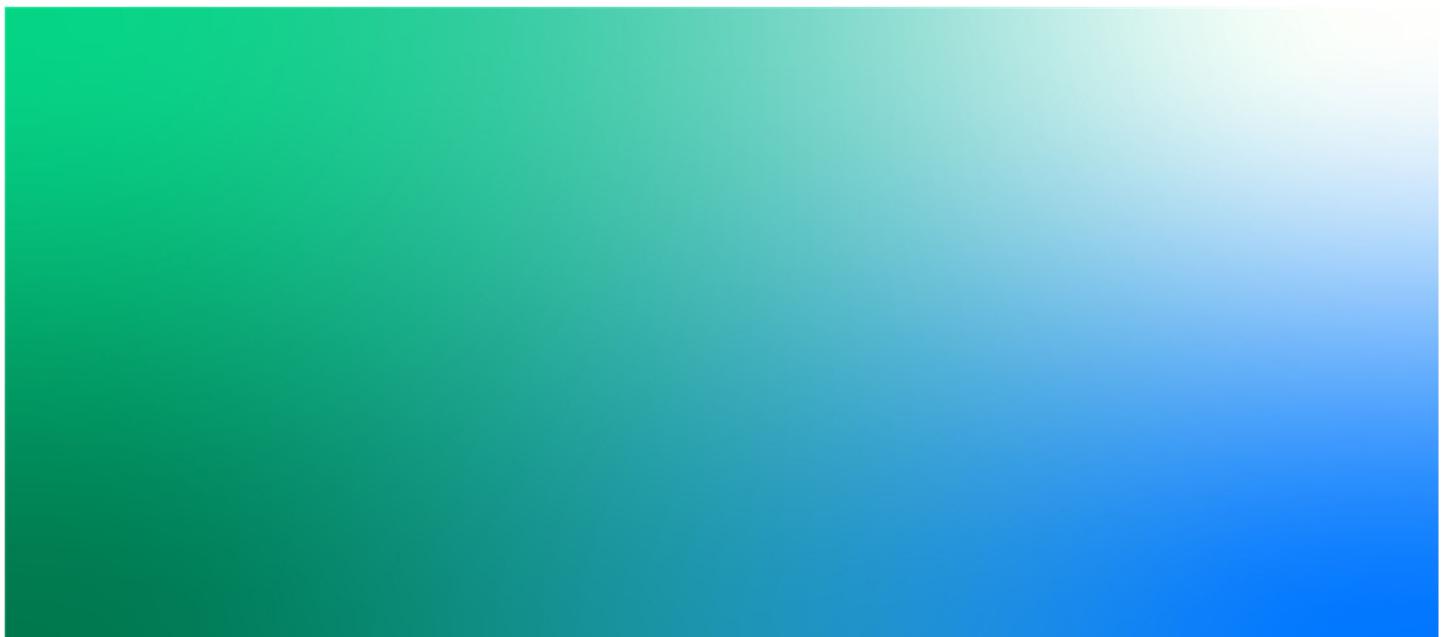




Bayswater Water and Other Associated Operational Works Project

Appendix G – Land Contamination Constraints Assessment





Land Contamination Constraints Assessment



AGL Macquarie: Bayswater Power Station
New England Highway, Muswellbrook NSW

10 January 2020

Land Contamination Constraints Assessment

Bayswater Water and Other Associated Operational Works Project

AGL Macquarie: Bayswater Power Station

New England Highway, Muswellbrook NSW

Kleinfelder Document Number: NCA19R102797

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EXECUTIVE SUMMARY

Kleinfelder Australia Pty Ltd (Kleinfelder) has been engaged by Jacobs Group (Australia) Pty Ltd (Jacobs) to undertake a Land Contamination Constraints Assessment of study areas included as part of the water/wastewater infrastructure and wider site improvements proposed for the Bayswater Power Station. The intent of this report is to determine the suitability of the study areas to accommodate the proposed infrastructure development with due regard to human health or aspects of environment that may be impacted by the Project.

In undertaking the assessment, the historical development of study areas along with existing soil and groundwater data (using site-specific data gained from recent environmental investigations provided by AGL Macquarie) was reviewed. This was followed by a detailed visual inspection of study areas as well as targeted shallow soil sampling where analytical data gaps had been identified.

Asbestos is present within above ground pipelines and in surface soils beneath pipelines along the northern and western boundaries of the Ash Dam Augmentation Area. Asbestos has also previously been identified in surface soils at one location on the eastern boundary of the Coal Storage Area. It is Kleinfelder's understanding that Project works are not expected to interact directly with these locations. As such, the risk of worker exposure to airborne asbestos fibres is considered to be low. Appropriate demarcation and restriction of access to identified asbestos-impacted areas should be undertaken to reduce potential exposure to workers. If works associated with the Ash Dam Augmentation or Coal Storage Areas are modified resulting in workers potentially coming into contact with asbestos-impacted areas, an Asbestos Management Plan will be required to manage exposure risk.

The chemical concentrations identified in soil within the study areas were below the applicable commercial/industrial soil screening criteria provided in NEPM 2013, and therefore considered unlikely to represent a significant risk to human health and/or the environment given the continued use of the site as a Power Station.

Heavy metals have been identified at concentrations in excess of relevant groundwater screening levels designated for the protection of freshwater environments in multiple study areas across the site. Elevated salinity concentrations have also been reported in groundwater within the Ash Dam Augmentation and Coal Storage Areas. It is understood that excavations planned to be undertaken as part of the Project have been designed to avoid interaction with

the groundwater table. Consequently, groundwater contaminant and salinity concentrations are not considered an impediment to the Project. Furthermore, as there are currently no abstraction bores for domestic potable or non-potable uses in the surrounding area, the exceedances are not considered to represent a significant risk to human health or the environment.

A Construction Environmental Management Plan (CEMP) should be prepared to provide appropriate control measures during the construction phase of the Project to mitigate the potential for pollution incidents occurring that could lead to contamination of study areas. The CEMP will be required to include an unexpected finds protocol to manage actual or potential contamination encountered during construction but not previously disclosed by this stage of assessment.

The CEMP should include measures to manage saline soils or stored process waters that are to be disturbed during the Project construction phase to ensure that they are adequately disposed or relocated on-site, and do not cause significant erosion issues that may harm the environment. Some management practices may require treatment of excavated or exposed soils to be determined by additional sampling and analysis once the detailed design is completed. Further, it is recommended that foundations located within areas of saline impact are subject to additional sampling to determine the need, or otherwise, for special concrete or other material mixes.

Based on the results of the assessment and conceptual site model presented herein, the potential contamination risks associated with the study areas are considered, overall, to be low and acceptable. The Project is therefore considered to be acceptable and potential contamination risks should not be viewed as an impediment to commencing with the water infrastructure upgrades and wider improvements.

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Abbreviations

Acronym	Definition
AHD	Australian Height Datum
AFFF	Aqueous Film Forming Foam
AGL	AGL Macquarie Pty Ltd
BTEXN	Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene
BPS	Bayswater Power Station
CLM	Contaminated Land Management
CSM	Conceptual Site Model
CEMP	Construction Environmental Management Plan
CoPC	Contaminants of Potential Concern
DBYD	Dial Before You Dig
DoH	Department of Health
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act
EPL	Environment Protection License
ha	hectares
HEPA	Heads of Environmental Protection Agencies in Australia and New Zealand
KL	Kilolitres
km	Kilometre
Kleinfelder	Kleinfelder Australia Pty Ltd
L	Litres
LEP	Local Environmental Plan
LOR	Limit of Reporting
m	Metres
mm	milometers
µg/L	Micrograms per litre
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measures
NSW	New South Wales
PAH	Polycyclic Aromatic Hydrocarbon
PEA	Preliminary Environmental Assessment
SDS	Safety Data Sheet
SMP	Site Management Plan
SRoH	Significant Risk of Harm
TPH	Total petroleum hydrocarbon
TRH	Total recoverable hydrocarbons
VOCs	Volatile Organic Compounds

1. INTRODUCTION

AGL Macquarie Pty. Ltd. (**AGL Macquarie**) owns and operates the Bayswater Power Station (**BPS**), located approximately 15 kilometres (km) south east of Muswellbrook, NSW and has commissioned Jacobs Group (Australia) Pty Ltd (**Jacobs**) to prepare an Environmental Impact Statement (**EIS**) to support the Development Application for improvements proposed to upgrade water/wastewater infrastructure at the power Station (**the Project**). Kleinfelder Australia Pty Ltd (**Kleinfelder**) has been engaged by Jacobs, on behalf of AGL Macquarie, to undertake a Land Contamination Constraints Assessment for the Project. The intent of this report is to determine the suitability of the study areas to accommodate the proposed infrastructure development with due regard to human health or the aspects of environment that may be impacted by the project.

1.1 BACKGROUND

Water/wastewater infrastructure and wider site improvements are required to ensure the continued operational and environmental performance of the BPS until its expected retirement in 2035. The improvements proposed as part of the Project will ensure the continued reliable, safe and efficient operation of BPS. AGL Macquarie is seeking State Significant Development approval under Division 4.7 of Part 4 of the NSW Environmental Planning and Assessment Act 1979 (**EP&A Act**) for the Project. Please refer to **Section 2.2.1** for a description of the key Project elements.

As part of the Preliminary Environmental Assessment (**PEA**) undertaken for the Project (GHD, 2018), the potential for soil contamination to impact upon the suitability of the Project was reported to represent a medium risk, whilst the water issues (surface water and groundwater) were reported to represent a high risk.

If present, within the lands impacted by the Project, soil and water contamination may impact upon the health of site workers and future construction/ maintenance workers, in addition to the receiving environment.

1.2 PURPOSE

The purpose of this land contamination constraints assessment is to provide supporting evidence to the EIS that land contamination (if present) does not present an impediment to the proposed Project, in accordance with State Environmental Planning Policy No 55 - Remediation of Land.

1.3 SCOPE OF WORK

1.3.1 Desktop Study

The initial phase of the assessment comprised a review of recent environmental assessment reports relating to historical and current site activities, supplied by AGL Macquarie. The following tasks were undertaken as part of the desktop study:

- A review of the historical development of the project/surrounding areas and existing baseline soil, groundwater and surface water quality using site-specific data gained from recent environmental investigations provided by AGL Macquarie.
- Preparation of a site-specific health, safety and environmental management plan.

The data review aided our understanding of the site's historical/current practices and identified where potential areas of environmental concern (**AEC**) may exist, warranting further targeted sampling and analysis where data gaps existed from the PEA.

1.3.2 Detailed Site Inspection & Targeted Sampling

The scope of fieldwork and laboratory analysis was finalised based on the findings of the desktop study. The approach undertaken is summarised below:

- Detailed visual inspection of the relevant study areas to ground-truth the desk-based assessment.
- Given the magnitude of the various study areas, extent of previous investigation/ sampling undertaken and anticipated low contamination status of remaining areas of the site, a pragmatic approach to sampling was based on professional judgement (namely the collection of six (6) primary surface soil samples by hand-trowel from 0-150mm).

- Submission of primary soil samples and QA/QC samples to our subcontracted laboratories (ALS Environmental and Eurofins) for analysis.

For the purposes of this assessment the study area has been defined to include all land within the project construction footprint (**the Project area**), plus a buffer area, which ranges from around 25 to 50 metres (**m**), included in the assessment to account for any potential indirect (inadvertent) impacts. The field inspections included consideration of the study area.

1.3.3 Land Contamination Assessment Constraints Report

Following completion of the fieldworks, this interpretive report was prepared to document the findings from the desktop study, detailed site inspection and the results of laboratory analysis.

The laboratory results were assessed against appropriate screening criteria that were developed following the completion of the Desktop Study as part of the investigation Data Quality Objectives, to assess soil, groundwater and sediment quality in line with potential contaminant exposure to human health and terrestrial/aquatic ecology.

This report presents a clear understanding of existing soil, groundwater and sediment quality prior to the proposed Project works, and potential risks posed to human health or the environment (if present) during construction and operation. Recommendations are made for mitigating and managing contamination risks during proposed construction activities via implementation of a Construction Environmental Management Plan (**CEMP**), which should include an unexpected finds protocol.

1.4 STATUTORY AND PLANNING CONTEXT

The principal approval required for the Project is State Significant Development (**SSD**) Consent under Division 4.7 of Part 4 of the EP&A Act.

The Project is located within the Muswellbrook and Singleton Local Government Areas (**LGAs**). The Muswellbrook Local Environmental Plan 2009 (**Muswellbrook LEP**) partially applies to land on which the Project is located. The subject land is zoned SP2 – Infrastructure: Power Station. The activities proposed as part of the Project are required to support the ongoing operation of BPS. Therefore, the Project is permissible under the provisions of the SP2 – Infrastructure: Power Station zone in the Muswellbrook LEP.

The subject land within the Singleton Local Environmental Plan 2013 (**Singleton LEP**) is zoned RU1 – Primary Production. Electricity generation, and associated infrastructure for the purposes of electricity generation, are not listed as permissible with or without consent under the zone and would therefore be prohibited under the provisions of Singleton LEP. However, under clause 34 of State Environmental Planning Policy (Infrastructure) 2007 (**ISEPP**) development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone. Land which is zoned RU1 - Primary Production is a prescribed rural zone for the purposes of clause 34 of ISEPP. Accordingly, the Project is permissible.

2. PROJECT DESCRIPTION & ENVIRONMENTAL SETTING

2.1 LOCATION AND DETAIL

BPS is located approximately 15 km south east of Muswellbrook, 25 km north west of Singleton, and approximately 165 km west north west of Sydney in NSW (**Figure 1**).

The total area of the AGL Macquarie landholding is approximately 9,900 hectares, including Liddell Power Station (**LPS**), the Ravensworth rehabilitation area, Lake Liddell and surrounding buffer lands. The BPS operational area occupies approximately 300 hectares (**ha**), including the Bayswater Ash Dam. The location of BPS is shown in **Figure 1**.

The Project is predominately located on land owned by AGL Macquarie although some Project infrastructure also crosses road reserves owned by Roads and Maritime Services (**RMS**) and Singleton and small areas of Crown land. The Project is located within the land outlined below.

Table 2.1 provides specific identification details relating to BPS.

Table 2.1: BPS identification details

Site Name	Bayswater Power Station	
Site Location	New England Highway, Muswellbrook, NSW 2333	
Lot / DP	Lot 1 DP 113655 Lot 1 DP 1142103 Lot 2012 DP 1151790 Lot 1 DP 1158700 Lot 120 DP 1174907 Lot 1 DP 1175303 Lot 3 DP 1193253 Lot 10 DP 1204457 Lots 4, 6, 9 & 11 DP 247943 Lot 13 DP 247945 Lot 1 DP 252530	Lot 1 DP 369326 Lots 1 & 2 DP 574168 Lot 1 DP 616025 Lot 2 DP 619383 Lot 10 DP 700554 Lots 19, 30, 62, 75, 86, 88, 89 & 151 DP 752468 Lot 331 DP 752486 Lots 1 & 2 DP 774679 Lot 5 DP 966589 Lot 107 DP 547864 Lot 4 DP 1193254
Approximate Site area	BPS land area - 300 hectares	
Zoning	SP2 Infrastructure Zone (Muswellbrook LEP 2009) RU1 Primary Production (Singleton LEP 2013)	

Local Government Areas	Muswellbrook Local Government Area Singleton Local Government Area
Current use	Operational Coal-fired Power Station – Commercial/Industrial Agricultural – livestock grazing
Intended use	Proposed site infrastructure upgrade works to support continued operational and environmental performance of BPS until expected retirement in 2035.
Government agencies and key stakeholders	Muswellbrook Shire Council Singleton Shire Council AGL Macquarie NSW Department of Planning, Industry and Environment

2.2 KEY FEATURES

BPS was commissioned in 1985. It comprises of four coal-fired units. The site has a current generation capacity of 2,640 megawatts (**MW**) and approval for efficiency upgrades that will increase its capacity to 2,740 MW. Prior to 1985, the land was used for grazing purposes. BPS comprises the following key features:

- Four coal-fired units and associated infrastructure.
- Bayswater Ash Dam, located approximately 200m to the east and associated pipelines for ash slurry and return water.
- Ravensworth Rehabilitation Area (fly ash disposal), located approximately 10km east of the Power Station and associated ash delivery and return water system.
- Coal conveyors transporting from Antiene Rail Coal Unloader (**RCU**) and nearby mines.
- Buffer lands surrounding the infrastructure described above.
- Water Treatment Plants.

BPS was built to utility standards of the time and has a current technical life up to 2035. BPS is now over 30 years old and AGL Macquarie has identified that the Project is required to ensure the continued safe, reliable and efficient operation of water and wastewater infrastructure to support BPS until its scheduled retirement.

2.2.1 Project Elements

The proposed upgrade works at the site are outlined in the PEA (GHD, 2018) prepared for the Project, and incorporate the following key elements:

- Augmentation of the existing Bayswater ash dam to provide additional ash storage capacity.
- Improvements to water management structures and systems to ensure continued collection and reuse of process water and return waters from the Bayswater ash dam.
- Improvements to the management of water and waste materials within the coal handling plant sediment basin and associated drainage system.
- Increasing coal ash recycling activities to produce up to 1,000,000 tonnes per annum of ash derived product material and reuse of coal ash.
- Construction and operation of a salt cake landfill facility to dispose of salt cake waste.
- Construction and operation of borrow pits on AGL Macquarie land to facilitate the improvements proposed for the Project.
- Upgrades to existing fly ash harvesting infrastructure including the installation of weighbridges, construction of a new 240 tonne silo, tanker wash facility and additional truck parking.
- Construction and operation of a new coal ash pipeline to Ravensworth Void No. 3 for ash emplacement.
- Ancillary infrastructure works including repositioning of underground pipelines to above ground, replacement or upgrading of ageing pipelines, vegetation clearing associated with maintaining existing infrastructure, including along pipeline/transmission corridors and drainage canals as necessary for the construction of feedlines.

Refer to **Figure 2** for indicative study areas.

2.3 TOPOGRAPHY

The general fall of land on BPS is towards the Hunter River to the South, and the regional topography of the area is characterised by undulating hills that give rise to variability in slope directions across the BPS.

The BPS operational area falls gently to the north with the main power block at an elevation of approximately 200 m above sea level dropping to an elevation of approximately 170 m above sea level at the northern edge of the coal storage facility. Bayswater Ash Dam is at an elevation of approximately 170 m above sea level with the downgradient Pikes Gully Valley falling towards the east. The Ravensworth Rehabilitation Site lies at an elevation of approximately 120 m above sea level with the local topography highly disturbed by former mining operations.

2.4 HYDROGEOLOGY AND GEOLOGY

2.4.1 Hydrogeology

Due to the undulating nature of the topography, variation in localised groundwater flow directions are probable and groundwater flow is expected to follow topography. Inferring localised groundwater flow from topography would suggest a northerly groundwater flow component at the BPS towards Lake Liddell, predominantly easterly groundwater flow at the Bayswater Ash Dam, westerly flow at the landfill, westerly to north westerly at the brine concentrator decant basin and predominantly southerly flow at lime softening sludge lagoons.

Regional groundwater flow is expected to be towards the Hunter River located to the south of the site.

There is currently no recorded regional beneficial use of groundwater. The target geological formations are generally of low permeability and of high salinity, being derived from marine or lacustrine deposits which are often characterised by high remnant salinity. The exceptions are the fractured coal horizons which are more permeable than other geological formations, which contain less saline water.

Numerous monitoring bores have been constructed on the BPS site and on surrounding properties. No bores on the BPS site are known to be used for beneficial extraction of groundwater.

A groundwater bore search conducted using the NSW Office of Water Groundwater Map (<http://allwaterdata.water.nsw.gov.au/water.stm>) revealed a total of ten (10) registered bores located within approximately 5 km from the main plant at BPS. Summarised details of the registered bores are provided below in **Table 2.2**.

Table 2.2: Registered Groundwater Bores in Proximity to the BPS Site

Bore ID	Distance from BPS (km)	Direction from BPS	Water Bearing Zone (m)	Registered Use
GW024022	3.3	North	3.0-3.05	Industrial (abandoned)
GW201061	5.0	East	12.0-15.1	Monitoring bore
GW201062	4.9	East	14.5-17.4	Monitoring bore
GW200957	3.7	South-east	Not recorded	Dewatering (Groundwater)
GW201266	3.7	South-east	Not recorded	Monitoring bore
GW200743	3.9	North, north-west	Not recorded	Test bore
GW200744	3.9	North, north-west	Not recorded	Test bore
GW200745	3.9	North, north-west	Not recorded	Test bore
GW200746	3.8	North, north-west	Not recorded	Test bore
GW053262	4.6	North, north-west	15.0-17.0 26.0-29.0 66.0-69.0 80.0-81.0 96.0-27.0	Industrial

2.4.2 Geology

A range of regional geological conditions make up the entire BPS, which are summarised below:

- BPS - The operational area is located on the northern section of the Sydney basin and the 1:100,000 Hunter coalfield geological map (Department of Mineral Resources -1993) indicates the BPS is underlain by Permian age conglomerate, sandstone, siltstone and claystone of the marine-derived Maitland Group. Coal measures of premium age also underlie the site.
- Bayswater Ash Dam - The majority of the Bayswater Ash Dam is located on the Mulbring Siltstone of the Maitland Group. The eastern-most extent is located on the sandstone, siltstone and minor coal bands of the Saltwater Creek Formation the Wittingham Coal Measures.
- The Ravensworth Rehabilitation Site - This site is underlined by the Jerrys Plain Subgroup, Archerfield sandstone and the Forbrook formation within the Wittingham Coal Measures, which consists of sandstones, shales, mudstone, minor conglomerate and coal seams.

This area occurs in a synclinal structure known as the Bayswater Syncline, and isolated basalt dykes or sills may occur within the stratigraphy of the general area.

The surface geology of the Ravensworth Rehabilitation site has been disturbed by mining operations. Much of the opencast mine workings have been backfilled with mine spoil, made-up fragments of mudstone, siltstone and medium to fine grained lithic sandstone mixed together, as well as coal from uneconomic seams. This coal is subject to spontaneous combustion, which has been identified at the site. Where mining has been completed in the area, approximately 60 to 80 m of disturbed overburden or mine spoil overlies the Archerfield sandstone which forms the base of opencast mine workings. There are also voids that have been backfilled with fly ash and coal preparation plant rejects.

2.5 HYDROLOGY AND SURFACE WATER FEATURES

The cooling water system at BPS is effectively a closed system, in that cooling water at BPS is pumped predominantly from Plashett Reservoir and to a lesser extent from Lake Liddell, with cooling achieved through use of evaporation towers. As this form of cooling generally creates a net loss to the reservoir, Plashett Reservoir is replenished from the Hunter River by a series of pump stations.

However, there are times when an excess of cooling water is present within the system and on such occasions, provision exists for excess cooling water to be directed into Lake Liddell (managed via the BPL Environment Protection Licence).

BPS receives domestic, but not potable water from the Freshwater Dam located on the western side of the BPS. The dam is replenished with piped water from the Hunter River by a series of pump stations, and to a lesser extent from runoff generated on the surrounding land on the north, west and southern sides. Land immediately surrounding the Freshwater Dam on the sides is largely undeveloped. It is understood that surface water runoff generated on the operational part of the BPS is largely diverted away from the Freshwater Dam, and into Tinkers Creek which discharges into Lake Liddell.

Based on the topography, which is generally elevated directly to the south of BPS, surface water generally flows in one of the following directions:

- To the southwest towards Saltwater Creek and Plashett Reservoir.

- To the west towards the Freshwater Dam, Tinkers Creek and then north to Lake Liddell.
- To the east towards the Bayswater Ash Dam and then north to Lake Liddell via a small spillway at the north-eastern end of the dam.

Beyond the receiving water bodies listed above, the nearest surface water body and the main receptor for surface water runoff from BPS is the Hunter River, located approximately 10 kms to the south of BPS. The Hunter River receives surface water inputs from Plashett Reservoir via Saltwater Creek and Lake Liddell via Bayswater Creek.

2.6 SALINITY

Salinity is the accumulation of salts (usually sodium chloride) in soil and water to sufficient levels that impact on human and natural assets (e.g. plants, animals, aquatic ecosystems, water supplies, agriculture or infrastructure). Salts are naturally occurring in rock, soil and groundwater derived primarily from marine sediments. The salts are mobilised in the subsurface by groundwater. Saline groundwater can reach the ground surface by springs, changes in the local hydrogeological regime, changes in the slope angle causing seepage.

Dryland salinity occurs in rural areas, similar to the environment that the BPS is set within and is caused by rising water tables causing salt scalds and reducing the growth of all but salt tolerant plants. Assessment of salinity is a key consideration when assessing Development Applications for projects that may substantially disturb saline soils and/or groundwater, since construction activities may create new pathways for salts to mobilise and impact the aquatic and/or ecological environment. High salinity can also affect permanent building structures and compromise the performance of building materials.

The Hunter River is located to the south east of the Project. The Hunter River has a relatively high level of naturally occurring salinity. Depending on operational requirements, water from the Hunter River is transferred to water storage dam at Bayswater.

The existing BPS water treatment plant removes naturally occurring salts and solids from the cooling water before the water is used in the power station. A modification was approved to authorise further upgrades to the water treatment plant including the construction of a salt caking plant to produce a salt cake by-product. Other key features of the BPS are associated with salinity impacts and are discussed further in **Section 6.0**.

2.7 SURROUNDING LAND USES

Surrounding areas are predominantly used for mining purposes, with some grazing, natural bushland, viticulture and horse stud farms in the region.

Existing development neighbouring BPS includes Liddell, the former Drayton and Liddell coal mines as well as the Main Northern Railway Line. The New England Highway runs parallel to BPS, with access from the highway provided by means of a dedicated road network designed to service BPS. Historic agricultural clearing for the purposes of grazing is also present within and surrounding the AGL Macquarie landholding.

Other industrial uses in the area include the Liddell Power Station, located approximately 4 km north-east of the BPS, coal mines and the Ravensworth Rehabilitation Area,

Lake Liddell (**Lake**) provides cooling water to both BPS and the LPS. The Lake was previously accessible for recreational purposes, however since 2016 has been indefinitely closed following a detection of Naegleria fowleri (naturally occurring amoeba).

Residential centres are remote from BPS and the Project:

- Muswellbrook, approximately 11 km north-west of BPS.
- Jerrys Plains Village, approximately 11 km to the south of BPS.
- Maison Dieu township, approximately 23 km south-east of BPS.
- Singleton, approximately 25 km south-east of BPS.

2.8 SENSITIVE RECEPTORS

Identification of sensitive receptors on and within the vicinity of BPS is an important step in understanding potential impacts that the Project may have on BPS and surrounding land use. Sensitive environmental receptors on and adjacent to BPS that have been identified by this study include:

- Indoor and outdoor human health receptors in the form of industrial workers on and off-site.
- Intrusive maintenance workers both on- and off- site.

- Potential groundwater users in the vicinity of the site.
- Ecological receptors, including endangered ecological communities and freshwater ecological receptors including vegetation in the local creeks, Lake Liddell, Plashett Reservoir and the Hunter River.
- Residents on rural properties along the Hunter River, east of Saltwater Creek, including users of irrigation water for agricultural purposes.
- Residents of the townships of Maison Dieu and Singleton adjacent to the Hunter River, approximately 14 and 16 kms east respectively from the junction of the Hunter River and Saltwater Creek.

3. SITE HISTORY AND PREVIOUS ENVIRONMENTAL SITE ASSESSMENTS

3.1 SITE HISTORY

A review of available aerial photographs was conducted and indicated that prior to construction of BPS, the site and surrounds were primarily occupied by a mixture of farms, native vegetation and coal mines. **Table 3.1** below provides a summary of development at BPS and surrounding areas from historical aerial photographs. Historical Aerial Photographs are presented in **Appendix A**.

Table 3.1: Summary of Historical Aerial Photographs

Year	Site	Surrounding Area
1974	<p>The Bayswater site is undeveloped with the exception of Freshwater Dam. The area surrounding the dam is vegetated, and the remainder of the site is clear with unsealed tracks and roadways.</p> <p>South-east of the Bayswater site, the Ravensworth open-cut mine is in operation, with site infrastructure including office buildings, roadways and surface water bodies established. The area is sparsely vegetated.</p>	<p>The Liddell Power Station is located on the western foreshore of Lake Liddell, north-east of the site. A coal conveyor runs south of the Lake between the Liddell Power Station and Ravensworth Coal Unloader facility.</p> <p>Several dams are present in the area along the south-eastern foreshore of Lake Liddell.</p> <p>The Howick open-cut mine is located immediately east of the site.</p> <p>The surrounding area is generally sparsely vegetated, with no other significant features in the area.</p>
1982	<p>The BPS appears to be under construction, with the site footprint and roadways established adjacent to the Freshwater Dam. Construction has commenced on the power station, with one of the four cooling towers erected. The Pikes Gully Ash Dam has yet to be built, however the lime softening plant sludge lagoons have been constructed.</p>	<p>Several of the dams previously identified along the south-eastern foreshore of Lake Liddell appear to have been backfilled.</p> <p>The Howick open-cut coal mine has expanded toward the east, with older portions of the mine rehabilitated.</p>
1993	<p>The BPS has been completed and is operational. In addition to the sludge lagoons identified in 1982 aerial photographs, key features on the site in the vicinity of the power station include the cooling water reservoir, brine concentrator decant basin, brine decant basin, the Plashett Dam and Bayswater Ash Dam. Ash slurry occupies half of the area of the Ash Dam. Coal appears to be stockpiled in the Coal Storage Area.</p> <p>The Ravensworth Mine has expanded operations.</p>	<p>Surrounding mining operations appear to have expanded.</p>

Year	Site	Surrounding Area
2003	The site layout and infrastructure appear to be the same as previously identified, and consistent with the current site layout. The northern portion of the Ravensworth Mine has been rehabilitated.	Several large coal stockpiles, buildings and other infrastructure are located where the apparent dams were present south-east of Lake Liddell. A small open-cut mine has been established to the north of the Howick mine. The Liddell open-cut mine is in operation to the east of Lake Liddell. The Drayton Mine is evident to the north-west of the BPS.
2009 (Google Earth)	No changes to the site features within the Bayswater or Ravensworth rehabilitation areas are apparent.	The Ashton open-cut mine is in operation to the east of the Ravensworth mine.
2013 (Nearmaps)	No changes to the site features within the Bayswater or Ravensworth rehabilitation areas are apparent.	The Drayton and Ashton open-cut mines have expanded the size of their operations. No other significant changes to the surrounding area are observed.
2019 (Nearmaps)	No changes to the site features within the Bayswater or Ravensworth rehabilitation areas are apparent.	No significant changes to the surrounding area are visually apparent.

3.2 PREVIOUS ENVIRONMENTAL ASSESSMENTS

In conducting this study, AGL Macquarie have supplied Kleinfelder with previous environmental assessments undertaken at the BPS in recent years. These reports have provided a sound basis for this land contamination constraints assessment. A review of the historical analytical data has been incorporated into this report to provide a greater understanding of soil and water quality present within study areas. Summary tables of the historical analytical data that are relevant to the Project footprint have been provided for reference.

4. SAMPLING AND ANALYSIS QUALITY PLAN

4.1 AREAS OF ENVIRONMENTAL CONCERN (AEC)

The review of historical information and data made available by AGL Macquarie have identified potential contamination sources to be present within study areas, which have been determined as AEC. These include the following:

1. Coal storage area (historical and potential leaks).
2. Mobile plant workshop and refuelling (historical leaks and spills of diesel fuel and lubricants, potential leak of waste oil).
3. Fire-fighting training area (potential fire-fighting foams with perfluorochemicals).
4. Coal unloaders, rail infrastructure and coal transfer lines (potential and historic fuel leaks).
5. Contaminated water treatment plants (potential leaks).
6. Former contractor staging area (potential spills, leaks and undocumented fill material).
7. Bayswater Ash Dam area (asbestos piping, seepage to groundwater and migration to surface water receptors).
8. Lime softening plant (storage of chemicals, potential for fuel leaks and spills).

