BURBURYCONSULTING

PROJECT

Bridgewater Bridge Stormwater Assessment

CLIENT

Department of State Growth

DATE

November 2021

→ burburyconsulting.com.au

CIVIL | STRUCTURAL | MARITIME

ENGINEERING & PROJECT MANAGEMENT

Burbury Consulting Pty Ltd
ABN 75 146 719 959

2/2 Gore Street, South Hobart, 7004
PO Box 354, South Hobart, 7004

admin@burburyconsulting.com.au
www.burburyconsulting.com.au

Tel 03 6223 8007
Fax 03 6212 0642

Contents

Burbury Consulting Pty Ltd ACN 146 719 959
2/2 Gore Street, South Hobart, TAS 7004

P. 03 6223 8007 F. 03 6212 0642
admin@burburyconsulting.com.au
www.burburyconsulting.com.au

Document Status

Rev No.	Author	Status	Approved for Issue	
			Name	Date
C	T.N.	For Approval	B.T.	11.08.21
D	T.N.	Water quality de-watering limits	B.T.	04.11.21

1. Background

1.1 Purpose

This document has been prepared to respond to the Assessment Criteria developed by the Development Assessment Panel and issued by the Tasmanian Planning Commission in May 2021.

In particular, this document has been prepared to address Assessment Criteria 5.1.4 which forms part of the Environmental Protection Agency's (EPA) requirement under the participating regulator matters of the criteria.

Specifically, it requires:

"Assessment of the capacity to control stormwater, entrained sediment and contaminant releases to waterways; and how the potential impacts from stormwater entrained sediment and contaminants in stormwater have an acceptable impact on waterways.

In the case of this document 'an acceptable impact' is taken to mean the same as 'not an unacceptable impact'.

The schedule 2 requirements for this assessment are:

(a) provide an outline of the proposed construction stormwater management approach to mitigate the potential for release of entrained sediment and contaminants from land-based activities to the Derwent Estuary and any other identified surface water bodies

(b) detail the results of any soil contamination and acid sulphate soil analysis, and if contaminated or acid sulphate soils are to be disturbed on land, then detail measures to prevent the release of contaminants to stormwater, and

(c) provide an outline of the proposed stormwater controls and design criteria for control infrastructure including design rainfall average recurrence interval for drainage and sediment retention infrastructure.

Items (a) and (c) are addressed as part of this assessment while item (b) is addressed as a separate report by Pitt & Sherry (2021).

1.2 Project Background

The existing Bridgewater Bridge has reached the end of its economic life and the Department of State Growth (DSG) proposes to replace the bridge.

To progress the project, DSG is preparing a Major Project Impact Statement (MPIS) that will be submitted to respond to the Assessment Criteria.

Due to the nature of the New Bridgewater Bridge procurement process that is occurring in parallel with the approval process, this assessment is not a definitive statement of the chosen design (or final design).

This document presents the most likely outcomes for this new piece of transport infrastructure, in the context of the information that is available at this point, for stormwater matters.

1.3 Existing Infrastructure

A preliminary review of existing catchments and drainage infrastructure has been undertaken to help identify areas that will need consideration during design development. It is not understood what infrastructure future designs will provide or impact upon; therefore a broad assessment of the project extent and infrastructure requirements has been undertaken, to help aid the assessment of likely works.

1.3.1 Black Snake Rivulet

Black Snake Rivulet is an existing natural channel that drains a catchment area of approximately 5.2 km^2. The rivulet extends from the upper reach of Mount Faulkner down to the Derwent River. The alignment of the existing Brooker Highway cuts the rivulet, with a 2500 x 2200 box culvert installed to divert the rivulet under the Brooker Highway and to the Derwent River.

There are a small number of houses, towards the lower reach of the rivulet, which may be subject to riverine flooding in large storm events. It is anticipated that the design in some way will change the conditions of the lower reaches of Black Snake Rivulet, hence affecting the storage and stormwater conveyance in the area. The PSTR requires that the designer develops a stormwater management solution that mitigates the effects of the works on this surrounding area, It has been shown that a likely solution can be achieved, please refer to section 2.2.4.2 of this report for details.

1.3.2 Main Road and Rail Corridor

It is anticipated that Main Road will remain in some capacity, as access to the existing Heritage Black Snake Inn must be retained. It is also necessary to maintain the existing rail corridor. There is existing drainage infrastructure in this area that is like to be retained. A small increase in the impervious area is expected. As such, no issues are anticipated to adequately drain this area.

1.3.2.1 Midland Highway

There is existing road drainage infrastructure traversing the Midland Highway. The anticipated increase in the impervious area as a result of widening of this section of the highway should be minimal. It is expected that if there is an increase in impervious area and subsequent runoff, drainage infrastructure will be provided to meet the requirements of the PSTR.

1.3.3 Lyell Highway

The new design of the Southern Interchanges is expected to modify the Lyell Highway past Tarrants Road. It is unknown what modification will be needed, but since the project corridor along the Lyell Highway is limited to the road reserve an increase in impervious area and load on the stormwater system is not anticipated.

1.3.4 Other Minor Infrastructure

As part of the design, it is anticipated that local roads within the project extent will be modified. These include the following roads:

- George Street,
- Southbound on-ramp from Black Snake Road,
- Forest Road,
- Tarrants Road,
- Old Main Road,
- Gunn Street, and
- Nielsen Esplanade.

It is expected that all of the works undertaken on the above roads will be compliant with the requirements of the PSTR; in particular flood immunity and surface drainage requirements. Under the PSTR, it is necessary to install drainage infrastructure to adequately drain the roadway, and ensure no nuisance runoff is directed towards adjacent properties. Where it is required to utilise existing infrastructure for the point of discharge, a capacity check of the existing infrastructure will be undertaken.

1.4 Proposed Development

The Project will provide a new river crossing for motor vehicles, cyclists, and pedestrians between the Brooker Highway and Midland Highway, with connections to the Lyell Highway and other surrounding roads.

The project will include the grade separation of the Lyell Highway from the Brooker Highway at Granton and provide connecting ramps with Gunn Street and Old Main Road at Bridgewater.

Associated with all these works will be a reconfiguration of the existing and the installation of new stormwater drainage networks to capture, control and discharge stormwater from across the development.

2. Water Quantity Management

2.1 Governing Standards

Stormwater Management is the responsibility of the Local Government Authority (LGA) in which the development resides. In Tasmania, two legislations govern how stormwater is managed; *Land Use Planning and Approvals Act* and the *Urban Drainage Act*.

The new works for Bridgwater Bridge span over three LGAs; Glenorchy City Council, Municipality of Brighton, and Derwent Valley Council. These councils have different requirements under their respective planning schemes. These requirements cover both flood inundation, nuisance flows, and connections.

