NSW Site Auditor Scheme

Site Audit Statement

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the *Contaminated Land Management Act 1997* on 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. **0503-1904**

This site audit is a:

☑ statutory audit

~~☐ non-statutory audit~~

within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name	**Andrew Lau**	
Company	**JBS&G Australia Pty Ltd**	
Address	**Level 1, 50 Margaret Street**	
	Sydney NSW	Postcode **2000**
Phone	**02 8245 0300**	
Email	**alau@jbsg.com.au**	

Site details

Address	**Broken Head Road**	
	Byron Bay NSW	Postcode **2481**

Property description

(Attach a separate list if several properties are included in the site audit.)

Lot 2 in DP 573835, Lot 7 in DP 580243, part Lot 1 in DP 573835 and part Lot 9 in DP 708338

Local government area **Byron Shire Council**

Area of site (include units, e.g. hectares) **4.31 hectares (approximately)**

Current zoning **RU2 Rural Landscape (Byron Local Environmental Plan 2014) and DM Deferred Matter (Byron Local Environmental Plan 1988)**

Regulation and notification

To the best of my knowledge:

☐ ~~**the site is** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985,* as follows: (provide the no. if applicable)~~

- ☐ ~~Declaration no.~~
- ☐ ~~Order no.~~
- ☐ ~~Proposal no.~~
- ☐ ~~Notice no.~~

☑ **the site is not** the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

☑ the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*

☐ ~~**the** site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.~~

Site audit commissioned by

Name	**Ben Nowland**	
Company	**Public Works Advisory**	
Address	**120 Dalley Street**	
	Lismore NSW	Postcode **2480**
Phone	**0436 634 024**	
Email	**benjamin.nowland@finance.nsw.gov.au**	

Contact details for contact person (if different from above)

Name **As above**

Phone

Email

Nature of statutory requirements (not applicable for non-statutory audits)

☐ ~~Requirements under the *Contaminated Land Management Act* 1997 (e.g. management order; please specify, including date of issue)~~

☐ ~~Requirements imposed by an environmental planning instrument (please specify, including date of issue)~~

☐ Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)

Byron Shire Council Development Application No. 10.2020.211.1 for remediation of 5-37 Broken Head Road Byron Bay (portion of Lot 9 in DP 708338) determined 28/09/2020.

☐ ~~Requirements under other legislation (please specify, including date of issue)~~

Purpose of site audit

☐ ~~**A1** To determine land use suitability~~

~~Intended uses of the land:~~

OR

☑ **A2** To determine land use suitability subject to compliance with either an active or passive environmental management plan

Intended uses of the land:

Eco-residential

Park, recreational open space, playing field

Commercial / industrial

Schools

Tourism

~~OR~~

~~(Tick all that apply)~~

☐ ~~**B1** To determine the nature and extent of contamination~~

☐ ~~**B2** To determine the appropriateness of:~~

- ☐ ~~an investigation plan~~
- ☐ ~~a remediation plan~~
- ☐ ~~a management plan~~

☐ ~~**B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

☐ ~~**B4** To determine the compliance with an approved:~~

- ☐ ~~**voluntary management proposal** or~~
- ☐ ~~**management order** under the *Contaminated Land Management Act 1997*~~

☐ ~~**B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.~~

~~Intended uses of the land:~~

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

Cavvanba Consulting Pty Ltd

Easterly Point Environmental Pty Ltd

GHD Pty Ltd

Titles of reports reviewed:

- *Byron Bay Sewerage Treatment Plant Demolition Work Plan, Revision A, Liberty Industrial Pty Ltd, 10.06.2015 (Liberty Industrial 2015a).*
- *Byron Bay Sewerage Treatment Plant Removal Work Health and Safety Management Plan, Revision A, Liberty Industrial Pty Ltd, 10.06.2015 (Liberty Industrial 2015b).*
- *South Byron STP Demolition Works Asbestos Control Plan, Revision B, Liberty Industrial Pty Ltd, 22/06/2015 (Liberty Industrial 2015c).*
- *Byron Bay STP Environmental Management Plan, Revision C, Liberty Industrial Pty Ltd, 29/06/2015 (Liberty Industrial 2015d).*
- *Acid Sulfate Soil Management Plan – Demolition Works South Byron Sewage Treatment Plan (STP) Broken Head Road, Byron Bay NSW 2481, Ref. 15019 R01, Cavvanba Consulting Pty Ltd, 16/06/15 (Cavvanba 2015).*
- *Sampling, Analysis and Quality Plan Former South Byron Sewage Treatment Plant Byron Bay NSW, Ref. 15027.1, Easterly Point Environmental Pty Ltd, 03/07/15 (Easterly Point Environmental 2015a).*
- *Sampling, Analysis and Quality Plan Additional Assessment of Stockpiles Former South Byron Sewage Treatment Plant Byron Bay NSW, Ref. 15027.2, Easterly Point Environmental Pty Ltd, 27/10/15 (Easterly Point Environmental 2015b).*
- *Remediation and Validation Report Former South Byron Sewage Treatment Plant Byron Bay NSW, Ref. 15027.2, Easterly Point Environmental Pty Ltd, 07/04/17 (Easterly Point Environmental 2017).*
- *STP Contaminated Materials Summary Report, Stage 2B Remediation Works South Byron Sewage Treatment Plant, Broken Head Road, Byron Bay NSW 2481, Ref: 18065 L01 (final), Cavvanba Consulting Pty Ltd, 8 October 2018 (Cavvanba 2018).*
- *South Byron Former Sewage Treatment Plant Remediation Supplementary PFAS Investigations, Draft, 221689600-14449, 20 February 2019, GHD Pty Ltd (GHD 2019a).*
- *Former South Byron Sewerage Treatment Plant Stage 2B High Level Remediation Options Review, 221689600-13839, 22 February 2019, GHD Pty Ltd (GHD 2019b)*
- *South Byron Former Sewage Treatment Plant Remediation Supplementary Detailed Site Investigation of the Bottle Dump Area, 221689600-93880, 4 March 2019, GHD Pty Ltd (GHD 2019c).*
- *South Byron Sewage Treatment Plant Detailed Remediation Action Plan – Addendum, Revision 0, 22/3/2019, GHD Pty Ltd (GHD 2019d).*
- *South Byron Sewage Treatment Plant Remediation and Validation Report – Stage 2A: Nightsoil Area, Revision 1, 25/3/2019, GHD Pty Ltd (GHD 2019e).*
- *South Byron STP Remediation – Nightsoil Area Assessment of Off-Site Soil Contamination, Draft, 22-SO-1257963288-9, 12 September 2019, GHD Pty Ltd (GHD 2019f).*
- *South Byron STP Remediation Stage 2B Data Gap Assessment, Revision 1, 27/09/2019, GHD Pty Ltd (GHD 2019g).*
- *South Byron STP Remediation Berm Core Excavation - Soil Characterisation, 22-SO-1257983288-11, 17 October 2019, GHD Pty Ltd (GHD 2019h).*

- *South Byron Sewage Treatment Plant Remediation Action Plan – East of Former Nightsoil Area, Revision 0, 07/11/2019, GHD Pty Ltd (GHD 2019i).*
- *South Byron Sewage Treatment Plant Remediation and Validation Report – Stage 2B, Revision 1, 6/12/2021, GHD Pty Ltd (GHD 2021).*
- *Former South Byron Sewage Treatment Plant Long Term Environmental Management Plan, Revision 0, 22/03/2022, GHD Pty Ltd (GHD 2022).*

Other information reviewed, including previous site audit reports and statements relating to the site:

- *Contaminated Site Investigation, Sampling and Analysis Program & Site Risk Assessment, South Byron Sewage Treatment Plant, Broken Head Road, South Byron Bay, LandPartners, January 2008.*
- *Detailed Acid Sulfate Soil Assessment, South Byron Sewage Treatment Plant, Broken Head Road, South Byron Bay, LandPartners, January 2008.*
- *Heritage Assessment at South Byron Sewage Treatment Works, Broken Head Road, Byron Bay NSW, Everick Heritage Consultants Pty Ltd, January 2008.*
- *Byron Shire Council South Byron Sewage Treatment Plant Draft Masterplan, Ref 22/15175/14542.*
- *Data Quality Objectives & Sampling, Analysis & Quality Plan, South Byron Sewage Treatment Plant, Ref 11108 R01, Cavvanba Consulting, October 2011.*
- *Detailed Site Investigation, South Byron Sewage Treatment Plant, Ref 11108 R02, Cavvanba Consulting, April 2012.*
- *Conceptual Remediation Action Plan, South Byron Sewage Treatment Plant, Ref 11108 R03, Cavvanba Consulting, August 2012.*
- *Sampling, Analytical and Quality Plan, South Byron Sewage Treatment Plant 22/16896/103247, Byron Shire Council, GHD Pty Ltd, September 2013.*
- *Additional Contamination Investigations, South Byron Sewage Treatment Plant 22/116896/104152, Byron Shire Council GHD Pty Ltd, 15 November 2013.*
- *Hazardous Building Materials Assessment, South Byron Sewerage Treatment Plant, 22/116896/104156, Byron Shire Council, GHD Pty Ltd.*
- *Detailed Remedial Action Plan, South Byron Sewage Treatment Plant, 22/116896/104900, Byron Shire Council, GHD Pty Ltd, February 2014.*
- *Review of Environmental Factors South Byron STP Nightsoil Removal Works, 2992-1092 Version 3, GeoLink, 19/11/2018.*
- *South Byron STP REF Nightsoil Removal Works Assessment of Review of Environmental Factors prepared by GeoLink, Tim Fitzroy & Associates, 20 November 2018.*
- *Review of Environmental Factors South Byron STP Stage 2B Works, 2992-1052 Version 3, GeoLink, 27/05/2019.*
- *Review of Environmental Factors South Byron STP Stage 2B Works Addendum 1, 2992-1055 Version 1, GeoLink, 17/07/2019.*

- *Review of Environmental Factors South Byron STP Stage 2B Works Addendum 2, 2992-1075 Version 2, GeoLink, 02/11/2020.*

Site audit report details

Title **Site Audit Report Former South Byron Sewage Treatment Plant Broken Head Road Byron Bay NSW**

Report no. **0503 - 1904** Date **27 May 2022**

Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section. (Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
  - (B1) the nature and extent of contamination, and/or
  - (B2) the appropriateness of an investigation, remediation or management plan[1], and/or
  - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
  - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
  - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

[1] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Section A1

I certify that, in my opinion:

The **site is suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

- ☐ Residential, including substantial vegetable garden and poultry
- ☐ Residential, including substantial vegetable garden, excluding poultry
- ☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry
- ☐ Day care centre, preschool, primary school
- ☐ Residential with minimal opportunity for soil access, including units
- ☐ Secondary school
- ☐ Park, recreational open space, playing field
- ☐ Commercial/industrial
- ☐ Other (please specify):

_____

OR

- ☐ I certify that, in my opinion, the **site is not suitable** for any use due to the risk of harm from contamination.

Overall comments:

_____

_____

_____

_____

Section A2

I certify that, in my opinion:

Subject to compliance with the **attached** environmental management plan[2] (EMP), the site is suitable for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

- ~~☐ Residential, including substantial vegetable garden and poultry~~
- ~~☐ Residential, including substantial vegetable garden, excluding poultry~~
- ~~☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~
- ☑ Day care centre, preschool, primary school
- ☑ Residential with minimal opportunity for soil access, including units
- ☑ Secondary school
- ☑ Park, recreational open space, playing field
- ☑ Commercial/industrial
- ☑ Other (please specify):

  Eco-residential

  Tourism

EMP details

Title	**Former South Byron Sewage Treatment Plant Long Term Environmental Management Plan**		
Author	**GHD Pty Ltd**		
Date	**22 March 2022**	No. of pages	**50**

EMP summary

This EMP (attached) is required to be implemented to address residual contamination on the site.

The EMP: (Tick appropriate box and strike out the other option.)

- ~~☐ requires operation and/or maintenance of active control systems~~[3]
- ☑ requires maintenance of **passive** control systems only[3].

[2] Refer to Part IV for an explanation of an environmental management plan.
[3] Refer to Part IV for definitions of active and passive control systems.

Purpose of the EMP:

Describe the nature and location of contamination remaining on-site, management measures to prevent exposure to contaminants (under normal site use) and site specific procedures for any works that would result in potential exposure of residual contaminants.

Description of the nature of the residual contamination:

- Physical and chemical contamination (soils containing inert waste material such as glass, plastic, metal and asbestos containing materials (ACM) or impacted with hydrocarbons (total recoverable hydrocarbons and polycyclic aromatic hydrocarbons from historic nightsoil activities) which is contained within the berm core on the southern and western site boundaries.

- Fill material with some physical contamination (in the form of glass and metal inclusions) beneath trees in the south western portion of the site along the western boundary.

- Fill material with minor physical contamination (in the form of glass inclusions) in the vicinity of the power pole in the north western portion of the site.

- Minor occurrences of inert contaminants in fill across the north eastern corner of the site (e.g. minor fragments of glass or non-friable bonded ACM).

All areas of residual contamination are covered with a minimum of 0.2 m of topsoil but exposure to the identified remnant contamination could occur due to erosion/degradation of the berm/site capping layers or topsoil or during site construction and maintenance activities that require subsurface works.

Summary of the actions required by the EMP:

- Management of berm and topsoil integrity including regular detailed and grid based walkovers; removal of visible surface contamination; and repair of erosion or loss of integrity of capping and landscaping.

- Establishment of a Construction Environmental Management Plan for construction and maintenance works if known areas of contamination may be impacted.

- Vegetation maintenance to assist in maintaining topsoil and minimising erosion.

- Periodic review of LTEMP. At least every 12 months for the first three years then at least once every five years.

- Any changes to the LTEMP that result in a reduction in site management requirements requires the approval of an accredited site auditor.

How the EMP can reasonably be made to be legally enforceable:

By Byron Shire Council as an entity under the *Local Government Act 1993* and under the requirements of the *Work Health and Safety Act 2011*.

How there will be appropriate public notification:

Under the provisions of the s10.7 certificate, and requirement for implementation of a LTEMP shall be noted in any future contract of sale of land and in DA consent conditions for redevelopment of the site.

Overall comments:

- The site assessment activities, remediation and validation works are considered to have met the requirements of the *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme* (3rd Edition) (EPA 2017).

- Remediation of the identified TRH and PAH impact in soil from the former night soil area, and inert materials (glass, plastic, metal and ACM) impact was undertaken through excavation and placement in an engineered containment berm constructed on-site. Waste materials encountered during the remediation works including asbestos impact from underground structures and within the former sludge lagoons, and metals and plastics (from the south-west corner of the site) that were considered unsuitable for placement within the L-shaped berm were excavated and disposed of off-site to appropriately licensed facilities.

