

10 March 2021

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**Subject: Selfs Point STP Expansion – Environmental Data Gap Analysis and Recommendations for Further Sampling**

Dear Daniel,

Elgin Associates Pty Ltd (Elgin) was engaged by ERA Planning and Environment (ERA) to undertake a review and gap analysis of existing contamination information for the Selfs Point Sewerage Treatment Plant (STP) expansion project. A sampling, analysis and quality plan (SAQP) is to be prepared separately based on the findings of this report. The existing STP site located at 12 Selfs Point Road (2.9ha) includes the treatment plant, laboratory and depot. The footprint of the project is proposed to extend beyond the current infrastructure to the north within 12 Selfs Point Road, and beyond the boundary of the existing STP to the south at 10 Selfs Point Road. The proposed 50% concept design plans indicate that the portion of 10 Selfs Point Road to be used for expansion of the STP (approx. 2.4ha) includes the New Town Bay Wetlands and the adjacent Council depot.

For the purposes of this report, the site is defined as the proposed project footprint within 10 and 12 Selfs Point Road (referred to as the 'wetlands' and the 'northern portion' respectively). The site layout and location of the proposed infrastructure are shown in attached **Figure 1** and are outlined below in **Table 1**.

This letter report details a review of previous site investigations completed at the site, a data gap analysis of those investigations in relation to the 50% concept design and recommendations for the assessment and management of potential contamination on site during construction works.

## **1. OBJECTIVES**

The objectives of the data gap analysis was to:

- Identify the currently understood data gaps in previous site investigations, with respect to the 50% Concept Design Drawings for the STP expansion project; and
- Make recommendations for further investigations based on the outcomes of the gap analysis.

The data gap analysis forms part of an overall objective to undertake an assessment of contamination at the site that would inform whether management or control measures are required during construction and operation of the proposed infrastructure to mitigate risks to human health or the environment.

## 2. SITE DETAILS

The site is located between the Derwent River and Selfs Point Road, New Town.

Land details are provided in **Table 1** below.

**Table 1.** Land Details

| Property Address    | Property ID | Authority                  | Current Land Use                                                         | Proposed Land Use*                                                                                                           |
|---------------------|-------------|----------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 12 Selfs Point Road | 3286956     | TasWater                   | Selfs Point STP                                                          | Selfs Point STP expansion to the area of open space to the north of the property                                             |
| 10 Selfs Point Road | 3189590     | Local Government Authority | New Town Bay Wetlands<br>Rugby Park<br>Council depot<br>TasCabling depot | The portion known as New Town Bay Wetlands is proposed to be acquired by TasWater for Selfs Point STP expansion to the south |

\* As described in Drawing 0089-DWG-SELST01-GA-C-0001 dated 21/02/2022

The northern portion of 12 Selfs Point Road (north of the current STP infrastructure) consists of an open space area used for stockpiling of soils and building waste and for the irrigation of treated sewage during peak periods (pers. comm Scott Lucas - TasWater). The area is fenced with no public access.

The northern portion of 10 Selfs Point Road (known as the New Town Bay Wetlands) has been most recently used as an artificial wetland, with a portion along Selfs Point Road that is currently used by Council for the stockpiling of materials. The area is fenced, although there is public access available off Marine Esplanade. The wetland area of 10 Selfs Point Road is heavily vegetated with grasses and blackberries.

## 3. DESKTOP DATA-GAP REVIEW

### 3.1 Desktop Review of Existing Environmental Reports

The following environmental assessment reports for the site were provided to Elgin by ERA for review:

- L. Koehnken (2013), Review of New Town Bay 'Wetlands', Report to HCC. Issued April 2013.
- CH2M HILL (2013), Southern Water, Phase I Environmental Site Assessment, Selfs Point STP, Tasmania, Australia. Issued 30 August 2013.
- EM&C (2016), Phase 2 Environmental Site Assessment Report, Selfs Point STP 12 Selfs Point Road & New Town Wetlands 10 Selfs Point Road, New Town, Tasmania. Issued 30 July 2016.
- GHD (2021), Selfs Point STP Concept Design, Interim Contamination Site Investigation Report. Issued 26 November 2021.

In addition, it is understood that GHD are in the process of undertaking a due diligence groundwater assessment at the New Town Wetlands. The assessment report should be provided to Elgin for review once available.

A review of the above reports in the context of the 50% concept design drawings, discussions with ERA and likely earthworks to be conducted on the site are provided below.

#### **L. Koehnken (2013)**

The report was focused on the wetlands, located at the northern end of 10 Selfs Point Road, to determine if they were achieving the original management aims identified for the wetland system. Background information identified that the wetlands were constructed on the site of a historic landfill. They were designed to be used as a dredge spoil repository for material dredged from New Town Bay from around the late 1990's as well as to receive inflow of treated water from the Selfs Point STP. The aim was to submerge the dredged sediments and prevent oxidation, however Hobart City Council temporarily decommissioned the wetlands to halt the ongoing build-up of salts and nutrients in the system, resulting in the wetlands drying out.

