SOIL AND WATER ASSESSMENT
PREPARED FOR
GOW STREET RECYCLING PTY LTD.
81 GOW STREET, PADSTOW 2211

Prepared for: Gow Street Recycling Pty Ltd

Prepared by: Damien Thomas, Environmental Scientist
Emma Hansma, Senior Engineer
Matthew Taylor, Environmental Scientist
Linda Zanotto, Senior Environmental Engineer
R T Benbow, Principal Consultant

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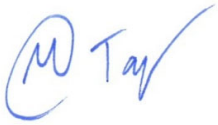
Benbow ENVIRONMENTAL

Engineering a Sustainable Future for Our Environment

Head Office: 25-27 Sherwood Street, Northmead, NSW 2152 AUSTRALIA
Tel: 61 2 9896 0399 Fax: 61 2 9896 0544
Email: admin@benbowenviro.com.au
Visit our website: www.benbowenviro.com.au

DOCUMENT CONTROL

Prepared by:	Position:	Signature:	Date:
Damien Thomas	Environmental Scientist		24 August 2021
Emma Hansma	Senior Engineer		24 August 2021
Matthew Taylor	Environmental Scientist		24 August 2021
Linda Zanotto	Senior Environmental Engineer		24 August 2021
Reviewed by:	**Position:**	**Signature:**	**Date:**
Kate Barker	Environmental Scientist		24 August 2021
Approved by:	**Position:**	**Signature:**	**Date:**
R T Benbow	Principal Consultant		24 August 2021

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Benbow ENVIRONMENTAL
A.B.N. 17 160 013 641

Head Office:
25-27 Sherwood Street Northmead NSW 2152 Australia
P.O. Box 687 Parramatta NSW 2124 Australia
Telephone: +61 2 9896 0399 Facsimile: +61 2 9896 0544
E-mail: admin@benbowenviro.com.au
Visit our Website at www.benbowenviro.com.au

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1. INTRODUCTION

Benbow Environmental has been engaged by Gow Street Recycling Centre to undertake a Soil and Water assessment to support an Environmental Impact Statement (EIS) for the proposed construction and operation of a liquid waste dewatering facility to be located at 81 Gow Street, Padstow NSW 2211.

The assessment is a qualitative study that addresses the potential impacts to soil and water from the proposed operations in accordance with the Secretary's Environmental Assessment Requirements (SEARs No. 10450). The assessment is based on the Stormwater Drainage Design and Flood Modelling undertaken by Indesco.

1.1 SEARS REQUIREMENTS

Water and soil requirements are listed in the Secretary's Environmental Assessment Requirements (SEAR 10450) as a key issue. Table 1-1 provides the details of requirements addressed in this Soil and Water assessment.

Table 1-1: SEARS Requirements

Requirement	Comment
DPIE REQUIREMENTS	
A description of local soils, topography, drainage and landscapes.	Section 4.1
The details of stormwater, leachate and wastewater management.	Section 3.4.4.1
The details of sediment and erosion controls.	Provided in erosion and sediment control plans.
A detailed site water balance.	Section 3.2.1
An assessment of impacts to surface and groundwater resources, flooding impacts and impacts to groundwater dependent ecosystems.	Section 3.4
An assessment in accordance with ASSMAC Guidelines for the presence and extent of actual acid sulfate soils (AASS) and potential acid sulfate soils (PASS) on the site.	Section 4.1.3
Details of the stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts.	Section 3.4.4.1
The identification of an adequate, secure, reliable and appropriately authorised water supply for the life of the project. Including assessment of current market depth where a water entitlement is required to be purchased.	Section 3.2
Quality and quantity assessment of impacts on surface and ground water sources	Section 3.4.4
Assessment of impacts and proposed mitigating measures to reduce impacts on: 1. related infrastructure 2. adjacent licensed water users 3. basic landholder rights 4. watercourses, riparian land, and groundwater dependent ecosystems	 Section 3.4.3 Section 3.4.4.1.2 Section 3.4.5.1
Proposed surface and groundwater monitoring activities and methodologies	Section 3.4.5.1

Table 1-1: SEARS Requirements

Requirement	Comment
Consideration of relevant legislation, policies and guidelines, including the NSW Aquifer Interference Policy (2012), the Guidelines for Controlled Activities on Waterfront Land (2018) and the relevant Water Sharing Plans.	Section 3.1
EES recommends the SEARs include the attached EES standard flooding requirements. (from DPI)	Section 3.4.8
EPA REQUIRMENTS	
Provide details of the project that are essential for predicting and assessing impacts to waters including: a) the quantity and physio-chemical properties of all potential water pollutants and the risks they pose to the environment and human health, including the risks they pose to Water Quality Objectives in the ambient waters (as defined on http://www.environment.nsw.gov.au/ieo/index.htm, using technical criteria derived from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC 2000) b) the management of discharges with potential for water impacts c) drainage works and associated infrastructure; land-forming and excavations; working capacity of structures; and water resource requirements of the proposal.	Section 3.4.4.1 Section 3.2 Section 2.10
Outline site layout, demonstrating efforts to avoid proximity to water resources (especially for activities with significant potential impacts e.g. effluent ponds) and showing potential areas of modification of contours, drainage etc.	Section 2
Outline how total water cycle considerations are to be addressed showing total water balances for the development (with the objective of minimising demands and impacts on water resources). Include water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.	Section 3.2 and 3.2.1
Provide an overview of: Provide an overview of the affected environment to place the proposal in its local and regional environmental context including: a) meteorological data (e.g. rainfall, temperature and evaporation, wind speed and direction); b) topography (landform element, slope type, gradient and length); c) surrounding land uses (potential synergies and conflicts); d) geomorphology (rates of landform change and current erosion and deposition processes); e) soil types and properties (including erodibility, engineering and structural properties, dispersibility, permeability, presence of acid sulfate soils and potential acid sulfate soils);	Section 2.7 Section 4.1.2 Section 2.2 Section 4.2.3 Section 4.1.3
Describe the catchment including proximity of the development to any waterways and provide an assessment of their sensitivity/significance from a public health, ecological and/or economic perspective. The Water Quality and River Flow Objectives on the website: http://www.environment.nsw.gov.au/ieo/index.htm should be used to identify the agreed environmental values and human uses for any affected waterways. This will help with the description of the local and regional area.	section 2.5 and 2.6 Section 2.5.1
Describe existing surface and groundwater quality – an assessment needs to be undertaken for any water resource likely to be affected by the proposal and for all conditions (e.g. a wet weather sampling program is needed if runoff events may cause impacts).	Section 2.4

Table 1-1: SEARS Requirements

Requirement	Comment
Provide site drainage details and surface runoff yield.	Section 3.4.4
State the ambient Water Quality and River Flow Objectives for the receiving waters. These refer to the community's agreed environmental values and human uses endorsed by the Government as goals for the ambient waters.	Section 2.5.1
State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC 2000 Guidelines for Fresh and Marine Water Quality (http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html)	Section 3.1.7
State any locally specific objectives, criteria or targets, which have been endorsed by the government e.g. the Healthy Rivers Commission Inquiries or the NSW Salinity Strategy (DLWC, 2000) (http://www.environment.nsw.gov.au/salinity/government/nswstrategy.htm).	Section 2.5 Section 2.6
Where site specific studies are proposed to revise the trigger values supporting the ambient Water Quality and River Flow Objectives, and the results are to be used for regulatory purposes (e.g. to assess whether a licensed discharge impacts on water quality objectives), then prior agreement from the EPA on the approach and study design must be obtained.	N/A
Describe the state of the receiving waters and relate this to the relevant Water Quality and River Flow Objectives (i.e. are Water Quality and River Flow Objectives being achieved?). Proponents are generally only expected to source available data and information. However, proponents of large or high-risk developments may be required to collect some ambient water quality / river flow / groundwater data to enable a suitable level of impact assessment. Issues to include in the description of the receiving waters could include: a) lake or estuary flushing characteristics b) specific human uses (e.g. exact location of drinking water offtake) c) sensitive ecosystems or species conservation values d) a description of the condition of the local catchment e.g. erosion levels, soils, vegetation cover, etc e) an outline of baseline groundwater information, including, but not restricted to, depth to water table, flow direction and gradient, groundwater quality, reliance on groundwater by surrounding users and by the environment f) historic river flow data where available for the catchment.	Section 2.5
No proposal should breach clause 120 of the Protection of the Environment Operations Act 1997 (i.e. pollution of waters is prohibited unless undertaken in accordance with relevant regulations).	Section 3.1.4
Identify and estimate the quantity of all pollutants that may be introduced into the water cycle by source and discharge point including residual discharges after mitigation measures are implemented.	Section 3.4
Include a rationale, along with relevant calculations, supporting the prediction of the discharges.	Section 3.4
Describe the effects and significance of any pollutant loads on the receiving environment. This should include impacts of residual discharges through modelling, monitoring or both, depending on the scale of the proposal. Determine changes to hydrology (including drainage patterns, surface runoff yield, flow regimes, wetland hydrologic regimes and groundwater).	Section 3.4

Table 1-1: SEARS Requirements

Requirement	Comment
Describe water quality impacts resulting from changes to hydrologic flow regimes (such as nutrient enrichment or turbidity resulting from changes in frequency and magnitude of stream flow).	Section 3.4
Identify any potential impacts on quality or quantity of groundwater describing their source.	Section 3.4.5
Identify potential impacts associated with geomorphological activities with potential to increase surface water and sediment runoff or to reduce surface runoff and sediment transport. Also consider possible impacts such as bed lowering, bank lowering, instream siltation, floodplain erosion and floodplain siltation.	N/A
Identify impacts associated with the disturbance of ASS and PASS.	Section 4.1.3
Containment of spills and leaks shall be in accordance with EPA's guidelines section 'Bunding and Spill Management' at http://www.epa.nsw.gov.au/mao/bundingspill.htm and the most recent versions of the Australian Standards referred to in the Guidelines. Containment should be designed for no-discharge.	Section 3.4.7
The significance of the impacts listed above should be predicted. When doing this it is important to predict the ambient water quality and river flow outcomes associated with the proposal and to demonstrate whether these are acceptable in terms of achieving protection of the Water Quality and River Flow Objectives, in particular the following questions should be answered: a) will the proposal protect Water Quality and River Flow Objectives where they are currently achieved in the ambient waters; and b) will the proposal contribute towards the achievement of Water Quality and River Flow Objectives over time, where they are not currently achieved in the ambient waters.	Section 2.5.1
Consult with the EPA as soon as possible if a mixing zone is proposed (a mixing zone could exist where effluent is discharged into a receiving water body, where the quality of the water being discharged does not immediately meet water quality objectives. The mixing zone could result in dilution, assimilation and decay of the effluent to allow water quality objectives to be met further downstream, at the edge of the mixing zone). The EPA will advise the proponent under what conditions a mixing zone will and will not be acceptable, as well as the information and modelling requirements for assessment.	N/A
Where a licensed discharge is proposed, provide the rationale as to why it cannot be avoided through application of a reasonable level of performance, using available technology, management practice and industry guidelines.	Section 3.2
Where a licensed discharge is proposed, provide the rationale as to why it represents the best environmental outcome and what measures can be taken to reduce its environmental impact. Reference should be made to Managing Urban Stormwater: Soils and Construction (Landcom, 2004) and Guidelines for Fresh and Marine Water Quality ANZECC 2000).	Section 3.2 Section 3.4.4.1
Outline stormwater management to control pollutants at the source and contain them within the site. Also describe measures for maintaining and monitoring any stormwater controls.	Section 3.4.4.1
Outline erosion and sediment control measures directed at minimising disturbance of land, minimising water flow through the site and filtering, trapping or detaining sediment. Also include measures to maintain and monitor controls as well as rehabilitation strategies.	Section 3.4.4.1.2

