	0	3.552	120	1128.498	0	0	3871.502	0	0
1999	4	2	0	0	0	39200	296900	0	0	3.552	120	1252.05	0	0	3747.95	0	0
1999	4	3	0	0	0	39200	296900	0	0	3.552	120	1375.602	0	0	3624.398	0	0
1999	4	4	1.2	0	0	39200	296900	0	0	3.552	120	1499.154	0	0	3500.846	0	0
1999	4	5	3.2	0	0	39200	296900	0	0	3.552	120	1622.706	0	0	3377.294	0	0
1999	4	6	0	0	0	39200	296900	0	0	3.552	120	1746.258	0	0	3253.742	0	0
1999	4	7	0	0	0	39200	296900	0	0	3.552	120	1869.81	0	0	3130.19	0	0
1999	4	8	0	0	0	39200	296900	0	0	3.552	120	1993.362	0	0	3006.638	0	0
1999	4	9	0	0	0	39200	296900	0	0	3.552	120	2116.914	0	723.086	2883.086	0	0
1999	4	10	0	0	0	39200	296900	0	0	3.552	120	2963.552	0	0	2036.448	0	0
1999	4	11	0	0	0	39200	296900	0	0	3.552	120	3087.104	0	0	1912.896	0	0
1999	4	12	0	0	0	39200	296900	0	0	3.552	120	3210.656	0	0	1789.344	0	0
1999	4	13	0	0	0	39200	296900	0	0	3.552	120	3334.208	0	0	1665.792	0	0
1999	4	14	0	0	0	39200	296900	0	0	3.552	120	3457.76	0	0	1542.24	0	0
1999	4	15	0	0	0	39200	296900	0	0	3.552	120	3581.312	0	0	1418.688	0	0
1999	4	16	0	0	0	39200	296900	0	0	3.552	120	3704.864	0	0	1295.136	0	0
1999	4	17	0	0	0	39200	296900	0	0	3.552	120	3828.416	0	0	1171.584	0	0
1999	4	18	0	0	0	39200	296900	0	0	3.552	120	3951.968	0	0	1048.032	0	0
1999	4	19	0	0	0	39200	296900	0	0	3.552	120	4075.52	0	0	924.48	0	0
1999	4	20	6.8	0	0	39200	296900	0	0	3.552	120	4199.072	0	0	800.928	0	0
1999	4	21	4.2	0	0	39200	296900	0	0	3.552	120	4322.624	0	0	677.376	0	0
1999	4	22	0	0	0	39200	296900	0	0	3.552	120	4446.176	0	0	553.824	0	0
1999	4	23	0	0	0	39200	296900	0	0	3.552	120	4569.728	0	0	430.272	0	0
1999	4	24	0	0	0	39200	296900	0	0	3.552	120	4693.28	0	0	306.72	0	0
1999	4	25	0	0	0	39200	296900	0	0	3.552	120	4816.832	0	0	183.168	0	0
1999	4	26	0	0	0	39200	296900	0	0	3.552	120	4940.384	0	0	59.616	0	0
1999	4	27	1.2	0	0	39200	296900	0	0	3.552	120	5063.936	0	0	0	1	0
1999	4	28	0.6	0	0	39200	296900	0	0	3.552	120	5123.552	0	0	0	1	0
1999	4	29	0.2	0	0	39200	296900	0	0	3.552	120	5123.552	0	0	0	1	0
1999	4	30	0	0	0	39200	296900	0	0	3.552	120	5123.552	0	0	0	1	0
1999	5	1	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	2	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	3	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	4	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	5	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	6	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	7	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	8	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	9	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	10	0.4	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	11	0	0	0	39200	296900	0	0	2.304	120	5122.304	0	0	0	1	0
1999	5	12	11.6	0.43	0.02	39200	296900	195.5296	68.8808	2.304	120	4857.8936	0	0	142.1064	0	0
1999	5	13	30.4	0.69	0.22	39200	296900	822.2592	1985.6672	2.304	120	2172.2712	0	0	2827.7288	0	0
1999	5	14	0.6	0	0	39200	296900	0	0	2.304	120	2294.5752	0	0	2705.4248	0	0
1999	5	15	0	0	0	39200	296900	0	0	2.304	120	2416.8792	0	0	2583.1208	0	0
1999	5	16	42.8	0.74	0.28	39200	296900	1241.5424	3558.0496	2.304	120	-2260.4088	2260.4088	0	5000	0	0
1999	5	17	0	0	0	39200	296900	0	0	2.304	120	122.304	0	0	4877.696	0	1
1999	5	18	0.8	0	0	39200	296900	0	0	2.304	120	244.608	0	0	4755.392	0	0
1999	5	19	0	0	0	39200	296900	0	0	2.304	120	366.912	0	0	4633.088	0	0
1999	5	20	0	0	0	39200	296900	0	0	2.304	120	489.216	0	0	4510.784	0	0
1999	5	21	6.4	0	0	39200	296900	0	0	2.304	120	611.52	0	0	4388.48	0	0
1999	5	22	5.2	0	0	39200	296900	0	0	2.304	120	733.824	0	0	4266.176	0	0
1999	5	23	44.2	0.74	0.28	39200	296900	1282.1536	3674.4344	2.304	120	-4100.46	4100.46	0	5000	0	0
1999	5	24	15.8	0.43	0.02	39200	296900	266.3248	93.8204	2.304	120	-237.8412	237.8412	0	5000	0	0
1999	5	25	78	0.81	0.41	39200	296900	2476.656	9494.862	2.304	120	-11849.214	11849.214	0	5000	0	0
1999	5	26	11.4	0.43	0.02	39200	296900	192.1584	67.6932	2.304	120	-137.5476	137.5476	0	5000	0	0
1999	5	27	1.6	0	0	39200	296900	0	0	2.304	120	122.304	0	0	4877.696	0	1
1999	5	28	0	0	0	39200	296900	0	0	2.304	120	244.608	0	0	4755.392	0	0
1999	5	29	14	0.43	0.02	39200	296900	235.984	83.132	2.304	120	47.796	0	0	4952.204	0	0
1999	5	30	10.4	0.43	0.02	39200	296900	175.3024	61.7552	2.304	120	-66.9576	66.9576	0	5000	0	0
1999	5	31	13.2	0.43	0.02	39200	296900	222.4992	78.3816	2.304	120	-178.5768	178.5768	0	5000	0	0
1999	6	1	0	0	0	39200	296900	0	0	1.728	120	121.728	0	0	4878.272	0	1
1999	6	2	0.2	0	0	39200	296900	0	0	1.728	120	243.456	0	0	4756.544	0	0
1999	6	3	0.2	0	0	39200	296900	0	0	1.728	120	365.184	0	0	4634.816	0	0
1999	6	4	0	0	0	39200	296900	0	0	1.728	120	486.912	0	0	4513.088	0	0
1999	6	5	12.8	0.43	0.02	39200	296900	215.7568	76.0064	1.728	120	316.8768	0	0	4683.1232	0	0
1999	6	6	1.4	0	0	39200	296900	0	0	1.728	120	438.6048	0	0	4561.3952	0	0
1999	6	7	8.2	0	0	39200	296900	0	0	1.728	120	560.3328	0	0	4439.6672	0	0

1999	6	8	0.2	0	0	39200	296900	0	0	1.728	120	682.0608	0	0	4317.9392	0	0
1999	6	9	0.2	0	0	39200	296900	0	0	1.728	120	803.7888	0	0	4196.2112	0	0
1999	6	10	7.2	0	0	39200	296900	0	0	1.728	120	925.5168	0	0	4074.4832	0	0
1999	6	11	0	0	0	39200	296900	0	0	1.728	120	1047.2448	0	0	3952.7552	0	0
1999	6	12	0	0	0	39200	296900	0	0	1.728	120	1168.9728	0	0	3831.0272	0	0
1999	6	13	36.2	0.69	0.22	39200	296900	979.1376	2364.5116	1.728	120	-2052.9484	2052.9484	0	5000	0	0
1999	6	14	0	0	0	39200	296900	0	0	1.728	120	121.728	0	0	4878.272	0	0
1999	6	15	16.6	0.43	0.02	39200	296900	279.8096	98.5708	1.728	120	-134.9244	134.9244	0	5000	0	0
1999	6	16	5	0	0	39200	296900	0	0	1.728	120	121.728	0	0	4878.272	0	1
1999	6	17	0.4	0	0	39200	296900	0	0	1.728	120	243.456	0	0	4756.544	0	0
1999	6	18	14.8	0.43	0.02	39200	296900	249.4688	87.8824	1.728	120	27.8328	0	0	4972.1672	0	1
1999	6	19	2.4	0	0	39200	296900	0	0	1.728	120	149.5608	0	0	4850.4392	0	0
1999	6	20	0.2	0	0	39200	296900	0	0	1.728	120	271.2888	0	0	4728.7112	0	0
1999	6	21	4.4	0	0	39200	296900	0	0	1.728	120	393.0168	0	0	4606.9832	0	0
1999	6	22	0.6	0	0	39200	296900	0	0	1.728	120	514.7448	0	0	4485.2552	0	0
1999	6	23	0.4	0	0	39200	296900	0	0	1.728	120	636.4728	0	0	4363.5272	0	0
1999	6	24	0.2	0	0	39200	296900	0	0	1.728	120	758.2008	0	0	4241.7992	0	0
1999	6	25	7.6	0	0	39200	296900	0	0	1.728	120	879.9288	0	0	4120.0712	0	0
1999	6	26	3.8	0	0	39200	296900	0	0	1.728	120	1001.6568	0	0	3998.3432	0	0
1999	6	27	0	0	0	39200	296900	0	0	1.728	120	1123.3848	0	0	3876.6152	0	0
1999	6	28	0.2	0	0	39200	296900	0	0	1.728	120	1245.1128	0	0	3754.8872	0	0
1999	6	29	0	0	0	39200	296900	0	0	1.728	120	1366.8408	0	0	3633.1592	0	0
1999	6	30	16.2	0.43	0.02	39200	296900	273.0672	96.1956	1.728	120	1119.306	0	0	3880.694	0	0
1999	7	1	0.6	0	0	39200	296900	0	0	1.632	120	1240.938	0	0	3759.062	0	0
1999	7	2	4.8	0	0	39200	296900	0	0	1.632	120	1362.57	0	0	3637.43	0	0
1999	7	3	0.4	0	0	39200	296900	0	0	1.632	120	1484.202	0	0	3515.798	0	0
1999	7	4	0	0	0	39200	296900	0	0	1.632	120	1605.834	0	0	3394.166	0	0
1999	7	5	0	0	0	39200	296900	0	0	1.632	120	1727.466	0	0	3272.534	0	0
1999	7	6	0	0	0	39200	296900	0	0	1.632	120	1849.098	0	0	3150.902	0	0
1999	7	7	0	0	0	39200	296900	0	0	1.632	120	1970.73	0	869.27	3029.27	0	0
1999	7	8	2	0	0	39200	296900	0	0	1.632	120	2961.632	0	0	2038.368	0	0
1999	7	9	18.6	0.43	0.02	39200	296900	313.5216	110.4468	1.632	120	2659.2956	0	0	2340.7044	0	0
1999	7	10	0	0	0	39200	296900	0	0	1.632	120	2780.9276	0	0	2219.0724	0	0
1999	7	11	0	0	0	39200	296900	0	0	1.632	120	2902.5596	0	0	2097.4404	0	0
1999	7	12	0.4	0	0	39200	296900	0	0	1.632	120	3024.1916	0	0	1975.8084	0	0
1999	7	13	0.4	0	0	39200	296900	0	0	1.632	120	3145.8236	0	0	1854.1764	0	0
1999	7	14	0.4	0	0	39200	296900	0	0	1.632	120	3267.4556	0	0	1732.5444	0	0
1999	7	15	0.2	0	0	39200	296900	0	0	1.632	120	3389.0876	0	0	1610.9124	0	0
1999	7	16	0	0	0	39200	296900	0	0	1.632	120	3510.7196	0	0	1489.2804	0	0
1999	7	17	0	0	0	39200	296900	0	0	1.632	120	3632.3516	0	0	1367.6484	0	0
1999	7	18	0	0	0	39200	296900	0	0	1.632	120	3753.9836	0	0	1246.0164	0	0
1999	7	19	0	0	0	39200	296900	0	0	1.632	120	3875.6156	0	0	1124.3844	0	0
1999	7	20	30.2	0.69	0.22	39200	296900	816.8496	1972.6036	1.632	120	1207.7944	0	0	3792.2056	0	0
1999	7	21	5.8	0	0	39200	296900	0	0	1.632	120	1329.4264	0	0	3670.5736	0	0
1999	7	22	5.8	0	0	39200	296900	0	0	1.632	120	1451.0584	0	0	3548.9416	0	0
1999	7	23	0	0	0	39200	296900	0	0	1.632	120	1572.6904	0	0	3427.3096	0	0
1999	7	24	0	0	0	39200	296900	0	0	1.632	120	1694.3224	0	0	3305.6776	0	0
1999	7	25	0	0	0	39200	296900	0	0	1.632	120	1815.9544	0	0	3184.0456	0	0
1999	7	26	0.8	0	0	39200	296900	0	0	1.632	120	1937.5864	0	0	3062.4136	0	0
1999	7	27	0	0	0	39200	296900	0	0	1.632	120	2059.2184	0	0	2940.7816	0	0
1999	7	28	0	0	0	39200	296900	0	0	1.632	120	2180.8504	0	0	2819.1496	0	0
1999	7	29	0	0	0	39200	296900	0	0	1.632	120	2302.4824	0	0	2697.5176	0	0
1999	7	30	0.2	0	0	39200	296900	0	0	1.632	120	2424.1144	0	0	2575.8856	0	0
1999	7	31	0.6	0	0	39200	296900	0	0	1.632	120	2545.7464	0	0	2454.2536	0	0
1999	8	1	0	0	0	39200	296900	0	0	2.208	120	2667.9544	0	0	2332.0456	0	0
1999	8	2	0	0	0	39200	296900	0	0	2.208	120	2790.1624	0	0	2209.8376	0	0
1999	8	3	0	0	0	39200	296900	0	0	2.208	120	2912.3704	0	0	2087.6296	0	0
1999	8	4	0	0	0	39200	296900	0	0	2.208	120	3034.5784	0	0	1965.4216	0	0
1999	8	5	0	0	0	39200	296900	0	0	2.208	120	3156.7864	0	0	1843.2136	0	0
1999	8	6	0	0	0	39200	296900	0	0	2.208	120	3278.9944	0	0	1721.0056	0	0
1999	8	7	0	0	0	39200	296900	0	0	2.208	120	3401.2024	0	0	1598.7976	0	0
1999	8	8	21	0.56	0.08	39200	296900	460.992	498.792	2.208	120	2563.6264	0	0	2436.3736	0	0
1999	8	9	24	0.56	0.08	39200	296900	526.848	570.048	2.208	120	1588.9384	0	0	3411.0616	0	0
1999	8	10	4	0	0	39200	296900	0	0	2.208	120	1711.1464	0	0	3288.8536	0	0
1999	8	11	0	0	0	39200	296900	0	0	2.208	120	1833.3544	0	0	3166.6456	0	0
1999	8	12	0.6	0	0	39200	296900	0	0	2.208	120	1955.5624	0	0	3044.4376	0	0
1999	8	13	1.2	0	0	39200	296900	0	0	2.208	120	2077.7704	0	0	2922.2296	0	0
1999	8	14	0	0	0	39200	296900	0	0	2.208	120	2199.9784	0	0	2800.0216	0	0
1999	8	15	5	0	0	39200	296900	0	0	2.208	120	2322.1864	0	0	2677.8136	0	0
1999	8	16	0	0	0	39200	296900	0	0	2.208	120	2444.3944	0	0	2555.6056	0	0
1999	8	17	0.2	0	0	39200	296900	0	0	2.208	120	2566.6024	0	0	2433.3976	0	0
1999	8	18	0	0	0	39200	296900	0	0	2.208	120	2688.8104	0	0	2311.1896	0	0
1999	8	19	0	0	0	39200	296900	0	0	2.208	120	2811.0184	0	0	2188.9816	0	0
1999	8	20	0	0	0	39200	296900	0	0	2.208	120	2933.2264	0	0	2066.7736	0	0
1999	8	21	0	0	0	39200	296900	0	0	2.208	120	3055.4344	0	0	1944.5656	0	0
1999	8	22	0	0	0	39200	296900	0	0	2.208	120	3177.6424	0	0	1822.3576	0	0
1999	8	23	0	0	0	39200	296900	0	0	2.208	120	3299.8504	0	0	1700.1496	0	0
1999	8	24	0.2	0	0	39200	296900	0	0	2.208	120	3422.0584	0	0	1577.9416	0	0
1999	8	25	0	0	0	39200	296900	0	0	2.208	120	3544.2664	0	0	1455.7336	0	0
1999	8	26	0.6	0	0	39200	296900	0	0	2.208	120	3666.4744	0	0	1333.5256	0	0
1999	8	27	4.6	0	0	39200	296900	0	0	2.208	120	3788.6824	0	0	1211.3176	0	0
1999	8	28	0	0	0	39200	296900	0	0	2.208	120	3910.8904	0	0	1089.1096	0	0
1999	8	29	0	0	0	39200	296900	0	0	2.208	120	4033.0984	0	0	966.9016	0	0
1999	8	30	0.4	0	0	39200	296900	0	0	2.208	120	4155.3064	0	0	844.6936	0	0
1999	8	31	0	0	0	39200	296900	0	0	2.208	120	4277.5144	0	0	722.4856	0	0
1999	9	1	0	0	0	39200	296900	0	0	3.264	120	4400.7784	0	0	599.2216	0	0
1999	9	2	0	0	0	39200	296900	0	0	3.264	120	4524.0424	0	0	475.9576	0	0
1999	9	3	0	0	0	39200	296900	0	0	3.264	120	4647.3064	0	0	352.6936	0	0
1999	9	4	36.2	0.69	0.22	39200	296900	979.1376	2364.5116	3.264	120	1426.9212	0	0	3573.0788	0	0
1999	9	5	0	0	0	39200	296900	0	0	3.264	120	1550.1852	0	0	3449.8148	0	0
1999	9	6	10.8	0.43	0.02	39200	296900	182.0448	64.1304	3.264	120	1427.274	0	0	3572.726	0	0
1999	9	7	0.4	0	0	39200	296900	0	0	3.264	120	1550.538	0	0	3449.462	0	0
1999	9	8	0	0	0	39200	296900	0	0	3.264	120	1673.802	0	0	3326.198	0	0
1999	9	9	0	0	0	39200	296900	0	0	3.264	120	1797.066	0	0	3202.934	0	0
1999	9	10	0	0	0	39200	296900	0	0	3.264	120	1920.33	0	0	3079.67	0	0
1999	9	11	4.6	0	0	39200	296900	0	0	3.264	120	2043.594	0	0	2956.406	0	0
1999	9	12	0.4	0	0	39200	296900	0	0	3.264	120	2166.858	0	0	2833.142	0	0
1999	9	13	2.2	0	0	39200	296900	0	0	3.264	120	2290.122	0	0	2709.878	0	0
1999	9	14	0	0	0	39200	296900	0	0	3.264	120	2413.386	0	0	2586.614	0	0
1999	9	15	0.2	0	0	39200	296900	0	0	3.264	120	2536.65	0	0	2463.35	0	0
1999	9	16	13.8	0.43	0.02	39200	296900	232.6128	81.9444	3.264	120	2345.3568	0	0	2654.6432	0	0
1999	9	17	26.8	0.56	0.08	39200	296900	588.3136	636.5536	3.264	120	1243.7536	0	0	3756.2464	0	0
1999	9	18	2	0	0	39200	296900	0	0	3.264	120	1367.0176	0	0	3632.9824	0	0
1999	9	19	0	0	0	39200	296900	0	0	3.264	120	1490.2816	0	0	3509.7184	0	0
1999	9	20	0.2	0	0	39200	296900	0	0	3.264	120	1613.5456	0	0	3386.4544	0	0
1999	9	21	0	0	0	39200	296900	0	0	3.264	120	1736.8096	0	0	3263.1904	0	0
1999	9	22	0	0	0	39200	296900	0	0	3.264	120	1860.0736	0	0	3139.9264	0	0
1999	9	23	0	0	0	39200	296900	0	0	3.264	120	1983.3376	0	0	3016.6624	0	0
1999	9	24	0	0	0	39200	296900	0	0	3.264	120	2106.6016	0	733.3984	2893.3984	0	0
1999	9	25	0	0	0	39200	296900	0	0	3.264	120	2963.264	0	0	2036.736	0	0
1999	9	26	0	0	0	39200	296900	0	0	3.264	120	3086.528	0	0	1913.472	0	0
1999	9	27	0	0	0	39200	296900	0	0	3.264	120	3209.792	0	0	1790.208	0	0
1999	9	28	0	0	0	39200	296900	0	0	3.264	120	3333.056	0	0	1666.944	0	0
1999	9	29	16.8	0.43	0.02	39200	296900	283.1808	99.7584	3.264	120	3073.3808	0	0	1926.6192	0	0
1999	9	30	0	0	0	39200	296900	0	0	3.264	120	3196.6448	0	0	1803.3552	0	0
1999	10	1	0	0	0	39200	296900	0	0	4.512	120	3321.1568	0	0	1678.8432	0	0
1999	10	2	0	0	0	39200	296900	0	0	4.512	120	3445.6688	0	0	1554.3312	0	0
1999	10	3	21.4	0.56	0.08	39200	296900	469.7728	508.2928	4.512	120	2592.1152	0	0	2407.8848	0	0
1999	10	4	0	0	0	39200	296900	0	0	4.512	120	2716.6272	0	0	2283.3728	0	0
1999	10	5	0	0	0	39200	296900	0	0	4.512	120	2841.1392	0	0	2158.8608	0	0
1999	10	6	0	0	0	39200	296900	0	0	4.512	120	2965.6512	0	0	2034.3488	0	0
1999	10	7	0	0	0	39200	296900	0	0	4.512	120	3090.1632	0	0	1909.8368	0	0
1999	10	8	0	0	0	39200	296900	0	0	4.512	120	3214.6752	0	0	1785.3248	0	0
1999	10	9	0.8	0	0	39200	296900	0	0	4.512	120	3339.1872	0	0	1660.8128	0	0
1999	10	10	20.6	0.56	0.08	39200	296900	452.2112	489.2912	4.512	120	2522.1968	0	0	2477.8032	0	0
1999	10	11	15.8	0.43	0.02	39200	296900	266.3248	93.8204	4.512	120	2286.5636	0	0	2713.4364	0	0
1999	10	12	0.4	0	0	39200	296900	0	0	4.512	120	2411.0756	0	0	2588.9244	0	0
1999	10	13	9.2	0	0	39200	296900	0	0	4.512	120	2535.5876	0	0	2464.4124	0	0
1999	10	14	7.4	0	0	39200	296900	0	0	4.512	120	2660.0996	0	0	2339.9004	0	0
1999	10	15	1	0	0	39200	296900	0	0	4.512	120	2784.6116	0	0	2215.3884	0	0
1999	10	16	0	0	0	39200	296900	0	0	4.512	120	2909.1236	0	0	2090.8764	0	0
1999	10	17	0	0	0	39200	296900	0	0	4.512	120	3033.6356	0	0	1966.3644	0	0
1999	10	18	0.4	0	0	39200	296900	0	0	4.512	120	3158.1476	0	0	1841.8524	0	0
1999	10	19	0.2	0	0	39200	296900	0	0	4.512	120	3282.6596	0	0	1717.3404	0	0
1999	10	20	0.2	0	0	39200	296900	0	0	4.512	120	3407.1716	0	0	1592.8284	0	0
1999	10	21	0	0	0	39200	296900	0	0	4.512	120	3531.6836	0	0	1468.3164	0	0
1999	10	22	0.6	0	0	39200	296900	0	0	4.512	120	3656.1956	0	0	1343.8044	0	0
1999	10	23	0	0	0	39200	296900	0	0	4.512	120	3780.7076	0	0	1219.2924	0	0
1999	10	24	0.2	0	0	39200	296900	0	0	4.512	120	3905.2196	0	0	1094.7804	0	0
1999	10	25	1.2	0	0	39200	296900	0	0	4.512	120	4029.7316	0	0	970.2684	0	0
1999	10	26	1.2	0	0	39200	296900	0	0	4.512	120	4154.2436	0	0	845.7564	0	0
1999	10	27	3	0	0	39200	296900	0	0	4.512	120	4278.7556	0	0	721.2444	0	0
1999	10	28	0.2	0	0	39200	296900	0	0	4.512	120	4403.2676	0	0	596.7324	0	0
1999	10	29	0	0	0	39200	296900	0	0	4.512	120	4527.7796	0	0	472.2204	0	0
1999	10	30	0	0	0	39200	296900	0	0	4.512	120	4652.2916	0	0	347.7084	0	0
1999	10	31	4.6	0	0	39200	296900	0	0	4.512	120	4776.8036	0	0	223.1964	0	0
1999	11	1	0	0	0	39200	296900	0	0	5.76	120	4902.5636	0	0	97.4364	0	0
1999	11	2	0	0	0	39200	296900	0	0	5.76	120	5028.3236	0	0	0	1	0
1999	11	3	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	4	0.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	5	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	6	10.4	0.43	0.02	39200	296900	175.3024	61.7552	5.76	120	4888.7024	0	0	111.2976	0	0
1999	11	7	0	0	0	39200	296900	0	0	5.76	120	5014.4624	0	0	0	1	0
1999	11	8	5.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	9	4.4	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	10	2.8	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	11	1.4	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	12	0.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	13	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	14	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	15	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	16	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	17	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0

1999	11	18	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	19	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	20	0.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	21	7.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	22	12.2	0.43	0.02	39200	296900	205.6432	72.4436	5.76	120	4847.6732	0	0	152.3268	0	0
1999	11	23	0.4	0	0	39200	296900	0	0	5.76	120	4973.4332	0	0	26.5668	0	0
1999	11	24	0	0	0	39200	296900	0	0	5.76	120	5099.1932	0	0	0	1	0
1999	11	25	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	26	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	27	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	28	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	29	0.2	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	11	30	0	0	0	39200	296900	0	0	5.76	120	5125.76	0	0	0	1	0
1999	12	1	2.8	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	2	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	3	23.4	0.56	0.08	39200	296900	513.6768	555.7968	6.912	120	4057.4384	0	0	942.5616	0	0
1999	12	4	0.6	0	0	39200	296900	0	0	6.912	120	4184.3504	0	0	815.6496	0	0
1999	12	5	0	0	0	39200	296900	0	0	6.912	120	4311.2624	0	0	688.7376	0	0
1999	12	6	0	0	0	39200	296900	0	0	6.912	120	4438.1744	0	0	561.8256	0	0
1999	12	7	0	0	0	39200	296900	0	0	6.912	120	4565.0864	0	0	434.9136	0	0
1999	12	8	1.6	0	0	39200	296900	0	0	6.912	120	4691.9984	0	0	308.0016	0	0
1999	12	9	8	0	0	39200	296900	0	0	6.912	120	4818.9104	0	0	181.0896	0	0
1999	12	10	0.2	0	0	39200	296900	0	0	6.912	120	4945.8224	0	0	54.1776	0	0
1999	12	11	0	0	0	39200	296900	0	0	6.912	120	5072.7344	0	0	0	1	0
1999	12	12	1.2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	13	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	14	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	15	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	16	4.6	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	17	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	18	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	19	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	20	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	21	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	22	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	23	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	24	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	25	1.2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	26	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	27	0.2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	28	1.8	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	29	0.2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	30	0	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
1999	12	31	2	0	0	39200	296900	0	0	6.912	120	5126.912	0	0	0	1	0
			997.8					17937.3712	34402.3968	1575.264	43800		21276.0308	2325.7544		119	6

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m³)	Evaporation (m³)						
1999	1	1	0	0	0	11.52	2840	0	0	2200	0	
1999	1	2	0	0	0	11.52	2851.52	0	0	5238.48	0	0
1999	1	3	0	0	0	11.52	2863.04	0	0	5226.96	0	0
1999	1	4	0	0	0	11.52	2874.56	0	0	5215.44	0	0
1999	1	5	0	0	0	11.52	2886.08	0	2503.92	5203.92	0	0
1999	1	6	0	0	0	11.52	5401.52	0	0	2688.48	0	0
1999	1	7	0.4	0	0	11.52	5413.04	0	0	2676.96	0	0
1999	1	8	16	0.43	677.68	11.52	4746.88	0	0	3343.12	0	0
1999	1	9	0	0	0	11.52	4758.4	0	0	3331.6	0	0
1999	1	10	0	0	0	11.52	4769.92	0	0	3320.08	0	0
1999	1	11	0	0	0	11.52	4781.44	0	0	3308.56	0	0
1999	1	12	0	0	0	11.52	4792.96	0	597.04	3297.04	0	0
1999	1	13	0	0	0	11.52	5401.52	0	0	2688.48	0	0
1999	1	14	0	0	0	11.52	5413.04	0	0	2676.96	0	0
1999	1	15	0	0	0	11.52	5424.56	0	0	2665.44	0	0
1999	1	16	0	0	0	11.52	5436.08	0	0	2653.92	0	0
1999	1	17	0	0	0	11.52	5447.6	0	0	2642.4	0	0
1999	1	18	0	0	0	11.52	5459.12	0	0	2630.88	0	0
1999	1	19	0	0	0	11.52	5470.64	0	0	2619.36	0	0
1999	1	20	0	0	0	11.52	5482.16	0	0	2607.84	0	0
1999	1	21	0	0	0	11.52	5493.68	0	0	2596.32	0	0
1999	1	22	0	0	0	11.52	5505.2	0	0	2584.8	0	0
1999	1	23	0	0	0	11.52	5516.72	0	0	2573.28	0	0
1999	1	24	0	0	0	11.52	5528.24	0	0	2561.76	0	0
1999	1	25	0	0	0	11.52	5539.76	0	0	2550.24	0	0
1999	1	26	0.8	0	0	11.52	5551.28	0	0	2538.72	0	0
1999	1	27	0	0	0	11.52	5562.8	0	0	2527.2	0	0
1999	1	28	0	0	0	11.52	5574.32	0	0	2515.68	0	0
1999	1	29	0.2	0	0	11.52	5585.84	0	0	2504.16	0	0
1999	1	30	0	0	0	11.52	5597.36	0	0	2492.64	0	0
1999	1	31	0.6	0	0	11.52	5608.88	0	0	2481.12	0	0
1999	2	1	0	0	0	10.224	5619.104	0	0	2470.896	0	0
1999	2	2	0	0	0	10.224	5629.328	0	0	2460.672	0	0
1999	2	3	0	0	0	10.224	5639.552	0	0	2450.448	0	0
1999	2	4	0	0	0	10.224	5649.776	0	0	2440.224	0	0
1999	2	5	0	0	0	10.224	5660	0	0	2430	0	0
1999	2	6	0.8	0	0	10.224	5670.224	0	0	2419.776	0	0
1999	2	7	0	0	0	10.224	5680.448	0	0	2409.552	0	0
1999	2	8	0	0	0	10.224	5690.672	0	0	2399.328	0	0
1999	2	9	0	0	0	10.224	5700.896	0	0	2389.104	0	0
1999	2	10	0	0	0	10.224	5711.12	0	0	2378.88	0	0
1999	2	11	0.4	0	0	10.224	5721.344	0	0	2368.656	0	0
1999	2	12	0	0	0	10.224	5731.568	0	0	2358.432	0	0
1999	2	13	0	0	0	10.224	5741.792	0	0	2348.208	0	0
1999	2	14	0	0	0	10.224	5752.016	0	0	2337.984	0	0
1999	2	15	0	0	0	10.224	5762.24	0	0	2327.76	0	0
1999	2	16	0	0	0	10.224	5772.464	0	0	2317.536	0	0
1999	2	17	0	0	0	10.224	5782.688	0	0	2307.312	0	0
1999	2	18	3.4	0	0	10.224	5792.912	0	0	2297.088	0	0
1999	2	19	0	0	0	10.224	5803.136	0	0	2286.864	0	0
1999	2	20	0	0	0	10.224	5813.36	0	0	2276.64	0	0
1999	2	21	0	0	0	10.224	5823.584	0	0	2266.416	0	0
1999	2	22	0	0	0	10.224	5833.808	0	0	2256.192	0	0
1999	2	23	0	0	0	10.224	5844.032	0	0	2245.968	0	0
1999	2	24	0	0	0	10.224	5854.256	0	0	2235.744	0	0
1999	2	25	0	0	0	10.224	5864.48	0	0	2225.52	0	0
1999	2	26	0	0	0	10.224	5874.704	0	0	2215.296	0	0
1999	2	27	0	0	0	10.224	5884.928	0	0	2205.072	0	0
1999	2	28	0	0	0	10.224	5895.152	0	0	2194.848	0	0
1999	3	1	0	0	0	8.352	5903.504	0	0	2186.496	0	0
1999	3	2	0	0	0	8.352	5911.856	0	0	2178.144	0	0
1999	3	3	0	0	0	8.352	5920.208	0	0	2169.792	0	0
1999	3	4	0	0	0	8.352	5928.56	0	0	2161.44	0	0
1999	3	5	0	0	0	8.352	5936.912	0	0	2153.088	0	0
1999	3	6	0	0	0	8.352	5945.264	0	0	2144.736	0	0
1999	3	7	19.6	0.43	830.158	8.352	5123.458	0	0	2966.542	0	0
1999	3	8	0.2	0	0	8.352	5131.81	0	0	2958.19	0	0
1999	3	9	0	0	0	8.352	5140.162	0	0	2949.838	0	0
1999	3	10	0	0	0	8.352	5148.514	0	0	2941.486	0	0
1999	3	11	0	0	0	8.352	5156.866	0	0	2933.134	0	0
1999	3	12	0	0	0	8.352	5165.218	0	224.782	2924.782	0	0
1999	3	13	0	0	0	8.352	5398.352	0	0	2691.648	0	0
1999	3	14	0	0	0	8.352	5406.704	0	0	2683.296	0	0
1999	3	15	0	0	0	8.352	5415.056	0	0	2674.944	0	0
1999	3	16	0	0	0	8.352	5423.408	0	0	2666.592	0	0
1999	3	17	0	0	0	8.352	5431.76	0	0	2658.24	0	0
1999	3	18	11	0.43	465.905	8.352	4974.207	0	0	3115.793	0	0
1999	3	19	1.6	0	0	8.352	4982.559	0	0	3107.441	0	0
1999	3	20	0	0	0	8.352	4990.911	0	0	3099.089	0	0
1999	3	21	48	0.74	3498.72	8.352	1500.543	0	0	6589.457	0	0
1999	3	22	2.6	0	0	8.352	1508.895	0	0	6581.105	0	0
1999	3	23	0	0	0	8.352	1517.247	0	0	6572.753	0	0
1999	3	24	0	0	0	8.352	1525.599	0	0	6564.401	0	0
1999	3	25	11	0.43	465.905	8.352	1068.046	0	0	7021.954	0	0
1999	3	26	2.8	0	0	8.352	1076.398	0	0	7013.602	0	0
1999	3	27	0	0	0	8.352	1084.75	0	0	7005.25	0	0
1999	3	28	4.6	0	0	8.352	1093.102	0	0	6996.898	0	0
1999	3	29	0	0	0	8.352	1101.454	0	0	6988.546	0	0
1999	3	30	0	0	0	8.352	1109.806	0	0	6980.194	0	0
1999	3	31	1.8	0	0	8.352	1118.158	0	0	6971.842	0	0
1999	4	1	0	0	0	5.328	1123.486	0	0	6966.514	0	0
1999	4	2	0	0	0	5.328	1128.814	0	0	6961.186	0	0
1999	4	3	0	0	0	5.328	1134.142	0	0	6955.858	0	0
1999	4	4	1.2	0	0	5.328	1139.47	0	0	6950.53	0	0
1999	4	5	3.2	0	0	5.328	1144.798	0	0	6945.202	0	0
1999	4	6	0	0	0	5.328	1150.126	0	0	6939.874	0	0
1999	4	7	0	0	0	5.328	1155.454	0	0	6934.546	0	0
1999	4	8	0	0	0	5.328	1160.782	0	0	6929.218	0	0
1999	4	9	0	0	0	5.328	1166.11	0	4223.89	6923.89	0	0
1999	4	10	0	0	0	5.328	5395.328	0	0	2694.672	0	0
1999	4	11	0	0	0	5.328	5400.656	0	0	2689.344	0	0
1999	4	12	0	0	0	5.328	5405.984	0	0	2684.016	0	0
1999	4	13	0	0	0	5.328	5411.312	0	0	2678.688	0	0
1999	4	14	0	0	0	5.328	5416.64	0	0	2673.36	0	0
1999	4	15	0	0	0	5.328	5421.968	0	0	2668.032	0	0
1999	4	16	0	0	0	5.328	5427.296	0	0	2662.704	0	0
1999	4	17	0	0	0	5.328	5432.624	0	0	2657.376	0	0
1999	4	18	0	0	0	5.328	5437.952	0	0	2652.048	0	0
1999	4	19	0	0	0	5.328	5443.28	0	0	2646.72	0	0
1999	4	20	6.8	0	0	5.328	5448.608	0	0	2641.392	0	0
1999	4	21	4.2	0	0	5.328	5453.936	0	0	2636.064	0	0
1999	4	22	0	0	0	5.328	5459.264	0	0	2630.736	0	0
1999	4	23	0	0	0	5.328	5464.592	0	0	2625.408	0	0
1999	4	24	0	0	0	5.328	5469.92	0	0	2620.08	0	0
1999	4	25	0	0	0	5.328	5475.248	0	0	2614.752	0	0

