

# Appendix L – Preliminary Site Investigation

PROJECT

**PRELIMINARY SITE  
INVESTIGATION -  
TWEED SAND PLANT  
EXPANSION, CUDGEN  
NEW SOUTH WALES**

PREPARED FOR

**HANSON CONSTRUCTION MATERIALS  
PTY LTD**

DATE

**JANUARY 2021**

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**SYNOPSIS** This report describes a Preliminary Site Investigation for the proposed Tweed Sand Plant Expansion area located in Cudgen, New South Wales.

## REVISION HISTORY

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## SUMMARY

Hanson Construction Materials Pty Ltd (Hanson) commissioned Gilbert & Sutherland Pty Ltd (G&S) to prepare a Preliminary Site Investigation (PSI) for the proposed expansion of their Tweed Sand Plant (TSP) operation located in Cudgen, New South Wales.

This report was prepared to satisfy the requirements of the Secretary's Environmental Assessment Requirements (SEARs) issued for the Project in December 2019 as they relate to the investigation of site contamination. The assessment included a review of previous assessments undertaken on the site, a review of historic aerial photography, site inspections and interviews with past and current owners. The following potentially contaminating activities/contaminants were found to be associated with the site:

### **Lot 51 DP1166990**

#### Treed area

- Demolition waste including bricks, timber, concrete and metal
- Other wastes including old tyres, various empty chemical drums and oil containers, scrap metal including old cars, white goods and an outboard motor, a boat, soil stockpiles and general rubbish

#### Other areas

- Evidence of demolition waste including concrete slabs
- Two soil stockpiles containing bricks and some bonded ACM
- Large vegetated stockpile of potentially imported soil

#### Additional

- possible buried asbestos concrete pipes used as part of the historic drainage across the site

### **Lot 2 DP 1192506 and Lot 1 DP1250570**

The historical assessment and site inspection identified no obvious contaminants of potential concern (CoPC) apart from:

- several stockpiles of imported soil and rock rubble
- a cattle pen/stockyard with imported gravel base and empty disused drum of endectocide
- other soil stockpiles and;
- an empty above ground fuels storage tank (AST).

**Lot 22 DP1082435 and Lot 23 DP1077509**

The historical assessment and site inspection identified no obvious CoPC apart from historical herbicide and pesticide use associated with the growing of *Melaleuca alternifolia* (tea tree).

It is recommended that further detailed inspection/assessment of the site be undertaken on a lot by lot basis prior to the proposed expansion works. This would include a soil sampling program to sample any of the identified potential areas of contamination including soil stockpiles within all lots, soils within the rows and headers of the currently cropped tea tree on Lot 22 DP1082435 and Lot 23 DP1077509, the current cattle pen/stockyard and surrounds and AST on Lot 1 DP1250570; and the treed area and surrounds on Lot 51 DP1166990.

The identified wastes within the treed area on Lot 51 DP1166990 in particular would require further assessment and removal prior to undertaking a detailed assessment of the underlying soils.

**Future progress**

The potentially contaminating activities/potential contaminants associated with the site are typical of land where agricultural activities have historically been undertaken and were limited to small areas of the site as identified on Drawing 12035-416 in Appendix 1.

Should the proposed expansion be approved, a detailed investigation would be undertaken to inform the preparation of a Remediation Action Plan (RAP) for the relevant areas of the site.

In many instances, remediation requirements are likely to be straightforward and simply require the removal of identified wastes with selected areas also requiring soil testing. These activities would be undertaken in accordance with an approved RAP and scheduled to occur on a lot by lot basis prior to the commencement of extraction within the relevant allotments. This staged approach is supported by State Environmental Planning Policy (SEPP) 55 which provides that detailed assessments need not be undertaken immediately following the preliminary investigation but should be undertaken prior to commencement of the new land use.

It is proposed that detailed investigations, preparation of the RAP and any subsequent remediation of the identified areas could reasonably form a condition of approval for the proposed expansion.

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DRAWING NO.	DESCRIPTION
12035_001	Existing Tweed Sand Plant Operation
12035_002	Proposed Tweed Sand Plant Expansion
Z19163-104	Concept Development Phasing
Z19163-101	Current lot plan
12035_401	Historical Image 1961
12035_402	Historical Image 1980
12035_403	Historical Image 1982
12035_404	Historical Image 1989
12035_405	Historical Image 2007
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12035_417	Location of Potentially Contaminated Areas

# 1 Introduction

Hanson Construction Materials Pty Ltd's (Hanson) Tweed Sand Plant (TSP) operation, located off Altona Road in Cudgen, New South Wales, has a total extraction footprint of approximately 46 hectares (ha). Sand extraction has been undertaken at this location since 1983 with Hanson assuming operation of the site in 2007.

TSP operates under Development Application (DA) DA 152-6-2006 issued on 31 July 2006, as modified on 20 August 2018 (Notice of Modification MOD 1). The current MOD 1 approval remains valid until 1 July 2036 and authorises TSP to produce and transport from the site up to 500,000 tonnes of quarry products per financial year. Drawing 12035\_001 shows the location of the TSP site.

To meet ongoing demand for sand, Hanson is proposing to expand its existing operations into lands to the north and west of the TSP site. The footprint of the expansion area is approximately 190 ha, giving a total combined footprint of 236 ha for the existing and future extraction areas.

## 1.1 Expansion proposal

The TSP site is level to gently inclined, exhibits elevations of less than five metres Australian Height Datum (<5 mAHD) and has a current extraction footprint of approximately 46 ha. The proposed expansion would see TSP's operations extend into some 190 ha of lands to the north and west of the existing TSP site.

The sand resource in the expansion area is estimated to approximate 30 to 35 million tonnes, extending to about 20 metres below ground level (mbgl). Overburden is limited to topsoils of around one metre thickness, while minimal interburden is present throughout the resource. Drawing 12035\_002 shows the footprint of the proposed expansion area and existing TSP site with respect to neighbouring operations and roadways.

Consistent with current TSP operations, sand would be extracted using a dredge and pumped to

an onshore wash plant, where the target sands are separated from the finer clay and silt materials ('the fines') through a hydrocyclone. To minimise potential environmental impacts associated with these materials, the fines would then be returned to the lake under controlled conditions.

Sand extraction rates would be market driven, but capped at an annual maximum limit of 950,000 tonnes with a proposed project life of some 30 years. As extraction proceeds, the site office, washplant, stockpiling area and weighbridge would be moved from their current locations on the eastern perimeter of the site to the northern end of Lot 2 DP1192506. Drawing Z19163-104 provides a conceptual overview of the progression of sand extraction throughout the proposed expansion area.

The nature and scale of the expansion classifies the proposal as a State Significant Development (SSD). In November 2019, a Scoping Study was completed for the project and submitted to the NSW Department of Planning, Industry and Environment (DPIE) for its consideration and subsequent issue of site-specific Secretary's Environmental Assessment Requirements (SEARs) on 17 December 2019. These SEARs form the basis of the Tweed Sand Plant Expansion (SSD – 10398) Environmental Impact Study (EIS), of which this report is a part.

## 1.2 Scope of this report

The proposed expansion area covers lands that have historically been used for sugar cane and tea tree production, and grazing and also contain existing structures. The aim of this Preliminary Site Investigation is to evaluate the potential for on-site contamination from the previous and proposed site uses in order to meet the SEARs.

The contaminated land investigation requirements detailed in the SEARs are reproduced in Table 1.2.1 (following page). For ease of reference, this table also cites where each requirement is addressed in this report. Where the requirements of the SEARs overlap between disciplines, a specific issue may be addressed under separate cover (as indicated in the table).

Table 1.2.1 SEARs relevant to site contamination

Department/Agency	Secretary's Environmental Assessment Requirements	Section
Tweed Shire Council	<p>To support any future expansion proposal, the application would need to be supported by the following technical reports prepared by suitably qualified and experienced consultants.</p> <ul style="list-style-type: none"> <li>• Air Quality Assessment</li> <li>• Surface water and Groundwater Assessment</li> <li>• Traffic Noise Assessment</li> <li>• Construction and Operational Noise Assessment</li> <li>• Acid Sulfate Soil Assessment</li> <li>• Contaminated Land Assessment</li> <li>• Environmental Management Plan: <ul style="list-style-type: none"> <li>- Air</li> <li>- Construction Noise</li> <li>- Operational Noise</li> <li>- Surface Water</li> <li>- Groundwater</li> <li>- Acid Sulfate Soils</li> </ul> </li> </ul>	
EPA (C - The location)	<p><b>Soil contamination issues</b></p> <p>Provide details of site history – if earthworks are proposed, this needs to be considered with regard to possible soil contamination.</p>	
EPA (E – The environmental issues)	<p><b>1. Soils and contamination</b></p> <p><b>Describe baseline conditions</b></p> <ul style="list-style-type: none"> <li>• Provide any details (in addition to those provided in the location description – section C) that are needed to describe the existing situation in terms of soil types and properties and soil contamination.</li> </ul> <p><b>Assess impacts</b></p> <ul style="list-style-type: none"> <li>• Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of: <ol style="list-style-type: none"> <li>a) Disturbing any existing contaminated soil</li> <li>b) Contamination of soil by operation of the activity</li> <li>c) Subsidence or instability</li> <li>d) Soil erosion</li> <li>e) Disturbing ASS or PASS</li> </ol> </li> </ul> <p>Reference should be made to Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites; Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (EPA, 2015).</p>	
	<p><b>Describe management and mitigation measures</b></p> <ul style="list-style-type: none"> <li>• Describe and assess the effectiveness of adequacy of any soil management and mitigation measures during construction and operation of the proposal including: <ol style="list-style-type: none"> <li>a) Erosion and sediment control measures</li> <li>b) Proposals for site remediation</li> <li>c) Proposals for the management of these soils</li> </ol> </li> </ul>	



### 1.3 Objectives

To address the SEARs with respect to contaminated land issues, Hanson commissioned G&S to undertake a PSI within the proposed expansion area. The objectives of the PSI were to undertake a desktop assessment to determine whether any current or historical land use activities have had the potential to contaminate the site. This would be supported by a limited site inspection to ground truth any findings of the desktop assessment and interviews with the current landholders if possible.