Table 1-1: SEARS Requirements

Requirement	Comment
Describe waste water treatment measures that are appropriate to the type and volume of waste water and are based on a hierarchy of avoiding generation of waste water; capturing all contaminated water (including stormwater) on the site; reusing/recycling waste water; and treating any unavoidable discharge from the site to meet specified water quality requirements.	Section 3.4.4.1
Outline pollution control measures relating to storage of materials, possibility of accidental spills (e.g. preparation of contingency plans), appropriate disposal methods, and generation of leachate.	Section 3.4.4.1 Section 3.4.7
Describe hydrological impact mitigation measures including: a) site selection (avoiding sites prone to flooding and waterlogging, actively eroding or affected by deposition); b) minimising runoff; c) minimising reductions or modifications to flow regimes; d) avoiding modifications to groundwater.	Section 3.4.4.2
Describe groundwater impact mitigation measures including: a) site selection; b) retention of native vegetation and revegetation; c) artificial recharge; d) providing surface storages with impervious linings; e) monitoring program.	Section 3.4.5
Describe geomorphological impact mitigation measures including: a) site selection; b) erosion and sediment controls; c) minimising instream works; d) treating existing accelerated erosion and deposition; e) monitoring program.	Section 4.2.3
Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of: a) disturbing any existing contaminated soil b) contamination of soil by operation of the activity c) subsidence or instability d) soil erosion e) disturbing acid sulfate or potential acid sulfate soils.	Section 4.1.4 Section 4.1.3
Describe and assess the effectiveness or adequacy of any soil management and mitigation measures during construction and operation of the proposal including: a) erosion and sediment control measures b) proposals for site remediation – see Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land (Department of Urban Affairs and Planning and Environment Protection Authority, 1998) c) proposals for the management of these soils	Section 4.1.3
Sydney Water	
The proponent of the development should determine service demands following servicing investigations and demonstrate that satisfactory arrangements for drinking water, wastewater, and if required, recycled water services have been made.	Section 3.2.4
The proponent must obtain endorsement and/or approval from Sydney Water to ensure that the proposed development does not adversely impact on any existing water, wastewater or stormwater main, or any other Sydney Water asset, including any easement or property. When determining landscaping options, the proponent should take into account that certain tree species can cause cracking or blockage of Sydney Water pipes and therefore should be avoided.	Section 3.2.4

Table 1-1: SEARS Requirements

Requirement	Comment
Strict requirements for Sydney Water's stormwater assets (for certain types of development) may apply to this site. The proponent should ensure that satisfactory steps/measures been taken to protect existing stormwater assets, such as avoiding building over and/or adjacent to stormwater assets and building bridges over stormwater assets. The proponent should consider taking measures to minimise or eliminate potential flooding, degradation of water quality, and avoid adverse impacts on any heritage items, and create pipeline easements where required.	Section 3.2.4
As this development creates trade wastewater, Sydney Water has trade wastewater requirements which need to be met. By law, the property owner must submit an application requesting permission to discharge trade wastewater to Sydney Water's sewerage system. The proponent must obtain Sydney Water approval for this permit before any business activities can commence. Given this development comprises industrial operations, wastewater may discharge into a sewerage area that is subject to wastewater reuse. Please contact Sydney Water's Business Customer Services to send your permit application or to find out more information. They can be contacted at the following email address: businesscustomers@sydneywater.com.au.	Section 3.2.4
The proponent should outline any sustainability initiatives that will minimise/reduce the demand for drinking water, including any alternative water supply and end uses of drinking and non-drinking water that may be proposed, and demonstrate water sensitive urban design (principles are used), and any water conservation measures that are likely to be proposed. This will allow Sydney Water to determine the impact of the proposed development on our existing services and required system capacity to service the development.	Section 3.2
Soil and Water (SEARS)	
An assessment of potential impacts to soil and water resources, topography, hydrology, groundwater, drainage lines, watercourses on or nearby the site, including mapping and description of existing background conditions and cumulative impacts.	Section 2 Section 3.4 Section 4.
A detailed site water balance including identification of water requirements for the life of the development, measures that would be implemented to ensure an adequate and secure water supply is available for the development and a detailed description of the measures to minimise the water use at the site.	Section 3.2.1
Characterisation of water quality at the point of discharge to surface and/or groundwater against the relevant water quality criteria (including details of the contaminants of concern that may leach from the waste into the wastewater and proposed mitigation measures to manage any impacts to receiving water).	Section 2.4
Details of stormwater/wastewater management system including the capacity of onsite detention system(s), onsite sewage management and measures to treat, reuse or dispose of water.	Section 3.4.4.1
A detailed flooding assessment.	Section 3.4.8
A description of erosion and sediment controls.	Provided in erosion and sediment control plans.

1.2 SCOPE OF WORKS

The assessment is qualitative, and the scope of works includes the following:

- Review of relevant plans and documentation relating to the site and proposed development;
- Addressing the key issues for "soil and water" identified in the Secretary's Environmental Assessment Requirements (SEARs) reference: SEAR 10450;
- Identify the existing environment;
- Assess the proposed development against the relevant legislation, policies and guidelines;
- Describe proposed water usage (including a water balance) and impacts on Sydney Water Infrastructure;
- Obtain baseline water quality data; and
- Assessment of potential impacts to soil and water during construction and operation and providing mitigation measures where required.

The report has been prepared based on the information provided by the client, the Phase II Detailed Environmental Investigation to assess existing site contamination prepared by Benbow Environmental and the stormwater drainage (including management of leachate) design and flood modelling undertaken by INDESCO. Baseline water sampling and analysis of the discharge outlet from the site was undertaken as part of this assessment. Recommendations for further studies to support the findings of this report are provided where considered necessary.

2. SITE DETAILS AND PROPOSED DEVELOPMENT

This section provides a description of the site, surroundings and proposed development.

2.1 SITE LOCATION

The site is located at 81 Gow Street Padstow NSW, 2211, and consists of a single rectangular lot (Lot A, DP103140). It is located within the Canterbury-Bankstown Local Government Area.

Figure 2-1 shows the aerial of the site location within its local setting.

Figure 2-1: Site Location (Local Setting)

Source: Land and Property Information – SixMaps

↑N Not to scale	LEGEND: Site Boundary	Benbow Environmental 25-27 Sherwood Road Northmead NSW 2152

2.2 DESCRIPTION OF THE SITE AND SURROUNDING AREA

The site is located within the Georges River Catchment and covers an area of approximately 10,115 m^2. It is of a single rectangular shape; predominately flat with a slight rise at its southern end. The property contains a site office and large built structure currently used as a workshop and storage for site tools and equipment; the remaining surface areas are covered in concrete hardstand. Other commercial/industrial premises surround the premises on all sides.

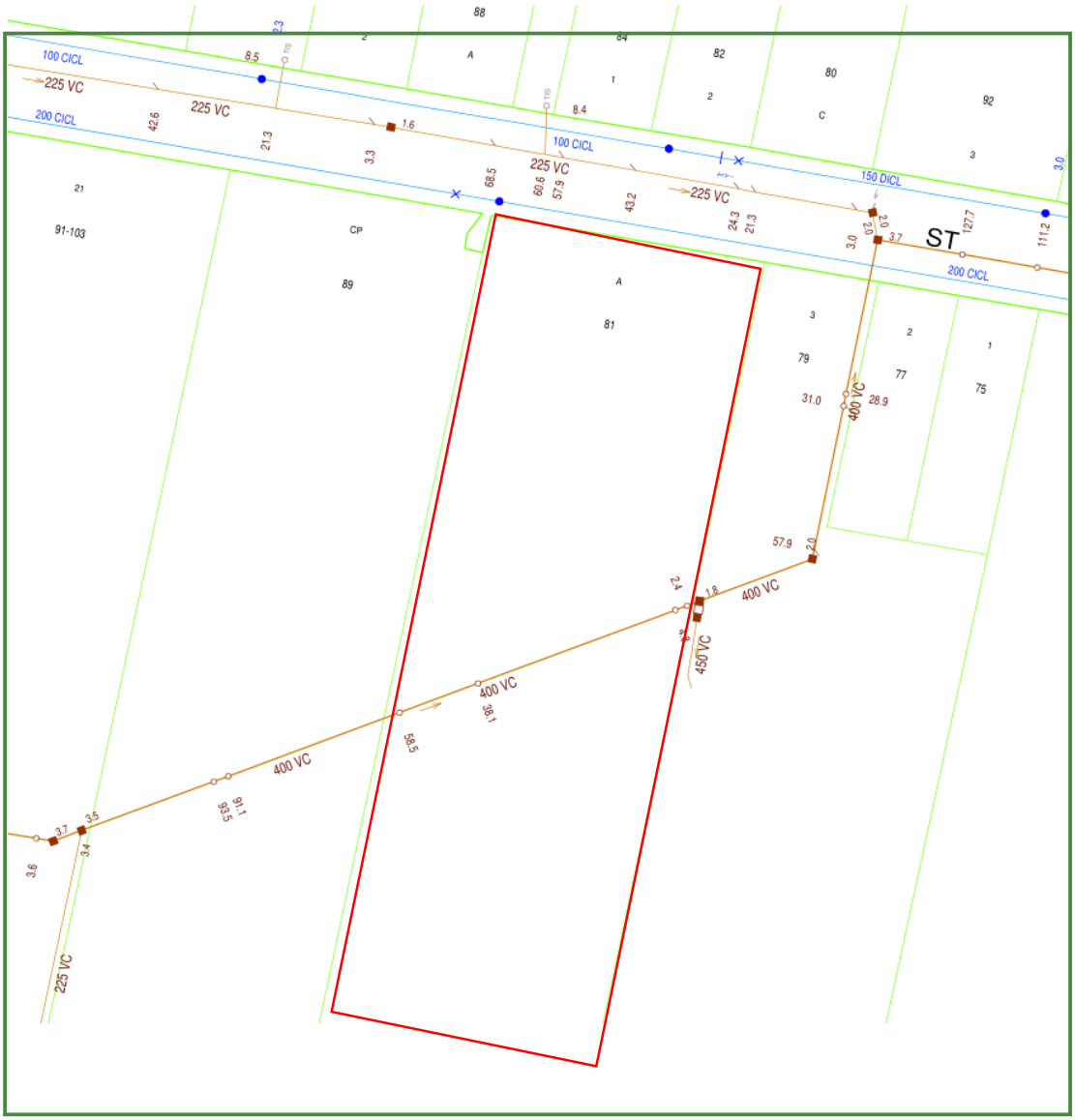
The site is situated within zone IN1 (General Industrial), under the Bankstown Local Environmental Plan (LEP) 2015. Surrounding zonal land classes include: to the south, SP2, Special Infrastructure (the South Western Motorway), to the far west, IN2 (Light Industrial) and to the south-west, west, north and east, R2 (Low Density Residential) and RE1 (Public Recreation).