1999	4	26	0	0	0	5.328	5480.576	0	0	2609.424	0	0
1999	4	27	1.2	0	0	5.328	5485.904	0	0	2604.096	0	0
1999	4	28	0.6	0	0	5.328	5491.232	0	0	2598.768	0	0
1999	4	29	0.2	0	0	5.328	5496.56	0	0	2593.44	0	0
1999	4	30	0	0	0	5.328	5501.888	0	0	2588.112	0	0
1999	5	1	0	0	0	3.456	5505.344	0	0	2584.656	0	0
1999	5	2	0	0	0	3.456	5508.8	0	0	2581.2	0	0
1999	5	3	0	0	0	3.456	5512.256	0	0	2577.744	0	0
1999	5	4	0	0	0	3.456	5515.712	0	0	2574.288	0	0
1999	5	5	0	0	0	3.456	5519.168	0	0	2570.832	0	0
1999	5	6	0	0	0	3.456	5522.624	0	0	2567.376	0	0
1999	5	7	0	0	0	3.456	5526.08	0	0	2563.92	0	0
1999	5	8	0	0	0	3.456	5529.536	0	0	2560.464	0	0
1999	5	9	0	0	0	3.456	5532.992	0	0	2557.008	0	0
1999	5	10	0.4	0	0	3.456	5536.448	0	0	2553.552	0	0
1999	5	11	0	0	0	3.456	5539.904	0	0	2550.096	0	0
1999	5	12	11.6	0.43	491.318	3.456	5052.042	0	0	3037.958	0	0
1999	5	13	30.4	0.69	2066.136	3.456	2989.362	0	0	5100.638	0	0
1999	5	14	0.6	0	0	3.456	2992.818	0	0	5097.182	0	0
1999	5	15	0	0	0	3.456	2996.274	0	0	5093.726	0	0
1999	5	16	42.8	0.74	3119.692	3.456	-119.962	119.962	0	8090	0	0
1999	5	17	0	0	0	3.456	3.456	0	0	8086.544	0	1
1999	5	18	0.8	0	0	3.456	6.912	0	0	8083.088	0	0
1999	5	19	0	0	0	3.456	10.368	0	0	8079.632	0	0
1999	5	20	0	0	0	3.456	13.824	0	0	8076.176	0	0
1999	5	21	6.4	0	0	3.456	17.28	0	0	8072.72	0	0
1999	5	22	5.2	0	0	3.456	20.736	0	0	8069.264	0	0
1999	5	23	44.2	0.74	3221.738	3.456	-3197.546	3197.546	0	8090	0	0
1999	5	24	15.8	0.43	669.209	3.456	-665.753	665.753	0	8090	0	0
1999	5	25	78	0.81	6223.23	3.456	-6219.774	6219.774	0	8090	0	0
1999	5	26	11.4	0.43	482.847	3.456	-479.391	479.391	0	8090	0	0
1999	5	27	1.6	0	0	3.456	3.456	0	0	8086.544	0	1
1999	5	28	0	0	0	3.456	6.912	0	0	8083.088	0	0
1999	5	29	14	0.43	592.97	3.456	-582.602	582.602	0	8090	0	0
1999	5	30	10.4	0.43	440.492	3.456	-437.036	437.036	0	8090	0	0
1999	5	31	13.2	0.43	559.086	3.456	-555.63	555.63	0	8090	0	0
1999	6	1	0	0	0	2.592	2.592	0	0	8087.408	0	1
1999	6	2	0.2	0	0	2.592	5.184	0	0	8084.816	0	0
1999	6	3	0.2	0	0	2.592	7.776	0	0	8082.224	0	0
1999	6	4	0	0	0	2.592	10.368	0	0	8079.632	0	0
1999	6	5	12.8	0.43	542.144	2.592	-529.184	529.184	0	8090	0	0
1999	6	6	1.4	0	0	2.592	2.592	0	0	8087.408	0	1
1999	6	7	8.2	0	0	2.592	5.184	0	0	8084.816	0	0
1999	6	8	0.2	0	0	2.592	7.776	0	0	8082.224	0	0
1999	6	9	0.2	0	0	2.592	10.368	0	0	8079.632	0	0
1999	6	10	7.2	0	0	2.592	12.96	0	0	8077.04	0	0
1999	6	11	0	0	0	2.592	15.552	0	0	8074.448	0	0
1999	6	12	0	0	0	2.592	18.144	0	0	8071.856	0	0
1999	6	13	36.2	0.69	2460.333	2.592	-2439.597	2439.597	0	8090	0	0
1999	6	14	0	0	0	2.592	2.592	0	0	8087.408	0	0
1999	6	15	16.6	0.43	703.093	2.592	-697.909	697.909	0	8090	0	0
1999	6	16	5	0	0	2.592	2.592	0	0	8087.408	0	1
1999	6	17	0.4	0	0	2.592	5.184	0	0	8084.816	0	0
1999	6	18	14.8	0.43	626.854	2.592	-619.078	619.078	0	8090	0	0
1999	6	19	2.4	0	0	2.592	2.592	0	0	8087.408	0	1
1999	6	20	0.2	0	0	2.592	5.184	0	0	8084.816	0	0
1999	6	21	4.4	0	0	2.592	7.776	0	0	8082.224	0	0
1999	6	22	0.6	0	0	2.592	10.368	0	0	8079.632	0	0
1999	6	23	0.4	0	0	2.592	12.96	0	0	8077.04	0	0
1999	6	24	0.2	0	0	2.592	15.552	0	0	8074.448	0	0
1999	6	25	7.6	0	0	2.592	18.144	0	0	8071.856	0	0
1999	6	26	3.8	0	0	2.592	20.736	0	0	8069.264	0	0
1999	6	27	0	0	0	2.592	23.328	0	0	8066.672	0	0
1999	6	28	0.2	0	0	2.592	25.92	0	0	8064.08	0	0
1999	6	29	0	0	0	2.592	28.512	0	0	8061.488	0	0
1999	6	30	16.2	0.43	686.151	2.592	-655.047	655.047	0	8090	0	0
1999	7	1	0.6	0	0	2.448	2.448	0	0	8087.552	0	1
1999	7	2	4.8	0	0	2.448	4.896	0	0	8085.104	0	0
1999	7	3	0.4	0	0	2.448	7.344	0	0	8082.656	0	0
1999	7	4	0	0	0	2.448	9.792	0	0	8080.208	0	0
1999	7	5	0	0	0	2.448	12.24	0	0	8077.76	0	0
1999	7	6	0	0	0	2.448	14.688	0	0	8075.312	0	0
1999	7	7	0	0	0	2.448	17.136	0	5372.864	8072.864	0	0
1999	7	8	2	0	0	2.448	5392.448	0	0	2697.552	0	0
1999	7	9	18.6	0.43	787.803	2.448	4607.093	0	0	3482.907	0	0
1999	7	10	0	0	0	2.448	4609.541	0	0	3480.459	0	0
1999	7	11	0	0	0	2.448	4611.989	0	0	3478.011	0	0
1999	7	12	0.4	0	0	2.448	4614.437	0	0	3475.563	0	0
1999	7	13	0.4	0	0	2.448	4616.885	0	0	3473.115	0	0
1999	7	14	0.4	0	0	2.448	4619.333	0	0	3470.667	0	0
1999	7	15	0.2	0	0	2.448	4621.781	0	0	3468.219	0	0
1999	7	16	0	0	0	2.448	4624.229	0	0	3465.771	0	0
1999	7	17	0	0	0	2.448	4626.677	0	0	3463.323	0	0
1999	7	18	0	0	0	2.448	4629.125	0	0	3460.875	0	0
1999	7	19	0	0	0	2.448	4631.573	0	758.427	3458.427	0	0
1999	7	20	30.2	0.69	2052.543	2.448	3339.905	0	0	4750.095	0	0
1999	7	21	5.8	0	0	2.448	3342.353	0	0	4747.647	0	0
1999	7	22	5.8	0	0	2.448	3344.801	0	0	4745.199	0	0
1999	7	23	0	0	0	2.448	3347.249	0	0	4742.751	0	0
1999	7	24	0	0	0	2.448	3349.697	0	0	4740.303	0	0
1999	7	25	0	0	0	2.448	3352.145	0	0	4737.855	0	0
1999	7	26	0.8	0	0	2.448	3354.593	0	0	4735.407	0	0
1999	7	27	0	0	0	2.448	3357.041	0	0	4732.959	0	0
1999	7	28	0	0	0	2.448	3359.489	0	0	4730.511	0	0
1999	7	29	0	0	0	2.448	3361.937	0	0	4728.063	0	0
1999	7	30	0.2	0	0	2.448	3364.385	0	0	4725.615	0	0
1999	7	31	0.6	0	0	2.448	3366.833	0	0	4723.167	0	0
1999	8	1	0	0	0	3.312	3370.145	0	0	4719.855	0	0
1999	8	2	0	0	0	3.312	3373.457	0	0	4716.543	0	0
1999	8	3	0	0	0	3.312	3376.769	0	0	4713.231	0	0
1999	8	4	0	0	0	3.312	3380.081	0	2009.919	4709.919	0	0
1999	8	5	0	0	0	3.312	5393.312	0	0	2696.688	0	0
1999	8	6	0	0	0	3.312	5396.624	0	0	2693.376	0	0
1999	8	7	0	0	0	3.312	5399.936	0	0	2690.064	0	0
1999	8	8	21	0.56	1158.36	3.312	4244.888	0	0	3845.112	0	0
1999	8	9	24	0.56	1323.84	3.312	2924.36	0	0	5165.64	0	0
1999	8	10	4	0	0	3.312	2927.672	0	0	5162.328	0	0
1999	8	11	0	0	0	3.312	2930.984	0	0	5159.016	0	0
1999	8	12	0.6	0	0	3.312	2934.296	0	0	5155.704	0	0
1999	8	13	1.2	0	0	3.312	2937.608	0	0	5152.392	0	0
1999	8	14	0	0	0	3.312	2940.92	0	0	5149.08	0	0
1999	8	15	5	0	0	3.312	2944.232	0	0	5145.768	0	0
1999	8	16	0	0	0	3.312	2947.544	0	0	5142.456	0	0
1999	8	17	0.2	0	0	3.312	2950.856	0	0	5139.144	0	0
1999	8	18	0	0	0	3.312	2954.168	0	0	5135.832	0	0
1999	8	19	0	0	0	3.312	2957.48	0	0	5132.52	0	0
1999	8	20	0	0	0	3.312	2960.792	0	0	5129.208	0	0
1999	8	21	0	0	0	3.312	2964.104	0	2425.896	5125.896	0	0
1999	8	22	0	0	0	3.312	5393.312	0	0	2696.688	0	0
1999	8	23	0	0	0	3.312	5396.624	0	0	2693.376	0	0

1999	8	24	0.2	0	0	3.312	5399.936	0	0	2690.064	0	0
1999	8	25	0	0	0	3.312	5403.248	0	0	2686.752	0	0
1999	8	26	0.6	0	0	3.312	5406.56	0	0	2683.44	0	0
1999	8	27	4.6	0	0	3.312	5409.872	0	0	2680.128	0	0
1999	8	28	0	0	0	3.312	5413.184	0	0	2676.816	0	0
1999	8	29	0	0	0	3.312	5416.496	0	0	2673.504	0	0
1999	8	30	0.4	0	0	3.312	5419.808	0	0	2670.192	0	0
1999	8	31	0	0	0	3.312	5423.12	0	0	2666.88	0	0
1999	9	1	0	0	0	4.896	5428.016	0	0	2661.984	0	0
1999	9	2	0	0	0	4.896	5432.912	0	0	2657.088	0	0
1999	9	3	0	0	0	4.896	5437.808	0	0	2652.192	0	0
1999	9	4	36.2	0.69	2460.333	4.896	2982.371	0	0	5107.629	0	0
1999	9	5	0	0	0	4.896	2987.267	0	0	5102.733	0	0
1999	9	6	10.8	0.43	457.434	4.896	2534.729	0	0	5555.271	0	0
1999	9	7	0.4	0	0	4.896	2539.625	0	0	5550.375	0	0
1999	9	8	0	0	0	4.896	2544.521	0	0	5545.479	0	0
1999	9	9	0	0	0	4.896	2549.417	0	0	5540.583	0	0
1999	9	10	0	0	0	4.896	2554.313	0	0	5535.687	0	0
1999	9	11	4.6	0	0	4.896	2559.209	0	0	5530.791	0	0
1999	9	12	0.4	0	0	4.896	2564.105	0	0	5525.895	0	0
1999	9	13	2.2	0	0	4.896	2569.001	0	0	5520.999	0	0
1999	9	14	0	0	0	4.896	2573.897	0	0	5516.103	0	0
1999	9	15	0.2	0	0	4.896	2578.793	0	0	5511.207	0	0
1999	9	16	13.8	0.43	584.499	4.896	1999.19	0	0	6090.81	0	0
1999	9	17	26.8	0.56	1478.288	4.896	525.798	0	0	7564.202	0	0
1999	9	18	2	0	0	4.896	530.694	0	0	7559.306	0	0
1999	9	19	0	0	0	4.896	535.59	0	0	7554.41	0	0
1999	9	20	0.2	0	0	4.896	540.486	0	0	7549.514	0	0
1999	9	21	0	0	0	4.896	545.382	0	0	7544.618	0	0
1999	9	22	0	0	0	4.896	550.278	0	0	7539.722	0	0
1999	9	23	0	0	0	4.896	555.174	0	0	7534.826	0	0
1999	9	24	0	0	0	4.896	560.07	0	4829.93	7529.93	0	0
1999	9	25	0	0	0	4.896	5394.896	0	0	2695.104	0	0
1999	9	26	0	0	0	4.896	5399.792	0	0	2690.208	0	0
1999	9	27	0	0	0	4.896	5404.688	0	0	2685.312	0	0
1999	9	28	0	0	0	4.896	5409.584	0	0	2680.416	0	0
1999	9	29	16.8	0.43	711.564	4.896	4702.916	0	0	3387.084	0	0
1999	9	30	0	0	0	4.896	4707.812	0	0	3382.188	0	0
1999	10	1	0	0	0	6.768	4714.58	0	0	3375.42	0	0
1999	10	2	0	0	0	6.768	4721.348	0	0	3368.652	0	0
1999	10	3	21.4	0.56	1180.424	6.768	3547.692	0	0	4542.308	0	0
1999	10	4	0	0	0	6.768	3554.46	0	0	4535.54	0	0
1999	10	5	0	0	0	6.768	3561.228	0	0	4528.772	0	0
1999	10	6	0	0	0	6.768	3567.996	0	0	4522.004	0	0
1999	10	7	0	0	0	6.768	3574.764	0	1815.236	4515.236	0	0
1999	10	8	0	0	0	6.768	5396.768	0	0	2693.232	0	0
1999	10	9	0.8	0	0	6.768	5403.536	0	0	2686.464	0	0
1999	10	10	20.6	0.56	1136.296	6.768	4274.008	0	0	3815.992	0	0
1999	10	11	15.8	0.43	669.209	6.768	3611.567	0	0	4478.433	0	0
1999	10	12	0.4	0	0	6.768	3618.335	0	0	4471.665	0	0
1999	10	13	9.2	0	0	6.768	3625.103	0	0	4464.897	0	0
1999	10	14	7.4	0	0	6.768	3631.871	0	0	4458.129	0	0
1999	10	15	1	0	0	6.768	3638.639	0	0	4451.361	0	0
1999	10	16	0	0	0	6.768	3645.407	0	0	4444.593	0	0
1999	10	17	0	0	0	6.768	3652.175	0	0	4437.825	0	0
1999	10	18	0.4	0	0	6.768	3658.943	0	0	4431.057	0	0
1999	10	19	0.2	0	0	6.768	3665.711	0	0	4424.289	0	0
1999	10	20	0.2	0	0	6.768	3672.479	0	0	4417.521	0	0
1999	10	21	0	0	0	6.768	3679.247	0	0	4410.753	0	0
1999	10	22	0.6	0	0	6.768	3686.015	0	0	4403.985	0	0
1999	10	23	0	0	0	6.768	3692.783	0	0	4397.217	0	0
1999	10	24	0.2	0	0	6.768	3699.551	0	0	4390.449	0	0
1999	10	25	1.2	0	0	6.768	3706.319	0	0	4383.681	0	0
1999	10	26	1.2	0	0	6.768	3713.087	0	0	4376.913	0	0
1999	10	27	3	0	0	6.768	3719.855	0	0	4370.145	0	0
1999	10	28	0.2	0	0	6.768	3726.623	0	0	4363.377	0	0
1999	10	29	0	0	0	6.768	3733.391	0	0	4356.609	0	0
1999	10	30	0	0	0	6.768	3740.159	0	0	4349.841	0	0
1999	10	31	4.6	0	0	6.768	3746.927	0	0	4343.073	0	0
1999	11	1	0	0	0	8.64	3755.567	0	0	4334.433	0	0
1999	11	2	0	0	0	8.64	3764.207	0	0	4325.793	0	0
1999	11	3	0	0	0	8.64	3772.847	0	0	4317.153	0	0
1999	11	4	0.2	0	0	8.64	3781.487	0	0	4308.513	0	0
1999	11	5	0	0	0	8.64	3790.127	0	0	4299.873	0	0
1999	11	6	10.4	0.43	440.492	8.64	3358.275	0	0	4731.725	0	0
1999	11	7	0	0	0	8.64	3366.915	0	0	4723.085	0	0

1999	11	8	5.2	0	0	8.64	3375.555	0	0	4714.445	0	0
1999	11	9	4.4	0	0	8.64	3384.195	0	0	4705.805	0	0
1999	11	10	2.8	0	0	8.64	3392.835	0	0	4697.165	0	0
1999	11	11	1.4	0	0	8.64	3401.475	0	0	4688.525	0	0
1999	11	12	0.2	0	0	8.64	3410.115	0	0	4679.885	0	0
1999	11	13	0	0	0	8.64	3418.755	0	0	4671.245	0	0
1999	11	14	0	0	0	8.64	3427.395	0	0	4662.605	0	0
1999	11	15	0	0	0	8.64	3436.035	0	0	4653.965	0	0
1999	11	16	0	0	0	8.64	3444.675	0	1945.325	4645.325	0	0
1999	11	17	0	0	0	8.64	5398.64	0	0	2691.36	0	0
1999	11	18	0	0	0	8.64	5407.28	0	0	2682.72	0	0
1999	11	19	0	0	0	8.64	5415.92	0	0	2674.08	0	0
1999	11	20	0.2	0	0	8.64	5424.56	0	0	2665.44	0	0
1999	11	21	7.2	0	0	8.64	5433.2	0	0	2656.8	0	0
1999	11	22	12.2	0.43	516.731	8.64	4925.109	0	0	3164.891	0	0
1999	11	23	0.4	0	0	8.64	4933.749	0	0	3156.251	0	0
1999	11	24	0	0	0	8.64	4942.389	0	0	3147.611	0	0
1999	11	25	0	0	0	8.64	4951.029	0	0	3138.971	0	0
1999	11	26	0	0	0	8.64	4959.669	0	0	3130.331	0	0
1999	11	27	0	0	0	8.64	4968.309	0	421.691	3121.691	0	0
1999	11	28	0	0	0	8.64	5398.64	0	0	2691.36	0	0
1999	11	29	0.2	0	0	8.64	5407.28	0	0	2682.72	0	0
1999	11	30	0	0	0	8.64	5415.92	0	0	2674.08	0	0
1999	12	1	2.8	0	0	10.368	5426.288	0	0	2663.712	0	0
1999	12	2	0	0	0	10.368	5436.656	0	0	2653.344	0	0
1999	12	3	23.4	0.56	1290.744	10.368	4156.28	0	0	3933.72	0	0
1999	12	4	0.6	0	0	10.368	4166.648	0	0	3923.352	0	0
1999	12	5	0	0	0	10.368	4177.016	0	0	3912.984	0	0
1999	12	6	0	0	0	10.368	4187.384	0	0	3902.616	0	0
1999	12	7	0	0	0	10.368	4197.752	0	0	3892.248	0	0
1999	12	8	1.6	0	0	10.368	4208.12	0	0	3881.88	0	0
1999	12	9	8	0	0	10.368	4218.488	0	0	3871.512	0	0
1999	12	10	0.2	0	0	10.368	4228.856	0	0	3861.144	0	0
1999	12	11	0	0	0	10.368	4239.224	0	0	3850.776	0	0
1999	12	12	1.2	0	0	10.368	4249.592	0	0	3840.408	0	0
1999	12	13	0	0	0	10.368	4259.96	0	0	3830.04	0	0
1999	12	14	0	0	0	10.368	4270.328	0	0	3819.672	0	0
1999	12	15	0	0	0	10.368	4280.696	0	0	3809.304	0	0
1999	12	16	4.6	0	0	10.368	4291.064	0	0	3798.936	0	0
1999	12	17	0	0	0	10.368	4301.432	0	0	3788.568	0	0
1999	12	18	0	0	0	10.368	4311.8	0	0	3778.2	0	0
1999	12	19	0	0	0	10.368	4322.168	0	0	3767.832	0	0
1999	12	20	0	0	0	10.368	4332.536	0	1057.464	3757.464	0	0
1999	12	21	0	0	0	10.368	5400.368	0	0	2689.632	0	0
1999	12	22	0	0	0	10.368	5410.736	0	0	2679.264	0	0
1999	12	23	0	0	0	10.368	5421.104	0	0	2668.896	0	0
1999	12	24	0	0	0	10.368	5431.472	0	0	2658.528	0	0
1999	12	25	1.2	0	0	10.368	5441.84	0	0	2648.16	0	0
1999	12	26	0	0	0	10.368	5452.208	0	0	2637.792	0	0
1999	12	27	0.2	0	0	10.368	5462.576	0	0	2627.424	0	0
1999	12	28	1.8	0	0	10.368	5472.944	0	0	2617.056	0	0
1999	12	29	0.2	0	0	10.368	5483.312	0	0	2606.688	0	0
1999	12	30	0	0	0	10.368	5493.68	0	0	2596.32	0	0
1999	12	31	2	0	0	10.368	5504.048	0	0	2585.952	0	0
			997.8		45072.221	2362.896		17198.509	28186.384		0	7

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m^3)	Uncontrolled Flow Discharged from Sediment Dam (m^3)	Controlled Flow Discharged from Sediment Dam (m^3)	Volume of Sediment Water Remaining (m^3)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m^3)	Evaporation (m^3)						
1999	1	1	0	0	0	11.52	2840	0	0	2200	0	
1999	1	2	0	0	0	11.52	2851.52	0	0	6808.48	0	0
1999	1	3	0	0	0	11.52	2863.04	0	0	6796.96	0	0
1999	1	4	0	0	0	11.52	2874.56	0	0	6785.44	0	0
1999	1	5	0	0	0	11.52	2886.08	0	3553.92	6773.92	0	0
1999	1	6	0	0	0	11.52	6451.52	0	0	3208.48	0	0
1999	1	7	0.4	0	0	11.52	6463.04	0	0	3196.96	0	0
1999	1	8	16	0.43	677.68	11.52	5796.88	0	0	3863.12	0	0
1999	1	9	0	0	0	11.52	5808.4	0	0	3851.6	0	0
1999	1	10	0	0	0	11.52	5819.92	0	0	3840.08	0	0
1999	1	11	0	0	0	11.52	5831.44	0	0	3828.56	0	0
1999	1	12	0	0	0	11.52	5842.96	0	597.04	3817.04	0	0
1999	1	13	0	0	0	11.52	6451.52	0	0	3208.48	0	0
1999	1	14	0	0	0	11.52	6463.04	0	0	3196.96	0	0
1999	1	15	0	0	0	11.52	6474.56	0	0	3185.44	0	0
1999	1	16	0	0	0	11.52	6486.08	0	0	3173.92	0	0
1999	1	17	0	0	0	11.52	6497.6	0	0	3162.4	0	0
1999	1	18	0	0	0	11.52	6509.12	0	0	3150.88	0	0
1999	1	19	0	0	0	11.52	6520.64	0	0	3139.36	0	0
1999	1	20	0	0	0	11.52	6532.16	0	0	3127.84	0	0
1999	1	21	0	0	0	11.52	6543.68	0	0	3116.32	0	0
1999	1	22	0	0	0	11.52	6555.2	0	0	3104.8	0	0
1999	1	23	0	0	0	11.52	6566.72	0	0	3093.28	0	0
1999	1	24	0	0	0	11.52	6578.24	0	0	3081.76	0	0
1999	1	25	0	0	0	11.52	6589.76	0	0	3070.24	0	0
1999	1	26	0.8	0	0	11.52	6601.28	0	0	3058.72	0	0
1999	1	27	0	0	0	11.52	6612.8	0	0	3047.2	0	0
1999	1	28	0	0	0	11.52	6624.32	0	0	3035.68	0	0
1999	1	29	0.2	0	0	11.52	6635.84	0	0	3024.16	0	0
1999	1	30	0	0	0	11.52	6647.36	0	0	3012.64	0	0
1999	1	31	0.6	0	0	11.52	6658.88	0	0	3001.12	0	0
1999	2	1	0	0	0	10.224	6669.104	0	0	2990.896	0	0
1999	2	2	0	0	0	10.224	6679.328	0	0	2980.672	0	0
1999	2	3	0	0	0	10.224	6689.552	0	0	2970.448	0	0
1999	2	4	0	0	0	10.224	6699.776	0	0	2960.224	0	0
1999	2	5	0	0	0	10.224	6710	0	0	2950	0	0
1999	2	6	0.8	0	0	10.224	6720.224	0	0	2939.776	0	0
1999	2	7	0	0	0	10.224	6730.448	0	0	2929.552	0	0
1999	2	8	0	0	0	10.224	6740.672	0	0	2919.328	0	0
1999	2	9	0	0	0	10.224	6750.896	0	0	2909.104	0	0
1999	2	10	0	0	0	10.224	6761.12	0	0	2898.88	0	0
1999	2	11	0.4	0	0	10.224	6771.344	0	0	2888.656	0	0
1999	2	12	0	0	0	10.224	6781.568	0	0	2878.432	0	0
1999	2	13	0	0	0	10.224	6791.792	0	0	2868.208	0	0
1999	2	14	0	0	0	10.224	6802.016	0	0	2857.984	0	0
1999	2	15	0	0	0	10.224	6812.24	0	0	2847.76	0	0
1999	2	16	0	0	0	10.224	6822.464	0	0	2837.536	0	0
1999	2	17	0	0	0	10.224	6832.688	0	0	2827.312	0	0
1999	2	18	3.4	0	0	10.224	6842.912	0	0	2817.088	0	0
1999	2	19	0	0	0	10.224	6853.136	0	0	2806.864	0	0
1999	2	20	0	0	0	10.224	6863.36	0	0	2796.64	0	0
1999	2	21	0	0	0	10.224	6873.584	0	0	2786.416	0	0
1999	2	22	0	0	0	10.224	6883.808	0	0	2776.192	0	0
1999	2	23	0	0	0	10.224	6894.032	0	0	2765.968	0	0
1999	2	24	0	0	0	10.224	6904.256	0	0	2755.744	0	0
1999	2	25	0	0	0	10.224	6914.48	0	0	2745.52	0	0
1999	2	26	0	0	0	10.224	6924.704	0	0	2735.296	0	0
1999	2	27	0	0	0	10.224	6934.928	0	0	2725.072	0	0
1999	2	28	0	0	0	10.224	6945.152	0	0	2714.848	0	0
1999	3	1	0	0	0	8.352	6953.504	0	0	2706.496	0	0
1999	3	2	0	0	0	8.352	6961.856	0	0	2698.144	0	0
1999	3	3	0	0	0	8.352	6970.208	0	0	2689.792	0	0
1999	3	4	0	0	0	8.352	6978.56	0	0	2681.44	0	0
1999	3	5	0	0	0	8.352	6986.912	0	0	2673.088	0	0
1999	3	6	0	0	0	8.352	6995.264	0	0	2664.736	0	0
1999	3	7	19.6	0.43	830.158	8.352	6173.458	0	0	3486.542	0	0
1999	3	8	0.2	0	0	8.352	6181.81	0	0	3478.19	0	0
1999	3	9	0	0	0	8.352	6190.162	0	0	3469.838	0	0
1999	3	10	0	0	0	8.352	6198.514	0	0	3461.486	0	0
1999	3	11	0	0	0	8.352	6206.866	0	0	3453.134	0	0
1999	3	12	0	0	0	8.352	6215.218	0	224.782	3444.782	0	0
1999	3	13	0	0	0	8.352	6448.352	0	0	3211.648	0	0
1999	3	14	0	0	0	8.352	6456.704	0	0	3203.296	0	0
1999	3	15	0	0	0	8.352	6465.056	0	0	3194.944	0	0
1999	3	16	0	0	0	8.352	6473.408	0	0	3186.592	0	0
1999	3	17	0	0	0	8.352	6481.76	0	0	3178.24	0	0
1999	3	18	11	0.43	465.905	8.352	6024.207	0	0	3635.793	0	0
1999	3	19	1.6	0	0	8.352	6032.559	0	0	3627.441	0	0
1999	3	20	0	0	0	8.352	6040.911	0	0	3619.089	0	0
1999	3	21	48	0.74	3498.72	8.352	2550.543	0	0	7109.457	0	0
1999	3	22	2.6	0	0	8.352	2558.895	0	0	7101.105	0	0
1999	3	23	0	0	0	8.352	2567.247	0	0	7092.753	0	0
1999	3	24	0	0	0	8.352	2575.599	0	0	7084.401	0	0
1999	3	25	11	0.43	465.905	8.352	2118.046	0	0	7541.954	0	0
1999	3	26	2.8	0	0	8.352	2126.398	0	0	7533.602	0	0
1999	3	27	0	0	0	8.352	2134.75	0	0	7525.25	0	0
1999	3	28	4.6	0	0	8.352	2143.102	0	0	7516.898	0	0
1999	3	29	0	0	0	8.352	2151.454	0	0	7508.546	0	0
1999	3	30	0	0	0	8.352	2159.806	0	0	7500.194	0	0
1999	3	31	1.8	0	0	8.352	2168.158	0	0	7491.842	0	0
1999	4	1	0	0	0	5.328	2173.486	0	0	7486.514	0	0
1999	4	2	0	0	0	5.328	2178.814	0	0	7481.186	0	0
1999	4	3	0	0	0	5.328	2184.142	0	0	7475.858	0	0
1999	4	4	1.2	0	0	5.328	2189.47	0	0	7470.53	0	0
1999	4	5	3.2	0	0	5.328	2194.798	0	0	7465.202	0	0
1999	4	6	0	0	0	5.328	2200.126	0	0	7459.874	0	0
1999	4	7	0	0	0	5.328	2205.454	0	0	7454.546	0	0
1999	4	8	0	0	0	5.328	2210.782	0	0	7449.218	0	0
1999	4	9	0	0	0	5.328	2216.11	0	4223.89	7443.89	0	0
1999	4	10	0	0	0	5.328	6445.328	0	0	3214.672	0	0
1999	4	11	0	0	0	5.328	6450.656	0	0	3209.344	0	0
1999	4	12	0	0	0	5.328	6455.984	0	0	3204.016	0	0
1999	4	13	0	0	0	5.328	6461.312	0	0	3198.688	0	0
1999	4	14	0	0	0	5.328	6466.64	0	0	3193.36	0	0
1999	4	15	0	0	0	5.328	6471.968	0	0	3188.032	0	0
1999	4	16	0	0	0	5.328	6477.296	0	0	3182.704	0	0
1999	4	17	0	0	0	5.328	6482.624	0	0	3177.376	0	0
1999	4	18	0	0	0	5.328	6487.952	0	0	3172.048	0	0
1999	4	19	0	0	0	5.328	6493.28	0	0	3166.72	0	0
1999	4	20	6.8	0	0	5.328	6498.608	0	0	3161.392	0	0
1999	4	21	4.2	0	0	5.328	6503.936	0	0	3156.064	0	0
1999	4	22	0	0	0	5.328	6509.264	0	0	3150.736	0	0
1999	4	23	0	0	0	5.328	6514.592	0	0	3145.408	0	0
1999	4	24	0	0	0	5.328	6519.92	0	0	3140.08	0	0
1999	4	25	0	0	0	5.328	6525.248	0	0	3134.752	0	0