### 1.4 Scope of work

To meet the objectives of this investigation, the following works were conducted:

- A site history investigation incorporating a search of the NSW Environmental Protection Authority (EPA) Registers (the public register and the 'Contaminated Land – records of notices register'); a search of the NSW Department of Primary Industries dip site register; review of historical aerial photographs; review of the historical use information; and interviews with TSP staff and current site owners of the other land parcels.
- A site inspection to ground-truth any findings from the site history desktop investigation (if required).
- Interpretation of desktop results and provision of preliminary advice (in the form of a Preliminary Site Investigation report), including advice and recommendations for further investigations (if required).

### 1.5 Relevant guidelines and documents

The PSI considered the following relevant guidelines and documents:

- Tweed Shire Council's Contaminated Land Policy (Version 1.1).
- NSW EPA *Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites* (EPA, 2011).
- NSW EPA *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (EPA, 2015) NSW DUAP/EPA *Managing Land Contamination Planning Guidelines SEPP 55 – Remediation of Land* (DUAP/EPA 1998).

## 2 Site characteristics

### 2.1 Property description and zoning

The project site comprises eight allotments with a total site footprint of approximately 236 ha (including the existing TSP operation) as shown on Drawing 12035\_002. Drawing Z19163-101 shows the current lot plan for the proposed expansion area.

Table 2.1 summarises the site details including property description, lot size and land zoning under Tweed Shire Council's (TSC) Local Environmental Plan (LEP) 2014.

### 2.2 Existing land uses

TSP is located within the Tweed Valley Floodplain and is surrounded by various land uses. Located immediately north of the site is TSC's wastewater treatment facility and open grazing lands. Further

to the north lies the Pacific Motorway, the township of Chinderah and the Tweed River.

To the north-east is Chinderah Golf Course and some residential properties fronting the Tweed Coast Road. Immediately to the east lies the Cudgen Lakes Sand Extraction. Further to the east is the townships of Cudgen and Kingscliff and the Pacific Ocean.

The Cudgen Plateau, immediately south of the project site, is primarily used for agricultural purposes including cropping and orchards. To the southeast is the Cudgen residential area and Cudgen Public School to the west of that area.

Open grazing lands, the ABLP land and facilities and the Pacific Motorway are present to the west of the site.

### 2.3 Topography and local drainage

Local topographic mapping indicates that the elevation of the property is uniform, with an

Table 2.1 Site details – property description, land zoning and lot size

Description	Details (including LEP 2014 zoning*)	Lot size (ha)
Lot and plan	Lot 22 DP1082435 (RU1 – Primary production)	74.560
	Lot 23 DP1077509 (RU1 – Primary production)	2.552
	Lot 494 DP720450 (RU1 – Primary production)	0.104
	Lot 1 DP1250570 (RU1 – Primary production and RU2 – Rural landscapes)	90.000
	Lot 2 DP1192506 (RU1 – Primary production)	11.120
	Lot 3 DP1243752 (RU1 – Primary production)	1.612
	Lot 51 DP1166990 (RU1 – Primary production)	55.130
	Lot 50 DP1056966 (RU1 – Primary production)	1.094
Site area		236.172
Current owners	Lot 22 DP1082435, Lot 23 DP1077509, Lot 494 DP720450 - Hanson Construction Materials Pty Ltd Lot 51 DP1166990 and Lot 50 DP1056966 – A. Brinsmead Lot 1 DP1250570, Lot 2 DP1192506, Lot 3 DP1243752 – Cudgen Land Pty Ltd	
Local government	Tweed Shire Council	
On site structures and infrastructure	Fencing on all Lot boundaries and some internal boundaries. Dwelling and water tank on Lot 51 DP1166990	
Surrounding land use	Existing Tweed Sand Plant, Rural land, Australian Bay Lobster Producers, Kingscliff Wastewater Treatment Plant	

Notes: \*Source: NSW Planning Portal, 23 October 2020

average relative level (RL) of 1.0 metres Australian Height Datum (mAHD).

The site's slopes are described as level (<1%) to very gently inclined (1-3%).<sup>1</sup> The project site abuts the Cudgen Plateau to the south, where elevations rise steeply to approximately 38 mAHD.

The site is located within the Tweed Valley Floodplain. Most runoff from the site passively infiltrates through the highly permeable sandy soils. Any remaining runoff is currently diverted towards the on-site extraction areas, or conveyed to a network of agricultural drains.

There are no natural water courses (including intermittent/ephemeral drainage lines) within the immediate vicinity of the expansion area. During high intensity rainfall events, the site becomes inundated and peak discharges may potentially flow toward the agricultural drainage lines constructed along the northern and western property boundaries. These drains convey runoff from the surrounding agricultural properties through flood gates to the Tweed River.

## 2.4 Regional drainage

The project site is located within the lower reaches of the Tweed River Floodplain. The headwaters of the Tweed River begin near Kunghur, approximately 50 km southwest of Chinderah and generally flow in a north-easterly direction. Numerous rivers, creeks and tributaries feed into the Tweed River, including the Oxley River approximately 5 km southwest of Murwillumbah, and the Rouse River west of Tumbulgum.

The Tweed River discharges into the Pacific Ocean at the Tweed River mouth, immediately east of Tweed Heads. The tidal influence of the Pacific Ocean extends just upstream of Murwillumbah (WBM, 2005).<sup>2</sup>

The floodplain is criss-crossed by a network of interconnecting agricultural drains and flood gates which convey water from the floodplain to the Tweed River. The main drain through the catchment ('the western drain', shown in blue on Figure 4.4) flows westwards from Tweed Coast Road parallel to Altona Drive. The drain then turns northwards adjacent to the TSP site before discharging into the Tweed River through culverts under the Pacific Highway and Chinderah Bay Drive. These culverts have flood gates installed on the River side, under Chinderah Bay Drive. Other minor drains run east-west and north-south across the floodplain and generally discharge into the western drain.

The floodplain is subject to inundation from both local catchment floods as well as Tweed River overbank floods.

## 2.5 Soil landscapes

Soil Landscapes within the project site are described in the DPIE's Soil Landscapes of Central and Eastern NSW dataset 2020.<sup>3</sup>

The expansion area is within the 'Tweed landscape' (9541tw). This landscape is described as an extensive marine plain of the lower Tweed catchment, consisting of deep Quaternary alluvium and estuarine sediments.

The marine plain has been created by the in-filling of a large estuary or embayment during the Pleistocene era. Marine clays and muds have dominated these fill materials. Since this period of aggradation, the Tweed River has been creating a covered plain consisting of terrestrial sediments.

The eastern extents of the TSP site are mapped as a 'Tweed landscape variant b' (9541twb) (DPIE, 2020).<sup>4</sup> This landscape is described as consisting of deep Quaternary alluvium and estuarine sediments with landscape variant 'twb', described as Pleistocene sands overlain by alluvial soil material.

<sup>1</sup> McDonald R. C., Isbell R. F., Speight J. G., Walker J. & Hopkins M. S. Australian Soil and Land Survey Field Handbook. Second Edition 1990, Inkata Press Pty Ltd.

<sup>2</sup> WBM Oceanics Australia (2005) Flood Impact Assessment for the Proposed Sand Quarry at Crescent Street, Cudgen. 13 June 2005.

<sup>3</sup> Department of Planning, Industry and Environment, 2020, Soil Landscapes of Central and Eastern NSW - v2.1, NSW Office of Environment and Heritage, Sydney.

<sup>4</sup> Ibid, 2020.

The project site lies within the Cudgen 1:25 000 Acid Sulfate Soil Planning Map (DLWC 1997). This mapping indicates that there is a high probability of ASS material being encountered within 1 m to 3 m of the ground surface.

## 2.6 Geology

A review of the 1:250,000 Geological Series SH56-3 (Tweed Heads) indicates that the site geology is comprised of Quaternary sedimentary deposits of river gravel, alluvium, sand and clay.

A hydrogeological investigation at the eastern neighbouring property (Lot 51) described the regional bedrock as interbedded argillite and metagreywacke of the Neranleigh-Fernvale Beds of lower Palaeozoic age. The materials overlying this stratum were described as Quaternary organic clays, which were in turn overlain by Quaternary sands.<sup>5</sup>

The quaternary sands were described as poorly graded medium to fine grained quartzose sands with some coarse grains. These materials had a relatively uniform thickness of around 21 m across the site. The depositional environment for the Quaternary sands was identified as deltaic, with the presence of shell and organic fragments throughout the sequence, indicative of alternating marine and terrestrial influence.<sup>6</sup>

## 2.7 Soils

The site soils were characterised in accordance with the Australian Soil Classification (Isbell, 2002)<sup>7</sup> as part of the Agricultural Assessment undertaken for the expansion application. This included review of borelog information from the five detailed shallow bores (1.2 mBGL) and 20 additional deep bores (up to 10 mBGL) drilled for acid sulfate soils assessment purposes. The following soil orders (or types) were identified:

- Tenosols – The soils at the site generally fall within the Tenosol soil type, which are soils exhibiting only weak pedologic organisation apart from the A horizons. The soil order

encompasses a rather diverse range of soils, which are nevertheless widespread in many parts of Australia.

- Podzols – These are soils which possess either a Bs horizon (visible dominance of iron compounds) a Bhs horizon (organic-aluminium and iron compounds) or a Bh horizon (organic-aluminium compounds). These horizons may occur singly in a profile or in combination.

## 2.8 Vegetation

The TSP site and proposed expansion area is characterised by open grazing lands which have been largely cleared of native vegetation. Within the TSP site an area of approximately 20 ha is currently cultivated under tea tree.

The agricultural drains that traverse the site contain some native vegetation, which is described in detail under separate cover.

## 2.9 NSW EPA register searches

The NSW Environmental Protection Authority (EPA) maintains the following two registers containing information relevant to potentially contaminating land uses:

- The Public Register under section 308 of the Protection of the Environment Operations Act 1997 (the POEO Act), which contains details of environment protection licences, license applications and notices issued under the POEO Act; and
- The 'Contaminated Land - Record of Notices', which includes details of contaminated sites that the EPA is aware of, together with details of sites that have been notified to the EPA under section 60 of the Contaminated Land Management Act 1997. Sites notified to the EPA are believed, by the site owner or a person responsible for the contamination, to be contaminated ('notified site(s)').

