

# Hexham Train Support Facility: Site Management Plan

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2 February 2023



## Plan Approval Table

Position	Name	Signature	Date
Regional Maintenance Manager	David Price		04/08/2023

## Revision History

Rev	Date	Author	Comments
Draft 1	10/07/18	Harry Egan	Draft for Auditors comments
Draft 2	04/01/19	Harry Egan	Draft for Auditors comments
1	13/01/19	Harry Egan	Final for issue
3	08/02/21	Harry Egan	Update following completion of turning angle.
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## Glossary

Term	Definitions
ACM	Asbestos Containing Material
ANZECC	Australian and New Zealand Environment and Conservation Council
the Approval	MP07_0171 MOD 1
ARTC	Australian Rail Track Corporation
ASSMP	Acid Sulphate Soil Management Plan – 39798.12 (Douglas Partners, February 2014)
the Auditor	NSW Site Auditor
CWR	Coal Washery Reject
CHPP	Coal Handling Preparation Plant
DP	Douglas Partners
DP&E	Department of Planning and Environment
OSGMP	Operation Surface and Groundwater Management Plan
SMP	Hexham Train Support Facility Site Management Plan
PAH	Poly Aromatic Hydrocarbon
PASS	Potential Acid Sulphate Soil
the Permit	14-FRM-006-WHS Permit to Work
RAP	NSW Long Term Train Support Facility Remediation Action Plan – Revision 4 (GHD, February 2014)
SAS	Site Audit Statement
SDP	Surface Disturbance Protocol
the Scheme	NSW Site Auditor Scheme (DEC 2006)
SSI	State Significant Infrastructure
TSF	Hexham Train Support Facility
TPH	Total Petroleum Hydrocarbons
UST	Underground Storage Tank

# 1.0 Introduction

## 1.1 Site Description

The Aurizon Hexham Train Support Facility (TSF) is situated on 255ha of land approximately 16km north-west of the Newcastle Central Business District with infrastructure restricted to a 38ha portion of the site.

Relevant site infrastructure consists of:

- Seven train tracks (10.5 kilometres) parallel to the existing mainline, turning angle and a shunt track;
- a provisioning building and associated refuelling pipeline to permit DIL activities
- service vehicle garage and combined maintenance/administrative centre;
- surface water management infrastructure including retention basins;
- bulk fuel storage area; and
- A wastewater treatment plant with on-site effluent irrigation and DAF.

The TSF shares borders with the Main Northern Railway and Pacific Highway to the east and the New England Highway to the north. To the south and west the TSF shares borders with rural properties and the Hexham Swamp Nature Reserve.

## 1.2 Regulatory Context

The project was assessed and approved as State Significant Infrastructure (SSI) under Part 5.1 of the *Environmental Planning and Assessment Act 1979 (EP&A Act)*.

The Site approval history is as follows:

- The Site was approved by a delegate of the Minister for Planning and Infrastructure under MP07\_0171, dated 10 October 2013.
- The Hexham TSF Turning Angle (the Turning Angle) Modification MP07\_0171 MOD 1 (SSI-6090) was approved on the 09 October 2019.
- The Operational Depot and Long-Term Wagon Storage Modification MP07\_0171 MOD 2 (SSI-6090) was approved in September 2022.

The TSF site characterisation, remediation and validation was originally undertaken to comply with Condition E30 of the Approval. Condition E30 requires that contaminated areas within the TSF project footprint be remediated prior to the commencement of construction in line with the requirements of the site NSW Long Term Train Support Facility Remediation Action Plan – Revision 4 (GHD, February 2014) (RAP).

The turning angle site characterisation, remediation and validation has been undertaken in compliance with Condition E31 of the Approval. As Condition E31 effectively supersedes the RAP with the SMP all turning angle characterisation, remediation and validation was undertaken in accordance with Revision 1 of the approved SMP.

Condition E33 of the Approval requires the effectiveness and completion of remediation activities as documented in the project validation reports to be assessed for appropriateness by a NSW Site Auditor (the Auditor). The Auditor's findings are required to be detailed in a Site Audit Report to allow the issue of a Site Audit Statement (SAS) under the *Contaminated Land Management Act 1997*.

As the site retains residual contamination from historical activities predating Aurizon ownership and following construction of the TSF/turning angle an approved Site Management Plan (the SMP) is a prerequisite for the issuing of a SAS. No contamination requiring remediation was present during the construction of the Aurizon depot and wagon stowage project.

The SMP is being developed with consideration to Section 3.4.6 Environmental Management Plans of the Guidelines for NSW Site Auditor Scheme (DEC 2006) (the Scheme).

The SAS audit, project and cadastral boundaries are detailed in Table 1 and shown in Figure 1 below.