1999	4	26	0	0	0	5.328	6530.576	0	0	3129.424	0	0
1999	4	27	1.2	0	0	5.328	6535.904	0	0	3124.096	0	0
1999	4	28	0.6	0	0	5.328	6541.232	0	0	3118.768	0	0
1999	4	29	0.2	0	0	5.328	6546.56	0	0	3113.44	0	0
1999	4	30	0	0	0	5.328	6551.888	0	0	3108.112	0	0
1999	5	1	0	0	0	3.456	6555.344	0	0	3104.656	0	0
1999	5	2	0	0	0	3.456	6558.8	0	0	3101.2	0	0
1999	5	3	0	0	0	3.456	6562.256	0	0	3097.744	0	0
1999	5	4	0	0	0	3.456	6565.712	0	0	3094.288	0	0
1999	5	5	0	0	0	3.456	6569.168	0	0	3090.832	0	0
1999	5	6	0	0	0	3.456	6572.624	0	0	3087.376	0	0
1999	5	7	0	0	0	3.456	6576.08	0	0	3083.92	0	0
1999	5	8	0	0	0	3.456	6579.536	0	0	3080.464	0	0
1999	5	9	0	0	0	3.456	6582.992	0	0	3077.008	0	0
1999	5	10	0.4	0	0	3.456	6586.448	0	0	3073.552	0	0
1999	5	11	0	0	0	3.456	6589.904	0	0	3070.096	0	0
1999	5	12	11.6	0.43	491.318	3.456	6102.042	0	0	3557.958	0	0
1999	5	13	30.4	0.69	2066.136	3.456	4039.362	0	0	5620.638	0	0
1999	5	14	0.6	0	0	3.456	4042.818	0	0	5617.182	0	0
1999	5	15	0	0	0	3.456	4046.274	0	0	5613.726	0	0
1999	5	16	42.8	0.74	3119.692	3.456	930.038	0	0	8729.962	0	0
1999	5	17	0	0	0	3.456	933.494	0	0	8726.506	0	0
1999	5	18	0.8	0	0	3.456	936.95	0	0	8723.05	0	0
1999	5	19	0	0	0	3.456	940.406	0	0	8719.594	0	0
1999	5	20	0	0	0	3.456	943.862	0	0	8716.138	0	0
1999	5	21	6.4	0	0	3.456	947.318	0	0	8712.682	0	0
1999	5	22	5.2	0	0	3.456	950.774	0	0	8709.226	0	0
1999	5	23	44.2	0.74	3221.738	3.456	-2267.508	2267.508	0	9660	0	0
1999	5	24	15.8	0.43	669.209	3.456	-665.753	665.753	0	9660	0	0
1999	5	25	78	0.81	6223.23	3.456	-6219.774	6219.774	0	9660	0	0
1999	5	26	11.4	0.43	482.847	3.456	-479.391	479.391	0	9660	0	0
1999	5	27	1.6	0	0	3.456	3.456	0	0	9656.544	0	1
1999	5	28	0	0	0	3.456	6.912	0	0	9653.088	0	0
1999	5	29	14	0.43	592.97	3.456	-582.602	582.602	0	9660	0	0
1999	5	30	10.4	0.43	440.492	3.456	-437.036	437.036	0	9660	0	0
1999	5	31	13.2	0.43	559.086	3.456	-555.63	555.63	0	9660	0	0
1999	6	1	0	0	0	2.592	2.592	0	0	9657.408	0	1
1999	6	2	0.2	0	0	2.592	5.184	0	0	9654.816	0	0
1999	6	3	0.2	0	0	2.592	7.776	0	0	9652.224	0	0
1999	6	4	0	0	0	2.592	10.368	0	0	9649.632	0	0
1999	6	5	12.8	0.43	542.144	2.592	-529.184	529.184	0	9660	0	0
1999	6	6	1.4	0	0	2.592	2.592	0	0	9657.408	0	1
1999	6	7	8.2	0	0	2.592	5.184	0	0	9654.816	0	0
1999	6	8	0.2	0	0	2.592	7.776	0	0	9652.224	0	0
1999	6	9	0.2	0	0	2.592	10.368	0	0	9649.632	0	0
1999	6	10	7.2	0	0	2.592	12.96	0	0	9647.04	0	0
1999	6	11	0	0	0	2.592	15.552	0	0	9644.448	0	0
1999	6	12	0	0	0	2.592	18.144	0	0	9641.856	0	0
1999	6	13	36.2	0.69	2460.333	2.592	-2439.597	2439.597	0	9660	0	0
1999	6	14	0	0	0	2.592	2.592	0	0	9657.408	0	0
1999	6	15	16.6	0.43	703.093	2.592	-697.909	697.909	0	9660	0	0
1999	6	16	5	0	0	2.592	2.592	0	0	9657.408	0	1
1999	6	17	0.4	0	0	2.592	5.184	0	0	9654.816	0	0
1999	6	18	14.8	0.43	626.854	2.592	-619.078	619.078	0	9660	0	0
1999	6	19	2.4	0	0	2.592	2.592	0	0	9657.408	0	1
1999	6	20	0.2	0	0	2.592	5.184	0	0	9654.816	0	0
1999	6	21	4.4	0	0	2.592	7.776	0	0	9652.224	0	0
1999	6	22	0.6	0	0	2.592	10.368	0	0	9649.632	0	0
1999	6	23	0.4	0	0	2.592	12.96	0	0	9647.04	0	0
1999	6	24	0.2	0	0	2.592	15.552	0	0	9644.448	0	0
1999	6	25	7.6	0	0	2.592	18.144	0	0	9641.856	0	0
1999	6	26	3.8	0	0	2.592	20.736	0	0	9639.264	0	0
1999	6	27	0	0	0	2.592	23.328	0	0	9636.672	0	0
1999	6	28	0.2	0	0	2.592	25.92	0	0	9634.08	0	0
1999	6	29	0	0	0	2.592	28.512	0	0	9631.488	0	0
1999	6	30	16.2	0.43	686.151	2.592	-655.047	655.047	0	9660	0	0
1999	7	1	0.6	0	0	2.448	2.448	0	0	9657.552	0	1
1999	7	2	4.8	0	0	2.448	4.896	0	0	9655.104	0	0
1999	7	3	0.4	0	0	2.448	7.344	0	0	9652.656	0	0
1999	7	4	0	0	0	2.448	9.792	0	0	9650.208	0	0
1999	7	5	0	0	0	2.448	12.24	0	0	9647.76	0	0
1999	7	6	0	0	0	2.448	14.688	0	0	9645.312	0	0
1999	7	7	0	0	0	2.448	17.136	0	6422.864	9642.864	0	0
1999	7	8	2	0	0	2.448	6442.448	0	0	3217.552	0	0
1999	7	9	18.6	0.43	787.803	2.448	5657.093	0	0	4002.907	0	0
1999	7	10	0	0	0	2.448	5659.541	0	0	4000.459	0	0
1999	7	11	0	0	0	2.448	5661.989	0	0	3998.011	0	0
1999	7	12	0.4	0	0	2.448	5664.437	0	0	3995.563	0	0
1999	7	13	0.4	0	0	2.448	5666.885	0	0	3993.115	0	0
1999	7	14	0.4	0	0	2.448	5669.333	0	0	3990.667	0	0
1999	7	15	0.2	0	0	2.448	5671.781	0	0	3988.219	0	0
1999	7	16	0	0	0	2.448	5674.229	0	0	3985.771	0	0
1999	7	17	0	0	0	2.448	5676.677	0	0	3983.323	0	0
1999	7	18	0	0	0	2.448	5679.125	0	0	3980.875	0	0
1999	7	19	0	0	0	2.448	5681.573	0	758.427	3978.427	0	0
1999	7	20	30.2	0.69	2052.543	2.448	4389.905	0	0	5270.095	0	0
1999	7	21	5.8	0	0	2.448	4392.353	0	0	5267.647	0	0
1999	7	22	5.8	0	0	2.448	4394.801	0	0	5265.199	0	0
1999	7	23	0	0	0	2.448	4397.249	0	0	5262.751	0	0
1999	7	24	0	0	0	2.448	4399.697	0	0	5260.303	0	0
1999	7	25	0	0	0	2.448	4402.145	0	0	5257.855	0	0
1999	7	26	0.8	0	0	2.448	4404.593	0	0	5255.407	0	0
1999	7	27	0	0	0	2.448	4407.041	0	0	5252.959	0	0
1999	7	28	0	0	0	2.448	4409.489	0	0	5250.511	0	0
1999	7	29	0	0	0	2.448	4411.937	0	0	5248.063	0	0
1999	7	30	0.2	0	0	2.448	4414.385	0	0	5245.615	0	0
1999	7	31	0.6	0	0	2.448	4416.833	0	0	5243.167	0	0
1999	8	1	0	0	0	3.312	4420.145	0	0	5239.855	0	0
1999	8	2	0	0	0	3.312	4423.457	0	0	5236.543	0	0
1999	8	3	0	0	0	3.312	4426.769	0	0	5233.231	0	0
1999	8	4	0	0	0	3.312	4430.081	0	2009.919	5229.919	0	0
1999	8	5	0	0	0	3.312	6443.312	0	0	3216.688	0	0
1999	8	6	0	0	0	3.312	6446.624	0	0	3213.376	0	0
1999	8	7	0	0	0	3.312	6449.936	0	0	3210.064	0	0
1999	8	8	21	0.56	1158.36	3.312	5294.888	0	0	4365.112	0	0
1999	8	9	24	0.56	1323.84	3.312	3974.36	0	0	5685.64	0	0
1999	8	10	4	0	0	3.312	3977.672	0	0	5682.328	0	0
1999	8	11	0	0	0	3.312	3980.984	0	0	5679.016	0	0
1999	8	12	0.6	0	0	3.312	3984.296	0	0	5675.704	0	0
1999	8	13	1.2	0	0	3.312	3987.608	0	0	5672.392	0	0
1999	8	14	0	0	0	3.312	3990.92	0	0	5669.08	0	0
1999	8	15	5	0	0	3.312	3994.232	0	0	5665.768	0	0
1999	8	16	0	0	0	3.312	3997.544	0	0	5662.456	0	0
1999	8	17	0.2	0	0	3.312	4000.856	0	0	5659.144	0	0
1999	8	18	0	0	0	3.312	4004.168	0	0	5655.832	0	0
1999	8	19	0	0	0	3.312	4007.48	0	0	5652.52	0	0
1999	8	20	0	0	0	3.312	4010.792	0	0	5649.208	0	0
1999	8	21	0	0	0	3.312	4014.104	0	2425.896	5645.896	0	0
1999	8	22	0	0	0	3.312	6443.312	0	0	3216.688	0	0
1999	8	23	0	0	0	3.312	6446.624	0	0	3213.376	0	0

1999	8	24	0.2	0	0	3.312	6449.936	0	0	3210.064	0	0
1999	8	25	0	0	0	3.312	6453.248	0	0	3206.752	0	0
1999	8	26	0.6	0	0	3.312	6456.56	0	0	3203.44	0	0
1999	8	27	4.6	0	0	3.312	6459.872	0	0	3200.128	0	0
1999	8	28	0	0	0	3.312	6463.184	0	0	3196.816	0	0
1999	8	29	0	0	0	3.312	6466.496	0	0	3193.504	0	0
1999	8	30	0.4	0	0	3.312	6469.808	0	0	3190.192	0	0
1999	8	31	0	0	0	3.312	6473.12	0	0	3186.88	0	0
1999	9	1	0	0	0	4.896	6478.016	0	0	3181.984	0	0
1999	9	2	0	0	0	4.896	6482.912	0	0	3177.088	0	0
1999	9	3	0	0	0	4.896	6487.808	0	0	3172.192	0	0
1999	9	4	36.2	0.69	2460.333	4.896	4032.371	0	0	5627.629	0	0
1999	9	5	0	0	0	4.896	4037.267	0	0	5622.733	0	0
1999	9	6	10.8	0.43	457.434	4.896	3584.729	0	0	6075.271	0	0
1999	9	7	0.4	0	0	4.896	3589.625	0	0	6070.375	0	0
1999	9	8	0	0	0	4.896	3594.521	0	0	6065.479	0	0
1999	9	9	0	0	0	4.896	3599.417	0	0	6060.583	0	0
1999	9	10	0	0	0	4.896	3604.313	0	0	6055.687	0	0
1999	9	11	4.6	0	0	4.896	3609.209	0	0	6050.791	0	0
1999	9	12	0.4	0	0	4.896	3614.105	0	0	6045.895	0	0
1999	9	13	2.2	0	0	4.896	3619.001	0	0	6040.999	0	0
1999	9	14	0	0	0	4.896	3623.897	0	0	6036.103	0	0
1999	9	15	0.2	0	0	4.896	3628.793	0	0	6031.207	0	0
1999	9	16	13.8	0.43	584.499	4.896	3049.19	0	0	6610.81	0	0
1999	9	17	26.8	0.56	1478.288	4.896	1575.798	0	0	8084.202	0	0
1999	9	18	2	0	0	4.896	1580.694	0	0	8079.306	0	0
1999	9	19	0	0	0	4.896	1585.59	0	0	8074.41	0	0
1999	9	20	0.2	0	0	4.896	1590.486	0	0	8069.514	0	0
1999	9	21	0	0	0	4.896	1595.382	0	0	8064.618	0	0
1999	9	22	0	0	0	4.896	1600.278	0	0	8059.722	0	0
1999	9	23	0	0	0	4.896	1605.174	0	0	8054.826	0	0
1999	9	24	0	0	0	4.896	1610.07	0	4829.93	8049.93	0	0
1999	9	25	0	0	0	4.896	6444.896	0	0	3215.104	0	0
1999	9	26	0	0	0	4.896	6449.792	0	0	3210.208	0	0
1999	9	27	0	0	0	4.896	6454.688	0	0	3205.312	0	0
1999	9	28	0	0	0	4.896	6459.584	0	0	3200.416	0	0
1999	9	29	16.8	0.43	711.564	4.896	5752.916	0	0	3907.084	0	0
1999	9	30	0	0	0	4.896	5757.812	0	0	3902.188	0	0
1999	10	1	0	0	0	6.768	5764.58	0	0	3895.42	0	0
1999	10	2	0	0	0	6.768	5771.348	0	0	3888.652	0	0
1999	10	3	21.4	0.56	1180.424	6.768	4597.692	0	0	5062.308	0	0
1999	10	4	0	0	0	6.768	4604.46	0	0	5055.54	0	0
1999	10	5	0	0	0	6.768	4611.228	0	0	5048.772	0	0
1999	10	6	0	0	0	6.768	4617.996	0	0	5042.004	0	0
1999	10	7	0	0	0	6.768	4624.764	0	1815.236	5035.236	0	0
1999	10	8	0	0	0	6.768	6446.768	0	0	3213.232	0	0
1999	10	9	0.8	0	0	6.768	6453.536	0	0	3206.464	0	0
1999	10	10	20.6	0.56	1136.296	6.768	5324.008	0	0	4335.992	0	0
1999	10	11	15.8	0.43	669.209	6.768	4661.567	0	0	4998.433	0	0
1999	10	12	0.4	0	0	6.768	4668.335	0	0	4991.665	0	0
1999	10	13	9.2	0	0	6.768	4675.103	0	0	4984.897	0	0
1999	10	14	7.4	0	0	6.768	4681.871	0	0	4978.129	0	0
1999	10	15	1	0	0	6.768	4688.639	0	0	4971.361	0	0
1999	10	16	0	0	0	6.768	4695.407	0	0	4964.593	0	0
1999	10	17	0	0	0	6.768	4702.175	0	0	4957.825	0	0
1999	10	18	0.4	0	0	6.768	4708.943	0	0	4951.057	0	0
1999	10	19	0.2	0	0	6.768	4715.711	0	0	4944.289	0	0
1999	10	20	0.2	0	0	6.768	4722.479	0	0	4937.521	0	0
1999	10	21	0	0	0	6.768	4729.247	0	0	4930.753	0	0
1999	10	22	0.6	0	0	6.768	4736.015	0	0	4923.985	0	0
1999	10	23	0	0	0	6.768	4742.783	0	0	4917.217	0	0
1999	10	24	0.2	0	0	6.768	4749.551	0	0	4910.449	0	0
1999	10	25	1.2	0	0	6.768	4756.319	0	0	4903.681	0	0
1999	10	26	1.2	0	0	6.768	4763.087	0	0	4896.913	0	0
1999	10	27	3	0	0	6.768	4769.855	0	0	4890.145	0	0
1999	10	28	0.2	0	0	6.768	4776.623	0	0	4883.377	0	0
1999	10	29	0	0	0	6.768	4783.391	0	0	4876.609	0	0
1999	10	30	0	0	0	6.768	4790.159	0	0	4869.841	0	0
1999	10	31	4.6	0	0	6.768	4796.927	0	0	4863.073	0	0
1999	11	1	0	0	0	8.64	4805.567	0	0	4854.433	0	0
1999	11	2	0	0	0	8.64	4814.207	0	0	4845.793	0	0
1999	11	3	0	0	0	8.64	4822.847	0	0	4837.153	0	0
1999	11	4	0.2	0	0	8.64	4831.487	0	0	4828.513	0	0
1999	11	5	0	0	0	8.64	4840.127	0	0	4819.873	0	0
1999	11	6	10.4	0.43	440.492	8.64	4408.275	0	0	5251.725	0	0
1999	11	7	0	0	0	8.64	4416.915	0	0	5243.085	0	0

1999	11	8	5.2	0	0	8.64	4425.555	0	0	5234.445	0	0
1999	11	9	4.4	0	0	8.64	4434.195	0	0	5225.805	0	0
1999	11	10	2.8	0	0	8.64	4442.835	0	0	5217.165	0	0
1999	11	11	1.4	0	0	8.64	4451.475	0	0	5208.525	0	0
1999	11	12	0.2	0	0	8.64	4460.115	0	0	5199.885	0	0
1999	11	13	0	0	0	8.64	4468.755	0	0	5191.245	0	0
1999	11	14	0	0	0	8.64	4477.395	0	0	5182.605	0	0
1999	11	15	0	0	0	8.64	4486.035	0	0	5173.965	0	0
1999	11	16	0	0	0	8.64	4494.675	0	1945.325	5165.325	0	0
1999	11	17	0	0	0	8.64	6448.64	0	0	3211.36	0	0
1999	11	18	0	0	0	8.64	6457.28	0	0	3202.72	0	0
1999	11	19	0	0	0	8.64	6465.92	0	0	3194.08	0	0
1999	11	20	0.2	0	0	8.64	6474.56	0	0	3185.44	0	0
1999	11	21	7.2	0	0	8.64	6483.2	0	0	3176.8	0	0
1999	11	22	12.2	0.43	516.731	8.64	5975.109	0	0	3684.891	0	0
1999	11	23	0.4	0	0	8.64	5983.749	0	0	3676.251	0	0
1999	11	24	0	0	0	8.64	5992.389	0	0	3667.611	0	0
1999	11	25	0	0	0	8.64	6001.029	0	0	3658.971	0	0
1999	11	26	0	0	0	8.64	6009.669	0	0	3650.331	0	0
1999	11	27	0	0	0	8.64	6018.309	0	421.691	3641.691	0	0
1999	11	28	0	0	0	8.64	6448.64	0	0	3211.36	0	0
1999	11	29	0.2	0	0	8.64	6457.28	0	0	3202.72	0	0
1999	11	30	0	0	0	8.64	6465.92	0	0	3194.08	0	0
1999	12	1	2.8	0	0	10.368	6476.288	0	0	3183.712	0	0
1999	12	2	0	0	0	10.368	6486.656	0	0	3173.344	0	0
1999	12	3	23.4	0.56	1290.744	10.368	5206.28	0	0	4453.72	0	0
1999	12	4	0.6	0	0	10.368	5216.648	0	0	4443.352	0	0
1999	12	5	0	0	0	10.368	5227.016	0	0	4432.984	0	0
1999	12	6	0	0	0	10.368	5237.384	0	0	4422.616	0	0
1999	12	7	0	0	0	10.368	5247.752	0	0	4412.248	0	0
1999	12	8	1.6	0	0	10.368	5258.12	0	0	4401.88	0	0
1999	12	9	8	0	0	10.368	5268.488	0	0	4391.512	0	0
1999	12	10	0.2	0	0	10.368	5278.856	0	0	4381.144	0	0
1999	12	11	0	0	0	10.368	5289.224	0	0	4370.776	0	0
1999	12	12	1.2	0	0	10.368	5299.592	0	0	4360.408	0	0
1999	12	13	0	0	0	10.368	5309.96	0	0	4350.04	0	0
1999	12	14	0	0	0	10.368	5320.328	0	0	4339.672	0	0
1999	12	15	0	0	0	10.368	5330.696	0	0	4329.304	0	0
1999	12	16	4.6	0	0	10.368	5341.064	0	0	4318.936	0	0
1999	12	17	0	0	0	10.368	5351.432	0	0	4308.568	0	0
1999	12	18	0	0	0	10.368	5361.8	0	0	4298.2	0	0
1999	12	19	0	0	0	10.368	5372.168	0	0	4287.832	0	0
1999	12	20	0	0	0	10.368	5382.536	0	1057.464	4277.464	0	0
1999	12	21	0	0	0	10.368	6450.368	0	0	3209.632	0	0
1999	12	22	0	0	0	10.368	6460.736	0	0	3199.264	0	0
1999	12	23	0	0	0	10.368	6471.104	0	0	3188.896	0	0
1999	12	24	0	0	0	10.368	6481.472	0	0	3178.528	0	0
1999	12	25	1.2	0	0	10.368	6491.84	0	0	3168.16	0	0
1999	12	26	0	0	0	10.368	6502.208	0	0	3157.792	0	0
1999	12	27	0.2	0	0	10.368	6512.576	0	0	3147.424	0	0
1999	12	28	1.8	0	0	10.368	6522.944	0	0	3137.056	0	0
1999	12	29	0.2	0	0	10.368	6533.312	0	0	3126.688	0	0
1999	12	30	0	0	0	10.368	6543.68	0	0	3116.32	0	0
1999	12	31	2	0	0	10.368	6554.048	0	0	3105.952	0	0
			997.8		45072.221	2362.896		16148.509	30286.384		0	6

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m³)	Evaporation (m³)						
1999	1	1	0	0	0	11.52	2840	0	0	2200	0	
1999	1	2	0	0	0	11.52	2851.52	0	0	8228.48	0	0
1999	1	3	0	0	0	11.52	2863.04	0	0	8216.96	0	0
1999	1	4	0	0	0	11.52	2874.56	0	0	8205.44	0	0
1999	1	5	0	0	0	11.52	2886.08	0	4493.92	8193.92	0	0
1999	1	6	0	0	0	11.52	7391.52	0	0	3688.48	0	0
1999	1	7	0.4	0	0	11.52	7403.04	0	0	3676.96	0	0
1999	1	8	16	0.43	677.68	11.52	6736.88	0	0	4343.12	0	0
1999	1	9	0	0	0	11.52	6748.4	0	0	4331.6	0	0
1999	1	10	0	0	0	11.52	6759.92	0	0	4320.08	0	0
1999	1	11	0	0	0	11.52	6771.44	0	0	4308.56	0	0
1999	1	12	0	0	0	11.52	6782.96	0	597.04	4297.04	0	0
1999	1	13	0	0	0	11.52	7391.52	0	0	3688.48	0	0
1999	1	14	0	0	0	11.52	7403.04	0	0	3676.96	0	0
1999	1	15	0	0	0	11.52	7414.56	0	0	3665.44	0	0
1999	1	16	0	0	0	11.52	7426.08	0	0	3653.92	0	0
1999	1	17	0	0	0	11.52	7437.6	0	0	3642.4	0	0
1999	1	18	0	0	0	11.52	7449.12	0	0	3630.88	0	0
1999	1	19	0	0	0	11.52	7460.64	0	0	3619.36	0	0
1999	1	20	0	0	0	11.52	7472.16	0	0	3607.84	0	0
1999	1	21	0	0	0	11.52	7483.68	0	0	3596.32	0	0
1999	1	22	0	0	0	11.52	7495.2	0	0	3584.8	0	0
1999	1	23	0	0	0	11.52	7506.72	0	0	3573.28	0	0
1999	1	24	0	0	0	11.52	7518.24	0	0	3561.76	0	0
1999	1	25	0	0	0	11.52	7529.76	0	0	3550.24	0	0
1999	1	26	0.8	0	0	11.52	7541.28	0	0	3538.72	0	0
1999	1	27	0	0	0	11.52	7552.8	0	0	3527.2	0	0
1999	1	28	0	0	0	11.52	7564.32	0	0	3515.68	0	0
1999	1	29	0.2	0	0	11.52	7575.84	0	0	3504.16	0	0
1999	1	30	0	0	0	11.52	7587.36	0	0	3492.64	0	0
1999	1	31	0.6	0	0	11.52	7598.88	0	0	3481.12	0	0
1999	2	1	0	0	0	10.224	7609.104	0	0	3470.896	0	0
1999	2	2	0	0	0	10.224	7619.328	0	0	3460.672	0	0
1999	2	3	0	0	0	10.224	7629.552	0	0	3450.448	0	0
1999	2	4	0	0	0	10.224	7639.776	0	0	3440.224	0	0
1999	2	5	0	0	0	10.224	7650	0	0	3430	0	0
1999	2	6	0.8	0	0	10.224	7660.224	0	0	3419.776	0	0
1999	2	7	0	0	0	10.224	7670.448	0	0	3409.552	0	0
1999	2	8	0	0	0	10.224	7680.672	0	0	3399.328	0	0
1999	2	9	0	0	0	10.224	7690.896	0	0	3389.104	0	0
1999	2	10	0	0	0	10.224	7701.12	0	0	3378.88	0	0
1999	2	11	0.4	0	0	10.224	7711.344	0	0	3368.656	0	0
1999	2	12	0	0	0	10.224	7721.568	0	0	3358.432	0	0
1999	2	13	0	0	0	10.224	7731.792	0	0	3348.208	0	0
1999	2	14	0	0	0	10.224	7742.016	0	0	3337.984	0	0
1999	2	15	0	0	0	10.224	7752.24	0	0	3327.76	0	0
1999	2	16	0	0	0	10.224	7762.464	0	0	3317.536	0	0
1999	2	17	0	0	0	10.224	7772.688	0	0	3307.312	0	0
1999	2	18	3.4	0	0	10.224	7782.912	0	0	3297.088	0	0
1999	2	19	0	0	0	10.224	7793.136	0	0	3286.864	0	0
1999	2	20	0	0	0	10.224	7803.36	0	0	3276.64	0	0
1999	2	21	0	0	0	10.224	7813.584	0	0	3266.416	0	0
1999	2	22	0	0	0	10.224	7823.808	0	0	3256.192	0	0
1999	2	23	0	0	0	10.224	7834.032	0	0	3245.968	0	0
1999	2	24	0	0	0	10.224	7844.256	0	0	3235.744	0	0
1999	2	25	0	0	0	10.224	7854.48	0	0	3225.52	0	0
1999	2	26	0	0	0	10.224	7864.704	0	0	3215.296	0	0
1999	2	27	0	0	0	10.224	7874.928	0	0	3205.072	0	0
1999	2	28	0	0	0	10.224	7885.152	0	0	3194.848	0	0
1999	3	1	0	0	0	8.352	7893.504	0	0	3186.496	0	0
1999	3	2	0	0	0	8.352	7901.856	0	0	3178.144	0	0
1999	3	3	0	0	0	8.352	7910.208	0	0	3169.792	0	0
1999	3	4	0	0	0	8.352	7918.56	0	0	3161.44	0	0
1999	3	5	0	0	0	8.352	7926.912	0	0	3153.088	0	0
1999	3	6	0	0	0	8.352	7935.264	0	0	3144.736	0	0
1999	3	7	19.6	0.43	830.158	8.352	7113.458	0	0	3966.542	0	0
1999	3	8	0.2	0	0	8.352	7121.81	0	0	3958.19	0	0
1999	3	9	0	0	0	8.352	7130.162	0	0	3949.838	0	0
1999	3	10	0	0	0	8.352	7138.514	0	0	3941.486	0	0
1999	3	11	0	0	0	8.352	7146.866	0	0	3933.134	0	0
1999	3	12	0	0	0	8.352	7155.218	0	224.782	3924.782	0	0
1999	3	13	0	0	0	8.352	7388.352	0	0	3691.648	0	0
1999	3	14	0	0	0	8.352	7396.704	0	0	3683.296	0	0
1999	3	15	0	0	0	8.352	7405.056	0	0	3674.944	0	0
1999	3	16	0	0	0	8.352	7413.408	0	0	3666.592	0	0
1999	3	17	0	0	0	8.352	7421.76	0	0	3658.24	0	0
1999	3	18	11	0.43	465.905	8.352	6964.207	0	0	4115.793	0	0
1999	3	19	1.6	0	0	8.352	6972.559	0	0	4107.441	0	0
1999	3	20	0	0	0	8.352	6980.911	0	0	4099.089	0	0
1999	3	21	48	0.74	3498.72	8.352	3490.543	0	0	7589.457	0	0
1999	3	22	2.6	0	0	8.352	3498.895	0	0	7581.105	0	0
1999	3	23	0	0	0	8.352	3507.247	0	0	7572.753	0	0
1999	3	24	0	0	0	8.352	3515.599	0	0	7564.401	0	0
1999	3	25	11	0.43	465.905	8.352	3058.046	0	0	8021.954	0	0
1999	3	26	2.8	0	0	8.352	3066.398	0	0	8013.602	0	0
1999	3	27	0	0	0	8.352	3074.75	0	0	8005.25	0	0
1999	3	28	4.6	0	0	8.352	3083.102	0	0	7996.898	0	0
1999	3	29	0	0	0	8.352	3091.454	0	0	7988.546	0	0
1999	3	30	0	0	0	8.352	3099.806	0	0	7980.194	0	0
1999	3	31	1.8	0	0	8.352	3108.158	0	0	7971.842	0	0
1999	4	1	0	0	0	5.328	3113.486	0	0	7966.514	0	0
1999	4	2	0	0	0	5.328	3118.814	0	0	7961.186	0	0
1999	4	3	0	0	0	5.328	3124.142	0	0	7955.858	0	0
1999	4	4	1.2	0	0	5.328	3129.47	0	0	7950.53	0	0
1999	4	5	3.2	0	0	5.328	3134.798	0	0	7945.202	0	0
1999	4	6	0	0	0	5.328	3140.126	0	0	7939.874	0	0
1999	4	7	0	0	0	5.328	3145.454	0	0	7934.546	0	0
1999	4	8	0	0	0	5.328	3150.782	0	0	7929.218	0	0
1999	4	9	0	0	0	5.328	3156.11	0	4223.89	7923.89	0	0
1999	4	10	0	0	0	5.328	7385.328	0	0	3694.672	0	0
1999	4	11	0	0	0	5.328	7390.656	0	0	3689.344	0	0
1999	4	12	0	0	0	5.328	7395.984	0	0	3684.016	0	0
1999	4	13	0	0	0	5.328	7401.312	0	0	3678.688	0	0
1999	4	14	0	0	0	5.328	7406.64	0	0	3673.36	0	0
1999	4	15	0	0	0	5.328	7411.968	0	0	3668.032	0	0
1999	4	16	0	0	0	5.328	7417.296	0	0	3662.704	0	0
1999	4	17	0	0	0	5.328	7422.624	0	0	3657.376	0	0
1999	4	18	0	0	0	5.328	7427.952	0	0	3652.048	0	0
1999	4	19	0	0	0	5.328	7433.28	0	0	3646.72	0	0
1999	4	20	6.8	0	0	5.328	7438.608	0	0	3641.392	0	0
1999	4	21	4.2	0	0	5.328	7443.936	0	0	3636.064	0	0
1999	4	22	0	0	0	5.328	7449.264	0	0	3630.736	0	0
1999	4	23	0	0	0	5.328	7454.592	0	0	3625.408	0	0
1999	4	24	0	0	0	5.328	7459.92	0	0	3620.08	0	0
1999	4	25	0	0	0	5.328	7465.248	0	0	3614.752	0	0

1999	4	26	0	0	0	5.328	7470.576	0	0	3609.424	0	0
1999	4	27	1.2	0	0	5.328	7475.904	0	0	3604.096	0	0
1999	4	28	0.6	0	0	5.328	7481.232	0	0	3598.768	0	0
1999	4	29	0.2	0	0	5.328	7486.56	0	0	3593.44	0	0
1999	4	30	0	0	0	5.328	7491.888	0	0	3588.112	0	0
1999	5	1	0	0	0	3.456	7495.344	0	0	3584.656	0	0
1999	5	2	0	0	0	3.456	7498.8	0	0	3581.2	0	0
1999	5	3	0	0	0	3.456	7502.256	0	0	3577.744	0	0
1999	5	4	0	0	0	3.456	7505.712	0	0	3574.288	0	0
1999	5	5	0	0	0	3.456	7509.168	0	0	3570.832	0	0
1999	5	6	0	0	0	3.456	7512.624	0	0	3567.376	0	0
1999	5	7	0	0	0	3.456	7516.08	0	0	3563.92	0	0
1999	5	8	0	0	0	3.456	7519.536	0	0	3560.464	0	0
1999	5	9	0	0	0	3.456	7522.992	0	0	3557.008	0	0
1999	5	10	0.4	0	0	3.456	7526.448	0	0	3553.552	0	0
1999	5	11	0	0	0	3.456	7529.904	0	0	3550.096	0	0
1999	5	12	11.6	0.43	491.318	3.456	7042.042	0	0	4037.958	0	0
1999	5	13	30.4	0.69	2066.136	3.456	4979.362	0	0	6100.638	0	0
1999	5	14	0.6	0	0	3.456	4982.818	0	0	6097.182	0	0
1999	5	15	0	0	0	3.456	4986.274	0	0	6093.726	0	0
1999	5	16	42.8	0.74	3119.692	3.456	1870.038	0	0	9209.962	0	0
1999	5	17	0	0	0	3.456	1873.494	0	0	9206.506	0	0
1999	5	18	0.8	0	0	3.456	1876.95	0	0	9203.05	0	0
1999	5	19	0	0	0	3.456	1880.406	0	0	9199.594	0	0
1999	5	20	0	0	0	3.456	1883.862	0	0	9196.138	0	0
1999	5	21	6.4	0	0	3.456	1887.318	0	0	9192.682	0	0
1999	5	22	5.2	0	0	3.456	1890.774	0	0	9189.226	0	0
1999	5	23	44.2	0.74	3221.738	3.456	-1327.508	1327.508	0	11080	0	0
1999	5	24	15.8	0.43	669.209	3.456	-665.753	665.753	0	11080	0	0
1999	5	25	78	0.81	6223.23	3.456	-6219.774	6219.774	0	11080	0	0
1999	5	26	11.4	0.43	482.847	3.456	-479.391	479.391	0	11080	0	0
1999	5	27	1.6	0	0	3.456	3.456	0	0	11076.544	0	1
1999	5	28	0	0	0	3.456	6.912	0	0	11073.088	0	0
1999	5	29	14	0.43	592.97	3.456	-582.602	582.602	0	11080	0	0
1999	5	30	10.4	0.43	440.492	3.456	-437.036	437.036	0	11080	0	0
1999	5	31	13.2	0.43	559.086	3.456	-555.63	555.63	0	11080	0	0
1999	6	1	0	0	0	2.592	2.592	0	0	11077.408	0	1
1999	6	2	0.2	0	0	2.592	5.184	0	0	11074.816	0	0
1999	6	3	0.2	0	0	2.592	7.776	0	0	11072.224	0	0
1999	6	4	0	0	0	2.592	10.368	0	0	11069.632	0	0
1999	6	5	12.8	0.43	542.144	2.592	-529.184	529.184	0	11080	0	0
1999	6	6	1.4	0	0	2.592	2.592	0	0	11077.408	0	1
1999	6	7	8.2	0	0	2.592	5.184	0	0	11074.816	0	0
1999	6	8	0.2	0	0	2.592	7.776	0	0	11072.224	0	0
1999	6	9	0.2	0	0	2.592	10.368	0	0	11069.632	0	0
1999	6	10	7.2	0	0	2.592	12.96	0	0	11067.04	0	0
1999	6	11	0	0	0	2.592	15.552	0	0	11064.448	0	0
1999	6	12	0	0	0	2.592	18.144	0	0	11061.856	0	0
1999	6	13	36.2	0.69	2460.333	2.592	-2439.597	2439.597	0	11080	0	0
1999	6	14	0	0	0	2.592	2.592	0	0	11077.408	0	0
1999	6	15	16.6	0.43	703.093	2.592	-697.909	697.909	0	11080	0	0
1999	6	16	5	0	0	2.592	2.592	0	0	11077.408	0	1
1999	6	17	0.4	0	0	2.592	5.184	0	0	11074.816	0	0
1999	6	18	14.8	0.43	626.854	2.592	-619.078	619.078	0	11080	0	0
1999	6	19	2.4	0	0	2.592	2.592	0	0	11077.408	0	1
1999	6	20	0.2	0	0	2.592	5.184	0	0	11074.816	0	0
1999	6	21	4.4	0	0	2.592	7.776	0	0	11072.224	0	0
1999	6	22	0.6	0	0	2.592	10.368	0	0	11069.632	0	0
1999	6	23	0.4	0	0	2.592	12.96	0	0	11067.04	0	0
1999	6	24	0.2	0	0	2.592	15.552	0	0	11064.448	0	0
1999	6	25	7.6	0	0	2.592	18.144	0	0	11061.856	0	0
1999	6	26	3.8	0	0	2.592	20.736	0	0	11059.264	0	0
1999	6	27	0	0	0	2.592	23.328	0	0	11056.672	0	0
1999	6	28	0.2	0	0	2.592	25.92	0	0	11054.08	0	0
1999	6	29	0	0	0	2.592	28.512	0	0	11051.488	0	0
1999	6	30	16.2	0.43	686.151	2.592	-655.047	655.047	0	11080	0	0
1999	7	1	0.6	0	0	2.448	2.448	0	0	11077.552	0	1
1999	7	2	4.8	0	0	2.448	4.896	0	0	11075.104	0	0
1999	7	3	0.4	0	0	2.448	7.344	0	0	11072.656	0	0
1999	7	4	0	0	0	2.448	9.792	0	0	11070.208	0	0
1999	7	5	0	0	0	2.448	12.24	0	0	11067.76	0	0
1999	7	6	0	0	0	2.448	14.688	0	0	11065.312	0	0
1999	7	7	0	0	0	2.448	17.136	0	7362.864	11062.864	0	0
1999	7	8	2	0	0	2.448	7382.448	0	0	3697.552	0	0
1999	7	9	18.6	0.43	787.803	2.448	6597.093	0	0	4482.907	0	0
1999	7	10	0	0	0	2.448	6599.541	0	0	4480.459	0	0
1999	7	11	0	0	0	2.448	6601.989	0	0	4478.011	0	0
1999	7	12	0.4	0	0	2.448	6604.437	0	0	4475.563	0	0
1999	7	13	0.4	0	0	2.448	6606.885	0	0	4473.115	0	0
1999	7	14	0.4	0	0	2.448	6609.333	0	0	4470.667	0	0
1999	7	15	0.2	0	0	2.448	6611.781	0	0	4468.219	0	0
1999	7	16	0	0	0	2.448	6614.229	0	0	4465.771	0	0
1999	7	17	0	0	0	2.448	6616.677	0	0	4463.323	0	0
1999	7	18	0	0	0	2.448	6619.125	0	0	4460.875	0	0
1999	7	19	0	0	0	2.448	6621.573	0	758.427	4458.427	0	0
1999	7	20	30.2	0.69	2052.543	2.448	5329.905	0	0	5750.095	0	0
1999	7	21	5.8	0	0	2.448	5332.353	0	0	5747.647	0	0
1999	7	22	5.8	0	0	2.448	5334.801	0	0	5745.199	0	0
1999	7	23	0	0	0	2.448	5337.249	0	0	5742.751	0	0
1999	7	24	0	0	0	2.448	5339.697	0	0	5740.303	0	0
1999	7	25	0	0	0	2.448	5342.145	0	0	5737.855	0	0
1999	7	26	0.8	0	0	2.448	5344.593	0	0	5735.407	0	0
1999	7	27	0	0	0	2.448	5347.041	0	0	5732.959	0	0
1999	7	28	0	0	0	2.448	5349.489	0	0	5730.511	0	0
1999	7	29	0	0	0	2.448	5351.937	0	0	5728.063	0	0
1999	7	30	0.2	0	0	2.448	5354.385	0	0	5725.615	0	0
1999	7	31	0.6	0	0	2.448	5356.833	0	0	5723.167	0	0
1999	8	1	0	0	0	3.312	5360.145	0	0	5719.855	0	0
1999	8	2	0	0	0	3.312	5363.457	0	0	5716.543	0	0
1999	8	3	0	0	0	3.312	5366.769	0	0	5713.231	0	0
1999	8	4	0	0	0	3.312	5370.081	0	2009.919	5709.919	0	0
1999	8	5	0	0	0	3.312	7383.312	0	0	3696.688	0	0
1999	8	6	0	0	0	3.312	7386.624	0	0	3693.376	0	0
1999	8	7	0	0	0	3.312	7389.936	0	0	3690.064	0	0
1999	8	8	21	0.56	1158.36	3.312	6234.888	0	0	4845.112	0	0
1999	8	9	24	0.56	1323.84	3.312	4914.36	0	0	6165.64	0	0
1999	8	10	4	0	0	3.312	4917.672	0	0	6162.328	0	0
1999	8	11	0	0	0	3.312	4920.984	0	0	6159.016	0	0
1999	8	12	0.6	0	0	3.312	4924.296	0	0	6155.704	0	0
1999	8	13	1.2	0	0	3.312	4927.608	0	0	6152.392	0	0
1999	8	14	0	0	0	3.312	4930.92	0	0	6149.08	0	0
1999	8	15	5	0	0	3.312	4934.232	0	0	6145.768	0	0
1999	8	16	0	0	0	3.312	4937.544	0	0	6142.456	0	0
1999	8	17	0.2	0	0	3.312	4940.856	0	0	6139.144	0	0
1999	8	18	0	0	0	3.312	4944.168	0	0	6135.832	0	0
1999	8	19	0	0	0	3.312	4947.48	0	0	6132.52	0	0
1999	8	20	0	0	0	3.312	4950.792	0	0	6129.208	0	0
1999	8	21	0	0	0	3.312	4954.104	0	2425.896	6125.896	0	0
1999	8	22	0	0	0	3.312	7383.312	0	0	3696.688	0	0
1999	8	23	0	0	0	3.312	7386.624	0	0	3693.376	0	0