The site contains no waterbodies, with the nearest water source being Salt Pan Creek, located approximately 760 m SE from the site (Figure 2-3). The creek flows south-easterly before reaching its confluence with the Georges River, at Riverwood.

2.3 EXISTING STORMWATER INFRASTRUCTURE

Two large Sydney Water stormwater drainage pipelines (diameter 1,500 mm), traverse underground in the centre of the site. Eight existing onsite stormwater pits connect to these two lines via 1,050 mm, 450 mm, 300 mm and 250 mm diameter through the site's underground pipelines. Existing infrastructure is presented in the stormwater concept plans and dial before you dig Sydney Water map (Figure 2-2). The site's stormwater system will be upgraded as detailed in section 2.11, however there will be no changes to Council's stormwater drainage easement/pipes, the existing connection will be retained.

Figure 2-2: Existing Stormwater Infrastructure



Source: Dial Before You Dig, Sydney Water

2.4 EXISTING WATER QUALITY

The existing water quality at the point of discharge has been sampled and analysed as described in Section 3.3.

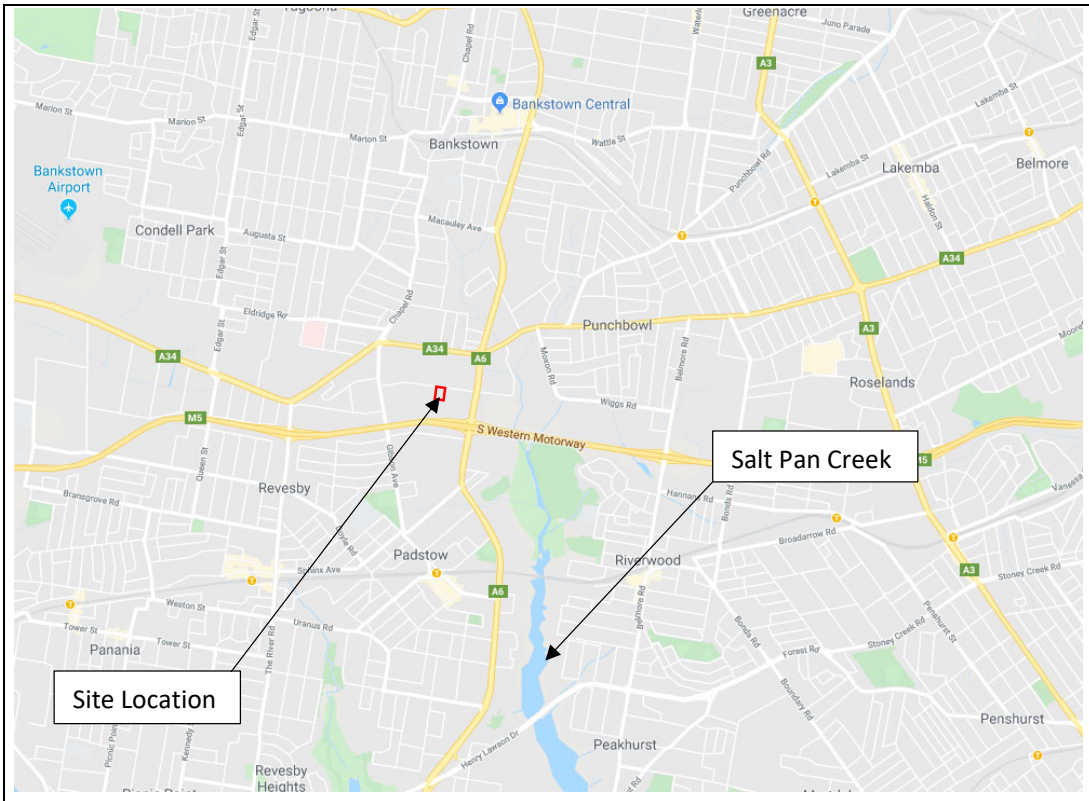
The default guideline values (DVG) adopted for the site is the 95% level of species protection recommended for application for slightly to moderately disturbed ecosystems under the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018). The results complied with the guideline values for "Slightly-moderately disturbed ecosystems" with the exception of pH which was slightly higher than the criteria. Therefore based on this data, the

stormwater runoff can be described as “slightly-moderately disturbed”. Guidelines are discussed further in Section 3.1.7.

2.5 NEAREST WATERWAYS

The site contains no waterbodies with the nearest water source being Salt Pan Creek, located approximately 760 m SE from the site, as shown in Figure 2-3. The creek’s headwaters are located at Mt Lewis, approx. four km NE from the site. The creek flows south-easterly before reaching its confluence with the Georges River, at Riverwood. Salt Pan Creek’s catchment is approx. 26 km^2 and is prone to flooding from stormwater overflows due to urban development and the removal of vegetation.

Figure 2-3: Nearest Water Course



Source: SixMaps 2021

N Not to scale	LEGEND Site Boundary	Benbow Environmental 25-27 Sherwood Road Northmead NSW 2152

2.5.1 Water Quality and River Flow Objectives

Water Quality Objectives (WQOs) and the River Flow Objectives (RFOs) identify the agreed environmental values and long-term goals for NSW’s surface waters.

There would be no discharges into any waterways from the proposed development as the site has been designed so that on-site stormwater will be captured and treated onsite prior to release to the street stormwater system.

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The subject site is located within 'Waterways affected by Urban Development'. The relevant WQOs and RFOs are summarised below in Table 2-1 and Table 2-2 respectively. If needed, key water quality indicators and related numerical criteria (default trigger values, included in section 3.4.6) relevant to assessing and monitoring the health of aquatic ecosystems can be found at: http://www.environment.nsw.gov.au/ieo/GeorgesRiver/report-02.htm

Table 2-1: Relevant Water Quality Objectives

WQO	Objective
Aquatic Ecosystems	*Maintaining or improving the ecological condition of waterbodies and their riparian zones over the long term*
Visual Amenity	*Aesthetic qualities of waters*
Secondary Contact Recreation	*Maintaining or improving water quality for activities such as boating and wading, where there is a low probability of water being swallowed*
Primary Contact Recreation	*Maintaining or improving water quality for activities such as swimming in which there is a high probability of water being swallowed*

Table 2-2: Relevant River Flow Objectives (RFOs)

RFO	Objective
Maintain wetland and floodplain inundation	*Maintain or restore the natural inundation patterns and distribution of floodwaters supporting natural wetland and floodplain ecosystems*
Maintain Natural Flow Variability	*Maintain or mimic natural flow variability in all streams*
Maintain Natural Rates of Change in Water Levels	*Maintain rates of rise and fall of river heights within natural bounds*
Minimise Effects of Weirs and Other Structures	*Minimise the impact of instream structures*

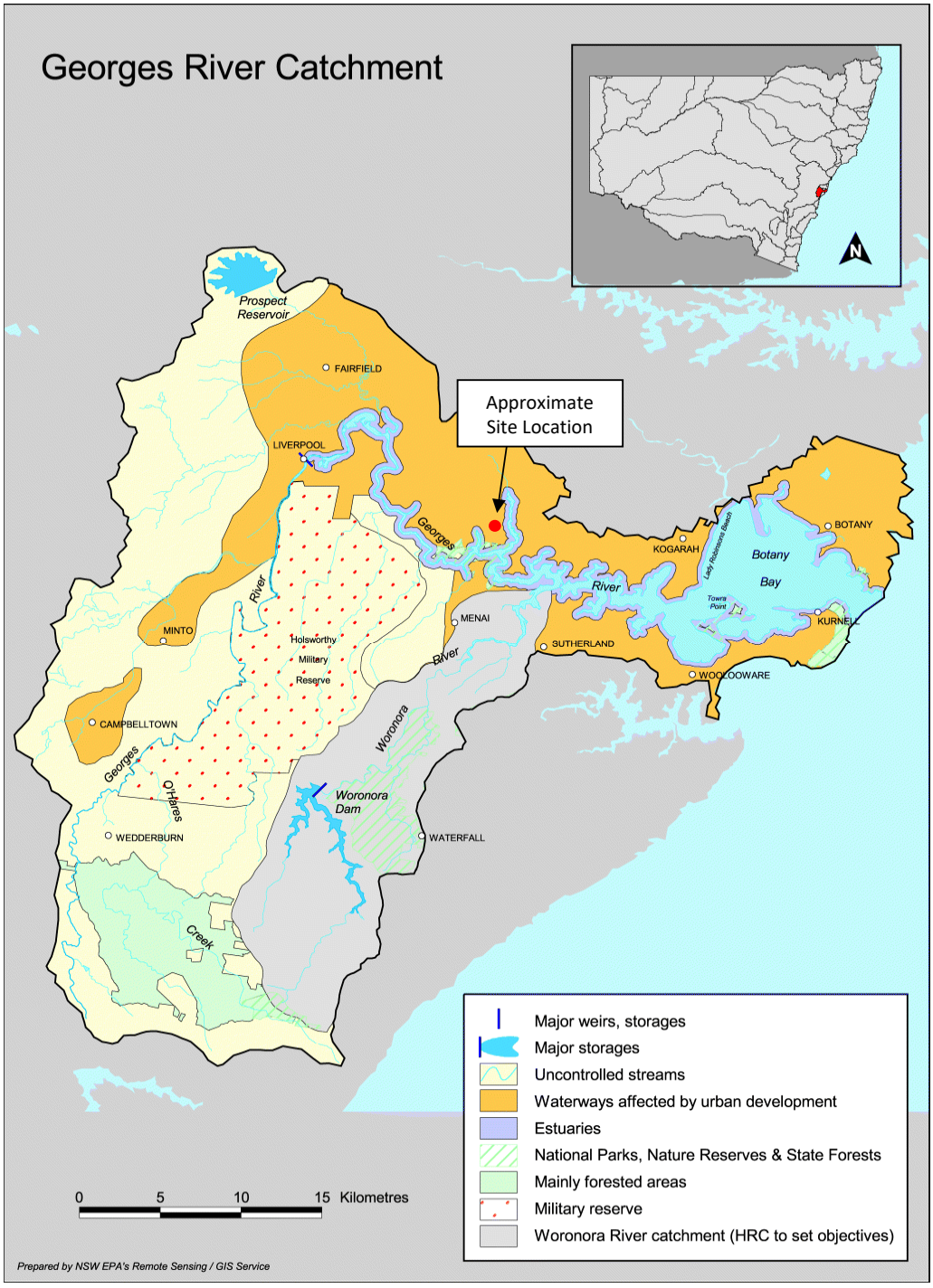
2.6 CATCHMENT MANAGEMENT PLAN

The site is located within the Georges River Catchment. Georges Riverkeeper Strategic Plan 2018-2022 is a four-year plan produced by Georges Riverkeeper, a catchment management group. The Group facilitates proactive waterway management that is adaptive and integrated across other areas of member councils, rather than being reactive and piecemeal. There are five focus areas in the Strategic Plan. These are:

- Catchment Actions Program (previously the Riverkeeper Program);
- River Health Monitoring Program;
- Storm water Program;
- Research Program; and
- Education and Capacity Building Program.