**Table 1 - SAS and Project Cadastral Boundaries**

Lot	DP	Within Audit Boundary	Within Project Boundary
104	1189565	Yes	Yes
1	155530	Yes	Yes
105	1189565	Yes	Yes
11	1236873	Yes	Yes
106	1189565	Yes	Yes
2	171105		Yes
104	1084709	Yes	Yes
2	73456	Yes	Yes
10	735235		Yes
102 (part lot)	1084709		Yes
1 (part lot)	256618		Yes
101 (part lot)	1189565	Yes	Yes
1 (part lot)	171105		Yes

### 1.3 Plan Purpose

The SMP is required to manage contamination retained onsite and as a pre requisite to the issue of an SAS. The SMP consists of the following information:

- Historical activities and known contamination types;
- completed remediation and residual management areas;

- monitoring, management and reporting requirements/guidelines;
- responsible parties for implementation of the SMP; and
- SMP review requirements.

As per the Scheme this SMP is an appropriate tool for the management of retained contamination due to:

- Complete remediation of contamination affecting the project area is not practicable or required;
- remediation of all site contamination is likely to cause a greater adverse impact than would occur if the site were left undisturbed; and
- Due to the sites industrial history it is likely contaminants have been retained on site.

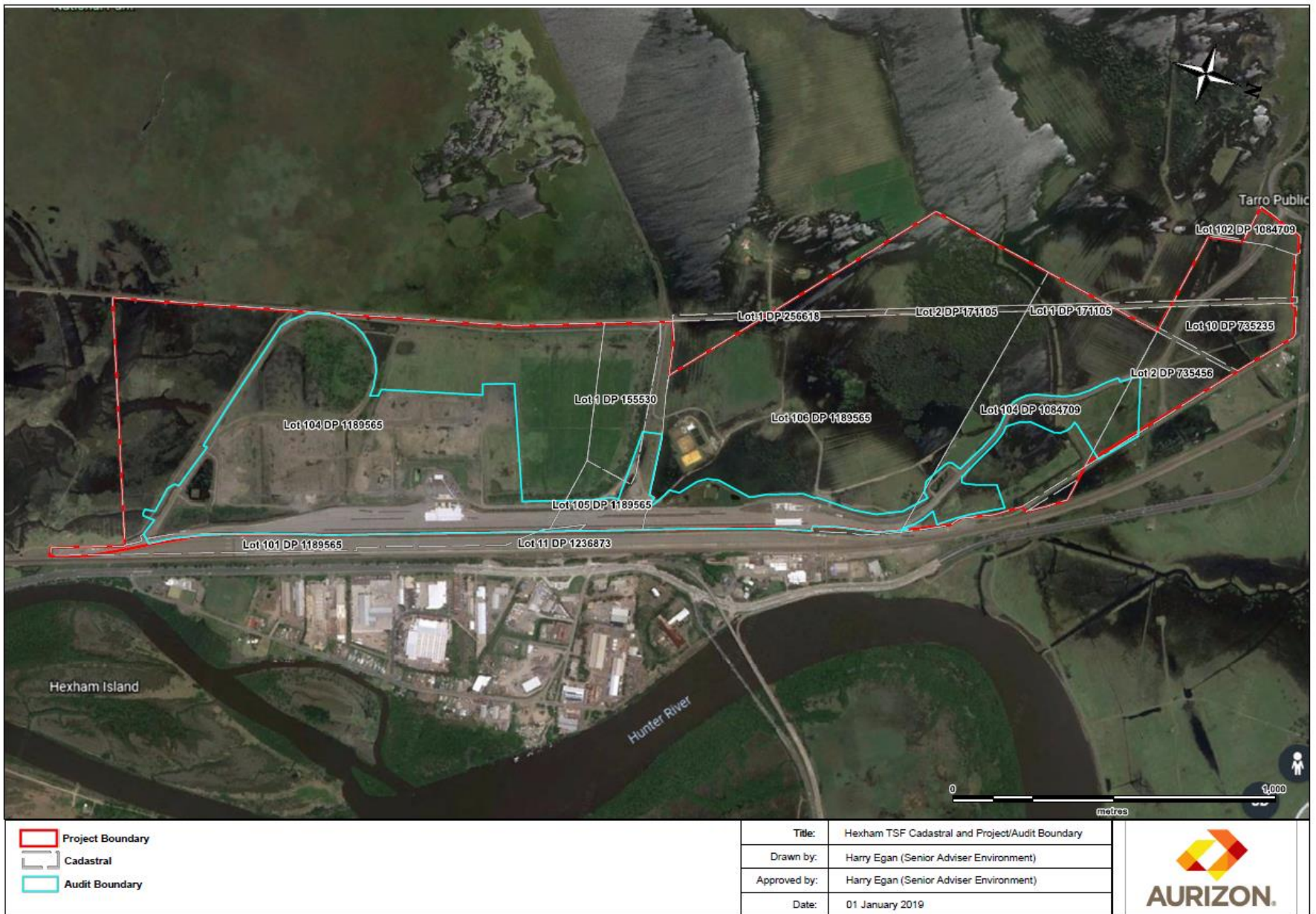


Figure 1 - Hexham TSF Cadastral and Project/Audit Boundary



## 2.0 Site Contamination and Remediation

### 2.1 Historical Contamination

Historical contamination concerns are summarised in the RAP and are as follows:

- Hazardous waste and building materials including asbestos containing materials (ACM);
- Total Petroleum Hydrocarbon (TPH) C10-C36;
- Poly Aromatic Hydrocarbon (PAH);
- Coal Washery Reject (CWR); and
- Potential acid sulphate soils (PASS).