1999	8	24	0.2	0	0	3.312	7389.936	0	0	3690.064	0	0
1999	8	25	0	0	0	3.312	7393.248	0	0	3686.752	0	0
1999	8	26	0.6	0	0	3.312	7396.56	0	0	3683.44	0	0
1999	8	27	4.6	0	0	3.312	7399.872	0	0	3680.128	0	0
1999	8	28	0	0	0	3.312	7403.184	0	0	3676.816	0	0
1999	8	29	0	0	0	3.312	7406.496	0	0	3673.504	0	0
1999	8	30	0.4	0	0	3.312	7409.808	0	0	3670.192	0	0
1999	8	31	0	0	0	3.312	7413.12	0	0	3666.88	0	0
1999	9	1	0	0	0	4.896	7418.016	0	0	3661.984	0	0
1999	9	2	0	0	0	4.896	7422.912	0	0	3657.088	0	0
1999	9	3	0	0	0	4.896	7427.808	0	0	3652.192	0	0
1999	9	4	36.2	0.69	2460.333	4.896	4972.371	0	0	6107.629	0	0
1999	9	5	0	0	0	4.896	4977.267	0	0	6102.733	0	0
1999	9	6	10.8	0.43	457.434	4.896	4524.729	0	0	6555.271	0	0
1999	9	7	0.4	0	0	4.896	4529.625	0	0	6550.375	0	0
1999	9	8	0	0	0	4.896	4534.521	0	0	6545.479	0	0
1999	9	9	0	0	0	4.896	4539.417	0	0	6540.583	0	0
1999	9	10	0	0	0	4.896	4544.313	0	0	6535.687	0	0
1999	9	11	4.6	0	0	4.896	4549.209	0	0	6530.791	0	0
1999	9	12	0.4	0	0	4.896	4554.105	0	0	6525.895	0	0
1999	9	13	2.2	0	0	4.896	4559.001	0	0	6520.999	0	0
1999	9	14	0	0	0	4.896	4563.897	0	0	6516.103	0	0
1999	9	15	0.2	0	0	4.896	4568.793	0	0	6511.207	0	0
1999	9	16	13.8	0.43	584.499	4.896	3989.19	0	0	7090.81	0	0
1999	9	17	26.8	0.56	1478.288	4.896	2515.798	0	0	8564.202	0	0
1999	9	18	2	0	0	4.896	2520.694	0	0	8559.306	0	0
1999	9	19	0	0	0	4.896	2525.59	0	0	8554.41	0	0
1999	9	20	0.2	0	0	4.896	2530.486	0	0	8549.514	0	0
1999	9	21	0	0	0	4.896	2535.382	0	0	8544.618	0	0
1999	9	22	0	0	0	4.896	2540.278	0	0	8539.722	0	0
1999	9	23	0	0	0	4.896	2545.174	0	0	8534.826	0	0
1999	9	24	0	0	0	4.896	2550.07	0	4829.93	8529.93	0	0
1999	9	25	0	0	0	4.896	7384.896	0	0	3695.104	0	0
1999	9	26	0	0	0	4.896	7389.792	0	0	3690.208	0	0
1999	9	27	0	0	0	4.896	7394.688	0	0	3685.312	0	0
1999	9	28	0	0	0	4.896	7399.584	0	0	3680.416	0	0
1999	9	29	16.8	0.43	711.564	4.896	6692.916	0	0	4387.084	0	0
1999	9	30	0	0	0	4.896	6697.812	0	0	4382.188	0	0
1999	10	1	0	0	0	6.768	6704.58	0	0	4375.42	0	0
1999	10	2	0	0	0	6.768	6711.348	0	0	4368.652	0	0
1999	10	3	21.4	0.56	1180.424	6.768	5537.692	0	0	5542.308	0	0
1999	10	4	0	0	0	6.768	5544.46	0	0	5535.54	0	0
1999	10	5	0	0	0	6.768	5551.228	0	0	5528.772	0	0
1999	10	6	0	0	0	6.768	5557.996	0	0	5522.004	0	0
1999	10	7	0	0	0	6.768	5564.764	0	1815.236	5515.236	0	0
1999	10	8	0	0	0	6.768	7386.768	0	0	3693.232	0	0
1999	10	9	0.8	0	0	6.768	7393.536	0	0	3686.464	0	0
1999	10	10	20.6	0.56	1136.296	6.768	6264.008	0	0	4815.992	0	0
1999	10	11	15.8	0.43	669.209	6.768	5601.567	0	0	5478.433	0	0
1999	10	12	0.4	0	0	6.768	5608.335	0	0	5471.665	0	0
1999	10	13	9.2	0	0	6.768	5615.103	0	0	5464.897	0	0
1999	10	14	7.4	0	0	6.768	5621.871	0	0	5458.129	0	0
1999	10	15	1	0	0	6.768	5628.639	0	0	5451.361	0	0
1999	10	16	0	0	0	6.768	5635.407	0	0	5444.593	0	0
1999	10	17	0	0	0	6.768	5642.175	0	0	5437.825	0	0
1999	10	18	0.4	0	0	6.768	5648.943	0	0	5431.057	0	0
1999	10	19	0.2	0	0	6.768	5655.711	0	0	5424.289	0	0
1999	10	20	0.2	0	0	6.768	5662.479	0	0	5417.521	0	0
1999	10	21	0	0	0	6.768	5669.247	0	0	5410.753	0	0
1999	10	22	0.6	0	0	6.768	5676.015	0	0	5403.985	0	0
1999	10	23	0	0	0	6.768	5682.783	0	0	5397.217	0	0
1999	10	24	0.2	0	0	6.768	5689.551	0	0	5390.449	0	0
1999	10	25	1.2	0	0	6.768	5696.319	0	0	5383.681	0	0
1999	10	26	1.2	0	0	6.768	5703.087	0	0	5376.913	0	0
1999	10	27	3	0	0	6.768	5709.855	0	0	5370.145	0	0
1999	10	28	0.2	0	0	6.768	5716.623	0	0	5363.377	0	0
1999	10	29	0	0	0	6.768	5723.391	0	0	5356.609	0	0
1999	10	30	0	0	0	6.768	5730.159	0	0	5349.841	0	0
1999	10	31	4.6	0	0	6.768	5736.927	0	0	5343.073	0	0
1999	11	1	0	0	0	8.64	5745.567	0	0	5334.433	0	0
1999	11	2	0	0	0	8.64	5754.207	0	0	5325.793	0	0
1999	11	3	0	0	0	8.64	5762.847	0	0	5317.153	0	0
1999	11	4	0.2	0	0	8.64	5771.487	0	0	5308.513	0	0
1999	11	5	0	0	0	8.64	5780.127	0	0	5299.873	0	0
1999	11	6	10.4	0.43	440.492	8.64	5348.275	0	0	5731.725	0	0
1999	11	7	0	0	0	8.64	5356.915	0	0	5723.085	0	0

1999	11	8	5.2	0	0	8.64	5365.555	0	0	5714.445	0	0
1999	11	9	4.4	0	0	8.64	5374.195	0	0	5705.805	0	0
1999	11	10	2.8	0	0	8.64	5382.835	0	0	5697.165	0	0
1999	11	11	1.4	0	0	8.64	5391.475	0	0	5688.525	0	0
1999	11	12	0.2	0	0	8.64	5400.115	0	0	5679.885	0	0
1999	11	13	0	0	0	8.64	5408.755	0	0	5671.245	0	0
1999	11	14	0	0	0	8.64	5417.395	0	0	5662.605	0	0
1999	11	15	0	0	0	8.64	5426.035	0	0	5653.965	0	0
1999	11	16	0	0	0	8.64	5434.675	0	1945.325	5645.325	0	0
1999	11	17	0	0	0	8.64	7388.64	0	0	3691.36	0	0
1999	11	18	0	0	0	8.64	7397.28	0	0	3682.72	0	0
1999	11	19	0	0	0	8.64	7405.92	0	0	3674.08	0	0
1999	11	20	0.2	0	0	8.64	7414.56	0	0	3665.44	0	0
1999	11	21	7.2	0	0	8.64	7423.2	0	0	3656.8	0	0
1999	11	22	12.2	0.43	516.731	8.64	6915.109	0	0	4164.891	0	0
1999	11	23	0.4	0	0	8.64	6923.749	0	0	4156.251	0	0
1999	11	24	0	0	0	8.64	6932.389	0	0	4147.611	0	0
1999	11	25	0	0	0	8.64	6941.029	0	0	4138.971	0	0
1999	11	26	0	0	0	8.64	6949.669	0	0	4130.331	0	0
1999	11	27	0	0	0	8.64	6958.309	0	421.691	4121.691	0	0
1999	11	28	0	0	0	8.64	7388.64	0	0	3691.36	0	0
1999	11	29	0.2	0	0	8.64	7397.28	0	0	3682.72	0	0
1999	11	30	0	0	0	8.64	7405.92	0	0	3674.08	0	0
1999	12	1	2.8	0	0	10.368	7416.288	0	0	3663.712	0	0
1999	12	2	0	0	0	10.368	7426.656	0	0	3653.344	0	0
1999	12	3	23.4	0.56	1290.744	10.368	6146.28	0	0	4933.72	0	0
1999	12	4	0.6	0	0	10.368	6156.648	0	0	4923.352	0	0
1999	12	5	0	0	0	10.368	6167.016	0	0	4912.984	0	0
1999	12	6	0	0	0	10.368	6177.384	0	0	4902.616	0	0
1999	12	7	0	0	0	10.368	6187.752	0	0	4892.248	0	0
1999	12	8	1.6	0	0	10.368	6198.12	0	0	4881.88	0	0
1999	12	9	8	0	0	10.368	6208.488	0	0	4871.512	0	0
1999	12	10	0.2	0	0	10.368	6218.856	0	0	4861.144	0	0
1999	12	11	0	0	0	10.368	6229.224	0	0	4850.776	0	0
1999	12	12	1.2	0	0	10.368	6239.592	0	0	4840.408	0	0
1999	12	13	0	0	0	10.368	6249.96	0	0	4830.04	0	0
1999	12	14	0	0	0	10.368	6260.328	0	0	4819.672	0	0
1999	12	15	0	0	0	10.368	6270.696	0	0	4809.304	0	0
1999	12	16	4.6	0	0	10.368	6281.064	0	0	4798.936	0	0
1999	12	17	0	0	0	10.368	6291.432	0	0	4788.568	0	0
1999	12	18	0	0	0	10.368	6301.8	0	0	4778.2	0	0
1999	12	19	0	0	0	10.368	6312.168	0	0	4767.832	0	0
1999	12	20	0	0	0	10.368	6322.536	0	1057.464	4757.464	0	0
1999	12	21	0	0	0	10.368	7390.368	0	0	3689.632	0	0
1999	12	22	0	0	0	10.368	7400.736	0	0	3679.264	0	0
1999	12	23	0	0	0	10.368	7411.104	0	0	3668.896	0	0
1999	12	24	0	0	0	10.368	7421.472	0	0	3658.528	0	0
1999	12	25	1.2	0	0	10.368	7431.84	0	0	3648.16	0	0
1999	12	26	0	0	0	10.368	7442.208	0	0	3637.792	0	0
1999	12	27	0.2	0	0	10.368	7452.576	0	0	3627.424	0	0
1999	12	28	1.8	0	0	10.368	7462.944	0	0	3617.056	0	0
1999	12	29	0.2	0	0	10.368	7473.312	0	0	3606.688	0	0
1999	12	30	0	0	0	10.368	7483.68	0	0	3596.32	0	0
1999	12	31	2	0	0	10.368	7494.048	0	0	3585.952	0	0
			997.8		45072.221	2362.896		15208.509	32166.384		0	6

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient Cv	Inputs Overland Flow Quarry (m^3)	Outputs Evaporation (m^3)	Estimated Sediment Dam Available Capacity (m^3)	Adjusted Sediment Dam Available Capacity (m^3)	Predicted Frequency of Event Discharge from Sediment Dam	Uncontrolled Flow Discharged from Sediment Dam (m^3)	Volume of Controlled Flow Discharged from Sediment Dam (m^3)	Controlled Flow Discharged from Sediment Dam (m^3)	Volume of Sediment Water Remaining (m^3)	Days Basin is empty	Predicted Frequency of Uncontrolled Discharge	Overflow events
1999	1	1	0	0	0	11.52	10990	10990	0	0	0	0	10990	0	0	
1999	1	2	0	0	0	11.52	11001.52	11001.52	0	0	0	0	5478.48	0	0	0
1999	1	3	0	0	0	11.52	11013.04	11013.04	0	0	0	0	5466.96	0	0	0
1999	1	4	0	0	0	11.52	11024.56	11024.56	0	0	0	0	5455.44	0	0	0
1999	1	5	0	0	0	11.52	11036.08	11036.08	0	0	-46.08	0	5443.92	0	0	0
1999	1	6	0	0	0	11.52	11047.6	11047.6	0	0	-57.6	0	5432.4	0	0	0
1999	1	7	0.4	0	0	11.52	11059.12	11059.12	0	0	0	0	5420.88	0	0	0
1999	1	8	16	0.43	677.68	11.52	10392.96	10392.96	0	0	0	0	6087.04	0	0	0
1999	1	9	0	0	0	11.52	10404.48	10404.48	0	0	0	0	6075.52	0	0	0
1999	1	10	0	0	0	11.52	10416	10416	0	0	0	0	6064	0	0	0
1999	1	11	0	0	0	11.52	10427.52	10427.52	0	0	0	0	6052.48	0	0	0
1999	1	12	0	0	0	11.52	10439.04	10439.04	0	0	550.96	550.96	6040.96	0	0	0
1999	1	13	0	0	0	11.52	11001.52	11001.52	0	0	-11.52	0	5478.48	0	0	0
1999	1	14	0	0	0	11.52	11013.04	11013.04	0	0	-23.04	0	5466.96	0	0	0
1999	1	15	0	0	0	11.52	11024.56	11024.56	0	0	-34.56	0	5455.44	0	0	0
1999	1	16	0	0	0	11.52	11036.08	11036.08	0	0	-46.08	0	5443.92	0	0	0
1999	1	17	0	0	0	11.52	11047.6	11047.6	0	0	-57.6	0	5432.4	0	0	0
1999	1	18	0	0	0	11.52	11059.12	11059.12	0	0	-69.12	0	5420.88	0	0	0
1999	1	19	0	0	0	11.52	11070.64	11070.64	0	0	-80.64	0	5409.36	0	0	0
1999	1	20	0	0	0	11.52	11082.16	11082.16	0	0	-92.16	0	5397.84	0	0	0
1999	1	21	0	0	0	11.52	11093.68	11093.68	0	0	-103.68	0	5386.32	0	0	0
1999	1	22	0	0	0	11.52	11105.2	11105.2	0	0	-115.2	0	5374.8	0	0	0
1999	1	23	0	0	0	11.52	11116.72	11116.72	0	0	-126.72	0	5363.28	0	0	0
1999	1	24	0	0	0	11.52	11128.24	11128.24	0	0	-138.24	0	5351.76	0	0	0
1999	1	25	0	0	0	11.52	11139.76	11139.76	0	0	-149.76	0	5340.24	0	0	0
1999	1	26	0.8	0	0	11.52	11151.28	11151.28	0	0	0	0	5328.72	0	0	0
1999	1	27	0	0	0	11.52	11162.8	11162.8	0	0	0	0	5317.2	0	0	0
1999	1	28	0	0	0	11.52	11174.32	11174.32	0	0	0	0	5305.68	0	0	0
1999	1	29	0.2	0	0	11.52	11185.84	11185.84	0	0	0	0	5294.16	0	0	0
1999	1	30	0	0	0	11.52	11197.36	11197.36	0	0	0	0	5282.64	0	0	0
1999	1	31	0.6	0	0	11.52	11208.88	11208.88	0	0	0	0	5271.12	0	0	0
1999	2	1	0	0	0	10.224	11219.104	11219.104	0	0	0	0	5260.896	0	0	0
1999	2	2	0	0	0	10.224	11229.328	11229.328	0	0	0	0	5250.672	0	0	0
1999	2	3	0	0	0	10.224	11239.552	11239.552	0	0	0	0	5240.448	0	0	0
1999	2	4	0	0	0	10.224	11249.776	11249.776	0	0	-259.776	0	5230.224	0	0	0
1999	2	5	0	0	0	10.224	11260	11260	0	0	-270	0	5220	0	0	0
1999	2	6	0.8	0	0	10.224	11270.224	11270.224	0	0	0	0	5209.776	0	0	0
1999	2	7	0	0	0	10.224	11280.448	11280.448	0	0	0	0	5199.552	0	0	0
1999	2	8	0	0	0	10.224	11290.672	11290.672	0	0	0	0	5189.328	0	0	0
1999	2	9	0	0	0	10.224	11300.896	11300.896	0	0	0	0	5179.104	0	0	0
1999	2	10	0	0	0	10.224	11311.12	11311.12	0	0	-321.12	0	5168.88	0	0	0
1999	2	11	0.4	0	0	10.224	11321.344	11321.344	0	0	0	0	5158.656	0	0	0
1999	2	12	0	0	0	10.224	11331.568	11331.568	0	0	0	0	5148.432	0	0	0
1999	2	13	0	0	0	10.224	11341.792	11341.792	0	0	0	0	5138.208	0	0	0
1999	2	14	0	0	0	10.224	11352.016	11352.016	0	0	0	0	5127.984	0	0	0
1999	2	15	0	0	0	10.224	11362.24	11362.24	0	0	-372.24	0	5117.76	0	0	0
1999	2	16	0	0	0	10.224	11372.464	11372.464	0	0	-382.464	0	5107.536	0	0	0
1999	2	17	0	0	0	10.224	11382.688	11382.688	0	0	-392.688	0	5097.312	0	0	0
1999	2	18	3.4	0	0	10.224	11392.912	11392.912	0	0	0	0	5087.088	0	0	0
1999	2	19	0	0	0	10.224	11403.136	11403.136	0	0	0	0	5076.864	0	0	0
1999	2	20	0	0	0	10.224	11413.36	11413.36	0	0	0	0	5066.64	0	0	0
1999	2	21	0	0	0	10.224	11423.584	11423.584	0	0	0	0	5056.416	0	0	0
1999	2	22	0	0	0	10.224	11433.808	11433.808	0	0	-443.808	0	5046.192	0	0	0
1999	2	23	0	0	0	10.224	11444.032	11444.032	0	0	-454.032	0	5035.968	0	0	0
1999	2	24	0	0	0	10.224	11454.256	11454.256	0	0	-464.256	0	5025.744	0	0	0
1999	2	25	0	0	0	10.224	11464.48	11464.48	0	0	-474.48	0	5015.52	0	0	0
1999	2	26	0	0	0	10.224	11474.704	11474.704	0	0	-484.704	0	5005.296	0	0	0
1999	2	27	0	0	0	10.224	11484.928	11484.928	0	0	-494.928	0	4995.072	0	0	0
1999	2	28	0	0	0	10.224	11495.152	11495.152	0	0	-505.152	0	4984.848	0	0	0
1999	3	1	0	0	0	8.352	11503.504	11503.504	0	0	-513.504	0	4976.496	0	0	0
1999	3	2	0	0	0	8.352	11511.856	11511.856	0	0	-521.856	0	4968.144	0	0	0
1999	3	3	0	0	0	8.352	11520.208	11520.208	0	0	-530.208	0	4959.792	0	0	0
1999	3	4	0	0	0	8.352	11528.56	11528.56	0	0	-538.56	0	4951.44	0	0	0
1999	3	5	0	0	0	8.352	11536.912	11536.912	0	0	-546.912	0	4943.088	0	0	0
1999	3	6	0	0	0	8.352	11545.264	11545.264	0	0	-555.264	0	4934.736	0	0	0
1999	3	7	19.6	0.43	830.158	8.352	10723.458	10723.458	0	0	0	0	5756.542	0	0	0
1999	3	8	0.2	0	0	8.352	10731.81	10731.81	0	0	0	0	5748.19	0	0	0
1999	3	9	0	0	0	8.352	10740.162	10740.162	0	0	0	0	5739.838	0	0	0
1999	3	10	0	0	0	8.352	10748.514	10748.514	0	0	0	0	5731.486	0	0	0
1999	3	11	0	0	0	8.352	10756.866	10756.866	0	0	0	0	5723.134	0	0	0
1999	3	12	0	0	0	8.352	10765.218	10765.218	0	0	224.782	224.782	5714.782	0	0	0
1999	3	13	0	0	0	8.352	10998.352	10998.352	0	0	-8.352	0	5481.648	0	0	0
1999	3	14	0	0	0	8.352	11006.704	11006.704	0	0	-16.704	0	5473.296	0	0	0
1999	3	15	0	0	0	8.352	11015.056	11015.056	0	0	-25.056	0	5464.944	0	0	0
1999	3	16	0	0	0	8.352	11023.408	11023.408	0	0	-33.408	0	5456.592	0	0	0
1999	3	17	0	0	0	8.352	11031.76	11031.76	0	0	-41.76	0	5448.24	0	0	0
1999	3	18	11	0.43	465.905	8.352	10574.207	10574.207	0	0	0	0	5905.793	0	0	0
1999	3	19	1.6	0	0	8.352	10582.559	10582.559	0	0	0	0	5897.441	0	0	0
1999	3	20	0	0	0	8.352	10590.911	10590.911	0	0	0	0	5889.089	0	0	0
1999	3	21	48	0.74	3498.72	8.352	7100.543	7100.543	0	0	0	0	9379.457	0	0	0
1999	3	22	2.6	0	0	8.352	7108.895	7108.895	0	0	0	0	9371.105	0	0	0
1999	3	23	0	0	0	8.352	7117.247	7117.247	0	0	0	0	9362.753	0	0	0
1999	3	24	0	0	0	8.352	7125.599	7125.599	0	0	0	0	9354.401	0	0	0
1999	3	25	11	0.43	465.905	8.352	6668.046	6668.046	0	0	0	0	9811.954	0	0	0
1999	3	26	2.8	0	0	8.352	6676.398	6676.398	0	0	0	0	9803.602	0	0	0
1999	3	27	0	0	0	8.352	6684.75	6684.75	0	0	0	0	9795.25	0	0	0
1999	3	28	4.6	0	0	8.352	6693.102	6693.102	0	0	0	0	9786.898	0	0	0
1999	3	29	0	0	0	8.352	6701.454	6701.454	0	0	0	0	9778.546	0	0	0
1999	3	30	0	0	0	8.352	6709.806	6709.806	0	0	0	0	9770.194	0	0	0
1999	3	31	1.8	0	0	8.352	6718.158	6718.158	0	0	0	0	9761.842	0	0	0
1999	4	1	0	0	0	5.328	6723.486	6723.486	0	0	0	0	9756.514	0	0	0
1999	4	2	0	0	0	5.328	6728.814	6728.814	0	0	0	0	9751.186	0	0	0
1999	4	3	0	0	0	5.328	6734.142	6734.142	0	0	0	0	9745.858	0	0	0
1999	4	4	1.2	0	0	5.328	6739.47	6739.47	0	0	0	0	9740.53	0	0	0
1999	4	5	3.2	0	0	5.328	6744.798	6744.798	0	0	0	0	9735.202	0	0	0
1999	4	6	0	0	0	5.328	6750.126	6750.126	0	0	0	0	9729.874	0	0	0
1999	4	7	0	0	0	5.328	6755.454	6755.454	0	0	0	0	9724.546	0	0	0
1999	4	8	0	0	0	5.328	6760.782	6760.782	0	0	0	0	9719.218	0	0	0
1999	4	9	0	0	0	5.328	6766.11	6766.11	0	0	4223.89	4223.89	9713.89	0	0	0
1999	4	10	0	0	0	5.328	10995.328	10995.328	0	0	-5.328	0	5484.672	0	0	0
1999	4	11	0	0	0	5.328	11000.656	11000.656	0	0	-10.656	0	5479.344	0	0	0
1999	4	12	0	0	0	5.328	11005.984	11005.984	0	0	-15.984	0	5474.016	0	0	0
1999	4	13	0	0	0	5.328	11011.312	11011.312	0	0	-21.312	0	5468.688	0	0	0
1999	4	14	0	0	0	5.328	11016.64	11016.64	0	0	-26.64	0	5463.36	0	0	0
1999	4	15	0	0	0	5.328	11021.968	11021.968	0	0	-31.968	0	5458.032	0	0	0
1999	4	16	0	0	0	5.328	11027.296	11027.296	0	0	-37.296	0	5452.704	0	0	0
1999	4	17	0	0	0	5.328	11032.624	11032.624	0	0	-42.624	0	5447.376	0	0	0
1999	4	18	0	0	0	5.328	11037.952	11037.952	0	0	-47.952	0	5442.048	0	0	0
1999	4	19	0	0	0	5.328	11043.28	11043.28	0	0	-53.28	0	5436.72	0	0	0
1999	4	20	6.8	0	0	5.328	11048.608	11048.608	0	0	0	0	5431.392	0	0	0
1999	4	21	4.2	0	0	5.328	11053.936	11053.936	0	0	0	0	5426.064	0	0	0
1999	4	22	0	0	0	5.328	11059.264	11059.264	0	0	0	0	5420.736	0	0	0
1999	4	23	0	0	0	5.328	11064.592	11064.592	0	0	0	0	5415.408	0	0	0
1999	4	24	0	0	0	5.328	11069.92	11069.92	0	0	0	0	5410.08	0	0	0
1999	4	25	0	0	0	5.328	11075.248	11075.248	0	0	-85.248	0	5404.752	0	0	0
1999	4	26	0	0	0	5.328	11080.576	11080.576	0	0	-90.576	0	5399.424	0	0	0
1999	4	27	1.2	0	0	5.328	11085.904	11085.904	0	0	0	0	5394.096	0	0	0
1999	4	28	0.6	0	0	5.328	11091.232	11091.232	0	0	0	0	5388.768	0	0	0
1999	4	29	0.2	0	0	5.328	11096.56	11096.56	0	0	0	0	5383.44	0	0	0
1999	4	30	0	0	0	5.328	11101.888	11101.888	0	0	0	0	5378.112	0	0	0
1999	5	1	0	0	0	3.456	11105.344	11105.344	0	0	0	0	5374.656	0	0	0
1999	5	2	0	0	0	3.456	11108.8	11108.8	0	0	0	0	5371.2	0	0	0
1999	5	3	0	0	0	3.456	11112.256	11112.256	0	0	-122.256	0	5367.744	0	0	0
1999	5	4	0	0	0	3.456	11115.712	11115.712	0	0	-125.712	0	5364.288	0	0	0
1999	5	5	0	0	0	3.456	11119.168	11119.168	0	0	-129.168	0	5360.832	0	0	0
1999	5	6	0	0	0	3.456	11122.624	11122.624	0	0	-132.624	0	5357.376	0	0	0
1999	5	7	0	0	0	3.456	11126.08	11126.08	0	0	-136.08	0	5353.92	0	0	0
1999	5	8	0	0	0	3.456	11129.536	11129.536	0	0	-139.536	0	5350.464	0	0	0
1999	5	9	0	0	0	3.456	11132.992	11132.992	0	0	-142.992	0	5347.008	0	0	0
1999	5	10	0.4	0	0	3.456	11136.448	11136.448	0	0	0	0	5343.552	0	0	0
1999	5	11	0	0	0	3.456	11139.904	11139.904	0	0	0	0	5340.096	0	0	0
1999	5	12	11.6	0.43	491.318	3.456	10652.042	10652.042	0	0	0	0	5827.958	0	0	0
1999	5	13	30.4	0.69	2066.136	3.456	8589.362	8589.362	0	0	0	0	7890.638	0	0	0
1999	5	14	0.6	0	0	3.456	8592.818	8592.818	0	0	0	0	7887.182	0	0	0
1999	5	15	0	0	0	3.456	8596.274	8596.274	0	0	0	0	7883.726	0	0	0
1999	5	16	42.8	0.74	3119.692	3.456	5480.038	5480.038	0	0	0	0	10999.962	0	0	0
1999	5	17	0	0	0	3.456	5483.494	5483.494	0	0	0	0	10996.506	0	0	0
1999	5	18	0.8	0	0	3.456	5486.95	5486.95	0	0	0	0	10993.05	0	0	0
1999	5	19	0	0	0	3.456	5490.406	5490.406	0	0	0	0	10989.594	0	0	0
1999	5	20	0	0	0	3.456	5493.862	5493.862	0	0	0	0	10986.138	0	0	0
1999	5	21	6.4	0	0	3.456	5497.318	5497.318	0	0	0	0	10982.682	0	0	0
1999	5	22	5.2	0	0	3.456	5500.774	5500.774	0	0	0	0	10979.226	0	0	0
1999	5	23	44.2	0.74	3221.738	3.456	2282.492	2282.492	0	0	0	0	14197.508	0	0	0
1999	5	24	15.8	0.43	669.209	3.456	1616.739	1616.739	0	0	0	0	14863.261	0	0	0
1999	5	25	78	0.81	6223.23	3.456	-4603.035	0	1	4603.035	0	0	16480	0	1	0
1999	5	26	11.4	0.43	482.847	3.456	-479.391	0	1	479.391	0	0	16480	0	1	0
1999	5	27	1.6	0	0	3.456	3.456	3.456	0	0	0	0	16476.544	0	1	1
1999	5	28	0	0	0	3.456	6.912	6.912	0	0	0	0	16473.088	0	0	0
1999	5	29	14	0.43	592.97	3.456	-582.602	0	1	582.602	0	0	16480	0	1	0
1999	5	30	10.4	0.43	440.492	3.456	-437.036	0	1	437.036	0	0	16480	0	1	0
1999	5	31	13.2	0.43	559.086	3.456	-555.63	0	1	555.63	0	0	16480	0	1	0
1999	6	1	0	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	1
1999	6	2	0.2	0	0	2.592	5.184	5.184	0	0	0	0	16474.816	0	0	0
1999	6	3	0.2	0	0	2.592	7.776	7.776	0	0	0	0	16472.224	0	0	0
1999	6	4	0	0	0	2.592	10.368	10.368	0	0	0	0	16469.632	0	0	0
1999	6	5	12.8	0.43	542.144	2.592	-529.184	0	1	529.184	0	0	16480	0	1	0
1999	6	6	1.4	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	1
1999	6	7	8.2	0	0	2.592	5.184	5.184	0	0	0	0	16474.816	0	0	0