With specific regard to salinity the following areas of infrastructure were identified from previous investigations as AEC:

- Brine Concentrator Decant Basin: receives highly saline wastewater from the Brine Concentrator treatment process, historically associated with high levels of salinity in groundwater.
- Brine Concentrator Holding Pond: waste products from the Cooling Water Treatment Plants transferred to this dam and associated with groundwater salinity impacts.
- Pikes Gully Ash Dam: receives runoff from sluiceways draining from the BPS, historically associated with high levels of salinity in groundwater.
- Lime Softening Plant Sludge Lagoons: calcium oxides, magnesium hydroxide and other precipitates from the water treatment process. Groundwater monitoring at this locale has been recorded as trending above background salinity.

- Ravensworth Rehabilitation Site: seepage from fly ash disposed in mine voids has the potential to be saline and has been proven by water quality monitoring.

The historical analytical data supplied by AGL Macquarie provided soil and (where available) groundwater, surface water and sediment data for each of the AEC described above. There was however no soil data available across the four proposed borrow pit areas representing approximately 270 hectares.

Given the closer proximity of proposed Borrow Pits 1 and 2 to operational areas and the existing Ash Dam, the collection and analysis of preliminary surface soil samples (top 150mm) from both Borrow Pit areas was recommended to address the data gaps in these locations.

Proposed Borrow Pits 3 and 4 are located a significant distance from existing operational infrastructure and based on their previous and current land use, are therefore determined unlikely to be impacted. As these areas have not previously been identified as areas requiring investigation in previous reports, a detailed visual inspection was deemed sufficient across these areas.

4.2 RELEVANT GUIDANCE & ASSESSMENT CRITERIA

4.1.1 Commercial/ Industrial Land Use

To account for the protection of health to future commercial/industrial and construction/maintenance workers that will interact with the Project, this assessment has adopted the screening criteria published in the National Environment Protection Council (**NEPC**) amended National Environmental Protection (Assessment of Site Contamination) Measure 1999 (the amended ASC **NEPM 2013**).

The ecological investigation and screening levels published in NEPM 2013 were also adopted to assess potential risks to terrestrial ecology (flora and fauna). Ecological screening criteria (Health Investigation Levels - **HIL** and Health Screening Levels - **HSL**) have been primarily selected based on public open space criteria, which is a more fitting land-use for preliminary exposure assessment (i.e. study areas will not be occupied by substantial buildings and hardstand).

Other key assessment criteria for screening potential risks to human health from both vapour intrusion and direct contact, and adoption of appropriate sampling and analysis protocols, were sourced from Friebel & Nadebaum (2011) - *Health screening levels for petroleum hydrocarbons in soil and groundwater. CRC CARE Technical Report 10, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia.*

4.2 SOIL SCREENING CRITERIA

Table 4.1 presents the soil screening levels that have been adopted for this assessment. HIL and HSL-D Commercial/Industrial criteria has been selected based on the proposed future use of each of the study areas. Ecological screening criteria (HIL and HSL) have been selected based on commercial/industrial criteria, which is the most appropriate land-use for exposure assessment. In applying the most suitable soil texture classification for soil HSLs, a review of AGL Macquarie supplied data and geological profile of the region indicates the categorisation of soils as 'clay' to be the most appropriate.

Table 4.1 Soil screening criteria

Analytical Groupings	Analyte	Limit of reporting (mg/kg)	EIL/ESL (mg/kg)	HSL/HIL-D & Direct Contact (CRC) (mg/kg)
Ammonia	N	20		
Metals	As	5	160	3,000
	B	50		300,000
	Ba	10		
	Be	1		500
	Cd	1		900
	Cr	2	550	3600
	Co	2		4000
	Cu	5	320	240,000
	Mn	5		60,000
	Ni	2	450	6,000
	Pb	5	1800	1,500
	Se	5		10000
	V	5		
TRH	Zn	5	1100	400,000
	Hg	0.1		730
	C ₆ -C ₁₀	10	125	-
	C ₆ -C ₁₀ minus BTEX (F1)	10	215	310/260,000
	>C ₁₀ -C ₁₆	50		-

Analytical Groupings	Analyte	Limit of reporting (mg/kg)	EIL/ESL (mg/kg)	HSL/HIL-D & Direct Contact (CRC) (mg/kg)
	>C10-C16 minus Naphthalene (F2)	50	170	20000
	>C ₁₆ -C ₃₄	100	2,500	27,000
	>C ₃₄ -C ₄₀	100	6,600	38,000
	Total >C ₁₀ -C ₄₀	50		-
PAH	Total PAH	0.5		4,000
	BaP	0.5	0.7	
	PAH as BaP TEQ	0.5		40
	Naphthalene	0.5	170	11,000
BTEX	Benzene	0.2-1	95	4
	Toluene	0.2-1	135	
	Ethylbenzene	0.2-1	185	
	Xylene	0.2-1	95	
Phenols	Phenol	0.5-1		240,000
	Pentachlorophenol	0.5-1		660
	Cresols	0.5-1		25,000
Organochlorine Pesticides	DDT + DDE + DDD	0.05-0.2		3,600
	Aldrin and dieldrin	0.05-0.2		45
	Chlordane	0.05-0.2		530
	Endosulfan	0.05-0.2		2,000
	Endrin	0.05-0.2		100
	Heptachlor	0.05-0.2		
	HCB	0.05-0.2		80
	Methoxychlor	0.05-0.2		2,500
	Mirex	0.05-0.2		
Other Pesticides	Toxaphene	0.05-0.2		
	Atrazine	0.05-0.2		2,500
	Chlorpyrifos	0.05-0.2		2,000
PCB	Bifenthrin	0.05-0.2		4,500
	PCB	0.1		7
Asbestos	Asbestos	Presence/Absence	N/A	Asbestos Detected

*Screening criteria in blue represents CRC Care Direct Contact

The Per and Polyfluorinated Alkyl Substances National Environmental Management Plan (**PFAS NEMP**) provides guideline values for the sum of PFOS and PFHxS and for PFOA in soil to be used for the assessment of potential human exposure through direct soil contact. The PFAS NEMP further notes that the guideline values should be used in conjunction with

other lines of investigations to account for potential leaching, off-site transport, bioaccumulation and secondary exposure.

The soil guideline values are based on the exposure assumptions that were used to derive the NEPM 2013 HIL assumptions for specific land uses. All of the guideline values assume that 20% of the Food Standards Australia New Zealand (**FSANZ**) Tolerable Daily Intakes (**TDI**) is from the exposure scenario, i.e. up to 80% of exposure is assumed to come from other pathways. In relation to the adopted PFAS investigation criteria for the assessment, the industrial/commercial values have been adopted as shown in **Table 4.2**.

Table 4.2 PFAS Investigation criteria for soils (HEPA, 2018)

Exposure scenario	Sum of PFOS + PFHxS (mg/kg)	PFOA (mg/kg)
Soil – Human health screening values- Industrial/commercial	20	50

Note: Where the guideline values refer to the sum of PFOS + PFHxS, this includes PFOS only, PFHxS only, and the sum of the two.

4.3 GROUNDWATER SCREENING CRITERIA

Table 4.3 below presents the groundwater screening levels that have been adopted for this assessment. There are no potable water users in the vicinity of the site, therefore groundwater results have been compared to the ecological risk-based criteria for fresh waters (due to the proximity of Hunter River) in the NEPM 2013 Groundwater Investigation Levels (**GILs**). Based on the setting of BPS and adjoining off-site area, 95% protection levels in Fresh water has been used for the assessment of groundwater conditions.

Table 4.3 Groundwater screening criteria

Analytical Groupings	Analyte	Limit of reporting (mg/L)	95% Fresh Water (mg/L)	Drinking Water (mg/L)
Physicals	pH	NA	6-8	ND
Metals and metalloids	As	0.005-0.1	0.013	0.01
	B	0.005-0.1	0.37	4
	Ba	0.005-0.1	ND	2
	Be	0.005-0.1	ND	0.06
	Cd	0.005-0.1	0.0002	0.002
	Cr	0.005-0.1	0.001	0.05
	Co	0.005-0.1	ND	ND
	Cu	0.005-0.1	0.0014	2
	Mn	0.005-0.1	1.9	0.5

Analytical Groupings	Analyte	Limit of reporting (mg/L)	95% Fresh Water (mg/L)	Drinking Water (mg/L)
	Ni	0.005-0.1	0.011	0.02
	Pb	0.005-0.1	0.0034	0.01
	Se	0.005-0.1	0.005	0.01
	V	0.005-0.1	ND	ND
	Zn	0.005-0.1	0.008	ND
	Hg	0.0001	0.00006	0.001
TRH	C ₆ -C ₁₀	0.02	ND	ND
	>C ₁₀ -C ₁₆	0.1	ND	ND
	>C ₁₆ -C ₃₄	0.1	ND	ND
	>C ₃₄ -C ₄₀	0.1	ND	ND
	Total >C ₁₀ -C ₄₀	0.1	ND	ND
	C ₆ -C ₁₀ minus BTEX (F1)	0.02	ND	ND
PAH	Total PAH	1	ND	ND
	Benzo(a)pyrene TEQ	0.5	ND	ND
	Benzo(a)pyrene	0.5	ND	0.00001
	Naphthalene	1	0.016	ND
BTEX	Benzene	0.001-0.005	0.95	0.001
	Toluene	0.001-0.005	ND	0.8
	Ethylbenzene	0.001-0.005	ND	0.3
	Total Xylene	0.001-0.005	0.35 (as o-Xylene) 0.2 (as p-Xylene)	0.6

Guidance values presented in the PFAS NEMP are provided by the Heads of EPA Australia New Zealand (HEPA, 2018) for the sum of PFOS and PFHxS and for PFOA in drinking water and recreational water for the protection of human health. The values are presented in **Table 4.4** and will form the adopted investigation criteria for the assessment.

Table 4.4 Health based investigation criteria

Exposure scenario	PFOS + PFHxS (µg/L)	PFOA (µg/L)
Recreational Water	0.7	5.6

Notes: µg = micrograms. Where the guideline values refer to the sum of PFOS + PFHxS, this includes PFOS only, PFHxS only, and the sum of the two.

The PFAS NEMP notes that soil guideline values for ecological protection should consider both direct exposure and indirect exposure. Direct exposure applies specifically to protection of organisms that live within, or are closely associated with, the soil. Indirect exposure guideline values are intended to account for the various pathways other organisms can be exposed due to bioaccumulation and/or off-site transport. In the absence of acceptable published guidelines

values for direct exposure, the PFAS NEMP recommends the use of the human health guideline values as an interim measure. The guideline values adopted are presented in **Table 4.5.**

Table 4.5 Soil Criteria for investigation – ecological guideline values (mg/kg) (HEPA, 2018)

Exposure scenario	Land Use	PFOS	PFOA
Interim soil – ecological direct exposure	Public open space	1	10
Interim soil – ecological indirect exposure	Commercial/Industrial	0.14	-

5. FIELDWORK ACTIVITIES

5.1 FIELD ACTIVITIES

Field activities were completed on the 6 - 7 August 2019. **Table 5.1** provides a summary of the works undertaken with the following sections providing more detailed methodologies and findings from the investigation.

Table 5.1: Summary of Field Activities

Activity	Description
Site Inspection and Sampling	<p>A detailed inspection of all study areas was undertaken by two Kleinfelder Environmental Scientists.</p> <p>During the site inspection, observations were made on all study areas and potential AECs.</p> <p>A total of 6 surface soil samples were taken from proposed Borrow Pits 1 and 2 and scheduled for analysis at a NATA accredited laboratory.</p>
Sample Preservation	Soil samples were stored on ice, in eskies whilst on site and in transit to the NATA-accredited laboratory. Samples were transported using strict chain of custody protocols. Soil laboratory results and chain of custody documentation are attached in Appendix C .
QA/QC	A single intra-laboratory duplicate sample was taken for Quality Assurance. A full QA/QC review is provided in Appendix C .
Decontamination Procedures	Dedicated sampling equipment was rinsed with deionised water following sampling at each sampling point.
Global Positioning System (GPS) and Historical Imagery	All locations were recorded using a GPS and camera. Locations of all samples are provided on Figure 3 . Photographs obtained during this investigation are provided in Appendix B .

5.2 SOIL SAMPLING

Given the extent of previous assessments undertaken in the study areas, as well as the low contamination status of study areas identified from the desk study and confirmed by the detailed site inspection with no history of development or operational use (i.e. Borrow Pit area), a pragmatic approach to sampling was undertaken based on sound professional judgement. This involved the collection of six (6) primary surface soil samples by hand-trowel from 0-150 mm (in accordance with S6.4 of Schedule B2 of NEPM 2013) below grass cover or detritus layer (or additionally if significant changes in lithology or contamination status was observed within this depth zone).

A summary of the soil investigation methodology is presented in **Table 5.2**.

Table 5.2 Soil Investigation Methodology

Activity	Details
Soil sampling	<p>Soil sampling was undertaken in accordance with standard Kleinfelder procedures, which are based on best industry practice.</p> <p>Soil samples were collected using dedicated hand tools from a starting depth of approximately 0.05 m below ground and placed directly into laboratory supplied glass jars, thus minimising the opportunity for cross-contamination. Soil samples were generally, where it is considered most appropriate, based on the observations made during the investigation.</p> <p>Key site observations include where any changes in lithology, evidence of contamination (odours, staining) were noted.</p> <p>All samples not being analysed were stored “on hold” by the primary laboratory in the event that additional analysis is required (i.e. within specified holding times).</p>
Field Duplicates	Refer to Appendix D .
Sample preservation	Samples were collected in laboratory supplied jars and immediately stored in an insulated esky chilled with ice upon sampling and during transit to the laboratory.

6. RESULTS AND DISCUSSION

Given the geographically separated nature of the respective study areas across the BPS site (**Figure 2**), each of the six study areas has been assessed independently. The following section outlines the findings from the detailed visual inspection undertaken of each study area. A summary of the results of sampling undertaken within each area, either through a review of analytical data provided from previous assessments or as part of this current assessment by Kleinfelder, is also provided.

6.1 ASH DAM AUGMENTATION

6.1.1 Field Observations

The Bayswater Ash Dam is located approximately 200 m to the east of BPS and covers an area of approximately 180ha. The investigation area also included the Fly Ash Plant area located between the Bayswater Ash Dam and the BPS operational area. The Fly Ash Plant area includes a number of office buildings, a workshop, truck loading bays, silos and associated fly ash infrastructure. Approximately 150 m to the east of the Fly Ash Plant area is a contractor office and two demountable office buildings. Two shipping containers are also present in the area associated with ash harvesting activities.

Above ground pipelines signed as asbestos containing material (**ACM**) were observed running from the return pumping station to the east of the ash dam wall, along the northern side of the ash dam to the return water holding tanks located to west of the ash dam. Signs were placed intermittently along the pipelines with the warning “contains asbestos fibre, avoid creating dust, surrounding soil (up to 1 metre) may contain fibres” (**Appendix B – Photo 1**). The pipelines appeared aged, but in reasonable condition, with limited visual indicators of deterioration.

Below the dam wall to the east the land has been predominantly cleared of vegetation, with visual indicators of elevated salinity observed in sections of the exposed surface along the banks of Pikes Creek (expected based on historical groundwater monitoring results in this area). Seepage Pond 2 including a pumping station is located approximately 180 m to the east of the dam wall.

With the exception of the above ground ACM piping, visual indicators of contamination, such as surface staining, odours, fill materials or visibly stressed vegetation were not observed within the area during the inspection.

6.1.2 Results

Table 6.1 below provides a summary of client supplied data from soil samples collected from within the proposed Ash Dam Augmentation Area.

Table 6.1 Summary of client supplied data - Ash Dam Augmentation Area

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
Metals and metalloids				
24	As	<5	24	None
24	Cd	<1	2	
24	Cr	<1	17	
24	Cu	<1	55	
24	Ni	<1	26	
24	Pb	6	25	
24	Zn	8	117	
24	Hg	<0.1	0.1	
TRH				
24	C ₆ -C ₁₀ Fraction	<10	<10	None
24	C ₆ -C ₁₀ Fraction minus BTEX (F1)	<10	<10	
24	>C ₁₀ -C ₁₆ Fraction	<50	<50	
24	>C ₁₀ -C ₁₆ Fraction minus Naphthalene (F2)	<50	<50	
24	>C ₁₆ -C ₃₄ Fraction	<100	230	
24	>C ₃₄ -C ₄₀ Fraction	<100	110	
BTEXN				
24	Benzene	<0.2	<0.2	None
24	Toluene	<0.5	<0.5	
24	Ethylbenzene	<0.5	<0.5	
24	Total Xylenes	<0.5	<0.5	
24	Naphthalene	<1	<1	
PAH				
24	Benzo(a)pyrene TEQ	<0.5	<0.5	None
24	Sum of PAHs	<0.5	0.5	
OC/OP Pesticides				

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
24	Organochlorine Pesticides	<0.05	<0.05	None
24	Organophosphorus Pesticides	<0.05	<0.05	
Asbestos				
32	Asbestos	-	-	Asbestos detected in 16 samples

A review of AGL supplied data revealed no exceedances of the adopted human health or ecological screening values were identified for TRH, BTEXN, PAH, OC/OP Pesticides or heavy metals within soil samples collected from the study area. (Refer to **Table B** for client supplied soil data). However, asbestos was detected in surface soils at 16 of the 32 locations sampled directly beneath the ACM pipelines.

A review of groundwater data from the 14 monitoring wells installed in the area indicated that with the exception of various metals, measured concentrations of Contaminants of Potential Concern (**CoPC**) have previously been reported below the laboratory LOR. Boron, cadmium, copper, lead, manganese, nickel and zinc have been reported at concentrations in excess of the adopted ecological and/or health (drinking water) screening values within the study area (Refer to **Table C** for client supplied groundwater data).

Groundwater within the study area has also been identified as having reported elevated salinity concentrations (16,000 mg/L).

6.2 SALT CAKE LANDFILL – FORMER CONTRACTOR STAGING AREA

6.2.1 Field Observations

The former contractor staging area is approximately 39 ha in size and was formerly utilised as the contractor staging area during the construction of BPS. The area slopes gently from north to south and two retention ponds, approximately 100 m in length are located along the southern boundary of the area.

Roads and lots constructed in a grid pattern were evident both in aerial imagery of the area and during the site inspection. Two storage sheds are present within the area – one appears currently utilised and the other abandoned and filled with stockpiles of sandy soil. The eastern

portion of the area appears to still be utilised by various contractors, including land maintenance contractors, for the storage of various equipment and materials. A wide variety of machinery and materials are currently stored in the area, including numerous shipping containers, large rolls of rubber conveyer belts, various industrial and former plant and equipment and empty drums. The area was also observed to contain multiple stockpiles of inert silty clay fill material, containing minor amounts of gravel, bricks, building rubble, wood chips and various anthropogenic materials, including concrete, plastics and timber (Refer to **Appendix B – Photo 2**).

Visual indicators of contamination, such as surface staining, odours or visibly stressed vegetation were not observed within the area during the inspection. No asbestos-containing materials were identified during the inspection of this area.

6.2.2 Results

Table 6.2 below provides a summary of client supplied data from soil samples collected from within the proposed Salt Cake Landfill Area.

Table 6.2 Summary of client supplied data - Salt Cake Landfill Area

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
Metals and metalloids				
50	As	<5	24	Three samples reported concentrations exceeding zinc EIL.
50	Cd	<1	2	
50	Cr	<1	<1	
50	Cu	<1	274	
50	Ni	<1	74	
50	Pb	6	246	
50	Zn	8	2800	
50	Hg	<0.1	<0.1	
TRH				
50	C ₆ -C ₁₀ Fraction	<10	<10	None
50	C ₆ -C ₁₀ Fraction minus BTEX (F1)	<10	<10	
50	>C ₁₀ -C ₁₆ Fraction	<50	<50	
50	>C ₁₀ -C ₁₆ Fraction minus Naphthalene (F2)	<50	<50	
50	>C ₁₆ -C ₃₄ Fraction	<100	230	
50	>C ₃₄ -C ₄₀ Fraction	<100	110	

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
BTEXN				
50	Benzene	<0.2	<0.2	None
50	Toluene	<0.5	<0.5	
50	Ethylbenzene	<0.5	<0.5	
50	Total Xylenes	<0.5	<0.5	
50	Naphthalene	<1	<1	
PAH				
50	Benzo(a)pyrene TEQ	<0.5	<0.5	None
50	Sum of PAHs	<0.5	0.5	
OC/OP Pesticides				
50	Organochlorine Pesticides	<0.05	<0.05	None
50	Organophosphorus Pesticides	<0.05	<0.05	

No exceedances of the adopted ecological or human health screening values were identified in soil samples collected from within the proposed salt cake landfill study area, with the exception of zinc in three samples which were found to exceed the adopted Ecological Investigation Level (**EIL**). (Refer to **Table B** for client supplied soil data). The zinc impacts in the study area were all <250% of the relevant screening level and the 95% UCL of the mean concentration for samples collected within the upper 1m of the soil profile with the area was 900.3 mg/kg, which was less than the adopted EIL. These impacts are therefore considered unlikely to represent a significant risk to the terrestrial environment under current usage or the proposed future use as a salt cake landfill.

A review of groundwater data from the two monitoring wells installed in the area indicated that with the exception of various metals, measured concentrations of CoPC have previously been reported below the laboratory LOR. Nickel and zinc have been reported at concentrations in excess of the adopted ecological and/or health (drinking water) screening values within the Salt Cake Landfill area (Refer to **Table C** for client supplied groundwater data). Elevated groundwater salinity is also considered of high potential via infiltration of rainwater and leaching of mobilised salts. However, it is understood that interaction with groundwater is not anticipated within the proposed Salt Cake Landfill area as part of the Project.

6.3 COAL STORAGE AREA

6.3.1 Field Observations

The study area is approximately 62 ha in size and incorporates the existing Coal Storage Area, Mobile Plant Workshop, Refuelling Area as well as sections of the Contaminated Water Holding Pond and former fire-fighting training area.

The coal storage area occupies the majority of the area (approximately 35 ha) and is used for the stockpiling of coal prior to it being transferred via conveyor to the coal mill and to the units. Retention ponds are located along the western and northern boundaries of the stockpile area.

The mobile plant workshop and refuelling area is located directly to the south of the coal storage area and comprises an area of approximately 2,500 m². Numerous surface stains on the concrete in the refuelling and lubrication areas were observed, indicative of potential historical diesel spills and leaks (**Appendix B – Photo 3**).

The former fire-fighting training area was a vacant, grass-covered area at the time of inspection, with no visual indicators of contamination, such as surface staining, odours or visibly stressed vegetation.

6.3.2 Results

Table 6.3 below provides a summary of client supplied data from soil samples collected from within the proposed Coal Storage Area.

Table 6.3 Summary of client supplied data - Coal Storage Area

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
Metals and metalloids				
55	As	<1	127	None
55	Cd	<1	0.5	
55	Cr	<1	16	
55	Cu	<1	37	
55	Ni	<1	55	
55	Pb	<1	43	
55	Zn	<1	288	

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
55	Hg	<0.1	0.1	
TRH				
55	C ₆ -C ₁₀ Fraction	<10	10	Two samples exceeded the F2 ESL: ERM_BP_MW05_0.1 ES_B_10_ESMW01_1.4 One sample exceeded the F3 ESL: ES_B_10_ESMW01_1.4
55	C ₆ -C ₁₀ Fraction minus BTEX (F1)	<10	10	
55	>C ₁₀ -C ₁₆ Fraction	<50	6400	
55	>C ₁₀ -C ₁₆ Fraction minus Naphthalene (F2)	<50	6400	
55	>C ₁₆ -C ₃₄ Fraction (F3)	<100	4600	
55	>C ₃₄ -C ₄₀ Fraction (F4)	<100	400	
BTEXN				
55	Benzene	<0.2	<0.2	None
55	Toluene	<0.5	<0.5	
55	Ethylbenzene	<0.5	<0.5	
55	Total Xylenes	<0.5	<0.5	
55	Naphthalene	<1	<1	
PAH				
55	Benzo(a)pyrene TEQ	<0.5	1.3	None
55	Sum of PAHs	<0.5	290	
OC/OP Pesticides				
55	Organochlorine Pesticides	<0.05	<0.05	None
55	Organophosphorus Pesticides	<0.05	<0.05	
Asbestos				
32	Asbestos	-	-	Asbestos fines identified in one location

A review of soil data supplied by AGL Macquarie for the coal storage area found concentrations of BTEXN, PAH, OC/OP pesticides and metals were below the adopted screening values in all soil samples (Refer to **Table B** for client supplied soil data). Two samples, one in the Mobile Plant Workshop area and the other adjacent to the Oil Water Separator, reported F2 Fraction (>C₁₀-C₁₆) concentrations exceeding the applicable ESL criteria, with one also exceeding the F3 (>C₁₆-C₃₄) Fraction ESL. Asbestos fibres were detected within a single surface soil sample located along the eastern boundary of the coal storage area.

PFAS concentrations have been reported above the laboratory limit of reporting (LOR) in two shallow soil samples (0.1m BGL) within the northern half of the fire-fighting training area. The maximum reported PFOS concentration was 0.05 mg/kg; with the maximum PFOA

concentration reported to be 0.02 mg/kg. All reported concentrations of PFAS compounds are below the adopted criteria.

A review of groundwater data from the 15 monitoring wells installed in the coal-storage area indicated that with the exception of various metals, measured concentrations of CoPC have been reported below the laboratory LOR. Cadmium, copper, lead, nickel and zinc have been reported at concentrations in excess of the adopted health and/or ecological screening values within the study area. PFOS and PFOA were not reported above the LOR in any groundwater samples collected in the vicinity of the fire-fighting training area.

Groundwater within the Maintenance Store area has reported elevated salinity concentrations (15,000 mg/L). However, it is understood that interaction with groundwater is not anticipated within the coal storage, mobile plant workshop or refuelling areas as part of the Project. (Refer to **Table C** for client supplied groundwater data).

6.4 BORROW PITS

Refer to **Figure 2** for proposed Borrow Pit Locations.

6.4.1 Field Observations

Borrow Pit 1 is approximately 28 ha in size, is located directly south of the south-east corner of the ash dam and is the closest of the four proposed borrow pits to the ash dam. The area has been predominantly cleared of vegetation and slopes gently from north to south. At the time of inspection, the area was vacant, however evidence of the prior light cattle grazing was apparent. Visual indicators of erosion along overland drainage lines were observable (**Appendix B – Photo 4**).

Visual indicators of contamination, such as surface staining, odours, fill materials or visibly stressed vegetation were not observed within the area during the inspection.

Three surface soil samples were collected from locations with varied aspects across the proposed area (Refer to **Figure 3** for sample locations). Surface soils (up to depth of 150 mm) were observed to consist of natural dry, red/brown silty clays.

Borrow Pit 2 is approximately 40 ha in size and located to the south west of the ash dam. The area has been predominantly cleared of vegetation. The topography of the area consists of undulating hills, steep in areas, with a ridgeline running north-south through the area. At the time of inspection, the area was vacant, however evidence of the prior light cattle grazing was apparent. Visual indicators of erosion along overland drainage lines were apparent (**Appendix B – Photo 5**).

Visual indicators of contamination, such as surface staining, odours, fill materials or visibly stressed vegetation were not observed within the area during the inspection.

Three surface soil samples were collected from across the area (Refer to **Figure 3** for sample locations). Samples were collected from locations with varied aspects across the proposed area. Surface soils (up to depth of 150 mm) were observed to consist of dry, light brown silty clays.

Borrow Pit 3 is approximately 66 ha in size, rectangular in shape and located to the east of the main vehicle accessway running from the operational areas of BPS toward Plashett Reservoir. The land has been almost entirely cleared of vegetation, and at the time of inspection a small herd of cattle were grazing within the area. The land slopes from east to west, with visual indicators of erosion present along drainage lines flowing east to west. Two dams, located approximately 100 m apart, are present in the centre of the area. Both dams were almost dry at the time of inspection (**Appendix B – Photo 6**).

Visual indicators of contamination, such as surface staining, odours, fill materials or visibly stressed vegetation were not observed within the area during the inspection.

Borrow Pit 4 is the largest of the four proposed borrow pits, is located to the north east of Plashett Reservoir and is approximately 137 ha in size. The area incorporates gently sloping hills and much of the land has been cleared of vegetation, however lightly forested areas remain, primarily along the main drainage line running east-west through the centre of the area. At the time of inspection, the area was vacant, however evidence of the prior light cattle grazing was apparent. The area contains two dams, with the northern-most dam dry at the time of inspection (**Appendix B – Photo 7**).

A cattle sorting area is located near the gate accessing the area, directly adjacent to the main vehicle accessway from the operational areas of the site toward Plashett Reservoir. The area surrounding the cattle sorting area contained a number of small grass-covered stockpiles,

empty 40-gallon drums and a storage container. Visual indicators of contamination, such as surface staining, odours, fill materials or visibly stressed vegetation were not observed within the area during the inspection.

6.4.2 Results

Table 6.4 below provides a summary of results of soil samples collected from within the proposed Borrow Pit Areas as part of this assessment.

Table 6.4 Summary of soil results - Borrow Pit Areas

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
Metals and metalloids				
6	As	<5	21	None
6	Cd	<1	<1	
6	Cr	8	33	
6	Cu	7	24	
6	Ni	6	33	
6	Pb	10	23	
6	Zn	37	89	
6	Hg	<0.1	<0.1	
TRH				
6	C ₆ -C ₁₀ Fraction	<10	<10	None
6	C ₆ -C ₁₀ Fraction minus BTEX (F1)	<10	<10	
6	>C ₁₀ -C ₁₆ Fraction	<50	<50	
6	>C ₁₀ -C ₁₆ Fraction minus Naphthalene (F2)	<50	<50	
6	>C ₁₆ -C ₃₄ Fraction	<100	<100	
6	>C ₃₄ -C ₄₀ Fraction	<100	<100	
BTEXN				
6	Benzene	<0.2	<0.2	None
6	Toluene	<0.5	<0.5	
6	Ethylbenzene	<0.5	<0.5	
6	Total Xylenes	<0.5	<0.5	
6	Naphthalene	<1	<1	
PAH				
6	Benzo(a)pyrene TEQ	<0.5	<0.5	None
6	Sum of PAHs	<0.5	<0.5	
OC/OP Pesticides				

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
6	Organochlorine Pesticides	<0.05	<0.05	None
6	Organophosphorus Pesticides	<0.05	<0.05	

The results from soil sampling undertaken as part of this assessment revealed no exceedances of the adopted human health or ecological screening values were identified for TRH, BTEXN, PAH, OC/OP Pesticides or heavy metals within surface soil samples collected from Borrow Pit Areas 1 and 2 (Refer to **Table A** for soil investigation results).

A review of groundwater data from the two monitoring wells that have been installed within the Borrow Pit 1 area indicated that with the exception of various metals, measured concentrations of CoPC have previously been reported below the laboratory LOR. Lead, manganese and zinc have been reported at concentrations in excess of the adopted ecological and/or health (drinking water) screening values within the study area (Refer to **Table C** for client supplied groundwater data). These concentrations are considered to be representative of background conditions given the spatial location/proximity to infrastructure or potential sources of contamination, as well as the natural mine setting of the regional area. Furthermore, interaction with groundwater is not anticipated within the proposed Borrow Pit areas as part of the Project.