It was noted that clay-material was used to cap the historical landfilling area and was also used as a clay 'base' over which dredge spoils were deposited. The dewatered dredged material was emplaced and shaped to create channels and crests and the entire area then covered with approximately 300 mm of a mixture of soil and organic rich sewage biosolids. The depth of this material over the landfill cap material was designed to be 2 m. It was also noted that the local water table was at a depth of around 4 m relative to the channels of the wetland.

As part of the investigation, a total of 4 test pits were excavated in February 2013 to a depth of 2 m below ground level (mbgl) and samples analysed for metals and sulphur. Four distinct layers were observed during the investigation which included: 1. A silty sandy surface with some shells (approx. 1 m thick); 2. A thin silty sandy dark bluish to grey layer (generally ~200 mm); 3. A greenish-grey to yellowish-brown clayey sand mixed with waste material (approx. 0.5-0.75 m thick); and 4. Waste material including bricks, newspapers and plastics with a strong hydrocarbon odour in some pits. Elevated concentrations of sulphur, arsenic, cadmium, chromium, manganese, lead and zinc were reported in all test pits. No groundwater was encountered.

#### **CH2M HILL (2013)**

CH2M HILL completed a preliminary ESA (Phase I ESA) for the STP site at 12 Selfs Point Road. It was reported that the site was reclaimed between 1966 and 1972 by infilling with material from unknown origins, which was expected to include municipal landfill and other rubble. Since 1972 the site had been used as an STP operated by Hobart City Council (HCC) and since 2009, operated by Southern Water. A number of recognised environmental conditions (RECs) were identified for the site, which included:

- The site was completely reclaimed using fill and rubble of unknown origin and historically, ash from onsite incineration of rags and screenings. Dried sewage biosolids had also been disposed onsite. Contaminants of Potential Concern (COPC) included: heavy metals, asbestos, ammonia and polycyclic aromatic hydrocarbons (PAH).
- Use of the site as an STP included historical operational practices such as chemical use and storage, and onsite disposal of chemicals and treatment by-products such as screenings, sludge and grit which may have impacted the subsurface. Additionally, spills and releases of wastewater may have

also directly contributed to subsurface contamination. COPC included: heavy metals, ammonia, PAH, *E.coli* and faecal coliforms.

- There was potential for surface soils across the site to have been impacted as a result of airborne heavy metal containing dusts from offsite operations including at Nyrstar zinc smelter.
- Operations at adjacent sites may have contributed to contamination at the site. Activities of concern include historical land reclamation, especially adjacent to the west where the former HCC landfill was operated and which had also been used as a repository for heavy-metal contaminated dredge spoil. Petroleum storage operations have also dominated Selfs Point east of the site. COPC include total petroleum hydrocarbons (TPH), heavy metals, volatile organic compounds (VOC) and benzene, toluene, ethylbenzene and xylene (BTEX).
- One 2,000 L underground storage tank (UST) was located at the site and was used for storage of diesel. The tank replaced another 2,000 L UST previously removed from the site (same location). The condition of both the existing and historical UST was unknown and no soil or groundwater sampling information was available for either the historical or operational UST. COPC include TPH, BTEX and heavy metals.
- Dumping and poor housekeeping was observed in the north-eastern portion of the site on unpaved ground. COPC include asbestos, TPH and heavy metals.

It was recommended that a detailed environmental site assessment (ESA) is completed to determine the contamination status of the site relative to the identified RECs. It was further recommended that the practice of dumping rubble and other refuse in the north-eastern area of the site be reviewed, and best practices such as the use of bins or other containment be investigated to remove the potential for activities in the area to contribute to an ongoing potential for subsurface contamination at the site.

### **EM&C (2016)**

EM&C completed a detailed ESA (Phase 2 ESA) at the Selfs Point STP and the New Town Bay Wetlands site located respectively at 12 and 10 Selfs Point Road, New Town. A review of previous investigations (prior to 2016) was undertaken by EM&C which identified the following:

- 12 Selfs Point Road (STP site) was used for reclamation purposes using fill, rubble and ash from the onsite incineration of rags and screenings and dried sewage biosolids. Potential deposition of metal impacted dust from the nearby Nystar zinc smelter and the presence of an operational 2kL diesel underground storage tank (UST) and another abandoned/removed 2kL diesel UST was noted. The locations of the UST(s) were not reported and a request/search for Worksafe records was not undertaken.
- The described history of the wetlands located at 10 Selfs Point Road was consistent with Koehnken (2013)
- A former Shell Fuel Terminal was located at 8 Selfs Point Road, which was adjacent to the site along the north eastern boundary.