1999	6	8	0.2	0	0	2.592	7.776	7.776	0	0	0	0	16472.224	0	0	0
1999	6	9	0.2	0	0	2.592	10.368	10.368	0	0	0	0	16469.632	0	0	0
1999	6	10	7.2	0	0	2.592	12.96	12.96	0	0	0	0	16467.04	0	0	0
1999	6	11	0	0	0	2.592	15.552	15.552	0	0	0	0	16464.448	0	0	0
1999	6	12	0	0	0	2.592	18.144	18.144	0	0	0	0	16461.856	0	0	0
1999	6	13	36.2	0.69	2460.333	2.592	-2439.597	0	1	2439.597	0	0	16480	0	1	0
1999	6	14	0	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	0
1999	6	15	16.6	0.43	703.093	2.592	-697.909	0	1	697.909	0	0	16480	0	1	0
1999	6	16	5	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	1
1999	6	17	0.4	0	0	2.592	5.184	5.184	0	0	0	0	16474.816	0	0	0
1999	6	18	14.8	0.43	626.854	2.592	-619.078	0	1	619.078	0	0	16480	0	1	0
1999	6	19	2.4	0	0	2.592	2.592	2.592	0	0	0	0	16477.408	0	1	1
1999	6	20	0.2	0	0	2.592	5.184	5.184	0	0	0	0	16474.816	0	0	0
1999	6	21	4.4	0	0	2.592	7.776	7.776	0	0	0	0	16472.224	0	0	0
1999	6	22	0.6	0	0	2.592	10.368	10.368	0	0	0	0	16469.632	0	0	0
1999	6	23	0.4	0	0	2.592	12.96	12.96	0	0	0	0	16467.04	0	0	0
1999	6	24	0.2	0	0	2.592	15.552	15.552	0	0	0	0	16464.448	0	0	0
1999	6	25	7.6	0	0	2.592	18.144	18.144	0	0	0	0	16461.856	0	0	0
1999	6	26	3.8	0	0	2.592	20.736	20.736	0	0	0	0	16459.264	0	0	0
1999	6	27	0	0	0	2.592	23.328	23.328	0	0	0	0	16456.672	0	0	0
1999	6	28	0.2	0	0	2.592	25.92	25.92	0	0	0	0	16454.08	0	0	0
1999	6	29	0	0	0	2.592	28.512	28.512	0	0	0	0	16451.488	0	0	0
1999	6	30	16.2	0.43	686.151	2.592	-655.047	0	1	655.047	0	0	16480	0	1	0
1999	7	1	0.6	0	0	2.448	2.448	2.448	0	0	0	0	16477.552	0	1	1
1999	7	2	4.8	0	0	2.448	4.896	4.896	0	0	0	0	16475.104	0	0	0
1999	7	3	0.4	0	0	2.448	7.344	7.344	0	0	0	0	16472.656	0	0	0
1999	7	4	0	0	0	2.448	9.792	9.792	0	0	0	0	16470.208	0	0	0
1999	7	5	0	0	0	2.448	12.24	12.24	0	0	0	0	16467.76	0	0	0
1999	7	6	0	0	0	2.448	14.688	14.688	0	0	0	0	16465.312	0	0	0
1999	7	7	0	0	0	2.448	17.136	17.136	0	0	10972.864	10972.864	16462.864	0	0	0
1999	7	8	2	0	0	2.448	10992.448	10992.448	0	0	0	0	5487.552	0	0	0
1999	7	9	18.6	0.43	787.803	2.448	10207.093	10207.093	0	0	0	0	6272.907	0	0	0
1999	7	10	0	0	0	2.448	10209.541	10209.541	0	0	0	0	6270.459	0	0	0
1999	7	11	0	0	0	2.448	10211.989	10211.989	0	0	0	0	6268.011	0	0	0
1999	7	12	0.4	0	0	2.448	10214.437	10214.437	0	0	0	0	6265.563	0	0	0
1999	7	13	0.4	0	0	2.448	10216.885	10216.885	0	0	0	0	6263.115	0	0	0
1999	7	14	0.4	0	0	2.448	10219.333	10219.333	0	0	0	0	6260.667	0	0	0
1999	7	15	0.2	0	0	2.448	10221.781	10221.781	0	0	0	0	6258.219	0	0	0
1999	7	16	0	0	0	2.448	10224.229	10224.229	0	0	0	0	6255.771	0	0	0
1999	7	17	0	0	0	2.448	10226.677	10226.677	0	0	0	0	6253.323	0	0	0
1999	7	18	0	0	0	2.448	10229.125	10229.125	0	0	0	0	6250.875	0	0	0
1999	7	19	0	0	0	2.448	10231.573	10231.573	0	0	758.427	758.427	6248.427	0	0	0
1999	7	20	30.2	0.69	2052.543	2.448	8939.905	8939.905	0	0	0	0	7540.095	0	0	0
1999	7	21	5.8	0	0	2.448	8942.353	8942.353	0	0	0	0	7537.647	0	0	0
1999	7	22	5.8	0	0	2.448	8944.801	8944.801	0	0	0	0	7535.199	0	0	0
1999	7	23	0	0	0	2.448	8947.249	8947.249	0	0	0	0	7532.751	0	0	0
1999	7	24	0	0	0	2.448	8949.697	8949.697	0	0	0	0	7530.303	0	0	0
1999	7	25	0	0	0	2.448	8952.145	8952.145	0	0	0	0	7527.855	0	0	0
1999	7	26	0.8	0	0	2.448	8954.593	8954.593	0	0	0	0	7525.407	0	0	0
1999	7	27	0	0	0	2.448	8957.041	8957.041	0	0	0	0	7522.959	0	0	0
1999	7	28	0	0	0	2.448	8959.489	8959.489	0	0	0	0	7520.511	0	0	0
1999	7	29	0	0	0	2.448	8961.937	8961.937	0	0	0	0	7518.063	0	0	0
1999	7	30	0.2	0	0	2.448	8964.385	8964.385	0	0	0	0	7515.615	0	0	0
1999	7	31	0.6	0	0	2.448	8966.833	8966.833	0	0	0	0	7513.167	0	0	0
1999	8	1	0	0	0	3.312	8970.145	8970.145	0	0	0	0	7509.855	0	0	0
1999	8	2	0	0	0	3.312	8973.457	8973.457	0	0	0	0	7506.543	0	0	0
1999	8	3	0	0	0	3.312	8976.769	8976.769	0	0	0	0	7503.231	0	0	0
1999	8	4	0	0	0	3.312	8980.081	8980.081	0	0	2009.919	2009.919	7499.919	0	0	0
1999	8	5	0	0	0	3.312	10993.312	10993.312	0	0	-3.312	0	5486.688	0	0	0
1999	8	6	0	0	0	3.312	10996.624	10996.624	0	0	-6.624	0	5483.376	0	0	0
1999	8	7	0	0	0	3.312	10999.936	10999.936	0	0	-9.936	0	5480.064	0	0	0
1999	8	8	21	0.56	1158.36	3.312	9844.888	9844.888	0	0	0	0	6635.112	0	0	0
1999	8	9	24	0.56	1323.84	3.312	8524.36	8524.36	0	0	0	0	7955.64	0	0	0
1999	8	10	4	0	0	3.312	8527.672	8527.672	0	0	0	0	7952.328	0	0	0
1999	8	11	0	0	0	3.312	8530.984	8530.984	0	0	0	0	7949.016	0	0	0
1999	8	12	0.6	0	0	3.312	8534.296	8534.296	0	0	0	0	7945.704	0	0	0
1999	8	13	1.2	0	0	3.312	8537.608	8537.608	0	0	0	0	7942.392	0	0	0
1999	8	14	0	0	0	3.312	8540.92	8540.92	0	0	0	0	7939.08	0	0	0
1999	8	15	5	0	0	3.312	8544.232	8544.232	0	0	0	0	7935.768	0	0	0
1999	8	16	0	0	0	3.312	8547.544	8547.544	0	0	0	0	7932.456	0	0	0
1999	8	17	0.2	0	0	3.312	8550.856	8550.856	0	0	0	0	7929.144	0	0	0
1999	8	18	0	0	0	3.312	8554.168	8554.168	0	0	0	0	7925.832	0	0	0
1999	8	19	0	0	0	3.312	8557.48	8557.48	0	0	0	0	7922.52	0	0	0
1999	8	20	0	0	0	3.312	8560.792	8560.792	0	0	0	0	7919.208	0	0	0
1999	8	21	0	0	0	3.312	8564.104	8564.104	0	0	2425.896	2425.896	7915.896	0	0	0
1999	8	22	0	0	0	3.312	10993.312	10993.312	0	0	-3.312	0	5486.688	0	0	0
1999	8	23	0	0	0	3.312	10996.624	10996.624	0	0	-6.624	0	5483.376	0	0	0
1999	8	24	0.2	0	0	3.312	10999.936	10999.936	0	0	0	0	5480.064	0	0	0
1999	8	25	0	0	0	3.312	11003.248	11003.248	0	0	0	0	5476.752	0	0	0
1999	8	26	0.6	0	0	3.312	11006.56	11006.56	0	0	0	0	5473.44	0	0	0
1999	8	27	4.6	0	0	3.312	11009.872	11009.872	0	0	0	0	5470.128	0	0	0
1999	8	28	0	0	0	3.312	11013.184	11013.184	0	0	0	0	5466.816	0	0	0
1999	8	29	0	0	0	3.312	11016.496	11016.496	0	0	0	0	5463.504	0	0	0
1999	8	30	0.4	0	0	3.312	11019.808	11019.808	0	0	0	0	5460.192	0	0	0
1999	8	31	0	0	0	3.312	11023.12	11023.12	0	0	0	0	5456.88	0	0	0
1999	9	1	0	0	0	4.896	11028.016	11028.016	0	0	0	0	5451.984	0	0	0
1999	9	2	0	0	0	4.896	11032.912	11032.912	0	0	0	0	5447.088	0	0	0
1999	9	3	0	0	0	4.896	11037.808	11037.808	0	0	-47.808	0	5442.192	0	0	0
1999	9	4	36.2	0.69	2460.333	4.896	8582.371	8582.371	0	0	0	0	7897.629	0	0	0
1999	9	5	0	0	0	4.896	8587.267	8587.267	0	0	0	0	7892.733	0	0	0
1999	9	6	10.8	0.43	457.434	4.896	8134.729	8134.729	0	0	0	0	8345.271	0	0	0
1999	9	7	0.4	0	0	4.896	8139.625	8139.625	0	0	0	0	8340.375	0	0	0
1999	9	8	0	0	0	4.896	8144.521	8144.521	0	0	0	0	8335.479	0	0	0
1999	9	9	0	0	0	4.896	8149.417	8149.417	0	0	0	0	8330.583	0	0	0
1999	9	10	0	0	0	4.896	8154.313	8154.313	0	0	0	0	8325.687	0	0	0
1999	9	11	4.6	0	0	4.896	8159.209	8159.209	0	0	0	0	8320.791	0	0	0
1999	9	12	0.4	0	0	4.896	8164.105	8164.105	0	0	0	0	8315.895	0	0	0
1999	9	13	2.2	0	0	4.896	8169.001	8169.001	0	0	0	0	8310.999	0	0	0
1999	9	14	0	0	0	4.896	8173.897	8173.897	0	0	0	0	8306.103	0	0	0
1999	9	15	0.2	0	0	4.896	8178.793	8178.793	0	0	0	0	8301.207	0	0	0
1999	9	16	13.8	0.43	584.499	4.896	7599.19	7599.19	0	0	0	0	8880.81	0	0	0
1999	9	17	26.8	0.56	1478.288	4.896	6125.798	6125.798	0	0	0	0	10354.202	0	0	0
1999	9	18	2	0	0	4.896	6130.694	6130.694	0	0	0	0	10349.306	0	0	0
1999	9	19	0	0	0	4.896	6135.59	6135.59	0	0	0	0	10344.41	0	0	0
1999	9	20	0.2	0	0	4.896	6140.486	6140.486	0	0	0	0	10339.514	0	0	0
1999	9	21	0	0	0	4.896	6145.382	6145.382	0	0	0	0	10334.618	0	0	0
1999	9	22	0	0	0	4.896	6150.278	6150.278	0	0	0	0	10329.722	0	0	0
1999	9	23	0	0	0	4.896	6155.174	6155.174	0	0	0	0	10324.826	0	0	0
1999	9	24	0	0	0	4.896	6160.07	6160.07	0	0	4829.93	4829.93	10319.93	0	0	0
1999	9	25	0	0	0	4.896	10994.896	10994.896	0	0	-4.896	0	5485.104	0	0	0
1999	9	26	0	0	0	4.896	10999.792	10999.792	0	0	-9.792	0	5480.208	0	0	0
1999	9	27	0	0	0	4.896	11004.688	11004.688	0	0	-14.688	0	5475.312	0	0	0
1999	9	28	0	0	0	4.896	11009.584	11009.584	0	0	-19.584	0	5470.416	0	0	0
1999	9	29	16.8	0.43	711.564	4.896	10302.916	10302.916	0	0	0	0	6177.084	0	0	0
1999	9	30	0	0	0	4.896	10307.812	10307.812	0	0	0	0	6172.188	0	0	0
1999	10	1	0	0	0	6.768	10314.58	10314.58	0	0	0	0	6165.42	0	0	0
1999	10	2	0	0	0	6.768	10321.348	10321.348	0	0	0	0	6158.652	0	0	0
1999	10	3	21.4	0.56	1180.424	6.768	9147.692	9147.692	0	0	0	0	7332.308	0	0	0
1999	10	4	0	0	0	6.768	9154.46	9154.46	0	0	0	0	7325.54	0	0	0
1999	10	5	0	0	0	6.768	9161.228	9161.228	0	0	0	0	7318.772	0	0	0
1999	10	6	0	0	0	6.768	9167.996	9167.996	0	0	0	0	7312.004	0	0	0
1999	10	7	0	0	0	6.768	9174.764	9174.764	0	0	1815.236	1815.236	7305.236	0	0	0
1999	10	8	0	0	0	6.768	10996.768	10996.768	0	0	-6.768	0	5483.232	0	0	0
1999	10	9	0.8	0	0	6.768	11003.536	11003.536	0	0	0	0	5476.464	0	0	0
1999	10	10	20.6	0.56	1136.296	6.768	9874.008	9874.008	0	0	0	0	6605.992	0	0	0
1999	10	11	15.8	0.43	669.209	6.768	9211.567	9211.567	0	0	0	0	7268.433	0	0	0
1999	10	12	0.4	0	0	6.768	9218.335	9218.335	0	0	0	0	7261.665	0	0	0
1999	10	13	9.2	0	0	6.768	9225.103	9225.103	0	0	0	0	7254.897	0	0	0
1999	10	14	7.4	0	0	6.768	9231.871	9231.871	0	0	0	0	7248.129	0	0	0
1999	10	15	1	0	0	6.768	9238.639	9238.639	0	0	0	0	7241.361	0	0	0
1999	10	16	0	0	0	6.768	9245.407	9245.407	0	0	0	0	7234.593	0	0	0
1999	10	17	0	0	0	6.768	9252.175	9252.175	0	0	0	0	7227.825	0	0	0
1999	10	18	0.4	0	0	6.768	9258.943	9258.943	0	0	0	0	7221.057	0	0	0
1999	10	19	0.2	0	0	6.768	9265.711	9265.711	0	0	0	0	7214.289	0	0	0
1999	10	20	0.2	0	0	6.768	9272.479	9272.479	0	0	0	0	7207.521	0	0	0
1999	10	21	0	0	0	6.768	9279.247	9279.247	0	0	0	0	7200.753	0	0	0
1999	10	22	0.6	0	0	6.768	9286.015	9286.015	0	0	0	0	7193.985	0	0	0
1999	10	23	0	0	0	6.768	9292.783	9292.783	0	0	0	0	7187.217	0	0	0
1999	10	24	0.2	0	0	6.768	9299.551	9299.551	0	0	0	0	7180.449	0	0	0
1999	10	25	1.2	0	0	6.768	9306.319	9306.319	0	0	0	0	7173.681	0	0	0
1999	10	26	1.2	0	0	6.768	9313.087	9313.087	0	0	0	0	7166.913	0	0	0
1999	10	27	3	0	0	6.768	9319.855	9319.855	0	0	0	0	7160.145	0	0	0
1999	10	28	0.2	0	0	6.768	9326.623	9326.623	0	0	0	0	7153.377	0	0	0
1999	10	29	0	0	0	6.768	9333.391	9333.391	0	0	0	0	7146.609	0	0	0
1999	10	30	0	0	0	6.768	9340.159	9340.159	0	0	0	0	7139.841	0	0	0
1999	10	31	4.6	0	0	6.768	9346.927	9346.927	0	0	0	0	7133.073	0	0	0
1999	11	1	0	0	0	8.64	9355.567	9355.567	0	0	0	0	7124.433	0	0	0
1999	11	2	0	0	0	8.64	9364.207	9364.207	0	0	0	0	7115.793	0	0	0
1999	11	3	0	0	0	8.64	9372.847	9372.847	0	0	0	0	7107.153	0	0	0
1999	11	4	0.2	0	0	8.64	9381.487	9381.487	0	0	0	0	7098.513	0	0	0
1999	11	5	0	0	0	8.64	9390.127	9390.127	0	0	0	0	7089.873	0	0	0
1999	11	6	10.4	0.43	440.492	8.64	8958.275	8958.275	0	0	0	0	7521.725	0	0	0
1999	11	7	0	0	0	8.64	8966.915	8966.915	0	0	0	0	7513.085	0	0	0
1999	11	8	5.2	0	0	8.64	8975.555	8975.555	0	0	0	0	7504.445	0	0	0
1999	11	9	4.4	0	0	8.64	8984.195	8984.195	0	0	0	0	7495.805	0	0	0
1999	11	10	2.8	0	0	8.64	8992.835	8992.835	0	0	0	0	7487.165	0	0	0
1999	11	11	1.4	0	0	8.64	9001.475	9001.475	0	0	0	0	7478.525	0	0	0
1999	11	12	0.2	0	0	8.64	9010.115	9010.115	0	0	0	0	7469.885	0	0	0
1999	11	13	0	0	0	8.64	9018.755	9018.755	0	0	0	0	7461.245	0	0	0
1999	11	14	0	0	0	8.64	9027.395	9027.395	0	0	0	0	7452.605	0	0	0
1999	11	15	0	0	0	8.64	9036.035	9036.035	0	0	0	0	7443.965	0	0	0
1999	11	16	0	0	0	8.64	9044.675	9044.675	0	0	1945.325	1945.325	7435.325	0	0	0
1999	11	17	0	0	0	8.64	10998.64	10998.64	0	0	-8.64	0	5481.36	0	0	0

1999	11	18	0	0	0	8.64	11007.28	11007.28	0	0	-17.28	0	5472.72	0	0	0
1999	11	19	0	0	0	8.64	11015.92	11015.92	0	0	-25.92	0	5464.08	0	0	0
1999	11	20	0.2	0	0	8.64	11024.56	11024.56	0	0	0	0	5455.44	0	0	0
1999	11	21	7.2	0	0	8.64	11033.2	11033.2	0	0	0	0	5446.8	0	0	0
1999	11	22	12.2	0.43	516.731	8.64	10525.109	10525.109	0	0	0	0	5954.891	0	0	0
1999	11	23	0.4	0	0	8.64	10533.749	10533.749	0	0	0	0	5946.251	0	0	0
1999	11	24	0	0	0	8.64	10542.389	10542.389	0	0	0	0	5937.611	0	0	0
1999	11	25	0	0	0	8.64	10551.029	10551.029	0	0	0	0	5928.971	0	0	0
1999	11	26	0	0	0	8.64	10559.669	10559.669	0	0	0	0	5920.331	0	0	0
1999	11	27	0	0	0	8.64	10568.309	10568.309	0	0	421.691	421.691	5911.691	0	0	0
1999	11	28	0	0	0	8.64	10998.64	10998.64	0	0	-8.64	0	5481.36	0	0	0
1999	11	29	0.2	0	0	8.64	11007.28	11007.28	0	0	0	0	5472.72	0	0	0
1999	11	30	0	0	0	8.64	11015.92	11015.92	0	0	0	0	5464.08	0	0	0
1999	12	1	2.8	0	0	10.368	11026.288	11026.288	0	0	0	0	5453.712	0	0	0
1999	12	2	0	0	0	10.368	11036.656	11036.656	0	0	0	0	5443.344	0	0	0
1999	12	3	23.4	0.56	1290.744	10.368	9756.28	9756.28	0	0	0	0	6723.72	0	0	0
1999	12	4	0.6	0	0	10.368	9766.648	9766.648	0	0	0	0	6713.352	0	0	0
1999	12	5	0	0	0	10.368	9777.016	9777.016	0	0	0	0	6702.984	0	0	0
1999	12	6	0	0	0	10.368	9787.384	9787.384	0	0	0	0	6692.616	0	0	0
1999	12	7	0	0	0	10.368	9797.752	9797.752	0	0	0	0	6682.248	0	0	0
1999	12	8	1.6	0	0	10.368	9808.12	9808.12	0	0	0	0	6671.88	0	0	0
1999	12	9	8	0	0	10.368	9818.488	9818.488	0	0	0	0	6661.512	0	0	0
1999	12	10	0.2	0	0	10.368	9828.856	9828.856	0	0	0	0	6651.144	0	0	0
1999	12	11	0	0	0	10.368	9839.224	9839.224	0	0	0	0	6640.776	0	0	0
1999	12	12	1.2	0	0	10.368	9849.592	9849.592	0	0	0	0	6630.408	0	0	0
1999	12	13	0	0	0	10.368	9859.96	9859.96	0	0	0	0	6620.04	0	0	0
1999	12	14	0	0	0	10.368	9870.328	9870.328	0	0	0	0	6609.672	0	0	0
1999	12	15	0	0	0	10.368	9880.696	9880.696	0	0	0	0	6599.304	0	0	0
1999	12	16	4.6	0	0	10.368	9891.064	9891.064	0	0	0	0	6588.936	0	0	0
1999	12	17	0	0	0	10.368	9901.432	9901.432	0	0	0	0	6578.568	0	0	0
1999	12	18	0	0	0	10.368	9911.8	9911.8	0	0	0	0	6568.2	0	0	0
1999	12	19	0	0	0	10.368	9922.168	9922.168	0	0	0	0	6557.832	0	0	0
1999	12	20	0	0	0	10.368	9932.536	9932.536	0	0	1057.464	1057.464	6547.464	0	0	0
1999	12	21	0	0	0	10.368	11000.368	11000.368	0	0	-10.368	0	5479.632	0	0	0
1999	12	22	0	0	0	10.368	11010.736	11010.736	0	0	-20.736	0	5469.264	0	0	0
1999	12	23	0	0	0	10.368	11021.104	11021.104	0	0	-31.104	0	5458.896	0	0	0
1999	12	24	0	0	0	10.368	11031.472	11031.472	0	0	-41.472	0	5448.528	0	0	0
1999	12	25	1.2	0	0	10.368	11041.84	11041.84	0	0	0	0	5438.16	0	0	0
1999	12	26	0	0	0	10.368	11052.208	11052.208	0	0	0	0	5427.792	0	0	0
1999	12	27	0.2	0	0	10.368	11062.576	11062.576	0	0	0	0	5417.424	0	0	0
1999	12	28	1.8	0	0	10.368	11072.944	11072.944	0	0	0	0	5407.056	0	0	0
1999	12	29	0.2	0	0	10.368	11083.312	11083.312	0	0	0	0	5396.688	0	0	0
1999	12	30	0	0	0	10.368	11093.68	11093.68	0	0	0	0	5386.32	0	0	0
1999	12	31	2	0	0	10.368	11104.048	11104.048	0	0	0	0	5375.952	0	0	0
			997.8		45072.221	2362.896				11598.509		31236.384		0	17	6

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m^3)	Uncontrolled Flow Discharged from Sediment Dam (m^3)	Controlled Flow Discharged from Sediment Dam (m^3)	Volume of Sediment Water Remaining (m^3)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m^3)	Evaporation (m^3)						
2009	1	1	0	0	0	5.12	1	0	0	2200	0	
2009	1	2	0	0	0	5.12	6.12	0	0	2224.88	0	0
2009	1	3	0	0	0	5.12	11.24	0	0	2219.76	0	0
2009	1	4	0	0	0	5.12	16.36	0	0	2214.64	0	0
2009	1	5	0	0	0	5.12	21.48	0	0	2209.52	0	0
2009	1	6	0	0	0	5.12	26.6	0	0	2204.4	0	0
2009	1	7	0	0	0	5.12	31.72	0	0	2199.28	0	0
2009	1	8	0	0	0	5.12	36.84	0	0	2194.16	0	0
2009	1	9	0	0	0	5.12	41.96	0	0	2189.04	0	0
2009	1	10	0	0	0	5.12	47.08	0	0	2183.92	0	0
2009	1	11	0	0	0	5.12	52.2	0	0	2178.8	0	0
2009	1	12	0	0	0	5.12	57.32	0	0	2173.68	0	0
2009	1	13	0	0	0	5.12	62.44	0	0	2168.56	0	0
2009	1	14	0	0	0	5.12	67.56	0	0	2163.44	0	0
2009	1	15	0	0	0	5.12	72.68	0	0	2158.32	0	0
2009	1	16	0	0	0	5.12	77.8	0	0	2153.2	0	0
2009	1	17	0	0	0	5.12	82.92	0	0	2148.08	0	0
2009	1	18	0	0	0	5.12	88.04	0	0	2142.96	0	0
2009	1	19	0	0	0	5.12	93.16	0	0	2137.84	0	0
2009	1	20	0	0	0	5.12	98.28	0	0	2132.72	0	0
2009	1	21	0	0	0	5.12	103.4	0	0	2127.6	0	0
2009	1	22	0	0	0	5.12	108.52	0	0	2122.48	0	0
2009	1	23	0	0	0	5.12	113.64	0	0	2117.36	0	0
2009	1	24	0.6	0	0	5.12	118.76	0	0	2112.24	0	0
2009	1	25	0	0	0	5.12	123.88	0	0	2107.12	0	0
2009	1	26	0	0	0	5.12	129	0	0	2102	0	0
2009	1	27	0	0	0	5.12	134.12	0	0	2096.88	0	0
2009	1	28	0	0	0	5.12	139.24	0	0	2091.76	0	0
2009	1	29	0	0	0	5.12	144.36	0	0	2086.64	0	0
2009	1	30	0	0	0	5.12	149.48	0	0	2081.52	0	0
2009	1	31	0	0	0	5.12	154.6	0	0	2076.4	0	0
2009	2	1	0	0	0	4.544	159.144	0	0	2071.856	0	0
2009	2	2	0	0	0	4.544	163.688	0	0	2067.312	0	0
2009	2	3	0	0	0	4.544	168.232	0	0	2062.768	0	0
2009	2	4	0	0	0	4.544	172.776	0	0	2058.224	0	0
2009	2	5	0	0	0	4.544	177.32	0	0	2053.68	0	0
2009	2	6	0	0	0	4.544	181.864	0	0	2049.136	0	0
2009	2	7	0	0	0	4.544	186.408	0	0	2044.592	0	0
2009	2	8	0.6	0	0	4.544	190.952	0	0	2040.048	0	0
2009	2	9	0	0	0	4.544	195.496	0	0	2035.504	0	0
2009	2	10	0	0	0	4.544	200.04	0	0	2030.96	0	0
2009	2	11	0	0	0	4.544	204.584	0	0	2026.416	0	0
2009	2	12	0	0	0	4.544	209.128	0	0	2021.872	0	0
2009	2	13	0	0	0	4.544	213.672	0	0	2017.328	0	0
2009	2	14	0	0	0	4.544	218.216	0	0	2012.784	0	0
2009	2	15	0	0	0	4.544	222.76	0	0	2008.24	0	0
2009	2	16	0	0	0	4.544	227.304	0	0	2003.696	0	0
2009	2	17	0	0	0	4.544	231.848	0	0	1999.152	0	0
2009	2	18	0	0	0	4.544	236.392	0	0	1994.608	0	0
2009	2	19	0	0	0	4.544	240.936	0	0	1990.064	0	0
2009	2	20	0	0	0	4.544	245.48	0	0	1985.52	0	0
2009	2	21	0	0	0	4.544	250.024	0	0	1980.976	0	0
2009	2	22	0	0	0	4.544	254.568	0	0	1976.432	0	0
2009	2	23	0	0	0	4.544	259.112	0	0	1971.888	0	0
2009	2	24	0	0	0	4.544	263.656	0	0	1967.344	0	0
2009	2	25	0	0	0	4.544	268.2	0	0	1962.8	0	0
2009	2	26	0	0	0	4.544	272.744	0	0	1958.256	0	0
2009	2	27	0	0	0	4.544	277.288	0	0	1953.712	0	0
2009	2	28	0	0	0	4.544	281.832	0	0	1949.168	0	0
2009	3	1	0	0	0	3.712	285.544	0	0	1945.456	0	0
2009	3	2	0	0	0	3.712	289.256	0	0	1941.744	0	0
2009	3	3	0	0	0	3.712	292.968	0	0	1938.032	0	0
2009	3	4	31.6	0.69	2575.0524	3.712	-2278.3724	2278.3724	0	2231	0	0
2009	3	5	0.8	0	0	3.712	3.712	0	0	2227.288	0	1
2009	3	6	0.4	0	0	3.712	7.424	0	0	2223.576	0	0
2009	3	7	0	0	0	3.712	11.136	0	0	2219.864	0	0
2009	3	8	0	0	0	3.712	14.848	0	0	2216.152	0	0
2009	3	9	0	0	0	3.712	18.56	0	0	2212.44	0	0
2009	3	10	0	0	0	3.712	22.272	0	0	2208.728	0	0
2009	3	11	0	0	0	3.712	25.984	0	0	2205.016	0	0
2009	3	12	0	0	0	3.712	29.696	0	0	2201.304	0	0
2009	3	13	0	0	0	3.712	33.408	0	0	2197.592	0	0
2009	3	14	0	0	0	3.712	37.12	0	0	2193.88	0	0
2009	3	15	0	0	0	3.712	40.832	0	0	2190.168	0	0
2009	3	16	8	0	0	3.712	44.544	0	0	2186.456	0	0
2009	3	17	0.8	0	0	3.712	48.256	0	0	2182.744	0	0
2009	3	18	0	0	0	3.712	51.968	0	0	2179.032	0	0
2009	3	19	0	0	0	3.712	55.68	0	0	2175.32	0	0
2009	3	20	0	0	0	3.712	59.392	0	0	2171.608	0	0
2009	3	21	0.2	0	0	3.712	63.104	0	0	2167.896	0	0
2009	3	22	0	0	0	3.712	66.816	0	0	2164.184	0	0
2009	3	23	0	0	0	3.712	70.528	0	0	2160.472	0	0
2009	3	24	0	0	0	3.712	74.24	0	0	2156.76	0	0
2009	3	25	3.4	0	0	3.712	77.952	0	0	2153.048	0	0
2009	3	26	0	0	0	3.712	81.664	0	0	2149.336	0	0
2009	3	27	0	0	0	3.712	85.376	0	0	2145.624	0	0
2009	3	28	0	0	0	3.712	89.088	0	0	2141.912	0	0
2009	3	29	0	0	0	3.712	92.8	0	0	2138.2	0	0
2009	3	30	0	0	0	3.712	96.512	0	0	2134.488	0	1
2009	3	31	0	0	0	3.712	100.224	0	0	2130.776	0	0
2009	4	1	0	0	0	2.368	102.592	0	0	2128.408	0	0
2009	4	2	0	0	0	2.368	104.96	0	0	2126.04	0	0
2009	4	3	0	0	0	2.368	107.328	0	0	2123.672	0	0
2009	4	4	0	0	0	2.368	109.696	0	0	2121.304	0	0
2009	4	5	0	0	0	2.368	112.064	0	0	2118.936	0	0
2009	4	6	3.2	0	0	2.368	114.432	0	0	2116.568	0	0
2009	4	7	0.2	0	0	2.368	116.8	0	0	2114.2	0	0
2009	4	8	0	0	0	2.368	119.168	0	0	2111.832	0	0
2009	4	9	0	0	0	2.368	121.536	0	0	2109.464	0	0
2009	4	10	0	0	0	2.368	123.904	0	0	2107.096	0	0
2009	4	11	0	0	0	2.368	126.272	0	0	2104.728	0	0
2009	4	12	0	0	0	2.368	128.64	0	0	2102.36	0	0
2009	4	13	0	0	0	2.368	131.008	0	0	2099.992	0	0
2009	4	14	0	0	0	2.368	133.376	0	0	2097.624	0	0
2009	4	15	0	0	0	2.368	135.744	0	0	2095.256	0	0
2009	4	16	0	0	0	2.368	138.112	0	0	2092.888	0	0
2009	4	17	3.6	0	0	2.368	140.48	0	0	2090.52	0	0
2009	4	18	0	0	0	2.368	142.848	0	0	2088.152	0	0
2009	4	19	0	0	0	2.368	145.216	0	0	2085.784	0	0
2009	4	20	0.4	0	0	2.368	147.584	0	0	2083.416	0	0
2009	4	21	0	0	0	2.368	149.952	0	0	2081.048	0	0
2009	4	22	0	0	0	2.368	152.32	0	0	2078.68	0	0
2009	4	23	0	0	0	2.368	154.688	0	0	2076.312	0	0
2009	4	24	31.15	0.69	2538.38235	2.368	-2381.32635	2381.32635	0	2231	0	0
2009	4	25	31.15	0.69	2538.38235	2.368	-2536.01435	2536.01435	0	2231	0	0

2009	4	26	31.15	0.69	2538.38235	2.368	-2536.01435	2536.01435	0	2231	0	0
2009	4	27	31.15	0.69	2538.38235	2.368	-2536.01435	2536.01435	0	2231	0	0
2009	4	28	3.2	0	0	2.368	2.368	0	0	2228.632	0	1
2009	4	29	0	0	0	2.368	4.736	0	0	2226.264	0	0
2009	4	30	0	0	0	2.368	7.104	0	0	2223.896	0	0
2009	5	1	0	0	0	1.536	8.64	0	0	2222.36	0	0
2009	5	2	14.2	0.43	721.1186	1.536	-710.9426	710.9426	0	2231	0	0
2009	5	3	0	0	0	1.536	1.536	0	0	2229.464	0	1
2009	5	4	0	0	0	1.536	3.072	0	0	2227.928	0	0
2009	5	5	0.2	0	0	1.536	4.608	0	0	2226.392	0	0
2009	5	6	0	0	0	1.536	6.144	0	0	2224.856	0	0
2009	5	7	2.2	0	0	1.536	7.68	0	0	2223.32	0	0
2009	5	8	0.8	0	0	1.536	9.216	0	0	2221.784	0	0
2009	5	9	0	0	0	1.536	10.752	0	0	2220.248	0	0
2009	5	10	0	0	0	1.536	12.288	0	0	2218.712	0	0
2009	5	11	0.4	0	0	1.536	13.824	0	0	2217.176	0	0
2009	5	12	0.2	0	0	1.536	15.36	0	0	2215.64	0	0
2009	5	13	0	0	0	1.536	16.896	0	0	2214.104	0	0
2009	5	14	6.8	0	0	1.536	18.432	0	0	2212.568	0	0
2009	5	15	2.8	0	0	1.536	19.968	0	0	2211.032	0	0
2009	5	16	0	0	0	1.536	21.504	0	0	2209.496	0	0
2009	5	17	0	0	0	1.536	23.04	0	0	2207.96	0	0
2009	5	18	40.6	0.74	3548.1964	1.536	-3523.6204	3523.6204	0	2231	0	0
2009	5	19	0	0	0	1.536	1.536	0	0	2229.464	0	1
2009	5	20	0	0	0	1.536	3.072	0	0	2227.928	0	0
2009	5	21	0	0	0	1.536	4.608	0	0	2226.392	0	0
2009	5	22	0.2	0	0	1.536	6.144	0	0	2224.856	0	0
2009	5	23	0	0	0	1.536	7.68	0	0	2223.32	0	0
2009	5	24	0	0	0	1.536	9.216	0	0	2221.784	0	0
2009	5	25	29.6	0.56	1957.6256	1.536	-1946.8736	1946.8736	0	2231	0	0
2009	5	26	8.4	0	0	1.536	1.536	0	0	2229.464	0	1
2009	5	27	0.2	0	0	1.536	3.072	0	0	2227.928	0	0
2009	5	28	3.2	0	0	1.536	4.608	0	0	2226.392	0	0
2009	5	29	0	0	0	1.536	6.144	0	0	2224.856	0	0
2009	5	30	0	0	0	1.536	7.68	0	0	2223.32	0	0
2009	5	31	0	0	0	1.536	9.216	0	0	2221.784	0	0
2009	6	1	0.2	0	0	1.152	10.368	0	0	2220.632	0	0
2009	6	2	0.8	0	0	1.152	11.52	0	0	2219.48	0	0
2009	6	3	2.4	0	0	1.152	12.672	0	0	2218.328	0	0
2009	6	4	0.2	0	0	1.152	13.824	0	0	2217.176	0	0
2009	6	5	0	0	0	1.152	14.976	0	0	2216.024	0	0
2009	6	6	0	0	0	1.152	16.128	0	0	2214.872	0	0
2009	6	7	0	0	0	1.152	17.28	0	0	2213.72	0	0
2009	6	8	0	0	0	1.152	18.432	0	0	2212.568	0	0
2009	6	9	76.4	0.81	7308.5004	1.152	-7288.9164	7288.9164	0	2231	0	0
2009	6	10	0.4	0	0	1.152	1.152	0	0	2229.848	0	1
2009	6	11	0	0	0	1.152	2.304	0	0	2228.696	0	0
2009	6	12	0	0	0	1.152	3.456	0	0	2227.544	0	0
2009	6	13	0	0	0	1.152	4.608	0	0	2226.392	0	0
2009	6	14	0	0	0	1.152	5.76	0	0	2225.24	0	0
2009	6	15	21	0.56	1388.856	1.152	-1381.944	1381.944	0	2231	0	0
2009	6	16	0.2	0	0	1.152	1.152	0	0	2229.848	0	1
2009	6	17	0.2	0	0	1.152	2.304	0	0	2228.696	0	0
2009	6	18	0	0	0	1.152	3.456	0	0	2227.544	0	0
2009	6	19	0	0	0	1.152	4.608	0	0	2226.392	0	0
2009	6	20	0	0	0	1.152	5.76	0	0	2225.24	0	0
2009	6	21	2	0	0	1.152	6.912	0	0	2224.088	0	0
2009	6	22	0	0	0	1.152	8.064	0	0	2222.936	0	0
2009	6	23	0.4	0	0	1.152	9.216	0	0	2221.784	0	0
2009	6	24	5	0	0	1.152	10.368	0	0	2220.632	0	0
2009	6	25	0.2	0	0	1.152	11.52	0	0	2219.48	0	0
2009	6	26	5.8	0	0	1.152	12.672	0	0	2218.328	0	0
2009	6	27	2	0	0	1.152	13.824	0	0	2217.176	0	0
2009	6	28	0	0	0	1.152	14.976	0	0	2216.024	0	0
2009	6	29	0	0	0	1.152	16.128	0	0	2214.872	0	0
2009	6	30	0	0	0	1.152	17.28	0	0	2213.72	0	0
2009	7	1	20.2	0.56	1335.9472	1.088	-1317.5792	1317.5792	0	2231	0	0
2009	7	2	23.4	0.56	1547.5824	1.088	-1546.4944	1546.4944	0	2231	0	0
2009	7	3	11.8	0.43	599.2394	1.088	-598.1514	598.1514	0	2231	0	0
2009	7	4	0	0	0	1.088	1.088	0	0	2229.912	0	1
2009	7	5	0	0	0	1.088	2.176	0	0	2228.824	0	0
2009	7	6	4.6	0	0	1.088	3.264	0	0	2227.736	0	0
2009	7	7	0	0	0	1.088	4.352	0	0	2226.648	0	0
2009	7	8	0	0	0	1.088	5.44	0	0	2225.56	0	0
2009	7	9	0	0	0	1.088	6.528	0	0	2224.472	0	0
2009	7	10	1.6	0	0	1.088	7.616	0	0	2223.384	0	0
2009	7	11	0	0	0	1.088	8.704	0	0	2222.296	0	0
2009	7	12	0	0	0	1.088	9.792	0	0	2221.208	0	0
2009	7	13	26.8	0.56	1772.4448	1.088	-1761.5648	1761.5648	0	2231	0	0
2009	7	14	17.4	0.43	883.6242	1.088	-882.5362	882.5362	0	2231	0	0
2009	7	15	21	0.56	1388.856	1.088	-1387.768	1387.768	0	2231	0	0
2009	7	16	11	0.43	558.613	1.088	-557.525	557.525	0	2231	0	0
2009	7	17	0.4	0	0	1.088	1.088	0	0	2229.912	0	1
2009	7	18	0	0	0	1.088	2.176	0	0	2228.824	0	0
2009	7	19	0	0	0	1.088	3.264	0	0	2227.736	0	0
2009	7	20	0	0	0	1.088	4.352	0	0	2226.648	0	0
2009	7	21	0	0	0	1.088	5.44	0	0	2225.56	0	0
2009	7	22	1	0	0	1.088	6.528	0	0	2224.472	0	0
2009	7	23	8	0	0	1.088	7.616	0	0	2223.384	0	0
2009	7	24	0	0	0	1.088	8.704	0	0	2222.296	0	0
2009	7	25	0	0	0	1.088	9.792	0	0	2221.208	0	0
2009	7	26	0	0	0	1.088	10.88	0	0	2220.12	0	0
2009	7	27	3.6	0	0	1.088	11.968	0	0	2219.032	0	0
2009	7	28	33.8	0.69	2754.3282	1.088	-2741.2722	2741.2722	0	2231	0	0
2009	7	29	16.2	0.43	822.6846	1.088	-821.5966	821.5966	0	2231	0	0
2009	7	30	19.2	0.43	975.0336	1.088	-973.9456	973.9456	0	2231	0	0
2009	7	31	8.4	0	0	1.088	1.088	0	0	2229.912	0	1
2009	8	1	0	0	0	1.472	2.56	0	0	2228.44	0	0
2009	8	2	0	0	0	1.472	4.032	0	0	2226.968	0	0
2009	8	3	9	0	0	1.472	5.504	0	0	2225.496	0	0
2009	8	4	2	0	0	1.472	6.976	0	0	2224.024	0	0
2009	8	5	4.4	0	0	1.472	8.448	0	0	2222.552	0	0
2009	8	6	0	0	0	1.472	9.92	0	0	2221.08	0	0
2009	8	7	5.6	0	0	1.472	11.392	0	0	2219.608	0	0
2009	8	8	0	0	0	1.472	12.864	0	0	2218.136	0	0
2009	8	9	0	0	0	1.472	14.336	0	0	2216.664	0	0
2009	8	10	0.8	0	0	1.472	15.808	0	0	2215.192	0	0
2009	8	11	4.4	0	0	1.472	17.28	0	0	2213.72	0	0
2009	8	12	2.2	0	0	1.472	18.752	0	0	2212.248	0	0
2009	8	13	0.2	0	0	1.472	20.224	0	0	2210.776	0	0
2009	8	14	0	0	0	1.472	21.696	0	0	2209.304	0	0
2009	8	15	0	0	0	1.472	23.168	0	0	2207.832	0	0
2009	8	16	0	0	0	1.472	24.64	0	0	2206.36	0	0
2009	8	17	9.2	0	0	1.472	26.112	0	0	2204.888	0	0
2009	8	18	0.4	0	0	1.472	27.584	0	0	2203.416	0	0
2009	8	19	0	0	0	1.472	29.056	0	0	2201.944	0	0
2009	8	20	0	0	0	1.472	30.528	0	0	2200.472	0	0
2009	8	21	0	0	0	1.472	32	0	0	2199	0	0
2009	8	22	0	0	0	1.472	33.472	0	0	2197.528	0	0
2009	8	23	0	0	0	1.472	34.944	0	0	2196.056	0	0