A search of both registers indicates that the EPA is not aware of any recognised (or reported) risk

<sup>5</sup> Coffey Geosciences (1999). Cudgen Sand Extraction – Hydrogeological Assessment and Installation of Monitoring Bores.

<sup>6</sup> Coffey and Partners (1985 - 1986). Geotechnical investigation for proposed extractive industry on Lot 2 DPG11021 and DP216705.

<sup>7</sup> Isbell, R.F (2002) The Australian Soil Classification, CSIRO Press.

of environmental harm or health impacts associated with the site and surrounds. Results of the notified sites search, together with search results in respect of lands within the Tweed Shire Council local government area (as at 1 December 2020) are included as Appendix 2.

### 3 Previous site investigations and history

A number of relevant investigations undertaken for the current Tweed Sand Plant and adjoining areas were reviewed as part of this assessment. These include the following, the most relevant of which are described further in sections 3.1, 3.2 and 3.3:

- Gilbert & Sutherland (2005) *Soil Survey, Acid Sulfate Soil Assessment, Agricultural Land Capability Assessment, Hydrological Assessment and Soil and Water Management Plan for proposed Expansion of Extractive Industry, Lot 2 DP777905, Cudgen, June 2005, prepared for P. Guinane Pty Ltd.*
- Gilbert & Sutherland (2005) Addendum Report Proposed Expansion of Extractive Industry. Lot 2 DP777905, Cudgen, June 2005, prepared for P. Guinane Pty Ltd.
- Planit Consulting Pty Ltd (2004) *Statement of Environmental Effects for the Proposed Aquaculture Development & Water Supply Works* prepared for Australian Bay Lobster Producers Pty Ltd (herein referred to as the 'ABLP Report').
- HMC Environmental Consulting (2008) *Acid Sulfate Soils, Soil Contamination & Agricultural Suitability Assessment, Cudgen Lakes Sand Extraction Project. April 2008*, prepared for Gales Holdings Pty Ltd.

#### 3.1 Gilbert & Sutherland 2005 Addendum Report

G&S undertook a Site History Investigation as part of the 2005 Addendum report for the TSP 2005 expansion application in order to identify any previous land use activities undertaken on the existing approved TSP operation area (i.e. previous Lot 2 DP777905, now Lot 22 DP1082435 and Lot 23 DP1077509) that may have potentially resulted in contamination.

The site history assessment indicated that prior to 1950 the site was used primarily for cattle grazing. Additional site uses included sugar cane

production until 1984 when sand extraction activities commenced. The report indicated that there was no site-specific record of agrichemical use whilst the site was cropped to sugarcane and based on the minimal agrichemical use at nearby sugarcane plantations, it is unlikely that the application of agrichemical was widespread on the site.

Based on a review of the site history including aerial photography and previous site inspections, the investigation did not identify any previous land use activities at the site and surrounds that may have potentially resulted in contamination.

#### 3.2 HMC 2008 assessment

HMC Environmental Consulting Pty Ltd undertook a Preliminary Site Contamination Investigation (PSI) as part of an overall Acid Sulfate Soils, Soil Contamination & Agricultural Suitability Assessment for the Cudgen Lakes Sand Extraction Project for Gales Kingscliff Pty Ltd in April 2008. This site is formally described as Lot 21 DP1082482 and Lot 2 DP216705 (the latter of which adjoins the current TSP operations).

The investigation included a detailed site history and review of aerial photography, a field inspection and limited soil sampling and analysis.

The site history assessment indicated the site had been formerly used as a wet grazing block until 1964 when the site was purchased and used as a tropical pasture grass and legume seed nursery (i.e. the same initial historical site use as Lot 51 DP1166990 within the TSP expansion footprint) before being utilised briefly for cane cropping and later for sand extraction (its current use).

The field assessment included the sampling and analysis of a total of nine (9) soil samples for OC/OP, lead, arsenic and mercury to represent potential residual pesticides and metal-based chemicals present from the former use.

The results showed all contaminants were below the recognised guideline levels for residential or commercial/industrial land uses.

Based on the assessments undertaken it was concluded that there was little environmental

health hazard associated with the proposed site use of sand extraction.

### 3.3 Planit Consulting 2004 Statement of Environmental Effects

This document assessed the potential environmental impacts of the then proposed large-scale aquaculture development (the Australian Bay Lobster Producers or 'ABLP site'), now comprising Lot 1 DP1192506 and adjoining Lot 2 DP1192506, Lot 1 DP1250570 and Lot 51

DP1166990.

The assessment included evaluation of the possible construction impacts in addition to potential operational impacts including management of wastes, soil, water, air quality and flora and fauna impacts.

The report concluded that all impacts would be minimised and manageable.



## 4 Aerial Imagery Review

### 4.1 Aerial image review (1961 to 2020)

Drawing Nos. 12035\_401 to 414 (included in Appendix 3) show the historical aerial imagery for the site. These images indicated the following:

#### 4.1.1 September 1961

Approximately 60% of the site is uncleared with minimal evidence of disturbance. The remainder of the site has been cleared for pasture or planted to sugarcane. No visible drainage apart from areas under cane. No obvious areas of potential contamination.

#### 4.1.2 July 1980

Entirety of site is cleared and planted to sugarcane. Extensive drainage across the site is evident. No obvious areas of potential contamination.

#### 4.1.3 October 1982

No change from July 1980

#### 4.1.4 July 1989

No change from July 1980

#### 4.1.5 July 2007

Majority of site is under pasture. North-western portion (Lot 51 DP1166990) planted to cane. Eastern portions (Lot 22 DP1082435) planted to tea tree. No obvious areas of potential contamination.

#### 4.1.6 20 July 2010

No change from 2007 apart from some evidence of deposited materials including building materials at the northern extent of the vegetated forest on Lot 51 DP1166990 and various minor soil stockpiles or disturbances on Lot 1 DP1250570 and Lot 2 DP1192506.

#### 4.1.7 19 June 2011

No change from 2010 apart from some soil disturbance associated with construction of a house pad south of the treed area on Lot 51 DP1166990.

#### 4.1.8 5 August 2013

The majority of the site is under pasture, with only the eastern lots (Lot 22 DP1082435) subject to cropping (tea tree). Construction of the house has commenced south of the treed area on Lot 51 DP1166990. Additionally, some deposited demolition and other materials are evident on the northern extent of the treed area and to the west of the drainage channel in that location. An area of stockpiled soil is also evident to the west of the drainage channel.

#### 4.1.9 9 April 2015

Further deposition of demolition materials evident on the northern extent of the treed area on Lot 51 DP1166990.

The house to the south of the treed area has been completed. Numerous soil stockpiles are evident to the north of the house. A large raised pad made from imported fill and concrete slabs is evident to the west of the treed area. No other area of potential contamination evident.

#### 4.1.10 1 July 2017

Further deposition of demolition materials evident on the northern extent of the treed area on Lot 51 DP1166990. Additional soil stockpiles and a small dam evident adjacent to the house south of the treed area. Large raised pad to the west of treed area has water tank and concrete debris.

Deposited concrete slabs evident on Lot 51 DP1166990 immediately adjacent (north) of the Australian Bay Lobster Producers' land (Lot 1 DP1192506) and Lot 2 DP1192506.

#### 4.1.11 6 May 2019

No change to treed area on Lot 51 DP1166990. Dam associated with house south of the treed area is larger and soil stockpiles are essentially landscaped. Further concrete rubble associated with raised pad to the west of treed area.

Cattle pen evident on Lot 1 DP1250570 with large soil or gravel stockpile to the east.

#### 4.1.12 09 September to 06 November 2019

No change to treed area on Lot 51 DP1166990. Some soil disturbance (filling) associated with dam to south of treed area, north of house.



**4.1.13 14 September 2020**

No change to treed area on Lot 51 DP1166990.

Substantial soil disturbance (filling) associated with the raised pad to the west of treed area.

## 5 Site inspection and assessment

A site inspection of the proposed expansion area was undertaken between 11 November and 25 November 2020 in general accordance with the NEPM site characterisation field checklist. A completed field checklist is included in Appendix 5

The inspection included a walkover of each lot with visual inspection of the ground surface for areas of possible contamination including imported and/or deposited materials, soil staining, vegetation dieback etc. Photographs were taken at selected spatial intervals or where significant land features or areas of potential contaminants were identified.

A photographic record of the inspection is attached as Appendix 4. The general photo locations are depicted on Drawings 12035\_416 and 417.

### 5.1 Lot 51 DP1166990 (Brinsmead land)

This lot consists predominantly of pasture/grazing land, having historically supported a seed farm, pasture/grazing land and also sugarcane. At the time of the inspection the paddock areas supported cattle, had good grass cover and were well grazed.

The lot includes an area of treed land and also an existing dwelling. An inspection of the treed land and land immediately south adjacent to the existing house indicated the following potential contaminants (as depicted on Drawings 12035\_416 and 12035\_417, Appendix 1):

- Demolition waste including bricks, timber, concrete and metal
- Concrete pipes
- Old truck tyres
- Discarded cable reels
- Timber trusses
- A discarded fibreglass boat
- Various empty 44 gallon drums

- Various empty 5L oil containers
- 3 x discarded cars
- Scrap metal
- Discarded TVs and white goods
- General rubbish
- Numerous soil stockpiles

Other areas of possible contamination identified on the lot included:

- Imported fill (coffee rock) and also numerous (28) empty/discarded 44 gallon drums to the north west of the treed area (shown as Photo locations 22 and 23 on Drawing ???).
- Concrete rubble and a separate soil stockpile to the north of Lot 2 DP1192506 (photo location 25 on Drawing 12015\_415). The soil in question contained various building waste fragments including bricks and 2 x small pieces of bonded ACM.
- Concrete slabs placed within the southern drain opposite Lot 1 DP1192506 in Photo location 26.
- Further stockpiles of concrete slab material and a separate soil stockpile (depicted as Photo locations 27 and 28) containing similar material to that at photo location 25 including bricks and at least 1 x piece of bonded ACM.
- A large vegetated soil stockpile consisting of imported fill materials in the northeast of the Lot. This is depicted on Drawing 12035\_416.