Hazardous waste and building materials including ACM were present within excavated fill, onsite stockpiles the derelict bathhouse/control cabin and bailing shed.

The extensive use of CWR as fill in the southern portion of the site associated with the former coal handling preparation plant and rail sidings was identified. Characterisation results returned a mix of positive and negative detections at various sampling locations and depths, including natural soils and in the CWR fill material.

TPH impacts were greatest in the fill used for the construction of Woodlands Close, former underground storage tank (UST) and refuelling areas.

Groundwater was found to be acidic to slightly alkaline and predominately brackish, with the exception of samples from the south to north western boundary which were found to be saline, and north to central eastern boundary which were found to be fresh. Widespread contamination of surface water comprising faecal coliforms, E.coli, nutrients and metals was identified both on and immediately off-site.

Surface and groundwater contamination was deemed to be associated with cattle disturbing historically deposited contaminated sediment and mobilisation of CWR stockpile in situ contaminants from effluent irrigation. Irrigation is undertaken by Brancourts Manufacturing and Processing Pty under Environmental Protection Licence (EPL) 816.

A summary of monitoring results from surface and groundwater determined that the majority of chemical analysis results were generally consistent within Australian and New Zealand Environment and Conservation Council (ANZECC) trigger values.

### 2.2 TSF Characterisation, Validation and Remediation

Characterisation and validation work, associated with construction of the TSF, relating to ASS and hydrocarbons were initially undertaken by Environmental Earth Sciences NSW and subsequently A.D. Envirotech Australia Pty. Ltd (ADE). Coffey Environments Australia Pty. Ltd was contracted by ADE to complete the characterisation and validation of stockpiles and in-situ soil identified as containing ACM.

Characterisation and validation work undertaken as part of the turning angle project was conducted by GHD.

Remediation completed during construction of the TSF was undertaken by Leighton Contractors (Leighton) and subcontractors consisting of:

- Neutralisation of stockpiles and excavated soil characterised as containing PASS/ASS;
- land farming of hydrocarbon impacted soils within PASS treatment stockpiles; and
- Disposal offsite of hazardous materials and hydrocarbon impacted soil to licenced facilities.

Remediation completed during construction of the turning angle was undertaken by Daracon and was limited to excavation and neutralisation of identified ASS. Characterisation and validation activities was undertaken by GHD.

Reports detailing completed characterisation, validation and remediation works are as follows:

- PASS and ASS:
  - Validation Report 114024, Version 1 (Environmental Earth Sciences NSW, 24 June 2015); and
  - Site Validation Report 9275/VAL1/v2 final (A.D. Envirotech Australia Pty. Ltd, 12 October 2015).
  - 12513786-REP-0\_AurizonTurning Angle Validation Report (GHD, January 2021).
- TPH and hazardous building materials including ACM:
  - Validation Report: Report 115080\_Val\_V2, Version 1 (Environmental Earth Sciences, 9 December 2015); and
  - Assessment of Former UST Area, Hexham Train Support Facility Maitland Road, Hexham: Project 39798.25 (Douglas Partners, July 2018).

## 2.3 Residual Management Areas

The RAP and supporting Acid Sulphate Soil Management Plan – 39798.12 (Douglas Partners, February 2014) (ASSMP) detailed the requirements for characterisation, validation and remediation of onsite contamination. While completed validation analysis indicates identified compliance criteria has been achieved for remediated contamination, residual management areas remain due to characterisation and validation methodologies, undertaken during construction of the TSF, departing from those prescribed in the RAP.

Completed remediation efforts, known residual management areas and their origin are discussed in Table 2. The location of known areas requiring residual management are shown in Figure 2.

As unidentified contamination is likely to exist elsewhere within the TSF project boundary from historical practices, such as underlying CWR or buried hazardous building materials dumped as fill, Figure 2 should be used as a guide only and will be updated as additional contamination is identified.