Intrusive investigations were undertaken and consisted of 54 surface samples tested in the field by x-ray fluorescence (XRF), with 25% of these analysed by a laboratory. It was reported that six soil bores were drilled and converted to groundwater wells, and another shallow groundwater well installed.

It is noted that not all the drill logs were attached to the report with some missing information, such as soil logs and the depth of some bores. The installation of the shallow/deep groundwater wells (MW5d and

MW5s) are not fully understood as the information provided did not indicate evidence of separate aquifers or strata with indicators of impact.

Soil and groundwater samples were analysed for a number of analytes, with only the relevant data reviewed here.

The locations of all investigations relevant to the 50% concept design are shown on attached **Figures 2 and 3**. Only the locations within, or in close proximity to the 50% concept design are discussed below.

The observed soil profile on the site was as shown in **Table 2**.

**Table 2.** Soil profile derived from previous bore logs

| Depth (mbgl)                          | Soil Profile                                                                                                           |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>12 Selfs Point Road</b>            |                                                                                                                        |
| 0.0-5.0                               | Fill: high plasticity clay with gravel, cobbles, bricks, basalt and dolerite                                           |
| 5.0-12.0                              | Marine sediment layers of silt, clay, sand and cobbles with shell fragments and weathered basalt and dolerite          |
| 11.5-21.0                             | Continuous basalt                                                                                                      |
| <b>10 Selfs Point Road (wetlands)</b> |                                                                                                                        |
| 0.0-2.0                               | Fill: Silty sand and clayey sand                                                                                       |
| 2.0-8.0                               | Fill: Landfill waste material (various rubbish, brick, wood, metal and paper) through a matrix of silt and clayey sand |
| 8.0-20.0                              | Organic silt and clay lenses with occasional shell fragments over weathered basalt and dolerite                        |
| 20.0                                  | Continuous basalt                                                                                                      |

It was noted that the wetland sits approximately 3-4 m higher than the Selfs Point STP and slopes gently to the north-west.

#### *Soil*

A comparison by Elgin of the surface soil XRF data with the laboratory results indicated inconsistencies between the two datasets, which included XRF results differing by a factor of 4 or more. Therefore the XRF data was not relied upon for the purposes of this review, other than highlighting the presence of copper and zinc, and to a lesser extent chromium, across the surface soils of the site. Of the investigations undertaken, 7 surface soil samples, 3 soil bores and 4 groundwater wells were located in, or close to, the 50% concept design area.

A review of the results relevant to the 50% design concept indicated that reported concentrations were below the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (amended 2013) ('ASC-NEPM') HSL D and HIL D (commercial/industrial) criteria, with the exception of lead soil

concentrations within SPBH16-01/MW1 at 4.4-4.5 mbgl and at SPBH16-03/MW3 at 4.9-5.0 mbgl in the northern portion of the site.

Screening of the data against the Tasmanian EPA Information Bulletin No.105 (IB105) criteria identified that:

- Soils in the Northern portion of 12 Sells Point Road (SPBH16-01/MW1 and SPBH-03/MW3; GR22, GR24 and GR28) – some metals (arsenic, cadmium and lead) reported concentrations above Level 2 criteria at depths of 4.4-4.5m bgl in SPBH16-01/MW1 and 4.9-5.0m bgl in SPBH16-03/MW3. Total PAH and benzo(a)pyrene (BaP) were reported above Level 1 or Level 2 criteria from 2 m and below in these locations. The corresponding borelogs for these locations were not attached to the report, however, according to the general soil profile logged (above), these depths correspond to the fill layer present in the northern area. No samples were analysed below 5 mbgl. Analysis of surface soil samples across the area identified exceedances of Level 1 criteria for cadmium, chromium, copper, lead, zinc and mercury. A detection of chromium above Level 2 was also identified at GR28.
- Soils in 10 Sells Point Road (wetlands) (SPBH16-05/MW5s and MW5d and SPBH16-06/MW6; GR39, GR44, GR47 and GR51) – zinc was reported above Level 1 criteria at SPBH16-05/6.2-6.3 mbgl, and copper and zinc were reported above Level 1 criteria in SPBH16-06/4.1-4.2 and 7.2-7.3 mbgl. BaP, TPH C<sub>10</sub>-C<sub>36</sub> and mercury were also reported above Level 1 criteria in the deeper sample SPBH16-06/7.2-7.3 mbgl. These exceedances correspond to the landfilling layer (2.0-8.0 mbgl) present in the wetlands. Metal concentrations were lower in samples collected at 9 – 10 mbgl. Analysis of surface soil samples across the area reported exceedances of Level 1 criteria for cadmium, chromium, copper, lead, zinc and mercury.