### 5.2 Lot 2 DP 1192506 and Lot 1 DP1250570 (Cudgen Land Pty Ltd)

These lots consist of pasture/grazing land. At the time of the inspection the paddock areas supported cattle, had good grass cover and were well grazed.

Areas of possible contamination are depicted in Drawing 12035\_416 and included the following:

Several stockpiles of imported soil and rock rubble in Photo location 31.

A cattle pen/stockyard in Photo location 32 with imported gravel base and empty drum of 'Cattle Guard' pour-on endectocide (Moxidectin 5g/L).

A vegetated soil stockpile in Photo location 33.

An empty above ground fuel storage tank (AST) in photo location 34.

A vegetated soil stockpile with old concrete pipe in photo location 35.

### 5.3 Lot 22 DP1082435 and Lot 23 DP1077509 (Hanson land)

These lots (within the proposed expansion area) consist of land cropped to tea tree (*melaleuca alternifolia*). Evidence of herbicide use as weed dieback was noted within rows.

No areas of obvious soil contamination (soil staining, odour etc) were noted during the inspection.

## 6 Current landholder interviews

### 6.1 Andrew Brinsmead (Lot 51 DP1166990)

The Brinsmeads have owned the land since 1971 at which time it was being utilised as a seed farm for tropical pastures. After purchasing the land, it was utilised for grazing purposes until 1974, when it was cropped to sugarcane. In recent years the site has been utilised primarily for pasture/grazing.

To Mr Brinsmead's knowledge, no contaminating activities have been undertaken on the site apart from agrichemical use. The primary herbicide used on site has been Glyphosate (Roundup). Prior to the early 1980's it is understood that Dieldrin was also added in fertilizer. It is understood that cattle sold for meat purposes are regularly tested and no issues with regard to dieldrin residues have been identified to date.

Although not evidenced during the site inspection, Mr Brinsmead said that the site may contain remnants of asbestos concrete piping used for agricultural drainage across the site. If encountered during the future expansion, these materials would be appropriately managed in accordance with a Remediation Action Plan.

According to Mr Brinsmead, the empty 44 gallon steel drums evident on site contained molasses used to feed cattle.

### 6.2 Michael Dalton (Lot 2 DP1192506; Lot 1 DP1250570)

According to Mr Dalton, both Lot 2 DP1192506 and Lot 1 DP1250570 were purchased from the

previous owner W&S Evans by DG & NA Dalton in 2008. The Lots are now owned by Cudgen Land Pty Ltd.

Both lots were historically utilized for cane cropping and later as pasture/grazing land for cattle. The current use is for cattle agistment.

The site adjoins the ABLP site. According to Mr Dalton, there are no known areas of contamination from the previous or current site uses and there is no current use of herbicides. Mr Dalton is unaware of any previous contamination reports having been prepared for the lots.

According to Mr Dalton, the AST located on Lot 1 1250570 was utilized by the previous site owners (W&S Evans) and contained diesel.

### 6.3 Paul and Pat Bolster (previous owners and current farmers of Lot 22 DP1082435 and Lot 23 DP1077509)

Site purchased from Nick Stevens in 1989.

Historically utilised as a turf farm and sugar cane prior to that. Planted to *Melaleuca alternifolia* (tea tree) in 1992-93.

Agrichemicals have been historically used in the rows and headers and include Glyphosate (Roundup) and 2, 4 D. Chlorpyrifos was used in the first year of cropping.

Current chemical used for weed control is BASTA, with 1 application of Roundup and 2,4 D a year to control problem weeds (e.g. "Morning Glory").

According to Mr & Mrs Bolster, no other potential contaminating activities have been undertaken on the lots in the area of the proposed expansion.

## 7 Conclusions and recommendations

Hanson commissioned G&S to prepare a Preliminary Site Investigation for the proposed expansion of its Tweed Sand Plant operation to address the SEARs issued for the Project in December 2019 as they relate to the investigation of site contamination. The assessment included a review of previous assessments undertaken on the site, a review of historic aerial photography, site inspections and interviews with past and current owners. The following potentially contaminating activities/ contaminants were found to be associated with the site:

### 7.1.1 Lot 51 DP1166990

#### Treed area

- Demolition waste including bricks, timber, concrete and metal
- Other wastes including old tyres, various empty chemical drums and oil containers, scrap metal including old cars,, white goods and an outboard motor, a boat, soil stockpiles and general rubbish

#### Other areas

- Evidence of demolition waste including concrete slabs.
- Two soil stockpiles containing bricks and some bonded ACM.
- Large vegetated stockpile of potentially imported soil.

#### Additional

- possible buried asbestos concrete pipes used as part of the historic drainage across the site.

### 7.1.2 Lot 2 DP 1192506 and Lot 1 DP1250570

No obvious contaminants of potential concern (CoPC) were identified by the historical assessment and site inspection apart from:

- Several stockpiles of imported soil and rock rubble.

- A cattle pen/stockyard with imported gravel base and empty disused drum of endectocide.
- Other soil stockpiles.
- An empty above ground fuel storage tank (AST).

### 7.1.3 Lot 22 DP1082435 and Lot 23 DP1077509

The historical assessment and site inspection identified no obvious CoPC apart from historical herbicide and pesticide use associated with the growing of *Melaleuca alternifolia* (tea tree).

It is recommended that further detailed inspection/assessment of the site be undertaken on a lot by lot basis prior to the proposed expansion works. This would include a soil sampling program to sample any of the identified potential areas of contamination including soil stockpiles within all lots, soils within the rows and headers of the currently cropped tea tree on Lot 22 DP1082435 and Lot 23 DP1077509, the current cattle pen/stockyard and surrounds and AST on Lot 1 DP1250570; and the treed area and surrounds on Lot 51 DP1166990.

The identified wastes within the treed area on Lot 51 DP1166990 in particular would require further assessment and removal prior to undertaking a detailed assessment of the underlying soils. The further assessment and remediation of the land would be undertaken in accordance with the following:

- State Environmental Planning Policy No 55 – Remediation of Land
- EPA (2017) Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme
- EPA Contaminated land guidelines – Consultants reporting on contaminated land
- Protection of the Environment Operations (Waste) Regulation 2014
- NSW EP A Waste Classification Guidelines – Part 1: Classifying Waste (EPA 2014)
- NSW EP A Waste Classification Guidelines – Part 3: Waste containing radioactive material (EPA 2014)
- Workcover NSW (2014) Managing asbestos in or on soil and;

- National Environment Protection (assessment of Site Contamination) Measure 1999 (NEPM) Schedule B1 Guideline on Investigation Levels for Soil and Groundwater.

## 7.2 Future progress

This Preliminary Site Investigation of the expansion area in response to the SEARs identified a number of potentially contaminating activities/potential contaminants associated with the site. These activities/potential contaminants are typical of land where agricultural activities have historically been undertaken and were limited to small areas of the site as identified on Drawing 12035-416 (Appendix 1).

Should the proposed expansion be approved, a detailed investigation would be undertaken to inform the preparation of a Remediation Action Plan (RAP) for the relevant areas of the site.

In many instances, remediation requirements are likely to be straightforward and simply require the removal of identified wastes with selected areas also requiring soil testing. These activities would be undertaken in accordance with an approved RAP and scheduled to occur on a lot by lot basis prior to the commencement of extraction within the relevant allotments.

This staged approach is supported by State Environmental Planning Policy (SEPP) 55 which provides that detailed assessments need not be undertaken immediately following the preliminary investigation but should be undertaken prior to commencement of the new land use.

It is proposed that detailed investigations, preparation of the RAP and any subsequent remediation of the identified areas could reasonably form a condition of approval for the proposed expansion.

## 8 Limitations of reporting

Gilbert & Sutherland Pty Ltd has attempted to be accurate providing this information. The interpretation of scientific data, however, involves professional judgement. As such, interpretation is open to error.

In recognising the potential for errors in scientific interpretation, Gilbert & Sutherland Pty Ltd does not guarantee that the information is totally accurate or complete and clients are advised not to rely solely on this information when making commercial decisions. Any representation, statement, opinion or advice, expressed or implied is made in good faith and on the basis that

the authors, Gilbert & Sutherland Pty Ltd, their agents or employees are not liable (whether by reason of lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above.

Furthermore, this information should not be relied upon by any other persons other than the client, the NSW Department of Planning, Industry and Environment (DPIE) and Tweed Shire Council for whom this information was compiled. This information reflects the specific brief and the budget of the client concerned, who enjoys an individual tolerance of risk.