**Table 2- Completed Remediation and Residual Management**

Contaminants of Concern	Remediation Process	Residual Management
PASS and ASS	<p><b><u>TSF</u></b></p> <p>In situ characterisation of PASS and ASS was completed to delineate in-situ soil requiring excavation and neutralisation as per RAP requirements.</p> <p>Excavated soil was placed in temporary holding Stockpiles 1 – 10 for further characterisation.</p> <p>Characterised soil from the temporary stockpiles was placed in 0.3 meter layers on Treatment Pads (Q1 – Q6). Treatment Pads were located on historical CWR cells.</p> <p>Soil placed within the Treatment Pads was neutralised via application of lime at rates of 37kg/m<sup>3</sup><sup>1</sup>. Neutralised layers were progressively validated with sampling prior to the application of additional layers.</p> <p>Surface and groundwater monitoring was undertaken at the boundary of the Treatment Pads to determine if an impact to surface and/or groundwater from acid leachate had occurred.</p>	<p><b><u>TSF</u></b></p> <p>The following areas of residual management remain relating to PASS and ASS retained in-situ and excavated for neutralisation</p> <ul style="list-style-type: none"> <li>• Baseline sampling of the Treatment Pad area was limited in scope preventing meaningful assessment of the impacts from management of PASS and subsequent neutralisation efforts.</li> <li>• Density of in situ characterisation was not consistent with RAP requirements and relevant guidelines.</li> <li>• Density of temporary stockpile characterisation sampling was not consistent with RAP requirements of 1/100 m<sup>3</sup>.</li> <li>• Density of progressive and final Treatment Pad validation sampling was not consistent with RAP requirements of 1/25m<sup>3</sup>.</li> <li>• Treatment Pad Stockpiles Q1 – Q4 and Q6 did not employ an impermeable membrane.</li> <li>• Treatment Pad validation testing indicated that all PASS and ASS had been neutralised however due to departing from RAP sampling density requirements this is unable to be confirmed.</li> <li>• Pockets of ASS and PASS may be retained in Treatment Pad Stockpiles Q1 – Q6.</li> <li>• PASS remains in situ within the southern portion of the TSF project boundary.</li> </ul>
	<p><b><u>Turning Angle</u></b></p> <p>In situ characterisation of PASS and ASS was completed to delineate in-situ soil requiring excavation and neutralisation as per SMP requirements.</p> <p>The neutralisation pad was characterised and prepared with the base limed and covered with an impermeable HDPE sheeting.</p>	

<sup>1</sup> Acid Sulfate Soil Manual (NSW Acid Sulfate Soil Management Advisory Committee, 1998)

Contaminants of Concern	Remediation Process	Residual Management
	<p>Excavated soil was directly placed within cells in the neutralisation pad area in 0.3m thick layers. Excavations were limed and covered with the replacement formation as soon as practically possible (&lt;24 hours).</p> <p>Soil placed within the neutralisation pad was neutralised via application of lime. Liming rates were determined from characterisation lab analysis. Neutralised layers were progressively validated with sampling prior to the application of additional layers on top.</p> <p>Surface and groundwater monitoring was undertaken as per the Construction Surface and Groundwater Monitoring Plan.</p>	
<p>Total Petroleum Hydrocarbons</p>	<p><b><u>TSF</u></b></p> <p>The former UST was observed as being removed in 2008 by DP.</p> <p>During TSF remediation activities the UST site was characterised as containing PASS and was excavated to a depth of one meter placed in Treatment Pad Stockpiles Q3 and Q4<sup>2</sup>. Hydrocarbons were not included in the characterisation analytical schedule.</p> <p>Monitoring for hydrocarbons during excavation activities was not undertaken although gross pollution was not observed as being present.</p> <p>Retrospective characterisation of the soil layer excavated from the former UST area and placed within Q3 and Q4 was undertaken for hydrocarbons.</p> <p>Characterisation reported petroleum hydrocarbons were within acceptable concentrations and were suitable to remain onsite in accordance with NEPM (2013).</p>	<p><b><u>TSF</u></b></p> <p>The following areas of residual management remain relating to total petroleum hydrocarbons potentially retained in-situ and soils excavated for neutralisation:</p> <ul style="list-style-type: none"> <li>• The UST excavation was not characterised for hydrocarbon contamination and may retain in situ contamination.</li> <li>• Density of validation sampling of Q3 and Q4 was not consistent with RAP requirements of 1/25m<sup>3</sup>.</li> <li>• Treatment Pad validation testing indicated that all hydrocarbon contamination had been remediated however due to departing from prescribed sampling densities this is unable to be confirmed.</li> <li>• Pockets of hydrocarbon impacted soil may be retained in Treatment Pad Stockpiles Q3 and Q4.</li> <li>• Unidentified historical hydrocarbon hotspots may be retained within the TSF project boundary.</li> </ul>

<sup>2</sup> Environmental Earth Sciences (2015a) – *Validation Report for the LTTSF*, Maitland Road, Hexham NSW (ref: 114024\_VAL; dated 24 June 2015)