Asbestos presence was tested in some surface soils and was not detected. No samples were tested for asbestos in soil at depth.

#### *Groundwater*

Groundwater was found to be present between 1.3 and 1.6 m below ground level (mbgl) (between 0.68 and 1.75 mAHD) in the northern STP site and between 0.72 and 1.03 mAHD in the southern wetlands area.

- Northern portion of 12 Sells Point Road – some dissolved metals (copper -MW1 only, nickel and zinc) and ammonia were reported above the ANZECC 95% trigger values for protection of marine ecosystems in MW1 and MW3.
- 10 Sells Point Road (wetlands) - concentrations of nickel in MW5s, MW5d and MW6, and zinc and naphthalene (in MW5s only), were reported above the ANZECC 95% trigger values for protection of marine ecosystems. It is noted that elevated concentrations of Total Recoverable Hydrocarbons (TRH) in the >C<sub>10</sub>-C<sub>16</sub> (4.15 mg/L), >C<sub>16</sub>-C<sub>34</sub> (63.7 mg/L) and >C<sub>34</sub>-C<sub>40</sub> (15.5 mg/L) fractions were reported in MW5d (>C<sub>10</sub>-C<sub>16</sub> hydrocarbons higher than the solubility limit at 3 mg/L) and elevated concentrations of naphthalene (0.054 mg/L), BaP (0.498 mg/L) and total PAH (6.41 mg/L) in MW5s. The presence of hydrocarbons at concentrations above the theoretical solubility limit at MW5d indicates the potential for groundwater at this location to be impacted with Light Non-Aqueous Phase Liquid (LNAPL) – that is, free phase hydrocarbons floating on top of the water table. It is noted that the hydrocarbon concentrations reported in MW5s/MW5d may have met the EPA requirements to notify of fuel contamination in groundwater as outlined at:

<https://epa.tas.gov.au/business-industry/regulation/underground-fuel-tanks/reporting-fuel->

[contamination-in-groundwater](#). It is not known whether a notification was made to EPA by EM&C or its client.

#### *Acid Sulfate Soils*

Six samples were collected for acid sulfate soils, including two samples from the wetlands. Elgin's interpretation of the results is that although reduced inorganic sulfur was present at some locations, soils at the site contain high levels of acid neutralizing capacity, sufficient to neutralise acid produced. Overall, no sample exceeded the action criteria in the Tasmanian Acid Sulfate Soils Management Guidelines. Groundwater pH, sulphate and chloride levels showed no indications of acid sulfate soils at the site.

#### **GHD (2021)**

GHD completed a contamination assessment as part of a geotechnical investigation program for the concept design of the STP. The project site comprised the two subject areas: the STP at 12 Selfs Point Road and the adjacent wetlands at 10 Selfs Point Road. Intrusive investigations across the northern and southern portions of the site were completed using large boreholes / test pits as part of geotechnical investigations and to better understand the fill material beneath the site. Locations were excavated up to a depth of 2 mbgl.

The topography of the areas was found to be consistent with the descriptions provided by EM&C (2016) and Koehnken (2013). The observed soil profile on the site was as follows:

Northern portion of 12 Selfs Point Road – Investigations (CPT07-CPT09 and CPT14) indicated the following general strata:

- Topsoil or fill to ~0.2 mbgl
- Fill material from ~0.2 – base of investigation

10 Selfs Point Road (wetlands) – Investigations (CPT01-CPT04 and CPT13) identified:

- Topsoil to ~0.2 mbgl
- FILL - Sandy Silt from ~0.2-0.5 mbgl
- FILL – CLAY, gravelly/sandy from ~0.2-1.2 mbgl
- FILL – CLAY with landfill from ~0.8-base of investigation

Samples collected were analysed for 8 metals, TRH, BTEXN and PAH. Only one sample per location was analysed. The results were consistent with EM&C (2016) where no soil concentrations exceeded the NEPM (2013) commercial/industrial human health criteria (HIL-D/HSL-D or direct contact).

Screening of the data against IB105 criteria identified that:

- Northern portion of 12 Selfs Point Road – In soil, elevated metals (predominantly zinc with some chromium) and BaP were reported above Level 1 criteria in all locations (vicinity of 0.45 m to 1.6m depth), with one location (CPT7\_0.6 m) exceeding Level 2 criteria for BaP.
- 10 Selfs Point Road (wetlands) – In soil, elevated metals (predominantly zinc and cadmium with some nickel, copper, mercury, chromium and arsenic) were reported above Level 1 criteria in all

locations (vicinity of 0.9 to 1.7 m depth). Concentrations of BaP above Level 1 criteria were also reported with two locations above Level 2 criteria (CPT1\_1.5 and CPT13\_1.5).