6.5 RAVENSWORTH ASH LINE

6.5.1 Field Observations

The proposed Ravensworth Ash Line runs from the Fly Ash Plant to the north side of the New England Highway and eastward toward Ravensworth Void No. 3 and consists of two pipelines in parallel. The new pipelines are proposed to be constructed adjacent to the existing ash pipelines.

Visual indicators of elevated salinity in surface soils were apparent in areas adjacent to waterbodies located between the Fly Ash Plant and New England Highway.

Suspected sheets of bonded asbestos-containing materials were observed on the ground within an abandoned concrete building adjacent to the intersection of the current pipeline and Liddell Station Road (Refer to **Appendix B – Photo 8**). Up to a dozen small stockpiles

approximately 10-15 m³ in size of inert silty clay material with no observable anthropogenic materials were present at various locations along the existing ash line. A fine white/grey fly ash was observable on the surface in multiple locations along the current pipeline. AGL has advised that these are attributable to minor historical ruptures to the existing pipe. (Refer to **Appendix B – Photo 9**).

With the exception of these minor historical ruptures and possible ACM within the abandoned concrete building, visual indicators of contamination, such as surface staining, odours, fill materials or visibly stressed vegetation were not observed within the area during the inspection.

6.5.2 Results

Table 6.5 below provides a summary of client supplied data from soil samples collected from within the proposed Ravensworth Ash Line Area.

Table 6.5 Summary of client supplied data - Ravensworth Ash Line Area

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
Metals and metalloids				
19	As	<1	25	None
19	Cd	<1	<1	
19	Cr	<1	36	
19	Cu	<1	43	
19	Ni	<1	53	
19	Pb	<1	32	
19	Zn	<1	120	
19	Hg	<0.1	0.1	
TRH				
19	C ₆ -C ₁₀ Fraction	<10	<10	None
19	C ₆ -C ₁₀ Fraction minus BTEX (F1)	<10	<10	
19	>C ₁₀ -C ₁₆ Fraction	<50	<10	
19	>C ₁₀ -C ₁₆ Fraction minus Naphthalene (F2)	<50	<10	
19	>C ₁₆ -C ₃₄ Fraction	<100	<10	
19	>C ₃₄ -C ₄₀ Fraction	<100	<10	
BTEXN				
19	Benzene	<0.2	<0.2	None

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
19	Toluene	<0.5	<0.5	
19	Ethylbenzene	<0.5	<0.5	
19	Total Xylenes	<0.5	<0.5	
19	Naphthalene	<1	<1	
PAH				
19	Benzo(a)pyrene TEQ	<0.5	<0.5	None
19	Sum of PAHs	<0.5	1.6	
OC/OP Pesticides				
3	Organochlorine Pesticides	<0.05	<0.05	None
3	Organophosphorus Pesticides	<0.05	<0.05	

No exceedances of the adopted ecological or human health screening levels were identified in soil samples collected from along the Ravensworth Ash Line corridor area. (Refer to **Table B** for client supplied soil data).

No groundwater data is available for the area. However, it is understood that interaction with groundwater is not anticipated as part of the Project within the Ravensworth Ash Line Area.

6.6 ANCILLARY INFRASTRUCTURE WORKS

6.6.1 Field Observations

The High Pressure Pumping station is located approximately 8.6 km to the south-west of the operational area of BPS. BPS receives water from the High Pressure pumping station via the above and below ground pipelines (**Appendix B** – Photo 10). A small substation is located directly to the west of the main pump station building and is outside the study area. Visual indicators of contamination, such as surface staining, odours, fill materials or visibly stressed vegetation were not observed within the vicinity of the pumping station, or along the current pipeline during the inspection.

The Lime Softening Plant (LSP) Sludge Line area is approximately 400 m in length, 120 m wide and located in the area between the LSP and LSP Sludge Lagoon. This area also includes the northern section of the high pressure pipeline. The area is lightly vegetated with no above ground buildings or infrastructure, with the exception of two unpaved access roads. At the time

of inspection, the drainage line that runs adjacent to the area was undergoing rehabilitation (**Appendix 2 – Photo 11**). Visual indicators of contamination, such as surface staining, odours, fill materials or visibly stressed vegetation were not observed within the vicinity of the proposed LSP Sludge Line Area during the inspection.

6.6.2 Results

Table 6.6 below provides a summary of client supplied data from soil samples collected from within the proposed Ancillary Infrastructure Works Areas.

Table 6.6 Summary of client supplied data - High Pressure Pipe and LSP Sludge Line Clearing Areas

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
Metals and metalloids				
4	As	<1	27	None
4	Cd	<1	<1	
4	Cr	<1	<1	
4	Cu	<1	23	
4	Ni	<1	34	
4	Pb	<1	17	
4	Zn	<1	63	
4	Hg	<0.1	0.1	
TRH				
4	C ₆ -C ₁₀ Fraction	<10	<10	None
4	C ₆ -C ₁₀ Fraction minus BTEX (F1)	<10	<10	
4	>C ₁₀ -C ₁₆ Fraction	<50	<10	
4	>C ₁₀ -C ₁₆ Fraction minus Naphthalene (F2)	<50	<10	
4	>C ₁₆ -C ₃₄ Fraction	<100	<10	
4	>C ₃₄ -C ₄₀ Fraction	<100	<10	
BTEXN				
4	Benzene	<0.2	<0.2	None
4	Toluene	<0.5	<0.5	
4	Ethylbenzene	<0.5	<0.5	
4	Total Xylenes	<0.5	<0.5	
4	Naphthalene	<1	<1	
PAH				
4	Benzo(a)pyrene TEQ	<0.5	<0.5	None

Number of Samples Analysed	Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	Samples Exceeding Screening Criteria (see Table 4.1)
4	Sum of PAHs	<0.5	<0.5	
OC/OP Pesticides				
4	Organochlorine Pesticides	<0.05	<0.05	None
4	Organophosphorus Pesticides	<0.05	<0.05	

No exceedances of the adopted ecological or human health screening levels were identified in soil samples collected from within the High Pressure pipeline or LSP sludge line station area. (Refer to **Table B** for client supplied soil data).

Groundwater data from the one monitoring well in the area reported metal concentrations greater than the adopted ecological screening values. Metals exceeding the adopted ecological screening values included copper, lead and zinc (Refer to **Table C** for client supplied groundwater data). These concentrations are considered to be representative of background conditions given the natural mine setting of the regional area. It is understood that interaction with groundwater is not anticipated to be part of the Ancillary Infrastructure Works being undertaken as part of the Project. Previous investigations have recorded elevated salinity in groundwater within the area of the LSP sludge lagoons.

6.7 QUALITY ASSURANCE / QUALITY CONTROL

The quality assurance and quality control procedures for the additional targeted soil sampling was based on the requirements of NEPM 2013. There are a number of strict protocols that required to be followed as set out in **Table 6.6**. A full QA/QC review is provided in **Appendix C**.

Table 6.6 QA/QC data quality indicators

QA/QC Objective	Data quality indicator (DQI)
Suitable field personnel	The environmental consultant should be required to maintain a quality systems protocol certified to AS/NZS ISO 9001:2015. All field personnel conducting sampling must be trained in the requirements detailed in this sampling plan. Field personnel will have relevant tertiary qualifications and will be required to demonstrate competence in the procedures for sampling (consistent with NEPM 2013 and AS4482.1 - 1999).
Standardised sample nomenclature	All samples will be labelled with a unique identifier that can be related to the sample location and depth. The following naming convention will be utilised: <ul style="list-style-type: none"> • Borrow pit (BP) – Number (01, 02, 03...) - Depth (0, 0.5, 1, 1.5, 2...) E.g. BP01_0.5;

QA/QC Objective	Data quality indicator (DQI)
Decontamination of field equipment	When sampling equipment is used, nitrile gloves will be worn and changed between samples. Equipment will also be decontaminated between sample locations using an appropriate surface-active cleaning agent that does not contain PFSA as consistent with NEPM 2013.
Sample handling	Samples will be sent to the laboratory accompanied by a chain of custody form and within relevant holding times. It is noted the distance from the site to the nearest laboratory (being either Melbourne or Sydney) and samples may not arrive at the laboratory on the same day or following day of sampling. In this circumstance the samples must be maintained at a temperature below 4°C. The laboratory will need to be informed for the time it will take to get the samples to them so that can process the samples promptly upon receipt ensuring that short holding times can be appropriately managed.
Transportation	A Chain of Custody (COC) document will be used to ensure the integrity of the samples from collection to receipt by the analytical laboratory within appropriate holding times.
National Association of Testing Authorities (NATA) accredited laboratory analysis	All samples will be forwarded to a laboratory holding NATA accreditation for the required analyses. The following Laboratories will be utilised: <ul style="list-style-type: none"> • ALS – Primary Laboratory for chemical analysis; and • Eurofins – Secondary Laboratory for chemical analysis.
Field QA/QC	Duplicate samples (intra-laboratory) were collected at a rate of one in every twenty (1:20) primary soil samples and submitted to the primary laboratory for analysis. Triplicate samples (inter-laboratory) were collected at a rate of one in every twenty (1:20) primary soil samples and submitted to the secondary laboratory for analysis. Field duplicate and triplicate samples are used to assess field and analytical precision and repeatability. The precision measurement is determined using the relative percent difference (RPD) between the primary sample (X1) and duplicate sample (X2) results, as shown in the following equation: $\text{Relative percent difference (RPD)} = \frac{(X_1 - X_2)}{(X_1 + X_2)/2} \times 100$ <p>Generally, it is recommended that RPD is not greater than 30% (NEPM 2013). Default RPD levels in the field may be non-compliant for the following reasons:</p> <ul style="list-style-type: none"> • Although all due care and attention will be taken to obtain samples containing the same material, it is feasible that with samples collected at the surface and/or from fill material there may be some exceedances caused by heterogeneity of the soil, particularly ash or clinker materials; • The differing laboratory equipment, procedures and limits of reporting (between the primary and secondary laboratories); • due to sample matrix interference; and • due to the reported concentrations being close to the limit of reporting where laboratory precision and accuracy are inherently low. <p>A rinsate blank sample will be collected for each piece of non-dedicated sampling equipment per day onsite and submitted to the primary laboratory for analysis. A field blank will be collected for each day in the field and submitted to the primary laboratory for analysis. A transport blank sample will be collected for each batch of samples sent to the laboratory (~one per day in the field) and submitted to the primary laboratory for analysis for each day samples are taken. Should rinsate blanks, field blanks and transport blanks analysis identify concentrations above the Laboratory LOR, this will indicate the potential for cross contamination and further discussions will be required to determine the integrity/validity of the data.</p>

QA/QC Objective	Data quality indicator (DQI)
	QA/QC non-compliance will be documented and discussed in the report. Should exceedances be identified (i.e. duplicates and triplicates be above the RPD or rinsate blanks, field blanks or transport blanks be above the LOR) then consideration will be given to the sample(s) being re-analysed or the higher concentration level to be conservatively adopted.
Laboratory Quality Control – Duplicates, spikes, blanks and surrogates – Acceptable Limits	<p>Laboratory QA/QC acceptance limits are as follows:</p> <ul style="list-style-type: none"> • Surrogates: 70% to 130% recovery; • Matrix Spikes: 70% to 130% recovery for organics or 80% to 120% recovery for inorganics; • Control Samples: 70% to 130% recovery for soil or 80% to 120% recovery for waters; • Duplicate Samples: <4 Practical Quantitation Limits (PQL) - +/- 2PQL, 4-10PQL – 0.-25 or 50%RPD, >10PQL – 0-10 or 30%RPD; and • Method Blanks: zero to <PQL.

6.7.1 Quality Statement

Field sampling procedures conformed to Kleinfelder's QA/QC protocols to prevent cross contamination, preserve sample integrity and allow for collection of a suitable data set from which to make technically sound and justifiable decisions with data of satisfactory useability.

Based on a review of the results for the Kleinfelder and laboratory QA/QC program adopted, the overall data quality is considered to be suitably reliable and representative of soil conditions at the Site. Copies of the final NATA endorsed laboratory reports, including internal QA/QC results and chain-of-custody documentation for the primary and secondary laboratories are attached as **Appendix D**.

7. CONCEPTUAL SITE MODEL

7.1 POTENTIAL SOURCES

7.1.1 On-site

Following a review of historical information, AGL supplied data and the Kleinfelder detailed site inspection, a total of six areas have been identified as potential AECs potentially within vicinity of the Project and warrant further consideration. **Table 7.1** outlines the identified AECs and the potential contaminants.

Table 7.1: AEC and Potential Contaminants

Name	Identified AEC	Potential Contaminants
AEC1	Bayswater Ash Dam	Asbestos
AEC2	Coal Storage Area	Asbestos, TRH, BTEX, PAH, heavy metals
AEC3	Fire-fighting training area	PFAS compounds – PFOA, PFOS
AEC4	Mobile plant workshop and refuelling area	TRH, BTEX, PAH, Heavy metals
AEC5	Ravensworth Ash Line	Asbestos
AEC6	Salt Cake Landfill	Heavy metals, asbestos

With specific regard to salinity, the following key site features are associated with salinity impact to retained process water storage, adjacent soils/stored materials and groundwater:

- Brine Concentrator Decant Basin: receives highly saline wastewater from the Brine Concentrator treatment process, historically associated with high levels of salinity in groundwater.
- Brine Concentrator Holding Pond: waste products from the Cooling Water Treatment Plants transferred to this dam and associated with groundwater salinity impacts.
- Pikes Gully Ash Dam: receives runoff from sluiceways draining from the BPS, historically associated with high levels of salinity in groundwater.
- Lime Softening Plant Sludge Lagoons: calcium oxides, magnesium hydroxide and other precipitates from the water treatment process. Groundwater monitoring at this locale has been recorded as trending above background salinity.

- Ravensworth Rehabilitation Site: seepage from fly ash disposed in mine voids has the potential to be saline and has been proven by water quality monitoring

7.1.2 Off-site

Given the typically rural setting of areas surrounding BPS, and the absence of any foreseen interaction with groundwater as part of the proposed Project works, no off-site potential sources of contamination have been identified during this assessment that would have an impact upon the proposed Project.

7.2 RELEASE MECHANISMS AND PATHWAYS

Potential exposure pathways associated with concentrations of chemical substances, if found to be present within study areas include:

- Dermal (skin) contact with contaminated soil/soil dust.
- Oral ingestion of contaminated soil/soil dust.
- Inhalation of contaminated soil dust/asbestos fibres in indoor/outdoor air.
- Indoor/outdoor vapour inhalation.
- Lateral migration of CoPC via sediment laden surface water runoff to impact users of surrounding land; and
- Soil leaching and lateral migration of CoPC in groundwater to impact aquatic ecology or recreational users of surface water off-site.

7.3 SOURCE-PATHWAY-RECEPTOR SUMMARY

Table 7.2 and 7.3 outline the *source – pathway – receptor* relationships identified for each study area and provide an initial assessment as to the likelihood of exposure pathways being completed in the on- and off-site environment for the proposed Project which will continue the existing commercial/industrial land use.

It should be noted that an exceedance of the adopted screening criteria does not necessarily mean that there is a significant risk of harm associated with the Project, and they should not

therefore be used as action criteria for remediation and/or management. The criteria adopted in this initial stage of assessment have been used to provide an initial understanding of likely soil and water conditions within identified AEC that may impact upon the Project during construction and operation. This preliminary information has been used to characterise current conditions across the Project footprint to allow an informed decision to be made regarding the suitability of BPS for the proposed infrastructure and wider site improvements.

The conceptual site model (**CSM**) excludes study areas and potential exposure pathways where significant contamination sources or pathways have not been identified (e.g. proposed Borrow Pit areas and use of groundwater for potable supply).

Table 7.2: Summary of Source – Pathway – Receptor Relationships (on site)

Sources	Transport Mechanism	Potential Receptors	Potential Exposure Pathways	Exposure Pathway Potentially Complete / Risks Acceptable?
Ash Dam ACM Piping Ravensworth Ash Line Coal Storage Area	Shallow soils	Current Workers	Inhalation of soil dust / asbestos fibres	Above ground asbestos piping is present from Dry Fly Ash collection area to pumping station to the east of Bayswater Ash Dam. Asbestos has been detected in surface soils below the pipeline at 16 of 32 sample locations.
			Dermal/Oral contact with soil	Asbestos fines have also been reported in one location within the Coal Storage Area and are potentially present within an abandoned building along the Ravensworth Ash Line.
		Future construction/maintenance workers (incl. sub-surface workers)	Inhalation of soil dust / asbestos fibres	Pathway considered potentially complete; however these receptors are unlikely to be repeatedly exposed to soil contaminants over a prolonged period, especially since AGL Macquarie have occupational hygiene controls in place to mitigate exposure with asbestos. It is considered that potential exposure to construction/maintenance workers would be managed via similar controls, including industry standard practice of wearing PPE and adopting good hygiene practices.
			Dermal/oral contact with soil	Contamination risks associated with the Project are therefore considered to be low and acceptable.
Fire-fighting training area	Soil	Current Workers	Ingestion/inhalation of soil/soil dust	PFAS analysis of soil in this area did not record detections above the adopted screening criteria. Moreover, it is understood that the area of Project disturbance is remote from this AEC. Although groundwater may contain concentrations of PFAS, groundwater will not be intercepted by the Project. The Project footprint is located within an existing commercial/industrial premise with substantial fill in places. Therefore, ecological receptors are considered to be of low significance with respect to the Project.
			Dermal contact with soil/soil dust	
		Future construction/maintenance workers (incl. sub-surface workers)	Ingestion/inhalation of soil/soil dust	
			Dermal contact with soil/soil dust	
		Terrestrial ecology	Ingestion of soil	
			Dermal contact with soil	

	Groundwater	Construction/maintenance workers (incl. sub-surface workers)	Incidental ingestion of groundwater	<p>It is understood that the area of Project disturbance is remote from this AEC. Although groundwater may contain concentrations of PFAS, groundwater will not be intercepted by the Project.</p> <p>Contamination risks associated with the Project are therefore considered to be low and acceptable.</p>
			Dermal contact with groundwater	
		Construction/maintenance workers (incl. sub-surface workers)	Incidental ingestion of surface water	
			Dermal contact with surface water	
Salt Cake Landfill	Soil	Terrestrial ecology	Ingestion of soil	<p>Concentrations of zinc have been found to be present above the EIL however no concentration was greater than 250% of the SAC and the standard deviation of the sample population did not exceed 50% of the SAC. Furthermore, material from the area is planned for excavation and placement onsite as part of the salt cake landfill works. The Project footprint is located within an existing commercial/industrial premise with substantial fill in places. Therefore, ecological receptors are considered to be of low significance with respect to the Project.</p> <p>Contamination risks are therefore considered to be low and acceptable.</p>
			Dermal contact with soil	
Salinity Impacted Areas	Stored Process Dams / Soil / Groundwater	Terrestrial ecology / Infrastructure	Direct contact with flora / fauna	<p>Saline impacted stored water and sludge are present within dams and lagoons as would be expected given the processes adopted at power station sites. Incidental leaching of stored water to groundwater has also been recorded during groundwater quality monitoring. Associated areas of localised salinity impact to surface soils have also been recorded in some surface water drainage channels discharging stored waters, as would be expected.</p> <p>Pathway considered potentially complete. However, given the industrial nature of the site significant impacts to flora and fauna in relation to the Project are considered unlikely. Current infrastructure across the BPS has not been reported to be suffering from severe damage due to the deleterious effects of saline soils, and foundation materials can readily be designed to be resistant to salt damage.</p> <p>Contamination risks are therefore considered to be low and acceptable.</p>
			Direct contact with building materials	

Table 7.3: Summary of Source – Pathway – Receptor Relationships (Off-site Receptors)

Sources / Migration Mechanism	Transport Mechanism	Potential Receptors	Hypothetical Exposure Pathways	Exposure Pathway Potentially Complete?
Ash Dam ACM Piping	Windblown dust from surface soils	Off-site commercial / industrial workers (incl. sub-surface maintenance workers)	Ingestion of soil dust	<p>Pathway considered incomplete. Areas of asbestos impact have been previously identified with access to impacted areas already controlled on the site. No disturbance or excavation works are planned within previously identified asbestos impacted areas as part of the project. Provided appropriate exclusion zones and occupational hygiene procedures are maintained during works, the risk of exposure to off-site receptors is unlikely.</p> <p>Contamination risks are therefore considered to be low and acceptable.</p>
			Dermal contact with soil dust	
			Inhalation of soil dust / asbestos fibres	
Ravensworth Ash Line Coal Storage Area	Groundwater	Off-site commercial / industrial workers (incl. sub-surface maintenance workers)	Ingestion of groundwater	<p>Pathway considered incomplete since planned excavations occurring within study areas are not anticipated to interact with the groundwater table. Terrestrial ecology are unlikely to come into direct contact with site-derived groundwater.</p> <p>Contamination risks considered to be low and acceptable.</p>
			Dermal contact with groundwater	
		Off-site commercial / industrial workers and residents (adults and children)	Ingestion of groundwater	
			Dermal contact with groundwater	
		Off-site terrestrial ecology	Ingestion of groundwater	

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

This Land Contamination Constraints Assessment Report has been undertaken in accordance with relevant guidelines and assessment criteria for a continued commercial/industrial land use associated with BPS and the proposed Project. The information presented in this report forms an understanding of existing conditions within study areas at BPS to allow a confident decision to be made on the suitability of the Project with respect to the protection of human health and environmental values.

The purpose of this land contamination constraints assessment is to provide supporting evidence to the EIS that land contamination (if present) does not present an impediment to the proposed Project, in accordance with State Environmental Planning Policy No 55 - Remediation of Land. This report has encompassed a review of available information to identify the historical development of the study areas and potential AECs, as well as existing environmental assessment data supplied by AGL Macquarie, supplemented by a comprehensive site inspection. Where data gaps relevant to study areas were identified by this study, targeted judgemental sampling was undertaken.

The following conclusions have been made based on this stage of supplemental assessment:

- Asbestos has been previously identified within above ground pipelines and in surface soils beneath the pipelines linking BPS with the return pumping station to the east of the Bayswater Ash Dam wall as well as with the Fuel Installation area. It is Kleinfelder's understanding that ACM pipeline areas are currently managed by controlling access to the areas, maintaining grass coverage of impacted soils and paint cover to above ground pipelines. As no works are planned within the vicinity of ACM impacted areas as part of the Project, the risks of worker exposure to airborne asbestos fibres is considered to be low. If, however augmentation works to the ash dam area are modified resulting in workers coming into contact with asbestos-impacted areas, an Asbestos Management Plan will be required to manage exposure risk;
- Asbestos has previously been identified in surface soils at one location on the eastern boundary of the Coal Storage Area. Given the isolated nature of the impacted area and its

remote location in relation to the proposed upgrade works, the risk of exposure to workers is considered to be low, and if present, will be manageable through the implementation of appropriate occupational hygiene controls that are currently enforced by AGL Macquarie;

- The site inspection identified suspected bonded ACM within an abandoned concrete building adjacent to the Liddell Station Road within the proposed Ravensworth Ash Line study area. It is understood that whilst the building lies within a 50 m buffer of the project area, no interaction is planned to occur with the abandoned structure during construction as it is beyond the maximum disturbance footprint. If, however works to the pipeline area are modified resulting in workers coming into contact with the area, an Asbestos Management Plan will be required to manage exposure risk;
- Heavy metals have been identified at concentrations in excess of relevant screening levels designated for the protection of freshwater environments in multiple study areas across the site. It is currently understood that excavations planned to be undertaken as part of the Project, specifically within the proposed Borrow Pit and Salt Cake Landfill areas have been designed to avoid potential interaction with the groundwater table. Furthermore, there are currently no abstraction bores for domestic potable or non-potable uses in the surrounding area. Therefore, the exceedances are not considered to represent a significant risk to human health or the environment;
- Groundwater within the Ash Dam Augmentation and Coal Storage study areas have been reported to contain elevated salinity concentrations (up to 16,000 mg/L). While it is likely that operational activities at the BPS have contributed to salinity concentrations in these areas, it is recognised that groundwater both at the BPS site and regionally is saline due to natural salinity in underlying bedrock. However, as interaction with groundwater is not anticipated within these areas during Project works, the elevated salinity levels are not considered to pose a risk to human health or the environment; and
- The chemical concentrations identified in soil and groundwater within the study areas are unlikely to represent a significant risk to human health and/or the environment given appropriate management and the continued use of the site as a power station. Based on the results of the assessment and CSM presented herein, the potential contamination risk associated with the study areas are considered, overall, to be low and acceptable. The Project is therefore considered to be acceptable and potential contamination risks should not be viewed as an impediment to commencing with the water infrastructure upgrades and wider improvements.

8.2 RECOMMENDATIONS

On the basis of this supplementary assessment the following recommendations are made:

- Appropriate demarcation and restriction of access to previously identified asbestos impacted areas in the Coal Storage area and along the pipelines with the Ash Dam Augmentation area should be undertaken to reduce potential exposure to workers in the short term;
- A Construction Environmental Management Plan (**CEMP**) should be prepared to provide appropriate control measures during the construction phase to mitigate the potential for pollution incidents occurring that could lead to contamination of study areas;
- The CEMP will be required to include an unexpected finds protocol to manage actual or potential contamination encountered during construction but not previously disclosed by this stage of assessment. The protocol should include measures for appropriate sampling, analysis and interpretation of results by a qualified environmental consultant; and
- The CEMP should include measures to manage saline soils or stored process waters that are to be disturbed during the Project construction phase to ensure that they are adequately disposed or relocated on-site, and do not cause significant erosion issues that may harm the environment. Some management practices may require treatment of excavated or exposed soils to be determined by additional sampling and analysis once the detailed design is completed. Further, it is recommended that foundations located within areas of saline impact are subject to additional sampling to determine the need, or otherwise, for special concrete or other material mixes.

9. REFERENCES

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PFAS National Environmental Management Plan (NEMP 2018).

10. LIMITATIONS

Contaminated land site investigations are generally designed based on a number of factors:

1. Objective and scope of works
2. State guidelines
3. Accessibility/ site restrictions
4. Visual and Olfactory observations
5. Historical land use
6. Proposed land use

Investigation designs can also be influenced by the following factors:

- Stage of the development process
- Purpose of the investigation (due diligence, environmental compliance etc)
- Available budget
- Client's risk management strategy
- Available timescale

Although the investigation is designed to identify and/or delineate potential contamination there are a number of uncertainties that can result in additional investigative work, increased remedial work and costs, re-development delays and changes in land values. These uncertainties are an inherent part of dealing with land contamination. This section is designed to outline some of the uncertainties and limitations that are generally encountered.

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10.5 OTHER LIMITATIONS

Kleinfelder has utilised state and national guidelines, Australian Standards, professional judgement and a degree of skill and care to develop risk assessment/evaluation/standard operating procedures (SOP) documents considered to be in line with industry best practice.

Risk assessments rely on the interpretation of factual information obtained as part of an investigation. Interpretations are based on professional judgements and opinions and as described in this section have a level of uncertainty attached.

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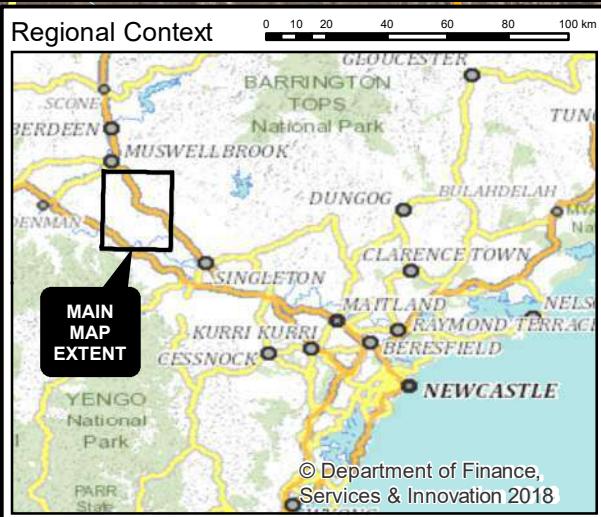
10.6 ENVIRONMENTAL CONCLUSIONS

All sites have varying degrees of heterogeneity in the vertical and lateral soil and groundwater horizons. No monitoring, common testing or sampling techniques can eliminate the possibility



FIGURES

Regional Context



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km

0 0.5 1 2 3 4 5



PROJECT REFERENCE: 20200509

DATE DRAWN: 15/10/2019 10:11 Version 1

DRAWN BY: GJoyce

DATA SOURCE:
Jacobs Group - 2019
NSW DFSI - 2018
NSW OEH - 2019

Locality

Jacobs Group
Land Assessment
Bayswater Power Station

FIGURE:

1

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0 0.25 0.5 1 1.5 2 2.5 km	N	Project Components	FIGURE: 2
KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com		Jacobs Group Land Assessment Bayswater Power Station	

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0 50 100 200 300 400 500 Metres	N	Jacobs Group Land Assessment Bayswater Power Station	FIGURE: 3
KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com			

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<p>0 25 50 100 150 200 250 Metres</p> <p> N</p> <p> www.kleinfelder.com</p>	<table border="1"> <tr> <td>PROJECT REFERENCE: 20200509</td></tr> <tr> <td>DATE DRAWN: 18/10/2019 15:43 Version 1</td></tr> <tr> <td>DRAWN BY: GJoyce</td></tr> <tr> <td>DATA SOURCE: Jacobs Group - 2019 NSW DFSI - 2018 NSW OEH - 2019</td></tr> </table>	PROJECT REFERENCE: 20200509	DATE DRAWN: 18/10/2019 15:43 Version 1	DRAWN BY: GJoyce	DATA SOURCE: Jacobs Group - 2019 NSW DFSI - 2018 NSW OEH - 2019	<p>Borrow Pit 3</p> <p>Jacobs Group Land Assessment Bayswater Power Station</p>	<p>FIGURE: 5</p>
PROJECT REFERENCE: 20200509							
DATE DRAWN: 18/10/2019 15:43 Version 1							
DRAWN BY: GJoyce							
DATA SOURCE: Jacobs Group - 2019 NSW DFSI - 2018 NSW OEH - 2019							

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Legend	
Project Areas	Local Road
Kleinfelder Sample Locations	Track
Previous Sample Locations	Named Watercourse
	Unnamed Watercourse

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0 25 50 100 150 200 250 Metres	N	PROJECT REFERENCE: 20200509 DATE DRAWN: 2019/11/15 08:51 Version 1 DRAWN BY: GJoyce	HP Pipe Clearing (South) Sample Locations	FIGURE: 9
KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com	Jacobs Group NSW DFSI - 2018 NSW OEH - 2019	Jacobs Group Land Assessment Bayswater Power Station		





TABLES

Table A

Soil Analytical Data - Metals
 AGL Macquarie -
 Bayswater Power Station
 Musswellbrook



Analyte			Metals							
Units			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
HIL-D (Commercial / Industrial) (NEPM 2013)			3,000	900	3,600	240,000	1,500	730	600	400,000
EIL - Commercial / Industrial (Aged) (NEPM 2013)			160	--	550	320	1,100	--	75 ²	380 ¹
Sample Name	Sample Date	Start Depth (m)								
BP1_1	07-Aug-19	0.1	7.0	< 1.0	9.0	23	16	< 0.1	14	84
BP1_2	07-Aug-19	0.1	6.0	< 1.0	11	7.0	16	< 0.1	6.0	42
BP1_3	07-Aug-19	0.1	<5.0	< 1.0	8.0	13	12	< 0.1	8.0	64
BP2_1	07-Aug-19	0.1	11	< 1.0	19	24	19	< 0.1	21	69
BP2_2	07-Aug-19	0.1	< 5.0	< 1.0	9.0	7.0	10	< 0.1	6.0	37
BP2_3	07-Aug-19	0.1	21	< 1.0	33	23	23	< 0.1	33	89

Notes:

< - Less than laboratory limit of reporting

mg/kg - Milligrams per kilogram

Bold indicates a detection above the laboratory limit of reporting

** denotes duplicate/triplicate sample result adopted for analytical use due to RPD >50%

Highlighting indicates an exceedance of the corresponding criteria (highlighting corresponds to the guideline with the highest criteria value where analytical result exceeds more than one guideline)

RPD - Relative Percentage Difference

¹ Value calculated from an Average CEC of 7 and pH of 6.5 (see separate calculation sheet)² Value calculated from an average CEC of 7³ value based on a clay content >10%**Criteria:**

National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013).