Contaminants of Concern	Remediation Process	Residual Management
Asbestos	<p><b><u>TSF</u></b></p> <p>Asbestos was identified within a variety of soil and miscellaneous stockpiles throughout the site at locations A2, B1, B4, C3 and C4.</p> <p>Where identified, hazardous materials were removed from site and disposed of at a licenced facility.</p>	<p><b><u>TSF</u></b></p> <p>The following residual areas of residual management remain relating to asbestos potentially retained onsite:</p> <ul style="list-style-type: none"> <li>• Clearance inspection reports for asbestos do not sufficiently detail the methodology employed during clearance.</li> <li>• Review of lab reports indicate that in situ soil samples analysed for friable asbestos were less than the required 500 ml.</li> <li>• Unidentified ACM may be retained within the TSF project boundary.</li> </ul>
Hazardous Building Materials	<p><b><u>TSF</u></b></p> <p>A hazardous materials assessment was undertaken on the 30 June 2014 for the historical bath house/control cabin and bailing shed by ADE<sup>3</sup>.</p> <p>The assessment identified that the buildings contained both asbestos and lead paint.</p> <p>Demolition was completed to the underside of slab on the 29 September 2014 by Australian Demolition &amp; Scrap Recovery Pty Ltd resulting in the removal of ACM and potential lead paint surface contamination.</p>	<p><b><u>TSF</u></b></p> <p>The following areas of residual management remain relating to hazardous building materials potentially retained onsite and within previously cleared areas:</p> <ul style="list-style-type: none"> <li>• Lead paint may still be present in soils surrounding the demolished bath house/control cabin and bailing shed buildings due to validation testing not being undertaken post demolition to confirm its absence.</li> <li>• Unidentified hazardous building materials may be retained within the TSF project boundary as historical fill material.</li> </ul>

<sup>3</sup> Hazardous Materials Survey Report, LTTSF Worksite, Hexham NSW (ref: 7797/HMS1/V1/final; dated 4 July 2014)



Figure 2 - Hexham TSF Areas of Residual Management

## 3.0 Management of Retained Contamination

Contamination retained onsite will be managed through the implementation of a surface and groundwater monitoring program and Surface Disturbance Protocol (SDP).

### 3.1 Surface and Groundwater Monitoring Program

#### 3.1.1 Purpose

The purpose of the surface and groundwater monitoring program is to ensure impacts from relevant historical contamination and residual management areas as identified in Section 2 will be monitored and managed.

#### 3.1.2 Monitoring Network

The placement of surface and groundwater monitoring locations is detailed in Table 3 and shown in Figure 3.

**Table 3 - Surface and Groundwater Monitoring Program**

Site	Type	Easting	Northing	Monitoring Frequency
MW01R	Groundwater	377080	6365705	Quarterly
MW301R	Groundwater	376564	6367446	Quarterly
MW302R	Groundwater	376918	6366499	Quarterly
MW307R	Groundwater	376287	6366363	Quarterly
MW308R	Groundwater	376405	6365896	Quarterly
MW109	Groundwater	376273	6368095	Quarterly
MW106R	Groundwater	376758	6366928	Quarterly
MW02	Groundwater	376711	6365816	Quarterly
101R	Groundwater	377110	6365956	Quarterly
MW108R	Groundwater	376083	6366960	Quarterly
MW101R	Groundwater	376282	6367404	Quarterly
SW1	Surface Water	376210	6368225	Quarterly
SW2	Surface Water	375612	6368068	Quarterly
SW3	Surface Water	375884	6367384	Quarterly
SW4	Surface Water	376197	6366571	Quarterly

Site	Type	Easting	Northing	Monitoring Frequency
SW4A	Surface Water	376222	6366553	Quarterly
SW05	Surface Water	377144	6365655	Quarterly
SW6	Surface Water	376411	6365873	Quarterly
SW07	Surface Water	376680	6365799	Quarterly
SW8	Surface Water	377474	6365420	Quarterly
SW9	Surface Water	377496	6365387	Quarterly
SW10	Surface Water	376776	6367600	Quarterly
SW11	Surface Water	375433	6367878	Quarterly





Figure 3 – Hexham TSF Environmental Monitoring Network

### 3.1.3 Performance Criteria and Contingency Measures

Performance criteria were developed for Aurizon by DP in February 2014<sup>4</sup> utilising information on water quality originating from the site since 1999. The DP report applied statistical analysis to the historic and baseline surface and groundwater data to determine appropriate background chemistry.

Performance criteria are categorised as A, B or C, based on the different categories of receiving environments as listed below:

- Performance Criteria A – Hunter River (SW01, SW02 and SW03);
- Performance Criteria B – Hexham Swamp (SW04, SW05, SW06, SW07); and
- Performance Criteria C – (Groundwater).

The developed criteria and monitoring analytical schedule is shown in Table 4, as included in the Operational Surface and Groundwater Management Plan and approved by the DP&E, take into account the sites historical utilisation and will be used to assess the quality of surface and groundwater results.

In the event that chronic exceedances of the listed performance criteria are recorded an investigation into the cause, potential impacts and feasible mitigation options will be triggered. The investigation will be undertaken by Aurizon and in consultation with suitably qualified contaminated land consultant if required.