It is noted that CPT1\_1.5 reported the highest concentrations of BaP and other PAHs, including detections of TRH C<sub>10</sub>-C<sub>36</sub>, which corresponded to the landfill material layer present on site.

### **GHD (2022)**

It is understood that GHD will be conducting additional groundwater assessment to aid in decision making of land acquisition at 10 Selfs Point Road (wetlands portion). GHD propose to install and sample four additional groundwater wells and to sample all existing groundwater wells. The location of the new and existing groundwater wells should provide good coverage of both 12 Selfs Point Road and the northern portion of 10 Selfs Point Road. GHD has agreed to include parameters identified as gaps in this report (namely hydrocarbons and potential LNAPL at MW5s/MW5d, tributyltin, PFAS and dissolved methane and carbon dioxide – refer to section 3.3). Elgin propose to review the due diligence report, once available, as part of the overall assessment of contamination at the site.

### **3.2 Current Site Conditions**

The northern and southern areas of the site were inspected by Elgin environmental scientist (Erika Heiden) on 25 January 2022. The inspection consisted of walking the boundary of the two portions, which are fenced and an inspection of the majority of the wetlands area at 10 Selfs Point Road. The wetland area could be accessed from an unlocked gate at the public walkway adjacent New Town Bay Rowing Centre off Marine Esplanade.

The northern portion mainly comprised the STP infrastructure. A closer view of the area to the north that is proposed to be used for infrastructure expansion could be seen from the Derwent River side. In this area there were numerous stockpiles of soil and building waste which had been deposited in this vicinity, including building rubble, plastic, concrete, bitumen, sand and gravel. Several stockpiles of mulch were also present. No other areas of potential impact were readily noted. These materials were within the TasWater land parcel.

The southern portion comprising the wetlands was accessed from the unlocked gate off Marine Esplanade. The wetland area appeared to be in its original state (as documented by L. Koehnken, 2013 and others), was free from water and heavily vegetated with long grass and blackberries. The area was elevated (as noted in previous investigations) with alternating swales and berms of at least 1-2 m in height difference. Access by foot was difficult due to the dense vegetation. It was noted that the groundwater wells (MW5s and MW5d and MW6) were present and appeared in good condition. No other areas of potential impact were noted, however, the whole area could not be viewed due to difficult access.

The portion of the wetlands fronting Selfs Point Road had been used for the storage of various stockpiles of building materials and waste. The area was accessed via a locked gate off Selfs Point Road, which was opened by TasWater staff (Scott Lucas). The area was relatively level in this portion, with a sharp elevation of 2-4 m as the wetland area began. In the flat portion adjacent the road were stockpiles of sandstone, gravel, pavers, wood and treated pine logs, waste soil with bitumen, a large disused drum roller and the roof of a building. In the vicinity of the roof, a piece of potential asbestos containing material (ACM) was noted lying on the ground in good condition (approximately 8 cm x 8 cm). No other potential ACM was identified on the ground in this area. This area could not be accessed by the public and it was considered likely the materials have recently been stockpiled by Council (pers. comm. Scott Lucas).

Photos from the site inspection have been provided in **Table 3**.

**Table 3.** Site inspection photographs (25 January 2022)

| Northern portion of 12 Selfs Point Road                                                                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <p><b>Photo 1.</b> Photo looking south towards the STP. Groundwater well MW1 was located in the foreground with white plastic shield. Stockpiled material centre photo.</p> |   |
| <p><b>Photo 2.</b> Photo looking south towards the STP. An example of stockpiled material in this area. Note presence of building waste.</p>                                |  |

## 10 Selfs Point Road (the Wetlands)

**Photo 3.** Photo looking east towards Selfs Point Road. Location of the roof and associated material. This was the vicinity of potential ACM identified.



**Photo 4.** Potential ACM identified from Photo 3.



**Photo 5.** Photo looking south. Stockpile of treated pine logs. Other building material stockpiles included sandstone and concrete blocks, tiles, boulders, bricks and abandoned equipment.



|                                                                                                                         |                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p><b>Photo 6.</b> Photo looking west towards the wetlands. Waste stockpile of soil, rock and bitumen.</p>              |    |
| <p><b>Photo 7.</b> Photo looking west towards the wetlands. Soil stockpile comprising rock, clay, sand and plastic.</p> |   |
| <p><b>Photo 8.</b> Stockpile adjacent the Wetlands comprising, bricks, soil, gravel and concrete.</p>                   |  |

**Photo 9.** Stockpile adjacent the Wetlands (looking west), comprising gravel, soil, concrete and metal.



### 3.3 Potential Sources of Contamination and Data Gaps

Based on the review of the above information, the identified potential sources of contamination and data gaps have been detailed in **Table 4**.