This report attempts to outline how the expected design will respond to the following sections of the planning schemes, with particular reference to the stated requirements for the design as part of the ECI process (the Project Scope and Technical Requirements or PSTRs):

2.1.1 Municipality of Brighton

Section C11.0 Flood Prone Areas Hazard Code

2.1.2 Glenorchy City Council

Section E7 Stormwater Drainage and Disposal

Section E15 Inundation Prone Areas Code

2.1.3 Derwent Valley Council

Section E7 Stormwater Management Code

Section E15 Inundation Prone Areas Code

2.1.4 Best Practice Stormwater Management

As part of the requirements under the PSTR and planning assessment criteria, the design is to be developed in accordance with industry best practices. Best practice stormwater management is outlined in the Australian Rainfall and Runoff 2019. New IFD data and temporal patterns have been developed by the Bureau of Meteorology and Australian Rainfall and Runoff which supersede old methodologies. The rational method is no longer supported for hydrology within Australia and as such the newly formed ensemble methodology are be used.

As part of the guidance provided by the Australian Rainfall and Runoff, the design of control structures should use either a coupled hydraulic-hydrology design or adopt the mean design storm from the set of runoff ensembles for the catchment.

The critical storm durations are to be determined for both the pre-development and the post-developed scenarios. The design will need to take into consideration the effect of control structures on the critical storm duration. As these structures impact the design storm's hydraulics, a different storm duration may become critical.

2.2 Design / Operations

2.2.1 Anticipated Controls

Due to the proximity of the development to the Derwent River and the available space, it is anticipated that the stormwater conveyance infrastructure will be upgraded to sufficient capacity to convey stormwater to the Derwent River without the need for control structures.

Where stormwater attenuation is required, the anticipated controls are detention basins with non-proprietary control structures, e.g. manholes with orifices.

2.2.2 Anticipated Location for Controls

As discussed in section 2.2.1, it is most likely that there will not be a need for control structures to manage stormwater. It is anticipated that the capacity of the stormwater infrastructure will be increased to facilitate the development and external catchment diversions. However, so that preliminary assessment may be undertaken, the following areas have been identified as the most likely locations for stormwater control:

Southern Interchange

- Adjacent to George Street and Main Road,
- Adjacent Black Snake Road and the Brooker Highway,
- Prior to the Black Snake Rivulet Culvert

Northern Interchange

- Wallace Street, adjacent to the rail corridor
- Nielsen Esplanade
- Old Main Road, within the northern interchange, exit, and entry ramps.

Figure 1: Southern interchange anticipated locations and Figure 2: Northern interchange anticipated locations show the anticipated locations of the control structures (if deemed necessary). It would be expected that these locations are also relevant for the water quality treatment devices.

These locations do not represent the final design and are assumed based on existing topography, drainage infrastructure, and possible road alignment.

Figure 1: Southern interchange anticipated locations

Figure 2: Northern interchange anticipated locations

2.2.3 Selection of Design Storm

To meet the requirements of the PSTR and planning assessment criteria it will be necessary to adequately select the design storm for both the 1% AEP and 5% AEP. To adequately make this assessment the hydrology will be in accordance with Australian Rainfall and Runoff 2019 (ARR19) and use the new 2016 rainfall intensity, frequency, and duration (IFD) data, which match the recently released temporal pattern ensembles for ARR'19. It is anticipated that the design rainfall events will be derived by the following acceptable stormwater runoff routing methodologies in wide use within Australia:

- XPRAFT,
- RORB,
- WBNM,
- Rainfall on Grid.

The requirements of the PSTR require that the pre-development and post-development design storms be determined. The new design will be assessed against the pre-developed conditions to ensure compliance with the PSTR and planning assessment criteria; both the infrastructure and flood inundation shall not be worsened.

It may be necessary to consider the effects of runoff attenuation by control structures and other hydraulic conditions which may change the critical storm duration. It will then be required to reassess the critical design storm.

To perform an adequate hydrological assessment, it is anticipated that land use information, including surface roughness and infiltration capacity, be derived from site information, aerial photography, geotechnical investigation, and guidance from the Australian Rainfall & Runoff (ARR) Data Hub.

Modeling will most likely consider the guidance provided in ARR19 Book 9 Runoff in Urban Areas. The analysis of the stormwater system based on rainfall ensembles allows the designed to adopt either a coupled hydrology-hydraulic simulation or mean stormwater runoff for stormwater infrastructure design.

2.2.4 Preliminary Flood Inundation Modeling

Entura was commissioned by Burbury Consulting to undertake preliminary hydrological and hydraulic modeling of the Derwent River and, northern and southern interchanges to help understand the potential impacts the works may have on the surrounding area.

To undertake this modeling it was necessary to use the reference design; produced by Burbury Consulting.

The reference design is an indication of what may be designed, it does not represent what is proposed. It will be the ultimate responsibility of the designers to make their design compliant with the PSTR.

A summary of the findings is provided below, for further information please refer to the report "New Bridgewater Bridge – Flood Hazard Report", Entura 2021.

2.2.4.1 Derwent River

Preliminary flood inundation modeling of the Derwent River has been undertaken using TUFLOW. Hydrological inputs were taken from the report "Bridge Water Bridge Preliminary Flood Levels" prepared by Entura. As the details of the proposed bridge are unknown, the modeling was undertaken on the reference design. This was necessary to understand the likely effects the new Bridgewater Bridge may have on the Derwent River's hydraulics.

The modeling shows that the impact to surrounding property and infrastructure from the construction of a new bridge is minor and considered to be within allowable limits. The designer will have ultimate responsibility under the PSTR to show that their design does not have detrimental effects on the surroundings.

2.2.4.2 Southern Interchange

A preliminary hydrological assessment of the Black Snake Rivulet catchment was undertaken. Runoff from this catchment is conveyed by Black Snake Rivulet and under the Brooker Highway. It was determined that this area may be prone to flood inundation. To develop a better understanding of the potential flooding in this area, a 1D-2D model was developed. The model was used to map the flood inundation and assess the impacts the development may have on the surrounding area.

The report highlights that there are areas that are subjected to ponding and higher hazard. The locations are limited to low lower-lying areas adjacent roads and within Black Snake Rivulet. It is anticipated that providing new drainage infrastructure (pits, table drains and culverts) at these locations will overcome these problems.

2.2.4.3 Northern Interchange

Entura undertook preliminary hydrology which assesses the critical storm duration and existing catchment runoff. The design storm was determined by running the temporal pattern ensembles from 10 min to 2 hours and adopting the maximum median runoff from this analysis. A 1D-2D model was then developed to map the overland flows paths and impacts to surrounding properties. Only the major stormwater infrastructure was modeled as it is anticipated that local drainage will be provided for nuisance flows.