**Table 4 - Performance Criteria and Analytical Schedule**

Parameter	Units	Performance Criteria A	Performance Criteria B	Performance Criteria C
Conductivity	uS/cm	40000	6000	20500
pH	pH Units	6.5 - 8.5	5.5 - 8.5	5.5 - 8.5
Aluminium (Al)	mg/L	2.5	2.5	0.055
Arsenic (As)	mg/L	0.013	0.013	0.013
Cadmium (Cd)	mg/L	0.0002	0.0002	0.0002
Chromium (Cr)	mg/L	0.004	0.002	0.002
Copper (Cu)	mg/L	0.0045	0.0026	0.0071
Iron (Fe)	mg/L	35	1.3	350
Lead (Pb)	mg/L	0.0044	0.0034	0.0034
Mercury (Hg)	mg/L	0.0006	0.0006	0.0006
Nickel (Ni)	mg/L	0.017	0.011	0.18

<sup>4</sup>Douglas Partners, 2014, *Report on discharge Criteria Assessment: Proposed Long Term Train Support Facility, Woodlands Close, Hexham*. Report for Aurizon Operations Limited.

Parameter	Units	Performance Criteria A	Performance Criteria B	Performance Criteria C
Zinc (Zn)	mg/L	0.054	0.019	0.65
Ammonia	mg/L	0.9	0.9	25
Turbidity	NTU	60	50	1200
Total Susp. Solids	mg/L	50	40	650
TKN	mg/L	8	4	12
Total Nitrogen	mg/L	10	4	12
Total Phosphorus	mg/L	2.75	1.9	14.5
Faecal Coliforms	cfu/100mL	1500	500	2000
BOD	mg/L	40	15	30
TRH C6-C36	mg/L	0.15	0.15	0.3
Naphthalene	mg/L	0.05	0.05	0.05
Phenanthrene	mg/L	0.0006	0.0006	0.0015
Anthracene	mg/L	0.0006	0.0006	0.00095
Fluoranthene	mg/L	0.001	0.001	0.0015
Benzo(a) pyrene	mg/L	0.0006	0.0001	0.0007
Total PAHs	mg/L	0.01	0.0015	0.02
Benzene	mg/L	0.95	0.95	0.95
Ethyl Benzene	mg/L	0.08	0.08	0.08
Toluene	mg/L	0.18	0.18	0.18
Xylenes (total)	mg/L	0.625	0.625	0.625

## 3.2 Surface Disturbance Protocol

### 3.2.1 Purpose

The purpose of the SDP is to provide a guideline for the ongoing management of contamination that is retained onsite or impacted from surface disturbance activities.

### 3.2.2 Regulatory Requirements and Guidelines

Where contamination has been or is suspected to have been encountered all works should be conducted in consultation with a suitably qualified contaminated land consultant with reference to the SDP, approved RAP/ASSMP and the following relevant regulatory requirements/guidelines:

- Sampling Design Guidelines (EPA 1995);
- NSW EPA Waste Classification Guidelines (EPA);
- NSW EPA 1994 Service Station Guidelines;
- National environment protection (Assessment of site contamination) measure 1999 (April 2013) (NEPM 2013);
- National Acid Sulfate Soils Guidance: National Acid Sulfate Soils Sampling and Identification Methods Manual (Sullivan et al, 2018);
- Work Health and Safety Act and Regulation 2011; and
- Managing asbestos in or on soil (Safe Work NSW, March 2014).

### 3.2.3 SDP Trigger

Any ground disturbance within the TSF project boundary requires the issuing of a completed 14-FRM-006-WHS Permit to Work (the Permit) by an Aurizon supervisor. The Permit is an enterprise wide document that contains a trigger to ensure that environmental requirements are considered prior to the commencement of activities.

### 3.2.4 Contamination Identification and Characterisation

In situ material (natural or fill) which is to be re-used in or near its existing location, where contamination has not been previously identified and which exhibits no visual signs of contamination or contaminant odours does not require testing.

Excavated material, stockpiles or general waste which is to be transported to a different area from its existing location for either re-use or disposal, will be characterised for potential contamination by a suitably qualified consultant regardless of whether evidence of pollution is present. Characterisation density guidelines have been provided in Table 5 below.

Generalised images and descriptions of contamination types known to or that have the potential to be retained onsite are provided in Table 6 below for reference purposes only.

**Table 5 – Characterisation Density Guidelines**

Type	Guideline Sample Density
In-situ soil/stockpiles	1 sample per 100 m <sup>3</sup> and/or a minimum of 3 samples per “batch” of material

Type	Guideline Sample Density
Hazardous materials and ACM	To be advised by consultant