**Table 4.** Sources of contamination and data gaps

| Area                                    | Potential Sources of Contamination                                                                                                                                                                                                                | Data Gaps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Identified Potential Risks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Northern portion of 12 Sells Point Road | <p>Fill material present to approx. 5 mbgl.</p> <p>Stockpiles of waste soil and materials.</p> <p>UST and abandoned/decommissioned UST (locations unknown).</p> <p>Potential dumping of sewage treatment wastes.</p> <p>Impacted groundwater.</p> | <p>Leachability analyses have not been undertaken to further inform the potential waste classification of waste soils contaminated by metals and/or BaP.</p> <p>The potential presence of Per- and Poly-Fluorinated Alkyl Substances (PFAS) in soil or groundwater has not been considered. These are common contaminants in STP's.</p> <p>Stockpiles have not been assessed for contamination and presence of waste materials.</p> <p>Location and status of abandoned/decommissioned UST is unknown.</p> <p>Groundwater may require management should excavations extend deeper than 0.6 mAHd.</p> | <p>Potential environmental impacts from discharge of contaminated groundwater or sediment/stockpile runoff to adjacent surface waters or land.</p> <p>Potential safety risk from encountering abandoned/decommissioned UST during excavations.</p> <p>Potential environmental impacts from abandoned/decommissioned UST if found to be leaking hydrocarbon liquids.</p> <p>Potential human health risk from exposure of workers to contaminants if present in excavated soils, soil stockpiles and/or ingress of shallow contaminated groundwater into excavations.</p> <p>Financial risk from landfill disposal of waste soils at higher contaminated soil classification level.</p> |
| 10 Sells Point Road (wetlands)          | <p>Reclaimed land (~8.0 mbgl to bedrock), landfill material (~2.0-8.0 mbgl), dredged spoil and use of site for disposal of sewage (~2.0 mbgl to surface).</p> <p>Stockpiles of waste soil and materials and potential ACM along Sells Point</p>   | <p>Limited investigations of the area characterising the underlying landfill waste material strata and associated contamination.</p> <p>There is also potential for the presence of landfill gas (i.e. methane, carbon dioxide, hydrogen sulfide) from the degradation of the landfilled waste materials (which is understood to include</p>                                                                                                                                                                                                                                                         | <p>Potential environmental impacts from discharge of contaminated groundwater or sediment/stockpile runoff to adjacent surface waters or land.</p> <p>Potential risk from landfill gas if present from degradation of landfill waste.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Area | Potential Sources of Contamination                                                                           | Data Gaps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Identified Potential Risks                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <p>Road vicinity.</p> <p>Impacted groundwater (elevated hydrocarbon concentrations and potential LNAPL).</p> | <p>putrescible wastes).</p> <p>Leachability analyses have not been undertaken to further inform the potential waste classification of soils contaminated by metals and/or BaP.</p> <p>No data on the potential presence of tributyltin (TBT) or PFAS contamination in soils and/or groundwater, from historical landfilling of dredge sediments and STP biosolids.</p> <p>Stockpiles have not been assessed for contamination and it is unknown if these are to be removed prior to land acquisition. There is potential for stockpiles to contain suspected ACM, based on observations from site inspection.</p> <p>Only a limited assessment of acid sulfate soils was undertaken in the wetlands (two samples). Although the results did not indicate the presence of acid sulfate soils, additional investigations should be undertaken if disturbance of more than 100 tonne of soil was proposed, given the elevated sulfur concentrations and high organic loads previously reported.</p> <p>Groundwater requires further investigation, including to the south (adjacent Rugby Park) to assess for potential offsite impacts from this direction. The reasons for installation of shallow and deep groundwater wells are not fully understood as the information provided did not</p> | <p>Potential human health risk from exposure of workers to contaminants (including asbestos) if present in excavated soils, soil stockpiles and/or ingress of shallow contaminated groundwater into excavations.</p> <p>Financial risk from landfill disposal of waste soils at higher contaminated soil classification level.</p> <p>Potential vapour intrusion risk from elevated concentrations of volatile hydrocarbons reported in groundwater.</p> |

| Area | Potential Sources of Contamination | Data Gaps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Identified Potential Risks |
|------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
|      |                                    | <p>indicate evidence of separate aquifers, particularly in the context of the reported impacts.</p> <p>The presence of elevated concentrations of hydrocarbons in wells MW5s and MW5d indicates the potential for the presence of LNAPL; it is not known if this hydrocarbon contamination is localised or more extensive. Some hydrocarbons detected at elevated concentrations included volatile C10-C16 fractions and naphthalene which may pose a vapour intrusion risk.</p> <p>Groundwater may require management if excavations extended deeper than 0.6 mAHD.</p> |                            |

#### 4. RECOMMENDATIONS FOR FURTHER INVESTIGATIONS

It is currently understood that the northern portion of 12 Sells Point Road and the wetland area of 10 Sells Point Road, are to be used for expansion of the STP. Some material may be excavated and disposed off-site during earthworks, of which exact depths of excavations and volumes of material are currently unknown. Groundwater at the site is shallow and may also be intercepted depending on excavation depths.