The results show the stormwater can be managed within this area through an appropriately sized conveyance system, discharging to the Derwent River. No flood issues were identified.

2.3 Construction

During construction, stormwater will need to be managed to ensure temporary construction activities do not have an impact on surrounding properties and receiving waterways. It will be the contractor's responsibility to prepare a construction methodology that ensures compliance with the PSTR. It is expected that this will be outlined in a Construction and Sediment Management Plan.

3. Water Quality

3.1 Governing Standards

The State Policy on Water Quality Management outlines the State's framework to manage point and diffuse sources of water emissions. To help meet the recommendation of this framework and bridge the gap between legislation and industry, The State Stormwater Strategy 2010 was produced; which outlines the requirements for new developments. This is further expanded through the work undertaken by the Derwent Estuary Program.

The Derwent Estuary Program monitors and reports on the health of the Derwent Catchment and water bodies. It also provides detailed technical guidance to the implementation of, and best practices in, Water Sensitive Urban Design. To meet the objectives of the State Stormwater Strategy 2010 the principles of Water Sensitive Urban Designed outlined by the Derwent Estuary Program will be used.

To determine the effectiveness of the water quality treatment train, modeling is necessary. This modeling is to be undertaken with MUSIC (Model for Urban Stormwater Improvement Conceptualisation). MUSIC is Australia's leading tool in urban runoff water quality modeling and is used extensively by the industry.

3.2 Environmental Reduction Targets and Design Criteria

The State Stormwater Strategy 2010 has identified three major pollutants that are to be the target for reduction. In addition to this, the environmental requirements of the project specify an additional two. These are outlined in Table 1: Target Pollutants below.

Table 1: Target Pollutants

Pollutant	Reduction
Total Nitrogen	45%
Total Phosphorus	45%
Total Suspended Solids	80%
Total Gross Pollutatns	90%
Containment of Hydrocarbons	Complete spill containment

3.3 Design / Operation

3.3.1 Treatment Methods

It is anticipated that the treatment methods will primarily consist of bio-retention basins or bio-retention swales. There is ample opportunity within the project extent to construct these devices. If space becomes constrained it may be necessary to install a propriety device. Figure 3: Indicative TSS Removal per area of bio-basin, Figure 4: Indicative TP Removal per area of bio-basin and Figure 5: Indicative TN Removal per area of bio-basin give an estimate of the amount of biofilter media required for the development.