The proposed development aims support the aspirational goals of the storm water logic program, “Best practice environmental management for a liveable urban river”.

Figure 2-4: Georges River Catchment Map



Source: NSW EPA

↑N Not to Scale	LEGEND: ● Subject Site Location	Benbow Environmental 25-27 Sherwood Street, Northmead NSW 2152

2.7 RAINFALL

The BoM IFD Design Rainfall Depth (mm) for the site area and location (-33.9375, 151.0319) is provided in Table 2-3 below, based on the 2016 Rainfall IFD Data System.

Table 2-3: Annual Exceedance Probability (AEP) Depth (-33.9375, 151.0319)

Duration	63.20%	50%#	20%*	10%	5%	2%	1%
1 min	2.15	2.38	3.07	3.54	3.98	4.56	5.00
2 min	3.53	3.84	4.84	5.54	6.22	7.09	7.79
3 min	4.91	5.36	6.79	7.78	8.75	9.99	11.0
4 min	6.17	6.77	8.63	9.90	11.1	12.7	14.0
5 min	7.31	8.04	10.3	11.9	13.3	15.3	16.8
10 min	11.6	12.8	16.7	19.2	21.6	24.8	27.2
15 min	14.4	16.0	20.8	24.0	27.1	31.0	34.0
30 min	19.6	21.7	28.1	32.3	36.4	41.7	45.6
1 hour	25.3	27.7	35.5	40.8	46.0	52.7	58.0
2 hours	32.0	35.0	44.6	51.3	58.0	67.0	74.1
3 hours	37.0	40.5	51.8	59.7	67.7	78.6	87.3
6 hours	48.4	53.3	69.3	80.7	92.3	108	121
12 hours	64.5	72.1	96.7	114	132	157	176
24 hours	85.9	97.7	136	163	190	227	257
48 hours	110	127	182	221	259	310	350
72 hours	124	144	208	252	296	352	396
96 hours	133	154	222	269	315	374	419
120 hours	139	161	230	278	324	385	430
144 hours	144	166	235	282	328	389	433
168 hours	148	170	238	284	329	390	434

2.8 EXISTING RESOURCE RECOVERY FACILITY

The site contains an existing resource recovery facility with approval under DA-51/1997 to process up to 80,000 tonnes per year and store tpa of construction and demolition (C&D) waste and has a storage capacity of 7,300 tonnes at any one time. The facility is authorised to accept the following wastes:

- General solid waste (non-putrescible) including:
  - Glass, plastic, rubber, plasterboard, ceramics, bricks, concrete or metal;
  - Virgin excavated material;
  - Building and Demolition waste;
  - Asphalt waste;
  - Cured concrete waste;
  - Any mixture of the wastes referred to above.

- Drilling mud, meaning a mixture of naturally occurring rock and soil, including but not limited to materials such as sandstone, shale and clay, and drilling fluid generated during drilling operations such as horizontal or directional drilling or potholing. This does not included drilling mud that has been generated by:
  - Deep drilling for mineral, gas or coal exploration; or
  - Drilling through contaminated soils, acid sulphate soils (ASS) or potential acid sulphate soils (PASS).

It should be noted that the facility currently does not accept drilling mud and this waste type is currently not included on the Site's EPL.

The site is fully developed and consists of two weighbridges, a wheel wash, a warehouse building, demountable office and a demountable lunchroom. Crushing and screening equipment are located in the south-east corner and there are 12 pre-cast concrete external storage bunkers for the storage of incoming wastes and recovered materials.

The existing development site is a fully developed industrial premises with a total area of approximately 10,115 m^2. The entire site consists of sealed concrete hardstand.

Approved hours of operation of the existing resource recovery facility are between 6.00am - 6.00pm on weekdays and 7.00 am - 6.00 pm weekends.

A description of the existing processes is provided in the following section.

2.8.1 Existing Process Description

The following steps are undertaken at the existing approved resource recovery facility:

- Incoming waste is received pre-sorted from skip bin facilities and is inspected at the weighbridge upon arrival at the site.
- Acceptable waste is weighed and recorded.
- Trucks unload the waste at the pre-crushed storage area.
- Material is crushed and screened to suitable sizes.
- Recovered material is stored in designated external storage bunkers.
- Materials are loaded onto trucks and weighed before leaving the site via the wheel wash for off-site reuse as road-base material.

Waste dockets are maintained for record keeping purposes.

2.9 Proposed Liquid Waste Dewatering Facility

Establishment and operation of a liquid waste dewatering plant is proposed. This plant would essentially operate separately from the existing approved resource recovery facility, however, there would be some minor interactions between processes. The proposal consists of the following elements:

- Construction of purpose-built building to enclose the dewatering facility. This would replace the existing warehouse building that would be demolished.

- A new office building would be constructed. This would replace the existing demountable office and amenities building as well as the demountable lunchroom that would be removed from site. The new office building would be used by staff of both the existing and proposed developments.
- Installation of dewatering equipment including a flocculant station/pit, screw separator and screen, slurry homogeniser, 2 x 60 kL silos, and filter press.
- A truck unloading area inside the building.
- Six (6) inground pits and sumps inside the building. Pits and sump details are as follows:
  - Inground Pit (receivals), 8.0 x 4.5 x 3.0 m deep (Volume: 108,000 L)
  - Floc Plant: Clean water pit, 3.0 x 2.835 x 2.5 m deep (Volume: 21,263 L)
  - Floc Plant: Dirty water pit (1), 2 x 2.835 x 2.5 m deep (Volume: 14,175 L)
  - Floc Plant: Dirty water pit (2), 3.33 x 2.835 x 2.5 m deep (Volume: 23,601 L)
  - Floc Plant: Sump Pit, 1.6 x 2.835 x 2.5 m deep (Volume: 11,340 L)
- Six (6) bunkers. Four (4) bunkers would be located inside the building and two (2) would be located external to the building under an awning. Bunker contents and dimensions are:
  - Bunker 1: Filter cake 6.3 x 8.5 m
  - Bunker 2: Sand 5.07 x 5.805 m
  - Bunker 3: Sand 5.295 x 5.805 m
  - Bunker 4: Sand 5.295 x 5.805 m
  - Bunker 5: Aggregate, 6.2 x 4.0 m
  - Bunker 6: Aggregate, 6.2 x 4.0 m
- Extension of the boundary wall up to new building behind the new aggregate bunkers.
- Connection to Sydney Water tradewaste under an agreement.
- Stormwater upgrades including a first flush system that directs the first 20 mm of on-site stormwater to a silt arrester and detention tank which will be used in the dewatering plant while the clean overflow is discharged to the stormwater easement using the existing stormwater connection during a heavy rain event.

A proposed site plan and equipment layout are provided in Appendix 8. A description of the dewatering process is provided in the following sub-section.

2.9.1 Proposed Process Description

The dewatering facility would operate as a recycling facility for the drilling mud and concrete washout water and stormwater captured onsite. The facility would involve the following activities:

- Unloading of drilling mud/concrete washout water into dirty water containment pits.
- This liquid is transferred into the dirty water pit and then into the flocculent station.
- The flocculants assist in settling sediments at the bottom of the tank.
- The sand/rock/sediment slurry is pumped from the bottom of the tank and into a screw separator.
- The screw separator removes the solids from the water.
- The solids are then transferred to a vibrating screen where the aggregates and sands are conveyed to internal and external storage bays.
- The water from the flocculent station and the screw separator is pumped to the two 60 kL silos, the slurry homogeniser tank and then into the filter press.
- The filter press removes the remaining silts and the cleaned water is pumped to the clean water pit.

- The sediments/silt from the filter press becomes a fine biscuit which is removed offsite as for application to land under the Treated Drilling Mud Exemption 2014 or to landfill.
- The filter press requires intermittent backwashing where backwash water is pumped to the dirty water pit to be reprocessed through the system.
- The clean water pit would be pH adjusted and then used for cleaning aggregates and sand during the screening process, dust suppression and washdown onsite. Excess water would be sent to tradewaste under a Trade Waste Agreement.

Site washdown water and stormwater will be collected in a 200 kL underground tank and through the above dewatering system.

The maximum quantity of liquid waste that can be processed through the dewatering plant in a 24-hour period is approximately 1,500 tonnes. This can easily accommodate stormwater runoff and the proposed 250,000 tonnes per annum.

2.10 Land forming and Excavation Works

Excavations will be required for upgrading the stormwater system and the installation of the water containment pits required for the dewatering plant. Minor excavation will also occur to allow laying of concrete bedding for machinery footings etc. It is expected less than 1,000 m^3 of material will require excavation.

Some of the proposed areas requiring earthworks contain Acid Sulfate Soils (ASS). Therefore, an ASS Management Plan (ASSMP) is required. Further details regarding ASS are discussed in Section 4.1.3.

2.11 Site Stormwater and Leachate System

Currently there is a drainage easement that runs across the site with stormwater drainage lines underground. Overland flooding is an issue under the existing conditions and has resulted in sediment laden runoff on occasions.

The proposed development involves modification to the stormwater system to enable adequate management of leachate and on-site stormwater which has been designed to Council requirements. The proposed stormwater system will provide onsite detention and water quality treatment and include, BCP Stream Guard Pollution Control Pit or equivalent at stormwater pits; a silt arrestor; 200kL underground containment and stormwater isolation valve. The design is shown in the INDESCO Engineering Plans.