Previous investigations undertaken at the site have not identified human health risks associated with soil or groundwater (no exceedances of the NEPM (2013) criteria for commercial/industrial land use), with the exception of soil in the northern portion of 12 Sells Point Road at around 4.5 mbgl in depth. However, data gaps were identified in this report (**Table 4**) which require further investigations to confirm risks are low and/or acceptable.

Recommendations for further investigations are provided below in **Table 5**. The recommendations have been broken down into investigations required prior to construction works commencing and those that should be undertaken during earthworks.

The management of potential human health and environmental risks during earthworks and construction should be managed under a Construction Environmental Management Plan (CEMP) developed for the site following completion of the recommended investigations. The CEMP should include, as a minimum:

- All soils to be treated as potentially contaminated in the areas of excavation; measures required to minimise human health and environmental risks during earthworks should be outlined in the CEMP.
- Uncontrolled fill is inherently heterogeneous and has a high probability of containing ACM or other pockets of potential contamination/waste material. This should be managed under an unexpected finds protocol to be outlined within the CEMP.
- Procedures for the management and assessment of soils during earthworks.
- Procedures for the management of potentially contaminated groundwater during excavations.

Following completion of all recommended investigations, identified potential human health and/or environmental risks relating to ongoing operation of the STP should be managed under a site specific Environmental Management Plan (EMP).

**Table 5. Data Gaps and Recommendations for Further Sampling**

| Timing              | Location                                                                       | Media       | Recommendations for Further Investigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------|--------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Before construction | Northern portion of 12 Selfs Point Road                                        | General     | Confirm the location of the UST in the context of proposed earthworks and gather existing information (such as decommissioning information).                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                     | Northern portion of 12 Selfs Point Road,<br>Council depot, 10 Selfs Point Road | Soil        | Assessment of soil stockpiles by an appropriately qualified environmental consultant and classification for waste disposal or on-site re-use. Stockpile sampling would be based on the number and size of stockpiles, in accordance with IB105. Analytes would include contaminants identified during previous investigations (including the contaminants listed in Table 2 of IB105) and presence/absence for asbestos should suspected ACM be identified.                                                                                                                              |
|                     | Wetlands, 10 Selfs Point Road                                                  | Groundwater | Assessment of groundwater for hydrocarbons, including LNAPL, tributyltin, PFAS and dissolved methane and CO <sub>2</sub> (to be undertaken by GHD as part of their current due diligence investigation). The GHD report should be reviewed by Elgin when available and these recommendations updated.                                                                                                                                                                                                                                                                                    |
|                     | Wetlands, 10 Selfs Point Road                                                  | Gas         | Assessment of landfill gas and volatile organic compounds at existing underground asset locations (stormwater drains, service pits and groundwater monitoring wells) on and surrounding the site. Install landfill gas bores in and around historical landfilling areas to assess presence of landfill gas in the subsurface.                                                                                                                                                                                                                                                            |
| During construction | Northern portion of 12 Selfs Point Road                                        | Soil        | Assess excavated soils on-site during earthworks. Soils should be stockpiled in a designated holding area, under the guidance of an appropriately qualified environmental consultant, with any identified landfill/waste material separated from other soils. All soils should be classified for waste disposal or on-site re-use. Analytes would include the contaminants identified during previous investigations, with selected samples tested for PFAS (sum of PFOS & PFHxS and PFOA), leachable contaminants and presence/absence for asbestos should suspected ACM be identified. |

| Timing | Location                      | Media | Recommendations for Further Investigation                                                                                                                                                                                                                                                                                                                                                                                                |
|--------|-------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | Wetlands, 10 Selfs Point Road | Soil  | <p>As above. It is proposed that the upper 2 m of dredged fill/clay capping/topsoil material is removed and stockpiled separately from any underlying waste/landfill material. Tributyltin should be included in the analytical suite.</p> <p>Sampling and testing for acid sulfate soils should be undertaken if disturbance of over 100 T of soil was proposed in the wetlands area, to confirm the absence of acid sulfate soils.</p> |

## 5. CLOSING

If you have any questions regarding the information contained in this letter report, please call Erika in the first instance on 0407 832 411 or Sophie on 0419 323 931.