  Assessment of contaminant source pathway receptor linkages post-remediation has not identified any complete linkages for human health or ecological receptors.

- The auditor considers that remediation and validation works for Stage 1 (Easterly Point Environmental 2015a), Stage 2A (GHD 2019f) and Stage 2B (GHD 2021) were conducted appropriately and in general accordance with the DRAP (GHD 2014), DRAP Addendum (GHD 2019d) and north eastern nightsoil area RAP (GHD 2019i). Departures from the remediation action plans were appropriately acknowledged in the validation reports and did not affect the remediation outcomes achieved.

- There is no evidence of migration of contamination from the site which is considered to pose any unacceptable risks to identified human health or ecological receptors.

- Based on the information provided, the site is considered suitable for proposed potential eco-residential, tourism, open space / parkland, commercial / industrial and schools land uses, as defined in NEPC 2013.

- The suitability of the site for the identified land uses is subject to implementation of the *Former South Byron Sewage Treatment Plant Long Term Environmental Management Plan* (LTEMP) (GHD 2022) prepared for the site. The auditor is satisfied that the LTEMP will be reasonably able to be legally enforceable by BSC as an entity under the *Local Government Act 1993* and under the requirements of the *Work Health and Safety Act 2011*. In accordance with the provisions of the s10.7 certificate and requirement for implementation of the LTEMP to be noted as part of any future contract of sale of the land and in DA consent conditions for redevelopment of the site, the auditor is satisfied that the LTEMP will be appropriately notified to the public.

Section B

Purpose of the plan[4] which is the subject of this audit:

_____

_____

_____

I certify that, in my opinion:

(B1)

☐ The nature and extent of the contamination **has** been appropriately determined

☐ The nature and extent of the contamination **has not** been appropriately determined

AND/OR (B2)

☐ The investigation, remediation or management plan **is** appropriate for the purpose stated above

☐ The investigation, remediation or management plan **is not** appropriate for the purpose stated above

AND/OR (B3)

☐ The site testing plan:

- ☐ **is** appropriate to determine
- ☐ **is not** appropriate to determine

if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*

AND/OR (B4)

☐ The terms of the approved voluntary management proposal* or management order** (strike out as appropriate):

- ☐ **have** been complied with
- ☐ **have not** been complied with.

*voluntary management proposal no. _____

**management order no. _____

AND/OR (B5)

☐ The site **can be made suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

- ☐ Residential, including substantial vegetable garden and poultry
- ☐ Residential, including substantial vegetable garden, excluding poultry

[4] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

- ❑ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry
- ❑ Day care centre, preschool, primary school
- ❑ Residential with minimal opportunity for soil access, including units
- ❑ Secondary school
- ❑ Park, recreational open space, playing field
- ❑ Commercial/industrial
- ❑ Other (please specify):

IF the site is remediated/managed* in accordance with the following plan (**attached**):

*Strike out as appropriate

Plan title

Plan author

Plan date No. of pages

SUBJECT to compliance with the following condition(s):

Overall comments:

Part III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997.*

Accreditation no. **0503**

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997,* and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.

Signed 

Date **27 May 2022**

Part IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remediation plan or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use or uses of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997*

(CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the CLM Act or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of *the Environmental Planning and Assessment Act 1979*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section B

In Section B the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement. The condition must not specify an individual auditor, only that further audits are required.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

Part III

In **Part III** the auditor certifies their standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to

- the **NSW Environment Protection Authority**: nswauditors@epa.nsw.gov.au or as specified by the EPA

AND

- the **local council** for the land which is the subject of the audit.

Paper Size ISO A4

0 50 100 150

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Byron Shire Council
South Byron STP - Stage 2B Remediation

Project No. **22-20278**
Revision No. **B**
Date **15/10/2021**

Site Location

FIGURE 1

\\ghdnet\ghd\AU\Coffs Harbour\Projects\22\20278\GIS\Maps\Working\2220278_Stage2bRemediation\2220278_Stage2bRemediation.aprx
Print date: 15 Oct 2021 - 16:24

Data source: LPI: Cadastre, Roads, Watercourse (2021); GHD: Remediation Area (2021); Google Earth Pro: Imagery 07/2021 (downloaded 16/07/2021); Department of Resources, Dept of Environment and Science, Esri, HERE, Garmin, METI/NASA, USGS, Esri, Geoscience Australia, NASA, NGA, USGS. Created by: knoble

Former South Byron Sewage Treatment Plant

Long Term Environmental Management Plan

Byron Shire Council

22 March 2022

→ The Power of Commitment

GHD Pty Ltd | ABN 39 008 488 373
Level 13, 203 Robina Town, Centre Drive
Robina, Queensland 4226, Australia
T +61 7 5557 1000 | **E** goldcoastmail@ghd.com | **ghd.com**

Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	0	A Hughes B Cork	I. Gregson		I. Gregson		22/03/2022

Executive summary

Background

GHD Pty Ltd (GHD) was commissioned by Byron Shire Council (BSC) to prepare a Long Term Environmental Management Plan (LTEMP) for a portion of the former South Byron Sewage Treatment Plant (STP), located at 1 Broken Head Road, South Byron Bay, NSW. This LTEMP applies to the land identified as the "Site (management area)" on Figure 1.

The site was used for night-cart operations from 1909 to 1972. Cleaning and maintenance of the night-cart vehicles, storage and collection of nightsoil cans and dumping of waste was conducted in the southern portion of the site during that time. The STP was developed in 1972 following conclusion of the night cart operations. STP operation included the collection, treatment and discharge of generated effluent from the surrounding area. Areas of the site were also reportedly filled during various stages of development of the site.

The STP was decommissioned in November 2005 with the augmentation of the West Byron STP. The STP is no longer required for operational purposes and BSC have since assessed opportunities, constraints and options for its future use. Based on the Draft Master Plan (GHD 2011), the preferred development options include one or a combination of the following:

– Residential - High-end residential or eco-residential studios with an education component.
– Tourism - High-end resort style tourism or lower end family camping style tourism with an education component.
– Parklands/Open Space - Passive Recreation including environmental protection.

The former STP has been subject to three stages of remediation to date. The first two stages comprised demolition of STP infrastructure and remediation of particular areas of the site. The third stage (Stage 2B) comprised the excavation of physically and chemically contaminated material, containment of the material within an engineered berm along the western and southern boundaries of the site, regrading of the site, placement of a capping layer across the surface and the berm, and revegetation. Following remediation, the site is considered suitable from a contamination perspective for redevelopment including a change in land use to potential urban residential (NEPM residential A), or tourism and parklands / open space, subject to appropriate long term management of residual contaminants.

As the remediation included on-site containment of impacted soils, this LTEMP is required to describe the nature and location of contamination remaining on-site, management measures to prevent exposure to contaminants (under normal site use) and site-specific procedures for any works that would result in potential exposure of residual contaminants.

Nature of residual contamination

Based on the remediation and validation undertaken, the following areas of known contamination remain within the site and require management to prevent exposure:

– Physical and chemical contamination (soils containing inert waste material such as glass, plastic, metal and asbestos containing materials (ACM) or impacted with hydrocarbons (total recoverable hydrocarbons (TRH) and polycyclic aromatic hydrocarbons (PAH) from historical nightsoil activities) which is contained within the berm core on the southern and western site boundaries.
– Fill material with some physical contamination (in the form of glass and metal inclusions) beneath trees in the south-western portion of the site, along the western site boundary.
– Fill material with minor physical contamination (in the form of glass inclusions) in the vicinity of the power pole in the north-western portion of the site.
– Minor occurrences of inert contaminants in fill across the remainder of the site (e.g. minor fragments of glass or non-friable bonded ACM).

All areas of residual contamination are covered with a minimum of 0.2 m of topsoil but exposure to the identified remnant contamination could occur due to erosion / degradation of the berm / site capping layers or topsoil or during site construction and maintenance activities that require sub-surface works.

Actions required by LTEMP

This LTEMP requires maintenance of passive control measures only, essentially to ensure site users are aware of the presence of residual contamination and to appropriately manage any potential for exposure.

The management and monitoring required and included in this LTEMP are summarised below.

Issue	Management	Frequency
Berm and topsoil integrity	Conduct a detailed walkover of the berm to assess the condition of the berm and identify items that may indicate issues with the berm integrity (erosion, cracks, differential settlement, areas of exposed geofabric or contaminated material or impact from animals – e.g. burrowing or digging). Conduct a grid based walkover of accessible soil across the site to identify areas of topsoil erosion or physical contamination (such as glass or ACM). Remove any visible surface contamination in accordance with the protocols in this LTEMP. Repair any erosion or loss of integrity of capping and landscaping to prevent potential exposure to contaminants.	Quarterly and following rainfall events >100 mm over a 24 hour period in the first year*.
Construction and maintenance	Review location of works with reference to areas of known contamination and establish a specific construction environmental management plan (CEMP) (where required) to manage risks associated with the proposed works. Ensure site workers are adequately briefed on this LTEMP, the known and potential contamination and the associated hazards involved in undertaking work at the site. Ensure workers have appropriate training and experience required to undertake their tasks, including management of contamination if subject to exposure.	Prior to any construction or maintenance work at the site.
Vegetation maintenance (to assist with maintaining topsoil and minimising erosion)	Maintain vegetation with reference to the Landscape Design (GHD, 2019b) to assist in minimising erosion.	As required.
Documentation and review	The most current LTEMP must be retained by BSC and referenced on the s.10.7 Planning Certificate. The LTEMP is to be periodically reviewed.	At least every twelve months for the first three years and then at least once every five years.

* The frequency of inspections may be reduced to a biannual basis if the berm and topsoil are considered to be stable and sufficient to prevent exposure to contamination over the course of the first year.

Responsibility for LTEMP

BSC has a commitment (as the landowner and appropriate regulatory authority) to ensure this LTEMP:

– Has appropriate public notification in regard to any restrictions applying to the land.
– Is reasonably able to be made legally enforceable.

It is anticipated that the LTEMP (or subsequent approved versions) will be enacted by BSC as an entity operating under the NSW *Local Government Act 1993*. Should BSC wish to repurpose the land, environmental assessments will be undertaken for any planned developments under the relevant planning instrument and in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Review and maintenance of this LTEMP is also required in relation to management of asbestos at the site, in accordance with the requirements of Part 8.3 of the WHS Regulation 2017.

Public notification of the LTEMP will be undertaken in accordance with Section 5 of the *Byron Shire Council Policy No. 5.61 Management of Contaminated Land Policy* (BSC 2008), or any future updates to that document/policy, which includes:

– Recording all relevant information on the BSC Contaminated Land Information System.
– Issuing Planning Certificates upon application.
– Making the following documents identified on the Planning Certificates and held by BSC available for inspection upon written request to BSC and approval by BSC's Public Officer:
    - Site investigation reports or any other contamination assessment reports prepared by consultants.
    - Site audit reports.
    - Site audit statements.
– Providing access to documents in accordance with the Freedom of Information Act 1989.

Contents

Table index

Appendices

1. Introduction

Byron Shire Council (BSC) engaged GHD Pty Ltd (GHD) to prepare a Long Term Environmental Management Plan (LTEMP) for a portion of the former South Byron Sewage Treatment Plant (STP), located at 1 Broken Head Road, South Byron Bay, NSW. The location of the former South Byron STP property and the subject area requiring management (hereafter referred to as 'the site') are presented on Figure 1, Appendix A and the site is further defined in Section 1.3 below.

1.1 Background

The site was used for night-cart operations from 1909 to 1972. Cleaning and maintenance of the night-cart vehicles, storage and collection of nightsoil cans and dumping of waste was conducted in the southern portion of the site during that time. The STP was developed in 1972 following conclusion of the night cart operations. STP operation included the collection, treatment and discharge of generated effluent from the surrounding area. Areas of the site were also reportedly filled during various stages of development of the site. This involved filling to raise areas for construction of the STP, excavation and replacement of soils in areas of the site during development of the STP and burial of waste generated by the STP process (such as grit and rag, metal, glass, plastic etc).

The STP was decommissioned in November 2005 with the augmentation of the West Byron STP. The STP is no longer required for operational purposes and BSC have since assessed opportunities, constraints and options for its future use. Based on the Draft Master Plan (GHD 2011), the preferred development options include one or a combination of the following:

– Residential - High-end residential or eco-residential studios with an education component.
– Tourism - High-end resort style tourism or lower end family camping style tourism with an education component.
– Parklands/Open Space - Passive Recreation including environmental protection.

The former STP has been subject to three stages of remediation to date:

– Stage 1 demolition and remediation works which took place between 2015 and 2017 and included removal of all STP infrastructure. This resulted in several stockpiles of varying materials being left on-site. Other previously stockpiled material resulting from removal of the STP infrastructure was used to backfill excavations.
– Stage 2A remediation of the nightsoil area which was completed in January 2019 and involved excavation and off-site disposal of contaminated soil.
– Stage 2B remediation, which was undertaken in 2020 and 2021 and comprised the excavation of physically and chemically contaminated material, containment of the material within an engineered berm along the western and southern boundaries of the site, regrading of the site, placement of a capping layer across the surface and the berm and revegetation.

Following remediation, the site is considered suitable from a contamination perspective for redevelopment including a change in land use to potential urban residential (NEPM residential A), or tourism and parklands / open space, subject to appropriate long term management of residual contaminants.

1.2 Purpose of this EMP

As the remediation included on-site containment of impacted soils, the purpose of this LTEMP is to describe the nature and location of contamination remaining on-site, management measures to prevent exposure to contaminants (under normal site use) and site-specific procedures for any works that would result in potential exposure of residual contaminants.

The LTEMP comprises passive management measures as contamination is predominantly contained / capped in locations that are unlikely to be subject to exposure during normal use of the site. Implementation of this LTEMP is the responsibility of BSC, in order to ensure the site remains suitable for potential residential development and ongoing use.

Implementation and notification of this LTEMP will be undertaken as discussed in Section 2.3 of this LTEMP.

This LTEMP is subject to the limitations described in Section 7 and the assumptions stated throughout the report.

This LTEMP is focused strictly on management of contamination within the site for the purposes of managing potential risks to health or safety to residents or workers at the site from this contamination in the context of the potential development and use of the site as discussed above. This LTEMP is not intended to address potential contamination outside of the site or other risks or management requirements (such as, but not limited to management of surface water or environmental impacts from construction works), nor use and development for purposes other than the potential development options discussed above.

1.3 Site identification

The overall former STP property includes Lot 1 and 2 of DP 573835 and Lot 7 DP 580423, as shown on Figure 1, Appendix A. The “management area”, which is the subject site of this LTEMP is confined to the area shown on Figure 1, Appendix A.