The system would capture first flush site stormwater (leachate) which would initially be treated through an arrestor and detained within the two underground storage tanks before being treated through the dewatering plant.

2.11.1 Leachate

Leachate is defined under the NSW EPA Environmental Guidelines: Solid Waste Landfills, Second Edition 2016 as:

> ***Leachate:*** *the liquid that passes through, or is released by, waste. It arises from the inherent moisture content of the waste and from rainwater (and sometimes groundwater) percolating through or contacting the waste mass. Leachate may contain high levels of dissolved solids, ammonia, organic matter, and sometimes metals and other pollutants. These levels are typically well above background levels for undisturbed or slightly disturbed groundwater and surface water systems. The levels are also well above national quality guidelines for drinking water and other beneficial reuses of water.*

In this case, leachate is created by stormwater percolating through the external stockpiles on site and essentially leachate and stormwater are the same thing. Therefore, these terms are used interchangeably and cannot be treated as separate sources of water.

2.12 EXISTING SITE CONTAMINATION

A limited Phase II Environmental Site Assessment (ESA) undertaken by Benbow Environmental in February 2020 (Ref: 191290_Phase II), found no evidence of soil or water contamination. The Phase II ESA was targeted to examine areas involved in this and future proposals that will require earthworks. The remainder of the site is covered in concrete hardstand.

3. WATER ASSESSMENT

This section provides the water assessment for the proposed development.

3.1 LEGISLATION POLICIES AND GUIDELINES

The two key pieces of legislation for the management of water in NSW are the *Water Act 1912* and the *Water Management Act 2000*.

Other legislation, policies and guidelines also considered in this section include:

- Water Sharing Plans;
- Protection of the Environment and Operation Act;
- NSW Aquifer Interference Policy;
- Guidelines for Controlled Activities on Waterfront Land; and
- Guidelines for Fresh and Marine Water Quality.

3.1.1 Water Act 1912

Licences for water conservation, irrigation, water supply or drainage as well as changing the course of a river can be applied for under the *Water Act 1912*.

The proposed development does not involve works for water conservation, irrigation, water supply or drainage and does not involve works that would change the course of a river; therefore, the *Water Act 1912* does not apply.

3.1.2 Water Management Act 2000

The *Water Management Act 2000* provides requirements for the extraction of water, water use, floodplain and drainage management, the construction of works such as dams and weirs, and undertaking activities on or near water sources in NSW. Approvals for the extraction and use of water, construction of works relating to water use and controlled activities carried out on waterfront land can be obtained under the Act.

This does not apply to the proposed development.

3.1.3 Water Sharing Plans

Two water sharing plans apply to the area where the subject site is located. These are:

- Water Sharing Plan for the Greater Metropolitan Region Unregulated River Sources; and
- Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources.

These do not apply to the proposed development.

3.1.4 Protection of the Environment Operations Act 1997

Clause 120 of the *Protection of the Environment Operations Act 1997* states the following:

> *120 Prohibition of pollution of waters*
> *(1) A person who pollutes any waters is guilty of an offence.*
> *Note. An offence against subsection (1) committed by a corporation is an offence attracting special executive liability for a director or other person involved in the management of the corporation—see section 169.*
> *(2) In this section:*
> *pollute waters includes cause or permit any waters to be polluted.*

The proposed development will not breach the above clause with regard given to the proposed mitigation measures and safeguards to be implemented as described throughout this report.

3.1.5 NSW Aquifer Interference Policy (2012)

The proposed development does not constitute an aquifer interference activity and therefore no further assessment is warranted.

3.1.6 Guidelines for Controlled Activities on Waterfront Land (2018)

The proposed development is not located on or in the vicinity of waterfront land. Therefore, no further assessment is warranted.

3.1.7 Guidelines for Fresh and Marine Water Quality

The default guideline values (DVG) adopted for the site is the 95% level of species protection recommended for application for slightly to moderately disturbed ecosystems under the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018). Where DVGs are not available the ANZECC guidelines have been adopted in the interim. Potential pollutants are presented in Section 3.4.1 and the applicable criteria is presented in the water monitoring program, Section 3.4.5.1.

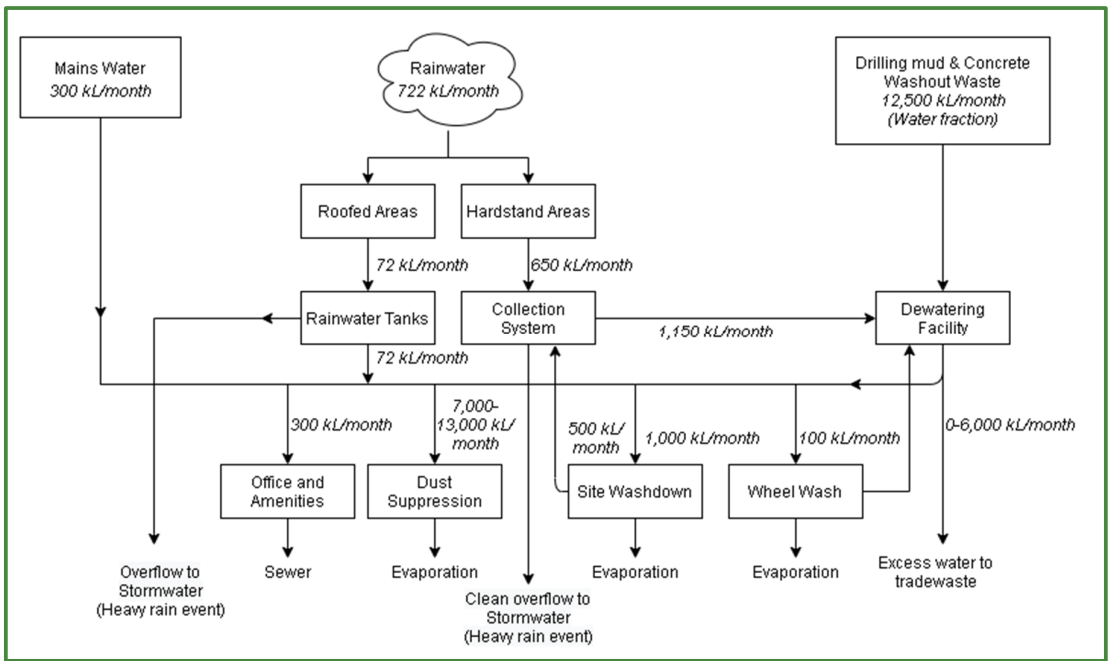
3.2 WATER USAGE & SUPPLY

The site will use mains water for the office and amenities. All other water usage will be recycled water sourced from the proposed dewatering facility and rainwater tanks onsite. Recycled water and captured rainwater would be used for dust suppression, wheel wash and aggregate washing. Any excess recycled water will be discharged into the sewer in accordance with the TWA until an EPA granted licence for a stormwater management of stormwater characterisation and discharge, can be provided.

3.2.1 Site Water Balance

Figure 3-1 shows the site's water balance.

Figure 3-1: Site Water Balance Diagram



The rainwater is based on an annual rainfall of 866.4 mm per year from Bankstown AWS climate data, and a site area of 10,000 square meters, 90% of which is assumed to be hardstand. The dust suppression requirements are based on an assumption of 1.5L per square meter per 20 minute period typically used for haul road dust suppression. Assuming this application is done 75% of the time for 60% of the site area this would result in an approximate maximum water usage quantity of 13,000 kL/month for dust suppression.

3.2.2 Wastewater

The proposed dewatering facility will accept wastewater from drilling mud and concrete washout water. Additionally, site generated stormwater will be collected from hardstand areas and recycled through the facility. This will be processed through the dewatering plant with the recycled water used for onsite activities such as dust suppression and aggregate washing. Any excess of recycled water will be disposed directly into the sewer as per a trade waste agreement. Sewerage water generated from the office and amenities buildings will be discharged directly into the sewer.

No other wastewater will be generated from the proposed facility.

3.2.3 Wheel Wash

The wheel wash is a fully bunded and closed loop system that recirculates water for the washing of truck wheels. The system periodically requires top up with mains/recycled/rainwater. The

wastewater generated during washing would be directed to a water filtration system that would remove oil, grease, detergent and suspended solids. Treated water is stored in a tank for reuse in the system. No chemicals are used in the wheel wash. Regular servicing is undertaken to maintain the wheel wash and periodic cleaning of the wheel wash is undertaken by a licensed waste contractor.

3.2.4 Sydney Water Infrastructure and Services

The proposed development will utilise recycled water for dust suppression etc., reducing the site's use of mains/potable water. Therefore, the proposed development will have minimal impact on the Sydney Water drinking assets.

The proposed development will upgrade the stormwater system, to allow better capture of sediment laden water (see INDESCO's Engineering Drawings for Water Reuse and Drainage Upgrade). This will reduce sediment impact on the existing stormwater infrastructure.

In addition, the dewatering plant will require a trade waste agreement and trade waste infrastructure connection. This will be in consultation with Sydney Water and will be undertaken following approval.

3.3 STORMWATER CHARACTERISATION

Stormwater sample collection and analysis for the purposes of characterisation of water quality and providing baseline data was undertaken on 27 October 2020 (Attachment 1). Chemicals and parameters selected for analysis included those associated with industrial activities such as heavy metals, TPH/TRH and BTEXN. Physicochemical attributes such as suspended solids, pH and electrical conductivity (EC) were also analysed.

Samples were collected from one (1) on site stormwater pit at the commencement of an independent rain event. The pit was located near the centre of the site, beside the north-western corner of the existing workshop structure and is the current point of discharge from the site.

Results of analysis were reviewed against the criteria outlined in the recommended water monitoring program (see Section 3.4.6). Criteria was obtained from the Australian and New Zealand Guidelines for Fresh and Marine Water (ANZG, 2018), or the Australian and New Zealand Environment and Conservation Council (ANZECC) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality Guidelines* (2000) where trigger levels are not provided by the 2018 guidelines. The criteria parameters relevant to the site are "slightly–moderately disturbed systems" and the conservative 95% protection value for freshwater was selected. All analysis was undertaken at NATA accredited facility, ALS Environmental.

Results of stormwater characterisation showed that the sample below LOR or within the adopted and selected ANZECC criteria for all parameters except pH. The adopted pH level criteria for the site is 6.5-8 (for slightly-moderately disturbed systems).

3.4 ASSESSMENT OF POTENTIAL IMPACTS ON WATER

Assessment of potential impacts of the proposed development to surface and groundwater resources and flooding, is presented in this section.

3.4.1 Potential Pollutants

This section identifies potential pollutants of concern at the site, the relevant source materials, the potential receptors (including Salt Pan Creek and downstream tributaries) and the potential exposure pathways. Pollutants are listed below in Table 3-1.