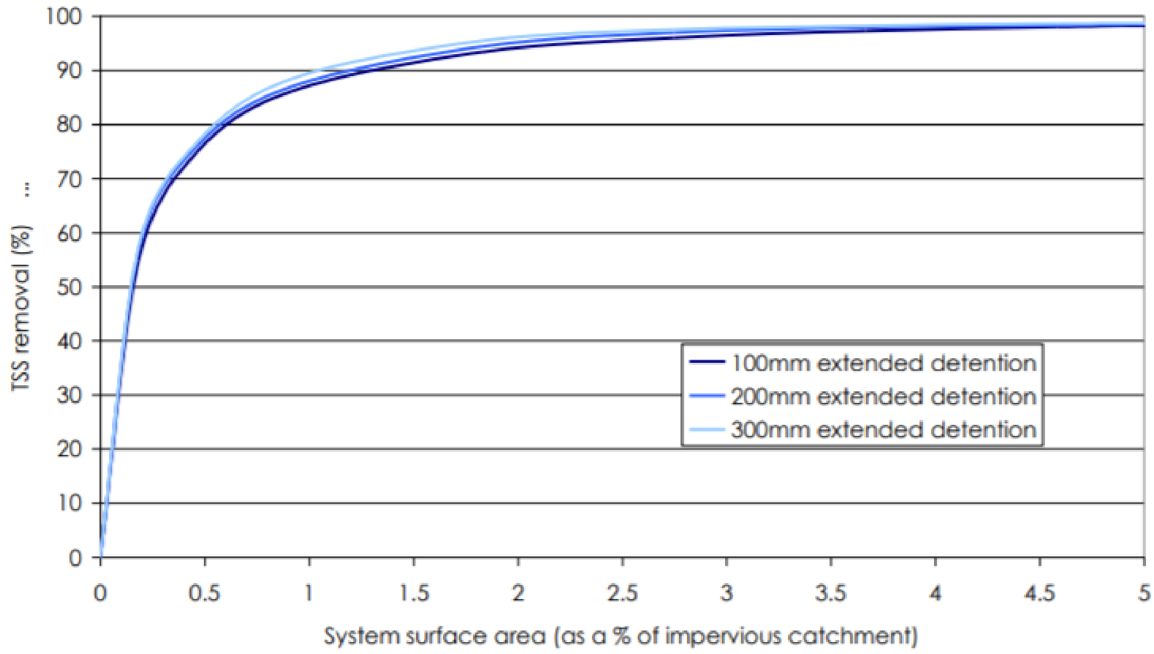


Figure 3: Indicative TSS Removal per area of bio-basin

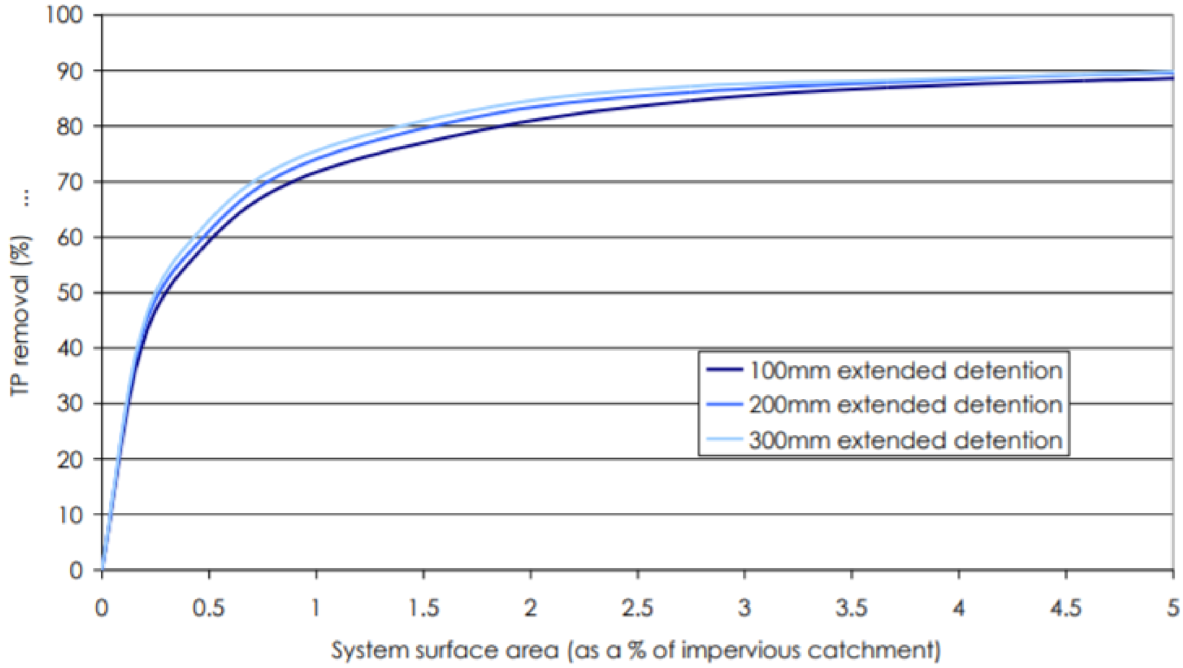


Figure 4: Indicative TP Removal per area of bio-basin

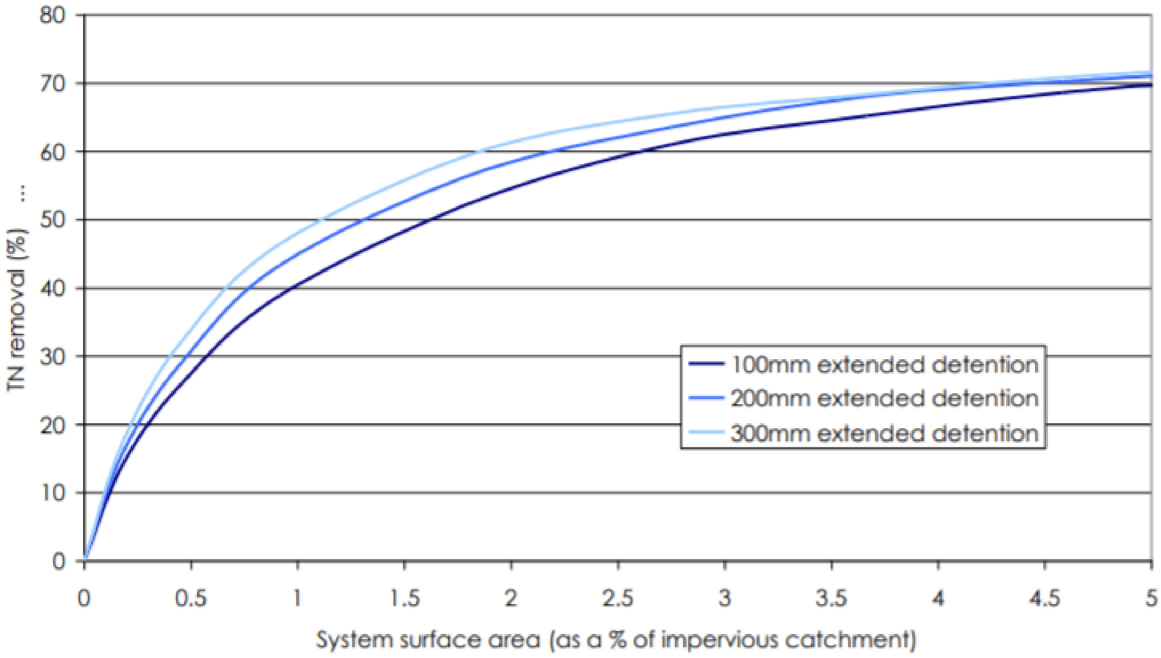


Figure 5: Indicative TN Removal per area of bio-basin

3.3.2 Anticipated Locations

The likely positioning of the WSUD devices shall be aligned with the stormwater control structures. For anticipated locations refer to Section 2.2.2 of this report.

3.3.3 Anticipated Treatment Train

The following indicative treatment train has been conceptualised to provide a proof of concept. It consists of a sediment forebay and a bio-retention basin to treat the stormwater pollutants before discharging the system. It is anticipated that two main types of pollutant sources will be present in the development.

- Road
- Ground

To treat the anticipated pollution sources a treatment train could utilise the following treatment devices.

Table 2: Treatment train nodes

Treatment Node	Description
Sediment Forebay	Concrete sediment forebay with 150mm settlement depth. Sediment forebays slow the incoming flow velocities to allow coarse sediment to fall out of stormwater before entering the basin
Bio-retention	Bioretention basins or rain gardens retain and filter stormwater through a natural process. They utilise a filter media with vegetation to remove, gross pollutants and nutrients.
Oil Baffles	Oil Baffles are installed at the outlet of basins to ensure spill containment. Oil Baffles allow clean water to be diverted underneath while the oil remains on top.

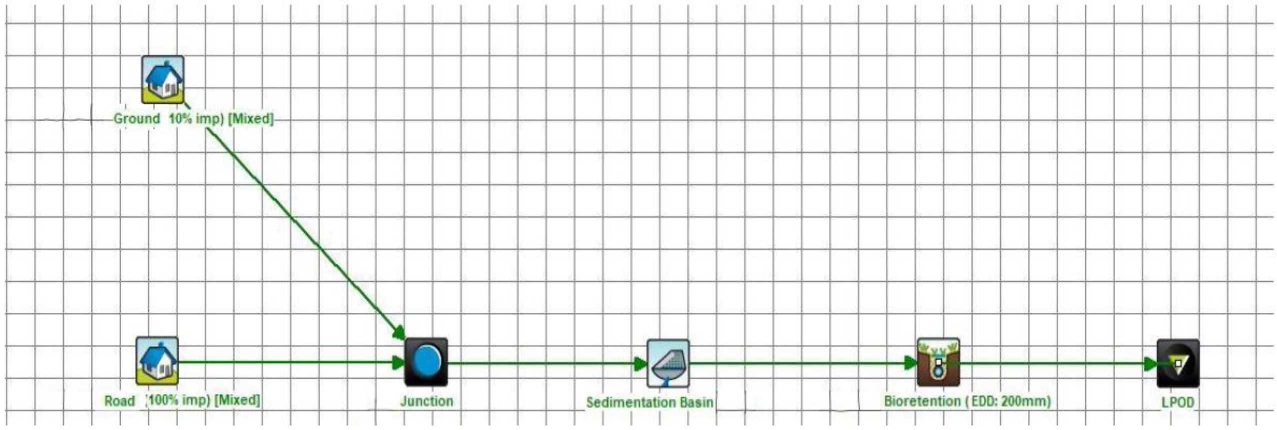


Figure 6: Indicative treatment train

As the final development is unknown, exact details of the treatment train cannot be given. As described in Section 2.2.2, there is ample space to provide stormwater treatment devices. Therefore no issues in meeting the requirements of the planning scheme are foreseen.