## 9 Appendix 1 – Drawings





**ORIENTATION**

**SCALE**

50 100 150 200 250 300 metres

**ROBINA**

PO Box 4115 Robina QLD4230 07 5578 9944  
Email robina@access.gs [www.access.gs](http://www.access.gs)

**LEGEND**

- Site Boundary
- Phase 4 Extraction Area (indicative only)

**SOURCES**

Image: Nearmap 2020. Image date: 14/09/2020

**PROJECT**

TWEED SAND  
PLANT  
EXPANSION

**CLIENT**

HANSON  
CONSTRUCTION  
MATERIALS

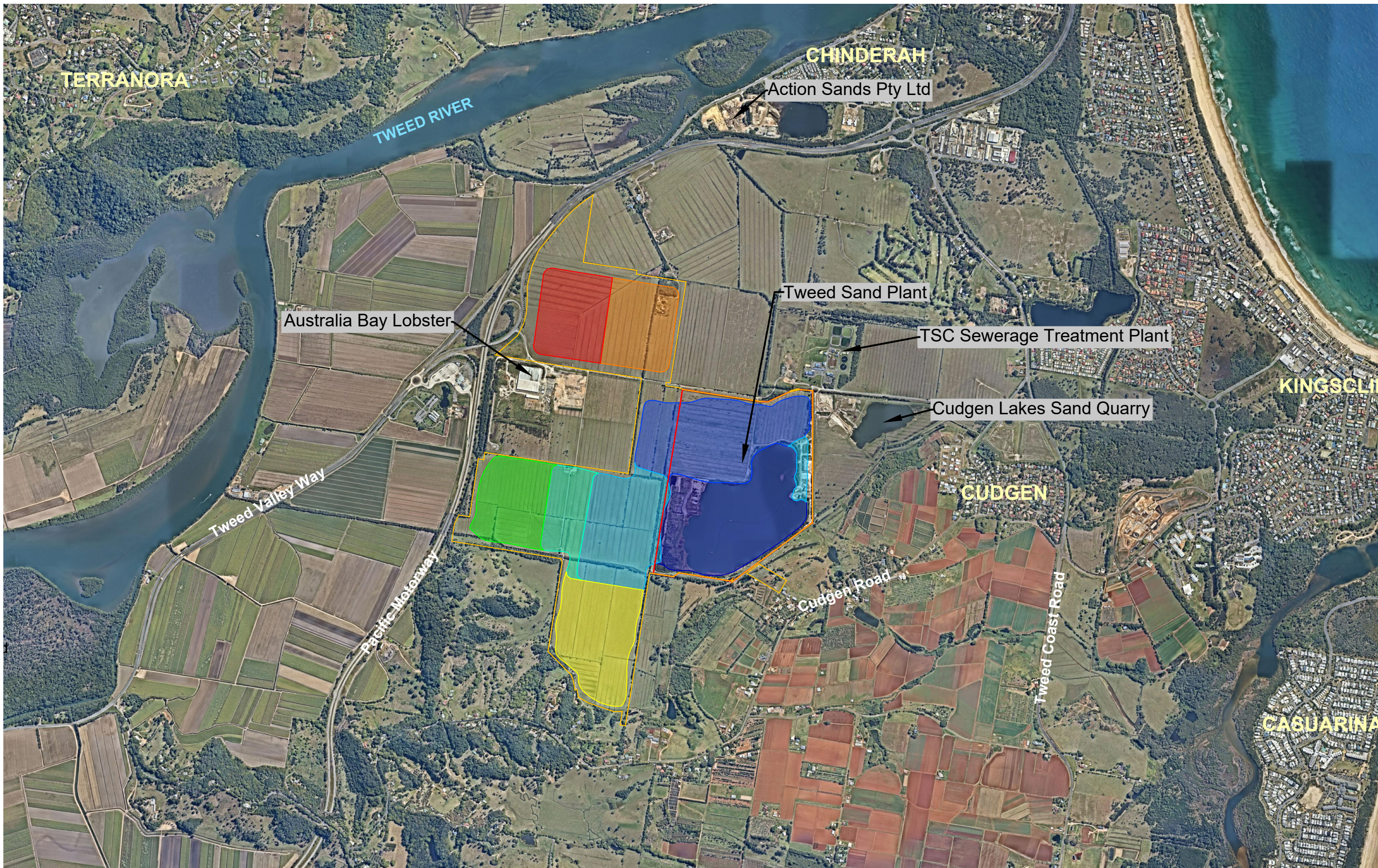
**DRAWING**

EXISTING TWEED SAND  
PLANT OPERATION

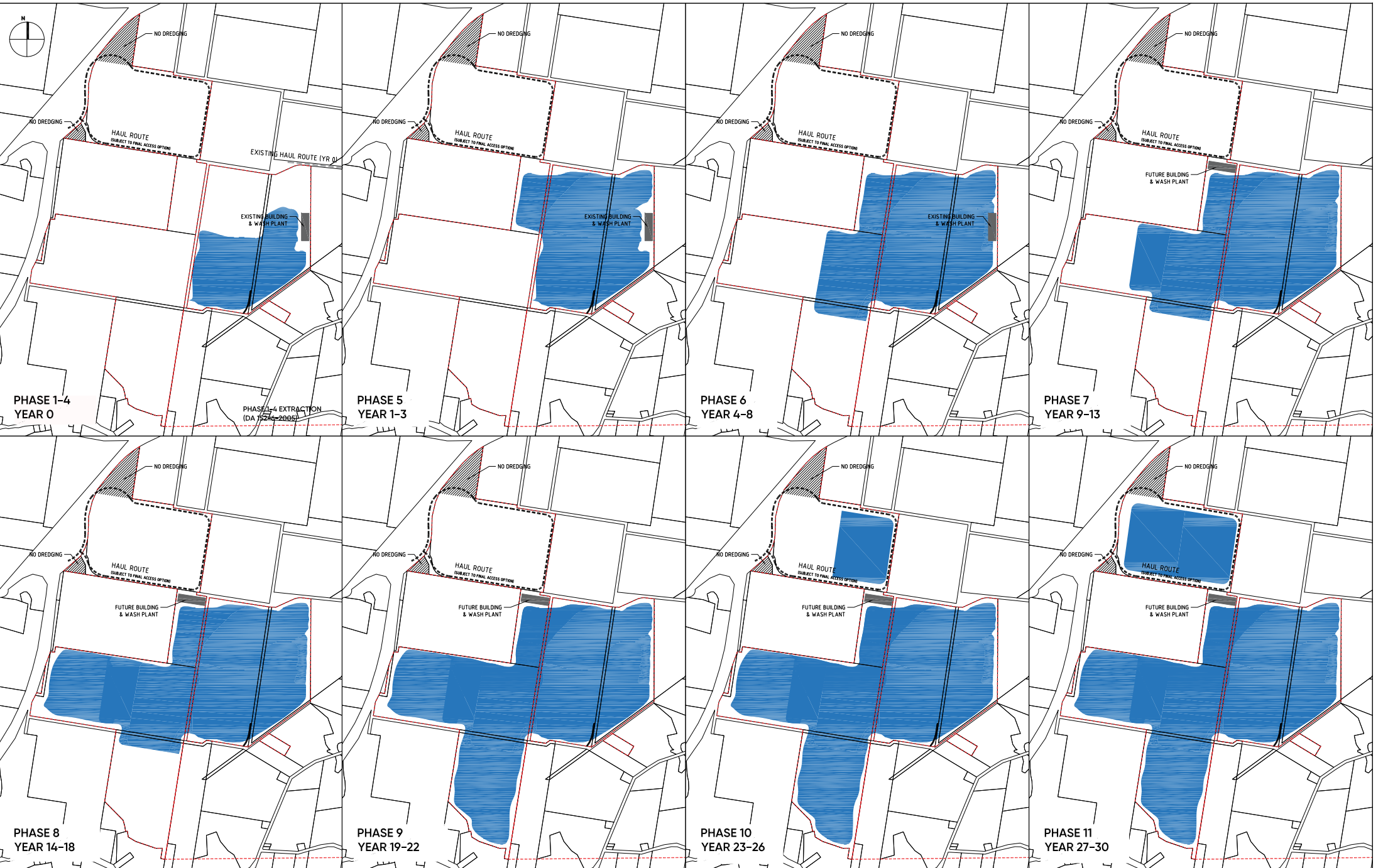
SCALE	DATE	DRAWN	CHECKED	PROJECT	DRAWING	REVISION
1:6 250@A3	1/12/2020	AJF	ELH	12035	001	-

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SUTHERLAND**









PROJECT TITLE

HANSON TWEED SAND PLANT

PHASE 5-11

DRAWING TITLE

CONCEPT DEVELOPMENT PHASING

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PAVING ARRANGEMENT CHANGES - REG. PLANNER	25.01.2021	ZP	LN	LN	LN

ISSUE: PRELIMINARY

CLIENT: HANSON CONSTRUCTION MATERIALS PTY LTD.

BASE PROVIDED BY: SERNAPS DCDB

MANAGER: LANCE NEWLEY

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Planning Group

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landscape architecture

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zonelandscapes.com.au | 07 55622303

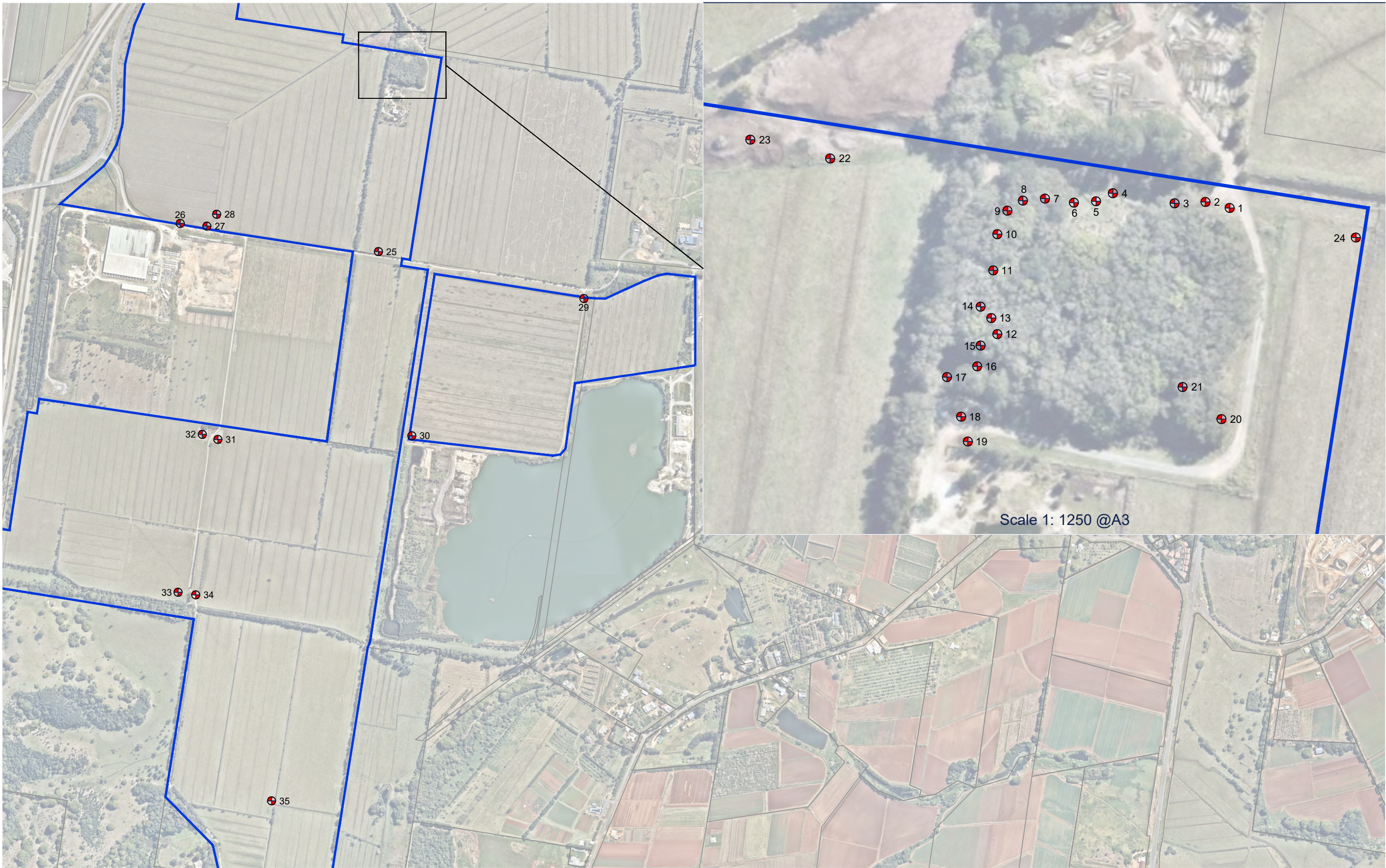
JOB / DRAWING NO:

Z19163- 104

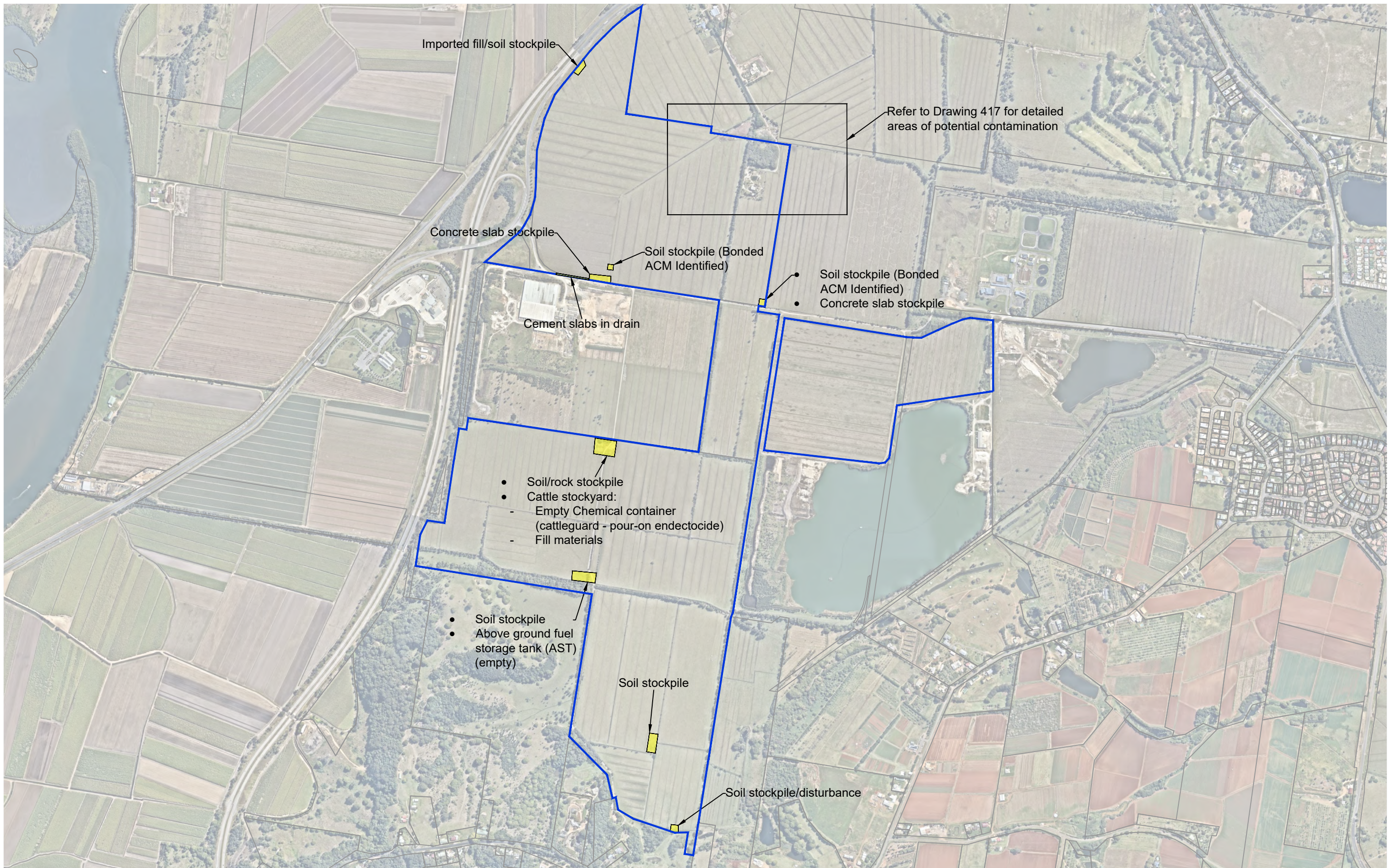
SHEET NO.

SHEET 01 OF 01















## 10 Appendix 2 – Contaminated land searches (sites within Tweed Shire Council local government area)

Suburb	SiteName	Address	ContaminationActivityType	ManagementClass	Latitude	Longitude
BANORA POINT	Caltex Service Station	Corner Leisure Drive and Darlington DRIVE	Service Station	Regulation under CLM Act not required	-28.21390712	153.5417434
BILAMBIL HEIGHTS	Former Banana Plantation Land	38 McAllisters ROAD	Other Industry	Regulation under CLM Act not required	-28.21218056	153.4778762
BUNGALORA	Former landfill area	Part of 840 Terranora ROAD	Other Industry	Regulation under CLM Act not required	-28.2424318	153.4789209
CABARITA	Dulux (Orica Australia)	Cabarita ROAD	Chemical Industry	Contamination formerly regulated under the CLM Act	-33.84643972	151.1157115
CABARITA	Wellcome Soil Containment Cells Cabarita	47 and 48 Phillips STREET	Other Industry	Ongoing maintenance required to manage residual contamination (CLM Act)	-33.85250251	151.1176366
HASTINGS POINT	Coles Express Hastings Point	99 Tweed Coast ROAD	Service Station	Regulation under CLM Act not required	-28.36914103	153.5725676
MOOBALL	Mooball General Store	5913 Tweed Valley WAY	Service Station	Regulation under CLM Act not required	-28.44204594	153.4887648
MURWILLUMBAH	Murwillumbah Ambulance Depot	27 Queen STREET	Other Petroleum	Regulation under CLM Act not required	-28.32552576	153.4000182
MURWILLUMBAH SOUTH	Puma Murwillumbah (formerly Matilda)	182 Tweed Valley WAY	Service Station	Contamination currently regulated under CLM Act	-28.3263681	153.4103824
MURWILLUMBAH SOUTH	Former Norco Butter Factory (Eastern Portion)	230 Tweed Valley WAY	Other Petroleum	Regulation under CLM Act not required	-28.32791359	153.4073052
TWEED HEADS	Former Mobil Quix Service Station	60 MINJUNGBAL DRIVE	Service Station	Contamination formerly regulated under the CLM Act	-28.20143775	153.5445381
TWEED HEADS	Francis Street Road Reserve adjacent to 79-81 Wharf Street, Tweed Heads	79-81 Wharf STREET	Other Petroleum	Regulation under CLM Act not required	-28.17351959	153.542262
TWEED HEADS SOUTH	Former BP Depot	142 Minjungbal DRIVE	Other Petroleum	Regulation under CLM Act not required	-28.20860702	153.5455932
TWEED HEADS SOUTH	Coles Express Service Station	Corner Minjungbal Drive and Heffron STREET	Service Station	Regulation under CLM Act not required	-28.19459987	153.5419978
TWEED HEADS SOUTH	Woolworths Plus Petrol	98-102 Pacific (100 Minjungbal Drive) HIGHWAY	Service Station	Regulation under CLM Act not required	-28.20488521	153.5448675
TWEED HEADS WEST	Caltex Service Station	96 to 98 Kennedy DRIVE	Service Station	Regulation under CLM Act not required	-28.1871486	153.5229866



## 11 Appendix 3 – Historic aerial imagery





**ORIENTATION**

SCALE 1:12 500

100 200 300 400 500 600 metres

**ROBINA**

PO Box 4115 Robina QLD4230 07 5578 9944  
Email robina@access.gs www.access.gs

**LEGEND**

- Assessment Boundary
- Lot Boundaries

**SOURCES**

Image: QImagery. Image date: 1/09/1961

**PROJECT**

TWEED SAND  
PLANT  
EXPANSION

**CLIENT**

HANSON  
CONSTRUCTION  
MATERIALS

**DRAWING**

HISTORICAL IMAGE 1961

SCALE	DATE	DRAWN	CHECKED	PROJECT	DRAWING	REVISION
1:12 500@A3	01/12/2020	SWP	GLH	12035	401	-

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ORIENTATION

SCALE 1:12 500

100 200 300 400 500 600  
metres

ROBINA

PO Box 4115 Robina QLD4230 07 5578 9944  
Email robina@access.gs www.access.gs

LEGEND

 Assessment Boundary

 Lot Boundaries

SOURCES

Image: Qlmagery. Image date: 07/07/1989

PROJECT

TWEED SAND  
PLANT  
EXPANSION

CLIENT

HANSON  
CONSTRUCTION  
MATERIALS

DRAWING

HISTORICAL IMAGE 1989

SCALE	DATE	DRAWN	CHECKED	PROJECT	DRAWING	REVISION
1:12 500@A3	01/12/2020	SWP	GLH	12035	404	-







**ORIENTATION**

SCALE 1:12 500

100 200 300 400 500 600 metres

**ROBINA**

PO Box 4115 Robina QLD4230 07 5578 9944  
Email robina@access.gs www.access.gs

**LEGEND**

— Assessment Boundary

— Lot Boundaries

**SOURCES**

Image: QImagery. Image date: 15/07/2007

<b>PROJECT</b>	<b>CLIENT</b>	<b>DRAWING</b>
TWEED SAND PLANT EXPANSION	HANSON CONSTRUCTION MATERIALS	HISTORICAL IMAGE 2007
<b>SCALE</b>	<b>DATE</b>	<b>DRAWN</b>
1:12 500@A3	01/12/2020	SWP
<b>CHECKED</b>	<b>PROJECT</b>	<b>DRAWING</b>
GLH	12035	405
<b>REVISION</b>		
-		