The site is located in an area of mixed land use (recreation, tourist park, National Park) and is located adjacent to Tallow Creek. The property locality details are summarised within Table 1.1.

Table 1.1 Site locality summary

Feature	Description
Property name	South Byron Sewage Treatment Plant
Street address	Broken Head Road, Byron Bay
Lot and DP	Lot 2 of DP 573835 and a portion of Lot 1 DP 573835 as shown on Figure 1, Appendix A. The Management Area does not include any portions of Lot 7 DP 580423 or Lot 9 DP 708338.
Ownership	Lot 1 DP 573835, Lot 2 DP573835 and Lot 7 DP 580423 are owned by Byron Shire Council.
Zoning	The property is zoned part RU2 (Rural Landscape) and part DM (deferred Matter); pursuant to the Byron Local Environment Plan (LEP) 2014 and Byron LEP 1988 (respectively).
Surrounding land uses	The surrounding land uses include: **North** – Arakwal National Park immediately to the north with Byron Bay High School approximately 400 m to the north. **South** – Tallow Creek wetlands lie to the south as well as vegetated land, a caravan park and residential areas. **East** – Tallow Creek and Tallow Creek wetlands along the eastern boundary of the site and the coastline (Pacific Ocean) 200 m east of the site. **West** –Caravan park, Broken Head Road and Byron Bay Golf Course.

1.4 Environmental setting

A summary of the environmental setting for the site and overall property is presented in Table 1.2.

Table 1.2 Environmental setting summary

Feature	Description
Topography	The site is elevated to less than 10 metres relative to the Australia Height Datum (AHD). The berm (constructed during Stage 2B remediation) is present on the western and southern boundaries of the site management area, as shown in Figure 2 Appendix A. Topography across the remainder of the site grades downwards gradually to the east, towards Tallow Creek.
Surface hydrology	Two tertiary treatment ponds are located to the east of the site. Tallow Creek is located further east and flows in a northerly direction, discharging into the South Pacific Ocean approximately 400 m north of the site. Wetlands are present to the south-east of the site. Rock drainage channels (installed during Stage 2B remediation work) are located in the south eastern and northern portion of the site and direct surface water flows to the east of the site, towards the tertiary treatment ponds and Tallow Creek.
Geology and soils	Based on information from previous investigations the predominant geology at the site is “beach and dune sand”. The soils are expected to be podzols (acid sandy soils with strongly differentiated horizons) with landscape units including the Black Rock Variant (bra) (south of the site) and the East Ballina Variant (eba) north of the site. The soil profile consists of layers of silty sand fill above natural sand. The depth of fill (prior to remediation) varied, with a maximum depth of approximately 1.6 metres below ground level (mbgl). As part of Stage 2B remediation, the natural soils and fill were re-shaped, resulting in an overall fill depth across the site of up to 1 m. Approximately 0.2 m of imported topsoil has also been placed over the remediated areas. Composition of the berm is discussed in Section 1.6.
Acid sulfate soils	The acid sulfate soil (ASS) risk map of Byron Bay indicates that the ASS properties at the site vary from high probability to low probability of occurrence. The high risk of acid sulfate soils occurrence is limited to the south eastern corner of the site, extending into the Ingenia Holidays Caravan Park.
Hydrogeology	Groundwater at the site is estimated to be at a depth of 2 – 4 m bgl and is inferred to flow to the East towards Tallow Creek and the South Pacific Ocean. Previous investigations (Cavvanba 2012 and GHD 2013) found ammonia, nitrate, cadmium, copper and zinc concentrations exceeding the NEPM groundwater investigation levels in groundwater at the site; however there was no evidence of potential or actual migration of contaminants from the site which may result in unacceptable risks to surrounding environmental or human receptors. Groundwater should not be extracted for use on the site without assessment of its suitability for the particular purpose.

1.5 Remediation and validation works

The site has been subject to numerous investigations and remediation, which are summarised in the Stage 2B validation report (GHD, 2021).

The Stage 2B remediation aimed to address remaining contamination issues at the site, to facilitate a change in land use and future site development. This involved the excavation of physically and chemically contaminated material (fill material with inert waste material such as glass, plastic, metal and asbestos containing material (ACM) in addition to stockpiled material from previous remediation stages), containment of the material within an engineered berm along the western and southern boundaries of the site, regrading of the site, placement of a capping layer across the surface and berm, and revegetation.

The conceptual site model (CSM) following remediation did not identify any potentially complete source-pathway-receptor linkages and accordingly, the site was considered suitable (from a contamination perspective) for redevelopment to potential urban residential (NEPM residential A), tourism and parklands / open space, subject to long term management of residual contaminants.

1.6 Site conditions following remediation

Following completion of Stage 2B remediation works, the site was vacant with the exception of the berm, drainage lines and remnant vegetation. Public Works Authority (PWA) indicated that planting and plant maintenance had also been undertaken across the site in general accordance with the Vegetation Management Plan provided in the Technical Specification (GHD, 2019b).

The berm occupies the western and southern boundary of the site, as shown on Figure 2, Appendix A. The berm comprises:

– The berm core, which was filled with physical and chemical contaminated soil (as shown in Figure 2C to 2G, Appendix A).
– A layer of geofabric, which extends around the physical and chemical contamination in the berm core.
– A layer of capping material (minimum of 1 m thickness) above the physical and chemical contaminated soil and geofabric.
– Topsoil (200 mm thickness).

Chemically contaminated material (comprising total recoverable hydrocarbons (TRH) and polycyclic aromatic hydrocarbons (PAH) from the former Nightsoil Area) is present within the berm core between Chainage 123 and Chainage 160 as shown on Figure 3, Appendix A. The remainder of the berm core comprises physically contaminated soils (inert waste material such as glass, plastic, metal and ACM).

A stockpile of trickle filter rock (approximately 400 m^3) remains in the north-western corner of the site, for future re-use. It is expected to be reused in the near future.

No formal access for heavy vehicles has been constructed on the site and the site, as a whole, is not trafficable by heavy vehicles such as water cartage trucks.

Site photographs showing the general site condition following remediation are presented in Table 1.3.

Table 1.3 Photographs of site conditions following remediation

	
Photo 1 –Site surface (prior to placement of topsoil) in north-eastern portion of site. Photo taken from the berm, looking north-east on 12 April 2021	Photo 2 -Site surface and berm in the south-western portion of site (prior to placement of topsoil). Photo looking south-east on 12 April 2021
	
Photo 3 – Site surface following placement of topsoil. Photo looking east on 12 May 2021	Photo 4–Berm surface following importation of topsoil. Photo looking east on 12 May 2021
	
Photo 5 – Drone photograph of site following completion of works. Photo looking north-east on 19 August 2021. The stockpile on the left (north-western) side of the site is residual trickle filter rock that has been retained on-site for future use.	Photo 6 – Drone photograph of site following completion of works. Photo looking south-east on 19 August 2021

2. Stakeholders and responsibility

2.1 Preparation of LTEMP

The LTEMP has been prepared by GHD on behalf of BSC, in consultation with BSC, PWA and BSC's appointed site auditor (Andrew Lau of JBS&G) during the course of its preparation. Review of this LTEMP and its acceptance as a basis for certifying that the site can be made suitable for the proposed development will mark the completion of the current site audit.

2.2 Implementation of LTEMP

It is understood BSC are intending to retain ownership of the site and that the site may be leased in the future. Discussion around the future sale of the site is discussed in Section 2.3.

Roles and responsibilities associated with the implementation of this EMP are outlined in Table 2.1.

Table 2.1 Roles and responsibilities

Role: Party / Title	Responsibility
Site Owner: BSC or future purchaser of the site (should Council resolve to sell the land at some point in the future)	– Overall responsibility of health and safety of site users and environmental performance of the site. – Ensure resources are adequately available and assigned for the implementation of this LTEMP, including appropriate delegation of responsibility to Council staff. – Maintain registers for inspections relating to this LTEMP (as discussed in Section 4). – Communicate requirements of this LTEMP for future planning for the site. – Ensuring this LTEMP is referenced on the s.10.7 Planning Certificate for the site.
Site Manager: BSC	– Awareness of LTEMP requirements by those undertaking intrusive works or maintenance on the site, and for ensuring appropriate inductions are carried out. – Implementation of this LTEMP including site inspections. – Undertaking management measures (as discussed in Section 4). – Reviewing and updating the EMP (as discussed in Section 6).
Grounds maintenance contractor	– Implementation of this LTEMP in regard to maintenance of the soil and vegetation in the management area (as discussed in Section 4.2).
Utilities or service contractors	– Implementation of this LTEMP in regard to soil disturbance (as discussed in Section 4.2).

2.3 Enforceability of LTEMP

The LTEMP will be enacted by BSC as an entity operating under the NSW *Local Government Act 1993*. BSC also has a statutory responsibility under S.59 of the *Contaminated Land Management Act 1997* (CLM Act) to include this LTEMP on the S10.7 certificates for the site for the purposes of implementing s.149 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Should BSC wish to repurpose the land, environmental assessments will be undertaken for any planned developments under the relevant planning instruments and in accordance with the EP&A Act.

Should Council resolve to sell the land at some point in the future, a contract of sale will highlight that an LTEMP applies to a remediated site. The contract of sale will stipulate that the restrictions and requirements of the LTEMP are the responsibility of the site owner (purchaser). Should the purchaser attempt to avoid responsibility of a breach of the LTEMP requirements, this can be potentially be enforced as a contractual breach of sale.

Furthermore, should the purchaser wish to develop the site, the proposed development will require an environmental assessment noting the LTEMP requirements. Should the development be approved, a DA will be issued under the EP&A Act with consent conditions specifically noting the requirement to comply with the LTEMP. Breaches of DA conditions are enforced by the BSC Statement of Environmental Effects (SEE) directorate under planning law.

As discussed in Section 5, review and maintenance of this LTEMP is also required in relation to management of asbestos at the site, in accordance with the requirements of Part 8.3 of the WHS Regulation 2017.

2.4 Communications

The contaminant status of the site and the requirements of this LTEMP are to be communicated in accordance with Section 5 of the *Byron Shire Council Policy No. 5.61 Management of Contaminated Land Policy* (BSC 2008), or any future updates to that document/policy, which includes:

– Recording all relevant information on the BSC Contaminated Land Information System.
– Issuing Planning Certificates upon application.
– Making the following documents identified on the Planning Certificates and held by BSC available for inspection upon written request to BSC and approval by BSC's Public Officer:
    - Site investigation reports or any other contamination assessment reports prepared by consultants.
    - Site audit reports.
    - Site audit statements.
– Providing access to documents in accordance with the Freedom of Information Act 1989.

3. Contamination requiring management

3.1 Remnant contamination

Based on the remediation and validation report (GHD, 2021), the following areas of known contamination remain within the site and require management to prevent exposure:

– Physical and chemical contamination which is contained within the berm core on the southern and western site boundary. Physical contamination within the berm comprises soil with inert STP wastes including glass and minor quantities of metal, plastic and bonded asbestos containing material (ACM). Chemical contamination within the berm is associated with former night cart operations from night soil excavations and has elevated concentrations of TRH and PAH which exceed *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013) (NEPM) Tier 1 screening criteria for residential land use.
– Fill material with some physical contamination (in the form of glass and metal inclusions) beneath trees in the south-western portion of the site, along the western boundary. This material was an unexpected find during the Stage 2B remediation and was considered to be aesthetically unsuitable. However, remediation of this material would have required the removal of several large trees. Given that the earthworks design required approximately 0.8 metres of cover in this location, the material was left in-situ beneath the trees, allowing the retention of the trees which provide a vegetative buffer from the adjacent caravan park.
– Fill material with minor physical contamination (in the form of glass inclusions) in the vicinity of the power pole in the north-western portion of the site. During remediation an area of glass in fill was identified in the vicinity of the power pole. The material was excavated and placed in the berm core to the extent practicable. Minor amounts of residual glass remain in the fill (beneath the imported topsoil) around the power pole in this area.
– Minor occurrences of inert waste in fill across the site (e.g. minor fragments of glass or non-friable bonded ACM).

The areas requiring management are shown on Figure 3, Appendix A.

3.2 Hazard assessment

The CSM in the validation report (GHD 2021) states that the likelihood of exposure to contaminants under post-remediation conditions is unlikely due to stockpiles having been placed in the berm or used as fill (where suitable), the Nightsoil area having been validated and soil that was not considered to meet aesthetic criteria also being placed in the berm. Exposure to the identified remnant contamination could; however, occur under the following scenarios during development or routine occupancy of the site under the proposed land uses:

– Erosion / degradation of the topsoil / capping layers on the berm and exposure of underlying physically or chemically contaminated material.
– Erosion / degradation of the topsoil within the site and exposure of minor levels of physically contaminated material.
– During development or maintenance works that require sub-surface works (particularly around the berm, power pole, or south western boundary).

Potential exposure pathways associated with the above contamination may include:

– Ingestion or dermal contact with the residual or excavated contaminated soils.
– Release of contaminated soils or aesthetically unsuitable material into the environment.

Inhalation of asbestos fibres from non-friable asbestos fragments during maintenance / construction works is not considered to be a significant potential exposure pathway, as all identified ACM has been disposed off-site or in the berm, the site was visually validated prior to placement of topsoil and the site has been capped with validated topsoil.

4. Management measures and procedures

The following section details management measures to be undertaken to prevent exposure to contaminants. These measures are consistent with normal maintenance practices for a passive management strategy, and it is considered feasible to implement these measures over the long term.

4.1 Berm and topsoil integrity

Physical and chemical contaminated material is contained within the berm. The contaminated material is contained by geofabric, a 1 m capping layer and 0.2 m of topsoil. A layer of topsoil (0.2 m in thickness) has also been placed across the surface of the remainder of the site.

Periodic inspections of the site are required to assess the integrity of the berm and topsoil at the site and that contamination remains adequately contained.

The inspections are to be undertaken on a quarterly basis for the first year and following rainfall events >100 mm over a 24-hour period. The frequency of inspections may be reduced to a biannual basis if the berm and topsoil are considered to be stable and sufficient to prevent exposure to contamination over the course of the first year.

Each inspection should comprise:

– A detailed walkover of the berm (across the top surface and accessible portions of each side) to assess the condition of the berm and issues such as:
  - Erosion, cracks, differential settlement or ponding water.
  - Impact from animals e.g. burrows (e.g. from Rainbow Bee-eaters or rabbits) or digging (e.g. bandicoots or dogs).
  - Areas of exposed geofabric.
  - Evidence of physical or chemical contamination (such as glass, metal, ACM or visual or olfactory contaminant indicators).
– A grid-based walkover of areas of accessible soil across the site to assess for areas of topsoil erosion, and waste (such as glass or ACM) which may be at the site surface due to weathering.