3.4 Construction

3.4.1 Erosion and Sediment Control

Erosion and sediment control during construction activities is primarily the responsibility of the contractor, and will be outlined in their Construction and Sediment Management Plan. However, to address the requirements of the assessment criteria and the PSTR; a preliminary methodology to manage erosion and sediment control has been developed.

While it is anticipated that there will be many stages to construct the new Bridgewater Bridge; the following four phases of erosion and sediment control typically apply:

- Phase 1: Clearing and Earthworks
- Phase 2: Services and Drainage
- Phase 3: Roadworks
- Phase 4: Landscaping

A conceptual methodology is provided for each phase to help in the assessment process and determining compliance with the assessment criteria.

3.4.1.1 Phase 1 – Clearing and Earthworks

The clearing and earthworks phase consists of stripping the natural vegetation and removing existing structures from within the extent of works and modifying the topography to facilitate the design. The potential for erosion of soil is high as the in-situ protection (vegetation and structures) has been removed from the surface of the soil.

Phase 1 will consist of establishing site controls that allow clearing and earthworks activities to take place:

- Minimise the extent of bare soil exposed during construction activities. Only clear what is needed for the current phase of construction.

- Construct clean water diversion drains upstream of the works to divert water around the construction works, reducing erosion.
- Construct sediment retention basin at high potential sites, where it is not practical to minimise all erosion.
- Establish dirty water diversion drains to control dirty runoff into receiving waterways.
- Establish silt fencing, site access, and wash-down points.
- Install silt fences, kerb check dams, and protection to existing drainage infrastructure.
- Establish monitoring to ensure the efficacy of controls.

3.4.1.2 Phase 2 – Services and Drainage

The services and drainage phase consist of the construction of underground services, conduits and stormwater drains. Bulk earthworks are typically complete. Work extent can be reduced to smaller areas.

- Undertake treatment of exposed soils to limit erosion. Hydromulching or polymer surface treatments to reduce the potential of bare earth erosion.
- Limit bare earth exposure.
- Re-position of controls; diversion drains, silt fencing etc. to the extent of works.
- Maintenance of sediment retention basins and other controls.
- Testing of sediment retention basins and release of clean water to the waterway.
- Continue monitoring on water quality.

3.4.1.3 Phase 3 – Roadworks

Road construction phase entails pavement, kerbing, surfacing and verge works. At this stage, the drainage infrastructure is typically constructed and connected to the receiving waterway. As there is drainage infrastructure now within the extent of work it is necessary to protect erosion from entering the environment through this infrastructure.

- Re-position controls to works extent.
- Maintain sediment retention basins and other erosion and sediment control devices.
- Install protection to new drainage infrastructure to limit soil transportation to the environment
- Continue monitoring on water quality.

3.4.1.4 Phase 4 – Landscaping

The landscaping phase is typically the final phase in a construction project. The high potential activities are completed and the bare soil is to be covered with vegetation if this was not completed during phase 2.

- Remove sediment retention basin,
- Re-locate controls to allow for the landscaping to be facilitated,
- Controls should remain in place until vegetation is established and bare soil surfaces covered,
- Remove final controls upon adequate coverage and site establishment (typically 80%).

The implementation details of erosion and sediment control should be project-specific and integrated into the construction methodology. Controls should also be adjusted if monitoring indicates current controls are ineffective. The above methodology shows how the construction works can manage the environmental requirements of the PSTR and assessment criteria and limit soil runoff into waterways.

3.4.2 Refuelling Management

Construction equipment will be operated, maintained, and refuelled throughout the project land, including on land and over water. With the operation of any heavy plant or equipment, there is a risk that hydrocarbons may be inadvertently released and make their way to the River Derwent. This risk of contamination is further increased during over-water activities.

It is expected that the Contractor, as part of their CEMP, will detail controls for each of these activities; including prevention measures in the first instance including:

- regularly maintained equipment,
- visual inspections before work commencing for visible leaks,
- refuelling away from potential paths of discharge,

and secondary, the installation of control measures, including appropriate bunding and spill controls during refuelling.

Construction management of stormwater will play a factor in ensuring that any hydrocarbons released are contained, collected and, disposed of per the requirements of the PSTR and as outlined in Section 3.4.1.

3.4.3 Water Quality Discharge Limits

As part of best practice stormwater water quality practices, it is necessary to consider pollution limits for dewatering of erosion and sediment control devices, in particular, sediment ponds/basins after storm events.

To meet the environmental requirements of the PSTR, the contractor will be required to ensure that only clean water is discharged from the construction site. To ensure this, it is expected that water quality samples will be taken & analysed prior to the release of any water from sediment ponds and/or basins. The water quality samples must satisfy the following criteria (IECA 2008):

- Total Suspended Solids (TSS) less than 50mg/l or alternatively,
- Turbidity: 90% NTU less than 100 and 50% NTU less than 60.
- pH between 6.5 & 8.5.
- Clear from visible hydrocarbons.

If water quality fails the criteria then the use of a gypsum flocculent is to be applied as directed by the managing contractor to meet the above criteria. If hydrocarbons are visible, surface water is to be skimmed clear before de-watering and hydrocarbons safely disposed of.

Sediment shall be removed (de-silted) from sediment basins when 50% of the basin volume is displaced by the sediment.