2009	8	24	11.8	0.43	599.2394	1.472	-562.8234	562.8234	0	2231	0	0
2009	8	25	14.8	0.43	751.5884	1.472	-750.1164	750.1164	0	2231	0	1
2009	8	26	16.6	0.43	842.9978	1.472	-841.5258	841.5258	0	2231	0	0
2009	8	27	0	0	0	1.472	1.472	0	0	2229.528	0	1
2009	8	28	0	0	0	1.472	2.944	0	0	2228.056	0	0
2009	8	29	0	0	0	1.472	4.416	0	0	2226.584	0	0
2009	8	30	0	0	0	1.472	5.888	0	0	2225.112	0	0
2009	8	31	37.4	0.69	3047.6886	1.472	-3040.3286	3040.3286	0	2231	0	0
2009	9	1	4.8	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	2	0	0	0	2.176	4.352	0	0	2226.648	0	0
2009	9	3	1	0	0	2.176	6.528	0	0	2224.472	0	0
2009	9	4	4.4	0	0	2.176	8.704	0	0	2222.296	0	0
2009	9	5	0	0	0	2.176	10.88	0	0	2220.12	0	0
2009	9	6	0	0	0	2.176	13.056	0	0	2217.944	0	0
2009	9	7	13.4	0.43	680.4922	2.176	-665.2602	665.2602	0	2231	0	0
2009	9	8	6.6	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	9	0	0	0	2.176	4.352	0	0	2226.648	0	0
2009	9	10	0	0	0	2.176	6.528	0	0	2224.472	0	0
2009	9	11	0	0	0	2.176	8.704	0	0	2222.296	0	0
2009	9	12	0	0	0	2.176	10.88	0	0	2220.12	0	0
2009	9	13	0	0	0	2.176	13.056	0	0	2217.944	0	0
2009	9	14	1.8	0	0	2.176	15.232	0	0	2215.768	0	0
2009	9	15	0	0	0	2.176	17.408	0	0	2213.592	0	0
2009	9	16	0	0	0	2.176	19.584	0	0	2211.416	0	0
2009	9	17	22.6	0.56	1494.6736	2.176	-1472.9136	1472.9136	0	2231	0	0
2009	9	18	0.8	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	19	1.2	0	0	2.176	4.352	0	0	2226.648	0	0
2009	9	20	0	0	0	2.176	6.528	0	0	2224.472	0	0
2009	9	21	0	0	0	2.176	8.704	0	0	2222.296	0	0
2009	9	22	26	0.56	1719.536	2.176	-1708.656	1708.656	0	2231	0	0
2009	9	23	10	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	24	1.4	0	0	2.176	4.352	0	0	2226.648	0	0
2009	9	25	4.2	0	0	2.176	6.528	0	0	2224.472	0	0
2009	9	26	0	0	0	2.176	8.704	0	0	2222.296	0	0
2009	9	27	0	0	0	2.176	10.88	0	0	2220.12	0	0
2009	9	28	30.2	0.69	2460.9678	2.176	-2447.9118	2447.9118	0	2231	0	0
2009	9	29	0	0	0	2.176	2.176	0	0	2228.824	0	1
2009	9	30	0	0	0	2.176	4.352	0	0	2226.648	0	0
2009	10	1	1	0	0	3.008	7.36	0	0	2223.64	0	0
2009	10	2	0.8	0	0	3.008	10.368	0	0	2220.632	0	0
2009	10	3	3	0	0	3.008	13.376	0	0	2217.624	0	0
2009	10	4	0	0	0	3.008	16.384	0	0	2214.616	0	0
2009	10	5	0	0	0	3.008	19.392	0	0	2211.608	0	0
2009	10	6	0	0	0	3.008	22.4	0	0	2208.6	0	0
2009	10	7	0	0	0	3.008	25.408	0	0	2205.592	0	0
2009	10	8	0	0	0	3.008	28.416	0	0	2202.584	0	0
2009	10	9	0	0	0	3.008	31.424	0	0	2199.576	0	0
2009	10	10	0	0	0	3.008	34.432	0	0	2196.568	0	0
2009	10	11	0	0	0	3.008	37.44	0	0	2193.56	0	0
2009	10	12	5.8	0	0	3.008	40.448	0	0	2190.552	0	0
2009	10	13	17.8	0.43	903.9374	3.008	-860.4814	860.4814	0	2231	0	0
2009	10	14	16	0.43	812.528	3.008	-809.52	809.52	0	2231	0	0
2009	10	15	8.4	0	0	3.008	3.008	0	0	2227.992	0	1
2009	10	16	3.6	0	0	3.008	6.016	0	0	2224.984	0	0
2009	10	17	0	0	0	3.008	9.024	0	0	2221.976	0	0
2009	10	18	0	0	0	3.008	12.032	0	0	2218.968	0	0
2009	10	19	0.8	0	0	3.008	15.04	0	0	2215.96	0	0
2009	10	20	0	0	0	3.008	18.048	0	0	2212.952	0	0
2009	10	21	0	0	0	3.008	21.056	0	0	2209.944	0	0
2009	10	22	0	0	0	3.008	24.064	0	0	2206.936	0	0
2009	10	23	0	0	0	3.008	27.072	0	0	2203.928	0	0
2009	10	24	0	0	0	3.008	30.08	0	0	2200.92	0	0
2009	10	25	0	0	0	3.008	33.088	0	0	2197.912	0	0
2009	10	26	0.2	0	0	3.008	36.096	0	0	2194.904	0	0
2009	10	27	0	0	0	3.008	39.104	0	0	2191.896	0	0
2009	10	28	0	0	0	3.008	42.112	0	0	2188.888	0	0
2009	10	29	0	0	0	3.008	45.12	0	0	2185.88	0	0
2009	10	30	0	0	0	3.008	48.128	0	0	2182.872	0	0
2009	10	31	0	0	0	3.008	51.136	0	0	2179.864	0	0
2009	11	1	0	0	0	3.84	54.976	0	0	2176.024	0	0
2009	11	2	0	0	0	3.84	58.816	0	0	2172.184	0	0
2009	11	3	1.2	0	0	3.84	62.656	0	0	2168.344	0	0
2009	11	4	0.8	0	0	3.84	66.496	0	0	2164.504	0	0
2009	11	5	0.6	0	0	3.84	70.336	0	0	2160.664	0	0
2009	11	6	0	0	0	3.84	74.176	0	0	2156.824	0	0
2009	11	7	0	0	0	3.84	78.016	0	0	2152.984	0	0
2009	11	8	0	0	0	3.84	81.856	0	0	2149.144	0	0
2009	11	9	0	0	0	3.84	85.696	0	0	2145.304	0	0
2009	11	10	0	0	0	3.84	89.536	0	0	2141.464	0	0
2009	11	11	0	0	0	3.84	93.376	0	0	2137.624	0	0
2009	11	12	0	0	0	3.84	97.216	0	0	2133.784	0	0
2009	11	13	0	0	0	3.84	101.056	0	0	2129.944	0	0
2009	11	14	0	0	0	3.84	104.896	0	0	2126.104	0	0
2009	11	15	0	0	0	3.84	108.736	0	0	2122.264	0	0
2009	11	16	0	0	0	3.84	112.576	0	0	2118.424	0	0
2009	11	17	0	0	0	3.84	116.416	0	0	2114.584	0	0
2009	11	18	0	0	0	3.84	120.256	0	0	2110.744	0	0
2009	11	19	0	0	0	3.84	124.096	0	0	2106.904	0	0
2009	11	20	0.4	0	0	3.84	127.936	0	0	2103.064	0	0
2009	11	21	0	0	0	3.84	131.776	0	0	2099.224	0	0
2009	11	22	0	0	0	3.84	135.616	0	0	2095.384	0	0
2009	11	23	12.6	0.43	639.8658	3.84	-500.4098	500.4098	0	2231	0	0
2009	11	24	0	0	0	3.84	3.84	0	0	2227.16	0	1
2009	11	25	0	0	0	3.84	7.68	0	0	2223.32	0	0
2009	11	26	3.8	0	0	3.84	11.52	0	0	2219.48	0	0
2009	11	27	0	0	0	3.84	15.36	0	0	2215.64	0	0
2009	11	28	16.6	0.43	842.9978	3.84	-823.7978	823.7978	0	2231	0	0
2009	11	29	0	0	0	3.84	3.84	0	0	2227.16	0	0
2009	11	30	28.8	0.56	1904.7168	3.84	-1897.0368	1897.0368	0	2231	0	0
2009	12	1	0.4	0	0	4.608	4.608	0	0	2226.392	0	1
2009	12	2	0	0	0	4.608	9.216	0	0	2221.784	0	0
2009	12	3	0	0	0	4.608	13.824	0	0	2217.176	0	0
2009	12	4	0	0	0	4.608	18.432	0	0	2212.568	0	0
2009	12	5	0	0	0	4.608	23.04	0	0	2207.96	0	0
2009	12	6	0	0	0	4.608	27.648	0	0	2203.352	0	0
2009	12	7	0	0	0	4.608	32.256	0	0	2198.744	0	0
2009	12	8	6.2	0	0	4.608	36.864	0	0	2194.136	0	0
2009	12	9	0.6	0	0	4.608	41.472	0	0	2189.528	0	0
2009	12	10	3	0	0	4.608	46.08	0	0	2184.92	0	0
2009	12	11	1.8	0	0	4.608	50.688	0	0	2180.312	0	0
2009	12	12	0	0	0	4.608	55.296	0	0	2175.704	0	0
2009	12	13	0	0	0	4.608	59.904	0	0	2171.096	0	0
2009	12	14	0	0	0	4.608	64.512	0	0	2166.488	0	0
2009	12	15	0	0	0	4.608	69.12	0	0	2161.88	0	1
2009	12	16	0	0	0	4.608	73.728	0	0	2157.272	0	0
2009	12	17	0	0	0	4.608	78.336	0	0	2152.664	0	0
2009	12	18	11.4	0.43	578.9262	4.608	-495.9822	495.9822	0	2231	0	0
2009	12	19	0	0	0	4.608	4.608	0	0	2226.392	0	1
2009	12	20	0	0	0	4.608	9.216	0	0	2221.784	0	0
2009	12	21	0	0	0	4.608	13.824	0	0	2217.176	0	0

2009	12	22	0	0	0	4.608	18.432	0	0	2212.568	0	0
2009	12	23	0	0	0	4.608	23.04	0	0	2207.96	0	0
2009	12	24	0.2	0	0	4.608	27.648	0	0	2203.352	0	0
2009	12	25	0	0	0	4.608	32.256	0	0	2198.744	0	0
2009	12	26	0	0	0	4.608	36.864	0	0	2194.136	0	0
2009	12	27	0	0	0	4.608	41.472	0	0	2189.528	0	0
2009	12	28	0	0	0	4.608	46.08	0	0	2184.92	0	0
2009	12	29	0	0	0	4.608	50.688	0	0	2180.312	0	0
2009	12	30	0	0	0	4.608	55.296	0	0	2175.704	0	0
2009	12	31	0	0	0	4.608	59.904	0	0	2171.096	0	0
			1029		57571.388	1050.176		56585.236	0		0	23

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient Cv	Inputs Overland Flow Quarry (m³)	Outputs Evaporation (m³)	Adjusted Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
1999	1	1	0	0	0	7.68	1200	0	0	0	0	
1999	1	2	0	0	0	7.68	1207.68	0	0	358.32	0	0
1999	1	3	0	0	0	7.68	1215.36	0	0	350.64	0	0
1999	1	4	0	0	0	7.68	1223.04	0	0	342.96	0	0
1999	1	5	0	0	0	7.68	1230.72	0	0	335.28	0	0
1999	1	6	0	0	0	7.68	1238.4	0	0	327.6	0	0
1999	1	7	0.4	0	0	7.68	1246.08	0	0	319.92	0	0
1999	1	8	16	0.43	677.68	7.68	576.08	0	989.92	989.92	0	0
1999	1	9	0	0	0	7.68	1566	0	0	0	1	0
1999	1	10	0	0	0	7.68	1566	0	0	0	1	0
1999	1	11	0	0	0	7.68	1566	0	0	0	1	0
1999	1	12	0	0	0	7.68	1566	0	0	0	1	0
1999	1	13	0	0	0	7.68	1566	0	0	0	1	0
1999	1	14	0	0	0	7.68	1566	0	0	0	1	0
1999	1	15	0	0	0	7.68	1566	0	0	0	1	0
1999	1	16	0	0	0	7.68	1566	0	0	0	1	0
1999	1	17	0	0	0	7.68	1566	0	0	0	1	0
1999	1	18	0	0	0	7.68	1566	0	0	0	1	0
1999	1	19	0	0	0	7.68	1566	0	0	0	1	0
1999	1	20	0	0	0	7.68	1566	0	0	0	1	0
1999	1	21	0	0	0	7.68	1566	0	0	0	1	0
1999	1	22	0	0	0	7.68	1566	0	0	0	1	0
1999	1	23	0	0	0	7.68	1566	0	0	0	1	0
1999	1	24	0	0	0	7.68	1566	0	0	0	1	0
1999	1	25	0	0	0	7.68	1566	0	0	0	1	0
1999	1	26	0.8	0	0	7.68	1566	0	0	0	1	0
1999	1	27	0	0	0	7.68	1566	0	0	0	1	0
1999	1	28	0	0	0	7.68	1566	0	0	0	1	0
1999	1	29	0.2	0	0	7.68	1566	0	0	0	1	0
1999	1	30	0	0	0	7.68	1566	0	0	0	1	0
1999	1	31	0.6	0	0	7.68	1566	0	0	0	1	0
1999	2	1	0	0	0	6.816	1566	0	0	0	1	0
1999	2	2	0	0	0	6.816	1566	0	0	0	1	0
1999	2	3	0	0	0	6.816	1566	0	0	0	1	0
1999	2	4	0	0	0	6.816	1566	0	0	0	1	0
1999	2	5	0	0	0	6.816	1566	0	0	0	1	0
1999	2	6	0.8	0	0	6.816	1566	0	0	0	1	0
1999	2	7	0	0	0	6.816	1566	0	0	0	1	0
1999	2	8	0	0	0	6.816	1566	0	0	0	1	0
1999	2	9	0	0	0	6.816	1566	0	0	0	1	0
1999	2	10	0	0	0	6.816	1566	0	0	0	1	0
1999	2	11	0.4	0	0	6.816	1566	0	0	0	1	0
1999	2	12	0	0	0	6.816	1566	0	0	0	1	0
1999	2	13	0	0	0	6.816	1566	0	0	0	1	0
1999	2	14	0	0	0	6.816	1566	0	0	0	1	0
1999	2	15	0	0	0	6.816	1566	0	0	0	1	0
1999	2	16	0	0	0	6.816	1566	0	0	0	1	0
1999	2	17	0	0	0	6.816	1566	0	0	0	1	0
1999	2	18	3.4	0	0	6.816	1566	0	0	0	1	0
1999	2	19	0	0	0	6.816	1566	0	0	0	1	0
1999	2	20	0	0	0	6.816	1566	0	0	0	1	0
1999	2	21	0	0	0	6.816	1566	0	0	0	1	0
1999	2	22	0	0	0	6.816	1566	0	0	0	1	0
1999	2	23	0	0	0	6.816	1566	0	0	0	1	0
1999	2	24	0	0	0	6.816	1566	0	0	0	1	0
1999	2	25	0	0	0	6.816	1566	0	0	0	1	0
1999	2	26	0	0	0	6.816	1566	0	0	0	1	0
1999	2	27	0	0	0	6.816	1566	0	0	0	1	0
1999	2	28	0	0	0	6.816	1566	0	0	0	1	0
1999	3	1	0	0	0	5.568	1566	0	0	0	1	0
1999	3	2	0	0	0	5.568	1566	0	0	0	1	0
1999	3	3	0	0	0	5.568	1566	0	0	0	1	0
1999	3	4	0	0	0	5.568	1566	0	0	0	1	0
1999	3	5	0	0	0	5.568	1566	0	0	0	1	0
1999	3	6	0	0	0	5.568	1566	0	0	0	1	0
1999	3	7	19.6	0.43	830.158	5.568	741.41	0	824.59	824.59	0	0
1999	3	8	0.2	0	0	5.568	1566	0	0	0	1	0
1999	3	9	0	0	0	5.568	1566	0	0	0	1	0
1999	3	10	0	0	0	5.568	1566	0	0	0	1	0
1999	3	11	0	0	0	5.568	1566	0	0	0	1	0
1999	3	12	0	0	0	5.568	1566	0	0	0	1	0
1999	3	13	0	0	0	5.568	1566	0	0	0	1	0
1999	3	14	0	0	0	5.568	1566	0	0	0	1	0
1999	3	15	0	0	0	5.568	1566	0	0	0	1	0
1999	3	16	0	0	0	5.568	1566	0	0	0	1	0
1999	3	17	0	0	0	5.568	1566	0	0	0	1	0
1999	3	18	11	0.43	465.905	5.568	1105.663	0	460.337	460.337	0	0
1999	3	19	1.6	0	0	5.568	1566	0	0	0	1	0
1999	3	20	0	0	0	5.568	1566	0	0	0	1	0
1999	3	21	48	0.74	3498.72	5.568	0	1927.152	1566	1566	0	0
1999	3	22	2.6	0	0	5.568	1566	0	0	0	1	1
1999	3	23	0	0	0	5.568	1566	0	0	0	1	0
1999	3	24	0	0	0	5.568	1566	0	0	0	1	0
1999	3	25	11	0.43	465.905	5.568	1105.663	0	460.337	460.337	0	0
1999	3	26	2.8	0	0	5.568	1566	0	0	0	1	0
1999	3	27	0	0	0	5.568	1566	0	0	0	1	0
1999	3	28	4.6	0	0	5.568	1566	0	0	0	1	0
1999	3	29	0	0	0	5.568	1566	0	0	0	1	0
1999	3	30	0	0	0	5.568	1566	0	0	0	1	0
1999	3	31	1.8	0	0	5.568	1566	0	0	0	1	0
1999	4	1	0	0	0	3.552	1566	0	0	0	1	0
1999	4	2	0	0	0	3.552	1566	0	0	0	1	0
1999	4	3	0	0	0	3.552	1566	0	0	0	1	0
1999	4	4	1.2	0	0	3.552	1566	0	0	0	1	0
1999	4	5	3.2	0	0	3.552	1566	0	0	0	1	0
1999	4	6	0	0	0	3.552	1566	0	0	0	1	0
1999	4	7	0	0	0	3.552	1566	0	0	0	1	0
1999	4	8	0	0	0	3.552	1566	0	0	0	1	0
1999	4	9	0	0	0	3.552	1566	0	0	0	1	0
1999	4	10	0	0	0	3.552	1566	0	0	0	1	0
1999	4	11	0	0	0	3.552	1566	0	0	0	1	0
1999	4	12	0	0	0	3.552	1566	0	0	0	1	0
1999	4	13	0	0	0	3.552	1566	0	0	0	1	0
1999	4	14	0	0	0	3.552	1566	0	0	0	1	0
1999	4	15	0	0	0	3.552	1566	0	0	0	1	0
1999	4	16	0	0	0	3.552	1566	0	0	0	1	0
1999	4	17	0	0	0	3.552	1566	0	0	0	1	0
1999	4	18	0	0	0	3.552	1566	0	0	0	1	0
1999	4	19	0	0	0	3.552	1566	0	0	0	1	0
1999	4	20	6.8	0	0	3.552	1566	0	0	0	1	0
1999	4	21	4.2	0	0	3.552	1566	0	0	0	1	0
1999	4	22	0	0	0	3.552	1566	0	0	0	1	0
1999	4	23	0	0	0	3.552	1566	0	0	0	1	0
1999	4	24	0	0	0	3.552	1566	0	0	0	1	0
1999	4	25	0	0	0	3.552	1566	0	0	0	1	0
1999	4	26	0	0	0	3.552	1566	0	0	0	1	0

1999	4	27	1.2	0	0	3.552	1566	0	0	0	1	0
1999	4	28	0.6	0	0	3.552	1566	0	0	0	1	0
1999	4	29	0.2	0	0	3.552	1566	0	0	0	1	0
1999	4	30	0	0	0	3.552	1566	0	0	0	1	0
1999	5	1	0	0	0	2.304	1566	0	0	0	1	0
1999	5	2	0	0	0	2.304	1566	0	0	0	1	0
1999	5	3	0	0	0	2.304	1566	0	0	0	1	0
1999	5	4	0	0	0	2.304	1566	0	0	0	1	0
1999	5	5	0	0	0	2.304	1566	0	0	0	1	0
1999	5	6	0	0	0	2.304	1566	0	0	0	1	0
1999	5	7	0	0	0	2.304	1566	0	0	0	1	0
1999	5	8	0	0	0	2.304	1566	0	0	0	1	0
1999	5	9	0	0	0	2.304	1566	0	0	0	1	0
1999	5	10	0.4	0	0	2.304	1566	0	0	0	1	0
1999	5	11	0	0	0	2.304	1566	0	0	0	1	0
1999	5	12	11.6	0.43	491.318	2.304	1076.986	0	489.014	489.014	0	0
1999	5	13	30.4	0.69	2066.136	2.304	0	497.832	1566	1566	0	0
1999	5	14	0.6	0	0	2.304	1566	0	0	0	1	1
1999	5	15	0	0	0	2.304	1566	0	0	0	1	0
1999	5	16	42.8	0.74	3119.692	2.304	0	1551.388	1566	1566	0	0
1999	5	17	0	0	0	2.304	1566	0	0	0	1	1
1999	5	18	0.8	0	0	2.304	1566	0	0	0	1	0
1999	5	19	0	0	0	2.304	1566	0	0	0	1	0
1999	5	20	0	0	0	2.304	1566	0	0	0	1	0
1999	5	21	6.4	0	0	2.304	1566	0	0	0	1	0
1999	5	22	5.2	0	0	2.304	1566	0	0	0	1	0
1999	5	23	44.2	0.74	3221.738	2.304	0	1653.434	1566	1566	0	0
1999	5	24	15.8	0.43	669.209	2.304	899.095	0	0	666.905	0	0
1999	5	25	78	0.81	6223.23	2.304	0	5321.831	0	1566	0	0
1999	5	26	11.4	0.43	482.847	2.304	0	480.543	0	1566	0	0
1999	5	27	1.6	0	0	2.304	2.304	0	0	1563.696	0	1
1999	5	28	0	0	0	2.304	4.608	0	1561.392	1561.392	0	0
1999	5	29	14	0.43	592.97	2.304	975.334	0	590.666	590.666	0	1
1999	5	30	10.4	0.43	440.492	2.304	1127.812	0	438.188	438.188	0	0
1999	5	31	13.2	0.43	559.086	2.304	1009.218	0	556.782	556.782	0	0
1999	6	1	0	0	0	1.728	1566	0	0	0	1	0
1999	6	2	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	3	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	4	0	0	0	1.728	1566	0	0	0	1	0
1999	6	5	12.8	0.43	542.144	1.728	1025.584	0	540.416	540.416	0	0
1999	6	6	1.4	0	0	1.728	1566	0	0	0	1	0
1999	6	7	8.2	0	0	1.728	1566	0	0	0	1	0
1999	6	8	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	9	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	10	7.2	0	0	1.728	1566	0	0	0	1	0
1999	6	11	0	0	0	1.728	1566	0	0	0	1	0
1999	6	12	0	0	0	1.728	1566	0	0	0	1	0
1999	6	13	36.2	0.69	2460.333	1.728	0	892.605	1566	1566	0	0
1999	6	14	0	0	0	1.728	1566	0	0	0	1	1
1999	6	15	16.6	0.43	703.093	1.728	864.635	0	701.365	701.365	0	0
1999	6	16	5	0	0	1.728	1566	0	0	0	1	0
1999	6	17	0.4	0	0	1.728	1566	0	0	0	1	0
1999	6	18	14.8	0.43	626.854	1.728	940.874	0	0	625.126	0	0
1999	6	19	2.4	0	0	1.728	942.602	0	0	623.398	0	0
1999	6	20	0.2	0	0	1.728	944.33	0	0	621.67	0	0
1999	6	21	4.4	0	0	1.728	946.058	0	0	619.942	0	0
1999	6	22	0.6	0	0	1.728	947.786	0	0	618.214	0	0
1999	6	23	0.4	0	0	1.728	949.514	0	0	616.486	0	0
1999	6	24	0.2	0	0	1.728	951.242	0	0	614.758	0	0
1999	6	25	7.6	0	0	1.728	952.97	0	0	613.03	0	0
1999	6	26	3.8	0	0	1.728	954.698	0	0	611.302	0	0
1999	6	27	0	0	0	1.728	956.426	0	609.574	609.574	0	0
1999	6	28	0.2	0	0	1.728	1566	0	0	0	1	0
1999	6	29	0	0	0	1.728	1566	0	0	0	1	0
1999	6	30	16.2	0.43	686.151	1.728	881.577	0	684.423	684.423	0	0
1999	7	1	0.6	0	0	1.632	1566	0	0	0	1	0
1999	7	2	4.8	0	0	1.632	1566	0	0	0	1	0
1999	7	3	0.4	0	0	1.632	1566	0	0	0	1	0
1999	7	4	0	0	0	1.632	1566	0	0	0	1	0
1999	7	5	0	0	0	1.632	1566	0	0	0	1	0
1999	7	6	0	0	0	1.632	1566	0	0	0	1	0
1999	7	7	0	0	0	1.632	1566	0	0	0	1	0
1999	7	8	2	0	0	1.632	1566	0	0	0	1	0
1999	7	9	18.6	0.43	787.803	1.632	779.829	0	786.171	786.171	0	0
1999	7	10	0	0	0	1.632	1566	0	0	0	1	0
1999	7	11	0	0	0	1.632	1566	0	0	0	1	0
1999	7	12	0.4	0	0	1.632	1566	0	0	0	1	0
1999	7	13	0.4	0	0	1.632	1566	0	0	0	1	0
1999	7	14	0.4	0	0	1.632	1566	0	0	0	1	0
1999	7	15	0.2	0	0	1.632	1566	0	0	0	1	0
1999	7	16	0	0	0	1.632	1566	0	0	0	1	0
1999	7	17	0	0	0	1.632	1566	0	0	0	1	0
1999	7	18	0	0	0	1.632	1566	0	0	0	1	0
1999	7	19	0	0	0	1.632	1566	0	0	0	1	0
1999	7	20	30.2	0.69	2052.543	1.632	0	484.911	1566	1566	0	0
1999	7	21	5.8	0	0	1.632	1566	0	0	0	1	1
1999	7	22	5.8	0	0	1.632	1566	0	0	0	1	0
1999	7	23	0	0	0	1.632	1566	0	0	0	1	0
1999	7	24	0	0	0	1.632	1566	0	0	0	1	0
1999	7	25	0	0	0	1.632	1566	0	0	0	1	0
1999	7	26	0.8	0	0	1.632	1566	0	0	0	1	0
1999	7	27	0	0	0	1.632	1566	0	0	0	1	0
1999	7	28	0	0	0	1.632	1566	0	0	0	1	0
1999	7	29	0	0	0	1.632	1566	0	0	0	1	0
1999	7	30	0.2	0	0	1.632	1566	0	0	0	1	0
1999	7	31	0.6	0	0	1.632	1566	0	0	0	1	0
1999	8	1	0	0	0	2.208	1566	0	0	0	1	0
1999	8	2	0	0	0	2.208	1566	0	0	0	1	0
1999	8	3	0	0	0	2.208	1566	0	0	0	1	0
1999	8	4	0	0	0	2.208	1566	0	0	0	1	0
1999	8	5	0	0	0	2.208	1566	0	0	0	1	0
1999	8	6	0	0	0	2.208	1566	0	0	0	1	0
1999	8	7	0	0	0	2.208	1566	0	0	0	1	0
1999	8	8	21	0.56	1158.36	2.208	409.848	0	1156.152	1156.152	0	0
1999	8	9	24	0.56	1323.84	2.208	244.368	0	1321.632	1321.632	0	1
1999	8	10	4	0	0	2.208	1566	0	0	0	1	0
1999	8	11	0	0	0	2.208	1566	0	0	0	1	0
1999	8	12	0.6	0	0	2.208	1566	0	0	0	1	0
1999	8	13	1.2	0	0	2.208	1566	0	0	0	1	0
1999	8	14	0	0	0	2.208	1566	0	0	0	1	0
1999	8	15	5	0	0	2.208	1566	0	0	0	1	0
1999	8	16	0	0	0	2.208	1566	0	0	0	1	0
1999	8	17	0.2	0	0	2.208	1566	0	0	0	1	0
1999	8	18	0	0	0	2.208	1566	0	0	0	1	0
1999	8	19	0	0	0	2.208	1566	0	0	0	1	0
1999	8	20	0	0	0	2.208	1566	0	0	0	1	0
1999	8	21	0	0	0	2.208	1566	0	0	0	1	0
1999	8	22	0	0	0	2.208	1566	0	0	0	1	0
1999	8	23	0	0	0	2.208	1566	0	0	0	1	0
1999	8	24	0.2	0	0	2.208	1566	0	0	0	1	0
1999	8	25	0	0	0	2.208	1566	0	0	0	1	0