The inspection is to be undertaken by a BSC environmental officer (or delegate) with an understanding of the site history, contamination and familiarity with this LTEMP. Each inspection should be documented in a report that includes:

– A reference to this document.
– Details of the person undertaking the inspection.
– Methodology of the inspection and areas inspected.
– Photographic records.
– Measurements and details of any areas where there is a potential to result in exposure of contamination.
– Recommended management measures.

The report is to be documented with photographic evidence and kept on file by BSC.

Measures for issues arising from the inspection are provided in Section 4.4.

4.2 Construction and maintenance

Prior to any construction and maintenance, the following is to be undertaken by a BSC environmental officer (or similar) with an understanding of the site history, contamination and familiarity with this LTEMP:

– Review location of works with reference to the known areas of contamination outlined in Figure 3, Appendix A. No work should be undertaken within the berm without prior consultation with the designer (GHD[1]) and BSC. Should construction or maintenance works be undertaken within the known contamination areas, a construction environmental management plan (CEMP) should be prepared by a suitably qualified environmental consultant (certified contaminated land environmental consultant) for BSC approval for the specific works being undertaken. The CEMP should include (at a minimum):
    - Erosion and sediment control measures to prevent sediment moving off-site and any sediment laden water from entering watercourses or drainage lines.
    - Procedures for segregation, management and tracking of any contaminated material disturbed by the works.
    - Stockpiling and contaminated material management controls and requirements.
    - Controls to minimise direct contact with impacted soils during works (such as wearing gloves, avoiding eating and drinking whilst working in areas of contamination and practising good hygiene).
    - Procedures for reinstatement of any disturbed capping.
– Ensure site induction / toolbox talk is provided to all relevant site personnel on this LTEMP, management measures and procedures. All relevant site personnel should be made aware of the site history, potential contamination, impacted areas and the potential hazards involved in undertaking work at the site.

Should contamination or an unexpected find (e.g. waste such as glass, metal or ACM or presence of odours, staining) the procedures in Section 4.4 should be followed. Any contamination or unexpected finds encountered during construction or maintenance is to be reported directly to BSC within 24 hours of identification.

4.3 Vegetation

Planting works have occurred across the site surface with reference to the Landscape Design (GHD, 2019b, which is included in Appendix B). Vegetation assists in maintaining topsoil and minimising erosion across the berm and site surface.

It is recommended that a routine assessment of vegetation is undertaken as part of the berm and topsoil site inspections (refer Section 4.1). The inspection should aim to identify plant losses and areas requiring maintenance (mowing, weeding, areas of plant loss or erosion).

4.4 Management measures

Measures to be undertaken in the event of an issue that has potential to result in exposure of contamination at the site are outlined in Table 4.1.

Table 4.1 Management measures

Issue	Action	Responsibility
Topsoil / berm integrity issues (such as cracks, erosion, differential settlement, water ponding or impact from animals) that have potential to expose residual contaminants.	– Restrict access to the area. – Consult appropriately qualified environmental consultant. – Establish cause of failure and requirements to prevent future occurrence. – Establish a proposed strategy to address the issue. This should be agreed upon by BSC and the appropriately qualified and experienced environmental consultant. – Repair in accordance with strategy.	BSC

[1] Should the designer not be available, a registered engineer should be consulted to interpret and modify the design as required.

Issue	Action	Responsibility
Encountering minor quantities of incidental waste (e.g. isolated fragments <10 cm^2 per m^2 ground surface of ACM, or isolated glass fragments)	– Removal and appropriate disposal (glass and ACM). – Remove all visible ACM. Where further minor quantities of ACM are considered likely to be present in surface soils (nominally to 10 cm), include (where practicable) gently fine raking of wetted soil to expose and remove ACM fragments. ACM removal is to be undertaken by a suitably qualified person (as defined by SafeWork NSW). – Guidance for removal of minor quantities of ACM may be found in WorkCover NSW fact sheet "*How to deal with asbestos 'fibro' in soil at home*" (provided in Appendix D), or subsequent similar guidelines. – See Section 5.2 for regulatory requirements relating to ACM removal.	BSC
Encountering large quantities of physical (e.g. >1 kg of glass) or chemical contamination, ACM (numerous fragments >10cm^2 per m^2 ground surface) or unexpected finds.	– Cease work in the area of concern and restrict access to the area. – Contact BSC. – Provide required environmental and human health controls (which could include installation of temporary barricading, warning signs, covering of odorous materials, erosion and sediment controls). – Document the exposed materials (including photographs), controls established and report to BSC. – Contact appropriately qualified and experienced environmental consultant to provide specialise advice / support. – No potentially contaminated or hazardous materials are to be disturbed further without approval / confirmation from the experienced environmental consultant. – Establish a proposed strategy to address the contaminated material. This should be agreed upon by BSC and the appropriately qualified and experienced environmental consultant. – See Section 5.2 for regulatory requirements relating to ACM removal.	BSC
Vegetation loss that has potential to lead to exposure of residual contaminants through erosion.	– Consult an appropriately experienced company to provide advice. – Undertake required maintenance.	BSC

5. Regulatory requirements

5.1 Asbestos register and asbestos management plan

As discussed in Section 3.1, asbestos materials are contained within the berm at the site and minor occurrences of non-friable bonded ACM may be encountered in fill material across the management area during future site use or soil disturbance works. Due to the presence of asbestos and as the site is likely to be a workplace from time to time, an asbestos register must be maintained documenting the present of asbestos at the site, in accordance with Part 8.1 Clause 425 to Clause 428 of the WHS Regulation 2017. An asbestos register is provided in Appendix B.

An Asbestos Management Plan (AMP) is also required in accordance with Part 8.1 Clause 429 to Clause 430 of the WHS Regulation 2017. This LTEMP is considered to fulfill the minimum requirements of an AMP, including information about the following:

– The identification of asbestos or ACM.
– Decisions, and reasons for decisions, about the management of asbestos at the workplace.
– Procedures for detailing incidents or emergencies involving asbestos or ACM at the workplace.
– Workers carrying out work involving asbestos.

The WHS Regulation imposes legislative requirements for the review and maintenance of the asbestos register and AMP.

5.2 Asbestos removal

ACM removal (if required) is to be carried out in accordance with Part 8.7 of the *Work Health and Safety (WHS) Regulation 2017* and the *Code of Practice – How to Safely Remove Asbestos* (SafeWork NSW 2016).

Minor quantities of ACM (<10 m^2) may be removed by a competent person (as defined in Part 1.1.5 of the WHS Regulation 2017), but any disturbance or removal of >10 m^2 of asbestos must be undertaken by a licensed asbestos contractor.

Staff potentially involved in ACM removal are to be trained in accordance with Clause 445 of the WHS Regulation 2017.

6. Review and improvement

6.1 LTEMP review

The LTEMP and its implementation will be reviewed at least every twelve months for the first three years and then at least once every five years. The purpose of each review is to ensure that the management measures and implementation is meeting the required objectives. The review will consider (where available or applicable):

– Changes to site operation or land use.
– Findings of environmental management measures.
– Incidents, complaints and any preventative actions undertaken.
– Changes in standards and legislation.
– The overall success of the LTEMP in minimising potential of exposure to contamination.

Review should be undertaken by an appropriately experienced and qualified person who should provide written verification to BSC that the provisions of the LTEMP are still appliable. Any changes to the LTEMP that result in a reduction in site management requirements will require approval from an accredited site auditor to ensure the site remains suitable for the intended land uses.

As noted in Section 5, the WHS Regulation 2017 imposes similar requirements for review and maintenance of an AMP and the asbestos register which is provided in Appendix B.

6.2 LTEMP updates

The outcomes of the above reviews may include amendments to this LTEMP and supporting documentation. Any amendments made to the LTEMP will be communicated to relevant personnel by BSC following completion of the review. The most current LTEMP must be retained by BSC and referenced on the s.10.7 Planning Certificate.

7. Limitations

This report:

1. Has been prepared by GHD for Byron Shire Council (BSC).
2. May be provided to and used by the appointed Site Auditor and the relevant planning authority for the purpose of meeting statutory obligations in accordance with the Contaminated Land Management Act 1997 (CLM Act) and the Environmental Planning and Assessment Act 1979 (EP&A Act).
3. May be provided to other third parties but such third parties' use of or reliance on the Report is at their sole risk, as this Report must not be relied on by any person other than those listed in 1-2 above without the prior written consent of GHD.
4. May only be used for the purpose agreed between GHD and BSC as set out in Section 1.2 of this report (and must not be used for any other purpose).

GHD otherwise disclaims responsibility to any person other than BSC arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the Report are excluded unless they are expressly stated to apply in this Report.

The services undertaken by GHD in connection with preparing this Report:

– Were limited to those specifically detailed within this Report.
– Were undertaken in accordance with current profession practice and by reference to relevant environmental regulatory authority and industry standards, guidelines and assessment criteria in existence as at the date of this Report.

The opinions, conclusions and any recommendations in this Report are based on assumptions made by GHD when undertaking the services mentioned above and preparing the Report ("Assumptions"), as specified throughout this Report. GHD expressly disclaims responsibility for any error in, or omission from, this Report arising from or in connection with any of the Assumptions being incorrect except where GHD has been negligent in the adoption of those Assumptions.

GHD has prepared this report on the basis of information provided by BSC and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Subject to the paragraphs in this section of the Report, the opinions, conclusions and any recommendations in this Report are based on conditions encountered and information reviewed at the time of preparation of this Report and are relevant until such times as the site conditions or relevant legislations changes, at which time, GHD expressly disclaims responsibility for any error in, or omission from, this Report arising from or in connection with those opinions, conclusions and any recommendations.

The opinions, conclusions and any recommendations in this Report are based on information obtained from, and testing undertaken at or in connection with, specific sampling points and may not fully represent the conditions that may be encountered across the site at other than these locations. Site conditions at other parts of the site may be different from the site conditions found at the specific sampling points.

GHD has considered and/or tested for only those chemicals specifically referred to in this Report, and makes no statement or representation as to the existence (or otherwise) of any other chemicals.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD expressly disclaims responsibility:

– Arising from, or in connection with, any change to the site conditions.
– To update this Report if the site conditions change.

Except as otherwise expressly stated in this Report GHD makes no warranty or representation as to the presence or otherwise of asbestos and/or asbestos containing materials (“ACM”) on the site. If fill material has been imported on to the site at any time, or if any buildings constructed prior to 1970 have been demolished on the site or material from such buildings disposed of on the site, the site may contain asbestos or ACM.

Except as otherwise expressly stated in this Report, GHD makes no warranty, statement or representation of any kind concerning the suitability of the site for any purpose or the permissibility of any use, development or re-development of the site.

These Disclaimers should be read in conjunction with the entire Report and no excerpts are taken to be representative of the findings of this Report.

To the extent of any inconsistency between this Disclaimer and the terms of any service agreement between BSC and GHD pursuant to which this Report was prepared, the terms of the service agreement will prevail.

8. References

BSC (2008) *Byron Shire Council Policy No. 5.61 Management of Contaminated Land Policy*

Cavvanba (2012) *Detailed Site Investigation, South Byron Sewage Treatment Plant*, 1108, R02. Cavvanba Consulting Pty Ltd. 2012

GHD (2011) *Byron Shire Council South Byron Sewage Treatment Plant Draft Masterplan*, Ref 22/15175/14542

GHD (2013b) *Byron Shire Council Additional Contamination Investigations Revision 0*

GHD (2014) *Detailed Remedial Action Plan. South Byron Sewage Treatment Plant*. Ref: 2216896

GHD (2019a) *South Byron Sewage Treatment Plant Detailed Remedial Action Plan – Addendum.* 221689600. March 2019

GHD (2019b) *Former South Byron Sewage Treatment Plant Stage 2B Remediation – Technical Specification.* 22-SO-1257983288. October 2019

GHD (2021) *South Byron Sewage Treatment Plant Remediation and Validation Report – Stage 2B*. October 2021

NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended by the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*, National Environment Protection Council, May 2013

NSW Work Health and Safety (WHS) Regulation 2017

SafeWork NSW (2016) *Code of Practice – How to Safely Remove Asbestos*

WorkCover NSW (2014) fact sheet *How to deal with asbestos 'fibro' in soil at home*

Appendices

Appendix A

Figures

Paper Size ISO A4

0 50 100 150

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Byron Shire Council
Former South Byron STP
Long Term Environmental Management Plan
1 Broken Head Road, Byron Bay

Project No. **22-20278**
Revision No. **2**
Date **13/01/2022**

Site Location

FIGURE 1

N:\AU\Coffs Harbour\Projects\22\20278\GIS\Maps\Working\2220278_Stage2bRemediation\2220278_Stage2bRemediation.aprx
Print date: 13 Jan 2022 - 15:52

Data source: LPI: Cadastre, Roads, Watercourse (2021); GHD: Site Boundary (2021); MetroMap: Imagery WMS (Accessed 08/11/2021); Department of Resources, Dept.of Environment and Science, Esri, HERE, Garmin, METI/NASA, USGS, Esri, Geoscience Australia, NASA, NGA, USGS. Created by: hselff

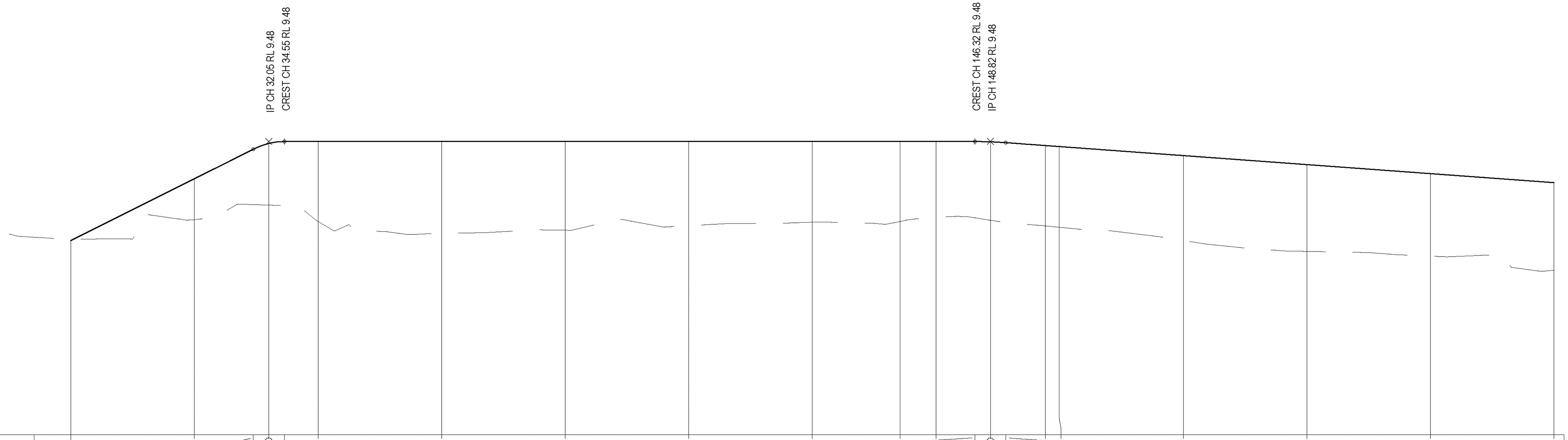
FIGURE 2A

0 20m

NORTHERN RIVERS LAND SOLUTIONS
© 2012
76 Tamar Street
BALLINA NSW 2478
PO Box 1324
M: 0414 217 664
P: 61 2 6681 6696
F: 61 2 6681 6410
E: tony.hart@nrls.com.au
www.nrls.com.au