3.4.4 Contaminates

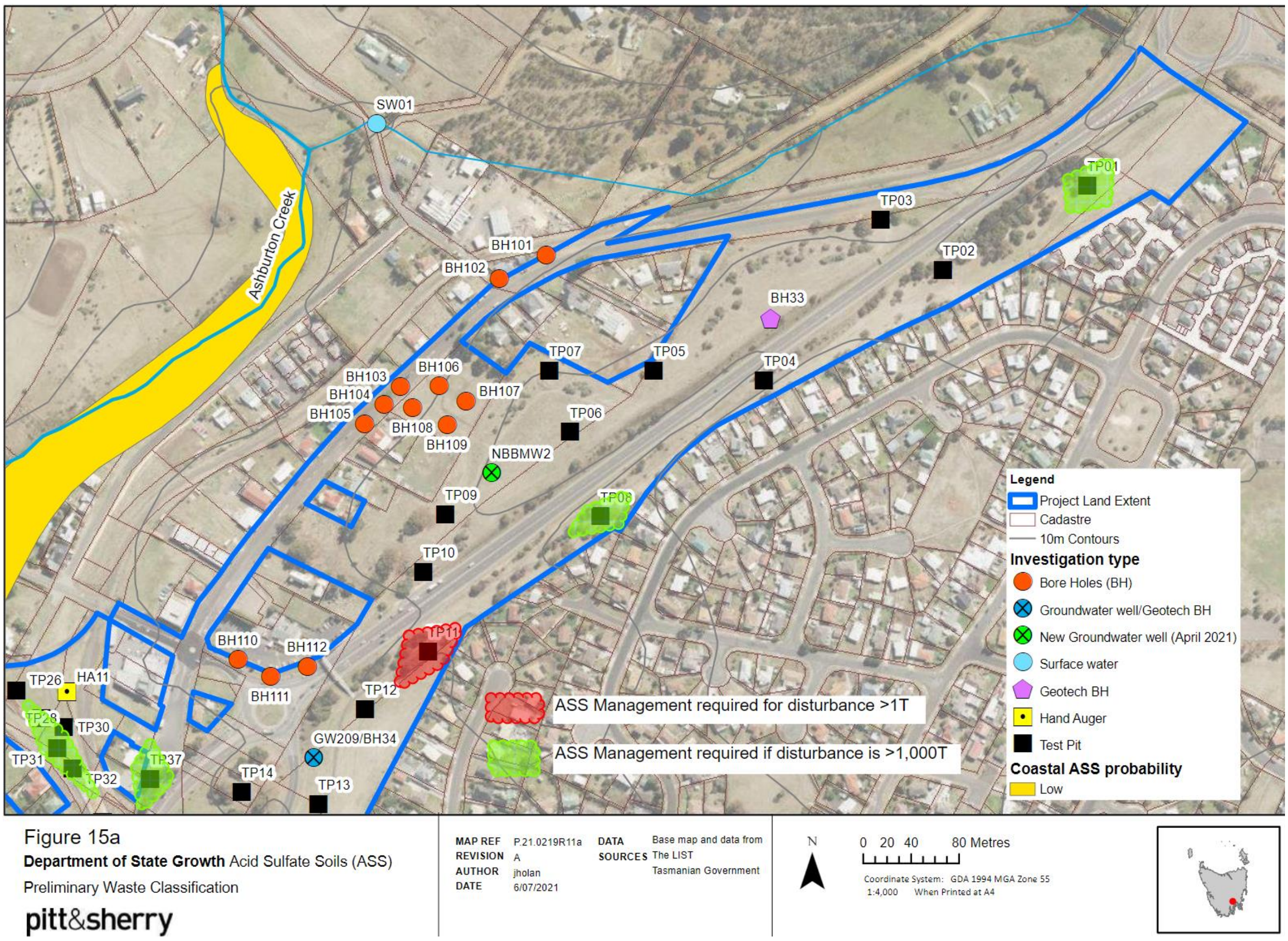
Pitt and Sherry (2021) have undertaken an extensive soil investigation to identify contamination within the project extent. Numerous contaminated soils have been identified throughout the project extent. A summary of the findings can be found in Section 7 of the report “New Bridgewater Bridge -Terrestrial Contamination and Acid Sulphate Soil Investigation” prepared by Pitt and Sherry.

Pitt and Sherry have also detailed management strategies for these contaminates to ensure that the project can be constructed in accordance with the requirements of the PSTR. Please refer to Table 30 of the report “New Bridgewater Bridge -Terrestrial Contamination and Acid Sulphate Soil Investigation” prepared by Pitt and Sherry. By following the management strategies the project can be constructed to the requirement of the PSTR.

3.4.5 Acid Sulphate Soil Management

Pitt and Sherry (2021) have undertaken site investigations of the terrestrial and aquatic environment, which has identified acid sulphate soils (both PASS and AASS) within the project extent. Their report “New Bridgewater Bridge -Terrestrial Contamination and Acid Sulphate Soil Investigation” details the findings and investigation methodology. Pit and Sherry have provided maps of the test locations and have summarised the results and whether ASS management is required. An extract of these maps has been provided in Figure 7a-d: ASS and contamination identification (Keserue-Ponte, 2021), for full details please refer to the Pit and Sherry report.

A Construction Environmental Management Plan will be developed as part of the project submission. The environmental management plan will address the management of contaminates and Acid Sulphate soils as part of the requirements under the PSTR. The Department of Primary Industries, Parks, Water and the Environment also published guidance on the management of Acid Sulphate Soils during the design and construction phase of a project. Pit and Sherry have also provided guidance to the management of these Acid Sulphates in Table 30 of their report. They have shown that these issues can be managed successfully to enable the construction of the new bridge with compliance to the PSTR.