1999	8	26	0.6	0	0	2.208	1566	0	0	0	1	0
1999	8	27	4.6	0	0	2.208	1566	0	0	0	1	0
1999	8	28	0	0	0	2.208	1566	0	0	0	1	0
1999	8	29	0	0	0	2.208	1566	0	0	0	1	0
1999	8	30	0.4	0	0	2.208	1566	0	0	0	1	0
1999	8	31	0	0	0	2.208	1566	0	0	0	1	0
1999	9	1	0	0	0	3.264	1566	0	0	0	1	0
1999	9	2	0	0	0	3.264	1566	0	0	0	1	0
1999	9	3	0	0	0	3.264	1566	0	0	0	1	0
1999	9	4	36.2	0.69	2460.333	3.264	0	891.069	1566	1566	0	0
1999	9	5	0	0	0	3.264	1566	0	0	0	1	1
1999	9	6	10.8	0.43	457.434	3.264	1111.83	0	454.17	454.17	0	0
1999	9	7	0.4	0	0	3.264	1566	0	0	0	1	0
1999	9	8	0	0	0	3.264	1566	0	0	0	1	0
1999	9	9	0	0	0	3.264	1566	0	0	0	1	0
1999	9	10	0	0	0	3.264	1566	0	0	0	1	0
1999	9	11	4.6	0	0	3.264	1566	0	0	0	1	0
1999	9	12	0.4	0	0	3.264	1566	0	0	0	1	0
1999	9	13	2.2	0	0	3.264	1566	0	0	0	1	0
1999	9	14	0	0	0	3.264	1566	0	0	0	1	0
1999	9	15	0.2	0	0	3.264	1566	0	0	0	1	0
1999	9	16	13.8	0.43	584.499	3.264	984.765	0	581.235	581.235	0	0
1999	9	17	26.8	0.56	1478.288	3.264	90.976	0	1475.024	1475.024	0	1
1999	9	18	2	0	0	3.264	1566	0	0	0	1	0
1999	9	19	0	0	0	3.264	1566	0	0	0	1	0
1999	9	20	0.2	0	0	3.264	1566	0	0	0	1	0
1999	9	21	0	0	0	3.264	1566	0	0	0	1	0
1999	9	22	0	0	0	3.264	1566	0	0	0	1	0
1999	9	23	0	0	0	3.264	1566	0	0	0	1	0
1999	9	24	0	0	0	3.264	1566	0	0	0	1	0
1999	9	25	0	0	0	3.264	1566	0	0	0	1	0
1999	9	26	0	0	0	3.264	1566	0	0	0	1	0
1999	9	27	0	0	0	3.264	1566	0	0	0	1	0
1999	9	28	0	0	0	3.264	1566	0	0	0	1	0
1999	9	29	16.8	0.43	711.564	3.264	857.7	0	708.3	708.3	0	0
1999	9	30	0	0	0	3.264	1566	0	0	0	1	0
1999	10	1	0	0	0	4.512	1566	0	0	0	1	0
1999	10	2	0	0	0	4.512	1566	0	0	0	1	0
1999	10	3	21.4	0.56	1180.424	4.512	390.088	0	1175.912	1175.912	0	0
1999	10	4	0	0	0	4.512	1566	0	0	0	1	0
1999	10	5	0	0	0	4.512	1566	0	0	0	1	0
1999	10	6	0	0	0	4.512	1566	0	0	0	1	0
1999	10	7	0	0	0	4.512	1566	0	0	0	1	0
1999	10	8	0	0	0	4.512	1566	0	0	0	1	0
1999	10	9	0.8	0	0	4.512	1566	0	0	0	1	0
1999	10	10	20.6	0.56	1136.296	4.512	434.216	0	1131.784	1131.784	0	0
1999	10	11	15.8	0.43	669.209	4.512	901.303	0	664.697	664.697	0	1
1999	10	12	0.4	0	0	4.512	1566	0	0	0	1	0
1999	10	13	9.2	0	0	4.512	1566	0	0	0	1	0
1999	10	14	7.4	0	0	4.512	1566	0	0	0	1	0
1999	10	15	1	0	0	4.512	1566	0	0	0	1	0
1999	10	16	0	0	0	4.512	1566	0	0	0	1	0
1999	10	17	0	0	0	4.512	1566	0	0	0	1	0
1999	10	18	0.4	0	0	4.512	1566	0	0	0	1	0
1999	10	19	0.2	0	0	4.512	1566	0	0	0	1	0
1999	10	20	0.2	0	0	4.512	1566	0	0	0	1	0
1999	10	21	0	0	0	4.512	1566	0	0	0	1	0
1999	10	22	0.6	0	0	4.512	1566	0	0	0	1	0
1999	10	23	0	0	0	4.512	1566	0	0	0	1	0
1999	10	24	0.2	0	0	4.512	1566	0	0	0	1	0
1999	10	25	1.2	0	0	4.512	1566	0	0	0	1	0
1999	10	26	1.2	0	0	4.512	1566	0	0	0	1	0
1999	10	27	3	0	0	4.512	1566	0	0	0	1	0
1999	10	28	0.2	0	0	4.512	1566	0	0	0	1	0
1999	10	29	0	0	0	4.512	1566	0	0	0	1	0
1999	10	30	0	0	0	4.512	1566	0	0	0	1	0
1999	10	31	4.6	0	0	4.512	1566	0	0	0	1	0
1999	11	1	0	0	0	5.76	1566	0	0	0	1	0
1999	11	2	0	0	0	5.76	1566	0	0	0	1	0
1999	11	3	0	0	0	5.76	1566	0	0	0	1	0
1999	11	4	0.2	0	0	5.76	1566	0	0	0	1	0
1999	11	5	0	0	0	5.76	1566	0	0	0	1	0
1999	11	6	10.4	0.43	440.492	5.76	1131.268	0	434.732	434.732	0	0
1999	11	7	0	0	0	5.76	1566	0	0	0	1	0
1999	11	8	5.2	0	0	5.76	1566	0	0	0	1	0
1999	11	9	4.4	0	0	5.76	1566	0	0	0	1	0
1999	11	10	2.8	0	0	5.76	1566	0	0	0	1	0
1999	11	11	1.4	0	0	5.76	1566	0	0	0	1	0
1999	11	12	0.2	0	0	5.76	1566	0	0	0	1	0
1999	11	13	0	0	0	5.76	1566	0	0	0	1	0
1999	11	14	0	0	0	5.76	1566	0	0	0	1	0
1999	11	15	0	0	0	5.76	1566	0	0	0	1	0
1999	11	16	0	0	0	5.76	1566	0	0	0	1	0
1999	11	17	0	0	0	5.76	1566	0	0	0	1	0
1999	11	18	0	0	0	5.76	1566	0	0	0	1	0
1999	11	19	0	0	0	5.76	1566	0	0	0	1	0
1999	11	20	0.2	0	0	5.76	1566	0	0	0	1	0
1999	11	21	7.2	0	0	5.76	1566	0	0	0	1	0
1999	11	22	12.2	0.43	516.731	5.76	1055.029	0	510.971	510.971	0	0
1999	11	23	0.4	0	0	5.76	1566	0	0	0	1	0
1999	11	24	0	0	0	5.76	1566	0	0	0	1	0
1999	11	25	0	0	0	5.76	1566	0	0	0	1	0
1999	11	26	0	0	0	5.76	1566	0	0	0	1	0
1999	11	27	0	0	0	5.76	1566	0	0	0	1	0
1999	11	28	0	0	0	5.76	1566	0	0	0	1	0
1999	11	29	0.2	0	0	5.76	1566	0	0	0	1	0
1999	11	30	0	0	0	5.76	1566	0	0	0	1	0
1999	12	1	2.8	0	0	6.912	1566	0	0	0	1	0
1999	12	2	0	0	0	6.912	1566	0	0	0	1	0
1999	12	3	23.4	0.56	1290.744	6.912	282.168	0	1283.832	1283.832	0	0
1999	12	4	0.6	0	0	6.912	1566	0	0	0	1	0
1999	12	5	0	0	0	6.912	1566	0	0	0	1	0
1999	12	6	0	0	0	6.912	1566	0	0	0	1	0
1999	12	7	0	0	0	6.912	1566	0	0	0	1	0
1999	12	8	1.6	0	0	6.912	1566	0	0	0	1	0
1999	12	9	8	0	0	6.912	1566	0	0	0	1	0
1999	12	10	0.2	0	0	6.912	1566	0	0	0	1	0
1999	12	11	0	0	0	6.912	1566	0	0	0	1	0
1999	12	12	1.2	0	0	6.912	1566	0	0	0	1	0
1999	12	13	0	0	0	6.912	1566	0	0	0	1	0
1999	12	14	0	0	0	6.912	1566	0	0	0	1	0
1999	12	15	0	0	0	6.912	1566	0	0	0	1	0
1999	12	16	4.6	0	0	6.912	1566	0	0	0	1	0
1999	12	17	0	0	0	6.912	1566	0	0	0	1	0
1999	12	18	0	0	0	6.912	1566	0	0	0	1	0
1999	12	19	0	0	0	6.912	1566	0	0	0	1	0
1999	12	20	0	0	0	6.912	1566	0	0	0	1	0
1999	12	21	0	0	0	6.912	1566	0	0	0	1	0
1999	12	22	0	0	0	6.912	1566	0	0	0	1	0
1999	12	23	0	0	0	6.912	1566	0	0	0	1	0
1999	12	24	0	0	0	6.912	1566	0	0	0	1	0

1999	12	25	1.2	0	0	6.912	1566	0	0	0	1	0
1999	12	26	0	0	0	6.912	1566	0	0	0	1	0
1999	12	27	0.2	0	0	6.912	1566	0	0	0	1	0
1999	12	28	1.8	0	0	6.912	1566	0	0	0	1	0
1999	12	29	0.2	0	0	6.912	1566	0	0	0	1	0
1999	12	30	0	0	0	6.912	1566	0	0	0	1	0
1999	12	31	2	0	0	6.912	1566	0	0	0	1	0
			997.8		45072.221	1575.264		13700.765	31553.616		312	11

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m³)	Uncontrolled Flow Discharged from Sediment Dam (m³)	Volume of Controlled Flow Discharged from Sediment Dam (m³)	Controlled Flow Discharged from Sediment Dam (m³)	Volume of Sediment Water Remaining (m³)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m³)	Evaporation (m³)							
1999	1	1	0	0	0	7.68	2840	0	0	0	2200	0	
1999	1	2	0	0	0	7.68	2847.68	0	0	0	794.32	0	0
1999	1	3	0	0	0	7.68	2855.36	0	0	0	786.64	0	0
1999	1	4	0	0	0	7.68	2863.04	0	0	0	778.96	0	0
1999	1	5	0	0	0	7.68	2870.72	0	-20.72	0	771.28	0	0
1999	1	6	0	0	0	7.68	2878.4	0	-28.4	0	763.6	0	0
1999	1	7	0.4	0	0	7.68	2886.08	0	-36.08	0	755.92	0	0
1999	1	8	16	0.43	677.68	7.68	2216.08	0	633.92	633.92	1425.92	0	0
1999	1	9	0	0	0	7.68	2857.68	0	-7.68	0	784.32	0	0
1999	1	10	0	0	0	7.68	2865.36	0	-15.36	0	776.64	0	0
1999	1	11	0	0	0	7.68	2873.04	0	-23.04	0	768.96	0	0
1999	1	12	0	0	0	7.68	2880.72	0	-30.72	0	761.28	0	0
1999	1	13	0	0	0	7.68	2888.4	0	-38.4	0	753.6	0	0
1999	1	14	0	0	0	7.68	2896.08	0	-46.08	0	745.92	0	0
1999	1	15	0	0	0	7.68	2903.76	0	-53.76	0	738.24	0	0
1999	1	16	0	0	0	7.68	2911.44	0	-61.44	0	730.56	0	0
1999	1	17	0	0	0	7.68	2919.12	0	-69.12	0	722.88	0	0
1999	1	18	0	0	0	7.68	2926.8	0	-76.8	0	715.2	0	0
1999	1	19	0	0	0	7.68	2934.48	0	-84.48	0	707.52	0	0
1999	1	20	0	0	0	7.68	2942.16	0	-92.16	0	699.84	0	0
1999	1	21	0	0	0	7.68	2949.84	0	-99.84	0	692.16	0	0
1999	1	22	0	0	0	7.68	2957.52	0	-107.52	0	684.48	0	0
1999	1	23	0	0	0	7.68	2965.2	0	-115.2	0	676.8	0	0
1999	1	24	0	0	0	7.68	2972.88	0	-122.88	0	669.12	0	0
1999	1	25	0	0	0	7.68	2980.56	0	-130.56	0	661.44	0	0
1999	1	26	0.8	0	0	7.68	2988.24	0	-138.24	0	653.76	0	0
1999	1	27	0	0	0	7.68	2995.92	0	-145.92	0	646.08	0	0
1999	1	28	0	0	0	7.68	3003.6	0	-153.6	0	638.4	0	0
1999	1	29	0.2	0	0	7.68	3011.28	0	-161.28	0	630.72	0	0
1999	1	30	0	0	0	7.68	3018.96	0	-168.96	0	623.04	0	0
1999	1	31	0.6	0	0	7.68	3026.64	0	-176.64	0	615.36	0	0
1999	2	1	0	0	0	6.816	3033.456	0	-183.456	0	608.544	0	0
1999	2	2	0	0	0	6.816	3040.272	0	-190.272	0	601.728	0	0
1999	2	3	0	0	0	6.816	3047.088	0	-197.088	0	594.912	0	0
1999	2	4	0	0	0	6.816	3053.904	0	-203.904	0	588.096	0	0
1999	2	5	0	0	0	6.816	3060.72	0	-210.72	0	581.28	0	0
1999	2	6	0.8	0	0	6.816	3067.536	0	-217.536	0	574.464	0	0
1999	2	7	0	0	0	6.816	3074.352	0	-224.352	0	567.648	0	0
1999	2	8	0	0	0	6.816	3081.168	0	-231.168	0	560.832	0	0
1999	2	9	0	0	0	6.816	3087.984	0	-237.984	0	554.016	0	0
1999	2	10	0	0	0	6.816	3094.8	0	-244.8	0	547.2	0	0
1999	2	11	0.4	0	0	6.816	3101.616	0	-251.616	0	540.384	0	0
1999	2	12	0	0	0	6.816	3108.432	0	-258.432	0	533.568	0	0
1999	2	13	0	0	0	6.816	3115.248	0	-265.248	0	526.752	0	0
1999	2	14	0	0	0	6.816	3122.064	0	-272.064	0	519.936	0	0
1999	2	15	0	0	0	6.816	3128.88	0	-278.88	0	513.12	0	0
1999	2	16	0	0	0	6.816	3135.696	0	-285.696	0	506.304	0	0
1999	2	17	0	0	0	6.816	3142.512	0	-292.512	0	499.488	0	0
1999	2	18	3.4	0	0	6.816	3149.328	0	-299.328	0	492.672	0	0
1999	2	19	0	0	0	6.816	3156.144	0	-306.144	0	485.856	0	0
1999	2	20	0	0	0	6.816	3162.96	0	-312.96	0	479.04	0	0
1999	2	21	0	0	0	6.816	3169.776	0	-319.776	0	472.224	0	0
1999	2	22	0	0	0	6.816	3176.592	0	-326.592	0	465.408	0	0
1999	2	23	0	0	0	6.816	3183.408	0	-333.408	0	458.592	0	0
1999	2	24	0	0	0	6.816	3190.224	0	-340.224	0	451.776	0	0
1999	2	25	0	0	0	6.816	3197.04	0	-347.04	0	444.96	0	0
1999	2	26	0	0	0	6.816	3203.856	0	-353.856	0	438.144	0	0
1999	2	27	0	0	0	6.816	3210.672	0	-360.672	0	431.328	0	0
1999	2	28	0	0	0	6.816	3217.488	0	-367.488	0	424.512	0	0
1999	3	1	0	0	0	5.568	3223.056	0	-373.056	0	418.944	0	0
1999	3	2	0	0	0	5.568	3228.624	0	-378.624	0	413.376	0	0
1999	3	3	0	0	0	5.568	3234.192	0	-384.192	0	407.808	0	0
1999	3	4	0	0	0	5.568	3239.76	0	-389.76	0	402.24	0	0
1999	3	5	0	0	0	5.568	3245.328	0	-395.328	0	396.672	0	0
1999	3	6	0	0	0	5.568	3250.896	0	-400.896	0	391.104	0	0
1999	3	7	19.6	0.43	830.158	5.568	2426.306	0	423.694	423.694	1215.694	0	0
1999	3	8	0.2	0	0	5.568	2855.568	0	-5.568	0	786.432	0	0
1999	3	9	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	10	0	0	0	5.568	2866.704	0	-16.704	0	775.296	0	0
1999	3	11	0	0	0	5.568	2872.272	0	-22.272	0	769.728	0	0
1999	3	12	0	0	0	5.568	2877.84	0	-27.84	0	764.16	0	0
1999	3	13	0	0	0	5.568	2883.408	0	-33.408	0	758.592	0	0
1999	3	14	0	0	0	5.568	2888.976	0	-38.976	0	753.024	0	0
1999	3	15	0	0	0	5.568	2894.544	0	-44.544	0	747.456	0	0
1999	3	16	0	0	0	5.568	2900.112	0	-50.112	0	741.888	0	0
1999	3	17	0	0	0	5.568	2905.68	0	-55.68	0	736.32	0	0
1999	3	18	11	0.43	465.905	5.568	2445.343	0	404.657	404.657	1196.657	0	0
1999	3	19	1.6	0	0	5.568	2855.568	0	-5.568	0	786.432	0	0
1999	3	20	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	21	48	0.74	3498.72	5.568	-632.016	632.016	2850	2850	3642	0	0
1999	3	22	2.6	0	0	5.568	2855.568	0	-5.568	0	786.432	0	1
1999	3	23	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	24	0	0	0	5.568	2866.704	0	-16.704	0	775.296	0	0
1999	3	25	11	0.43	465.905	5.568	2406.367	0	443.633	443.633	1235.633	0	0
1999	3	26	2.8	0	0	5.568	2855.568	0	-5.568	0	786.432	0	0
1999	3	27	0	0	0	5.568	2861.136	0	-11.136	0	780.864	0	0
1999	3	28	4.6	0	0	5.568	2866.704	0	-16.704	0	775.296	0	0
1999	3	29	0	0	0	5.568	2872.272	0	-22.272	0	769.728	0	0
1999	3	30	0	0	0	5.568	2877.84	0	-27.84	0	764.16	0	0
1999	3	31	1.8	0	0	5.568	2883.408	0	-33.408	0	758.592	0	0
1999	4	1	0	0	0	3.552	2886.96	0	-36.96	0	755.04	0	0
1999	4	2	0	0	0	3.552	2890.512	0	-40.512	0	751.488	0	0
1999	4	3	0	0	0	3.552	2894.064	0	-44.064	0	747.936	0	0
1999	4	4	1.2	0	0	3.552	2897.616	0	-47.616	0	744.384	0	0
1999	4	5	3.2	0	0	3.552	2901.168	0	-51.168	0	740.832	0	0
1999	4	6	0	0	0	3.552	2904.72	0	-54.72	0	737.28	0	0
1999	4	7	0	0	0	3.552	2908.272	0	-58.272	0	733.728	0	0
1999	4	8	0	0	0	3.552	2911.824	0	-61.824	0	730.176	0	0
1999	4	9	0	0	0	3.552	2915.376	0	-65.376	0	726.624	0	0
1999	4	10	0	0	0	3.552	2918.928	0	-68.928	0	723.072	0	0
1999	4	11	0	0	0	3.552	2922.48	0	-72.48	0	719.52	0	0
1999	4	12	0	0	0	3.552	2926.032	0	-76.032	0	715.968	0	0
1999	4	13	0	0	0	3.552	2929.584	0	-79.584	0	712.416	0	0
1999	4	14	0	0	0	3.552	2933.136	0	-83.136	0	708.864	0	0
1999	4	15	0	0	0	3.552	2936.688	0	-86.688	0	705.312	0	0
1999	4	16	0	0	0	3.552	2940.24	0	-90.24	0	701.76	0	0
1999	4	17	0	0	0	3.552	2943.792	0	-93.792	0	698.208	0	0
1999	4	18	0	0	0	3.552	2947.344	0	-97.344	0	694.656	0	0
1999	4	19	0	0	0	3.552	2950.896	0	-100.896	0	691.104	0	0
1999	4	20	6.8	0	0	3.552	2954.448	0	-104.448	0	687.552	0	0
1999	4	21	4.2	0	0	3.552	2958	0	-108	0	684	0	0
1999	4	22	0	0	0	3.552	2961.552	0	-111.552	0	680.448	0	0
1999	4	23	0	0	0	3.552	2965.104	0	-115.104	0	676.896	0	0
1999	4	24	0	0	0	3.552	2968.656	0	-118.656	0	673.344	0	0
1999	4	25	0	0	0	3.552	2972.208	0	-122.208	0	669.792	0	0
1999	4	26	0	0	0	3.552	2975.76	0	-125.76	0	666.24	0	0
1999	4	27	1.2	0	0	3.552	2979.312	0	-129.312	0	662.688	0	0
1999	4	28	0.6	0	0	3.552	2982.864	0	-132.864	0	659.136	0	0
1999	4	29	0.2	0	0	3.552	2986.416	0	-136.416	0	655.584	0	0
1999	4	30	0	0	0	3.552	2989.968	0	-139.968	0	652.032	0	0
1999	5	1	0	0	0	2.304	2992.272	0	-142.272	0	649.728	0	0
1999	5	2	0	0	0	2.304	2994.576	0	-144.576	0	647.424	0	0
1999	5	3	0	0	0	2.304	2996.88	0	-146.88	0	645.12	0	0
1999	5	4	0	0	0	2.304	2999.184	0	-149.184	0	642.816	0	0
1999	5	5	0	0	0	2.304	3001.488	0	-151.488	0	640.512	0	0

1999	5	6	0	0	0	2.304	3003.792	0	-153.792	0	638.208	0	0
1999	5	7	0	0	0	2.304	3006.096	0	-156.096	0	635.904	0	0
1999	5	8	0	0	0	2.304	3008.4	0	-158.4	0	633.6	0	0
1999	5	9	0	0	0	2.304	3010.704	0	-160.704	0	631.296	0	0
1999	5	10	0.4	0	0	2.304	3013.008	0	-163.008	0	628.992	0	0
1999	5	11	0	0	0	2.304	3015.312	0	-165.312	0	626.688	0	0
1999	5	12	11.6	0.43	491.318	2.304	2526.298	0	323.702	323.702	1115.702	0	0
1999	5	13	30.4	0.69	2066.136	2.304	786.168	0	2063.832	2063.832	2855.832	0	0
1999	5	14	0.6	0	0	2.304	2852.304	0	-2.304	0	789.696	0	0
1999	5	15	0	0	0	2.304	2854.608	0	-4.608	0	787.392	0	0
1999	5	16	42.8	0.74	3119.692	2.304	-262.78	262.78	2850	2850	3642	0	0
1999	5	17	0	0	0	2.304	2852.304	0	-2.304	0	789.696	0	1
1999	5	18	0.8	0	0	2.304	2854.608	0	-4.608	0	787.392	0	0
1999	5	19	0	0	0	2.304	2856.912	0	-6.912	0	785.088	0	0
1999	5	20	0	0	0	2.304	2859.216	0	-9.216	0	782.784	0	0
1999	5	21	6.4	0	0	2.304	2861.52	0	-11.52	0	780.48	0	0
1999	5	22	5.2	0	0	2.304	2863.824	0	-13.824	0	778.176	0	0
1999	5	23	44.2	0.74	3221.738	2.304	-355.61	355.61	2850	2850	3642	0	0
1999	5	24	15.8	0.43	669.209	2.304	2183.095	0	0	0	1458.905	0	0
1999	5	25	78	0.81	6223.23	2.304	-4037.831	4037.831	0	0	3642	0	0
1999	5	26	11.4	0.43	482.847	2.304	-480.543	480.543	0	0	3642	0	0
1999	5	27	1.6	0	0	2.304	2.304	0	0	0	3639.696	0	1
1999	5	28	0	0	0	2.304	4.608	0	2845.392	2845.392	3637.392	0	0
1999	5	29	14	0.43	592.97	2.304	2259.334	0	590.666	590.666	1382.666	0	1
1999	5	30	10.4	0.43	440.492	2.304	2411.812	0	438.188	438.188	1230.188	0	0
1999	5	31	13.2	0.43	559.086	2.304	2293.218	0	556.782	556.782	1348.782	0	0
1999	6	1	0	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	2	0.2	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	3	0.2	0	0	1.728	2855.184	0	-5.184	0	786.816	0	0
1999	6	4	0	0	0	1.728	2856.912	0	-6.912	0	785.088	0	0
1999	6	5	12.8	0.43	542.144	1.728	2316.496	0	533.504	533.504	1325.504	0	0
1999	6	6	1.4	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	7	8.2	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	8	0.2	0	0	1.728	2855.184	0	0	0	786.816	0	0
1999	6	9	0.2	0	0	1.728	2856.912	0	0	0	785.088	0	0
1999	6	10	7.2	0	0	1.728	2858.64	0	0	0	783.36	0	0
1999	6	11	0	0	0	1.728	2860.368	0	-10.368	0	781.632	0	0
1999	6	12	0	0	0	1.728	2862.096	0	-12.096	0	779.904	0	0
1999	6	13	36.2	0.69	2460.333	1.728	403.491	0	2446.509	2446.509	3238.509	0	0
1999	6	14	0	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	15	16.6	0.43	703.093	1.728	2150.363	0	699.637	699.637	1491.637	0	0
1999	6	16	5	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	17	0.4	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	18	14.8	0.43	626.854	1.728	2228.33	0	0	0	1413.67	0	0
1999	6	19	2.4	0	0	1.728	2230.058	0	0	0	1411.942	0	0
1999	6	20	0.2	0	0	1.728	2231.786	0	0	0	1410.214	0	0
1999	6	21	4.4	0	0	1.728	2233.514	0	0	0	1408.486	0	0
1999	6	22	0.6	0	0	1.728	2235.242	0	0	0	1406.758	0	0
1999	6	23	0.4	0	0	1.728	2236.97	0	0	0	1405.03	0	0
1999	6	24	0.2	0	0	1.728	2238.698	0	0	0	1403.302	0	0
1999	6	25	7.6	0	0	1.728	2240.426	0	0	0	1401.574	0	0
1999	6	26	3.8	0	0	1.728	2242.154	0	0	0	1399.846	0	0
1999	6	27	0	0	0	1.728	2243.882	0	606.118	606.118	1398.118	0	0
1999	6	28	0.2	0	0	1.728	2851.728	0	-1.728	0	790.272	0	0
1999	6	29	0	0	0	1.728	2853.456	0	-3.456	0	788.544	0	0
1999	6	30	16.2	0.43	686.151	1.728	2169.033	0	680.967	680.967	1472.967	0	0
1999	7	1	0.6	0	0	1.632	2851.632	0	-1.632	0	790.368	0	0
1999	7	2	4.8	0	0	1.632	2853.264	0	-3.264	0	788.736	0	0
1999	7	3	0.4	0	0	1.632	2854.896	0	0	0	787.104	0	0
1999	7	4	0	0	0	1.632	2856.528	0	-6.528	0	785.472	0	0
1999	7	5	0	0	0	1.632	2858.16	0	-8.16	0	783.84	0	0
1999	7	6	0	0	0	1.632	2859.792	0	-9.792	0	782.208	0	0
1999	7	7	0	0	0	1.632	2861.424	0	-11.424	0	780.576	0	0
1999	7	8	2	0	0	1.632	2863.056	0	-13.056	0	778.944	0	0
1999	7	9	18.6	0.43	787.803	1.632	2076.885	0	773.115	773.115	1565.115	0	0
1999	7	10	0	0	0	1.632	2851.632	0	-1.632	0	790.368	0	0
1999	7	11	0	0	0	1.632	2853.264	0	-3.264	0	788.736	0	0
1999	7	12	0.4	0	0	1.632	2854.896	0	-4.896	0	787.104	0	0
1999	7	13	0.4	0	0	1.632	2856.528	0	-6.528	0	785.472	0	0
1999	7	14	0.4	0	0	1.632	2858.16	0	-8.16	0	783.84	0	0
1999	7	15	0.2	0	0	1.632	2859.792	0	0	0	782.208	0	0
1999	7	16	0	0	0	1.632	2861.424	0	-11.424	0	780.576	0	0
1999	7	17	0	0	0	1.632	2863.056	0	-13.056	0	778.944	0	0
1999	7	18	0	0	0	1.632	2864.688	0	-14.688	0	777.312	0	0
1999	7	19	0	0	0	1.632	2866.32	0	-16.32	0	775.68	0	0
1999	7	20	30.2	0.69	2052.543	1.632	815.409	0	2034.591	2034.591	2826.591	0	0
1999	7	21	5.8	0	0	1.632	2851.632	0	-1.632	0	790.368	0	0
1999	7	22	5.8	0	0	1.632	2853.264	0	-3.264	0	788.736	0	0
1999	7	23	0	0	0	1.632	2854.896	0	-4.896	0	787.104	0	0
1999	7	24	0	0	0	1.632	2856.528	0	-6.528	0	785.472	0	0
1999	7	25	0	0	0	1.632	2858.16	0	-8.16	0	783.84	0	0
1999	7	26	0.8	0	0	1.632	2859.792	0	-9.792	0	782.208	0	0
1999	7	27	0	0	0	1.632	2861.424	0	-11.424	0	780.576	0	0
1999	7	28	0	0	0	1.632	2863.056	0	-13.056	0	778.944	0	0
1999	7	29	0	0	0	1.632	2864.688	0	-14.688	0	777.312	0	0
1999	7	30	0.2	0	0	1.632	2866.32	0	-16.32	0	775.68	0	0
1999	7	31	0.6	0	0	1.632	2867.952	0	-17.952	0	774.048	0	0
1999	8	1	0	0	0	2.208	2870.16	0	-20.16	0	771.84	0	0
1999	8	2	0	0	0	2.208	2872.368	0	-22.368	0	769.632	0	0
1999	8	3	0	0	0	2.208	2874.576	0	-24.576	0	767.424	0	0
1999	8	4	0	0	0	2.208	2876.784	0	-26.784	0	765.216	0	0
1999	8	5	0	0	0	2.208	2878.992	0	-28.992	0	763.008	0	0
1999	8	6	0	0	0	2.208	2881.2	0	-31.2	0	760.8	0	0
1999	8	7	0	0	0	2.208	2883.408	0	-33.408	0	758.592	0	0
1999	8	8	21	0.56	1158.36	2.208	1727.256	0	1122.744	1122.744	1914.744	0	0
1999	8	9	24	0.56	1323.84	2.208	1528.368	0	1321.632	1321.632	2113.632	0	0
1999	8	10	4	0	0	2.208	2852.208	0	-2.208	0	789.792	0	0
1999	8	11	0	0	0	2.208	2854.416	0	-4.416	0	787.584	0	0
1999	8	12	0.6	0	0	2.208	2856.624	0	-6.624	0	785.376	0	0
1999	8	13	1.2	0	0	2.208	2858.832	0	-8.832	0	783.168	0	0
1999	8	14	0	0	0	2.208	2861.04	0	-11.04	0	780.96	0	0
1999	8	15	5	0	0	2.208	2863.248	0	-13.248	0	778.752	0	0
1999	8	16	0	0	0	2.208	2865.456	0	-15.456	0	776.544	0	0
1999	8	17	0.2	0	0	2.208	2867.664	0	-17.664	0	774.336	0	0
1999	8	18	0	0	0	2.208	2869.872	0	-19.872	0	772.128	0	0
1999	8	19	0	0	0	2.208	2872.08	0	-22.08	0	769.92	0	0
1999	8	20	0	0	0	2.208	2874.288	0	-24.288	0	767.712	0	0
1999	8	21	0	0	0	2.208	2876.496	0	-26.496	0	765.504	0	0
1999	8	22	0	0	0	2.208	2878.704	0	-28.704	0	763.296	0	0
1999	8	23	0	0	0	2.208	2880.912	0	-30.912	0	761.088	0	0
1999	8	24	0.2	0	0	2.208	2883.12	0	-33.12	0	758.88	0	0
1999	8	25	0	0	0	2.208	2885.328	0	-35.328	0	756.672	0	0
1999	8	26	0.6	0	0	2.208	2887.536	0	-37.536	0	754.464	0	0
1999	8	27	4.6	0	0	2.208	2889.744	0	-39.744	0	752.256	0	0
1999	8	28	0	0	0	2.208	2891.952	0	-41.952	0	750.048	0	0
1999	8	29	0	0	0	2.208	2894.16	0	-44.16	0	747.84	0	0
1999	8	30	0.4	0	0	2.208	2896.368	0	-46.368	0	745.632	0	0
1999	8	31	0	0	0	2.208	2898.576	0	-48.576	0	743.424	0	0
1999	9	1	0	0	0	3.264	2901.84	0	-51.84	0	740.16	0	0
1999	9	2	0	0	0	3.264	2905.104	0	-55.104	0	736.896	0	0
1999	9	3	0	0	0	3.264	2908.368	0	-58.368	0	733.632	0	0
1999	9	4	36.2	0.69	2460.333	3.264	451.299	0	2398.701	2398.701	3190.701	0	0
1999	9	5	0	0	0	3.264	2853.264	0	-3.264	0	788.736	0	0
1999	9	6	10.8	0.43	457.434	3.264	2399.094	0	450.906	450.906	1242.906	0	0
1999	9	7	0.4	0	0	3.264	2853.264	0	-3.264	0	788.736	0	0
1999	9	8	0	0	0	3.264	2856.528	0	-6.528	0	785.472	0	0
1999	9	9	0	0	0	3.264	2859.792	0	-9.792	0	782.208	0	0
1999	9	10	0	0	0	3.264	2863.056	0	-13.056	0	778.944	0	0
1999	9	11	4.6	0	0	3.264	2866.32	0	-16.32	0	775.68	0	0
1999	9	12	0.4	0	0	3.264	2869.584	0	-19.584	0	772.416	0	0

1999	9	13	2.2	0	0	3.264	2872.848	0	-22.848	0	769.152	0	0
1999	9	14	0	0	0	3.264	2876.112	0	-26.112	0	765.888	0	0
1999	9	15	0.2	0	0	3.264	2879.376	0	-29.376	0	762.624	0	0
1999	9	16	13.8	0.43	584.499	3.264	2298.141	0	551.859	551.859	1343.859	0	0
1999	9	17	26.8	0.56	1478.288	3.264	1374.976	0	1475.024	1475.024	2267.024	0	0
1999	9	18	2	0	0	3.264	2853.264	0	0	0	788.736	0	0
1999	9	19	0	0	0	3.264	2856.528	0	-6.528	0	785.472	0	0
1999	9	20	0.2	0	0	3.264	2859.792	0	-9.792	0	782.208	0	0
1999	9	21	0	0	0	3.264	2863.056	0	-13.056	0	778.944	0	0
1999	9	22	0	0	0	3.264	2866.32	0	-16.32	0	775.68	0	0
1999	9	23	0	0	0	3.264	2869.584	0	-19.584	0	772.416	0	0
1999	9	24	0	0	0	3.264	2872.848	0	-22.848	0	769.152	0	0
1999	9	25	0	0	0	3.264	2876.112	0	-26.112	0	765.888	0	0
1999	9	26	0	0	0	3.264	2879.376	0	-29.376	0	762.624	0	0
1999	9	27	0	0	0	3.264	2882.64	0	-32.64	0	759.36	0	0
1999	9	28	0	0	0	3.264	2885.904	0	-35.904	0	756.096	0	0
1999	9	29	16.8	0.43	711.564	3.264	2177.604	0	672.396	672.396	1464.396	0	0
1999	9	30	0	0	0	3.264	2853.264	0	-3.264	0	788.736	0	0
1999	10	1	0	0	0	4.512	2857.776	0	-7.776	0	784.224	0	0
1999	10	2	0	0	0	4.512	2862.288	0	-12.288	0	779.712	0	0
1999	10	3	21.4	0.56	1180.424	4.512	1686.376	0	1163.624	1163.624	1955.624	0	0
1999	10	4	0	0	0	4.512	2854.512	0	-4.512	0	787.488	0	0
1999	10	5	0	0	0	4.512	2859.024	0	-9.024	0	782.976	0	0
1999	10	6	0	0	0	4.512	2863.536	0	-13.536	0	778.464	0	0
1999	10	7	0	0	0	4.512	2868.048	0	-18.048	0	773.952	0	0
1999	10	8	0	0	0	4.512	2872.56	0	-22.56	0	769.44	0	0
1999	10	9	0.8	0	0	4.512	2877.072	0	-27.072	0	764.928	0	0
1999	10	10	20.6	0.56	1136.296	4.512	1745.288	0	1104.712	1104.712	1896.712	0	0
1999	10	11	15.8	0.43	669.209	4.512	2185.303	0	664.697	664.697	1456.697	0	0
1999	10	12	0.4	0	0	4.512	2854.512	0	0	0	787.488	0	0
1999	10	13	9.2	0	0	4.512	2859.024	0	0	0	782.976	0	0
1999	10	14	7.4	0	0	4.512	2863.536	0	0	0	778.464	0	0
1999	10	15	1	0	0	4.512	2868.048	0	0	0	773.952	0	0
1999	10	16	0	0	0	4.512	2872.56	0	-22.56	0	769.44	0	0
1999	10	17	0	0	0	4.512	2877.072	0	-27.072	0	764.928	0	0
1999	10	18	0.4	0	0	4.512	2881.584	0	-31.584	0	760.416	0	0
1999	10	19	0.2	0	0	4.512	2886.096	0	-36.096	0	755.904	0	0
1999	10	20	0.2	0	0	4.512	2890.608	0	-40.608	0	751.392	0	0
1999	10	21	0	0	0	4.512	2895.12	0	-45.12	0	746.88	0	0
1999	10	22	0.6	0	0	4.512	2899.632	0	-49.632	0	742.368	0	0
1999	10	23	0	0	0	4.512	2904.144	0	-54.144	0	737.856	0	0
1999	10	24	0.2	0	0	4.512	2908.656	0	-58.656	0	733.344	0	0
1999	10	25	1.2	0	0	4.512	2913.168	0	-63.168	0	728.832	0	0
1999	10	26	1.2	0	0	4.512	2917.68	0	-67.68	0	724.32	0	0
1999	10	27	3	0	0	4.512	2922.192	0	0	0	719.808	0	0
1999	10	28	0.2	0	0	4.512	2926.704	0	0	0	715.296	0	0
1999	10	29	0	0	0	4.512	2931.216	0	-81.216	0	710.784	0	0
1999	10	30	0	0	0	4.512	2935.728	0	-85.728	0	706.272	0	0
1999	10	31	4.6	0	0	4.512	2940.24	0	-90.24	0	701.76	0	0
1999	11	1	0	0	0	5.76	2946	0	-96	0	696	0	0
1999	11	2	0	0	0	5.76	2951.76	0	-101.76	0	690.24	0	0
1999	11	3	0	0	0	5.76	2957.52	0	-107.52	0	684.48	0	0
1999	11	4	0.2	0	0	5.76	2963.28	0	-113.28	0	678.72	0	0
1999	11	5	0	0	0	5.76	2969.04	0	-119.04	0	672.96	0	0
1999	11	6	10.4	0.43	440.492	5.76	2534.308	0	315.692	315.692	1107.692	0	0
1999	11	7	0	0	0	5.76	2855.76	0	-5.76	0	786.24	0	0
1999	11	8	5.2	0	0	5.76	2861.52	0	-11.52	0	780.48	0	0
1999	11	9	4.4	0	0	5.76	2867.28	0	-17.28	0	774.72	0	0
1999	11	10	2.8	0	0	5.76	2873.04	0	-23.04	0	768.96	0	0
1999	11	11	1.4	0	0	5.76	2878.8	0	0	0	763.2	0	0
1999	11	12	0.2	0	0	5.76	2884.56	0	0	0	757.44	0	0
1999	11	13	0	0	0	5.76	2890.32	0	-40.32	0	751.68	0	0
1999	11	14	0	0	0	5.76	2896.08	0	-46.08	0	745.92	0	0
1999	11	15	0	0	0	5.76	2901.84	0	-51.84	0	740.16	0	0
1999	11	16	0	0	0	5.76	2907.6	0	-57.6	0	734.4	0	0
1999	11	17	0	0	0	5.76	2913.36	0	-63.36	0	728.64	0	0
1999	11	18	0	0	0	5.76	2919.12	0	-69.12	0	722.88	0	0
1999	11	19	0	0	0	5.76	2924.88	0	-74.88	0	717.12	0	0
1999	11	20	0.2	0	0	5.76	2930.64	0	-80.64	0	711.36	0	0
1999	11	21	7.2	0	0	5.76	2936.4	0	-86.4	0	705.6	0	0
1999	11	22	12.2	0.43	516.731	5.76	2425.429	0	424.571	424.571	1216.571	0	0
1999	11	23	0.4	0	0	5.76	2855.76	0	0	0	786.24	0	0
1999	11	24	0	0	0	5.76	2861.52	0	-11.52	0	780.48	0	0
1999	11	25	0	0	0	5.76	2867.28	0	-17.28	0	774.72	0	0
1999	11	26	0	0	0	5.76	2873.04	0	-23.04	0	768.96	0	0
1999	11	27	0	0	0	5.76	2878.8	0	-28.8	0	763.2	0	0
1999	11	28	0	0	0	5.76	2884.56	0	-34.56	0	757.44	0	0
1999	11	29	0.2	0	0	5.76	2890.32	0	-40.32	0	751.68	0	0
1999	11	30	0	0	0	5.76	2896.08	0	-46.08	0	745.92	0	0
1999	12	1	2.8	0	0	6.912	2902.992	0	-52.992	0	739.008	0	0
1999	12	2	0	0	0	6.912	2909.904	0	-59.904	0	732.096	0	0
1999	12	3	23.4	0.56	1290.744	6.912	1626.072	0	1223.928	1223.928	2015.928	0	0
1999	12	4	0.6	0	0	6.912	2856.912	0	-6.912	0	785.088	0	0
1999	12	5	0	0	0	6.912	2863.824	0	-13.824	0	778.176	0	0
1999	12	6	0	0	0	6.912	2870.736	0	-20.736	0	771.264	0	0
1999	12	7	0	0	0	6.912	2877.648	0	-27.648	0	764.352	0	0
1999	12	8	1.6	0	0	6.912	2884.56	0	-34.56	0	757.44	0	0
1999	12	9	8	0	0	6.912	2891.472	0	-41.472	0	750.528	0	0
1999	12	10	0.2	0	0	6.912	2898.384	0	-48.384	0	743.616	0	0
1999	12	11	0	0	0	6.912	2905.296	0	-55.296	0	736.704	0	0
1999	12	12	1.2	0	0	6.912	2912.208	0	-62.208	0	729.792	0	0
1999	12	13	0	0	0	6.912	2919.12	0	-69.12	0	722.88	0	0
1999	12	14	0	0	0	6.912	2926.032	0	-76.032	0	715.968	0	0
1999	12	15	0	0	0	6.912	2932.944	0	-82.944	0	709.056	0	0
1999	12	16	4.6	0	0	6.912	2939.856	0	-89.856	0	702.144	0	0
1999	12	17	0	0	0	6.912	2946.768	0	-96.768	0	695.232	0	0
1999	12	18	0	0	0	6.912	2953.68	0	-103.68	0	688.32	0	0
1999	12	19	0	0	0	6.912	2960.592	0	-110.592	0	681.408	0	0
1999	12	20	0	0	0	6.912	2967.504	0	-117.504	0	674.496	0	0
1999	12	21	0	0	0	6.912	2974.416	0	-124.416	0	667.584	0	0
1999	12	22	0	0	0	6.912	2981.328	0	-131.328	0	660.672	0	0
1999	12	23	0	0	0	6.912	2988.24	0	-138.24	0	653.76	0	0
1999	12	24	0	0	0	6.912	2995.152	0	-145.152	0	646.848	0	0
1999	12	25	1.2	0	0	6.912	3002.064	0	-152.064	0	639.936	0	0
1999	12	26	0	0	0	6.912	3008.976	0	-158.976	0	633.024	0	0
1999	12	27	0.2	0	0	6.912	3015.888	0	-165.888	0	626.112	0	0
1999	12	28	1.8	0	0	6.912	3022.8	0	-172.8	0	619.2	0	0
1999	12	29	0.2	0	0	6.912	3029.712	0	-179.712	0	612.288	0	0
1999	12	30	0	0	0	6.912	3036.624	0	-186.624	0	605.376	0	0
1999	12	31	2	0	0	6.912	3043.536	0	-193.536	0	598.464	0	0
			997.8		45072.221	1575.264		5768.78		37939.393		0	4