Table A

Soil Analytical Data - BTEXN, TRH
 AGL Macquarie -
 Bayswater Power Station
 Musswellbrook



Analyte			BTEXN								Total Petroleum Hydrocarbons					Total Recoverable Hydrocarbons						
			Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene	Sum of BTEX	C ₆ - C ₉	C ₁₀ - C ₁₄	C ₁₅ - C ₂₈	C ₂₉ - C ₃₆	C ₁₀ - C ₃₆ sum	C ₆ - C ₁₀	C ₆ - C ₁₀ minus BTEX (F1)	>C ₁₀ - C ₁₆	>C ₁₆ - C ₃₄	>C ₃₄ - C ₄₀	>C ₁₀ - C ₄₀ (sum)	
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
HSL-D (Commercial/ Industrial) - Vapour (SAND 1.0-2.0m)			3.0	NL	NL	--	--	NL	NL	--	--	--	--	--	--	370	--	NL	--	--	--	
EIL - Urban Residential/Public Open Space (NEPM 2013)			50	85	70	--	--	105	170	--	--	--	--	--	--	180	--	120	300	2,800	--	
Sample Name	Sample Date	Start Depth (m)																				
BP1_1	07-Aug-19	0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 50	< 10	< 10	< 50	< 50	< 100	< 100	< 50
BP1_2	07-Aug-19	0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 50	< 10	< 10	< 50	< 50	< 100	< 100	< 50
BP1_3	07-Aug-19	0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 50	< 10	< 10	< 50	< 50	< 100	< 100	< 50
BP2_1	07-Aug-19	0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 50	< 10	< 10	< 50	< 50	< 100	< 100	< 50
BP2_2	07-Aug-19	0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 50	< 10	< 10	< 50	< 50	< 100	< 100	< 50
BP2_3	07-Aug-19	0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 50	< 10	< 10	< 50	< 50	< 100	< 100	< 50

Notes:

< - Less than laboratory limit of reporting

mg/kg - Milligrams per kilogram

BTEXN - Benzene, toluene, ethylbenzene, xylenes, naphthalene

Bold indicates a detection above the laboratory limit of reporting

** denotes duplicate/triplicate sample result adopted for analytical use due to RPD >50%

RPD - Relative Percentage Difference

NL = No Limit

Screening criteria for Vapour only shows the specific criteria relating to samples where analytical results were reported above the LOR (i.e. . All other screening criteria has been considered but not presented in the above table.

Criteria:

National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013).

Table A

Soil Analytical Data - PAHs
 AGL Macquarie -
 Bayswater Power Station
 Muswellbrook



Analyte		Polycyclic Aromatic Hydrocarbons												Polycyclic Aromatic Hydrocarbons											
Units	mg/kg	Naphthalen	Aceanaphthyle	Aceanaphthe	Fluorene	Phenanthre	Anthracene	Fluoranthene	Pyrene	Chrysene	benzo[a]anthracen	benzo[k]fluoranthene	benzo(b+)fluoranthene	benzo[a]pyren	ndeno[1,2,3-c,d]pyren	benz[a,h]anthracen	benzo[g,h]perylene	Total PAH	Benzo[a]pyrene	Benzo[a]pyrene	Benzo[a]pyrene	Benzo[a]pyrene			
		ng/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
HIL-D (Commercial / Industrial) (NEPM 2013)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	3 (OC)	3 (OC)	3 (OC)	3 (OC)		
EIL - Urban Residential/Public Open Space (NEPM 2013)	170	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Sample Name	Sample Date	Start Depth (m)																							
BPI_1	07-Aug-19	0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	0.6	
BPI_2	07-Aug-19	0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	0.6	
BPI_3	07-Aug-19	0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	0.6	
BPI_4	07-Aug-19	0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	0.6	
BPI_2	07-Aug-19	0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	0.6	
BPI_3	07-Aug-19	0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	0.6	

Notes:
 - Not analyzed
 < LOR = less than laboratory limit of reporting

LOR = Laboratory limit of reporting

mg/kg = Milligrams per kilogram

Bold indicates a detection above the laboratory limit of reporting

** denotes duplicate/triplicate sample result adopted for analytical use due to RPD > 50%

RPD = Relative Percentage Difference

DC = Direct Contact

Criteria:
 National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013).

Table A

Analyte		Organochlorine Pesticides																		Organophosphorus Pesticides																					
Units		4,4'-DDE	4,4'-DDD	4,4'-DDT	alpha-BHC	beta-BHC	gamma-BHC	delta-BHC	Aldrin	Heptachlor epoxide	cis-Chlordane	trans-Chlordane	Total Chlordane (sum)	alpha-Endosulfan	beta-Endosulfan sulfate	Endosulfan (sum)	Endosulfan sulfate	Endrin	Endrin aldehyde	Heptachlor	Hexachlorobenzene	Methoxychlor	Sum of Aldrin + DDD + DDE + DDT	Azinphos-methyl	Bromophos-ethyl	Carbofenthion	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-s-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion	Monocrotophos	Parathion	Parathion-methyl	Pirimiphos-ethyl	Prothiophos
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						
HLL-O (Commercial / Industrial) (NEPM 2013)		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--								
EEL - Urban Residential/Public Open Space (NEPM 2013)		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--								
Sample Name	Sample Date	Start Depth (m)																																							
BP1_1	07-Aug-19	0.1	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05							
BP1_2	07-Aug-19	0.1	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05						
BP1_3	07-Aug-19	0.1	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05						
BP2_1	07-Aug-19	0.1	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05						
BP2_2	07-Aug-19	0.1	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05						
BP2_3	07-Aug-19	0.1	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05						

Notes:

< - Less than laboratory limit of reporting

LOR - Laboratory limit of reporting

mg/kg - Milligrams per kilogram

DDD - Diclorodihydrodichlorothene

DDT - Diclorodihydrodichlorotetraene

DDD - Diclorodihydrodichlorothene

DDE - Diclorodihydrodichlorothene

DDO - Diclorodihydrodichlorothene

DFO - Diclorodihydrodichlorothene

EEL - Environmental Evaluation Limit

EPM - Environmental Protection Measure

Table A

Analyte			Metals							
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sample Name	Sample Date	Sample Type								
BP2_2	07-Aug-19	Primary	11	< 1.0	19	24	19	< 0.1	21	69
QC1	07-Aug-19	Duplicate	13	< 1.0	20	26	21	< 0.1	23	78
Relative Percentage Difference			17%	NC	5%	8%	10%	NC	9%	12%
BP2_2	07-Aug-19	Primary	11	< 1.0	19	24	19	< 0.1	21	69
QC2	07-Aug-19	Triplicate	11	< 0.4	21	24	18	< 0.1	21	63
Relative Percentage Difference			0%	NC	10%	0%	5%	NC	0%	9%

Notes:

< - Less than laboratory limit of reporting

NC - Not calculated

mg/kg - Milligrams per kilogram

Half the laboratory limit of reporting used when calculating RPD

RPD - Relative Percentage Difference

Table A

Analyte			BTEXN								Total Petroleum Hydrocarbons				Total Recoverable Hydrocarbons							
			Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene	Sum of BTEX	C ₆ - C ₉	C ₁₀ - C ₁₁	C ₁₅ - C ₂₈	C ₁₀ - C ₁₆ sum	C ₆ - C ₁₀	C ₆ - C ₁₀ minus BTEX (F1)	>C ₁₀ - C ₁₆ minus Naphthalene	>C ₁₀ - C ₁₆ (sum)	>C ₁₅ - C ₂₄	>C ₁₅ - C ₄₀		
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Sample Name	Sample Date	Sample Type																				
BP2_2	07-Aug-19	Primary	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 50	
Q51	07-Aug-19	Duplicate	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 50	
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
BP2_2	07-Aug-19	Primary	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 50	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 50
QC2	07-Aug-19	TriPLICATE	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.2	< 10	< 50	< 100	< 100	< 50	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 50
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	

Notes:

< - Less than laboratory limit of reporting

NC - Not calculated

mg/kg - Milligrams per kilogram

BTEXN - Benzene, toluene, ethylbenzene, xylenes, naphthalene

Half the laboratory limit of reporting used when calculating RPD

RPD - Relative Percentage Difference

Table A

Soil Analytical Data - Asbestos
AGL Macquarie
Baywater Power Station



Analyte		Asbestos	Sample Weight (dry)	Asbestos Type	Description	
LOR			0.01			
Units		YES/NO	g			
Absesnce / Prescence in soil or buk solid						
Sample Name	Sample Date	Start Depth (m)	Sample Type			
AGL_ASB	06-Aug-19	0.1	Solid	No	9.0	- Several pieces of cement sheeting

Notes:

Bold indicates a detection

Criteria:

Absesnce / Prescence in soil or buk solid

Table C - Client Supplied Groundwater Data

Analyte	>C ₁₀ - C ₁₂ Fraction	>C ₁₃ - C ₁₆ Fraction (sum)	>C ₁₆ - C ₁₈ Fraction	>C ₁₈ - C ₂₀ Fraction	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloropropylene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,4-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
Sample Name	Sample Date																					
BA_MW01	11-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BA_MW03	11-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW01	12-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW03	12-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW04	04-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW05	04-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW06	04-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW08	05-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW05	12-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW07	09-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW08	09-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW09	09-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW10	10-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW13	10-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BT_MW01	19-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		

Notes:

-- Not analysed

< - Less than laboratory limit of reporting

LOR - Laboratory limit of reporting

TRH - Total recoverable hydrocarbons

µg/L - Micrograms per litre

mg/L - Milligrams per litre

BTEX - Benzene, toluene, ethylbenzene, xylenes, naphthalene

Bold indicates a detection above the laboratory limit of reporting

Criteria:

Table C - Client Supplied Groundwater Data

Table C - Client Supplied Groundwater Data

Benzo[a]anthracene	Benz[a]pyrene	Benzo[b]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Beryllium	Beryllium	Bicarbonate, alkalinity	Boron	Boron	Bromobenzene	Bromodichloromethane	Bromoform	Bromomethane	C ₂₂ - C ₂₈ Fraction	C ₂₈ - C ₃₄ Fraction (sum)	C ₃₄ - C ₄₀ Fraction	C ₄₀ - C ₄₆ Fraction	C ₄₆ - C ₅₂ Fraction minus BTEX (F1)	C ₅₂ - C ₆₈ Fraction	Cadmium	Cadmium	Calcium	Carbon disulfide	Carbon tetrachloride	Carbone, alkalinity	Chloride	
µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	mg/L	µg/L	mg/L
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	45	-	1,930	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	1.93	553	< 5.0	< 5.0	< 1.0	2,000	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	0.1	48	-	767	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	542	45	< 5.0	< 5.0	< 1.0	1,910	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	-	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.23	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	1.36	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	577	-	165	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	187	< 5.0	< 5.0	< 1.0	741	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	165	-	165	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.19	533	< 5.0	< 5.0	< 1.0	3,940	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	143	-	1,630	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	1.45	467	< 5.0	< 5.0	< 1.0	633	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	799	-	162	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.07	219	< 5.0	< 5.0	< 1.0	3,660	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	144	-	1,740	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.08	534	< 5.0	< 5.0	< 1.0	659	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	280	-	902	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.1	486	< 5.0	< 5.0	< 1.0	959	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	133	-	2,340	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.13	554	< 5.0	< 5.0	< 1.0	652	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	27	-	1,000	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.14	608	< 5.0	< 5.0	< 1.0	548	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	455	-	1,620	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	298	< 5.0	< 5.0	< 1.0	769	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	-	< 5.0	< 5.0	< 1.0	-	

Table C - Client Supplied Groundwater Data

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Ionic Balance %	Isopropylbenzene	Lead	Lead	Magnesium	Manganese	Manganese	Mercury	meta- & para-Xylene	Molybdenum	Molybdenum	Naphthalene	n-Butylbenzene	Nickel	Nickel	o-Xylene	Pentachloroethane	Pentachlorophenol	Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	Phenanthrene	Phenol	Potassium	Propylbenzene	Pyrene	sec-Butylbenzene	Selenium	Selenium	Sodium	
	µg/L	mg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
1.15	< 5.0	-	4.3	641	-	2,460	< 0.0001	< 2.0	-	0.3	< 7.0	< 5.0	-	122	< 2.0	< 5.0	< 2.0	-	-	< 1.0	32	< 5.0	< 1.0	< 5.0	-	0.5	1,550		
0.78	< 5.0	-	0.6	509	-	3,200	< 0.0001	< 2.0	-	0.4	< 7.0	< 5.0	-	216	< 2.0	< 5.0	< 2.0	-	-	< 1.0	50	< 5.0	< 1.0	< 5.0	-	0.3	1,680		
-	< 5.0	-	17	-	-	-	< 0.0001	< 2.0	-	-	< 7.0	< 5.0	-	14	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-	
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
2.63	< 5.0	-	6.4	232	-	472	< 0.0001	< 2.0	-	1.9	< 7.0	< 5.0	-	8.9	< 2.0	< 5.0	< 2.0	-	-	< 1.0	13	< 5.0	< 1.0	< 5.0	-	< 0.2	1,170		
0.26	< 5.0	-	1.1	1,000	-	507	< 0.0001	< 2.0	-	1.1	< 7.0	< 5.0	-	10	< 2.0	< 5.0	< 2.0	-	-	< 1.0	33	< 5.0	< 1.0	< 5.0	-	1.3	3,280		
0.52	< 5.0	-	6.9	300	-	147	< 0.0001	< 2.0	-	0.8	< 7.0	< 5.0	-	11	< 2.0	< 5.0	< 2.0	-	-	< 1.0	15	< 5.0	< 1.0	< 5.0	-	0.2	870		
1.19	< 5.0	-	46	345	-	99	< 0.0001	< 2.0	-	3.6	< 7.0	< 5.0	-	6.7	< 2.0	< 5.0	< 2.0	-	-	< 1.0	31	< 5.0	< 1.0	< 5.0	-	0.9	2,180		
0.62	< 5.0	-	1.8	265	-	99	< 0.0001	< 2.0	-	2.9	< 7.0	< 5.0	-	9.0	< 2.0	< 5.0	< 2.0	-	-	< 1.0	26	< 5.0	< 1.0	< 5.0	-	0.3	776		
1.59	< 5.0	-	14	300	-	47	< 0.0001	< 2.0	-	1.8	< 7.0	< 5.0	-	7.6	< 2.0	< 5.0	< 2.0	-	-	< 1.0	35	< 5.0	< 1.0	< 5.0	-	3.0	1,460		
2.54	< 5.0	-	2.5	184	-	69	< 0.0001	< 2.0	-	0.4	< 7.0	< 5.0	-	5.9	< 2.0	< 5.0	< 2.0	-	-	< 1.0	27	< 5.0	< 1.0	< 5.0	-	0.2	776		
0.41	< 5.0	-	1.2	43	-	646	< 0.0001	< 2.0	-	0.6	< 7.0	< 5.0	-	227	< 2.0	< 5.0	< 2.0	-	-	< 1.0	23	< 5.0	< 1.0	< 5.0	-	2.1	429		
0.04	< 5.0	-	17	166	-	111	< 0.0001	< 2.0	-	1.2	< 7.0	< 5.0	-	7.9	< 2.0	< 5.0	< 2.0	-	-	< 1.0	6.0	< 5.0	< 1.0	< 5.0	-	0.3	799		
-	< 5.0	-	6.5	-	-	-	< 0.0001	< 2.0	-	-	< 7.0	< 5.0	-	4.5	< 2.0	< 5.0	< 2.0	-	-	< 1.0	5.9	-	< 5.0	< 1.0	-	-	-	-	

Table C - Client Supplied Groundwater Data

Styrene	Sulfate	Sum of BTEX chemicals	tert-Butylbenzene	Tetrachloroethylene	Thallium	Thallium	Titanium	Titanium	Toluene	Total Alkalinity as CaCO ₃	Total Anions	Total Cations	Total PAH	Total Polychlorinated biphenyls	trans-1,2-Dichloroethylene	trans-1,3-Dichloropropene	trans-1,4-Dichlorobutene	Trichloroethylene	Trichlorofluoromethane	Vanadium	Vanadium	Vinyl acetate	Vinyl chloride	Xylenes, total	Zinc	Zinc
µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	meq/L	meq/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L
< 5.0	4,220	< 1.0	< 5.0	-	0.3	-	-	-	< 2.0	45	145	148	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.5	< 50	< 2.0	-	60	
< 5.0	4,140	< 1.0	< 5.0	-	0.21	-	-	-	< 2.0	48	141	143	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.4	< 50	< 2.0	-	99	
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	23
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	2,070	< 1.0	< 5.0	-	< 0.02	-	-	-	< 2.0	577	76	80	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	1.0	< 50	< 2.0	-	21	
< 5.0	6,330	< 1.0	< 5.0	-	0.75	-	-	-	< 2.0	812	259	261	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	4.8	< 50	< 2.0	-	25	
< 5.0	3,310	< 1.0	< 5.0	-	0.69	-	-	-	< 2.0	143	91	92	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.5	< 50	< 2.0	-	21	
< 5.0	909	< 1.0	< 5.0	-	0.1	-	-	-	< 2.0	799	138	135	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	3.4	< 50	< 2.0	-	23	
< 5.0	2,900	< 1.0	< 5.0	-	0.04	-	-	-	< 2.0	144	82	83	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.3	< 50	< 2.0	-	17	
< 5.0	4,010	< 1.0	< 5.0	-	0.05	-	-	-	< 2.0	261	116	120	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.8	< 50	< 2.0	-	24	
< 5.0	2,140	< 1.0	< 5.0	-	0.07	-	-	-	< 2.0	189	68	70	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.2	< 50	< 2.0	-	6	
< 5.0	1,790	< 1.0	< 5.0	-	0.19	-	-	-	< 2.0	1	53	53	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.3	< 50	< 2.0	-	272	
< 5.0	1,570	< 1.0	< 5.0	-	0.03	-	-	-	< 2.0	455	64	63	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.7	< 50	< 2.0	-	25	
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	< 1.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	49	

Table B - Client Supplied Soil Data

Notes: MAX VALUE: 37 260 0.0 3,070 0.0 2,410 0.0 400 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

mol⁻¹ - Milligrams per litre
mg/kg - Milligrams per kilogram

$\mu\text{S/cm}$ - Microsiemens per centimeter
EC50% - Recovery time for cell lysis after 50% inhibition

DLAN = benzene, toluene, ethylbenzene, xylenes, naphthalene
Bold indicates a detection above the laboratory limit of reporting

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Isopropylbenzene	Isopropylbenzene	Lead	Lead	Lead	Magnesium	Manganese	Manganese	Manganese	Manganese	Mercury	Mercury	meta- & para-Xylene	meta- & para-Xylene	Moisture	Molybdenum	Molybdenum	Molybdenum	Naphthalene	Naphthalene	n-Butylbenzene	n-Butylbenzene	Nickel	Nickel	Nickel	Organic Matter	o-Xylene	o-Xylene	Particles < 0.075 mm	Particles Larger than 0.075 mm (No. 200 Sieve)	Particle Larger than 0.15 mm (No. 100 Sieve)	Particles Larger than 0.3 mm (No. 50 Sieve)		
		mg/kg	µg/L	mg/kg	mg/L	µg/L	mg/kg	mg/L	µg/L	mg/kg	mg/L	µg/L	mg/kg	µg/L	%	mg/kg	mg/L	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	%	mg/kg	µg/L	%	mg/kg	µg/L	%
-	-	59	-	-	-	-	1,500	-	-	< 0.1	-	< 0.5	-	13	4.0	-	-	< 1.0	-	-	-	49	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	34	-	-	-	-	920	-	-	< 0.1	-	< 0.5	-	19	3.0	-	-	< 1.0	-	-	-	34	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	19	-	-	-	-	244	-	-	< 0.1	-	< 0.5	-	14	2.0	-	-	< 1.0	-	-	-	24	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	13	-	-	-	-	227	-	-	< 0.1	-	< 0.5	-	18	2.0	-	-	< 1.0	-	-	-	26	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	25	-	-	-	-	251	-	-	< 0.1	-	< 0.5	-	5.9	< 2.0	-	-	< 1.0	-	-	-	12	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	17	-	-	-	-	14	-	-	< 0.1	-	< 0.5	-	13	< 2.0	-	-	< 1.0	-	-	-	3.0	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	13	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	11	-	-	-	< 1.0	-	-	-	16	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	6.0	-	-	-	-	-	-	-	0.1	-	< 0.5	-	12	-	-	-	< 1.0	-	-	-	12	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	11	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	18	-	-	-	< 1.0	-	-	-	17	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	14	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	7	-	-	-	< 1.0	-	-	-	22	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	18	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	14	-	-	-	< 1.0	-	-	-	14	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	82	7.0	13	12		
-	-	13	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	22	-	-	-	< 1.0	-	-	-	14	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	17	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	13	-	-	-	< 1.0	-	-	-	18	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	10	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	18	-	-	-	< 1.0	-	-	-	13	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	12	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	20	-	-	-	< 1.0	-	-	-	17	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	13	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	19	-	-	-	< 1.0	-	-	-	18	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	< 0.8	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	13	-	-	-	< 1.0	-	-	-	15	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	22	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	8.2	-	-	-	< 1.0	-	-	-	16	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	11	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	14	-	-	-	< 1.0	-	-	-	11	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	215	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	8.5	-	-	-	< 1.0	-	-	-	22	-	-	-	< 0.5	-	-	-	97	3.0	< 1.0	< 1.0
-	-	9.0	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	18	-	-	-	< 1.0	-	-	-	9.0	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	18	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	5.9	-	-	-	< 1.0	-	-	-	30	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	4	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	7.1	-	-	-	< 1.0	-	-	-	30	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	13	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	5.4	-	-	-	< 1.0	-	-	-	19	-	-	-	0.8	< 0.5	-	-	37	63	49	42
-	-	16	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	9.3	-	-	-	< 1.0	-	-	-	21	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	20	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	6.3	-	-	-	< 1.0	-	-	-	29	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	74	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	2.5	-	-	-	< 1.0	-	-	-	32	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	33	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	18	-	-	-	< 1.0	-	-	-	10	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	22	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	7.4	-	-	-	< 1.0	-	-	-	7.0	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	30	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	10	-	-	-	< 1.0	-	-	-	30	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	246	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	2.5	-	-	-	< 1.0	-	-	-	32	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	113	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	9.5	-	-	-	< 1.0	-	-	-	34	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	23	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	18	-	-	-	< 1.0	-	-	-	26	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	15	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	15	-	-	-	< 1.0	-	-	-	18	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	14	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	5.9	-	-	-	< 1.0	-	-	-	8.0	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	25	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	15	-	-	-	< 1.0	-	-	-	65	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	21	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	6.7	-	-	-	< 1.0	-	-	-	22	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	21	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	9.7	-	-	-	< 1.0	-	-	-	25	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	20	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	7.1	-	-	-	< 1.0	-	-	-	34	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	14	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	9.1	-	-	-	< 1.0	-	-	-	31	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	12	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	2.1	-	-	-	< 1.0	-	-	-	24	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	12	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	6.1	-	-	-	< 1.0	-	-	-	9.0	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	8.0	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	4.4	-	-	-	< 1.0	-	-	-	8.0	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	< 0.5	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	1.1	-	-	-	< 1.0	-	-	-	16	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	18	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	20	-	-	-	< 1.0	-	-	-	16	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	9.0	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	6.7	-	-	-	< 1.0	-	-	-	10	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	14	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	9.4	-	-	-	< 1.0	-	-	-	74	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	16	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	9.5	-	-	-	< 1.0	-	-	-	22	-	-	-	< 0.5	-	-	-	-	-	-	
-	-	20	-	-	-	-	-	-	-	< 0.1	-	< 0.5	-	18	-	-	-	< 1.0	-														

Table B - Client Supplied Soil Data

Table B - Client Supplied Soil Data

Table B - Client Supplied Soil Data

trans-1,3-Dichloropropene	trans-1,4-Dichloro-2-butene	trans-1,4-Dichloro-2-butene	Trichloroethylene	Trichloroethylene	Trichlorofluoromethane	Trichlorofluoromethane	Vanadium	Vanadium	Vanadium	Vinyl acetate	Vinyl acetate	Vinyl chloride	Vinyl chloride	Xylenes, total	Xylenes, total	Zinc	Zinc	Zinc	
µg/L	mg/kg	µg/L	mg/kg	µg/L	µg/L	mg/kg	mg/L	µg/L	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	mg/L	µg/L	
-	-	-	-	-	-	132	-	-	-	-	-	< 0.5	-	134	-	-	-	-	
-	-	-	-	-	-	81	-	-	-	-	-	< 0.5	-	117	-	-	-	-	
-	-	-	-	-	-	86	-	-	-	-	-	< 0.5	-	75	-	-	-	-	
-	-	-	-	-	-	35	-	-	-	-	-	< 0.5	-	54	-	-	-	-	
-	-	-	-	-	-	9.0	-	-	-	-	-	< 0.5	-	52	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	61	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	64	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	48	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	66	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	63	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	52	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	55	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	63	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	87	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	59	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	54	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	46	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	53	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	193	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	65	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	1,950	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	35	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	68	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	24	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	59	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	54	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	75	-	-	-	-	
-	< 0.5	-	< 5.0	-	-	-	-	-	-	< 5.0	-	< 5.0	-	95	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	60	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	228	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	54	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	339	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	29	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	2,800	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	1,220	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	150	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	101	-	-	-	-	
-	< 0.5	-	< 5.0	-	-	-	-	-	-	< 5.0	-	< 5.0	-	87	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	95	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	88	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	79	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	87	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	66	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	107	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	72	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	66	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	59	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	50	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	36	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	93	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	54	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	72	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	48	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	67	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	53	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	83	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	36	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	93	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	54	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	72	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	44	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	65	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	60	-	-	-	-	
-	< 5.0	-	< 5.0	-	-	50	-	< 0.01	-	< 50	-	< 50	-	60	-	-	-	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	24	-	-	-	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	80	-	-	-	-	-
-	< 5.0	-	< 5.0	-	-	50	-	-	-	< 5.0	-	< 5.0	-	72	-	-	-	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	0.6	-	-	84	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	53	-	-	52	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	62	-	-	74	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	135	-	-	37	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	24	-	-	24	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	164	-	-	112	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	48	-	-	109	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	13	-	-	61	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	55	-	-	34	-	-
-	< 0.5	-	< 0.5	-	-	46	-	-	-	< 5.0	-	< 5.0	-	115	-	-	51	-	-
-	< 0.5	-	< 0.5	-	-	33	-	-	-	< 5.0	-	< 5.0	-	116	-	-	62	-	-
-	< 0.5	-	< 0.5	-	-	50	-	-	-	< 5.0	-	< 5.0	-	55	-	-	53	-	-
-	< 0.5	-	< 0.5	-	-	16	-	-	-	< 5.0	-	< 5.0	-	44	-	-	63	-	-
-	< 0.5	-	< 0.5	-	-	14	-	-	-	< 5.0	-	< 5.0	-	9.0	-	-	54	-	-
-	< 0.5	-	< 0.5	-	-	66	-	-	-	< 5.0	-	< 5.0	-	117	-	-	60	-	-
-	< 0.5	-	< 0.5	-	-	59	-	-	-	< 5.0	-	< 5.0	-	52	-	-	84	-	-
-	< 0.5	-	< 0.5	-	-	46	-	-	-	< 5.0	-	< 5.0	-	61	-	-	75	-	-
-	< 0.5	-	< 0.5	-	-	63	-	-	-	< 5.0	-	< 5.0	-	53	-	-	55	-	-
-	< 0.5	-	< 0.5	-	-	55	-	-	-	< 5.0	-	< 5.0	-	63	-	-	63	-	-
-	< 0.5	-	< 0.5	-	-	40	-	-	-	< 5.0	-	< 5.0	-	56	-	-	56	-	-
-	< 0.5	-	< 0.5	-	-	-	-	-	-	-	-	-	< 0.5	-	52	-	-	-	-
-	< 0.5	-	< 0.5	-	-	-	-	-	-	-	-	-	&						

Table B - Client Supplied Soil Data

Table B - Client Supplied Soil Data

Table B - Client Supplied Soil Data

Table B - Client Supplied Soil Data

	Pentachloroethane	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,4-Dinitrotoluene	2,6-dichlorophenol	2,6-dinitrotoluene	2-chlorophenol	2-methylnaphthalene	2-methylphenol	2-naphthylamine	2-nitroaniline	3&4-Methylphenol (m & p-cresol)	4-(dimethylamino) azobenzene	4-chlorobiphenyl	4-bromophenyl phenyl ether	4-chloro-3-methylphenol	4-chloroaniline	4-nitroaniline	4-nitrophenol	7,12-dimethylbenz(a)anthracene	2-methyl-5-nitroaniline	a-BHC	b-BHC	Aldrin	Dieldrin	Aldrine	Anthracene	Benzof[b-h]fluoranthene	Benzof[b-j]fluoranthene	Benzof[k]anthracene	Benzof[k]fluoranthene	Bis(2-chloroisopropyl) ether	Bis(2-chloroethyl)ether	Bis(2-ethylhexyl) phthalate	Bromophos-ethyl	Butyl benzyl phthalate	Carbofuran		
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						
B_43_ESSD02	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5	1	1	1	0.5	1	1	0.5	2	1	0.5	1	1	0.5	1	100	0.1	0.1	0.5	1	1	0.1	0.1	0.5	5	0.2	0.5	0.5	0.5	0.5	0.5
B_43_ESSD02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_43_ESSD03	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5	1	1	1	0.5	1	1	0.5	2	1	0.5	1	1	0.5	1	100	0.1	0.1	0.5	1	1	0.1	0.1	0.5	5	0.2	0.5	0.5	0.5	0.5	0.5
B_43_ESSD03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_14_ESSD01	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5	1	1	1	0.5	1	1	0.5	2	1	0.5	1	1	0.5	1	100	0.1	0.1	0.5	1	1	0.1	0.1	0.5	5	0.2	0.5	0.5	0.5	0.5	0.5
B_14_ESSD01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_14_ESSD02	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5	1	1	1	0.5	1	1	0.5	2	1	0.5	1	1	0.5	1	100	0.1	0.1	0.5	1	1	0.1	0.1	0.5	5	0.2	0.5	0.5	0.5	0.5	0.5
B_21_ESMW02	0.5-0.5	30-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_21_ESMW02	3-3	30-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_22_ESSB02	0.5-0.5	30-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_22_ESSB02	1-1	30-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_19_ESMW02	0.1-0.1	31-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_19_ESMW02	6-6	31-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_21_ESMW01	0.1-0.1	31-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_21_ESMW01	1-1	31-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_23_ESSB01	0.5-0.5	31-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_23_ESSB01	2-2	31-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_23_ESSB02	1-1	31-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_23_ESSB02	3-3	31-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_14_ESTP01	0-0.05	01-Sep-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_14_ESTP01	0.2-0.2	01-Sep-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_14_ESTP03	0.1-0.1	01-Sep-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_14_ESTP03	0.4-0.4	01-Sep-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_14_ESTP04	0.8-0.8	01-Sep-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_14_ESTP04	1.35-1.35	01-Sep-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_14_ESTP01	0-0.05	01-Sep-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_10_ESMW01	1.4-1.4	03-Sep-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_10_ESMW01	4-4	03-Sep-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B_10_ESMW02	0.21-0.21	03																																							