**Table 6 - Contamination Examples**

Type	Description	Example
Hazardous and non-hazardous waste including ACM	<ul style="list-style-type: none"> <li>• Metal or plastic drums (contents unknown);</li> <li>• non-hazardous waste such as tyres, bedding, timber and concrete; and</li> <li>• Hazardous waste such as asbestos, chemicals, lead paint.</li> <li>• ACM non-friable or bonded (sheeting)</li> <li>• ACM friable (insulation, fibres)</li> </ul>	
Hydrocarbon impacts	<ul style="list-style-type: none"> <li>• Discoloured soil or groundwater (rainbow sheen) and</li> <li>• Pungent, petroleum, compost, putrefied, sulphurous, acidic, caustic, septic, sweet, aromatic odours.</li> </ul>	
PASS or ASS	<ul style="list-style-type: none"> <li>• Acid sulfate soils (grey/black/green, sulphur odour).</li> </ul>	
CWR	<ul style="list-style-type: none"> <li>• Fine black material or black liquid;</li> <li>• sulphuric odour;</li> <li>• potential surface sheen; and</li> <li>• Likely to be buried in cells.</li> </ul>	
UST	<ul style="list-style-type: none"> <li>• Likely to be located within or adjacent to historical and current refuelling facilities, mechanical and industrial operations;</li> <li>• more likely to contain fuel and waste oil products;</li> <li>• metal or fibreglass construction;</li> <li>• be aware of above ground evidence of tanks (i.e. pavement scarring, fill and dip points, bowser foundations, vent pipes on adjoining buildings);</li> <li>• hydrocarbon odours; and</li> <li>• Be aware of sand backfill and concrete anchors during excavation works.</li> </ul>	

### 3.2.5 Management and Remediation

Management and remediation of characterised contamination, including excavations, will be undertaken under the direction of a suitably qualified consultant/contractor.

The extent of excavations will be determined by visual and olfactory observations as well as previous characterisation results to ensure contingency actions are initiated if unexpected contamination is encountered and contamination is not retained in-situ.

General management guidelines have been provided in Table 7 below.

**Table 7 - Management and Remediation Guidelines**

Type	General Validation Guidelines
PASS and ASS	<ul style="list-style-type: none"> <li>• Soil characterised as being PASS and/or ASS which requires disturbance will be excavated and stockpiled.</li> <li>• Prior to backfilling the excavation floor and walls will undergo validation sampling to confirm absence PASS/ASS or if neutralisation is required.</li> <li>• Excavated soil (and subsequent leachate) will be placed within a fully bunded and impermeable based landfarm for further characterisation and neutralisation.</li> <li>• Neutralisation will be undertaken as per relevant guidelines and standards.</li> <li>• Upon completion of neutralisation validation testing will be completed to ensure compliance with relevant criteria and soil stockpiled or reused onsite as required.</li> </ul>
Total Petroleum Hydrocarbons	<ul style="list-style-type: none"> <li>• Soil characterised as being impacted by hydrocarbons which exceed NEPM criteria which requires disturbance will be excavated.</li> <li>• Prior to backfilling the excavation floor and walls will undergo validation sampling to confirm absence of contamination.</li> <li>• Excavated soil will either be landfarmed or disposed offsite by a suitably licenced waste disposal contractor.</li> <li>• Landfarms will be constructed, maintained and operated with reference to the NSW EPA Best Practice Note: Landfarming (2014).</li> <li>• Upon completion of landfarming validation testing will be completed to ensure compliance with relevant NEPM criteria and soil stockpiled or reused onsite as required.</li> </ul>
ACM	<ul style="list-style-type: none"> <li>• All fragments of ACM will be disposed of off-site in accordance with regulatory requirements.</li> <li>• Stockpiles and in situ material containing ACM fragments will be characterised for friable asbestos.</li> <li>• If volumes of asbestos containing soil are relatively small, it will be disposed of off-site. If larger quantities are encountered, consideration will be given to on-site containment of asbestos containing soils.</li> </ul>
Hazardous Materials	<ul style="list-style-type: none"> <li>• Characterise the material and dispose off-site, re-use onsite or manage in-situ depending on the waste classification results.</li> </ul>

### 3.2.6 Validation

Validation sampling will be undertaken to demonstrate that contamination has been remediated to a standard that is compatible with the proposed land use as per NEPM 2013. A guideline for validation sampling density has been provided in Table 8 below.

**Table 8 - Validation Sampling Density Guidelines**

Type	Sample Density	General Validation Guidelines
Excavations	1 sample per 10 m (linear)	<ul style="list-style-type: none"> <li>Samples from the base of each excavation (based on a 10 x 10 m grid, or at least one sample per 10 lineal metres of trench).</li> </ul>
	1 sample per 100 m <sup>2</sup>	<ul style="list-style-type: none"> <li>At least one base sample from any single excavation.</li> <li>Aesthetic considerations will be based on observations.</li> </ul>
Excavated materials and/or stockpiles	1 sample per 100 m <sup>3</sup>	<ul style="list-style-type: none"> <li>Heterogeneous material may require sampling at a higher rate to ensure all elements of the material are sampled.</li> </ul>
Landfarms	1 sample per 25 m <sup>3</sup>	<ul style="list-style-type: none"> <li>Validation sampling of farmed material to be along a systematic grid from mid depth for monthly progress and final testing.</li> </ul>
Hazardous materials, ASS and ACM	As per consultants recommendations.	<ul style="list-style-type: none"> <li>As per consultants recommendations.</li> </ul>

### 3.2.7 Reporting

Progressive reporting on completed characterisation, remediation and validation must be undertaken for all remediation projects.