**ORIENTATION**

SCALE 1:12 500

100 200 300 400 500 600 metres

**ROBINA**

PO Box 4115 Robina QLD4230 07 5578 9944  
Email robina@access.gs www.access.gs

**LEGEND**

Assessment Boundary

Lot Boundaries

**SOURCES**

Image: Nearmap 2020. Image date: 20/07/2010

**PROJECT**

TWEED SAND  
PLANT  
EXPANSION

**CLIENT**

HANSON  
CONSTRUCTION  
MATERIALS

**DRAWING**

HISTORICAL IMAGE 2010

<b>SCALE</b>	<b>DATE</b>	<b>DRAWN</b>	<b>CHECKED</b>	<b>PROJECT</b>	<b>DRAWING</b>	<b>REVISION</b>
1:12 500@A3	01/12/2020	SWP	GLH	12035	406	-















**ORIENTATION**

**SCALE 1:12 500**

100 200 300 400 500 600 metres

**ROBINA**

PO Box 4115 Robina QLD4230 07 5578 9944  
Email robina@access.gs [www.access.gs](http://www.access.gs)

**LEGEND**

— Assessment Boundary

— Lot Boundaries

**SOURCES**

Image: Nearmap 2020. Image date: 09/04/2015

**PROJECT**

TWEED SAND  
PLANT  
EXPANSION

**CLIENT**

HANSON  
CONSTRUCTION  
MATERIALS

**DRAWING**

HISTORICAL IMAGE 2015

<b>SCALE</b>	<b>DATE</b>	<b>DRAWN</b>	<b>CHECKED</b>	<b>PROJECT</b>	<b>DRAWING</b>	<b>REVISION</b>
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**ORIENTATION**

SCALE 1:12 500

100 200 300 400 500 600 metres

**ROBINA**

PO Box 4115 Robina QLD4230 07 5578 9944  
Email robina@access.gs www.access.gs

**LEGEND**

— Assessment Boundary

— Lot Boundaries

**SOURCES**

Image: Nearmap 2020. Image date: 01/07/2017

**PROJECT**

TWEED SAND  
PLANT  
EXPANSION

**CLIENT**

HANSON  
CONSTRUCTION  
MATERIALS

**DRAWING**

HISTORICAL IMAGE 2017

<b>SCALE</b>	<b>DATE</b>	<b>DRAWN</b>	<b>CHECKED</b>	<b>PROJECT</b>	<b>DRAWING</b>	<b>REVISION</b>
1:12 500@A3	01/12/2020	SWP	GLH	12035	410	-



















  
ORIENTATION

SCALE 1:12 500  
100 200 300 400 500 600  
metres

ROBINA  
PO Box 4115 Robina QLD4230 07 5578 9944  
Email robina@access.gs www.access.gs

LEGEND

Assessment Boundary

Lot Boundaries

SOURCES

Image: Nearmap 2020. Image date: 14/09/2020

PROJECT TWEED SAND PLANT EXPANSION		CLIENT HANSON CONSTRUCTION MATERIALS		DRAWING HISTORICAL IMAGE 2020		
SCALE 1:12 500@A3	DATE 01/12/2020	DRAWN SWP	CHECKED GLH	PROJECT 12035	DRAWING 414	REVISION -





## 12 Appendix 4 – Site inspection photographs



Refer inset area Drawing 417



Plate 1 Old tyres, cable reels and timber



Plate 2 Concrete pipes



Plate 3 Old boat



Plate 4 44 gallon drum





Plate 5 Empty 5L oil containers



Plate 6 Scrap metal and PVC



Plate 7 Old paint tins and general rubbish



Plate 8 Scrap metal



Plate 9 Scrap metal



Plate 10 Old car



Refer Drawing 416



Plate 11 Demolition rubble and bricks



Plate 12 Imported soil stockpile





Plate 13 Disused 44 gallon drums



Plate 14 Imported soil pad for water tank



Plate 15 Concrete pile and imported soil stockpile



Plate 16 Imported soil stockpile





Plate 17 Bonded ACM



Plate 18 Bonded ACM



Plate 19 Concrete slabs and Imported soil stockpile



Plate 20 Bonded ACM





Plate 21 Tea Tree rows and header



Plate 22 Tea Tree header



Plate 23 Imported rock/rubble stockpile



Plate 24 Imported soil stockpile



Plate 25 Stockyards



Plate 26 Chemical drum



Plate 27 Empty AST



Plate 28 Old soil stockpile and concrete pipe

## 13 Appendix 5 – NEPM Field and Northern Rivers Contaminated Land Program checklists



Checklist of field data parameters for the assessment of site contamination - Proposed Expansion Tweed Sand Plant

This checklist is intended to be used as a reference tool to assist practioners in planning and carrying out assessments of site contamination. It provides a list of parameters for consideration in the collection of data, based on specific objectives of investigations and contaminants of concern. This list is not intended to be exhaustive but identifies information and parameters typically expected to be considered. Consideration should be given to site specific data quality objectives and issues in the application and use of this checklist. Refer to Schedule B2 of the NEPM for guidance. Documents referenced in compiling this checklist include AS1726, AS3798, AS4482, AS/NZS 5667, ITRC, NEPM

Information / parameter to be considered and/or obtained	Yes	N/A
Site identification and details		
site name or description: <b>Proposed Expansion Area, Tweed Sand Plant</b>	X	<input type="checkbox"/>
street address (street number & name, suburb), town/city: <b>Altona Road Cudgen</b>	X	<input type="checkbox"/>
property description (e.g. section, hundred, plan, parcel): Lot 22 DP1082435 Lot 23 DP1077509 Lot 494 DP720450 Lot 1 DP1250570 Lot 2 DP1192506 Lot 3 DP1243752 Lot 51 DP1166990 <del>Lot 50 DP1056966</del>	X	<input type="checkbox"/>
current certificates of title (identifying portion or full title)	<input type="checkbox"/>	X
latitude, longitude (centre of site, or site corners for regular shapes)	<input type="checkbox"/>	X
geographic coordinates using GDA94 / MGA	<input type="checkbox"/>	X
current owner(s):	X	<input type="checkbox"/>
current occupier(s):	X	<input type="checkbox"/>
site area and dimensions: <b>236 hectares</b>	X	<input type="checkbox"/>
local government authority: <b>Tweed Shire Council</b>	X	<input type="checkbox"/>
current zoning (planning): <b>RU1 (Primary production) and RU2 (Rural landscape)</b>	X	<input type="checkbox"/>
locality map: <b>Attached in report appendix</b>	X	<input type="checkbox"/>
trigger for assessment (e.g. change in land use): <b>Land Contamination Assessment</b>	X	<input type="checkbox"/>
state or local government statutory controls assigned to the site	<input type="checkbox"/>	X
legal permission to access site required/obtained	<input type="checkbox"/>	X
consent of adjoining land owners and/or occupiers to access land (if required)	X	<input type="checkbox"/>
Site history		
historical property title search (with copies of certificates of title)	<input type="checkbox"/>	X
identification of previous and present owners, occupiers, managers and users of the site	<input type="checkbox"/>	X
interviews with owner/occupier/staff/neighbours (present and former) who have an historical knowledge of the site	<input type="checkbox"/>	X
review of historical aerial and site photography: <b>Included in report appendix</b>	X	<input type="checkbox"/>
chronological list and summary of land use activities including information gaps and uncertainties, unoccupied periods	<input type="checkbox"/>	X
details, charts and diagrams of previous and current buildings and site structures	X	<input type="checkbox"/>
site layout plans showing locations of present and past industrial processes, storage areas, waste disposal areas	X	<input type="checkbox"/>
description of manufacturing processes, raw materials, chemicals and fuels associated with site use	<input type="checkbox"/>	X
products (including intermediate products) discharged during batch or continuous production processes, listed by common, systematic and trade names where possible	<input type="checkbox"/>	X
identification and location of chemical storage and transfer areas	X	<input type="checkbox"/>
wastes (including failed batched) discharged during batch or continuous production processes, listed by common, systematic and trade names where possible including their chemical characteristics, volume and method of treatment	<input type="checkbox"/>	X
disposal locations (on and off-site) of the wastes from previous and present industries and uses, identifying solid waste and liquid waste lagoons, settling tanks and sumps	<input type="checkbox"/>	X
discharges to land, water and air (authorised and unauthorised)	<input type="checkbox"/>	X
product spills, losses, incidents and accidents, including fires, with an indication of the chemicals spilled, frequency, estimates of quantity, extent of fire damage and structures affected	<input type="checkbox"/>	X
plans of sewer and underground service locations identifying active and abandoned services: <b>Dial before you dig results</b>	X	<input type="checkbox"/>
location and size of previous or existing storage tanks (both above ground and underground) and infrastructure and details of integrity testing	<input type="checkbox"/>	X
location of on-site and nearby wells and groundwater monitoring wells: <b>Review of Water NSW Real-time data and Bureau of Meteorology Groundwater Explorer</b>	X	<input type="checkbox"/>
location of transfer lines and notation of whether they are above or below ground: <b>Dial before you dig results</b>	<input type="checkbox"/>	X
locations of dispensing or fill points	<input type="checkbox"/>	X
spill control systems e.g. bund (noting construction details)	<input type="checkbox"/>	X
earthmoving activities carried out on site	<input type="checkbox"/>	X
current and previous land uses of adjacent land taking into account relevant features listed above as appropriate	<input type="checkbox"/>	X
complaint history - regulatory actions, legal actions	<input type="checkbox"/>	X
state and local government planning records including historical zoning and land uses: <b>Local Environmental Plans, Land Zoning</b>	X	<input type="checkbox"/>
details of permits, licences, approvals and trade waste agreements with records of compliance	<input type="checkbox"/>	X
state and local government environmental records including licensing conditions, regulatory notices, inspection records, complaints, licence breaches	<input type="checkbox"/>	X
state or local government dangerous goods records including licensing requirements, goods licensed to store, storage licences, inspection records, complaints, licence breaches	<input type="checkbox"/>	X
state and local government records on contamination for site and surrounding areas: <b>Search of NSW databases for contaminated land and notified sites - returned no results</b>	X	<input type="checkbox"/>
historical site photographs (labelled and dated)	<input type="checkbox"/>	X
summary of literature relating to the site (including newspaper articles)	<input type="checkbox"/>	X
potential sources of site contamination and potential off-site impacts: <b>Drawings 12035_416 and 12025_417</b>	X	<input type="checkbox"/>
potential chemical substances associated with activities (refer Schedule B1 and AS4482.1/2)	<input type="checkbox"/>	X
plan of the site, to scale, noting relevant above details: <b>Shown in report appendix</b>	X	<input type="checkbox"/>
verification of information sources (assessment of the integrity and accuracy of the information)	<input type="checkbox"/>	X
Site condition and surrounding environment		
site inspection <b>by GLH and SAM (11 and 27 November 2020)</b>	X	<input type="checkbox"/>
topography of site and in relation to surrounding land: <b>generally low lying, agricultural drains and access roads throughout.</b>	X	<input type="checkbox"/>
elevation: <b>Approx. 3 to 6m AHD</b>	X	<input type="checkbox"/>
position on slope (e.g. crest, upper slope, mid slope, lower slope, flat), including direction: <b>all of site</b>	X	<input type="checkbox"/>
quantification of slope (if required) as percentage slope	<input type="checkbox"/>	X
summary of local meteorology - survey of climatic information from nearby weather stations (e.g. annual range in monthly temperature, precipitation, seasonal variations)	<input type="checkbox"/>	X
climatic conditions: <b>Sunny</b>	X	<input type="checkbox"/>
current land use: <b>Grazing</b>	X	<input type="checkbox"/>