Table 3-1: Conceptual Model of Potential Contaminants and their Source

Known and Potential Primary Sources of Contamination	Primary Release Mechanism	Contaminants of Potential Concern	Potential Environmental Receptors	Exposure Pathways	Risk Level	Controls	Residual Risk Level
Concrete	Crushing	pH (highly alkaline) Sediments	Wetlands, streams, groundwater ecosystems and native habitats	Surface water runoff Alkaline surface waters seeping into ground water	Moderate	Stormwater pits Silt Arrestor Pit 200 KL ROCLA PLASTREAM underground containment and stormwater isolation valve Underground containment outlet water sampling EMP -Water Monitoring & Housekeeping	Low
Diesel Fuel and Oils	Leaks/spills from transport vehicles	TRH* BTEX^ PAH#	Wetlands, streams, groundwater ecosystems and native habitats	Surface water runoff, dissolved pollutants seeping into ground water	Low	Spill kits 200 KL ROCLA PLASTREAM underground containment and stormwater isolation valve Underground containment outlet water sampling ; EMP -Water Monitoring & Housekeeping	Low

Table 3-1: Conceptual Model of Potential Contaminants and their Source

Known and Potential Primary Sources of Contamination	Primary Release Mechanism	Contaminants of Potential Concern	Potential Environmental Receptors	Exposure Pathways	Risk Level	Controls	Residual Risk Level
Bricks and Tiles	crushing	sediment	Wetlands, streams, groundwater ecosystems and native habitats	Surface water runoff	Low	Stormwater pits Silt Arrestor Pit 200 KL ROCLA PLASTREAM underground containment and stormwater isolation valve Underground containment outlet water sampling EMP -Water Monitoring & Housekeeping	Low
Soil, Organic Matter	Release of chemicals of concern	Nitrogen Phosphorus Ammonia	Wetlands, streams, groundwater ecosystems and native habitats	Surface water runoff, dissolved pollutants seeping into ground water	Low	Stormwater pits Silt Arrestor Pit 200 KL ROCLA PLASTREAM underground containment and stormwater isolation valve Underground containment outlet water sampling EMP -Water Monitoring & Housekeeping	Low

Table 3-1: Conceptual Model of Potential Contaminants and their Source

Known and Potential Primary Sources of Contamination	Primary Release Mechanism	Contaminants of Potential Concern	Potential Environmental Receptors	Exposure Pathways	Risk Level	Controls	Residual Risk Level
Asphalt Waste	Debris generated during sorting procedures	Hydrocarbons, PAH	Wetlands, streams, groundwater ecosystems and native habitats	Surface water runoff, dissolved pollutants seeping into ground water	Negligible	Stormwater pits Silt Arrestor Pit 200 KL ROCLA PLASTREAM underground containment and stormwater isolation valve Underground containment outlet water sampling EMP -Water Monitoring & Housekeeping	Negligible

*__TRH:__ Total Recoverable Hydrocarbons
^__BTEX:__ Benzene, Toluene, Ethylbenzene and Xylenes
#__PAH:__ Polycyclic Aromatic Hydrocarbons

3.4.2 Catchment Impacts

The prime risk to the catchment from the proposed development is associated with surface water and groundwater impacts; these are assessed in the following sections.

3.4.3 Wetland Impacts

There are no wetlands near the site.

3.4.4 Surface Water Impacts

Surface water would be generated from rain events and some surface water may be generated from the use of fine mist water sprayers for dust suppression and site washdown.

The proposal does not require use of or access to groundwater. No water from the facility will be discharged into groundwater.

The operation of the facility would contribute negligible additional quantities of sediment to surface water runoff. That is, almost nil contaminants will reach off site receptors due to surface water runoff.

3.4.4.1 Stormwater Management

3.4.4.1.1 Operational Phase

Most of the surface water will be from rain events, with a smaller portion attributed to site operations such as dust suppression and site washdown.

Surface water from hardstand areas would be captured within two Rocla Plastream underground storage tanks with a combined capacity of 200 kL to be processed within the dewatering plant. Roofwater from the facility would be captured within rainwater tanks. This water is to be reused for dust suppression.

The water from the dust suppression is unlikely to contribute much to surface waters as the volume of applied water would be minimal and the majority of it would evaporate. Dust suppression would consist of water sprays/water cannon that provide a mist to adequately dampen materials and working areas. This would be a fine mist that would be switched off once stockpiles are damp. Any residual water from dust suppression would be captured within the 200 kL stormwater containment system.

Site washdown water and most of the rainwater will be collected by the stormwater capture and reuse system. This provides two direct benefits:

- Firstly, the site will reduce the use of potable water from the mains system to use in processes where potable water is not required (such as dust suppression, washing and sorting of aggregate materials). This reduces the demand on Sydney Water as the current site operations have a licence to process C&D material where mains water is sourced.

- Secondly, the site will reduce the volume of stormwater it currently discharges, as the proposal includes a capture and storage system for stormwater. This lessens the pressure on the stormwater infrastructure.

The stormwater system will be upgraded, as shown in the stormwater concept plans provided by INDESCO. It involves installing BCP Stream Guard Pollution Control Pit or equivalent at stormwater pits; connecting to the stormwater lines, which will all connect to a new silt arrestor pit with gas BCP SAP-400 or other approved equivalent, before entering the 200 kL Rocla Plastream underground containment. This will be connected to an existing stormwater drainage line that is presently connected to the central drainage pipeline (easement). The other existing drainage lines will be decommissioned so all runoff from the site will go through the proposed silt arrestor pit and underground containment.

A stormwater isolation valve will be installed after the 200kL underground containment to prevent contaminated discharge if required.

The sediment collected in the silt arrestor pit and ROCLA underground containment will be periodically serviced by the proponent, and then processed through the dewatering plant.

The system is designed to only discharge rainwater after a heavy rain event (>25 mm) which according to the BoM Bankstown Airport automatic weather station (ID #: 066137), occurs on average 8.5 times per year (1968-2020).

3.4.4.1.2 Construction Phase

The prime impact from surface water due to construction works would be release of sediments into receiving stormwater drains. Erosion and sediment controls have been prepared by INDESCO as part of the Engineering Drawings for Water Reuse and Drainage Upgrade and shall be installed in accordance with Councils' specifications. They will be maintained throughout the period of works and replace/repaired when necessary e.g., after storm events.

The proposed construction works involve the excavation of a small area of the site including the water containment pits for the dewatering plant and the upgrades to the stormwater system. During the construction phase erosion and sediment controls will be implemented.

A Construction Environmental Management Plan (CEMP) (Ref: 191290-03_CEMP) has been provided for the proposed development to ensure effective management of surface water runoff during construction.

Excavations

The proposed pits for the dewatering plant require excavation to a depth of approximately 3.0 m. No groundwater is expected to be encountered at this depth. The proposed area for excavation is 11.7 m AHD (Australian Height Datum).

The site is within 500 m of Class 2 ASS. As the proposal requires some earthworks and the presence of ASS has been confirmed, an ASSMP is required before earthworks commence.

Excavations are expected to have a minimal impact on groundwater.

Erosion & Sediment Controls

Erosion and sediment controls have been prepared by INDESCO as part of the Engineering Drawings for Water Reuse and Drainage Upgrade. These show the concept design details of the stabilised site access, stockpile stabilisation, earth banks, straw bale filters, kerbside turf strip, sediment fence, stormwater pit drainage protection measures (inlet filters), design maintenance and notes.

3.4.4.2 Hydrological Impacts

Flooding is assessed in Section 3.4.8 and is considered to be adequately addressed. Stormwater concept plans have been provided, which control runoff on site to minimise impacts. The site is covered by concrete hardstand. Negligible impacts to groundwater are expected.

3.4.5 Groundwater Impacts

The site is covered by concrete hardstand and there is expected to be minimal impacts to groundwater. No further assessment is considered warranted.

3.4.5.1 Groundwater Dependant Ecosystems

Groundwater Dependant Ecosystems (GDEs) are defined ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants, animals, ecological processes and ecosystem services.

Types of GDEs have been defined which can be split into three categories:

1. Ecosystems that depend on the surface expression of groundwater (lacustrine, palustrine, riverine, estuarine and marine);
2. Ecosystems that depend on the subsurface presence of groundwater (riverine wetlands, terrestrial) and;
3. Ecosystems dependent on the subterranean presence of groundwater (aquifer, cave).

If groundwater sources are altered, polluted or contaminated, surrounding GDEs would be impacted.

There are no wetlands within close proximity to the site. No groundwater is accessed by any current or proposed onsite activities. The site is fully concreted which is a robust barrier against contaminants entering the groundwater. Thus, any onsite activities would cause minimal impacts on groundwater. The site will store only a limited volume of contaminants (fuel and oils) for onsite use only. These are kept in a covered, bunded area. The proposal has a stormwater catch and reuse system that would collect any contaminants captured by surface water from onsite activities. Therefore, there is little to no risk to GDE from this proposal. No further assessment is considered warranted.

3.4.6 Water Monitoring Program

This section details the water monitoring program recommended for the proposed development. Monitoring should be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* (DEC, 2004).

3.4.6.1 Water Discharge Monitoring

It is recommended the water discharged to the stormwater system after the underground stormwater silt arrestor and underground containment, and before entering the Sydney Water stormwater easement pipeline. This water is to be monitored after heavy rain events. When constructing the stormwater system, access to this location for monitoring will be installed. Stormwater monitoring is currently not required under any licence or approval for the site.

Contaminants and their respective trigger values were obtained from the Australian and New Zealand Environment and Conservation Council (ANZECC) Water Quality Guidelines (2000). Trigger values were selected for "typical slightly–moderately disturbed systems" and "Lowland Rivers", as they are representative of the nearest waterways to the site. The species level of protection of 95% was selected for this system and stormwater monitoring procedure.