Table B - Client Supplied Soil Data

Table B - Client Supplied Soil Data

Table B - Client Supplied Soil Data

Location_Code	Sample_Depth_Range	Sampled_Date_Time	pH	Electrical conductivity *(lab)	Salinity	TOC	Perfluorooctane sulfonate	Perfluorooctanoic acid (PFOS)
			pH Units	us/cm				
			mg/kg	mg/kg				
B_43_ESSD02		07-Jul-15	-	-	-	-	-	-
B_43_ESSD02		07-Jul-15	7.8	330	1100	-	-	-
B_43_ESSD03		08-Jul-15	-	-	-	-	-	-
B_43_ESSD03		08-Jul-15	7.5	420	1400	-	-	-
B_14_ESSD01		14-Jul-15	-	-	-	-	-	-
B_14_ESSD01		14-Jul-15	7.1	70	230	-	-	-
B_14_ESSD02		14-Jul-15	6.8	130	440	-	-	-
B_21_ESMW02	0.5-0.5	30-Aug-15	-	200	670	-	-	-
B_21_ESMW02	3-3	30-Aug-15	-	490	1600	-	-	-
B_22_ESSB02	0.5-0.5	30-Aug-15	-	350	1100	-	-	-
B_22_ESSB02	1-1	30-Aug-15	-	690	2300	-	-	-
B_19_ESMW02	0.1-0.1	31-Aug-15	-	360	1200	-	-	-
B_19_ESMW02	6-6	31-Aug-15	-	880	2900	-	-	-
B_21_ESMW01	0.1-0.1	31-Aug-15	-	120	400	-	-	-
B_21_ESMW01	1-1	31-Aug-15	-	870	2800	-	-	-
B_23_ESSB01	0.5-0.5	31-Aug-15	-	2900	9500	-	-	-
B_23_ESSB01	2-2	31-Aug-15	-	610	2000	-	-	-
B_23_ESSB02	1-1	31-Aug-15	-	2000	6600	-	-	-
B_23_ESSB02	3-3	31-Aug-15	-	540	1700	-	-	-
B_14_ESTP01	0-0.05	01-Sep-15	-	43	140	-	-	-
B_14_ESTP01	0.2-0.2	01-Sep-15	-	120	380	-	-	-
B_14_ESTP03	0.1-0.1	01-Sep-15	-	31	100	-	-	-
B_14_ESTP03	0.4-0.4	01-Sep-15	-	310	1000	-	-	-
B_14_ESTP04	0.8-0.8	01-Sep-15	-	1900	6100	-	-	-
B_14_ESTP04	1.35-1.35	01-Sep-15	-	2500	8200	-	-	-
B_14_ESTP01	0-0.05	01-Sep-15	-	-	-	-	-	-
B_10_ESMW01	1.4-1.4	03-Sep-15	-	400	1300	-	-	-
B_10_ESMW01	4-4	03-Sep-15	-	1200	4000	-	-	-
B_10_ESMW02	0.21-0.21	03-Sep-15	-	120	370	-	-	-
B_10_ESMW02	1-1	03-Sep-15	-	1200	3900	-	-	-
B_47_ESSB01	0.1-0.1	06-Sep-15	-	130	430	-	-	-
B_47_ESSB01	1-1	06-Sep-15	-	210	680	-	-	-
B_47_ESSB03	0.1-0.1	06-Sep-15	-	140	450	-	-	-
B_47_ESSB03	1-1	06-Sep-15	-	800	2600	-	-	-
B_49_ESSB01	0.1-0.1	10-Sep-15	-	10	32	-	-	-
B_49_ESSB01	1-1	10-Sep-15	-	600	2000	-	-	-
B_62_ESSB06	0.1-0.1	25-Sep-15	-	190	630	-	-	-
B_62_ESSB06	2-2	25-Sep-15	-	200	660	-	-	-
B_61_ESSB01	0.1-0.1	07-Oct-15	-	290	940	-	-	-
B_61_ESSB01	0.5-0.5	07-Oct-15	-	860	2800	-	-	-
B_61_ESSB02	0.1-0.1	07-Oct-15	-	660	2100	-	-	-
B_61_ESSB02	2-2	07-Oct-15	-	910	3000	-	-	-
B_61_ESSB03	0.1-0.1	07-Oct-15	-	99	320	-	-	-
B_61_ESSB03	2.4-2.4	07-Oct-15	-	180	580	-	-	-
B_61_ESSB04	0.1-0.1	07-Oct-15	-	1000	3400	-	-	-
B_61_ESSB04	2-2	07-Oct-15	-	830	2700	-	-	-
B_61_ESSB05	0.5-0.5	07-Oct-15	-	700	2300	-	-	-
B_61_ESSB05	3-3	07-Oct-15	-	930	3000	-	-	-
B_61_ESSB06	0.1-0.1	07-Oct-15	-	62	200	-	-	-
B_61_ESSB06	2-2	07-Oct-15	-	720	2300	-	-	-
B_58_ESMW01	0.1-0.1	13-Oct-15	-	250	810	-	-	-
B_58_ESMW01	3-3	13-Oct-15	-	670	2200	-	-	-
B_43_ESSB03	0-0.02	14-Oct-15	7.2	280	900	-	-	-
B_11_ESMW03	0.1-0.1	12-Jan-16	-	-	-	-	-	-
B_11_ESMW03	1-1	12-Jan-16	-	-	-	-	-	-
B_11_ESMW04	0.1-0.1	12-Jan-16	-	-	-	-	-	-
B_11_ESMW04	1-1	12-Jan-16	-	-	-	-	-	-
B_11_ESMW05	0.1-0.1	12-Jan-16	-	-	-	-	-	-
B_11_ESMW05	3-3	12-Jan-16	-	-	-	-	-	-
B_148_ESMW01	0.1-0.1	12-Jan-16	-	1500	4900	-	-	-
B_148_ESMW01	2-2	12-Jan-16	-	1100	3600	-	-	-
B_148_ESMW02	0.1-0.1	12-Jan-16	-	200	650	-	-	-
B_148_ESMW02	2-2	12-Jan-16	-	1400	4600	-	-	-

Table B – Client Supplied Soil Data

Fire Fighting Training Area -PFAS Investigation Results

	PFAS	
	Perfluorooctanoic Acid (PFOA) µg/L	Perfluorooctane sulfonate (PFOS) µg/L
EQL	0.05	0.05
EnRiskS (2016) Trigger Point 3 - Low Level of Contamination	0.05	0.05

Site_ID	Location_Code	Sampled_Date_Time		
15092_Bayswater	B_11_ESMW01	14/01/2016	<0.05	<0.05
15092_Bayswater	B_11_ESMW03	20/01/2016	<0.05	<0.05
15092_Bayswater	B_11_ESMW04	20/01/2016	<0.05	<0.05
15092_Bayswater	B_11_ESMW05	20/01/2016	<0.05	<0.05
15092_Bayswater	B_12_ESMW01	14/01/2016	<0.05	<0.05
15092_Bayswater	B_45_ESMW02	14/01/2016	<0.05	<0.05
15092_Bayswater	BAW_11_ESMW03	14/01/2016	<0.05	<0.05
15092_Bayswater	BAW_12_ESMW03	14/01/2016	<0.05	<0.05
15092_Bayswater	BG_MW03	14/01/2016	<0.05	<0.05
15092_Bayswater	BG_MW04	14/01/2016	<0.05	<0.05
15092_Bayswater	BG_MW04	14/01/2016	<0.05	<0.05

Statistical Summary

Number of Results	16	16
Number of Detects	0	0
Minimum Concentration	<0.05	<0.05
Minimum Detect	<0.05	<0.05
Maximum Concentration	<0.05	<0.05
Maximum Detect	<0.05	<0.05
Average Concentration	<0.05	<0.05
Median Concentration	<0.05	<0.05
Standard Deviation	0	0
Number of Guideline Exceedances	0	0
Number of Guideline Exceedances(Detects Only)	0	0

Table B – Client Supplied Soil Data

Fire Fighting Training Area -PFAS Investigation Results

	Perfluorooctanoate (PFOA)	Perfluorooctane sulfonate (PFOS)
	mg/kg	mg/kg
EQL	0.0005	
DoH WA (2016) Human Health - Industrial		100
Dept of Defence Directive #8 Interim Screening Criteria - Commercial Industrial	240	
Dept of Defence Directive #8 Interim Screening Criteria - Ecological	3.73	0.373

Site_ID	Location_Code	Field_ID	Sampled_Date_Time		
15092_Bayswater	B_11_ESMW02		13/01/2016	<0.01	<0.01
15092_Bayswater	B_11_ESMW02		13/01/2016	<0.01	<0.01
15092_Bayswater	B_11_ESMW03		13/01/2016	<0.01	<0.01
15092_Bayswater	B_11_ESMW03		13/01/2016	0.02	0.05
15092_Bayswater	B_11_ESMW04		13/01/2016	<0.01	0.01
15092_Bayswater	B_11_ESMW04		13/01/2016	<0.01	<0.01

Statistical Summary

Number of Results	6	6
Number of Detects	1	2
Minimum Concentration	<0.01	<0.01
Minimum Detect	0.02	0.01
Maximum Concentration	0.02	0.05
Maximum Detect	0.02	0.05
Average Concentration	0.0075	0.013
Median Concentration	0.005	0.005
Standard Deviation	0.0061	0.018
Number of Guideline Exceedances	0	0
Number of Guideline Exceedances(Detects Only)	0	0

Table C - Client Supplied Groundwater Data

Analyte	>C ₁₀ - C ₁₂ Fraction	>C ₁₃ - C ₁₆ Fraction (sum)	>C ₁₆ - C ₁₈ Fraction	>C ₁₈ - C ₂₀ Fraction	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloropropylene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,4-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
Sample Name	Sample Date																					
BA_MW01	11-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BA_MW03	11-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW01	12-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW03	12-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW04	04-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW05	04-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW06	04-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BE_MW08	05-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW05	12-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW07	09-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW08	09-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW09	09-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW10	10-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BD_MW13	10-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
BT_MW01	19-Dec-13	< 100	< 100	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		

Notes:

-- Not analysed

< - Less than laboratory limit of reporting

LOR - Laboratory limit of reporting

TRH - Total recoverable hydrocarbons

µg/L - Micrograms per litre

mg/L - Milligrams per litre

BTEX - Benzene, toluene, ethylbenzene, xylenes, naphthalene

Bold indicates a detection above the laboratory limit of reporting

Criteria:

Table C - Client Supplied Groundwater Data

Table C - Client Supplied Groundwater Data

Benzo[a]anthracene	Benz[a]pyrene	Benzo[b]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Beryllium	Beryllium	Bicarbonate, alkalinity	Boron	Boron	Bromobenzene	Bromodichloromethane	Bromoform	Bromomethane	C ₂₂ - C ₂₈ Fraction	C ₂₈ - C ₃₄ Fraction (sum)	C ₃₄ - C ₄₀ Fraction	C ₄₀ - C ₄₆ Fraction	C ₄₆ - C ₅₂ Fraction minus BTEX (F1)	C ₅₂ - C ₆₈ Fraction	Cadmium	Cadmium	Calcium	Carbon disulfide	Carbon tetrachloride	Carbone, alkalinity	Chloride	
µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	mg/L	µg/L	mg/L
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	45	-	1,930	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	1.93	553	< 5.0	< 5.0	< 1.0	2,000	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	0.1	48	-	767	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	542	45	< 5.0	< 5.0	< 1.0	1,910	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	-	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.23	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	1.36	-	< 5.0	< 5.0	< 1.0	-	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	577	-	165	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	187	< 5.0	< 5.0	< 1.0	741	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	143	-	163	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.19	533	< 5.0	< 5.0	< 1.0	3,940	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	143	-	1,630	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	1.45	457	< 5.0	< 5.0	< 1.0	633	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	799	-	162	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.07	219	< 5.0	< 5.0	< 1.0	3,660	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	144	-	1,740	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.08	534	< 5.0	< 5.0	< 1.0	659	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	280	-	902	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.1	486	< 5.0	< 5.0	< 1.0	959	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	133	-	2,340	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.13	554	< 5.0	< 5.0	< 1.0	652	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	27	-	3,230	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.14	608	< 5.0	< 5.0	< 1.0	548	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	< 0.1	455	-	1,620	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	298	< 5.0	< 5.0	< 1.0	769	
< 1.0	< 0.5	< 1.0	< 1.0	< 1.0	-	-	-	-	-	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 20	< 20	-	0.05	-	< 5.0	< 5.0	< 1.0	-	

Table C - Client Supplied Groundwater Data

Table C - Client Supplied Groundwater Data

Ionic Balance %	Isopropylbenzene	Lead	Lead	Magnesium	Manganese	Manganese	Mercury	meta- & para-Xylene	Molybdenum	Molybdenum	Naphthalene	n-Butylbenzene	Nickel	Nickel	o-Xylene	Pentachloroethane	Pentachlorophenol	Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	Phenanthrene	Phenol	Potassium	Propylbenzene	Pyrene	sec-Butylbenzene	Selenium	Selenium	Sodium
	µg/L	mg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1.15	< 5.0	-	4.3	641	-	2,460	< 0.0001	< 2.0	-	0.3	< 7.0	< 5.0	-	122	< 2.0	< 5.0	< 2.0	-	-	< 1.0	32	< 5.0	< 1.0	< 5.0	-	0.5	1,550	
0.78	< 5.0	-	0.6	509	-	3,200	< 0.0001	< 2.0	-	0.4	< 7.0	< 5.0	-	216	< 2.0	< 5.0	< 2.0	-	-	< 1.0	50	< 5.0	< 1.0	< 5.0	-	0.3	1,680	
-	< 5.0	-	17	-	-	-	< 0.0001	< 2.0	-	-	< 7.0	< 5.0	-	14	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
-	< 5.0	-	-	-	-	-	-	< 2.0	-	-	< 7.0	< 5.0	-	-	< 2.0	< 5.0	< 2.0	-	-	< 1.0	-	53	< 5.0	< 1.0	< 5.0	-	-	-
2.63	< 5.0	-	6.4	232	-	472	< 0.0001	< 2.0	-	1.9	< 7.0	< 5.0	-	8.9	< 2.0	< 5.0	< 2.0	-	-	< 1.0	1.0	13	< 5.0	< 1.0	< 5.0	-	< 0.2	1,170
0.26	< 5.0	-	1.1	1,000	-	507	< 0.0001	< 2.0	-	1.1	< 7.0	< 5.0	-	10	< 2.0	< 5.0	< 2.0	-	-	< 1.0	33	< 5.0	< 1.0	< 5.0	-	1.3	3,280	
0.52	< 5.0	-	6.9	300	-	147	< 0.0001	< 2.0	-	0.8	< 7.0	< 5.0	-	11	< 2.0	< 5.0	< 2.0	-	-	< 1.0	15	< 5.0	< 1.0	< 5.0	-	0.2	850	
1.19	< 5.0	-	46	345	-	99	< 0.0001	< 2.0	-	3.6	< 7.0	< 5.0	-	6.7	< 2.0	< 5.0	< 2.0	-	-	< 1.0	31	< 5.0	< 1.0	< 5.0	-	0.9	2,180	
0.62	< 5.0	-	1.8	265	-	99	< 0.0001	< 2.0	-	2.9	< 7.0	< 5.0	-	9.0	< 2.0	< 5.0	< 2.0	-	-	< 1.0	26	< 5.0	< 1.0	< 5.0	-	0.3	776	
1.59	< 5.0	-	14	300	-	47	< 0.0001	< 2.0	-	1.8	< 7.0	< 5.0	-	7.6	< 2.0	< 5.0	< 2.0	-	-	< 1.0	35	< 5.0	< 1.0	< 5.0	-	3.0	1,460	
2.54	< 5.0	-	2.5	184	-	69	< 0.0001	< 2.0	-	0.4	< 7.0	< 5.0	-	5.9	< 2.0	< 5.0	< 2.0	-	-	< 1.0	27	< 5.0	< 1.0	< 5.0	-	0.2	776	
0.41	< 5.0	-	1.2	43	-	646	< 0.0001	< 2.0	-	0.6	< 7.0	< 5.0	-	227	< 2.0	< 5.0	< 2.0	-	-	< 1.0	23	< 5.0	< 1.0	< 5.0	-	2.1	429	
0.04	< 5.0	-	17	166	-	111	< 0.0001	< 2.0	-	1.2	< 7.0	< 5.0	-	7.9	< 2.0	< 5.0	< 2.0	-	-	< 1.0	6.0	< 5.0	< 1.0	< 5.0	-	0.3	799	
-	< 5.0	-	6.5	-	-	-	< 0.0001	< 2.0	-	-	< 7.0	< 5.0	-	4.5	< 2.0	< 5.0	< 2.0	-	-	< 1.0	5.9	-	< 5.0	< 1.0	-	-	-	

Table C - Client Supplied Groundwater Data

Styrene	Sulfate	Sum of BTEX chemicals	tert-Butylbenzene	Tetrachloroethylene	Thallium	Thallium	Titanium	Titanium	Toluene	Total Alkalinity as CaCO ₃	Total Anions	Total Cations	Total PAH	Total Polychlorinated biphenyls	trans-1,2-Dichloroethylene	trans-1,3-Dichloropropene	trans-1,4-Dichlorobutene	Trichloroethylene	Trichlorofluoromethane	Vanadium	Vanadium	Vinyl acetate	Vinyl chloride	Xylenes, total	Zinc	Zinc
µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	meq/L	meq/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L
< 5.0	4,220	< 1.0	< 5.0	-	0.3	-	-	-	< 2.0	45	145	148	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.5	< 50	< 2.0	-	60	
< 5.0	4,140	< 1.0	< 5.0	-	0.21	-	-	-	< 2.0	48	141	143	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.4	< 50	< 2.0	-	99	
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	23
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	-
< 5.0	2,070	< 1.0	< 5.0	-	< 0.02	-	-	-	< 2.0	577	76	80	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	1.0	< 50	< 2.0	-	21	
< 5.0	6,330	< 1.0	< 5.0	-	0.75	-	-	-	< 2.0	812	259	261	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	4.8	< 50	< 2.0	-	25	
< 5.0	3,310	< 1.0	< 5.0	-	0.69	-	-	-	< 2.0	143	91	92	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.5	< 50	< 2.0	-	21	
< 5.0	909	< 1.0	< 5.0	-	0.1	-	-	-	< 2.0	799	138	135	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	3.4	< 50	< 2.0	-	23	
< 5.0	2,900	< 1.0	< 5.0	-	0.04	-	-	-	< 2.0	144	82	83	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.3	< 50	< 2.0	-	17	
< 5.0	4,010	< 1.0	< 5.0	-	0.05	-	-	-	< 2.0	261	116	120	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.8	< 50	< 2.0	-	24	
< 5.0	2,150	< 1.0	< 5.0	-	0.07	-	-	-	< 2.0	189	68	70	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.2	< 50	< 2.0	-	6	
< 5.0	1,790	< 1.0	< 5.0	-	0.19	-	-	-	< 2.0	1	53	53	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.3	< 50	< 2.0	-	272	
< 5.0	1,570	< 1.0	< 5.0	-	0.03	-	-	-	< 2.0	455	64	63	< 0.5	-	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	0.7	< 50	< 2.0	-	25	
< 5.0	-	< 1.0	< 5.0	-	-	-	-	-	< 2.0	-	-	-	< 0.5	< 1.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 50	< 2.0	-	-	49	

Table C - Client Supplied Groundwater Data

Site_ID	Field_ID	Sampled_Date_Ti	Project_ID	SampleCode	SDG	EW_APHA2510		EW_APHA3112B		EW_APHA3112B_TOT		EW_APHA4110		EW_APHA4500H		EW_APHA4500NO2B_DA		PHA4500NORC	
						Electrical conductivity *(lab)	Electrical conductivity *(lab) (Filtered)	Salinity	Salinity (Filtered)	Mercury (Filtered)	Mercury	Nitrate [as N] (Filtered)	pH [Lab]	pH (Lab) (Filtered)	Nitrite [as N] (Filtered)	Kjeldahl Nitrogen Total	Nitrogen (Total)		
uS/cm	uS/cm	mg/L	mg/L	µg/L	µg/L	mg/L	pH_Units	pH_Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
EQL						2	2	2	2	0.05	0.05	0.005	0	0	0.005	0.05	0.05		
15092_Bayswater	BE_MW04	25-Jun-15	15092	SE140862-1_BE_MW04	SE140862-1	-	3800	-	2500	0.08	<0.05	<0.025	-	-	<0.005	0.32	0.32		
15092_Bayswater	BE_MW05	25-Jun-15	15092	SE140862-1_BE_MW05	SE140862-1	-	4100	-	2700	<0.05	<0.05	<0.025	-	-	<0.005	0.41	0.41		
15092_Bayswater	BE_MW06	25-Jun-15	15092	SE140862-1_BE_MW06	SE140862-1	-	6600	-	4300	<0.05	<0.05	<0.025	-	-	<0.005	0.39	0.39		
15092_Bayswater	BE_MW07	25-Jun-15	15092	SE140862-1_BE_MW07	SE140862-1	-	9800	-	6400	<0.05	<0.05	<0.05	-	-	<0.005	0.33	0.33		
15092_Bayswater	BE_MW08	25-Jun-15	15092	SE140862-1_BE_MW08	SE140862-1	-	5000	-	3300	<0.05	<0.05	<0.025	-	-	<0.005	0.31	0.31		
15092_Bayswater	BO_MW05	25-Jun-15	15092	SE140862-1_BO_MW05	SE140862-1	-	4800	-	3100	<0.05	<0.05	<0.025	-	-	<0.005	0.15	0.15		
15092_Bayswater	BP_MW01	24-Jun-15	15092	SE140862-1_BP_MW01	SE140862-1	-	1700	-	1100	<0.05	<0.05	<0.01	-	-	<0.005	1.2	1.2		
15092_Bayswater	BP_MW03	24-Jun-15	15092	SE140862-1_BP_MW03	SE140862-1	-	4500	-	2900	<0.05	<0.05	<0.025	-	-	<0.005	0.92	0.92		
15092_Bayswater	BP_MW04	24-Jun-15	15092	SE140862-1_BP_MW04	SE140862-1	-	5300	-	3400	<0.05	0.25	<0.025	-	-	<0.005	6.6	6.6		
15092_Bayswater	BP_MW05	24-Jun-15	15092	SE140862-1_BP_MW05	SE140862-1	-	6200	-	4000	<0.05	<0.05	<0.025	-	-	<0.005	2.6	2.6		
15092_Bayswater	BQ_MW08	25-Jun-15	15092	SE140862-1_BQ_MW08	SE140862-1	-	3800	-	2500	<0.05	<0.05	<0.025	-	-	<0.005	0.23	0.23		
15092_Bayswater	BQ_MW13	25-Jun-15	15092	SE140862-1_BQ_MW13	SE140862-1	-	4100	-	2700	<0.05	<0.05	<0.025	-	-	<0.005	0.35	0.35		
15092_Bayswater	BA_MW01	26-Jun-15	15092	SE140863-1_BA_MW01	SE140863-1	-	8900	-	5800	<0.1	<0.1	<0.05	-	-	<0.005	0.53	0.53		
15092_Bayswater	BA_MW03	26-Jun-15	15092	SE140863-1_BA_MW03	SE140863-1	-	9400	-	6100	<0.1	<0.1	0.086	-	-	<0.005	0.28	0.36		
15092_Bayswater	BQ_MW07	29-Jun-15	15092	SE140988-1_BQ_MW07	SE140988-1	-	12,000	-	7800	<0.1	0.7	0.73	-	7.6	0.006	-	-		
15092_Bayswater	BQ_MW11	29-Jun-15	15092	SE140988-1_BQ_MW11	SE140988-1	-	11,000	-	7400	<0.1	<0.1	3.8	-	7.9	<0.005	-	-		
15092_Bayswater	BT_MW01	29-Jun-15	15092	SE140988-1_BT_MW01	SE140988-1	-	5700	-	3700	<0.1	<0.1	1.5	-	8.1	<0.005	-	-		
15092_Bayswater	BQ_MW02	30-Jun-15	15092	SE141051-1_BQ_MW02	SE141051-1	-	13,000	-	8700	<0.05	<0.05	0.15	-	7.1	<0.005	-	-		
15092_Bayswater	BQ_MW03	30-Jun-15	15092	SE141051-1_BQ_MW03	SE141051-1	-	3700	-	2400	<0.05	<0.05	<0.025	-	6.3	<0.005	-	-		
15092_Bayswater	B_19_ESMW02	14-Jul-15	15092	SE141521-1_B_19_ESMW02	SE141521-1	-	8800	-	5700	<0.05	<0.05	<0.01	-	3.9	<0.005	-	-		
15092_Bayswater	B_10_ESMW01	29-Sep-15	15092	SE144264-1_B_10_ESMW01	SE144264-1	18,000	-	12,000	-	<0.05	<0.05	<0.1	5.7	-	<0.005	-	-		
15092_Bayswater	B_10_ESMW03	29-Sep-15	15092	SE144264-1_B_10_ESMW03	SE144264-1	-	-	-	-	-	-	-	-	-	-	-	-		

Table C - Client Supplied Groundwater Data

Table C - Client Supplied Groundwater Data

EQI	0A_DIS				EW_EPA6020A_TOT												EW_EPA8082												
	Lead (Filtered)	Nickel (Filtered)	Selenium (Filtered)	Zinc (Filtered)	Arsenic	Boron	Cadmium	Chromium (III+VI)	Copper	Lead	Nickel	Selenium	Zinc	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1268	Arochlor 1248	Arochlor 1254	Arochlor 1260	Arochlor 1262	PCBs (Sum of total)	Total PAH (18)					
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
	1	1	1	5	1	5	0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.001	1	0.1	1	1	5	0.1

Site_ID	Field_ID	Sampled_Date_Ti	Project_ID	SampleCode	SDG																							
15092_Bayswater	BE_MW04	25-Jun-15	15092	SE140862-1_BE_MW04	SE140862-1	<1	20	<1	42	<1	310	0.4	<1	<1	1	21	<1	35	-	-	-	-	-	-	-	-	-	
15092_Bayswater	BE_MW05	25-Jun-15	15092	SE140862-1_BE_MW05	SE140862-1	<1	15	<1	40	30	190	<0.1	1	<1	65	17	<1	51	-	-	-	-	-	-	-	-	-	
15092_Bayswater	BE_MW06	25-Jun-15	15092	SE140862-1_BE_MW06	SE140862-1	<1	8	<1	17	4	400	<0.1	<1	<1	11	8	<1	34	-	-	-	-	-	-	-	-	-	
15092_Bayswater	BE_MW07	25-Jun-15	15092	SE140862-1_BE_MW07	SE140862-1	<1	5	<1	120	5	340	<0.1	<1	<1	26	5	<1	92	-	-	-	-	-	-	-	-	-	
15092_Bayswater	BE_MW08	25-Jun-15	15092	SE140862-1_BE_MW08	SE140862-1	2	210	46	490	8	70	1	<1	10	2	220	45	530	-	-	-	-	-	-	-	-	-	
15092_Bayswater	BO_MW05	25-Jun-15	15092	SE140862-1_BO_MW05	SE140862-1	<1	6	<1	72	<1	270	<0.1	<1	<1	2	7	<1	39	-	-	-	-	-	-	-	-	-	
15092_Bayswater	BP_MW01	24-Jun-15	15092	SE140862-1_BP_MW01	SE140862-1	<1	18	2	110	1	320	<0.1	<1	2	5	17	2	110	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BP_MW03	24-Jun-15	15092	SE140862-1_BP_MW03	SE140862-1	<1	15	1	65	2	560	<0.1	<1	1	11	15	1	72	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BP_MW04	24-Jun-15	15092	SE140862-1_BP_MW04	SE140862-1	<1	60	<1	79	3	98	0.4	7	15	50	99	6	71	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BP_MW05	24-Jun-15	15092	SE140862-1_BP_MW05	SE140862-1	<1	110	2	79	37	120	0.2	1	1	44	110	2	91	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BQ_MW08	25-Jun-15	15092	SE140862-1_BQ_MW08	SE140862-1	<1	6	<1	35	<1	3500	0.2	<1	2	1	7	<1	54	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BQ_MW13	25-Jun-15	15092	SE140862-1_BQ_MW13	SE140862-1	<1	6	<1	32	<1	2500	<0.1	<1	2	6	8	<1	29	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BA_MW01	26-Jun-15	15092	SE140863-1_BA_MW01	SE140863-1	<1	110	<1	67	<1	2300	2.5	<1	1	<1	130	<1	95	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BA_MW03	26-Jun-15	15092	SE140863-1_BA_MW03	SE140863-1	<1	200	<1	110	<1	1200	2.6	<1	<1	<1	220	<1	130	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BQ_MW07	29-Jun-15	15092	SE140988-1_BQ_MW07	SE140988-1	<1	18	14	52	65	760	5.3	250	500	830	380	62	1500	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BQ_MW11	29-Jun-15	15092	SE140988-1_BQ_MW11	SE140988-1	<1	3	<1	40	1	430	<0.1	1	1	3	4	<1	51	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BT_MW01	29-Jun-15	15092	SE140988-1_BT_MW01	SE140988-1	<1	37	1	34	<1	350	<0.1	2	6	8	39	2	73	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BQ_MW02	30-Jun-15	15092	SE141051-1_BQ_MW02	SE141051-1	<1	12	<1	42	<1	290	0.2	<1	<1	<1	9	<1	63	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	BQ_MW03	30-Jun-15	15092	SE141051-1_BQ_MW03	SE141051-1	<1	7	3	67	<1	1900	<0.1	<1	1	<1	7	<1	91	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	B_19_ESSMW02	14-Jul-15	15092	SE141521-1_B_19_ESSMW02	SE141521-1	2	270	25	810	67	520	0.6	80	120	71	250	45	1300	-	-	-	-	-	-	-	-	-	-
15092_Bayswater	B_10_ESMW01	29-Sep-15	15092	SE144264-1_B_10_ESMW01	SE144264-1	<1	99	3	43	1	310	0.7	1	3	<1	100	3	46	<1	<1	<1	<0.1	<0.001	<1	<0.1	<1	<1	<5
15092_Bayswater	B_10_ESMW03	29-Sep-15	15092	SE144264-1_B_10_ESMW03	SE144264-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C - Client Supplied Groundwater Data