Checklist of field data parameters for the assessment of site contamination - Proposed Expansion Tweed Sand Plant

This checklist is intended to be used as a reference tool to assist practioners in planning and carrying out assessments of site contamination. It provides a list of parameters for consideration in the collection of data, based on specific objectives of investigations and contaminants of concern. This list is not intended to be exhaustive but identifies information and parameters typically expected to be considered. Consideration should be given to site specific data quality objectives and issues in the application and use of this checklist. Refer to Schedule B2 of the NEPM for guidance. Documents referenced in compiling this checklist include AS1726, AS3798, AS4482, AS/NZS 5667, ITRC, NEPM

Information / parameter to be considered and/or obtained	Yes	N/A
surrounding land uses (north, south, east, west) noting apparent condition: <b>See Section ?? In report</b>	X	<input type="checkbox"/>
density of residential use in surrounding area: <b>Low density residential</b>	X	<input type="checkbox"/>
boundary conditions	<input type="checkbox"/>	X
location and conditions of all visible features, including current buildings and surface structures, roads, foundations, positions of former buildings, tanks, pits, wells, drains and bores: <b>Drawings 12035_416 and 12025_417</b>	X	<input type="checkbox"/>
site building information:	<input type="checkbox"/>	X
– occupancy and use of buildings	<input type="checkbox"/>	X
– age of buildings	<input type="checkbox"/>	X
– construction of buildings including materials (e.g. wood frame), openings (e.g. windows, doors), and height (e.g. one storey, multistorey)	<input type="checkbox"/>	X
– number of storeys	<input type="checkbox"/>	X
– height of storeys	<input type="checkbox"/>	X
– foundation type (e.g. basement, crawlspace, slab on ground), if combination then percentage	<input type="checkbox"/>	X
– depth below grade to base of foundation	<input type="checkbox"/>	X
– foundation construction for both floor and subsurface walls (e.g. poured concrete, concrete block, brick, timber)	<input type="checkbox"/>	X
– general condition of foundation (cracks, openings)	<input type="checkbox"/>	X
– elevator shafts	<input type="checkbox"/>	X
– sub-slab ventilation systems or moisture vapour barriers below buildings	<input type="checkbox"/>	X
– sumps or drains or wells inside buildings	<input type="checkbox"/>	X
– attached garage	<input type="checkbox"/>	X
– below building parking	<input type="checkbox"/>	X
– chemical use and storage	<input type="checkbox"/>	X
– type of cooling and heating systems (e.g. natural gas, oil, radiant, steam, electrical)	<input type="checkbox"/>	X
– equipment location (e.g. basement, crawl space, roof)	<input type="checkbox"/>	X
– air intake and exhaust units	<input type="checkbox"/>	X
– source of return air (e.g. inside air, outside air, combination)	<input type="checkbox"/>	X
– system design consideration relation to indoor air pressure (e.g. positive pressure is often the case for commercial buildings)	<input type="checkbox"/>	X
condition and type of surface cover: <b>Improved pastures</b>	X	<input type="checkbox"/>
chemical storage and transfer areas, including the presence of waste or chemical containers	<input type="checkbox"/>	X
details of above ground and underground storage systems and associated infrastructure (number, location, capacities, contents, age, construction, condition, bunding & spill control): <b>See Drawings 12035_416 and 12025_417</b>	X	<input type="checkbox"/>
underground storage tanks (USTs)- product stored, volume, direct or remote fill points, dispenser bowsers, contained or uncontained fill points, underground piping and ventilation points, dip stick volume gauge, age of tank, records of spills or stock loss	<input type="checkbox"/>	X
above ground storage tanks (ASTs)- product stored, volume, remote fill, bunded or unbunded containment area, staining within bund, staining outside bund, bund plug in place, staining around bund plug, nearby drains, record of spills or stock losses: <b>See Drawings 12035_416 and 12025_417</b>	X	<input type="checkbox"/>
evidence of debris, waste disposal, lagoons, drums, chemical storage or other indicators of potential contamination sources: <b>See Drawings 12035_416 and 12025_417</b>	X	<input type="checkbox"/>
locations of settlement ponds	<input type="checkbox"/>	X
description and location of services and utilities including on-site septic systems	<input type="checkbox"/>	X
identification of electrical transformers/substation/capacitors	<input type="checkbox"/>	X
odours	<input type="checkbox"/>	X
visible signs of contamination such as discolouration or staining on the surface of soil or water, bare soil patches - on-site and at site boundaries	<input type="checkbox"/>	X
presence of any stockpiled material, imported soil or fill material as well as any signs of settlement, subsidence or disturbed ground	<input type="checkbox"/>	X
vegetation type and extent of cover (e.g. scattered, sparse, dense, absent, invasive, native): <b>improved grazing pastures</b>	X	<input type="checkbox"/>
condition of vegetation (noting visibly distressed, disturbed or dead vegetation)	<input type="checkbox"/>	X
assessment of soil loss or deposition that has occurred in the past and evaluation of the future erosion potential	<input type="checkbox"/>	X
visible signs of erosion (on and off-site)	<input type="checkbox"/>	X
surface water bodies (e.g. lakes, rivers, streams, wetlands), fresh/marine and distance from site: <b>various agricultural drains throughout site</b>	X	<input type="checkbox"/>
surface water drainage (e.g. drainage bores, soak wells, sumps) and run-off and identification of ponding areas (and potential for flooding): <b>various agricultural drains throughout site</b>	X	<input type="checkbox"/>
direction of flow of water runoff from the site and adjacent properties:	X	<input type="checkbox"/>
depth of any standing water, the direction and rate of flow of rivers, streams or canals, together with their flood levels and any tidal inundations	<input type="checkbox"/>	X
surface water and groundwater use on site including rate and location of abstractions (current and historical): <b>No known groundwater use</b>	<input type="checkbox"/>	X
evidence of possible naturally occurring contaminants	<input type="checkbox"/>	X
identification of environmentally sensitive or significant features or habitats:	X	<input type="checkbox"/>
evidence chemical substances have migrated or are likely to have migrated to a neighbouring site and is or is likely to be causing contamination of the neighbouring property	<input type="checkbox"/>	X
photographs of site and surrounding adjacent land, showing significant features, topography, nature of surface and existing structures): <b>See report appendix</b>	X	<input type="checkbox"/>
differences between current site condition and site history	X	<input type="checkbox"/>

## Northern Rivers Contaminated Land Program - Contamination Report Summary Table

Property description and address	Page no.
Lot 22 DP1082435 Lot 23 DP1077509 Lot 494 DP720450 Lot 1 DP1250570 Lot 2 DP1192506 Lot 3 DP1243752 Lot 51 DP1166990 Lot 50 DP1056966	Section 2
<b>Conceptual Site Model</b>	
No CSM developed at this stage	N/A
<b>Sampling and Analysis Quality Plan (SAQP)</b>	
No sampling undertaken	N/A
No sampling undertaken	N/A
No sampling or analysis undertaken	N/A
Not applicable at this stage	N/A
<b>Sampling Methodology</b>	
No sampling undertaken	N/A
No sampling undertaken	N/A
<b>Notable contaminant concentrations e.g. maximum specific concentrations and validation results</b>	
No sampling undertaken	N/A
No sampling undertaken	N/A
No sampling undertaken	N/A
<b>Nature of works carried out</b>	
PSI for EIS purposes including desktop assessment, site history and aerial photograph review and site inspection	
<b>Nature and extent of residual contamination</b>	
Areas of potential contamination identified on site including asbestos in soil	Section 5, App 4, App 5
<b>Waste removed</b>	
No waste removed	N/A
<b>Remediation Summary</b>	
Detailed Site Investigation recommended on a stage by stage basis with materials removed in accordance with a Remediation Action Plan	N/A
<b>Statement of suitability</b>	
N/A	N/A
<b>Report details</b>	
<b>Report title:</b> Preliminary Site Investigation, Tweed Sand Plant Expansion, Cudgen, New South Wales	

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