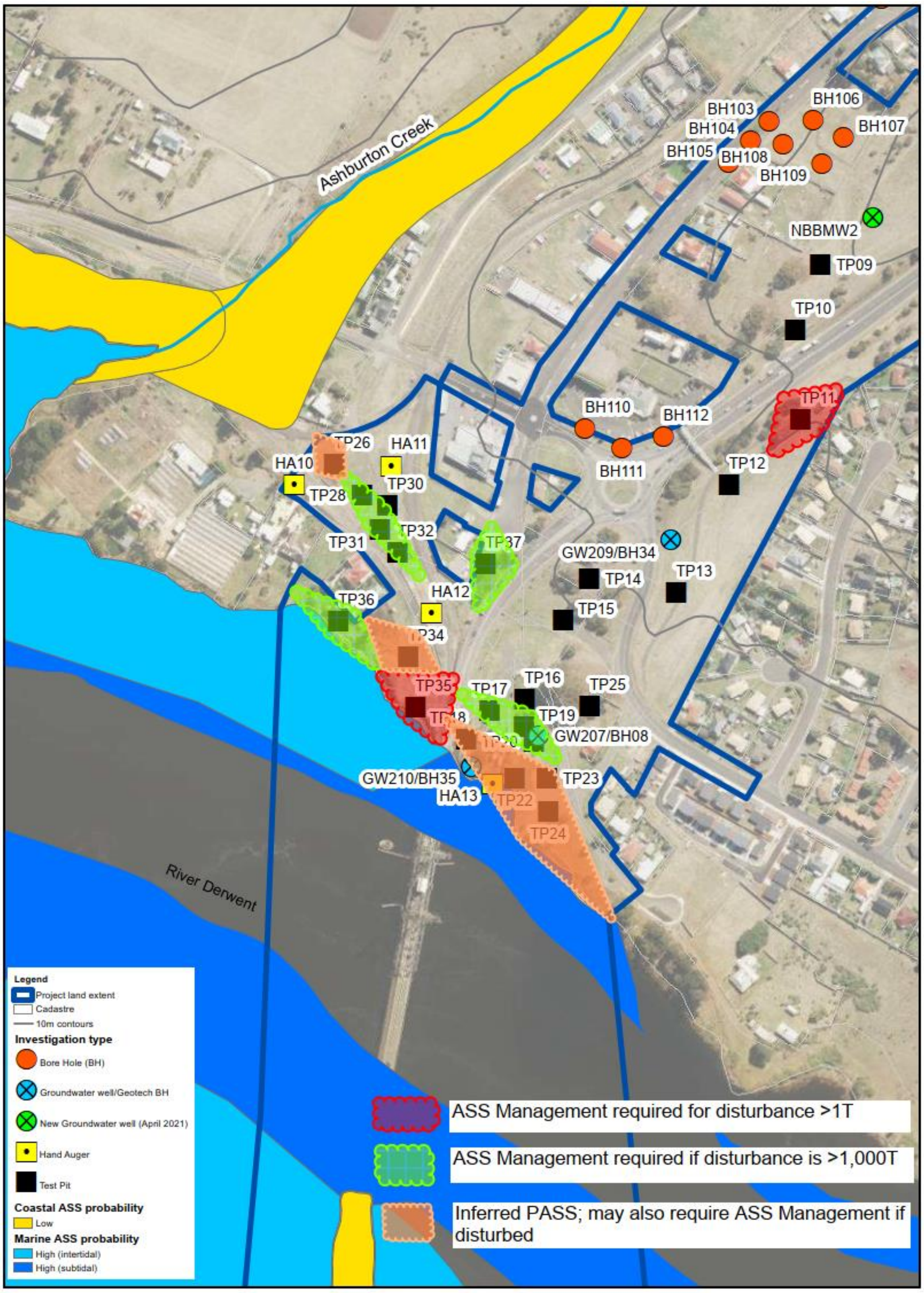


Figure 15b

Department of State Growth

Acid Sulfate Soils (ASS)
Preliminary Waste Classification

pitt&sherry

N

0 25 50 100 Metres

Coordinate System: GDA 1994 MGA Zone 55
1:4,000 When Printed at A4

MAP REF P.21.0219R10b
REVISION B
AUTHOR jholan
DATE 6/07/2021

DATA SOURCES Base map and data from The LIST Tasmanian Government

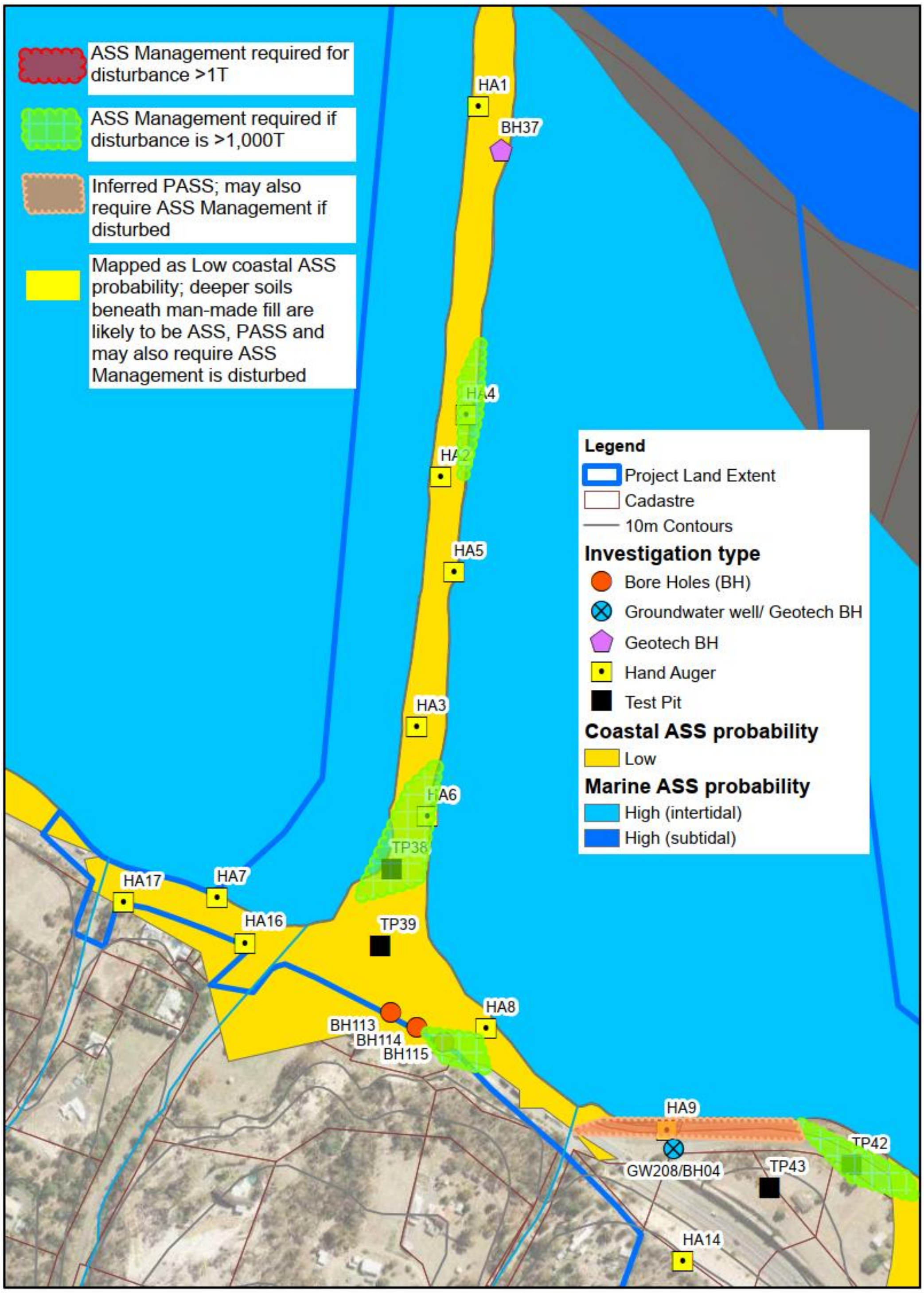


Figure 15c

Department of State Growth

Acid Sulfate Soils (ASS)
Preliminary Waste Classification

pitt&sherry

N

0 25 50 100 Metres

Coordinate System: GDA 1994 MGA Zone 55
1:4,000 When Printed at A4

MAP REF P.21.0219R11c
REVISION A
AUTHOR jholan
DATE 6/07/2021

DATA SOURCES Base map and data from The LIST Tasmanian Government

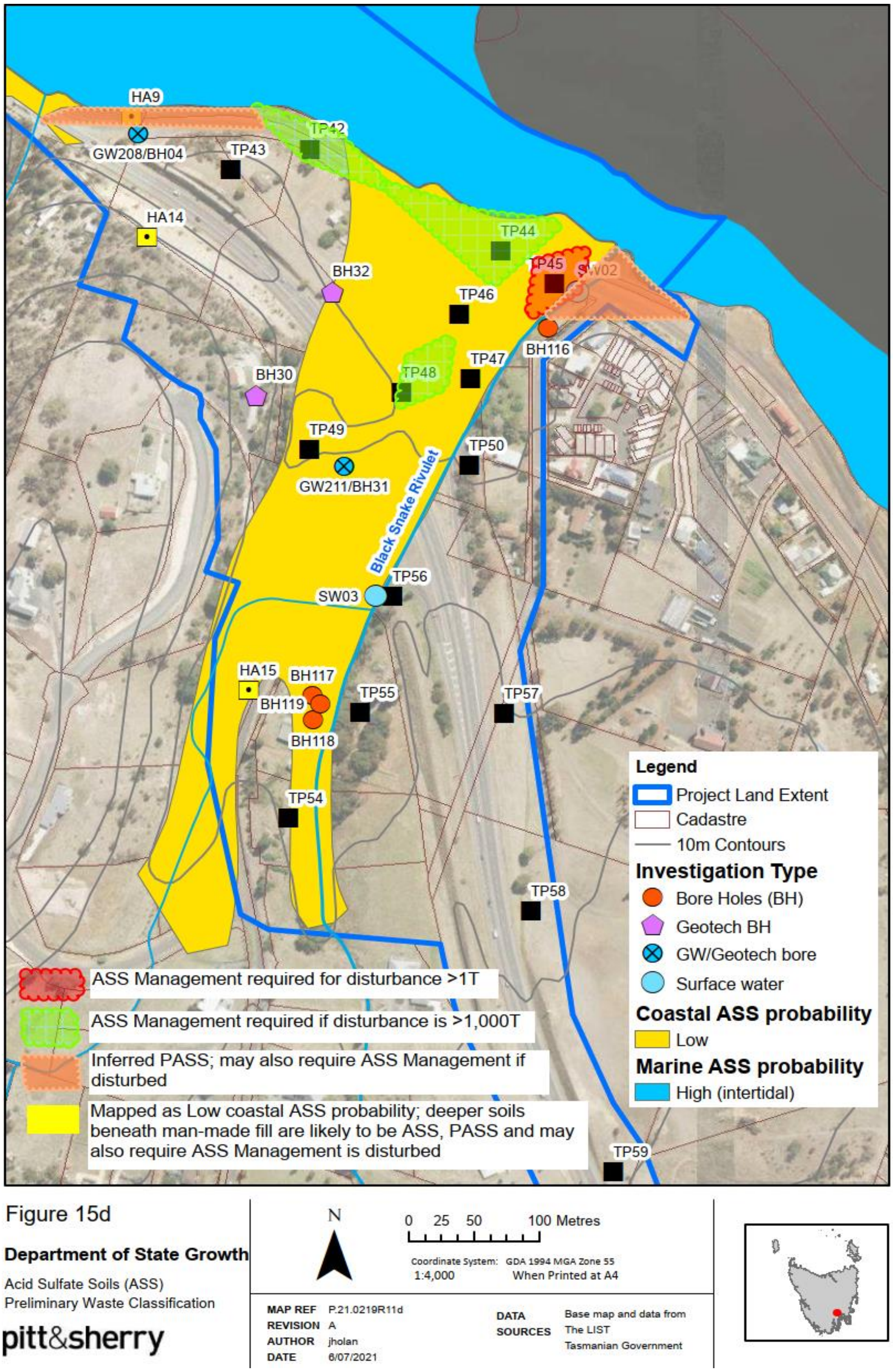


Figure 7a-d: ASS and contamination identification (Keserue-Ponte, 2021)

4. Conclusion

The project will have potential impacts both during construction and operation of the new development due to:

- the reconfiguration of roads and drainage infrastructure,
- the extent of works to be undertaken on-site, including earthworks, and
- the presence of PASS/ASS and other contaminants of concern.

While the final design has not been determined, an assessment of the requirements for the design which form part of the contract conditions has been completed.

Assuming these requirements are integrated into the design solution and implemented on-site, it is determined that these controls will not lead to unacceptable impacts to the waterway.

Specifically, it is expected that the designed infrastructure will have the capacity to control, capture and release stormwater to waterways without unacceptable impacts.

Sediments can be managed to acceptable limits through control infrastructure.