It is recommended water be tested for pollutants listed in Table 3-2

Table 3-2: Stormwater Monitoring List and Relevant Trigger Values

Analytes	ANZECC Trigger Value	Test Method /Reference	Analytical Limit
Metals			
Arsenic	24 (as III), 13 µg L^{-1} (as V)	ICP-MS	0.001 mg/L
Copper	1.4 µg L^{-1}	ICP-MS	0.001 mg/L
Chromium	1.0 µg L^{-1} (as Cr VI)	ICP-MS	0.001 mg/L
Zinc	8 µg L^{-1}	ICP-MS	0.005 mg/L
Lead	3.4 µg L^{-1}	ICP-MS	0.001 mg/L
Aluminium	55 µg L^{-1} (pH>6.5)	ICP-MS	0.01 mg/L
Nickel	11 µg L^{-1}	ICP-MS	0.001 mg/L
Cadmium	0.02 µg L^{-1}	ICP-MS	0.0001 mg/L
Mercury (Inorganic)	0.06 µg L^{-1}	ICP/MS	0.0001 mg/L
Nutrients			
Oxides of Nitrogen	40 µg L^{-1}	APHA 4500	0.002 mg/L
Filterable Reactive Phosphorus	20 µg L^{-1}	APHA 4500	0.01 mg/L
Total Ammonia	900 µg L^{-1} (at pH 8)	APHA 4500	0.01mg/L
Physical			
pH	6.5-8 (Lower-Upper Limit)	APHA 4500 or in situ	0.01 (pH units)
Electrical Conductivity	200-300 µScm^{-1}	APHA 2510 or in situ	1µS/cm
Suspended Solids	<50 mg/L[(2)]	APHA 2540	1 mg/L

Table 3-2: Stormwater Monitoring List and Relevant Trigger Values

Analytes	ANZECC Trigger Value	Test Method /Reference	Analytical Limit
Polycyclic Aromatic Hydrocarbons			
Naphthalene	16 µg L^{-1}	EP075B Sim	1 µg/L
BTEX			
Benzene	950 µg L^{-1}	EP080	1 µg/L
Toluene	ID	EP080	2 µg/L
Ethylbenzene	ID	EP080	2 µg/L
O-Xylene	350 µg L^{-1}	EP080	2 µg/L
Total Recoverable Hydrocarbons			
TRH (C6-C40)	ID	EP071,80	20-100 µg/L
Organochlorine Pesticides			
Chlordane	0.03 µg L^{-1}	EP068A	0.5 µg/L
Endosulfan	0.003 µg L^{-1}	EP068A	0.5 µg/L
Endrin	0.01 µg L^{-1}	EP068A	0.5 µg/L
Heptachlor	0.01 µg L^{-1}	EP068A	0.5 µg/L
Organophosphorus Pesticides			
Azinphos methyl	0.01 µg L^{-1}	EP068B	0.5 µg/L
Chlorpyrifos	0.01 µg L^{-1}	EP068B	0.5 µg/L
Diazinon	0.01 µg L^{-1}	EP068B	0.5 µg/L
Malathion	0.05 µg L^{-1}	EP068B	0.5 µg/L
Parathion	0.004 µg L^{-1}	EP068B	2 µg/L
Herbicides and Fungicides			
2,4-D	280 µg L^{-1}	EP202	10 µg/L
2,4,5-T	36 µg L^{-1}	EP202	10 µg/L

Note: "ID" = insufficient data in ANZECC

The stormwater outlet pit should be checked after/during any rain event greater than 25 mm/day and sampled if water is being released. Stormwater monitoring events must be undertaken by a suitably qualified person. If no water is being released, this should be recorded. After the first year, this data will provide an indication of the rain events that will result in release of water. The monitoring program and sampling regime can then be revised.

The EMP provides an action plan for measures to be implemented if the trigger values are exceeded.

3.4.7 Bunding and Containment

Minimal chemicals will be used and stored on site. They will be stored inside on bunded pallets. A 65,000 L self-bunded diesel storage tank will be located externally in accordance with AS1940. This tank be located on a sealed concrete hardstand with an available spill kit nearby.

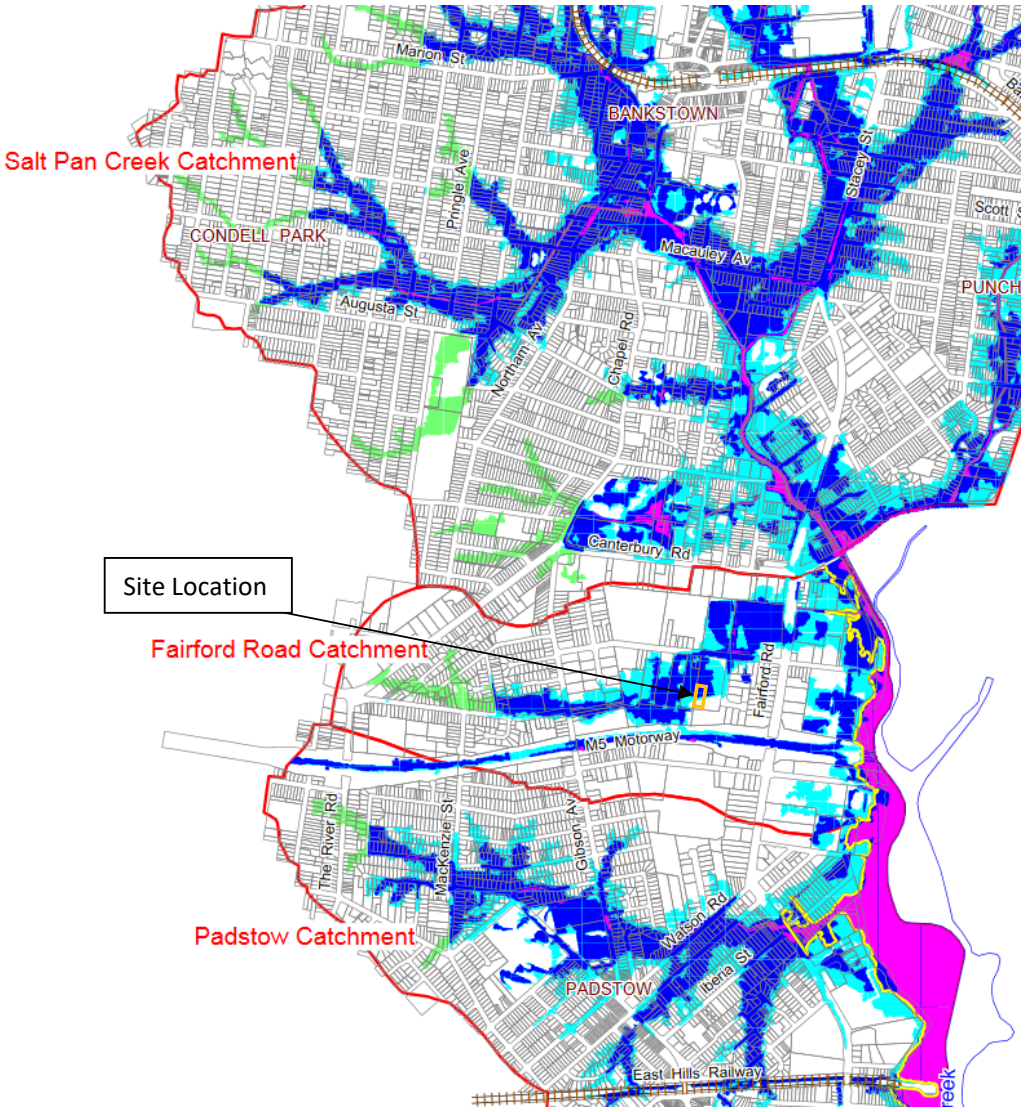
3.4.8 Flooding

The Section 10.7 (2) Certificate (Ref: #20202885) for the subject site states the property is subject to flood related development controls. The property is affected by a policy known as *Bankstown Development Control Plan 2015, Part B12 - Flood Risk Management and clause 6.3 – Flood planning of the LEP 2015*, by reference to the *Fairford Road Catchment Flood Study, February 2010*, which categorises land affected by the 1:100 ARI (Average Recurrence Interval), into the following two flood risk precincts:

- High flood risk precinct – Land below the 100-year flood that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties; and
- Medium flood risk precinct - Land below the 100-year flood that is not subject to a high hydraulic hazard and where there are no evacuation difficulties.

The Fairford Road Catchment Flood Study risk precincts map shows the site situated in a medium risk flood area due to stormwater (see Figure 3-2).

Figure 3-2: Flood Risk Precincts



Source: Canterbury Bankstown Council 2019

To address flood concerns, a Flood Impact Assessment Report (Ref: 7524) was undertaken by INDESCO for the proposed development. The findings of the assessment demonstrate that:

> *The proposed development does not generate any considerable flood impacts with respect to the local overland flow. In particular, the results indicate that:*
>
> - *The proposed development does not lead to adverse flooding impact on the surrounding residential areas;*
> - *The proposed development does not create any safety issue at the subject site and the surrounding areas;*
> - *Minor ponding difference reflected from existing to post development scenarios, occurring in the eastern adjoining neighbour, which is considered negligible;*
> - *Minor ponding difference reflected from existing to post development scenarios, occurring within the eastern boundary due to the level difference in the merged surfaces between Post Development TIN (1 meter grid) and ALS TIN (2 meter grid). In reality, the proposed development will be aligned to the adjoining neighbour and this ponding would disappear; and*
> - *Minor ponding difference reflected from existing to post development scenarios, occurring at the south of the subject site area, possibly due to the underground OSD built in TUFLOW 1D with grated pit (not impermeable pit lid). It is noted that the proposed stormwater system has been designed to comply with Council requirements.*

A Flood Impact Assessment Report was undertaken by INDESCO which concludes: *The results of the flood assessment generally indicate that the proposed development:*

1. Do not generate flooding issues at the subject site due to local overland flow;
2. Do not lead to adverse flooding impacts on the surrounding areas; and
3. Does not create safety issues at the subject site and the surrounding areas.

3.5 CLIMATE CHANGE

Rising temperature and sea levels are expected to increase the frequency and severity of storm events. This may increase the likelihood of wet weather events leading to more frequent storm events (and thus greater stormwater flooding). An increase of 10% precipitation has been is not expected to significantly impact the site.

4. SOIL ASSESSMENT

This soil assessment addresses the following:

- A description of local soils, topography, drainage and landscapes; and
- Consideration of any contaminated soil, including ASS.

Reference is made to the limited Phase II ESA (Ref: 191290-02_Phase II) throughout this soil assessment.

4.1 EXISTING SOIL CONDITIONS

4.1.1 Local Soils

The 'Sydney 1:100 000 Geological Map Sheet 9130' describes the geological composition of the area as *Ashfield Shale (Rwa)* which is part of the Wianamatta Group and comprises of dark-grey to black claystone-siltstone and fine sandstone-siltstone laminate.