Year	Month	Day	Daily Recorded Rainfall (mm)	Runoff Coefficient	Inputs	Outputs	Estimated Sediment Dam Available Capacity (m^3)	Uncontrolled Flow Discharged from Sediment Dam (m^3)	Controlled Flow Discharged from Sediment Dam (m^3)	Volume of Sediment Water Remaining (m^3)	Days Basin is empty	Overflow events
				Cv	Overland Flow Quarry (m^3)	Evaporation (m^3)						
1999	1	1	0	0	0	7.68	2840	0	0	2200	0	
1999	1	2	0	0	0	7.68	2847.68	0	0	1412.32	0	0
1999	1	3	0	0	0	7.68	2855.36	0	0	1404.64	0	0
1999	1	4	0	0	0	7.68	2863.04	0	0	1396.96	0	0
1999	1	5	0	0	0	7.68	2870.72	0	0	1389.28	0	0
1999	1	6	0	0	0	7.68	2878.4	0	0	1381.6	0	0
1999	1	7	0.4	0	0	7.68	2886.08	0	0	1373.92	0	0
1999	1	8	16	0.43	677.68	7.68	2216.08	0	0	2043.92	0	0
1999	1	9	0	0	0	7.68	2223.76	0	0	2036.24	0	0
1999	1	10	0	0	0	7.68	2231.44	0	0	2028.56	0	0
1999	1	11	0	0	0	7.68	2239.12	0	0	2020.88	0	0
1999	1	12	0	0	0	7.68	2246.8	0	593.2	2013.2	0	0
1999	1	13	0	0	0	7.68	2847.68	0	0	1412.32	0	0
1999	1	14	0	0	0	7.68	2855.36	0	0	1404.64	0	0
1999	1	15	0	0	0	7.68	2863.04	0	0	1396.96	0	0
1999	1	16	0	0	0	7.68	2870.72	0	0	1389.28	0	0
1999	1	17	0	0	0	7.68	2878.4	0	0	1381.6	0	0
1999	1	18	0	0	0	7.68	2886.08	0	0	1373.92	0	0
1999	1	19	0	0	0	7.68	2893.76	0	0	1366.24	0	0
1999	1	20	0	0	0	7.68	2901.44	0	0	1358.56	0	0
1999	1	21	0	0	0	7.68	2909.12	0	0	1350.88	0	0
1999	1	22	0	0	0	7.68	2916.8	0	0	1343.2	0	0
1999	1	23	0	0	0	7.68	2924.48	0	0	1335.52	0	0
1999	1	24	0	0	0	7.68	2932.16	0	0	1327.84	0	0
1999	1	25	0	0	0	7.68	2939.84	0	0	1320.16	0	0
1999	1	26	0.8	0	0	7.68	2947.52	0	0	1312.48	0	0
1999	1	27	0	0	0	7.68	2955.2	0	0	1304.8	0	0
1999	1	28	0	0	0	7.68	2962.88	0	0	1297.12	0	0
1999	1	29	0.2	0	0	7.68	2970.56	0	0	1289.44	0	0
1999	1	30	0	0	0	7.68	2978.24	0	0	1281.76	0	0
1999	1	31	0.6	0	0	7.68	2985.92	0	0	1274.08	0	0
1999	2	1	0	0	0	6.816	2992.736	0	0	1267.264	0	0
1999	2	2	0	0	0	6.816	2999.552	0	0	1260.448	0	0
1999	2	3	0	0	0	6.816	3006.368	0	0	1253.632	0	0
1999	2	4	0	0	0	6.816	3013.184	0	0	1246.816	0	0
1999	2	5	0	0	0	6.816	3020	0	0	1240	0	0
1999	2	6	0.8	0	0	6.816	3026.816	0	0	1233.184	0	0
1999	2	7	0	0	0	6.816	3033.632	0	0	1226.368	0	0
1999	2	8	0	0	0	6.816	3040.448	0	0	1219.552	0	0
1999	2	9	0	0	0	6.816	3047.264	0	0	1212.736	0	0
1999	2	10	0	0	0	6.816	3054.08	0	0	1205.92	0	0
1999	2	11	0.4	0	0	6.816	3060.896	0	0	1199.104	0	0
1999	2	12	0	0	0	6.816	3067.712	0	0	1192.288	0	0
1999	2	13	0	0	0	6.816	3074.528	0	0	1185.472	0	0
1999	2	14	0	0	0	6.816	3081.344	0	0	1178.656	0	0
1999	2	15	0	0	0	6.816	3088.16	0	0	1171.84	0	0
1999	2	16	0	0	0	6.816	3094.976	0	0	1165.024	0	0
1999	2	17	0	0	0	6.816	3101.792	0	0	1158.208	0	0
1999	2	18	3.4	0	0	6.816	3108.608	0	0	1151.392	0	0
1999	2	19	0	0	0	6.816	3115.424	0	0	1144.576	0	0
1999	2	20	0	0	0	6.816	3122.24	0	0	1137.76	0	0
1999	2	21	0	0	0	6.816	3129.056	0	0	1130.944	0	0
1999	2	22	0	0	0	6.816	3135.872	0	0	1124.128	0	0
1999	2	23	0	0	0	6.816	3142.688	0	0	1117.312	0	0
1999	2	24	0	0	0	6.816	3149.504	0	0	1110.496	0	0
1999	2	25	0	0	0	6.816	3156.32	0	0	1103.68	0	0
1999	2	26	0	0	0	6.816	3163.136	0	0	1096.864	0	0
1999	2	27	0	0	0	6.816	3169.952	0	0	1090.048	0	0
1999	2	28	0	0	0	6.816	3176.768	0	0	1083.232	0	0
1999	3	1	0	0	0	5.568	3182.336	0	0	1077.664	0	0
1999	3	2	0	0	0	5.568	3187.904	0	0	1072.096	0	0
1999	3	3	0	0	0	5.568	3193.472	0	0	1066.528	0	0
1999	3	4	0	0	0	5.568	3199.04	0	0	1060.96	0	0
1999	3	5	0	0	0	5.568	3204.608	0	0	1055.392	0	0
1999	3	6	0	0	0	5.568	3210.176	0	0	1049.824	0	0
1999	3	7	19.6	0.43	830.158	5.568	2385.586	0	0	1874.414	0	0
1999	3	8	0.2	0	0	5.568	2391.154	0	0	1868.846	0	0
1999	3	9	0	0	0	5.568	2396.722	0	0	1863.278	0	0
1999	3	10	0	0	0	5.568	2402.29	0	0	1857.71	0	0
1999	3	11	0	0	0	5.568	2407.858	0	0	1852.142	0	0
1999	3	12	0	0	0	5.568	2413.426	0	426.574	1846.574	0	0
1999	3	13	0	0	0	5.568	2845.568	0	0	1414.432	0	0
1999	3	14	0	0	0	5.568	2851.136	0	0	1408.864	0	0
1999	3	15	0	0	0	5.568	2856.704	0	0	1403.296	0	0
1999	3	16	0	0	0	5.568	2862.272	0	0	1397.728	0	0
1999	3	17	0	0	0	5.568	2867.84	0	0	1392.16	0	0
1999	3	18	11	0.43	465.905	5.568	2407.503	0	0	1852.497	0	0
1999	3	19	1.6	0	0	5.568	2413.071	0	0	1846.929	0	0
1999	3	20	0	0	0	5.568	2418.639	0	0	1841.361	0	0
1999	3	21	48	0.74	3498.72	5.568	-1074.513	1074.513	0	4260	0	0
1999	3	22	2.6	0	0	5.568	5.568	0	0	4254.432	0	1
1999	3	23	0	0	0	5.568	11.136	0	0	4248.864	0	0
1999	3	24	0	0	0	5.568	16.704	0	0	4243.296	0	0
1999	3	25	11	0.43	465.905	5.568	-443.633	443.633	0	4260	0	0
1999	3	26	2.8	0	0	5.568	5.568	0	0	4254.432	0	1
1999	3	27	0	0	0	5.568	11.136	0	0	4248.864	0	0
1999	3	28	4.6	0	0	5.568	16.704	0	0	4243.296	0	0
1999	3	29	0	0	0	5.568	22.272	0	0	4237.728	0	0
1999	3	30	0	0	0	5.568	27.84	0	0	4232.16	0	0
1999	3	31	1.8	0	0	5.568	33.408	0	0	4226.592	0	0
1999	4	1	0	0	0	3.552	36.96	0	0	4223.04	0	0
1999	4	2	0	0	0	3.552	40.512	0	0	4219.488	0	0
1999	4	3	0	0	0	3.552	44.064	0	0	4215.936	0	0
1999	4	4	1.2	0	0	3.552	47.616	0	0	4212.384	0	0
1999	4	5	3.2	0	0	3.552	51.168	0	0	4208.832	0	0
1999	4	6	0	0	0	3.552	54.72	0	0	4205.28	0	0
1999	4	7	0	0	0	3.552	58.272	0	0	4201.728	0	0
1999	4	8	0	0	0	3.552	61.824	0	0	4198.176	0	0
1999	4	9	0	0	0	3.552	65.376	0	2774.624	4194.624	0	0
1999	4	10	0	0	0	3.552	2843.552	0	0	1416.448	0	0
1999	4	11	0	0	0	3.552	2847.104	0	0	1412.896	0	0
1999	4	12	0	0	0	3.552	2850.656	0	0	1409.344	0	0
1999	4	13	0	0	0	3.552	2854.208	0	0	1405.792	0	0
1999	4	14	0	0	0	3.552	2857.76	0	0	1402.24	0	0
1999	4	15	0	0	0	3.552	2861.312	0	0	1398.688	0	0
1999	4	16	0	0	0	3.552	2864.864	0	0	1395.136	0	0
1999	4	17	0	0	0	3.552	2868.416	0	0	1391.584	0	0
1999	4	18	0	0	0	3.552	2871.968	0	0	1388.032	0	0
1999	4	19	0	0	0	3.552	2875.52	0	0	1384.48	0	0
1999	4	20	6.8	0	0	3.552	2879.072	0	0	1380.928	0	0
1999	4	21	4.2	0	0	3.552	2882.624	0	0	1377.376	0	0
1999	4	22	0	0	0	3.552	2886.176	0	0	1373.824	0	0
1999	4	23	0	0	0	3.552	2889.728	0	0	1370.272	0	0
1999	4	24	0	0	0	3.552	2893.28	0	0	1366.72	0	0
1999	4	25	0	0	0	3.552	2896.832	0	0	1363.168	0	0

1999	4	26	0	0	0	3.552	2900.384	0	0	1359.616	0	0
1999	4	27	1.2	0	0	3.552	2903.936	0	0	1356.064	0	0
1999	4	28	0.6	0	0	3.552	2907.488	0	0	1352.512	0	0
1999	4	29	0.2	0	0	3.552	2911.04	0	0	1348.96	0	0
1999	4	30	0	0	0	3.552	2914.592	0	0	1345.408	0	0
1999	5	1	0	0	0	2.304	2916.896	0	0	1343.104	0	0
1999	5	2	0	0	0	2.304	2919.2	0	0	1340.8	0	0
1999	5	3	0	0	0	2.304	2921.504	0	0	1338.496	0	0
1999	5	4	0	0	0	2.304	2923.808	0	0	1336.192	0	0
1999	5	5	0	0	0	2.304	2926.112	0	0	1333.888	0	0
1999	5	6	0	0	0	2.304	2928.416	0	0	1331.584	0	0
1999	5	7	0	0	0	2.304	2930.72	0	0	1329.28	0	0
1999	5	8	0	0	0	2.304	2933.024	0	0	1326.976	0	0
1999	5	9	0	0	0	2.304	2935.328	0	0	1324.672	0	0
1999	5	10	0.4	0	0	2.304	2937.632	0	0	1322.368	0	0
1999	5	11	0	0	0	2.304	2939.936	0	0	1320.064	0	0
1999	5	12	11.6	0.43	491.318	2.304	2450.922	0	0	1809.078	0	0
1999	5	13	30.4	0.69	2066.136	2.304	387.09	0	0	3872.91	0	0
1999	5	14	0.6	0	0	2.304	389.394	0	0	3870.606	0	0
1999	5	15	0	0	0	2.304	391.698	0	0	3868.302	0	0
1999	5	16	42.8	0.74	3119.692	2.304	-2725.69	2725.69	0	4260	0	0
1999	5	17	0	0	0	2.304	2.304	0	0	4257.696	0	1
1999	5	18	0.8	0	0	2.304	4.608	0	0	4255.392	0	0
1999	5	19	0	0	0	2.304	6.912	0	0	4253.088	0	0
1999	5	20	0	0	0	2.304	9.216	0	0	4250.784	0	0
1999	5	21	6.4	0	0	2.304	11.52	0	0	4248.48	0	0
1999	5	22	5.2	0	0	2.304	13.824	0	0	4246.176	0	0
1999	5	23	44.2	0.74	3221.738	2.304	-3205.61	3205.61	0	4260	0	0
1999	5	24	15.8	0.43	669.209	2.304	-666.905	666.905	0	4260	0	0
1999	5	25	78	0.81	6223.23	2.304	-6220.926	6220.926	0	4260	0	0
1999	5	26	11.4	0.43	482.847	2.304	-480.543	480.543	0	4260	0	0
1999	5	27	1.6	0	0	2.304	2.304	0	0	4257.696	0	1
1999	5	28	0	0	0	2.304	4.608	0	0	4255.392	0	0
1999	5	29	14	0.43	592.97	2.304	-586.058	586.058	0	4260	0	0
1999	5	30	10.4	0.43	440.492	2.304	-438.188	438.188	0	4260	0	0
1999	5	31	13.2	0.43	559.086	2.304	-556.782	556.782	0	4260	0	0
1999	6	1	0	0	0	1.728	1.728	0	0	4258.272	0	1
1999	6	2	0.2	0	0	1.728	3.456	0	0	4256.544	0	0
1999	6	3	0.2	0	0	1.728	5.184	0	0	4254.816	0	0
1999	6	4	0	0	0	1.728	6.912	0	0	4253.088	0	0
1999	6	5	12.8	0.43	542.144	1.728	-533.504	533.504	0	4260	0	0
1999	6	6	1.4	0	0	1.728	1.728	0	0	4258.272	0	1
1999	6	7	8.2	0	0	1.728	3.456	0	0	4256.544	0	0
1999	6	8	0.2	0	0	1.728	5.184	0	0	4254.816	0	0
1999	6	9	0.2	0	0	1.728	6.912	0	0	4253.088	0	0
1999	6	10	7.2	0	0	1.728	8.64	0	0	4251.36	0	0
1999	6	11	0	0	0	1.728	10.368	0	0	4249.632	0	0
1999	6	12	0	0	0	1.728	12.096	0	0	4247.904	0	0
1999	6	13	36.2	0.69	2460.333	1.728	-2446.509	2446.509	0	4260	0	0
1999	6	14	0	0	0	1.728	1.728	0	0	4258.272	0	0
1999	6	15	16.6	0.43	703.093	1.728	-699.637	699.637	0	4260	0	0
1999	6	16	5	0	0	1.728	1.728	0	0	4258.272	0	1
1999	6	17	0.4	0	0	1.728	3.456	0	0	4256.544	0	0
1999	6	18	14.8	0.43	626.854	1.728	-621.67	621.67	0	4260	0	0
1999	6	19	2.4	0	0	1.728	1.728	0	0	4258.272	0	1
1999	6	20	0.2	0	0	1.728	3.456	0	0	4256.544	0	0
1999	6	21	4.4	0	0	1.728	5.184	0	0	4254.816	0	0
1999	6	22	0.6	0	0	1.728	6.912	0	0	4253.088	0	0
1999	6	23	0.4	0	0	1.728	8.64	0	0	4251.36	0	0
1999	6	24	0.2	0	0	1.728	10.368	0	0	4249.632	0	0
1999	6	25	7.6	0	0	1.728	12.096	0	0	4247.904	0	0
1999	6	26	3.8	0	0	1.728	13.824	0	0	4246.176	0	0
1999	6	27	0	0	0	1.728	15.552	0	0	4244.448	0	0
1999	6	28	0.2	0	0	1.728	17.28	0	0	4242.72	0	0
1999	6	29	0	0	0	1.728	19.008	0	0	4240.992	0	0
1999	6	30	16.2	0.43	686.151	1.728	-665.415	665.415	0	4260	0	0
1999	7	1	0.6	0	0	1.632	1.632	0	0	4258.368	0	1
1999	7	2	4.8	0	0	1.632	3.264	0	0	4256.736	0	0
1999	7	3	0.4	0	0	1.632	4.896	0	0	4255.104	0	0
1999	7	4	0	0	0	1.632	6.528	0	0	4253.472	0	0
1999	7	5	0	0	0	1.632	8.16	0	0	4251.84	0	0
1999	7	6	0	0	0	1.632	9.792	0	0	4250.208	0	0
1999	7	7	0	0	0	1.632	11.424	0	2828.576	4248.576	0	0
1999	7	8	2	0	0	1.632	2841.632	0	0	1418.368	0	0
1999	7	9	18.6	0.43	787.803	1.632	2055.461	0	0	2204.539	0	0
1999	7	10	0	0	0	1.632	2057.093	0	0	2202.907	0	0
1999	7	11	0	0	0	1.632	2058.725	0	0	2201.275	0	0
1999	7	12	0.4	0	0	1.632	2060.357	0	0	2199.643	0	0
1999	7	13	0.4	0	0	1.632	2061.989	0	0	2198.011	0	0
1999	7	14	0.4	0	0	1.632	2063.621	0	0	2196.379	0	0
1999	7	15	0.2	0	0	1.632	2065.253	0	0	2194.747	0	0
1999	7	16	0	0	0	1.632	2066.885	0	0	2193.115	0	0
1999	7	17	0	0	0	1.632	2068.517	0	0	2191.483	0	0
1999	7	18	0	0	0	1.632	2070.149	0	0	2189.851	0	0
1999	7	19	0	0	0	1.632	2071.781	0	768.219	2188.219	0	0
1999	7	20	30.2	0.69	2052.543	1.632	789.089	0	0	3470.911	0	0
1999	7	21	5.8	0	0	1.632	790.721	0	0	3469.279	0	0
1999	7	22	5.8	0	0	1.632	792.353	0	0	3467.647	0	0
1999	7	23	0	0	0	1.632	793.985	0	0	3466.015	0	0
1999	7	24	0	0	0	1.632	795.617	0	0	3464.383	0	0
1999	7	25	0	0	0	1.632	797.249	0	0	3462.751	0	0
1999	7	26	0.8	0	0	1.632	798.881	0	0	3461.119	0	0
1999	7	27	0	0	0	1.632	800.513	0	0	3459.487	0	0
1999	7	28	0	0	0	1.632	802.145	0	0	3457.855	0	0
1999	7	29	0	0	0	1.632	803.777	0	0	3456.223	0	0
1999	7	30	0.2	0	0	1.632	805.409	0	0	3454.591	0	0
1999	7	31	0.6	0	0	1.632	807.041	0	0	3452.959	0	0
1999	8	1	0	0	0	2.208	809.249	0	0	3450.751	0	0
1999	8	2	0	0	0	2.208	811.457	0	0	3448.543	0	0
1999	8	3	0	0	0	2.208	813.665	0	0	3446.335	0	0
1999	8	4	0	0	0	2.208	815.873	0	2024.127	3444.127	0	0
1999	8	5	0	0	0	2.208	2842.208	0	0	1417.792	0	0
1999	8	6	0	0	0	2.208	2844.416	0	0	1415.584	0	0
1999	8	7	0	0	0	2.208	2846.624	0	0	1413.376	0	0
1999	8	8	21	0.56	1158.36	2.208	1690.472	0	0	2569.528	0	0
1999	8	9	24	0.56	1323.84	2.208	368.84	0	0	3891.16	0	0
1999	8	10	4	0	0	2.208	371.048	0	0	3888.952	0	0
1999	8	11	0	0	0	2.208	373.256	0	0	3886.744	0	0
1999	8	12	0.6	0	0	2.208	375.464	0	0	3884.536	0	0
1999	8	13	1.2	0	0	2.208	377.672	0	0	3882.328	0	0
1999	8	14	0	0	0	2.208	379.88	0	0	3880.12	0	0
1999	8	15	5	0	0	2.208	382.088	0	0	3877.912	0	0
1999	8	16	0	0	0	2.208	384.296	0	0	3875.704	0	0
1999	8	17	0.2	0	0	2.208	386.504	0	0	3873.496	0	0
1999	8	18	0	0	0	2.208	388.712	0	0	3871.288	0	0
1999	8	19	0	0	0	2.208	390.92	0	0	3869.08	0	0
1999	8	20	0	0	0	2.208	393.128	0	0	3866.872	0	0
1999	8	21	0	0	0	2.208	395.336	0	2444.664	3864.664	0	0
1999	8	22	0	0	0	2.208	2842.208	0	0	1417.792	0	0
1999	8	23	0	0	0	2.208	2844.416	0	0	1415.584	0	0

1999	8	24	0.2	0	0	2.208	2846.624	0	0	1413.376	0	0
1999	8	25	0	0	0	2.208	2848.832	0	0	1411.168	0	0
1999	8	26	0.6	0	0	2.208	2851.04	0	0	1408.96	0	0
1999	8	27	4.6	0	0	2.208	2853.248	0	0	1406.752	0	0
1999	8	28	0	0	0	2.208	2855.456	0	0	1404.544	0	0
1999	8	29	0	0	0	2.208	2857.664	0	0	1402.336	0	0
1999	8	30	0.4	0	0	2.208	2859.872	0	0	1400.128	0	0
1999	8	31	0	0	0	2.208	2862.08	0	0	1397.92	0	0
1999	9	1	0	0	0	3.264	2865.344	0	0	1394.656	0	0
1999	9	2	0	0	0	3.264	2868.608	0	0	1391.392	0	0
1999	9	3	0	0	0	3.264	2871.872	0	0	1388.128	0	0
1999	9	4	36.2	0.69	2460.333	3.264	414.803	0	0	3845.197	0	0
1999	9	5	0	0	0	3.264	418.067	0	0	3841.933	0	0
1999	9	6	10.8	0.43	457.434	3.264	-36.103	36.103	0	4260	0	0
1999	9	7	0.4	0	0	3.264	3.264	0	0	4256.736	0	1
1999	9	8	0	0	0	3.264	6.528	0	0	4253.472	0	0
1999	9	9	0	0	0	3.264	9.792	0	0	4250.208	0	0
1999	9	10	0	0	0	3.264	13.056	0	0	4246.944	0	0
1999	9	11	4.6	0	0	3.264	16.32	0	0	4243.68	0	0
1999	9	12	0.4	0	0	3.264	19.584	0	0	4240.416	0	0
1999	9	13	2.2	0	0	3.264	22.848	0	0	4237.152	0	0
1999	9	14	0	0	0	3.264	26.112	0	0	4233.888	0	0
1999	9	15	0.2	0	0	3.264	29.376	0	0	4230.624	0	0
1999	9	16	13.8	0.43	584.499	3.264	-551.859	551.859	0	4260	0	0
1999	9	17	26.8	0.56	1478.288	3.264	-1475.024	1475.024	0	4260	0	0
1999	9	18	2	0	0	3.264	3.264	0	0	4256.736	0	1
1999	9	19	0	0	0	3.264	6.528	0	0	4253.472	0	0
1999	9	20	0.2	0	0	3.264	9.792	0	0	4250.208	0	0
1999	9	21	0	0	0	3.264	13.056	0	0	4246.944	0	0
1999	9	22	0	0	0	3.264	16.32	0	0	4243.68	0	0
1999	9	23	0	0	0	3.264	19.584	0	0	4240.416	0	0
1999	9	24	0	0	0	3.264	22.848	0	2817.152	4237.152	0	0
1999	9	25	0	0	0	3.264	2843.264	0	0	1416.736	0	0
1999	9	26	0	0	0	3.264	2846.528	0	0	1413.472	0	0
1999	9	27	0	0	0	3.264	2849.792	0	0	1410.208	0	0
1999	9	28	0	0	0	3.264	2853.056	0	0	1406.944	0	0
1999	9	29	16.8	0.43	711.564	3.264	2144.756	0	0	2115.244	0	0
1999	9	30	0	0	0	3.264	2148.02	0	0	2111.98	0	0
1999	10	1	0	0	0	4.512	2152.532	0	0	2107.468	0	0
1999	10	2	0	0	0	4.512	2157.044	0	0	2102.956	0	0
1999	10	3	21.4	0.56	1180.424	4.512	981.132	0	0	3278.868	0	0
1999	10	4	0	0	0	4.512	985.644	0	0	3274.356	0	0
1999	10	5	0	0	0	4.512	990.156	0	0	3269.844	0	0
1999	10	6	0	0	0	4.512	994.668	0	0	3265.332	0	0
1999	10	7	0	0	0	4.512	999.18	0	1840.82	3260.82	0	0
1999	10	8	0	0	0	4.512	2844.512	0	0	1415.488	0	0
1999	10	9	0.8	0	0	4.512	2849.024	0	0	1410.976	0	0
1999	10	10	20.6	0.56	1136.296	4.512	1717.24	0	0	2542.76	0	0
1999	10	11	15.8	0.43	669.209	4.512	1052.543	0	0	3207.457	0	0
1999	10	12	0.4	0	0	4.512	1057.055	0	0	3202.945	0	0
1999	10	13	9.2	0	0	4.512	1061.567	0	0	3198.433	0	0
1999	10	14	7.4	0	0	4.512	1066.079	0	0	3193.921	0	0
1999	10	15	1	0	0	4.512	1070.591	0	0	3189.409	0	0
1999	10	16	0	0	0	4.512	1075.103	0	0	3184.897	0	0
1999	10	17	0	0	0	4.512	1079.615	0	0	3180.385	0	0
1999	10	18	0.4	0	0	4.512	1084.127	0	0	3175.873	0	0
1999	10	19	0.2	0	0	4.512	1088.639	0	0	3171.361	0	0
1999	10	20	0.2	0	0	4.512	1093.151	0	0	3166.849	0	0
1999	10	21	0	0	0	4.512	1097.663	0	0	3162.337	0	0
1999	10	22	0.6	0	0	4.512	1102.175	0	0	3157.825	0	0
1999	10	23	0	0	0	4.512	1106.687	0	0	3153.313	0	0
1999	10	24	0.2	0	0	4.512	1111.199	0	0	3148.801	0	0
1999	10	25	1.2	0	0	4.512	1115.711	0	0	3144.289	0	0
1999	10	26	1.2	0	0	4.512	1120.223	0	0	3139.777	0	0
1999	10	27	3	0	0	4.512	1124.735	0	0	3135.265	0	0
1999	10	28	0.2	0	0	4.512	1129.247	0	0	3130.753	0	0
1999	10	29	0	0	0	4.512	1133.759	0	0	3126.241	0	0
1999	10	30	0	0	0	4.512	1138.271	0	0	3121.729	0	0
1999	10	31	4.6	0	0	4.512	1142.783	0	0	3117.217	0	0
1999	11	1	0	0	0	5.76	1148.543	0	0	3111.457	0	0
1999	11	2	0	0	0	5.76	1154.303	0	0	3105.697	0	0
1999	11	3	0	0	0	5.76	1160.063	0	0	3099.937	0	0
1999	11	4	0.2	0	0	5.76	1165.823	0	0	3094.177	0	0
1999	11	5	0	0	0	5.76	1171.583	0	0	3088.417	0	0
1999	11	6	10.4	0.43	440.492	5.76	736.851	0	0	3523.149	0	0
1999	11	7	0	0	0	5.76	742.611	0	0	3517.389	0	0
1999	11	8	5.2	0	0	5.76	748.371	0	0	3511.629	0	0
1999	11	9	4.4	0	0	5.76	754.131	0	0	3505.869	0	0
1999	11	10	2.8	0	0	5.76	759.891	0	0	3500.109	0	0
1999	11	11	1.4	0	0	5.76	765.651	0	0	3494.349	0	0
1999	11	12	0.2	0	0	5.76	771.411	0	0	3488.589	0	0
1999	11	13	0	0	0	5.76	777.171	0	0	3482.829	0	0
1999	11	14	0	0	0	5.76	782.931	0	0	3477.069	0	0
1999	11	15	0	0	0	5.76	788.691	0	0	3471.309	0	0
1999	11	16	0	0	0	5.76	794.451	0	2045.549	3465.549	0	0
1999	11	17	0	0	0	5.76	2845.76	0	0	1414.24	0	0
1999	11	18	0	0	0	5.76	2851.52	0	0	1408.48	0	0
1999	11	19	0	0	0	5.76	2857.28	0	0	1402.72	0	0
1999	11	20	0.2	0	0	5.76	2863.04	0	0	1396.96	0	0
1999	11	21	7.2	0	0	5.76	2868.8	0	0	1391.2	0	0
1999	11	22	12.2	0.43	516.731	5.76	2357.829	0	0	1902.171	0	0
1999	11	23	0.4	0	0	5.76	2363.589	0	0	1896.411	0	0
1999	11	24	0	0	0	5.76	2369.349	0	0	1890.651	0	0
1999	11	25	0	0	0	5.76	2375.109	0	0	1884.891	0	0
1999	11	26	0	0	0	5.76	2380.869	0	0	1879.131	0	0
1999	11	27	0	0	0	5.76	2386.629	0	453.371	1873.371	0	0
1999	11	28	0	0	0	5.76	2845.76	0	0	1414.24	0	0
1999	11	29	0.2	0	0	5.76	2851.52	0	0	1408.48	0	0
1999	11	30	0	0	0	5.76	2857.28	0	0	1402.72	0	0
1999	12	1	2.8	0	0	6.912	2864.192	0	0	1395.808	0	0
1999	12	2	0	0	0	6.912	2871.104	0	0	1388.896	0	0
1999	12	3	23.4	0.56	1290.744	6.912	1587.272	0	0	2672.728	0	0
1999	12	4	0.6	0	0	6.912	1594.184	0	0	2665.816	0	0
1999	12	5	0	0	0	6.912	1601.096	0	0	2658.904	0	0
1999	12	6	0	0	0	6.912	1608.008	0	0	2651.992	0	0
1999	12	7	0	0	0	6.912	1614.92	0	0	2645.08	0	0
1999	12	8	1.6	0	0	6.912	1621.832	0	0	2638.168	0	0
1999	12	9	8	0	0	6.912	1628.744	0	0	2631.256	0	0
1999	12	10	0.2	0	0	6.912	1635.656	0	0	2624.344	0	0
1999	12	11	0	0	0	6.912	1642.568	0	0	2617.432	0	0
1999	12	12	1.2	0	0	6.912	1649.48	0	0	2610.52	0	0
1999	12	13	0	0	0	6.912	1656.392	0	0	2603.608	0	0
1999	12	14	0	0	0	6.912	1663.304	0	0	2596.696	0	0
1999	12	15	0	0	0	6.912	1670.216	0	0	2589.784	0	0
1999	12	16	4.6	0	0	6.912	1677.128	0	0	2582.872	0	0
1999	12	17	0	0	0	6.912	1684.04	0	0	2575.96	0	0
1999	12	18	0	0	0	6.912	1690.952	0	0	2569.048	0	0
1999	12	19	0	0	0	6.912	1697.864	0	0	2562.136	0	0
1999	12	20	0	0	0	6.912	1704.776	0	1135.224	2555.224	0	0
1999	12	21	0	0	0	6.912	2846.912	0	0	1413.088	0	0

1999	12	22	0	0	0	6.912	2853.824	0	0	1406.176	0	0
1999	12	23	0	0	0	6.912	2860.736	0	0	1399.264	0	0
1999	12	24	0	0	0	6.912	2867.648	0	0	1392.352	0	0
1999	12	25	1.2	0	0	6.912	2874.56	0	0	1385.44	0	0
1999	12	26	0	0	0	6.912	2881.472	0	0	1378.528	0	0
1999	12	27	0.2	0	0	6.912	2888.384	0	0	1371.616	0	0
1999	12	28	1.8	0	0	6.912	2895.296	0	0	1364.704	0	0
1999	12	29	0.2	0	0	6.912	2902.208	0	0	1357.792	0	0
1999	12	30	0	0	0	6.912	2909.12	0	0	1350.88	0	0
1999	12	31	2	0	0	6.912	2916.032	0	0	1343.968	0	0
			997.8		45072.221	1575.264		23428.569	20152.1		0	11