SCALE:	1:1000 (A3)	CONTOURS:	0.25m INTERVAL	CLIENT:	LIBERTY INDUSTRIAL
SURVEY:	PF	DATUM:	AHD	PROJECT:	SOUTH BYRON STP REMEDIATION
DRAWN:	azaCAD	ORIGIN:	PM 42275 RL 6.354	LGA:	BYRON
DATE OF SVY:	3rd MAY '21			SOURCE:	AERIAL: NEARMAP (APR 2021)
CAD REF:	20099-09				

WORKS AS EXECUTED DETAIL - SITE PLAN
LOT 2 DP573835
1 BROKEN HEAD ROAD, BYRON BAY



DATUM RL. 0.00

VERTICAL ALIGNMENT		L=29.55m G=10%	L=5m				L=111.77m G=0%				L=5m				L=98.29m G=-1.46%		
HORIZONTAL ALIGNMENT						L=134.20m				L=23.56m R=-15.00m						L=123.00m	
COMBINED SURFACE LEVEL		8.28	9.37	9.48	9.48	9.48	9.48	9.48	9.48	9.48	9.47	9.35	9.32	9.03	8.74	8.45	8.15
LEVEL DIFFERENCE CUT - / FILL +	-0.04	1.32	1.99	2.59	2.97	2.87	2.72	2.61	2.59	2.45	2.54	2.60	2.61	2.75	2.81	2.67	2.83
DESIGN SURFACE LEVEL	6.278	7.62 ~~8.278~~	8.84 ~~9.421~~	9.11 ~~9.483~~	9.32 ~~9.483~~	9.39 ~~9.483~~	9.35 ~~9.483~~	9.40 ~~9.483~~	9.39 ~~9.483~~	9.32 ~~9.483~~	9.40 ~~9.474~~	9.44 ~~9.353~~	~~9.320~~ 9.43	9.39 ~~9.029~~	9.13 ~~8.738~~	8.46 ~~8.446~~	8.28 ~~8.155~~
EXISTING SURFACE LEVEL	6.32	6.96	7.43	6.90	6.51	6.61	6.76	6.87	6.90	7.04	6.93	6.75	6.71	6.28	5.93	5.78	5.32
CHAINAGE	0.00	20.00	32.05	40.00	60.00	80.00	100.00	120.00	134.20	140.00	148.82	157.76	160.00	180.00	200.00	220.00	240.00

LONGITUDINAL SECTION - BERM01

SCALE H 1:500 V 1:100

FIGURE 2B

0

NORTHERN RIVERS LAND SOLUTIONS © 2012
76 Tamar Street
BALLINA NSW 2478
PO Box 1324
M: 0414 217 664
P: 61 2 6681 6696
F: 61 2 6681 6410
E: tony.hart@nrls.com.au
www.nrls.com.au

SCALE: AS SHOWN
SURVEY: PF
DRAWN: azaCAD
DATE OF SVY: 3rd MAY '21
CAD REF: 20099-09

CONTOURS:
DATUM: AHD
ORIGIN: PM 42275
RL 6.354

CLIENT: LIBERTY INDUSTRIAL
PROJECT: SOUTH BYRON STP REMEDIATION
LGA: BYRON
SOURCE: DESIGN: GHD

WORKS AS EXECUTED - BERM LONG SECTION

1 BROKEN HEAD ROAD, BYRON BAY

DATUM RL. 0.00

VERTICAL ALIGNMENT		L=5m	L=26.16m G=-7.1%			
HORIZONTAL ALIGNMENT						
COMBINED SURFACE LEVEL	8.15	7.91	7.42			6.00
LEVEL DIFFERENCE CUT - / FILL +	2.83	2.56	1.25			2.31
DESIGN SURFACE LEVEL	~~8.155~~ 8.28	~~8.35~~ 7.943	~~7.81~~ 7.410			~~4.32~~ 5.997
EXISTING SURFACE LEVEL	5.32	5.38	6.17			3.68
CHAINAGE	240.00	252.10	260.00			280.00

LONGITUDINAL SECTION - BERM01

SCALE H 1:500 V 1:100

0

NORTHERN RIVERS LAND SOLUTIONS
© 2012
76 Tamar Street
BALLINA NSW 2478
PO Box 1324
M: 0414 217 664
P: 61 2 6681 6696
F: 61 2 6681 6410
E: tony.hart@nrls.com.au
www.nrls.com.au

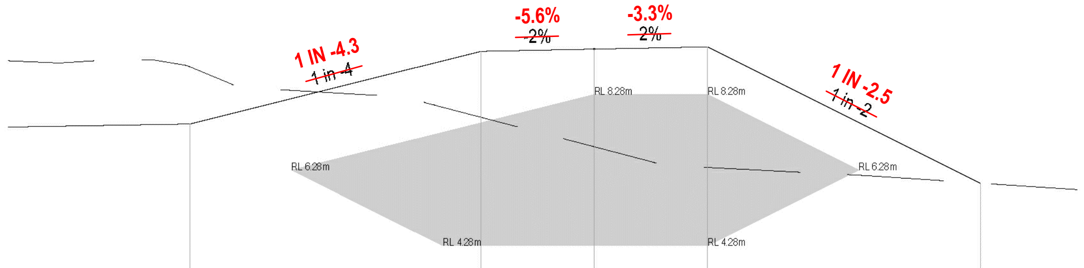
SCALE:	AS SHOWN	CONTOURS:	
SURVEY:	PF	DATUM:	AHD
DRAWN:	azaCAD	ORIGIN:	PM 42275
DATE OF SVY:	3rd MAY '21		RL 6.354
CAD REF:	20099-09		

CLIENT:	LIBERTY INDUSTRIAL
PROJECT:	SOUTH BYRON STP REMEDIATION
LGA:	BYRON
SOURCE:	DESIGN: GHD

FIGURE 2C

WORKS AS EXECUTED - BERM LONG SECTION (CONT.)

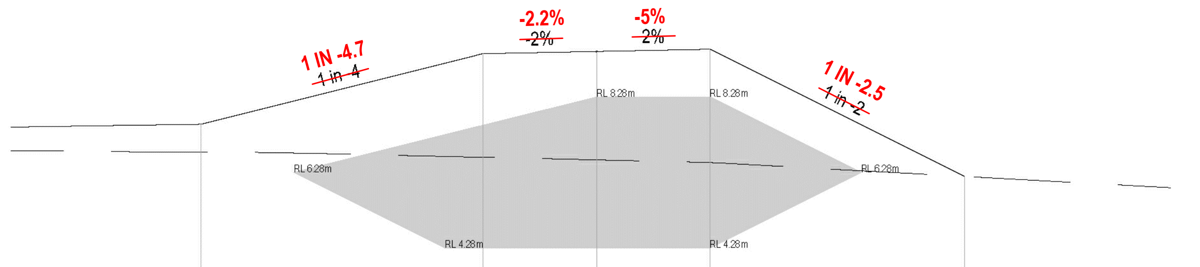
1 BROKEN HEAD ROAD, BYRON BAY



DATUM R.L. 3.00

DESIGN SURFACE LEVEL	7.60 ~~7.502~~	8.97 ~~9.423~~	9.11 ~~9.483~~	~~9.483~~	9.02 ~~9.543~~	5.91 ~~5.934~~
LEVEL DIFFERENCE CUT - / FILL +	-1.51	1.74	2.59	2.59	3.19	0.00
EXISTING SURFACE LEVEL	9.01	7.68	6.90	6.90	6.35	5.93
OFFSET FROM CONTROL LINE	-10.683	-3.000	0.000	0.000	3.000	10.219

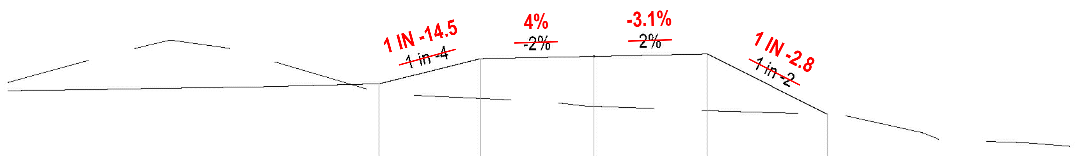
CH 40



DATUM R.L. 3.00

DESIGN SURFACE LEVEL	7.57 ~~7.558~~	9.33 ~~9.423~~	9.39 ~~9.483~~	9.25 ~~9.543~~	6.27 ~~6.176~~
LEVEL DIFFERENCE CUT - / FILL +	0.74	2.74	2.87	3.00	0.00
EXISTING SURFACE LEVEL	6.82	6.68	6.61	6.54	6.18
OFFSET FROM CONTROL LINE	-10.460	-3.000	0.000	3.000	9.735

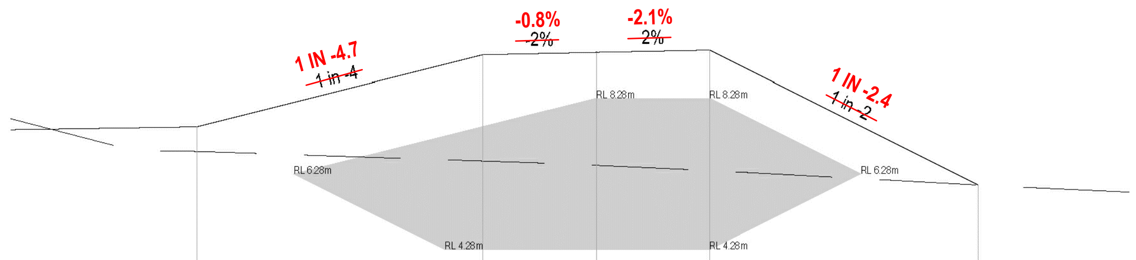
CH 80



DATUM R.L. 5.00

DESIGN SURFACE LEVEL	7.49 ~~7.551~~	7.71 ~~8.218~~	7.62 ~~8.278~~	~~8.278~~	7.49 ~~8.338~~	6.11 ~~6.746~~
LEVEL DIFFERENCE CUT - / FILL +	0.23	1.06	1.32	1.32	1.50	0.00
EXISTING SURFACE LEVEL	7.32	7.16	6.96	6.96	6.84	6.75
OFFSET FROM CONTROL LINE	-5.668	-3.000	0.000	0.000	3.000	6.183

CH 20



DATUM R.L. 3.00

DESIGN SURFACE LEVEL	7.67 ~~7.530~~	9.31 ~~9.423~~	9.32 ~~9.483~~	~~9.483~~	9.26 ~~9.543~~	6.14 ~~5.990~~
LEVEL DIFFERENCE CUT - / FILL +	0.65	2.80	2.97	2.97	3.17	0.00
EXISTING SURFACE LEVEL	6.88	6.62	6.51	6.51	6.37	5.99
OFFSET FROM CONTROL LINE	-10.571	-3.000	0.000	0.000	3.000	10.106

CH 60

FIGURE 2D

0

NORTHERN RIVERS LAND SOLUTIONS
76 Tamar Street
BALLINA NSW 2478
PO Box 1324
M: 0414 217 664
P: 61 2 6681 6696
F: 61 2 6681 6410
E: tony.hart@nrls.com.au
www.nrls.com.au

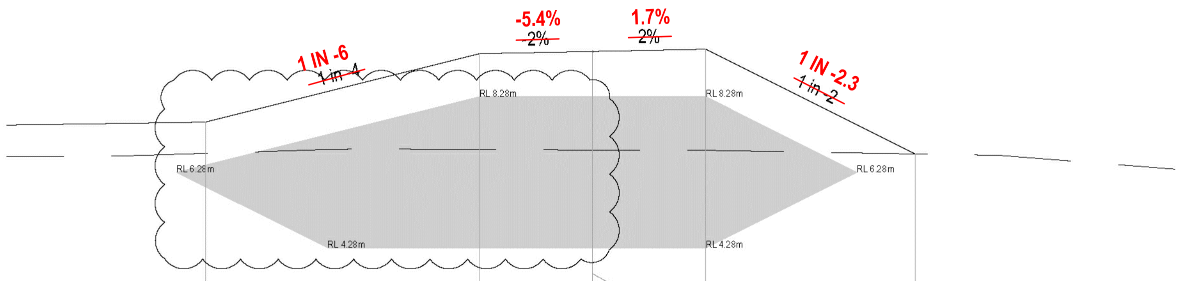
SCALE: AS SHOWN
SURVEY: PF
DRAWN: azaCAD
DATE OF SVY: 3rd MAY '21
CAD REF: 20099-09

CONTOURS:
DATUM: AHD
ORIGIN: PM 42275
RL 6.354

CLIENT: LIBERTY INDUSTRIAL
PROJECT: SOUTH BYRON STP REMEDIATION
LGA: BYRON
SOURCE: DESIGN: GHD

WORKS AS EXECUTED - BERM CROSS SECTIONS

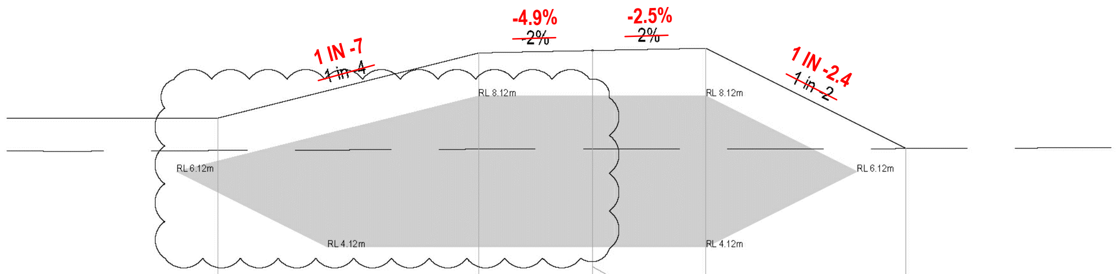
1 BROKEN HEAD ROAD, BYRON BAY



DATUM R.L. 3.00

DESIGN SURFACE LEVEL	7.44 ~~7.614~~	9.25 ~~9.423~~	9.40 ~~9.483~~	~~9.483~~	9.45 ~~9.543~~	6.55 ~~6.770~~
LEVEL DIFFERENCE CUT - / FILL +	0.83	2.54	2.61	2.61	2.68	0.00
EXISTING SURFACE LEVEL	6.78	6.89	6.87	6.87	6.86	6.77
OFFSET FROM CONTROL LINE	-10.237	-3.000	0.000	0.000	3.000	8.547