The soil map 'Soil Landscape of Sydney 1:100,000 Sheet 9130' shows that the subject site is located in a 'Blacktown' (bt) area and is described as follows:

> *Blacktown (bt)*
>
> *Landscape – gently undulating rises on Wianamatta Group shales and Hawkesbury shale. Local relief to 30 m, slopes are usually <5%. Broad rounded crests and ridges with gently inclined slopes. Cleared Eucalypt woodland and tall open-forest (wet sclerophyll forests).*
>
> *Soils – shallow to moderately deep (<100 cm) Red and Brown Podzolic Soils (Dr3.21, Dr3.11, Db2.11) on crests, upper slopes and well-drained areas, deep (150-300 cm) Yellow Podzolic Soils and Soloths (Dy2.11, Dy3.11) on lower slopes and in areas of poor drainage.*
>
> *Limitations – moderately reactive highly plastic subsoil, low soil fertility, poor soil drainage*

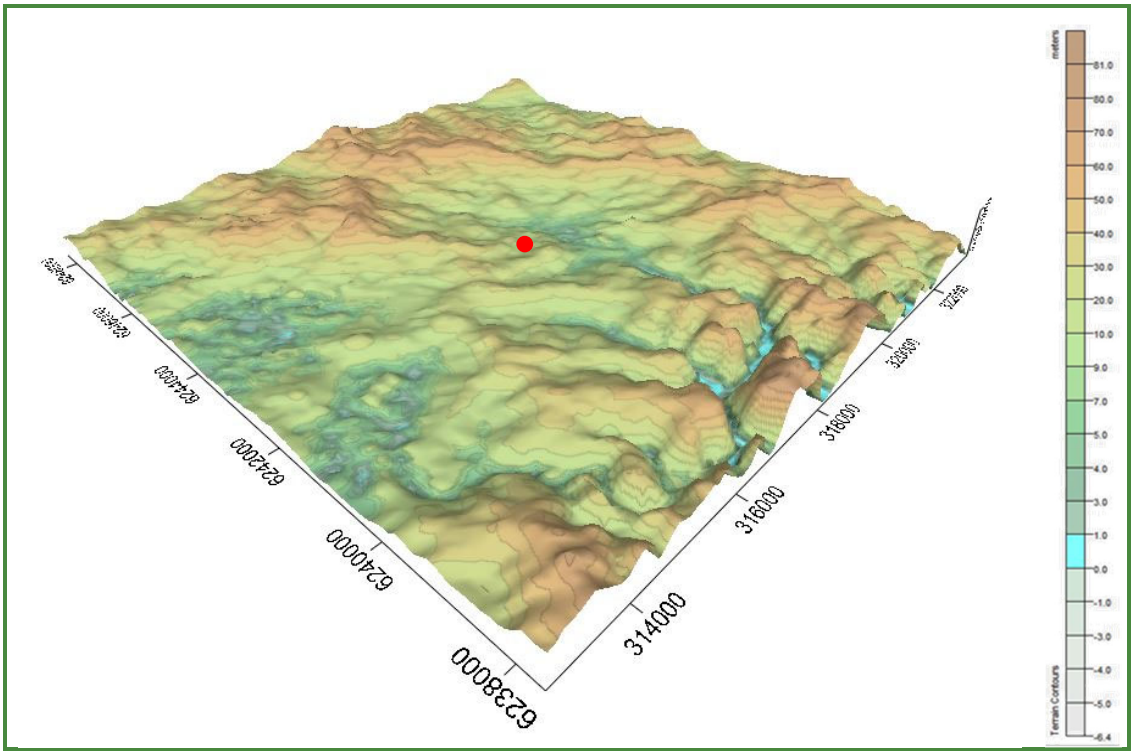
Soil logs from the recent limited Phase II ESA confirm the site as having red and brown Podzolic soils with highly plastic (high clay content) subsoils.

4.1.2 Topography, Drainage and Landscapes

The site is located within an industrial area. Its surface is covered in concrete hardstand and is generally flat, rising slightly at the southern end of the property.

A three-dimensional view of the local topography surrounding the site has been provided in Figure 4-1, with the terrain/vertical axis exaggerated by a factor of 10. It should be noted that this figure is an approximation of the actual terrain, based on information that has been digitised from local contour maps.

Figure 4-1: Local Topography with Vertical Exaggeration of 10



Note: ● = Approximate Site Location

4.1.3 Acid Sulfate Soils (ASS)

Information on the SEED (Sharing and Enabling Environmental Data) Map Viewer of Acid Sulfate Soils Risk indicates the site lies in an area of low probability ASS. The subject site is located on Class 5 ASS land, as per the Bankstown LEP 2015. Class 5 areas are generally low risk of containing ASS. As per the LEP, development consent is required for works in Class 5 areas that are located within 500 m of adjacent class 1, 2, 3 or 4 land that is below 5 metres AHD and by which the water table is likely to be lowered below 1 metre AHD on adjacent class 1, 2, 3 or 4 land. Class 2 land is approximately 365 m north-east of the site perimeter

6.1 Acid sulfate soils

(2) Development consent is required for the carrying out of works described in the Table to this subclause on land shown on the Acid Sulfate Soils Map as being of the class specified for those works.

Class of land Works

5 Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.

Due to the potential risk of ASS occurrence, sampling for ASS was included during the Phase II ESA. The results from this found the site does contain ASS, therefore an ASSMP has been provided to manage ASS during excavation.

4.1.4 Existing Contaminated Soil

The conclusions of the limited Phase II ESA found no evidence of soil contamination within the proposed areas marked for excavation. Laboratory results from all soil samples showed any contaminants detected were all below the adopted site criteria (of HIL-D).

4.2 Potential Impacts on Soil

4.2.1 Construction

An impact to soil during the construction phase may occur from erosion; this is addressed in Section 0. There are no likely impacts to soil based on the construction activities proposed.

An acid sulfate soil management plan is required for excavation works.

4.2.2 Operation

The most likely contamination sources are from the onsite use of fuel and oils, either through spillage during refuelling and/or maintenance activities or from waste materials stored onsite. Any contaminants left on the hardstand surface would likely be collected by stormwater runoff. However, as stormwater is intended to be collected and reused onsite, any contaminates in surface waters will also be captured and removed. Stormwater will be sent and processed through the proposed dewatering plan. Potential contaminants are shown in Table 3-1.

- Potential spillages of diesel and lubricating oil could occur during refuelling and equipment maintenance; the risk would be minimised through procedures and training in appropriate methods and signage showing how to avoid spills and the use of appropriately trained contractors.

- Good housekeeping practices are important to prevent contamination. These include regular cleaning of all hardstand areas, inspection of the integrity of equipment and inspection, cleaning and maintenance of stormwater/surface water system.

4.2.3 Geomorphological Impacts

Minimal earthworks are proposed, therefore geomorphological impacts are considered minor. Erosion and sediment controls are provided. No further assessment of geomorphological impacts is considered warranted.

5. SAFEGUARDS AND MITIGATION MEASURES

A summary of the soil and water environmental safeguards are provided as follows:

- Implementation of a Construction Environmental Management Plan that includes:
  - an Acid Sulfate Soil Management Plan; and
  - Erosion and Sediment Control Plan;
- Construction of the proposed stormwater capture, storage and reuse system;
  - Stormwater pits – BCP Steam Guard Pollution Control Pits or approved equivalent;
  - Underground stormwater pipelines;
  - Underground Silt Arrestor Pit (with gas BCP SAP-4000 or other approved equivalent);
  - 200 KL ROCLA PLASTREAM underground containment;
  - Stormwater isolation valve; and
  - Underground containment outlet water sampling point;
- Staff trained in spill response and emergency procedures, including maintenance and EMP procedures;
- Implementation of an Environmental Management Plan that includes the water monitoring program presented in this report and regular workplace inspection to maintain a high standard of housekeeping;

5.1 EROSION & SEDIMENT CONTROLS

An Erosion and Sediment Control Plan is provided with the INDESCO Engineering Drawings reference 7524-104 and 7524-104A. A description of the erosion and sediment control measures to be implemented on site during construction include:

- Geotextile inlet filter: Sediment barrier made from geotextile or straw bales to protect existing stormwater pits.
- Mesh and gravel inlet filter: Filters at kerb inlets to be gravel-filled wire mesh or geotextile sausage placed at sag point applied to pits as required.
- Sediment fences used along any disturbed/excavated constructed parallel to the site contours and around stockpiles and at site boundary.
- Shaker pad at site entrance and stabilised construction site access (if required). Existing concrete driveways would be used to enter the site from Gow Street where the shaker pad would be located. A stabilised site access consisting of geotextile fabric with road base or 30 mm aggregate to form a thick pad at the entrance of the construction area of the site if needed.

5.2 STORMWATER MANAGEMENT SYSTEM

The upgrades to the stormwater system include stormwater pits to capture on-site stormwater contaminated with suspended sediment (leachate) within underground pipelines that are directed to a silt arrestor. A silt arrestor is a purpose built underground storage pit that treats stormwater by trapping it within the unit and slowing the flow velocity with internal baffles providing gravitational separation of fine particles within the stormwater. Filtered stormwater is then discharged via an outlet pipe to the underground storage tanks. This water will be processed

within the dewatering plant, with the exception of heave rainfall events where water in excess of 200kL will be discharged to the stormwater system utilising the existing connection to the stormwater drainage easement.

5.3 WATER MONITORING REGIME

The monitoring program is provided in section 3.4.6.

There are no onsite groundwater monitoring bores.

6. CUMULATIVE IMPACTS

With the controls in place the site's impacts to soil and water will be improved. Therefore cumulative impacts will be reduced. No further assessment of cumulative impacts is considered warranted.

7. CONCLUDING REMARKS

Benbow Environmental has been engaged by Gow Street Recycling Centre Pty to undertake a Soil and Water assessment to support an Environmental Impact Statement (EIS) for the proposed construction and operations of a dewatering facility to be located at 81 Gow Street Padstow NSW 2211. The assessment is a qualitative study that addresses the potential impacts to soil and water from the proposed operations in accordance with the Secretary's Environmental Assessment Requirements (SEARs No. 1188).

With the control measures and monitoring procedures recommended in this report, the potential soil and water impacts of the proposed development are considered low.

This concludes the report.

Damien Thomas	Emma Hansma	R T Benbow
Environmental Scientist	Senior Engineer	Principal Consultant

8. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Gow Street Recycling Centre Pty Ltd, as per our agreement for providing environmental services. Only Gow Street Recycling Centre Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Gow Street Recycling Centre *Pty Ltd* for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

9. REFERENCES

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ATTACHMENTS

Attachment 1: Certificate of Analysis

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2037665**	Page	: 1 of 4
Client	: **BENBOW ENVIRONMENTAL**	Laboratory	: Environmental Division Sydney
Contact	: Matthew Taylor	Contact	: Customer Services ES
Address	: 25-27 SHERWOOD STREET NORTHMEAD NSW, AUSTRALIA 2152	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 191290_Stormwater	Date Samples Received	: 27-Oct-2020 11:00
Order number	: 191290	Date Analysis Commenced	: 27-Oct-2020
C-O-C number	: ----	Issue Date	: 03-Nov-2020 12:07
Sampler	: Matthew Taylor		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP080: Positive result is confirmed by re-analysis.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	SW1	----	----	----	----
			Client sampling date / time	27-Oct-2020 10:30	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2037665-001	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**8.14**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**214**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	**41**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.008**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	**50**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	**50**	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	**50**	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**104**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**115**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**103**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128