At the completion of any works requiring the implementation of the SDP the responsible Project Manager in consultation with the Aurizon Environmental Department will engage a suitably qualified contaminated land consultant to complete a validation report consistent with the Guidelines for Consultants Reporting on Contaminated Sites (OEH, 2011).

This report will act as an addendum to any existing approved validation report as required by Condition E33 of the Approval and be assessed by an accredited NSW Site Auditor as part of an updated Site Audit Report. The approved report will be submitted to the DP&E and Newcastle City Council.

## 4.0 Continual Improvement and Communication

### 4.1 Document Review

The SMP will form an appendix to the approved Hexham TSF Operational Environmental Management Plan and be reviewed annually, following a major environmental incident or upon completion of a remediation project.

All reviewed documents are to be entered into iN-Gauge with the previous document removed.

### 4.2 Communications

The contents of the SMP will be communicated to key site supervisors and project managers responsible for the issue of work permits to ensure all staff remain up-to-date with site contamination issues prior to the commencement of projects involving disturbance. Communication may be delivered by:

- Incident and hazard reports, safety alerts and advices, public distribution lists;
- SHEM database;
- site Workplace Health Safety & Environment Committees;
- daily pre-start meetings, site safety meetings, toolbox talks, safety interactions; and
- Aurizon intranet sites, newsletters.

Evidence of communications having been delivered will be retained in an electronic format.



## 5.0 Responsibilities

All staff and contractors have an obligation to implement the requirements of the SMP. Specific responsibilities for administering, monitoring and reporting as required by the SMP are detailed below in Table 9.

**Table 9 - Management Hierarchy and Responsibilities**

Position	Responsibility
General Manager	<ul style="list-style-type: none"> <li>• Ensure site / site operations comply with regulatory obligations; and</li> <li>• Report compliance to Board.</li> </ul>
Regional Maintenance Manager	<ul style="list-style-type: none"> <li>• Ensure that management representatives and supervisors comply with and fulfil their obligations in relation to the SMP;</li> <li>• implement Aurizon's Environmental Policy (POL 08) and Environmental Management Principle (ENV/PRI/001);</li> <li>• effective functioning / management of operations;</li> <li>• communicate information concerning key environmental issues and responsibilities;</li> <li>• ensure site personnel are appropriately trained;</li> <li>• manage incidents, complaints and related investigations; and</li> <li>• Address non-conformances identified through incidents.</li> </ul>
Regional Maintenance Superintendent	<ul style="list-style-type: none"> <li>• Supporting implementation of the SMP;</li> <li>• communication of the SMP requirements to site personnel;</li> <li>• liaising with the SAE to determine if the SDP is triggered when completing 14-FRM-006-WHS Permit to Work;</li> </ul>
Construction Project Manager	<ul style="list-style-type: none"> <li>• complete routine site inspections;</li> <li>• manage incidents, complaints and related investigations;</li> </ul>
Facilities Coordinator	<ul style="list-style-type: none"> <li>• address non-conformances identified through incidents;</li> <li>• adhere to site waste management and record keeping requirements; and</li> <li>• Ensure all staff and sub-contractors are adequately inducted; and trained.</li> </ul>
Senior Adviser Environment	<ul style="list-style-type: none"> <li>• Review of the SMP annually or following completion of remediation project;</li> <li>• supporting implementation of the SMP;</li> <li>• conduct environmental audits to ensure compliance with SMP;</li> <li>• facilitating technical studies and expert advice; and</li> <li>• Review of monitoring data and reports to identify non compliances.</li> </ul>
Project and Site Personnel	<ul style="list-style-type: none"> <li>• Implementation of the SDP.</li> </ul>

## Related Documents

- Project Thomas II, Stage 2 Environmental Site Assessment”, Hexham, (ERM, October 2010);
- Acid Sulphate Soil Management Plan (ASSMP) (Project 39798.08, Nov 2012);
- Preliminary Contamination Assessment Proposed Train Support Facility Woodlands Close, Hexham, (Douglas Partners, November 2012);
- NSW Long Term Train Support Facility Remediation Action Plan - Rev 4, (GHD, 4 February 2014);
- Hazardous Materials Survey Report, LTTSF Worksite, Hexham NSW (ADE ref: 7797, 4 July 2014).
- Site Soil Characterisation report, (ADE, 1 September 2014).
- EESI Contracting, Acid Sulfate Management Plan, Neutralisation of PASS and CWR (Document No. 914011 005 Rev 3, 17 June 2015).
- Environmental Earth Sciences NSW, Validation Report (Report 114024, Version 1, 24 June 2015);
- Environmental Earth Sciences NSW, Validation Report (Report 115080\_VAL\_V2, Version 1, 9 December 2015);
- A.D. Envirotech Australia Pty. Ltd., Site Validation Report (9275/VAL1/v2 final, 12 October 2015)
- 12513786-REP-0\_AurizonTurning Angle Validation Report.