Works during construction (including controls) will mean that PASS/ASS and contaminates can be managed without impact to waterways.

5. References

Tasmanian Planning Scheme - Brighton. (n.d.). [online] Available at: https://iplan.tas.gov.au/pages/plan/book.aspx?exhibit=britps [Accessed 15 Jul. 2021].

Tasmanian Planning Scheme – Glenorchy City Council. (n.d.). [online] Available at: https://iplan.tas.gov.au/pages/plan/book.aspx?exhibit=gccips [Accessed 15 Jul. 2021].

Tasmanian Planning Scheme – Derwent Valley Council. (n.d.). [online] Available at: https://iplan.tas.gov.au/pages/plan/book.aspx?exhibit=derips [Accessed 15 Jul. 2021].

Coombes, P., and Roso, S. (Editors), 2019 Runoff in Urban Areas, Book 9 in Australian Rainfall and Runoff - A Guide to Flood Estimation, Commonwealth of Australia, © Commonwealth of Australia (Geoscience Australia), 2019.

Wylie, A., 2020, Bridgewater Bridge Preliminary Flood Levels, Entura, Cambridge, Tasmania.

Wylie, A. and Gibbs, S., 2021, New Bridgewater Bridge Flood Hazard Report, Entura, Cambridge, Tasmania.

DPIPWE, EPA Division (2010). State Stormwater Strategy. Tasmanian State Government, 2010.

Derwent Estuary Program. (n.d.). Water sensitive urban design. [online] Available at: https://www.derwentestuary.org.au/water-sensitive-urban-design/ [Accessed 22 Jul. 2021].

Keserue-Ponte, F., Clark, C., Holan, J., 2021, New Bridgewater Bridge -Terrestrial Contamination and Acid Sulphate Soil Investigation, Pit and Sherry, Hobart, Tasmania.

Wiltheridge, G., 2012 Principles of Construction Site Erosion and Sediment Control. Catchment and Creeks Pty Ltd. Brisbane, QLD.

IECA 2008, Best Practice Erosion and Sediment Control. International Erosion and Sediment Control Association (Australasia), Piction, NSW.