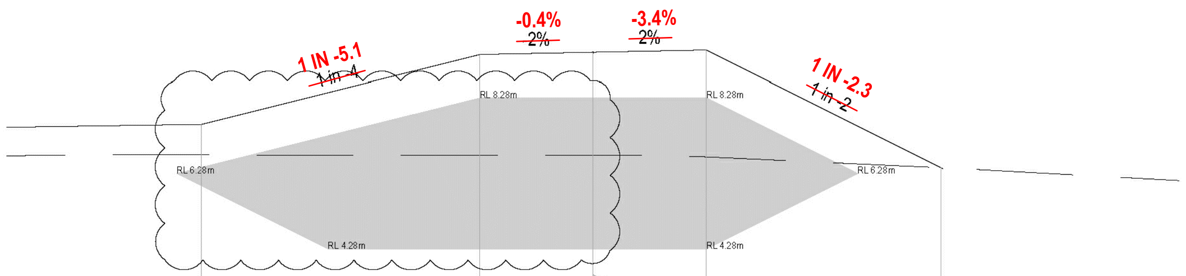
CH 120



DATUM R.L. 3.00

DESIGN SURFACE LEVEL	7.31 ~~7.534~~	9.25 ~~9.260~~	9.43 ~~9.320~~	~~9.320~~	9.34 ~~9.380~~	6.78 ~~6.728~~
LEVEL DIFFERENCE CUT - / FILL +	0.86	2.55	2.61	2.61	2.67	0.00
EXISTING SURFACE LEVEL	6.68	6.71	6.71	6.71	6.71	6.73
OFFSET FROM CONTROL LINE	-9.903	-3.000	0.000	0.000	3.000	8.304

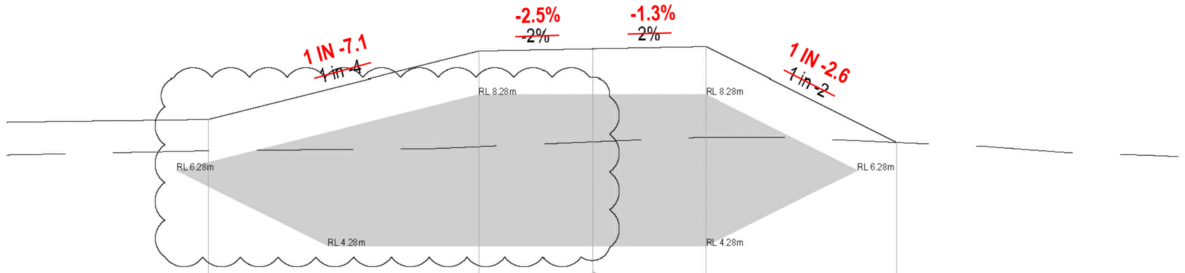
CH 160



DATUM R.L. 3.00

DESIGN SURFACE LEVEL	7.42 ~~7.586~~	9.34 ~~9.423~~	9.35 ~~9.483~~	~~9.483~~	9.26 ~~9.543~~	6.53 ~~6.436~~
LEVEL DIFFERENCE CUT - / FILL +	0.81	2.66	2.72	2.72	2.82	0.00
EXISTING SURFACE LEVEL	6.78	6.76	6.76	6.76	6.72	6.44
OFFSET FROM CONTROL LINE	-10.349	-3.000	0.000	0.000	3.000	9.210

CH 100



DATUM R.L. 3.00

DESIGN SURFACE LEVEL	7.30 ~~7.630~~	9.26 ~~9.423~~	9.32 ~~9.483~~	~~9.483~~	9.29 ~~9.543~~	6.99 ~~7.020~~
LEVEL DIFFERENCE CUT - / FILL +	0.83	2.51	2.45	2.45	2.38	0.00
EXISTING SURFACE LEVEL	6.80	6.91	7.04	7.04	7.16	7.02
OFFSET FROM CONTROL LINE	-10.171	-3.000	0.000	0.000	3.000	8.047

CH 140

FIGURE 2E

0

NORTHERN RIVERS LAND SOLUTIONS
76 Tamar Street
BALLINA NSW 2478
PO Box 1324
M: 0414 217 664
P: 61 2 6681 6696
F: 61 2 6681 6410
E: tony.hart@nrls.com.au
www.nrls.com.au

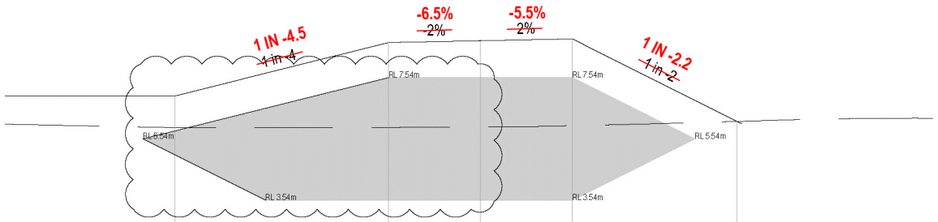
SCALE: AS SHOWN
SURVEY: PF
DRAWN: azaCAD
DATE OF SVY: 3rd MAY '21
CAD REF: 20099-09

CONTOURS:
DATUM: AHD
ORIGIN: PM 42275
RL 6.354

CLIENT: LIBERTY INDUSTRIAL
PROJECT: SOUTH BYRON STP REMEDIATION
LGA: BYRON
SOURCE: DESIGN: GHD

WORKS AS EXECUTED - BERM CROSS SECTIONS

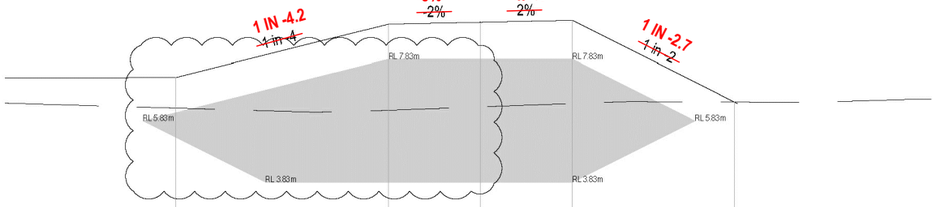
1 BROKEN HEAD ROAD, BYRON BAY



DATUM R.L. 2.00

DESIGN SURFACE LEVEL	6.70	6.997	8.93	8.678	9.13	8.730	8.736	8.96	8.798	6.12	6.166
LEVEL DIFFERENCE CUT - / FILL +	1.03		2.77		2.81	2.81		2.83		0.00	
EXISTING SURFACE LEVEL	5.90		5.91		5.93	5.93		5.97		6.11	
OFFSET FROM CONTROL LINE	-9.963		-3.000		0.000	0.000		3.000		8.383	

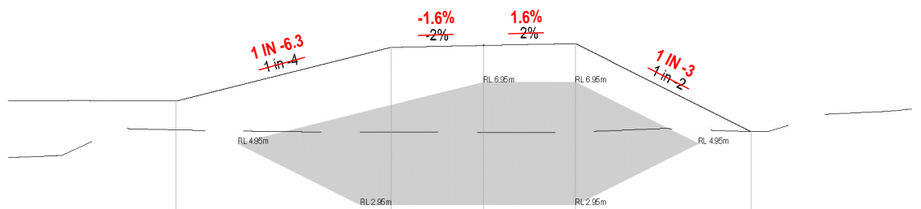
CH 200



DATUM R.L. 2.00

DESIGN SURFACE LEVEL	6.97	7.236	9.24	8.969	9.39	9.029	9.029	9.26	9.089	6.65	6.441
LEVEL DIFFERENCE CUT - / FILL +	0.99		2.79		2.75	2.75		2.70		0.00	
EXISTING SURFACE LEVEL	6.24		6.17		6.28	6.28		6.39		6.44	
OFFSET FROM CONTROL LINE	-9.933		-3.000		0.000	0.000		3.000		8.297	

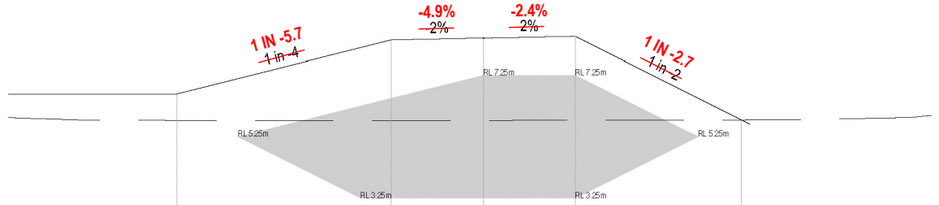
CH 180



DATUM R.L. 2.00

DESIGN SURFACE LEVEL	6.11	6.339	8.23	8.095	8.28	8.155	8.155	8.32	8.215	5.93	5.343
LEVEL DIFFERENCE CUT - / FILL +	0.94		2.77		2.83	2.83		2.88		0.00	
EXISTING SURFACE LEVEL	5.40		5.33		5.32	5.32		5.34		5.34	
OFFSET FROM CONTROL LINE	-10.024		-3.000		0.000	0.000		3.000		8.743	

CH 240



DATUM R.L. 2.00

DESIGN SURFACE LEVEL	6.43	6.638	8.28	8.386	8.46	8.446	8.446	8.37	8.506	5.81	5.794
LEVEL DIFFERENCE CUT - / FILL +	0.86		2.61		2.67	2.67		2.73		0.00	
EXISTING SURFACE LEVEL	5.78		5.77		5.78	5.78		5.78		5.79	
OFFSET FROM CONTROL LINE	-9.994		-3.000		0.000	0.000		3.000		8.425	

CH 220

FIGURE 2F

0

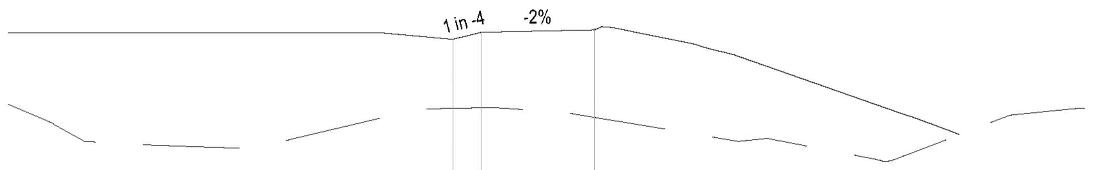
NORTHERN RIVERS LAND SOLUTIONS © 2012
76 Tamar Street
BALLINA NSW 2478
PO Box 1324
M: 0414 217 664
P: 61 2 6681 6696
F: 61 2 6681 6410
E: tony.hart@nrls.com.au
www.nrls.com.au

SCALE:	AS SHOWN	CONTOURS:	
SURVEY:	PF	DATUM:	AHD
DRAWN:	azaCAD	ORIGIN:	PM 42275
DATE OF SVY:	3rd MAY '21		RL 6.354
CAD REF:	20099-09		

CLIENT: LIBERTY INDUSTRIAL
PROJECT: SOUTH BYRON STP REMEDIATION
LGA: BYRON
SOURCE: DESIGN: GHD

WORKS AS EXECUTED - BERM CROSS SECTIONS

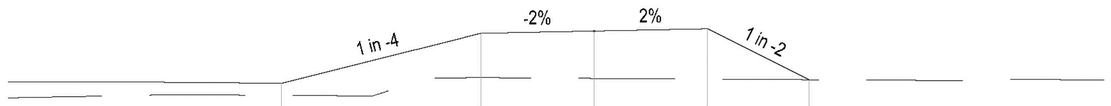
1 BROKEN HEAD ROAD, BYRON BAY



DATUM R.L. 1.00

DESIGN SURFACE LEVEL	5.749	5.937	5.997	5.997
LEVEL DIFFERENCE CUT - / FILL +	1.83	2.00	2.31	2.31
EXISTING SURFACE LEVEL	3.92	3.94	3.68	3.68
OFFSET FROM CONTROL LINE	-3.751	-3.000	0.000	0.000

CH 280



DATUM R.L. 4.00

DESIGN SURFACE LEVEL	6.042	7.358	7.418	7.418	7.478	6.134
LEVEL DIFFERENCE CUT - / FILL +	0.32	1.17	1.25	1.25	1.33	0.00
EXISTING SURFACE LEVEL	5.72	6.19	6.17	6.17	6.15	6.13
OFFSET FROM CONTROL LINE	-8.261	-3.000	0.000	0.000	3.000	5.687

CH 260

FIGURE 2G

0

NORTHERN RIVERS LAND SOLUTIONS
76 Tamar Street
BALLINA NSW 2478
PO Box 1324
M: 0414 217 664
P: 61 2 6681 6696
F: 61 2 6681 6410
E: tony.hart@nrls.com.au
www.nrls.com.au

SCALE: AS SHOWN
SURVEY: PF
DRAWN: azaCAD
DATE OF SVY: 3rd MAY '21
CAD REF: 20099-09

CONTOURS:
DATUM: AHD
ORIGIN: PM 42275
RL 6.354

CLIENT: LIBERTY INDUSTRIAL
PROJECT: SOUTH BYRON STP REMEDIATION
LGA: BYRON
SOURCE: DESIGN: GHD

WORKS AS EXECUTED - BERM CROSS SECTIONS

1 BROKEN HEAD ROAD, BYRON BAY

Paper Size ISO A4

0 10 20 30 40 50

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Byron Shire Council
Former South Byron STP
Long Term Environmental Management Plan

Areas of known contamination

Project No. **22-20278**
Revision No. **2**
Date **13/01/2022**

FIGURE 3

N:\AU\Coffs Harbour\Projects\22\20278\GIS\Maps\Working\2220278_Stage2bRemediation\2220278_Stage2bRemediation.aprx
Print date: 13 Jan 2022 - 15:04

Data source: LPI: Cadastre (2021); GHD: Site Boundary, Contamination Areas (2021); MetroMap: Imagery WMS (Accessed 08/11/2021); . Created by: hselff