Table C - Client Supplied Groundwater Data

Table C - Client Supplied Groundwater Data

Table C - Client Supplied Groundwater Data

Site_ID	Field_ID	Sampled_Date_Ti	Project_ID	SampleCode	SDG	Groundwater Data (µg/L)														EW_EPA8260_B	EW_INHOUSE_NH3_DA					
						Styrene	Trichloroethene	tert-butylbenzene	Tetrachloroethene	Toluene	Ethylbenzene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl acetate	Trichlorofluoromethane	Vinyl chloride	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C6-C10	>C6-C10 less BTEX (F1)	C6-C9	Benzene		
15092_Bayswater	BE_MW04	25-Jun-15	15092	SE140862-1_BE_MW04	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BE_MW05	25-Jun-15	15092	SE140862-1_BE_MW05	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BE_MW06	25-Jun-15	15092	SE140862-1_BE_MW06	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BE_MW07	25-Jun-15	15092	SE140862-1_BE_MW07	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BE_MW08	25-Jun-15	15092	SE140862-1_BE_MW08	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BO_MW05	25-Jun-15	15092	SE140862-1_BO_MW05	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BP_MW01	24-Jun-15	15092	SE140862-1_BP_MW01	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BP_MW03	24-Jun-15	15092	SE140862-1_BP_MW03	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BP_MW04	24-Jun-15	15092	SE140862-1_BP_MW04	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BP_MW05	24-Jun-15	15092	SE140862-1_BP_MW05	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BP_MW08	25-Jun-15	15092	SE140862-1_BO_MW08	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BO_MW13	25-Jun-15	15092	SE140862-1_BO_MW13	SE140862-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BA_MW01	26-Jun-15	15092	SE140863-1_BA_MW01	SE140863-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BA_MW03	26-Jun-15	15092	SE140863-1_BA_MW03	SE140863-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	
15092_Bayswater	BQ_MW07	29-Jun-15	15092	SE140988-1_BQ_MW07	SE140988-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	0.48	
15092_Bayswater	BQ_MW11	29-Jun-15	15092	SE140988-1_BQ_MW11	SE140988-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	0.12	
15092_Bayswater	BT_MW01	29-Jun-15	15092	SE140988-1_BT_MW01	SE140988-1	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	0.11
15092_Bayswater	BQ_MW02	30-Jun-15	15092	SE141051-1_BQ_MW02	SE141051-1	-	-	-	-	0.8	<0.5	-	-	-	-	-	-	-	-	-	<50	<50	<40	<0.5	0.34	
15092_Bayswater	BQ_MW03	30-Jun-15	15092	SE141051-1_BQ_MW03	SE141051-1	-	-	-	-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	<50	<50	<40	<0.5	0.45	
15092_Bayswater	B_19_ESSMW02	14-Jul-15	15092	SE141521-1_B_19_ESSMW02	SE141521-1	-	-	-	-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	<50	<50	<40	<0.5	0.23	
15092_Bayswater	B_10_ESMW01	29-Sep-15	15092	SE144264-1_B_10_ESMW01	SE144264-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	0.36	
15092_Bayswater	B_10_ESMW03	29-Sep-15	15092	SE144264-1_B_10_ESMW03	SE144264-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<0.3	<1	<0.5	<1.5	<3	<50	<50	<40	<0.5	-	

Ammonia as N (Filtered)

Table C - Client Supplied Groundwater Data**Table T1 - Gauging
Brine Plant Baseline Monitoring**

AGL Macquarie

Well ID	Gauging Date	Top of Screen Depth (mbtoc)	Total Well Depth (mbtoc)	Stabilised Depth to Water (mbtoc)	Depth to NAPL (mbtoc)	NAPL Thickness m	Water Column Length m
MW_A01	7/08/2018	8.9	15.94	12.190	-	-	3.750
	20/09/2018	8.9	15.94	12.720	-	-	3.220
	18/10/2018	8.9	15.94	11.670	-	-	4.270
	15/11/2018	8.9	15.94	12.990	-	-	2.950
MW_A02	30/08/2018	16.8	20.79	12.810	-	-	7.980
	21/09/2018	16.79	20.79	12.43	-	-	8.36
	19/10/2018	16.79	20.79	12.12	-	-	8.67
	16/11/2018	16.79	20.79	11.89	-	-	8.9
MW_A03S	30/08/2018	3.52	7.52	2.87	-	-	4.65
	19/09/2018	3.52	7.52	2.86	-	-	4.66
	17/10/2018	3.52	7.52	2.67	-	-	4.85
	14/11/2018	3.52	7.52	2.86	-	-	4.66
MW_A03D	30/08/2018	11.37	15.37	2.36	-	-	13.01
	19/09/2018	11.37	15.37	2.33	-	-	13.04
	17/10/2018	11.37	15.37	2.14	-	-	13.23
	14/11/2018	11.37	15.37	2.21	-	-	13.16
MW_A04	6/08/2018	12.72	16.72	8.25	-	-	8.47
	20/09/2018	12.72	16.72	2.51	-	-	14.21
	18/10/2018	12.72	16.72	7.63	-	-	9.09
	15/11/2018	12.72	16.72	10.8	-	-	5.92
MW_A05	29/08/2018	9.68	13.68	7.05	-	-	6.63
	19/09/2018	9.68	13.68	7.08	-	-	6.6
	17/10/2018	9.68	13.68	7.14	-	-	6.54
	14/11/2018	9.68	13.68	7.2	-	-	6.48
MW_A06	29/08/2018	11.76	18.76	6.89	-	-	11.87
	19/09/2018	11.76	18.76	6.93	-	-	11.83
	17/10/2018	11.76	18.76	6.98	-	-	11.78
	14/11/2018	11.76	18.76	7.02	-	-	11.74
MW_A07	30/08/2018	19.72	26.72	5.01	-	-	21.71
	21/09/2018	19.72	26.72	5.32	-	-	21.4
	19/10/2018	19.72	26.72	4.89	-	-	21.83
	16/11/2018	19.72	26.72	3.97	-	-	22.75

- = Not detected

Table C - Client Supplied Groundwater Data**Table T2 - Field Parameters**
Brine Plant Baseline Monitoring

AGL Macquarie

Well ID	Sampling Date	Sampling Methodology	Volume Purged	Dissolved Oxygen	Electrical	Total Dissolved	pH	Redox Collected	Corrected	Temperature	Description
			Litres	mg/L	µS/cm	mg/L	pH units	mV	mV	°C	
MW_A01	7/08/2018	Groundwater Pump	29.0	1.48	6,830	4371	6.80	217	423	21.2	Clear, no odour
	20/09/2018	Groundwater Pump	35.0	1.73	6,350	4064	6.70	170	376	21.0	Clear, no odour
	18/10/2018	Groundwater Pump	60.0	1.3	5,380	3443	6.80	179	385	22.2	Clear, no odour
	15/11/2018	Groundwater Pump	30.0	1.36	8,390	5370	6.70	132	338	22.5	Clear, no odour
MW_A02	30/08/2018	Groundwater Pump	Bore volume	6.7	12,450	7968	6.60	215	421	20.0	Clear, no odour
	21/09/2018	Groundwater Pump	6.0	4.61	11,680	7475	6.70	239	445	20.6	Clear, no odour
	19/10/2018	Groundwater Pump	10.0	3.29	12,530	8019	6.70	162	368	21.9	Clear, no odour
	16/11/2018	Groundwater Pump	10.0	4.9	14,400	9216	6.60	166	372	21.4	Clear, no odour
MW_A03S	30/08/2018	Peristaltic	40.0	2.73	17,440	11162	7.10	136	342	17.9	Clear, no odour
	19/09/2018	Peristaltic	30.0	3.31	15,800	10112	7.10	173	379	20.3	Clear, no odour
	17/10/2018	Peristaltic	30.0	3.14	17,390	11130	7.10	191	397	19.1	Clear, no odour
	14/11/2018	Peristaltic	30.0	2.08	17,450	11168	7.00	59	265	20.3	Clear, no odour
MW_A03D	30/08/2018	Groundwater Pump	104.0	1.17	13,220	8461	6.90	-64	142	19.2	Clear, H2S odour
	19/09/2018	Groundwater Pump	78.0	1.91	12,220	7821	6.90	-79	127	20.8	Clear, no odour
	17/10/2018	Groundwater Pump	90.0	1.54	13,130	8403	6.90	-43	163	20.3	Clear, no odour
	14/11/2018	Groundwater Pump	78.0	1.4	13,100	8384	6.80	-132	74	20.7	Clear, no odour
MW_A04	6/08/2018	Groundwater Pump	56.00	3.15	531	340	7.70	159	365	19.5	Clear, no odour
	20/09/2018	Groundwater Pump	120.00	4.16	628	402	7.80	245	451	19.7	Clear, no odour
	18/10/2018	Groundwater Pump	80.00	4.21	563	360	7.90	214	420	21.2	Clear, no odour
	15/11/2018	Groundwater Pump	60.00	3.02	687	440	7.80	187	393	21.6	Clear, no odour
MW_A05	29/08/2018	Groundwater Pump	52.0	0.88	11,330	7251	6.90	142	348	19.2	Clear, no odour
	19/09/2018	Groundwater Pump	50.0	1.66	10,420	6669	6.90	144	350	20.5	Clear, no odour
	17/10/2018	Groundwater Pump	60.0	1.66	11,290	7226	6.90	127	333	20.9	Clear, no odour
	14/11/2018	Groundwater Pump	45.0	1.04	11,240	7194	6.80	124	330	20.7	Clear, no odour
MW_A06	29/08/2018	Groundwater Pump	118.0	1.62	13,250	8480	7.00	43	249	20.3	Clear, no odour
	19/09/2018	Groundwater Pump	95.0	1.89	12,100	7744	6.80	42	248	20.5	Clear, no odour
	17/10/2018	Groundwater Pump	75.0	1.14	13,160	8422	6.80	37	243	20.9	Clear, no odour
	14/11/2018	Groundwater Pump	75.0	0.98	13,130	8403	6.70	-10	196	20.5	Clear, no odour
MW_A07	30/08/2018	Groundwater Pump	Bore volume	0.94	21,500	13760	6.70	82	288	21.1	Light grey, no odour, slightly turbid
	21/09/2018	Groundwater Pump	10.0	2.21	20,300	12992	6.90	147	353	19.7	Light grey, no odour, slightly turbid
	19/10/2018	Groundwater Pump	10.0	1.64	21,400	13696	6.80	100	306	21.9	Clear, no odour
	16/11/2018	Groundwater Pump	10.0	1.62	21,300	13632	6.70	110	316	20.0	Clear, no odour

Table C - Client Supplied Groundwater Data

Table T3 - Analytical Results
Brine Plant Baseline Monitoring

AGL Macquarie

Method Name	ChemName	Units	LOR	MW-A01	MW-A01	MW-A01	MW_A01	MW-A02	MW-A02	MW-A02	MW_A02	MW-A03S	MW-A03S	MW_A03S	MW-A03D	MW-A03D	MW-A03D	MW_A03D	MW-A04	MW-A04	MW_A04	
	Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
ED037P: Alkalinity by PC Titrator	Alkalinity (Hydroxide) as CaCO3	µg/L	1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000		
	Alkalinity (total) as CaCO3	mg/L	1	634	456	515	634	806	715	792	858	1200	1090	1240	1120	1000	1190	1220	145	110	138	
	Alkalinity (Bicarbonate as CaCO3)	mg/L	1	634	456	515	634	806	715	792	858	1200	1090	1240	1120	1000	1190	1220	145	110	138	
	Alkalinity (Carbonate as CaCO3)	mg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
ED045G: Chloride by Discrete Analyser	Chloride	mg/L	1	736	744	574	1110	983	939	1050	1330	2910	3140	3210	3000	2180	1910	2240	1800	37	62	48
EG035F: Dissolved Mercury by FIMS	Mercury (Filtered)	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	
EG020F: Dissolved Metals by ICP-MS	Arsenic (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	0.003	-	0.002	0.004	<0.001	-	<0.001	0.001	0.002	0.002	0.002	<0.001	-	<0.001	
	Barium (Filtered)	mg/L	0.001	0.015	-	0.011	0.017	0.016	-	0.01	0.015	0.019	-	0.016	0.02	0.01	0.008	0.01	0.006	-	0.008	
	Beryllium (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	
	Boron (Filtered)	mg/L	0.05	0.2	-	0.16	0.2	0.23	-	0.18	0.27	0.2	-	0.08	0.18	0.25	0.2	0.25	<0.05	-	<0.05	
	Cadmium (Filtered)	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	
	Chromium (III+VI) (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	
	Cobalt (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	0.038	-	0.008	0.022	0.006	-	0.004	0.005	<0.001	<0.001	<0.001	<0.001	-	<0.001	
	Copper (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	0.001	<0.001	-	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	-	0.001	
	Lead (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	
	Manganese (Filtered)	mg/L	0.001	0.068	-	0.102	0.21	0.323	-	0.247	0.657	0.602	-	0.408	0.596	0.127	0.112	0.134	0.006	-	0.003	
	Nickel (Filtered)	mg/L	0.001	0.012	-	0.009	0.017	0.04	-	0.014	0.043	0.011	-	0.01	0.015	0.002	0.002	0.003	<0.001	-	<0.001	
	Selenium (Filtered)	mg/L	0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	
	Vanadium (Filtered)	mg/L	0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	
	Zinc (Filtered)	mg/L	0.005	<0.005	-	<0.005	<0.005	0.016	-	0.012	0.016	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	
EK040P: Fluoride by PC Titrator	Fluoride	mg/L	0.1	0.4	0.3	0.4	0.3	0.2	0.1	0.2	0.2	0.5	0.4	0.6	0.6	0.7	0.6	0.8	0.7	0.6	0.6	
EN055: Ionic Balance	Anions Total	meq/L	0.01	95.7	85.5	86.2	111	178	181	175	184	238	246	239	241	168	156	177	158	5.58	5.3	6.23
	Cations Total	meq/L	0.01	90.3	82.4	76.6	110	165	167	172	206	216	217	204	228	150	148	161	159	5.18	5.79	6.76
ED093F: Dissolved Major Cations	Calcium (Filtered)	mg/L	1	629	595	579	650	364	322	359	437	410	410	365	393	252	217	248	233	37	50	58
	Magnesium (Filtered)	mg/L	1	356	331	288	472	857	900	899	1100	870	872	818	913	524	532	560	554	11	10	13
	Potassium (Filtered)	mg/L	1	38	32	35	43	50	48	56	58	34	33	33	37	26	25	30	28	3	3	4
	Sodium (Filtered)	mg/L	1	658	568	532	866	1720	1740	1820	2110	2380	2840	2700	3050	2160	2140	2340	2330	54	55	62
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1	2990	2660	2870	3200	6470	6730	6240	6220	6350	6530	5960	6230	4030	3940	4340	3990	79	65	102
EG035T: Total Recoverable Mercury by FIMS	Mercury	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	
EG020T: Total Metals by ICP-MS	Arsenic	mg/L	0.001	<0.001	-	<0.001	<0.001	0.003	-	0.002	0.005	0.001	-	<0.001	<0.001	0.002	0.002	0.002	<0.001	-	<0.001	
	Barium	mg/L	0.001	0.016	-	0.013	0.02	0.017	-	0.017	0.021	0.021	-	0.02	0.023	0.01	0.01	0.01	0.006	-	0.009	
	Beryllium	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	
	Boron	mg/L	0.05	0.19	-	0.19	0.23	0.25	-	0.23	0.36	0.18	-	0.15	0.21	0.25	0.21	0.26	<0.05	-	<0.05	
	Cadmium																					

Table C - Client Supplied Groundwater Data**Table T3 - Analytical Results**
Brine Plant Baseline Monitoring

	Field ID	MW-A01	MW-A01	MW_A01	MW-A02	MW-A02	MW-A02	MW_A02	MW-04	MW-A05	MW-A05	MW-05	MW_A05	MW-A06	MW-A06	MW-06	MW_A06	MW-A07	MW-A07	
	Sampled Date-Time	7/08/2018	20/09/2018	18/10/2018	15/11/2018	30/08/2018	21/09/2018	19/10/2018	16/11/2018	18/10/2018	29/08/2018	19/09/2018	17/10/2018	14/11/2018	29/08/2018	19/09/2018	17/10/2018	14/11/2018	30/08/2018	21/09/2018
	Lab Report Number	ES1823548	ES1828100	ES1831118	ES1834288	ES1825802	ES1828100	ES1831118	ES1834288	ES1831118	ES1825802	ES1828100	ES1831118	ES1825802	ES1828100	ES1831118	ES1834288	ES1825802	ES1828100	
	Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
Method Name	ChemName	Units	LOR																	
ED037P: Alkalinity by PC Titrator	Alkalinity (Hydroxide) as CaCO3	µg/L	1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	
	Alkalinity (total) as CaCO3	mg/L	1	634	456	515	634	806	715	792	858	123	1030	903	1150	1160	851	770	885	942
	Alkalinity (Bicarbonate as CaCO3)	mg/L	1	634	456	515	634	806	715	792	858	123	1030	903	1150	1160	851	770	885	942
	Alkalinity (Carbonate as CaCO3)	mg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ED045G: Chloride by Discrete Analyser	Chloride	mg/L	1	736	744	574	1110	983	939	1050	1330	61	1440	1340	1460	1280	1740	1600	1810	1550
EG035F: Dissolved Mercury by FIMS	Mercury (Filtered)	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
EG020F: Dissolved Metals by ICP-MS	Arsenic (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	0.003	-	0.002	0.004	<0.001	<0.001	-	<0.001	<0.001	0.004	0.005	<0.001	-
	Barium (Filtered)	mg/L	0.001	0.015	-	0.011	0.017	0.016	-	0.01	0.015	0.006	0.021	-	0.02	0.008	-	0.007	0.008	0.013
	Beryllium (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	
	Boron (Filtered)	mg/L	0.05	0.2	-	0.16	0.2	0.23	-	0.18	0.27	<0.05	0.16	-	0.17	0.16	0.22	-	0.18	0.23
	Cadmium (Filtered)	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
	Chromium (III+VI) (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	
	Cobalt (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	0.038	-	0.008	0.022	<0.001	<0.001	-	<0.001	<0.001	0.002	-	<0.001	0.005
	Copper (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lead (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	
	Manganese (Filtered)	mg/L	0.001	0.068	-	0.102	0.21	0.323	-	0.247	0.657	0.002	0.032	-	0.039	0.086	-	0.077	0.09	0.03
	Nickel (Filtered)	mg/L	0.001	0.012	-	0.009	0.017	0.04	-	0.014	0.043	<0.001	0.004	-	0.004	0.011	-	0.009	0.011	0.006
	Selenium (Filtered)	mg/L	0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	
	Vanadium (Filtered)	mg/L	0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	
	Zinc (Filtered)	mg/L	0.005	<0.005	-	<0.005	<0.005	0.016	-	0.012	0.016	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	
EK040P: Fluoride by PC Titrator	Fluoride	mg/L	0.1	0.4	0.3	0.2	0.1	0.2	0.2	0.6	0.5	0.7	0.7	0.4	0.3	0.5	0.4	0.3	0.3	
EN055: Ionic Balance	Anions Total	meq/L	0.01	95.7	85.5	86.2	111	178	181	175	184	5.59	149	132	152	148	176	169	178	284
	Cations Total	meq/L	0.01	90.3	82.4	76.6	110	165	167	172	206	5.72	137	135	160	146	165	161	168	251
	Ionic Balance	%	0.01	2.9	1.8	5.9	0.25	4	3.98	0.82	5.5	1.11	4.23	1.22	2.65	0.59	3.17	2.46	3	1.33
ED093F: Dissolved Major Cations	Calcium (Filtered)	mg/L	1	629	595	579	650	364	322	359	437	49	340	290	367	313	342	302	333	321
	Magnesium (Filtered)	mg/L	1	356	331	288	472	857	900	899	1100	10	566	580	663	613	724	730	737	644
	Potassium (Filtered)	mg/L	1	38	32	35	43	50	48	56	58	4	28	27	34	31	28	27	31	44
	Sodium (Filtered)	mg/L	1	658	568	532	866	1720	1740	1820	2110	54	1680	1660	1990	1820	2010	1950	2060	4240
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1	2990	2660	2870	3200	6470	6730	6240	6220	68	4240	3650	4220	4250	5260	5200	5250	5350
EG035T: Total Recoverable Mercury by FIMS	Mercury	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	<0.00												

Table C - Client Supplied Groundwater Data**Table T3 - Analytical Results**
Brine Plant Baseline Monitoring

Method Name	ChemName	Units	LOR										
			Field ID	MW-A01	MW-A01	MW-A01	MW_A01	MW-A02	MW-A02	MW-A02	MW_A02	MW-07	MW_A07
			Sampled Date-Time	7/08/2018	20/09/2018	18/10/2018	15/11/2018	30/08/2018	21/09/2018	19/10/2018	16/11/2018	19/10/2018	16/11/2018
ED037P: Alkalinity by PC Titrator	Alkalinity (Hydroxide) as CaCO3	µg/L	1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
	Alkalinity (total) as CaCO3	mg/L	1	634	456	515	634	806	715	792	858	1440	1540
	Alkalinity (Bicarbonate as CaCO3)	mg/L	1	634	456	515	634	806	715	792	858	1440	1540
	Alkalinity (Carbonate as CaCO3)	mg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloride	mg/L	1	736	744	574	1110	983	939	1050	1330	3470	3200
	Mercury (Filtered)	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001
	Arsenic (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	0.003	-	0.002	0.004	<0.001	<0.001
	Barium (Filtered)	mg/L	0.001	0.015	-	0.011	0.017	0.016	-	0.01	0.015	0.006	0.007
	Beryllium (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
	Boron (Filtered)	mg/L	0.05	0.2	-	0.16	0.2	0.23	-	0.18	0.27	0.32	0.41
EG035F: Dissolved Mercury by FIMS	Cadmium (Filtered)	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (III+VI) (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	0.002	0.002
	Cobalt (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	0.038	-	0.008	0.022	0.002	0.003
	Copper (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	0.001	<0.001	0.002
	Lead (Filtered)	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
	Manganese (Filtered)	mg/L	0.001	0.068	-	0.102	0.21	0.323	-	0.247	0.657	0.024	0.03
	Nickel (Filtered)	mg/L	0.001	0.012	-	0.009	0.017	0.04	-	0.014	0.043	0.005	0.006
	Selenium (Filtered)	mg/L	0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
	Vanadium (Filtered)	mg/L	0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
	Zinc (Filtered)	mg/L	0.005	<0.005	-	<0.005	<0.005	0.016	-	0.012	0.016	<0.005	0.006
EK040P: Fluoride by PC Titrator	Fluoride	mg/L	0.1	0.4	0.3	0.4	0.3	0.2	0.1	0.2	0.2	0.4	0.3
	Anions Total	meq/L	0.01	95.7	85.5	86.2	111	178	181	175	184	280	287
EN055: Ionic Balance	Cations Total	meq/L	0.01	90.3	82.4	76.6	110	165	167	172	206	268	285
	Ionic Balance	%	0.01	2.9	1.8	5.9	0.25	4	3.98	0.82	5.5	2.25	0.4
	Calcium (Filtered)	mg/L	1	629	595	579	650	364	322	359	437	254	254
ED093F: Dissolved Major Cations	Magnesium (Filtered)	mg/L	1	356	331	288	472	857	900	899	1100	668	712
	Potassium (Filtered)	mg/L	1	38	32	35	43	50	48	56	58	50	52
	Sodium (Filtered)	mg/L	1	658	568	532	866	1720	1740	1820	2110	4580	4880
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1	2990	2660	2870	3200	6470	6730	6240	6220	7390	7980
EG035T: Total Recoverable Mercury by FIMS	Mercury	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001
	Total Metals by ICP-MS	mg/L	0.001	<0.001	-	<0.001	<0.001	0.003	-	0.002	0.005	<0.001	<0.001
EG020T: Total Metals by ICP-MS	Arsenic	mg/L	0.001	<0.001	-	<0.001	<0.001	0.003	-	0.002	0.005	<0.001	<0.001
	Barium	mg/L	0.001	0.016	-	0.013	0.02	0.017	-	0.017	0.021	0.008	0.01
	Beryllium	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
	Boron	mg/L	0.05	0.19	-	0.19	0.23	0.25	-	0.23	0.36	0.37	0.46
	Cadmium	mg/L	0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (III+VI)	mg/L	0.001	0.003	-	0.002	<0.001	<0.001	-	0.002	0.001	0.01	0.01
	Cobalt	mg/L	0.001	<0.001	-	<0.001	<0.001	0.039	-	0.01	0.03	0.003	0.004
	Copper	mg/L	0.001	<0.001	-	0.001	<0.001	0.001	-	0.001	<0.001	0.015	<0.001
	Lead	mg/L	0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
	Manganese	mg/L	0.001	0.078	-	0.114	0.232	0.323	-	0.288	0.897	0.033	0.035
	Nickel	mg/L	0.001	0.014	-	0.012	0.021	0.042	-	0.017	0.062	0.018	0.01
	Selenium	mg/L	0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
	Vanadium	mg/L	0.01	<0.01	-	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
	Zinc	mg/L	0.005	<0.005	-	<0.005	<0.005	0.016	-	0.017	0.022	0.008	0.008
EP080/071: Total Petroleum Hydrocarbons	C10 - C14	µg/L	50	<50	-	-	<50	-	-	-	-	-	-
	C15 - C28	µg/L	100	<100	-	-	<100	-	-	-	-	-	-
	C29-C36	µg/L	50	<50	-	-	<50	-	-	-	-	-	-
	+C10 - C36 (Sum of total)	µg/L	50	<50	-	-	<50	-	-	-	-	-	-
	F2-NAPHTHALENE	mg/L	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions	C10 - C40 (Sum of total)	µg/L	100	<100	-	-	<100	-	-	-	-	-	-
	C10-C16	mg/L	0.1	<0.1									

Table C - Client Supplied Groundwater Data

Table T4 - QA/QC Results
Brine Plant Baseline Monitoring

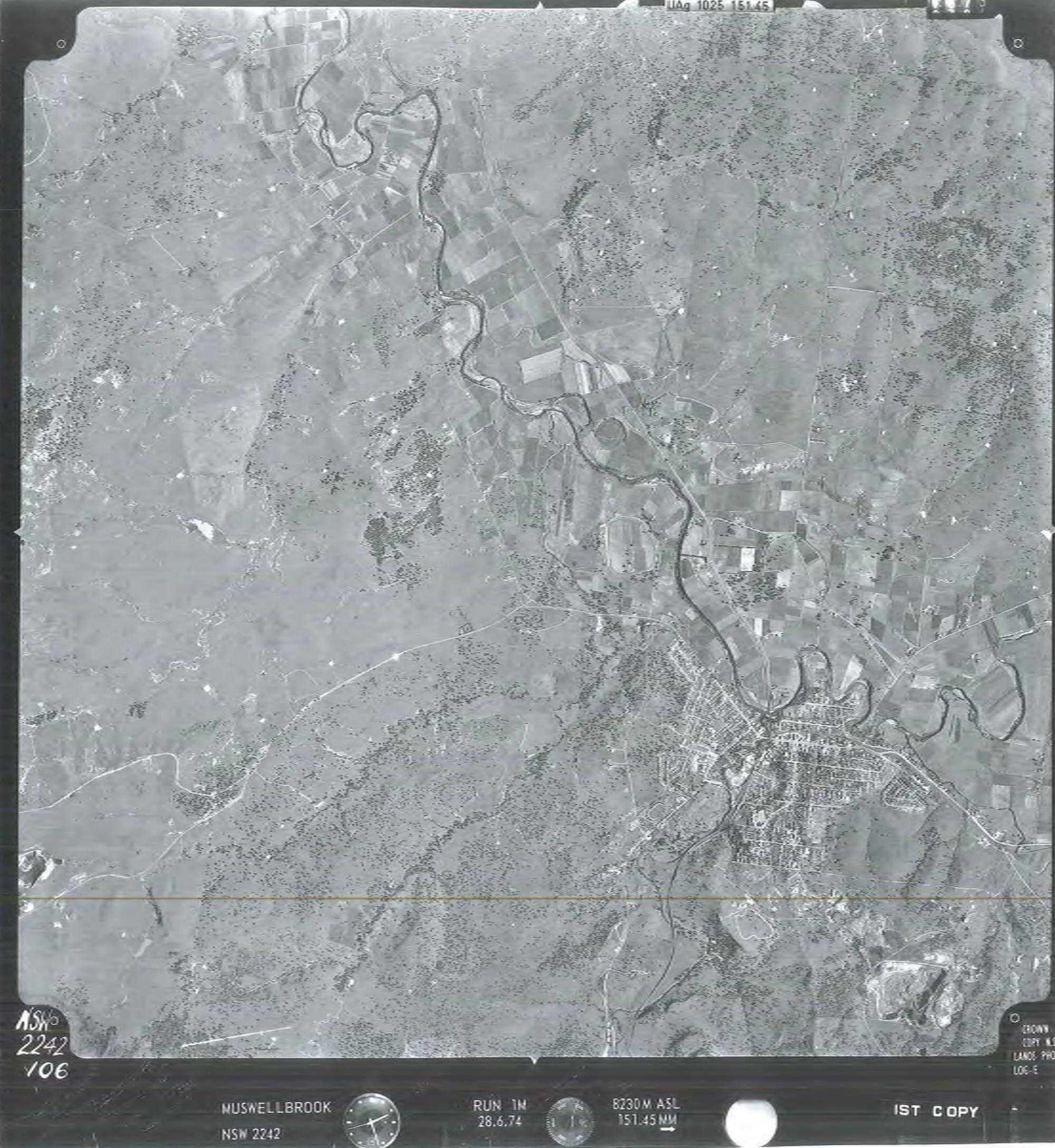
AGI Macquarie

- Not analyzed / not calculated
LOR - Limit of Reporting
Sample Type - N - Primary, Intra - Intralaboratory Duplicate, Inter - Interlaboratory Duplicate
mql = milligrams per liter
ug/l = micrograms/liter
TPH = Total Petroleum Hydrocarbons
TRH = Total Recoverable Hydrocarbons
BTEXN = Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene



APPENDIX A. HISTORICAL PHOTOGRAPHS

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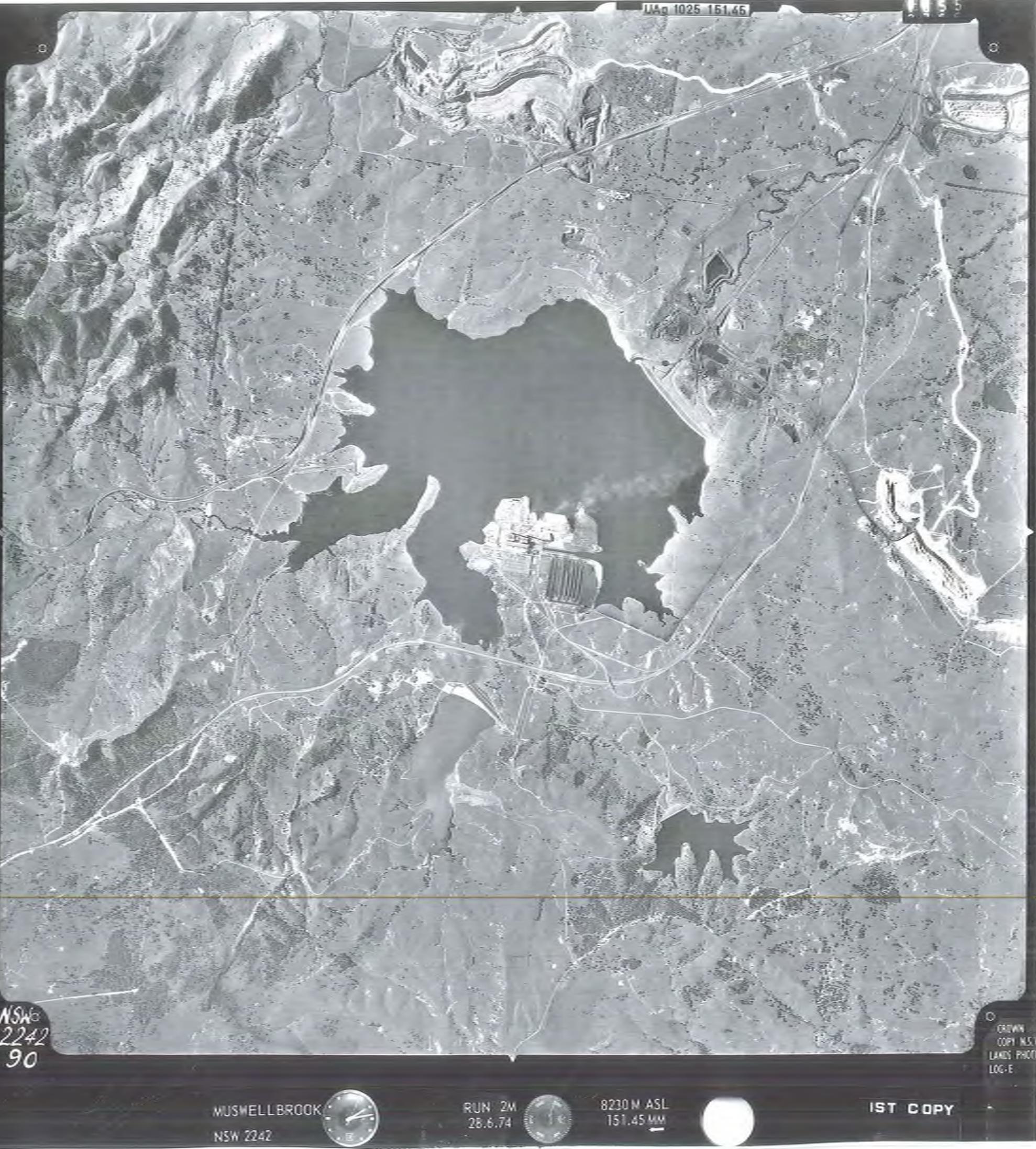
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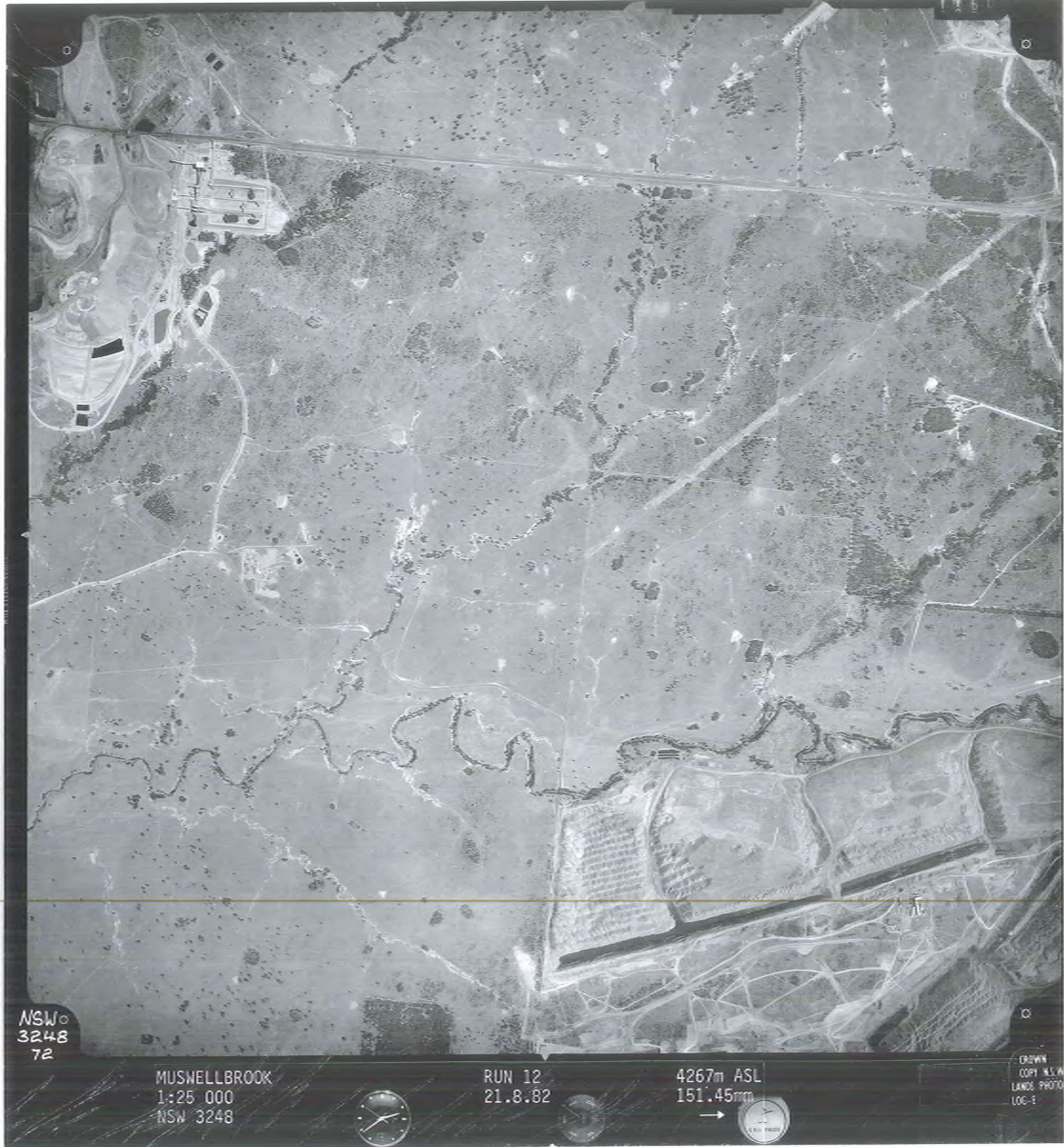
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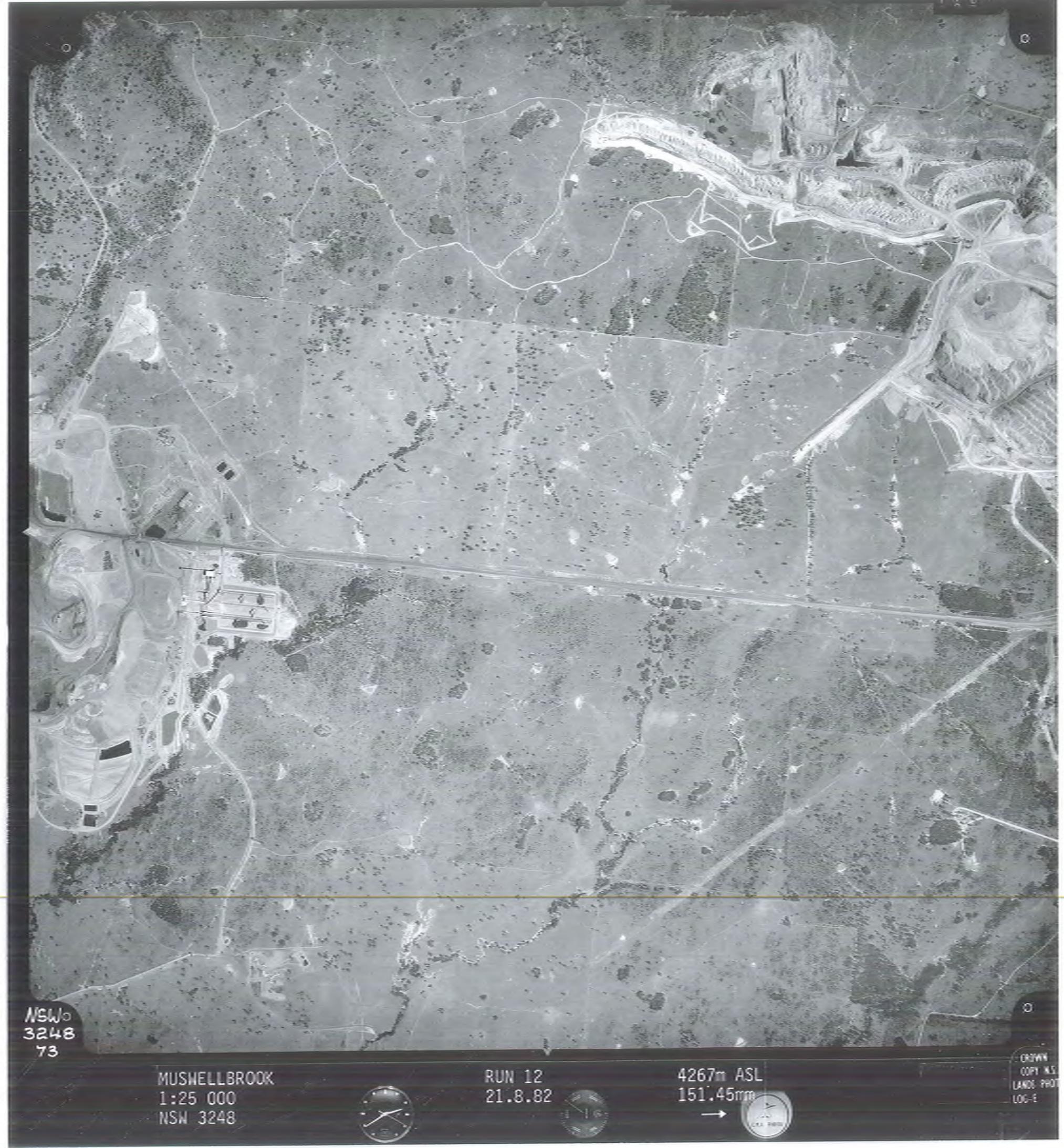
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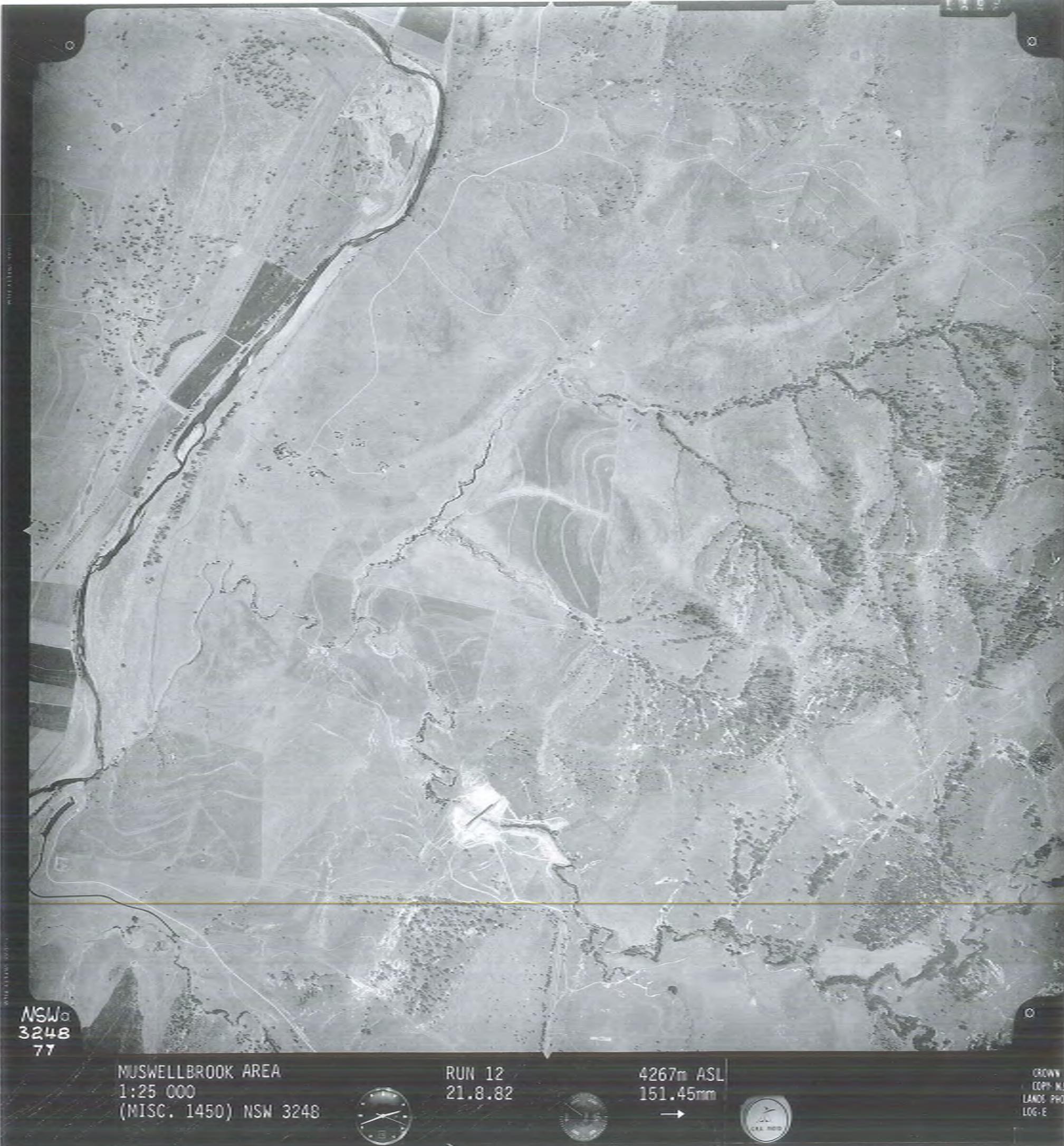
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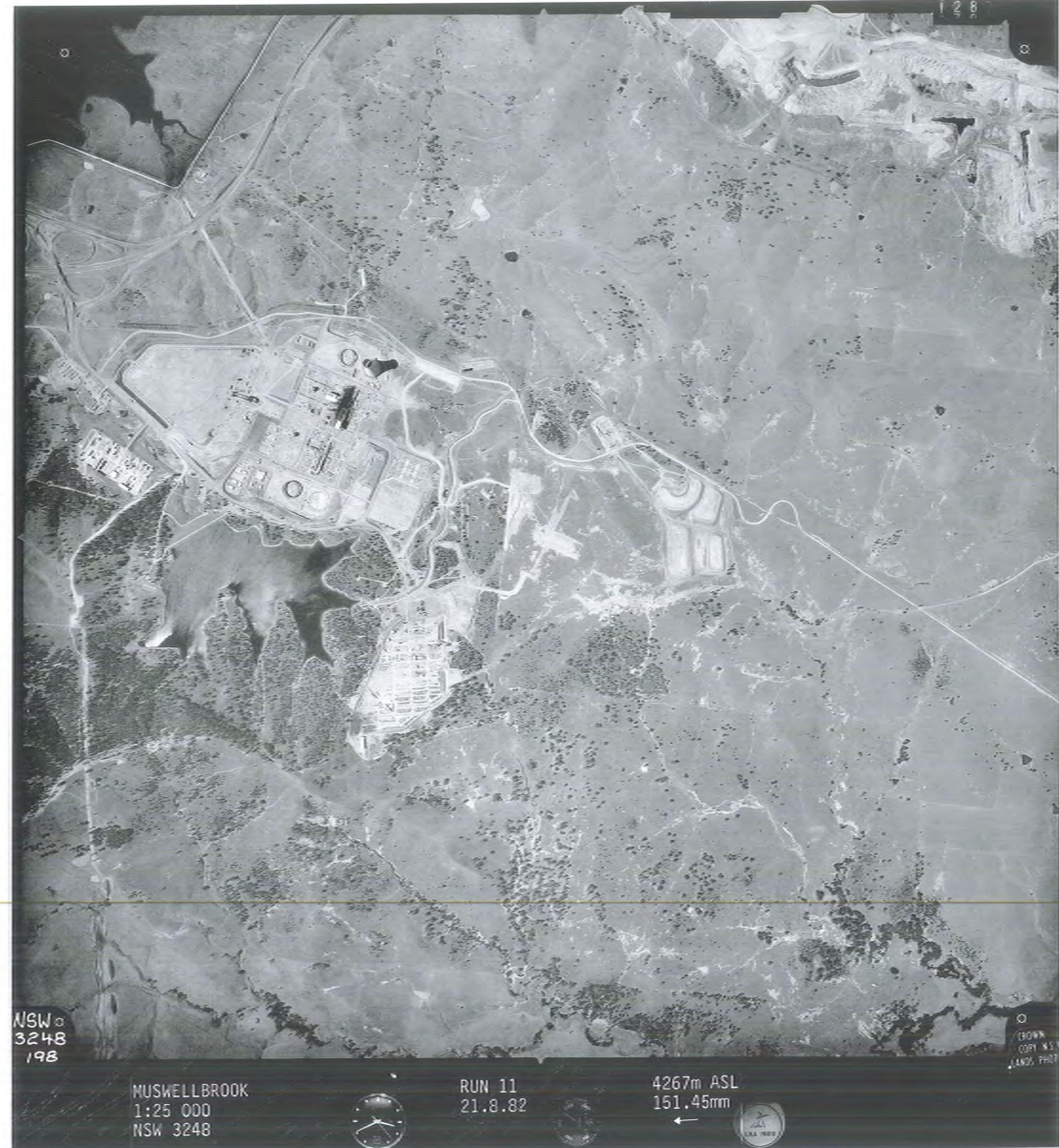
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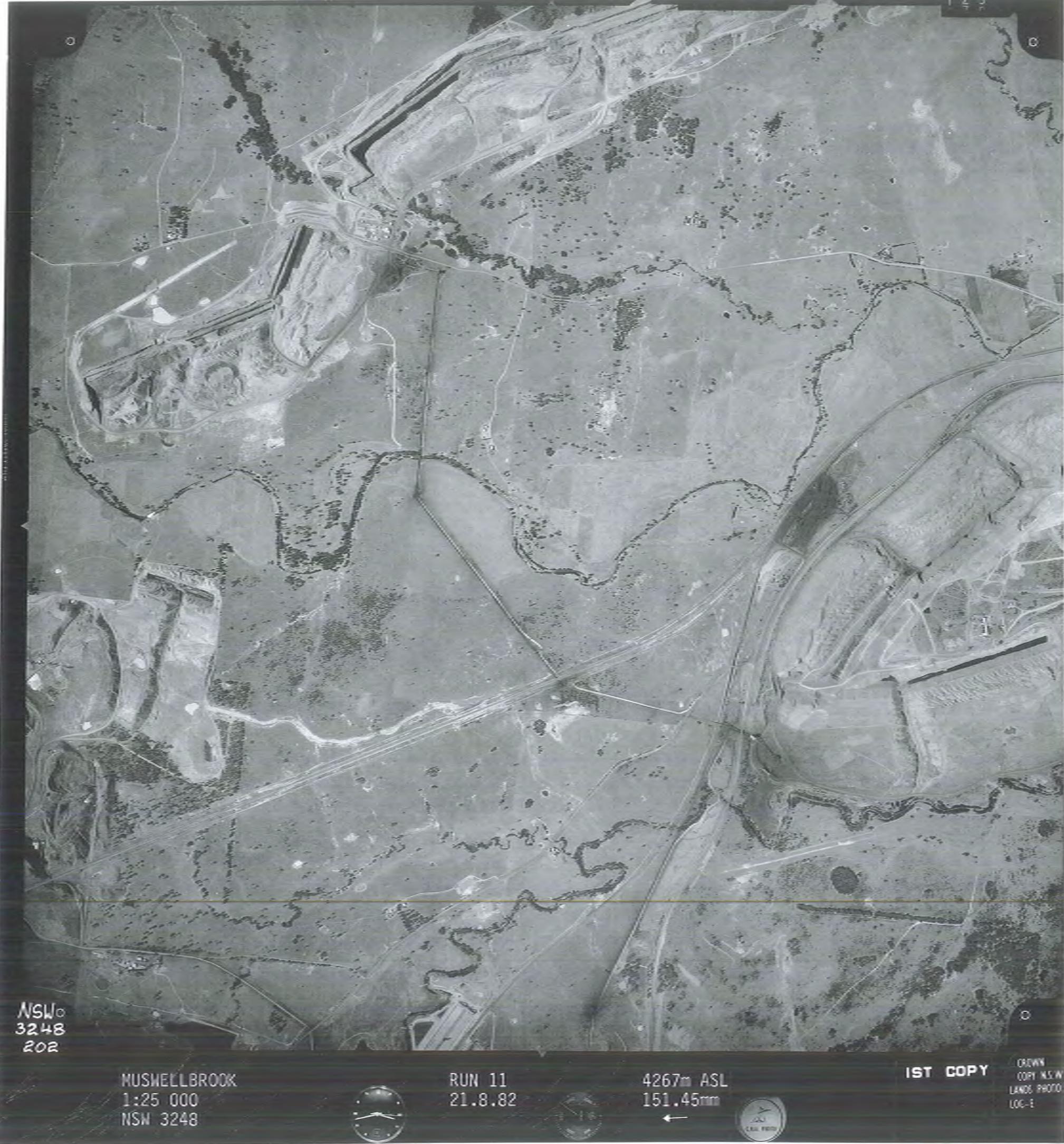


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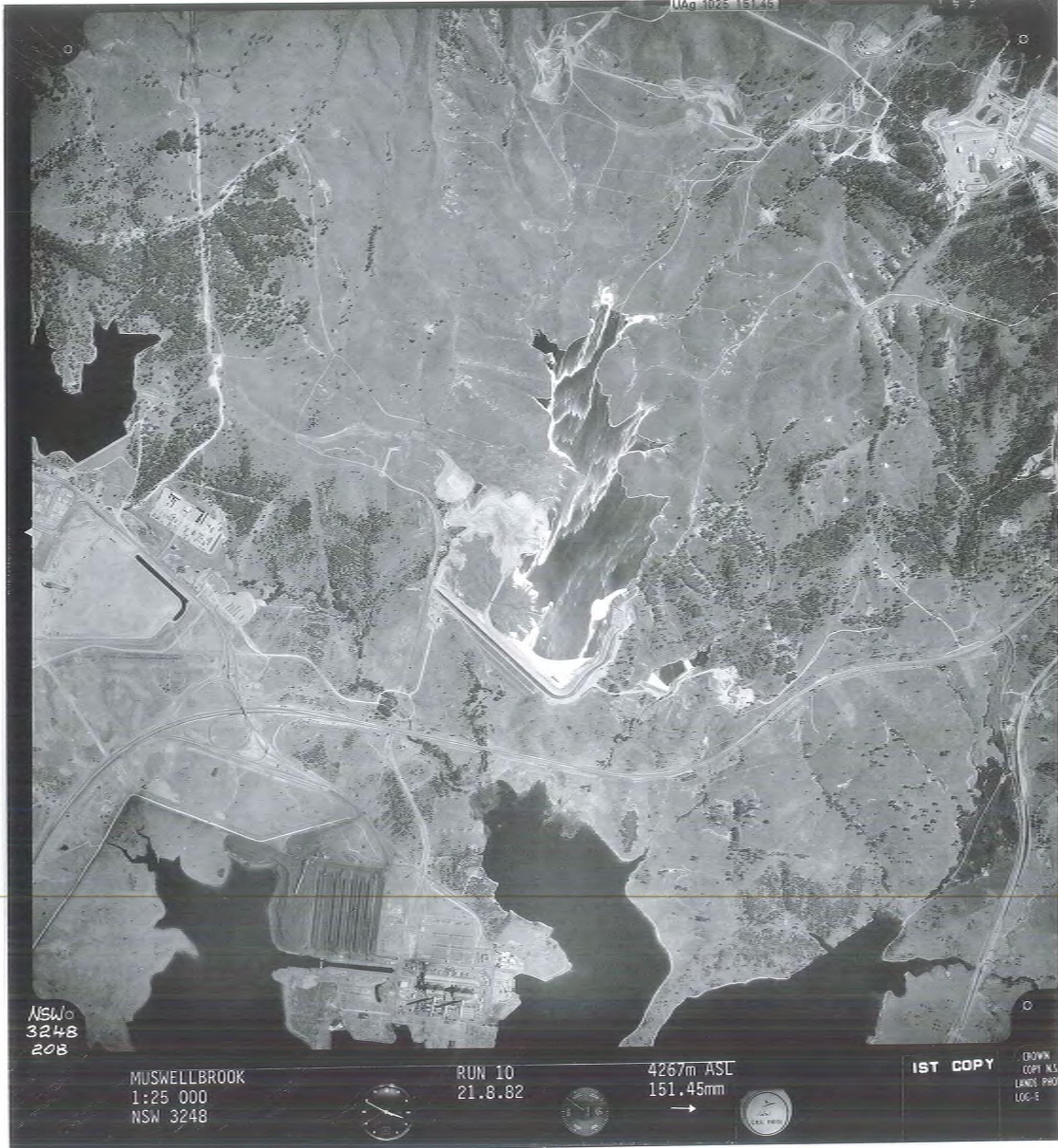
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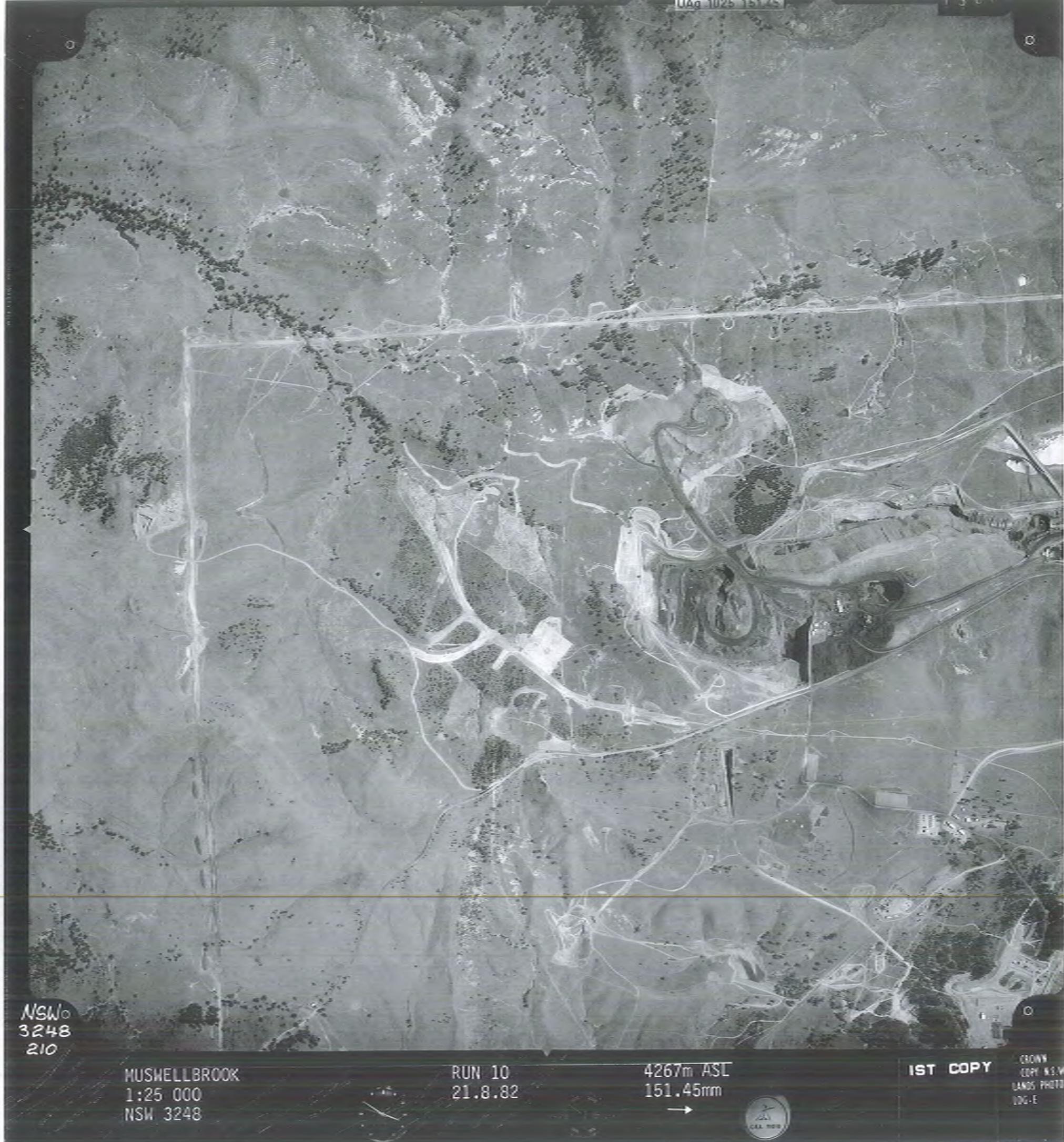
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APPENDIX B. SITE PHOTOGRAPHS



Photo 1: Signage for ACM piping - north of the Fly Ash Plant



Photo 2: Stockpiles of silty clay fill with anthropogenic materials – Former Contractor Storage Area



Photo 3: Storage area – Mobile Plant Workshop and Storage Area



Photo 4: Borrow Pit 1 Area – Looking west toward operational area



Photo 5: Borrow Pit 2 – Sample location with operational area to the north in the background



Photo 6: Borrow Pit 3 Area – looking west

Legend:



Project No: 20200509.001A
Date: August 2019

Site Photographs

Jacobs
Land Assessment
AGL Bayswater



Photo 7: Borrow Pit 4 area – Looking south



Photo 8: Potential ACM sheeting within abandoned concrete building – intersection of ash pipeline and Liddell Station Road



Photo 10: High Pressure Pumping Station



Photo 11: LSP Sludge Line Area – Looking northward along drainage line undergoing rehabilitation.

Photo 9: Suspected fly ash adjacent to minor pipeline rupture along Ravensworth Ash Line.

Legend:



Project No: 20200509.001A
Date: August 2019

Site Photographs
Jacobs
Land Assessment
AGL Bayswater



APPENDIX C. QA/QC ASSESSMENT

1. DATA QUALITY OBJECTIVES

Setting the study objectives

Data quality objectives (DQO) are generated to ensure that sufficient data is collected to characterise a site in accordance with the project objectives and to enable the appropriate assessment of environmental risks that will enable the development of this Land Assessment. DQOs ensure that:

- The study objectives are set;
- Appropriate types of data are collected (based on historical land use and CoPC); and
- The tolerance levels are set for potential decision-making errors (NEPM 2013 and AS 4482.1:2005).

The DQO process, documented by the US EPA (2000) and adopted in NEPM 2013, is a seven-step iterative planning approach to enable the project team to communicate the project goals and decisions, project constraints (time, budget, etc.), an assessment of the project uncertainties and how they are to be addressed (Steps 1 and 6) and to optimise the project specific sampling and analysis program (Step 7).

Step 1 – Define the problem

Sections 1 and 2 provide details on the background of the Bayswater Power Station, a description of the site and project areas as well as the environmental setting. The problem is defined as follows:

- A review of data supplied by AGL Macquarie has indicated that CoPC have previously been identified within a number of proposed project areas, presenting potentially unacceptable risks.
- The presence of CoPC within project area may present potentially unacceptable risks to workers during the construction of the project, if not delineated, remediated or managed appropriately.

Step 2 – Decision identification

The decisions to be made based on the results of this Land Assessment are as follows:

- Do the results indicate a need for further detailed investigation of project areas to better understand contamination risks?
- Do the results require the implementation of remediation and/or management measures to mitigate unacceptable risks to human health or the environment from the future use of the site as a solar farm?

Step 3 – Inputs to the decision

Detailed assessment of project areas is required to:

- Identify areas of potential concern using client supplied data, desktop reviews, historical aerial photographs and a site walkover;

- Assess the potential for CoPC to be present at concentrations that present an unacceptable risk; and
- Identify where CoPCs present an unacceptable risk, sufficient data is collected to delineate areas where contaminated material may be present.

The output of the investigation is to obtain sufficient data required to either assess the risks as being acceptable or for the development of a RAP aimed at achieving the project objectives, as detailed in Step 7 (below) and discussed in detail in Section 1.

Step 4 – Define the study boundaries

The boundaries of the investigation have been identified as follows:

Spatial boundaries: the lateral boundary of the investigation is limited to the boundary of the designated project areas (Refer to Figure 2). The vertical boundary is limited to the depth of sampling of surface soils.

Temporal boundaries: the temporal boundaries of the assessment have been determined based on an assessment of the reliability of the data received from third parties during this study, and the assumption that site conditions are acceptable for future construction and use as an operational power station.