Appendix B

Landscape design plan

Byron Shire Council

SOUTH BYRON STP REMEDIATION

LANDSCAPE DESIGN REPORT

23 OCTOBER 2019

DRAWING NO.	DRAWING TITLE
L1	LANDSCAPE COVER SHEET
L2	VEGETATION PROTECTION AND CLEARING
L3	LANDSCAPE CONCEPT
L4	SECTIONS
L5	STAGE 1: PROTECTIVE GRASS SEEDING
L6	STAGE 2: MASS PLANTING
L7	PLANTING SCHEDULE
L8	LANDSCAPE SPECIFICATION NOTES
L9	DETAILS

Landscape Architecture + Urban Design
redbelly

Red Belly Landscape Architecture + Urban Design
6 Canale Drive Boambee NSW 2450
www.redbellydesign.com.au

BYRON
HOLIDAY
PARK

LEGEND

- Existing vegetation and individual trees to be retained
- Protective fencing
- Existing Slash Pine plantation to be harvested

redbelly

BYRON SHIRE COUNCIL
SOUTH BYRON STP REMEDIATION

VEGETATION PROTECTION AND CLEARING

0 10 20 50m

L2

LEGEND

- Existing vegetation and individual trees to be retained
- Protective fencing
- Mass littoral rainforest planting
- Strap-leaf / open tree planting
- Strap-leaf planting
- Mowable grass
- Possible future footpath (indicative alignment)

redbelly

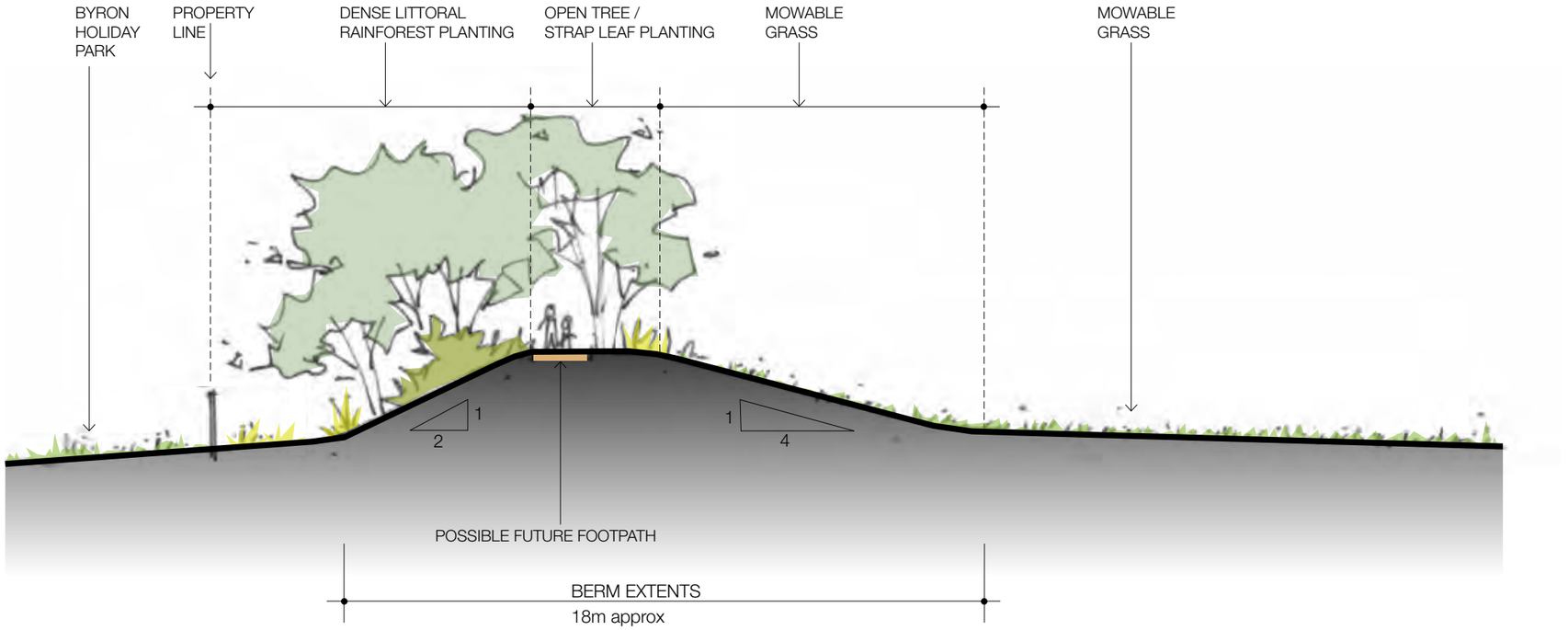
BYRON SHIRE COUNCIL
SOUTH BYRON STP REMEDIATION

LANDSCAPE CONCEPT

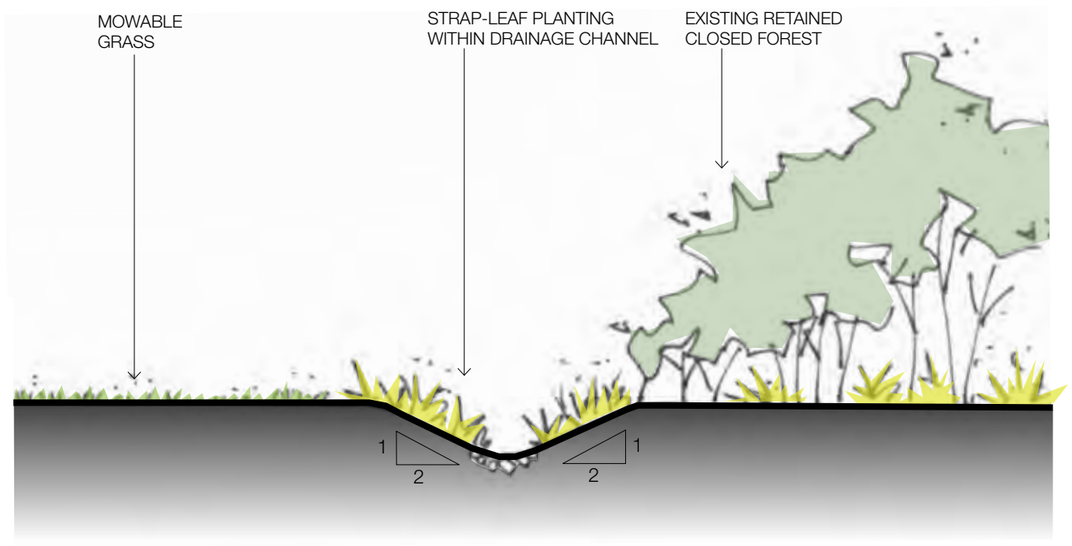
0 10 20 50m

L3

SECTION A



SECTION B



LEGEND

- Protective fencing
- Possible future footpath (indicative alignment)
- Extent of hydroseeding Grass mix Type A
- Extent of hydromulching Grass mix Type B

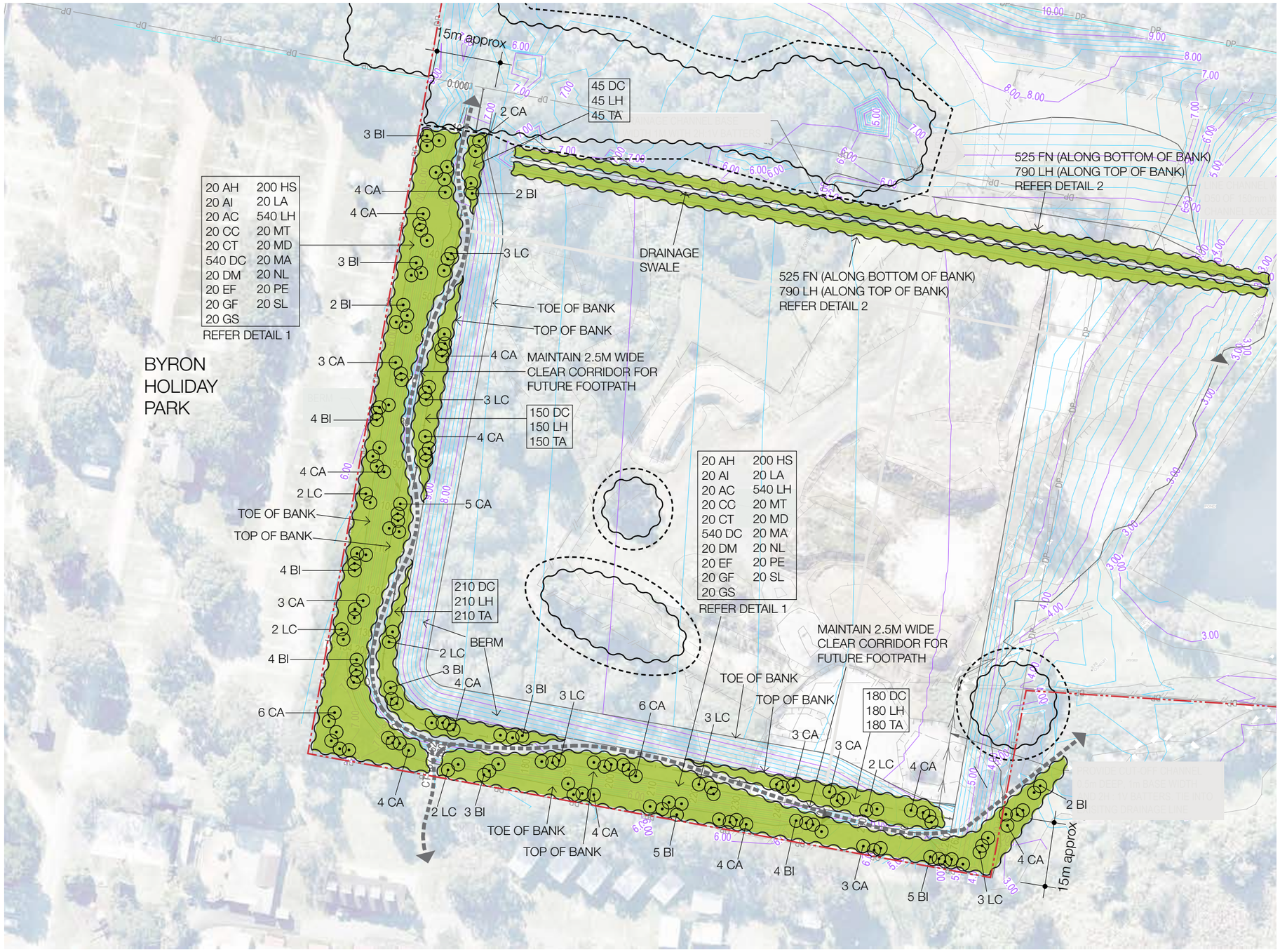
redbelly

BYRON SHIRE COUNCIL
SOUTH BYRON STP REMEDIATION

STAGE 1:
PROTECTIVE GRASS SEEDING

0 10 20 50m

L5



LEGEND

- Protective fencing
- Possible future footpath (indicative alignment)
- Mass tubestock planting
- 15 litre pot size planting

NOTES

1. Refer Drawing L7 for plant schedule.
2. Refer Drawing L8 for specification notes
3. Refer Drawing L9 for typical planting details
4. 15 litre trees to be planted at varying spacing of between 1-4m centres
5. All tree and shrub tubestock planting to be installed in groups of 5 -10 plants / group. Groups to be evenly distributed throughout mass planting area.
6. All strap-leaf and grass tubestock planting to be installed in groups of 30 - 60 plants / group. Groups to be evenly distributed throughout mass planting area shown.

redbelly

BYRON SHIRE COUNCIL
SOUTH BYRON STP REMEDIATION

STAGE 2:
MASS PLANTING

0 10 20 50m

L6

No		BOTANICAL NAME	COMMON NAME	POT SIZE	SPACING	QUANTITY
1	AH	*Acmena hemilampra* subs. *Hemilampra*	Broad-leaved Lilly Pilly	Tubestock	1/2m^2	40
2	AI	*Achronychia imperforata*	Beach Acronychia	Tubestock	1/2m^2	40
3	AC	*Alectryon coriaceus*	Beach Alectryon	Tubestock	1/2m^2	40
4	BI	*Banksia integrifolia* subs. *Integrifolia*	Coast Banksia	15 litre	1-4m	47
5	CC	*Callitris columellaris*	Coastal Cypress Pine	Tubestock	1/2m^2	40
6	CT	*Cryptocarya triplinervis*	Three-veined Laurel	Tubestock	1/2m^2	40
7	CA	*Cupaniopsis anacardioides*	Tuckeroo	15 litre	1-4m	78
8	DC	*Dianella caerulea*	Flax Lily	Tubestock	3/m^2	1665
9	DM	*Duboisia myoporoides*	Corkwood	Tubestock	1/2m^2	40
10	EF	*Euroschinus falcatus*	Ribbonwood	Tubestock	1/2m^2	40
11	FN	*Ficinia nodosa*	Knobby Club Rush	Tubestock	1/2m^2	1050
12	GF	*Glochidion ferdinandii*	Cheese Tree	Tubestock	1/2m^2	40
13	GS	*Guioa semiglauca*	Guioa	Tubestock	1/2m^2	40
14	HS	*Hibbertia scandens*	Guinea Flower	Tubestock	1/2m^2	400
15	LA	*Litsea australis*	Brown Bolly Gum	Tubestock	1/2m^2	40
16	LH	*Lomandra hystrix*	Green Mat-rush	Tubestock	3/m^2	3245
17	LC	*Lophostemon confertus*	Brush Box	15 litre	1-4m	25
18	MT	*Macaranga tanarius*	Macaranga	Tubestock	1/2m^2	40
19	MD	*Mallotus discolor*	Yellow Kamala	Tubestock	1/2m^2	40
20	MA	*Mischocarpus australis*	Yellow Pear-fruit	Tubestock	1/2m^2	40
21	NL	*Notelaea longifolia*	Mock-olive	Tubestock	1/2m^2	40
22	PE	*Polyscias elegans*	Celery Wood	Tubestock	1/2m^2	40
23	SL	*Syzygium leuhmannii*	Riberry	Tubestock	1/2m^2	40
24	TA	*Themeda australis*	Kangaroo Grass	Tubestock	3/m^2	585

LANDSCAPE SPECIFICATION NOTES

SITE WORKS AND SUBSOIL TREATMENT
Refer Engineer's drawings for finished levels and layout. Carry out minor site works necessary to achieve subsoil levels and grades to all areas of work and ensure cultivated (& not glazed) surface to key-in topsoil where required.