Step 5 – Develop a decision rule

To be able to make the decisions identified in Step 2 above, the following rules were applied:

- If it is determined that the data generated through this investigation is reliable and determines that contamination is unlikely to present an increased risk of harm to human health or the environment, then further site investigations will not be warranted; or
- If it is determined that the data generated through this investigation is reliable and determines that contamination may present an increased risk of harm to human health or the environment, then further site investigations will not be required to determine the need for remediation and/or management measures.

Step 6 – Specify limits on decision errors

Acceptable limits on decision errors, and the manner of addressing possible decision errors, have been developed based on the Data Quality Indicators (DQIs) of sensitivity, precision, accuracy, representativeness, comparability and completeness (SPARCC).

- The tolerable limits on decision errors for data that Kleinfelder considers acceptable are:
- Probability that 95% of data satisfied the DQIs, therefore the limit on the decision error was 5% that a conclusive statement may be incorrect;
- In applying statistical analysis of a data set (where appropriate): No individual sample will report a concentration that exceeds 250% of Site assessment criteria;
 - A normal distribution will only be used if the coefficient of variance is not greater than 1.2;

- The standard deviation of a sample population will not exceed 50% of the Site assessment criteria; and
- A robust quality assurance and quality control (QA/QC) program was implemented to ensure an appropriate sampling and analytical density was adopted and representative sampling undertaken.

The possible outcomes on making an error in the decision are:

- Basing decisions on unreliable data and consequently making incorrect decisions; and
- Basing decisions on unreliable data and inappropriately recommending the need for further investigation, remediation and/or management.

Relevant performance and/or acceptance criteria were determined for quality assurance/quality control purposes and screening of soil and dam water analytical results against appropriate assessment criteria was undertaken. The DQI's are described below, as presented in **Table C.1**.

Table C.1 QA/QC data quality indicators

QA/QC Objective	Data quality indicator (DQI)
Successful completion of project	To conduct a site investigation in accordance with NEPM 2013 in order to achieve the project objective and Step 1 and 2 above.
Suitable environmental consultant	The environmental consultant will maintain QA Systems certified to AS/NZS ISO 9001:2015.
Suitable field personnel	All Kleinfelder field personnel conducting sampling will be trained in the requirements detailed in this QC plan. All Kleinfelder field personnel will have relevant tertiary qualifications and will be required to demonstrate competence in Kleinfelder procedures for sampling (consistent with NEPM 2013 and AS4482.1 - 1999).
Adequate sample collection density	The sampling strategy has been developed based on historical information available for the site, personal knowledge of the site and the objective of the investigation.
Standardised sample nomenclature	All samples will be labelled with a unique identifier that can be related to surveyed sample location and depth. The following naming convention will be utilised: Soil Bore (SB) – Bore number (01, 02, 03...) - Depth (0, 0.5, 1, 1.5, 2...) E.g. KLFSB101_0.5 Test pit (TP) – Number (01, 02, 03...) - Depth (0, 0.5, 1, 1.5, 2...) E.g. KLFTP101_0.5 Surface water (SW) – Number (01, 02, 03...) E.g. KLFSW101
Decontamination of field equipment	When sampling equipment is used, nitrile gloves will be worn and changed between samples. Equipment will also be decontaminated between sample locations using an appropriate surface-active cleaning agent (e.g. Decon 90) as consistent with NEPM.
Calibration of field instruments	All field instruments will be calibrated prior to use, and the calibration will be documented in the final report.
Transportation	A Chain of Custody (COC) document will be used to ensure the integrity of the samples from collection to receipt by the analytical laboratory within appropriate holding times.

QA/QC Objective	Data quality indicator (DQI)
National Association of Testing Authorities (NATA) accredited laboratory analysis	<p>All samples will be forwarded to a laboratory holding NATA accreditation for the required analyses.</p> <p>The following Laboratories will be utilised:</p> <ul style="list-style-type: none"> • ALS – Primary Laboratory for chemical analysis • Eurofins – Secondary Laboratory for chemical analysis.
Field QA/QC	<p>Duplicate samples (intra-laboratory) will be collected at a rate of one in every twenty (1:20) primary soil samples and submitted to the primary laboratory for analysis.</p> <p>Triplicate samples (inter-laboratory) will be collected at a rate of one in every twenty (1:20) primary soil samples and submitted to the secondary laboratory for analysis.</p> <p>Field duplicate and triplicate samples are used to assess field and analytical precision and the precision measurement is determined using the relative percent difference (RPD) between the primary sample (X1) and duplicate sample (X2) results, as shown in the following equation:</p> $\text{Relative percent difference (RPD)} = \frac{(X_1 - X_2)}{(X_1 + X_2)/2} \times 100$ <p>Generally, it is recommended that RPD is not greater than 30% (NEPM 2013).</p> <p>Default RPD levels in the field may be non-compliant for the following reasons:</p> <ul style="list-style-type: none"> • Although all due care and attention will be taken to obtain samples containing the same material, it is feasible that with samples collected at the surface and/or from fill material there may be some exceedances caused by heterogeneity of the soil, particularly ash or clinker materials (if present). • The differing laboratory equipment, procedures and limits of reporting (between the primary and secondary laboratories). • Due to sample matrix interference. • Due to the reported concentrations being close to the limit of reporting where laboratory precision and accuracy are inherently low. <p>A rinsate blank sample will be collected for each piece of non-dedicated sampling equipment per day onsite and submitted to the primary laboratory for analysis.</p> <p>A field blank will be collected for each day in the field and submitted to the primary laboratory for analysis.</p> <p>A transport blank sample will be collected for each batch of samples sent to the laboratory (~one per day in the field) and submitted to the primary laboratory for analysis for each day samples are taken.</p> <p>Should rinsate blanks, field blanks and transport blanks analysis identify concentrations above the Laboratory LOR, this will indicate the potential for cross contamination and further discussions will be required to determine the integrity/validity of the data.</p> <p>QA/QC non-compliance will be documented and discussed in the report. Should exceedances be identified (i.e. duplicates and triplicates be above the RPD or rinsate blanks, field blanks or transport blanks be above the LOR) then consideration will be given to the sample(s) being re-analysed or the higher concentration level to be conservatively adopted.</p>
Laboratory Quality Control – Duplicates, spikes, blanks and surrogates – Acceptable Limits	<p>Laboratory QA/QC acceptance limits are as follows:</p> <p>Surrogates: 70% to 130% recovery;</p> <p>Matrix Spikes: 70% to 130% recovery for organics or 80% to 120% recovery for inorganics;</p> <p>Control Samples: 70% to 130% recovery for soil or 80% to 120% recovery for waters;</p> <p>Duplicate Samples: <4 Practical Quantitation Limits (PQL) - +/- 2PQL, 4-10PQL – 0.-25 or 50%RPD, >10PQL – 0-10 or 30%RPD; and</p> <p>Method Blanks: zero to <PQL.</p>

In order to ensure appropriate analytical concentrations are obtained **Table 4.1** in Section 5 provide the laboratories limit of reporting (LOR) adjacent to the adopted screening criteria.

Step 7 – Optimise the design for obtaining data

To optimise the design for obtaining data Kleinfelder undertook the following approach:

- The investigation design has been based on addressing the concerns outlined in Sections 1 and 6
- Field screening of soil samples for laboratory analysis using both visual and olfactory observations in the field was undertaken to select appropriate samples for analysis (See Table 5.2).
- The investigation is to be conducted to a level of accuracy and confidence that is consistent with the standards specified in NEPM 2013.
- A summary of the site investigation methodology is presented Section 5.

2. ASSESSMENT OF PERFORMANCE

Field method validation

In order to ensure the quality and quantity of both field and laboratory data being used in the decision-making process, QA/QC objectives and corresponding DQIs were developed. To ensure the completeness, comparability, representativeness, precision and accuracy of QA/QC items, **Table C.2** details how the DQI's have been met.

Table C.2: QA/QC objectives and DQIs

QA/QC Objective	Data Quality Indicator (DQI)
Suitable field personnel	All field personnel conducting sampling were trained in the requirements of the agreed scope of works. All field scientists/engineers had relevant tertiary qualifications and were required to demonstrate competence in Kleinfelder's sampling procedures (consistent with NEPM 2013 requirements and AS4482.1 2005).
Adequate sample collection density	Soil sampling was undertaken based on information provided in previous reports, a desktop study, size of the project areas and site inspection. A total of 6 soil samples were sampled.
Sample preservation	Samples were collected in laboratory supplied jars and immediately stored in an insulated esky chilled with ice upon sampling.
Sample handling	Samples were couriered from AGL Bayswater to the primary NATA laboratory, ALS Laboratories. Chains of custody are included in Appendix C .

Laboratory QA/QC

The results for internal laboratory QA/QC procedures are provided within the laboratory analysis reports (**Appendix D**). **Table C.3** summarise conformance to specific QA/QC procedures.

Table C.3: QA/QC

Quality assurance	Confirmed	Comment
Collection of rinsate water from decontaminated field equipment	Yes	A rinsate sample (QW1) was taken from the sampling equipment (interface probe and water quality meter). All rinsate results were below the laboratory limit of reporting.
Holding times met	Yes	Holding times were met for all samples.
LOR less than assessment criteria	Majority	The majority of LOR were below the assessment criteria. For a small number of analytes the LOR was above the assessment criteria. However, where this occurred, the sample results were typically non-detect and the sample locations were from natural soils with no visual or olfactory observations of potential contamination. Therefore, this is not considered to impair the reliability of the analytical data for confident decision making.
All analyses National Association of Testing Authorities (NATA) accredited	Yes	All samples were forwarded to a NATA accredited laboratory for the required analysis, within specified holding times. The primary laboratory used was ALS (delivered to the Smithfield, NSW) and the secondary laboratory was Eurofins mgt (delivered to the Lane Cove, NSW Lab).
Field intra-laboratory duplicate samples collected and analysed to represent 5% of sample population	Yes	One intra-laboratory duplicate sample and one inter-laboratory triplicate soil sample were collected. This is considered to exceed the requirement of 5% of the total number of primary analyses undertaken (minimum 1 in 20 duplicate and 1 in 20 triplicate samples).
Did duplicate sample meet RPD requirements	Yes	All soil samples met the RPD requirements of being within 30%.
Internal laboratory procedures	Majority	Internal laboratory QC procedures were generally met. Some exceedances of internal procedures for laboratory duplicates and matrix spikes were recorded for soil samples, for organic analysis. However, the primary laboratory results recorded these analytes to be below the LOR. Therefore, this does not impair the reliability of the analytical data for decision making.

Table C.4 Container types, preservation and order of filling

Analyte	Container Type	Preservation
Soil	1 x 250mL Clear Glass Jar – Natural	Refrigerate

Table C.5 Summary of Soil QC program

Analyte	Number of Groundwater Samples Analysed			% QC Samples Relative to Primary Samples
	Primary	Field Duplicates (intra-lab)	Laboratory Splits (inter-lab)	
Metals (8) As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	6	1	1	16.66%
TRH (C6-C40)/ BTEXN/ PAH/ Phenols/ OCP/OPP/ PCB	6	1	1	16.66%



3. QUALITY STATEMENT

Field sampling procedures conformed to Kleinfelder's QA/QC protocols to prevent cross contamination, preserve sample integrity and allow for collection of a suitable data set from which to make technically sound and justifiable decisions with data of satisfactory usability.

Based on a review of the results for the Kleinfelder and laboratory QA/QC program adopted, the overall data quality is considered to be suitably reliable and representative of soil conditions at the Site. Copies of the final NATA endorsed laboratory reports, including internal QA/QC results and chain-of-custody documentation for the primary and secondary laboratories are attached as Appendix D



APPENDIX D LABORATORY REPORTS



Environmental

CERTIFICATE OF ANALYSIS

Work Order	ES1924989	Page	: 1 of 13
Client	KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	TOM OVERTON	Contact	: Shirley LeCornu
Address	95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9630
Project	AGL BAYSWATER	Date Samples Received	: 07-Aug-2019 16:02
Order number	:	Date Analysis Commenced	: 08-Aug-2019
C-O-C number	:	Issue Date	: 13-Aug-2019 16:02
Sampler	Josh Crawford		
Site	:		
Quote number	EN/222		
No. of samples received	11		
No. of samples analysed	10		

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
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW



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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

∅ = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BP1_1_0.05	BP1_2_0.05	BP1_3_0.05	BP2_1_0.05	BP2_2_0.05
Compound	CAS Number	LOR	Unit	07-Aug-2019 00:00				
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	---	1.0	%	7.0	5.1	4.8	5.6	3.8
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	6	<5	11	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	9	11	8	19	9
Copper	7440-50-8	5	mg/kg	23	7	13	24	7
Lead	7439-92-1	5	mg/kg	16	16	12	19	10
Nickel	7440-02-0	2	mg/kg	14	6	8	21	6
Zinc	7440-66-6	5	mg/kg	84	42	64	69	37
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID		BP1_1_0.05	BP1_2_0.05	BP1_3_0.05	BP2_1_0.05	BP2_2_0.05
		Client sampling date / time		07-Aug-2019 00:00				
Compound	CAS Number	LOR	Unit	ES1924989-001	ES1924989-002	ES1924989-003	ES1924989-004	ES1924989-005
EP068A: Organochlorine Pesticides (OC) - Continued								
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlорfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID		BP1_1_0.05	BP1_2_0.05	BP1_3_0.05	BP2_1_0.05	BP2_2_0.05
		Client sampling date / time		07-Aug-2019 00:00				
Compound	CAS Number	LOR	Unit	ES1924989-001	ES1924989-002	ES1924989-003	ES1924989-004	ES1924989-005
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(b+j)fluoranthene	205-99-2	205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene		207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene		50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3,cd)pyrene		193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene		53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene		191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX	C6_C10-BTEX (F1)	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3	106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
ortho-Xylene		95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BP1_1_0.05	BP1_2_0.05	BP1_3_0.05	BP2_1_0.05	BP2_2_0.05
				Client sampling date / time	07-Aug-2019 00:00				
Compound	CAS Number	LOR	Unit	ES1924989-001	ES1924989-002	ES1924989-003	ES1924989-004	ES1924989-005	
				Result	Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	104	96.0	106	94.4	86.2	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	77.0	115	67.8	117	119	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	82.8	87.9	86.4	83.5	81.7	
2-Chlorophenol-D4	93951-73-6	0.5	%	78.3	83.2	87.6	85.9	82.6	
2,4,6-Tribromophenol	118-79-6	0.5	%	57.6	67.0	62.6	71.2	67.2	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	101	105	100	112	111	
Anthracene-d10	1719-06-8	0.5	%	98.7	98.5	91.9	96.0	97.3	
4-Terphenyl-d14	1718-51-0	0.5	%	101	118	107	110	110	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	84.7	92.0	89.9	90.8	87.1	
Toluene-D8	2037-26-5	0.2	%	83.0	85.3	86.8	84.0	83.4	
4-Bromofluorobenzene	460-00-4	0.2	%	83.4	88.1	86.8	85.2	84.6	

Analytical Results

Client sample ID				BP2_3_05	QS1	---	---	---
Compound	CAS Number	LOR	Unit	07-Aug-2019 00:00	07-Aug-2019 00:00	---	---	---
				ES1924989-006	ES1924989-007	-----	-----	-----
EA055: Moisture Content				Result	Result	---	---	---
Moisture Content	---	1.0	%	---	5.4	---	---	---
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	---	1.0	%	7.7	---	---	---	---
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	21	13	---	---	---
Cadmium	7440-43-9	1	mg/kg	<1	<1	---	---	---
Chromium	7440-47-3	2	mg/kg	33	20	---	---	---
Copper	7440-50-8	5	mg/kg	23	26	---	---	---
Lead	7439-92-1	5	mg/kg	23	21	---	---	---
Nickel	7440-02-0	2	mg/kg	33	23	---	---	---
Zinc	7440-66-6	5	mg/kg	89	78	---	---	---
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	---	---	---
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	---	---	---	---
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	---	---	---	---
beta-BHC	319-85-7	0.05	mg/kg	<0.05	---	---	---	---
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	---	---	---	---
delta-BHC	319-86-8	0.05	mg/kg	<0.05	---	---	---	---
Heptachlor	76-44-8	0.05	mg/kg	<0.05	---	---	---	---
Aldrin	309-00-2	0.05	mg/kg	<0.05	---	---	---	---
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	---	---	---	---
^ Total Chlordane (sum)	---	0.05	mg/kg	<0.05	---	---	---	---
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	---	---	---	---
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	---	---	---	---
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	---	---	---	---
Dieldrin	60-57-1	0.05	mg/kg	<0.05	---	---	---	---
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	---	---	---	---
Endrin	72-20-8	0.05	mg/kg	<0.05	---	---	---	---
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	---	---	---	---
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	---	---	---	---
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	---	---	---	---
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	---	---	---	---
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	---	---	---	---

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID		BP2_3_05	QS1	---	---	---
		Client sampling date / time		07-Aug-2019 00:00	07-Aug-2019 00:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1924989-006	ES1924989-007	-----	-----	-----
				Result	Result	---	---	---
EP068A: Organochlorine Pesticides (OC) - Continued								
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	---	---	---	---
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	---	---	---	---
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	---	---	---	---
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	---	---	---	---
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	---	---	---	---
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	---	---	---	---
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	---	---	---	---
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	---	---	---	---
Dimethoate	60-51-5	0.05	mg/kg	<0.05	---	---	---	---
Diazinon	333-41-5	0.05	mg/kg	<0.05	---	---	---	---
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	---	---	---	---
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	---	---	---	---
Malathion	121-75-5	0.05	mg/kg	<0.05	---	---	---	---
Fenthion	55-38-9	0.05	mg/kg	<0.05	---	---	---	---
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	---	---	---	---
Parathion	56-38-2	0.2	mg/kg	<0.2	---	---	---	---
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	---	---	---	---
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	---	---	---	---
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	---	---	---	---
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	---	---	---	---
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	---	---	---	---
Ethion	563-12-2	0.05	mg/kg	<0.05	---	---	---	---
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	---	---	---	---
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	---	---	---	---
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	---	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.5	---	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	---	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.5	---	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	---	---	---	---
Pyrene	129-00-0	0.5	mg/kg	<0.5	---	---	---	---

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID		BP2_3_0.05	QS1	---	---	---
		Client sampling date / time		07-Aug-2019 00:00	07-Aug-2019 00:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1924989-006	ES1924989-007	-----	-----	-----
				Result	Result	---	---	---
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	---	---	---	---
Chrysene	218-01-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	---	---	---	---
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	---	---	---	---
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	---	---	---	---
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	---	---	---	---
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	---	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	---	---	---	---
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	---	---	---	---
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	---	---	---
C10 - C14 Fraction	----	50	mg/kg	<50	<50	---	---	---
C15 - C28 Fraction	----	100	mg/kg	<100	<100	---	---	---
C29 - C36 Fraction	----	100	mg/kg	<100	<100	---	---	---
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	---	---	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	---	---	---
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	---	---	---
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	---	---	---
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	---	---	---
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	---	---	---
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	---	---	---
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	---	---	---
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	---	---	---
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	---	---	---

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID		BP2_3_0.05	QS1	---	---	---
		Client sampling date / time		07-Aug-2019 00:00	07-Aug-2019 00:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1924989-006	ES1924989-007	-----	-----	-----
				Result	Result	---	---	---
EP080: BTEXN - Continued								
^ Sum of BTEX	---	0.2	mg/kg	<0.2	<0.2	---	---	---
^ Total Xylenes	---	0.5	mg/kg	<0.5	<0.5	---	---	---
Naphthalene	91-20-3	1	mg/kg	<1	<1	---	---	---
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	122	---	---	---	---
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	95.6	---	---	---	---
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	89.4	---	---	---	---
2-Chlorophenol-D4	93951-73-6	0.5	%	86.2	---	---	---	---
2,4,6-Tribromophenol	118-79-6	0.5	%	63.7	---	---	---	---
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	103	---	---	---	---
Anthracene-d10	1719-06-8	0.5	%	95.1	---	---	---	---
4-Terphenyl-d14	1718-51-0	0.5	%	102	---	---	---	---
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	94.4	90.7	---	---	---
Toluene-D8	2037-26-5	0.2	%	79.6	82.1	---	---	---
4-Bromofluorobenzene	460-00-4	0.2	%	84.2	83.7	---	---	---

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		QW1	TRIP SPIKE	TRIP BLANK	---	---
Compound	CAS Number	LOR	Unit	07-Aug-2019 00:00	05-Aug-2019 00:00	05-Aug-2019 00:00	---	---
				Result	Result	Result	---	---
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	<0.001	---	---	---	---
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	<20	---	<20	---	---
C10 - C14 Fraction	---	50	µg/L	<50	---	---	---	---
C15 - C28 Fraction	---	100	µg/L	<100	---	---	---	---
C29 - C36 Fraction	---	50	µg/L	<50	---	---	---	---
^ C10 - C36 Fraction (sum)	---	50	µg/L	<50	---	---	---	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	---	<20	---	---
^ C6 - C10 Fraction minus BTEX	C6_C10-BTEX (F1)	20	µg/L	<20	---	<20	---	---
>C10 - C16 Fraction	---	100	µg/L	<100	---	---	---	---
>C16 - C34 Fraction	---	100	µg/L	<100	---	---	---	---
>C34 - C40 Fraction	---	100	µg/L	<100	---	---	---	---
^ >C10 - C40 Fraction (sum)	---	100	µg/L	<100	---	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	100	µg/L	<100	---	---	---	---
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	14	<1	---	---
Toluene	108-88-3	2	µg/L	<2	15	<2	---	---
Ethylbenzene	100-41-4	2	µg/L	<2	14	<2	---	---
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	15	<2	---	---
ortho-Xylene	95-47-6	2	µg/L	<2	16	<2	---	---
^ Total Xylenes	---	2	µg/L	<2	31	<2	---	---
^ Sum of BTEX	---	1	µg/L	<1	74	<1	---	---
Naphthalene	91-20-3	5	µg/L	<5	18	<5	---	---

Analytical Results

Client sample ID				QW1	TRIP SPIKE	TRIP BLANK	---	---
Client sampling date / time				07-Aug-2019 00:00	05-Aug-2019 00:00	05-Aug-2019 00:00	---	---
Compound	CAS Number	LOR	Unit	ES1924989-008	ES1924989-010	ES1924989-011	-----	-----
				Result	Result	Result	---	---
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	108	95.8	112	---	---
Toluene-D8	2037-26-5	2	%	106	101	115	---	---
4-Bromofluorobenzene	460-00-4	2	%	105	102	109	---	---

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130
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

Environment Testing

Kleinfelder Australia Pty Ltd (NEWC)
95 Mitchell Rd
Cardiff
NSW 2285



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: Tom Overton

Report 670360-S
Project name AGL BAYSWATER
Received Date Aug 08, 2019

Client Sample ID			QC2
Sample Matrix			Soil
Eurofins Sample No.			S19-Au12600
Date Sampled			Aug 07, 2019
Test/Reference	LOR	Unit	
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	95
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
Total Recoverable Hydrocarbons			
TRH C6-C9	20	mg/kg	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
Heavy Metals			
Arsenic	2	mg/kg	11
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	21
Copper	5	mg/kg	24
Lead	5	mg/kg	18
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	21
Zinc	5	mg/kg	63
% Moisture	1	%	5.7

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins mgt Suite B1			
BTEX	Sydney	Aug 12, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 12, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 12, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Aug 12, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Aug 12, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Sydney	Aug 12, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Aug 08, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

Company Name:	Kleinfelder Aust Pty Ltd (NEWCASTLE)	Order No.:		Received:	Aug 8, 2019 3:35 PM
Address:	95 Mitchell Rd Cardiff NSW 2285	Report #:	670360	Due:	Aug 15, 2019
Project Name:	AGL BAYSWATER	Phone:	02 4949 5200	Priority:	5 Day
		Fax:		Contact Name:	Tom Overton
					Eurofins Analytical Services Manager : Andrew Black

Sample Detail

Metals M8	Moisture Set	Eurofins mgt Suite B1
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Melbourne Laboratory - NATA Site # 1254 & 14271
Sydney Laboratory - NATA Site # 18217
Brisbane Laboratory - NATA Site # 20794
Perth Laboratory - NATA Site # 23736
External Laboratory

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	QC2	Aug 07, 2019		Soil	S19-Au12600	X	X	X
Test Counts						1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpa, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	103			70-130	Pass	
Toluene	%	106			70-130	Pass	
Ethylbenzene	%	105			70-130	Pass	
m&p-Xylenes	%	104			70-130	Pass	
o-Xylene	%	103			70-130	Pass	
Xylenes - Total	%	103			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	108			70-130	Pass	
TRH C6-C10	%	101			70-130	Pass	
TRH >C10-C16	%	109			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	106			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	%	115			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Heavy Metals									
Arsenic		%		114			70-130	Pass	
Cadmium		%		110			70-130	Pass	
Chromium		%		107			70-130	Pass	
Copper		%		103			70-130	Pass	
Lead		%		102			70-130	Pass	
Mercury		%		98			70-130	Pass	
Nickel		%		105			70-130	Pass	
Zinc		%		103			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Au15456	NCP	%	101			70-130	Pass	
Toluene	S19-Au15456	NCP	%	104			70-130	Pass	
Ethylbenzene	S19-Au15456	NCP	%	100			70-130	Pass	
m&p-Xylenes	S19-Au15456	NCP	%	99			70-130	Pass	
o-Xylene	S19-Au15456	NCP	%	98			70-130	Pass	
Xylenes - Total	S19-Au15456	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S19-Au15456	NCP	%	90			70-130	Pass	
TRH C6-C10	S19-Au15456	NCP	%	105			70-130	Pass	
TRH >C10-C16	S19-Au16266	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S19-Au15456	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S19-Au16266	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Au11163	NCP	%	116			70-130	Pass	
Cadmium	S19-Au11163	NCP	%	116			70-130	Pass	
Chromium	S19-Au11163	NCP	%	101			70-130	Pass	
Copper	S19-Au11163	NCP	%	103			70-130	Pass	
Lead	S19-Au11163	NCP	%	112			70-130	Pass	
Mercury	S19-Au11163	NCP	%	106			70-130	Pass	
Nickel	S19-Au11163	NCP	%	119			70-130	Pass	
Zinc	S19-Au11163	NCP	%	97			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Au15455	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Au15455	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Au15455	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Au15455	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Au15455	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Au15455	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S19-Au15455	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S19-Au15455	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	S19-Au16264	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S19-Au16264	NCP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S19-Au16264	NCP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD		
TRH C6-C9	S19-Au15455	NCP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C10-C14	S19-Au16264	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	S19-Au16264	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S19-Au16264	NCP	mg/kg	76	71	6.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S19-Au11162	NCP	mg/kg	4.6	5.3	15	30%	Pass
Cadmium	S19-Au11162	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S19-Au11162	NCP	mg/kg	26	28	7.0	30%	Pass
Copper	S19-Au11162	NCP	mg/kg	6.2	10	<1	30%	Pass
Lead	S19-Au11162	NCP	mg/kg	15	13	14	30%	Pass
Mercury	S19-Au11162	NCP	mg/kg	0.2	0.2	19	30%	Pass
Nickel	S19-Au11162	NCP	mg/kg	< 5	5.8	<1	30%	Pass
Zinc	S19-Au11162	NCP	mg/kg	14	14	1.0	30%	Pass
Duplicate								
% Moisture				Result 1	Result 2	RPD		
% Moisture	S19-Au12601	NCP	%	19	20	6.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.

Authorised By



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accredited

Measurement uncertainty of test data is available on request or please [click here](#)

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Eunbros

EP670360

ALS		CHAIN OF CUSTODY		DADELADE 21 Burns Road Pembrata SA 5055 Ph: 03 8329 0500 E: alsdade@alsglobal.com		MACQUAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4644 0177 E: macy@alsglobal.com		NEWCASTLE 5-105 Matland Rd Mayfield West NSW 2304 Ph: 02 4914 2500 E: samples.newcastle@alsglobal.com		SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com		
				<input type="checkbox"/> BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com		<input type="checkbox"/> MELBOURNE 2-4 Weston Road Springvale VIC 3171 Ph: 03 8549 6009 E: samples.melbourne@alsglobal.com		<input type="checkbox"/> NOVRA 4/13 Goany Plaza North Novra NSW 2541 Ph: 024422 2003 E: novra@alsglobal.com		<input type="checkbox"/> TOWNSVILLE 14-15 Desma Court Bohle QLD 4816 Ph: 07 4769 0000 E: townsville.environmental@alsglobal.com		
				<input type="checkbox"/> GLADSTON 48 Calmoundah Drive Clinton QLD 4660 Ph: 07 7471 5600 E: gladstone@alsglobal.com		<input type="checkbox"/> MUDGEES 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 9735 E: mudgee.mud@alsglobal.com		<input type="checkbox"/> PERTH 10 Hod Way Matilda WA 6020 Ph: 08 9209 7655 E: samples.perth@alsglobal.com		<input type="checkbox"/> WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com		
CLIENT: Klemfelder		TURNAROUND REQUIREMENTS:		<input checked="" type="checkbox"/> Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		<input type="checkbox"/> Non Standard or urgent TAT (List due date):		FOR LABORATORY USE ONLY (Circle)				
OFFICE: Newcastle		PROJECT: AGL Bayswater		ALS QUOTE NO.:				Customer Seal Intact? Yes No NA				
ORDER NUMBER:		PROJECT MANAGER: Tom Overtan		CONTACT PH: 0415170312				Free Ice / Frozen ice bricks present upon receipt? Yes No NA				
SAMPLER: Josh Crawford		SAMPLER MOBILE: 0477538879		RELINQUISHED BY: JC		COC SEQUENCE NUMBER (Circle) COC: <u>1</u> 2 3 4 5 6 7 OF: <u>1</u> 2 3 4 5 6 7		Random Sample Temperature on Receipt: C		RECEIVED BY: <u>JM</u>		
COC emailed to ALS? { YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		EDD FORMAT (or default):		DATE/TIME: 7.8.19		RECEIVED BY: <u>JM</u>		RELINQUISHED BY: DATE/TIME:		RECEIVED BY: <u>Approved</u>		
Email Reports to (will default to PM if no other addresses are listed): j Crawford@klemfelder.com		Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME: 7/8/19 16:02		DATE/TIME: 7/8/19 3:35PM		DATE/TIME:		DATE/TIME:		
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:												
ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).					Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL CONTAINERS	7ml / BTEX N	PAH	DCLP	M8	Hold	
1	BP1-1-0.05	7.8.19	S	Q52 / Envirofins								
2	BP1-2-0.05			Subcon - Forward Lab / Split WO								
3	BP1-3-0.05			Lab / Analyse								
4	BP2-1-0.05			Organised By / Date:								
5	BP2-2-0.05			Relinquished By / Date:								
6	BP2-3-0.05			Connote / Courier:								
7	Q51			WO No:								
8	Q52			Attached By PO / Internal Sheet:								
9	QW1	1	W									
10	#AGL-ASB	6.8.19										
TOTAL												
Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; DRC = Nitric Preserved DRC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphite Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.												



Telephone : +61 2 8784 8555

#Please send Q52 to Envirofins

that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered.

The sampling results obtained are therefore representative of the conditions at the point at which the sample was taken. Additional data derived from indirect field measurements and sometimes other reports may also be used in the interpretation of environmental conditions. However, the environmental field monitoring and/or testing are merely indicative of the environmental conditions of the site at the time of preparing the report. Any evaluations, discussions and conclusions are based on the data results presented. No liability can be accepted for changes in ground conditions in between exploratory locations. It should also be recognised that site conditions, including the extent and concentration of contaminants, can change with time.