WEED CONTROL
Where necessary, spray proposed grassed and planting areas with systemic non-residual herbicide and pre-emergent weedicide (Roundup Bi-active & Ronstar or equal) withhold planting for 14 days or as manufacturer recommends. Maintain weed-free during construction & 12 week maintenance period.

TOPSOIL
Topsoil from stockpile to be used in preference to imported pending compliance with quality specification of
- Free draining friable texture
- pH of 5.5 to 7.0
- Free of rubbish, stones, oils & other contaminants.

Reject soils of low humus content. Sub standard topsoil can be used to make up subsoil levels. Treat topsoil after spreading if necessary to eliminate weed growth.

SOIL WORKS
All areas to be grassed or mass planted to be evenly covered with 100mm minimum depth topsoil. Existing ground to be cultivated to 100mm depth prior to distribution of additional topsoil layer. Apply soil conditioning such as gypsum where necessary to subgrade in accordance with manufacturer's recommendations.

STAGE 1: PROTECTIVE GRASS SEEDING

SEED MIX TYPE A:
Supply grass seed mix equal to Williams Lawn Mix or in accordance with the following content:
20% Millet / Annual Ryegrass
10% Millet / Perennial Ryegrass
20% Carpet Grass
20% Couch
15% Bluegrass
15% Turf Type Fescue

Seed mix will depend on seasonal change and will require final approval by superintendent prior to application.

APPLICATION:
Seed Mix Type A is to be broadcast either by direct drilling or hydroseeding across the area shown on Drawing L5. Hydroseeding to incorporate a suitable matrix of pulp, tackifier, seed and fertiliser and applied hydraulically in accordance with recognised industry standards (or equal to hydroseeding method, products and services as provided by Envirofix). Apply seed at a rate recommended by the seed supplier.

SEED MIX TYPE B:
Host species only:
50% Millet / Annual Ryegrass
50% Millet / Perennial Ryegrass

Seed mix will depend on seasonal change and will require final approval by superintendent prior to application.

APPLICATION
Seed Mix Type B to be broadcast by hydromulching across the area shown on Drawing L5. Hydromulching to incorporate a suitable matrix of wood fibre, tackifier, seed and fertiliser and applied hydraulically in accordance with recognised industry standards (or equal to hydromulching method, products and services as provided by Envirofix). Apply seed at a rate recommended by the seed supplier.

WATERING
All seeded areas to be gently watered immediately following sowing and followed up over the following three days to ensure that the soil is dense with water.

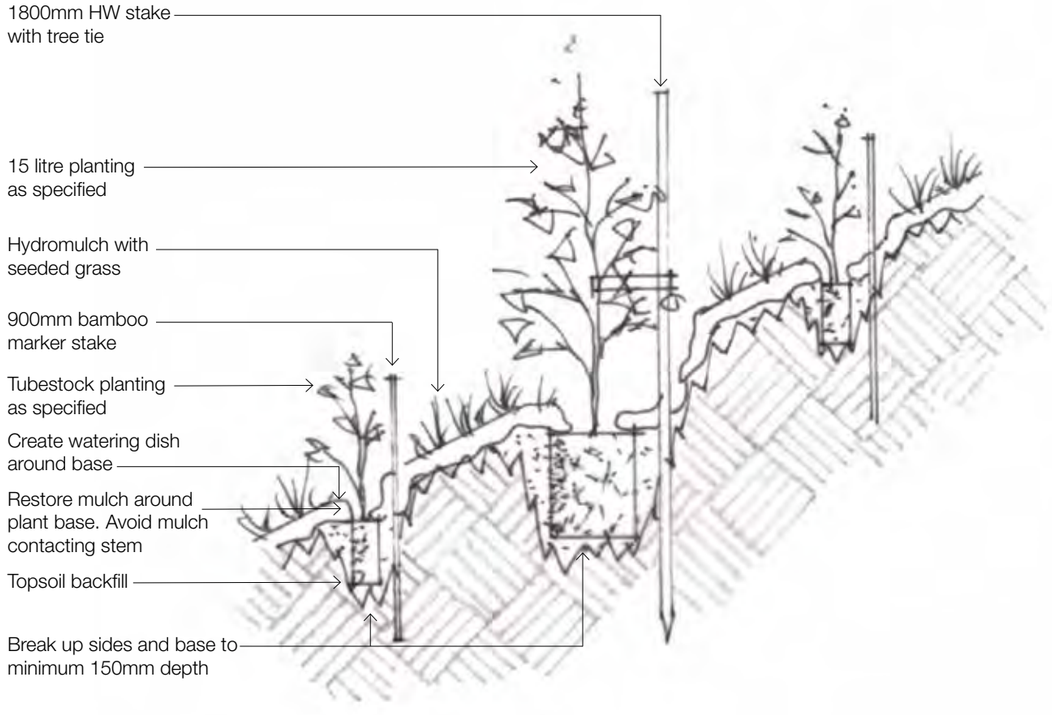
STAGE 2: MASS PLANTING

METHOD
Mass planting will only commence after the successful germination and establishment of all grass seeding works and at the approval of the superintendent. Areas to be mass planted are to be set out for approval by the superintendent.

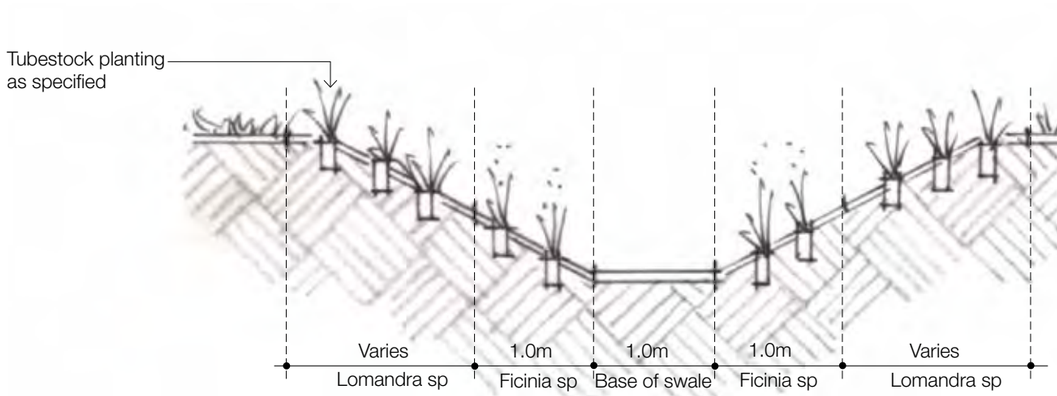
PLANT MATERIALS
All plants are to be true to type, of healthy growth and not displaying restricted growth patterns. Should there be a requirement for substitutions they shall not be changed without prior approval by the site superintendent Allow for slow-release fertiliser to all plants applied at the manufacturer's recommended rate or equal to Osmocote for Native Plants. Water in plants immediately after planting to remove air pockets.

STAKES AND TIES
For each 15 litre pot size plant incorporate 1 x 50 x 50 x 1800mm long hardwood stakes. Stakes are to be straight and free from knots or twists and pointed at one end. Drive stakes into the ground for at least a third of their length avoiding damage to the root system. Provide one 75mm wide hessian ties to stake plant. Install tie at half the height of the main stem to stabilise the plant. Install tie around the stake and stem in figure of eight pattern and securly fix to the stake.
A single bamboo stake is to be installed adjacent to each tubestock plant to identify plant location.

MAINTENANCE
Maintain the landscape area for a period of 12 weeks from the date of practical completion. Works shall include weeding, watering, mowing, fertilising, rubbish removal, plant replacement, grass repair and replacement, and the control of pests and diseases to the plants as they arise.



1 **MASS PLANTING ON 1:2 SLOPE**
TYPICAL SECTION NTS



2 **MASS PLANTING IN DRAINAGE SWALE**
TYPICAL SECTION NTS

Appendix C

Asbestos register

Asbestos Register

Site Location: Former South Byron Sewage Treatment Plant (STP), located on Broken Head Road, South Byron Bay, NSW
Register version: 1
Register Date: 8 November 2021

	Material description					Risk Assessment								
Consultant	Location	Material Description	Photo Reference	Reference	Laboratory results	Friability	Material condition	Likelihood of disturbance	Risk	Control method	Labelling	Estimated quantity	Units	Comments
GHD	Berm core on western and southern portion of site	Minor fragments of non-friable bonded ACM in berm core	 Example photograph	South Byron Sewage Treatment Plant Remediation and Validation Report – Stage 2B. (GHD 2021a)	Chrysotile & Amosite Detected	Non-friable	Fair	Low	Low	Containment. See Long Term Environmental Management Plan (GHD 2021b)	Geofabric marker layer over berm core	2	m2	As discussed in the validation report, all ACM identified during remediation was disposed off-site or in the berm core and the site was visually validated prior to placement of topsoil. There remains a small potential for exposure to ACM fragments in fill or within the berm . Quantity estimates are very approximate.
GHD	Fill material across site	Minor fragments of non-friable bonded ACM in fill			Chrysotile & Amosite Detected	Non-friable	Fair	Low	Low		NA	2	m2	

Appendix D

Asbestos removal guidance

How to deal with asbestos ‘fibro’ in soil at home

The most common form of asbestos found in homes is ‘fibro’ asbestos cement sheets or pipes – this is called ‘non-friable’ asbestos. Asbestos may be found in a powder form or in pieces that can be crumbled or crushed by hand pressure – this is called ‘friable’ asbestos.

If you have more than 10 square metres of fibro material or any amount of friable asbestos then you should use a licensed asbestos removalist.

The WorkCover NSW website (workcover.nsw.gov.au) provides a searchable list of licensed asbestos removal contractors for both friable and non-friable asbestos removal, along with information on asbestos including a code of practice *How to safely remove asbestos* (catalogue no. WC03561).

If I decide to remove the non-friable asbestos pieces myself, what should I do?

Scenario[1]

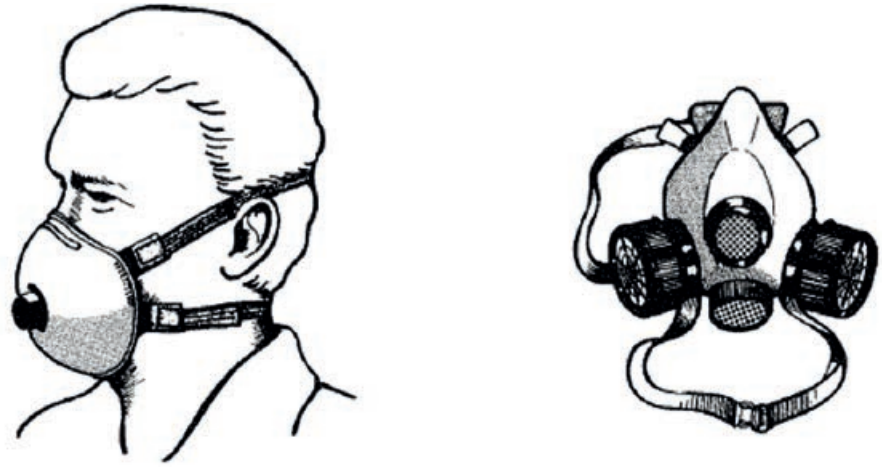
While landscaping the back garden, you find a pile of old building materials behind a shed, half buried under thick weeds. Some of the pieces appear to be broken non-friable asbestos or ‘fibro’, but you are not sure. Most of the pieces are quite big and don’t look at all flaky, but when you look around the area, you find several smaller fragments. You are worried that they might get crushed and scattered by the lawnmower.

What should you do first?

Although asbestos was phased out of fibro products by the late 1980s, if in doubt you should treat any fibro products as if they contain asbestos.

You should wear a well-fitting P2 dust mask (see figure 1, below), disposable gloves and appropriate disposable clothing that can be bagged up and disposed of with the fibro when you are finished[2].

Figure 1: P2 masks



1. Based on a case study from *Asbestos – A guide for householders and the general public* (enHealth 2013). (health.gov.au)
2. Examples of appropriate protective equipment and clothing include a P2 dust mask, coveralls with a hood, safety glasses or goggles, and boot cover protectors. These items are commonly available from hardware stores, work clothing shops or specialist WHS providers. EnHealth’s *Asbestos – A guide for householders and the general public* (health.gov.au) and WorkCover’s guide on *Working with asbestos* (catalogue no. WC05484) (workcover.nsw.gov.au) provide additional information on appropriate protective clothing and masks.

January 2014

There are special requirements for workplaces. But as a home owner you can remove small amounts of fibro from your property as long as you follow suitable health and safety measures and appropriately dispose of the fibro sheets and fragments, as described in this document and on the Asbestos Awareness website. If you are not comfortable with doing the work yourself and unsure of the appropriate safe work procedures, it is recommended that you use a licensed asbestos removalist.

The danger from asbestos arises if elevated levels of dust are generated and this dust is breathed in. So when cleaning up pieces of fibro keep the material damp but not flooded with water; and minimise further break-up of the fibro sheets or activities that cause dust to be liberated.

If practical, once you have removed the visible fibro sheets and fragments, you should gently rake wetted soil to 10cm depth to expose fibro fragments. All visible pieces of fibro should be removed by hand-picking and securing in a sealed bag. Never use power tools or saws on asbestos materials.

No visible fibro fragments should be present on the surface (top 10 centimetres) when you have finished.

How should I dispose of the asbestos?

Asbestos waste including fibro should be disposed of as soon as practicable. The materials should be kept damp until they can be double wrapped in heavy duty (0.2mm) plastic and sealed with tape and labelled as asbestos waste.

Asbestos waste can only be accepted at some landfill facilities. You should contact your local council or call the NSW EPA to find out the nearest lawful waste facility and contact the facility to determine if they have special requirements, such as particular times that they will accept asbestos waste.

Who can I contact for advice?

- Contact your local council for information on local requirements and waste facilities.
- For information about safely removing asbestos from your home, visit asbestosawareness.com.au
- For information about the safe handling and removal of asbestos or a list of licenced asbestos removalists, visit workcover.nsw.gov.au or phone the WorkCover Authority of NSW on **13 10 50**.
- For information about transport and disposal of asbestos waste, including a list of facilities that can accept asbestos waste, visit epa.nsw.gov.au or phone the NSW EPA Environment Line on **13 15 55**.
- For information about the health risks associated with asbestos, visit health.nsw.gov.au or phone the NSW Ministry of Health on **1300 066 055**.

Catalogue No. **WC01254** WorkCover Publications Hotline **1300 799 003**
WorkCover NSW, 92–100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252 | Customer Service Centre **13 10 50**
Website **workcover.nsw.gov.au**
ISBN 978 1 74341 508 5 ©Copyright WorkCover NSW 0214

ghd.com

The Power of Commitment