Kind regards,

**Elgin Associates Pty Ltd**

*E Heiden*

Erika Heiden

SENIOR ENVIRONMENTAL SCIENTIST



Dr Sophie Le Roux

PRINCIPAL ENVIRONMENTAL SCIENTIST



Andrew Roberts

SENIOR PRINCIPAL

CEnvP- SC (Site Contamination) No. SC41173

## ATTACHMENTS

Figure 1 – Site Layout

Figure 2 – 50% Concept Design and Previous Investigations (Northern)

Figure 3 - 50% Concept Design and Previous Investigations (Southern)

## REFERENCES

AS4482.1 (2005). Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non- volatile and semi-volatile compounds.

AS4482.2 (1999). Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile substances.

EPA Tasmania (2018). Information Bulletin 105: Classification and management of contaminated soil for disposal.

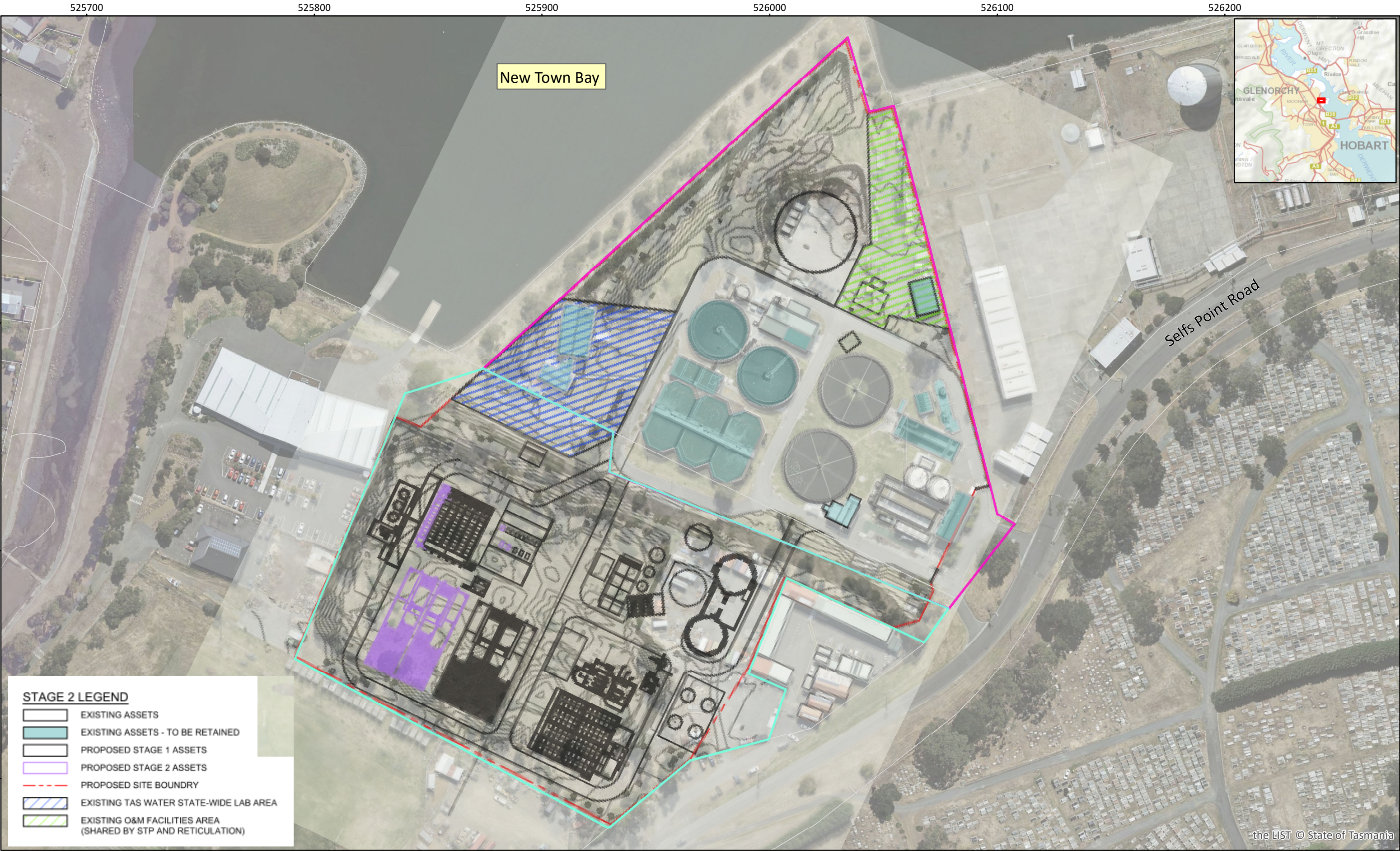
EPA Tasmania (2020). Environmental Management and Pollution Control (Waste Management) Regulations.

EPA Victoria (2009). Industrial Waste Resource Guidelines: Soil Sampling, Publication IWRG702.

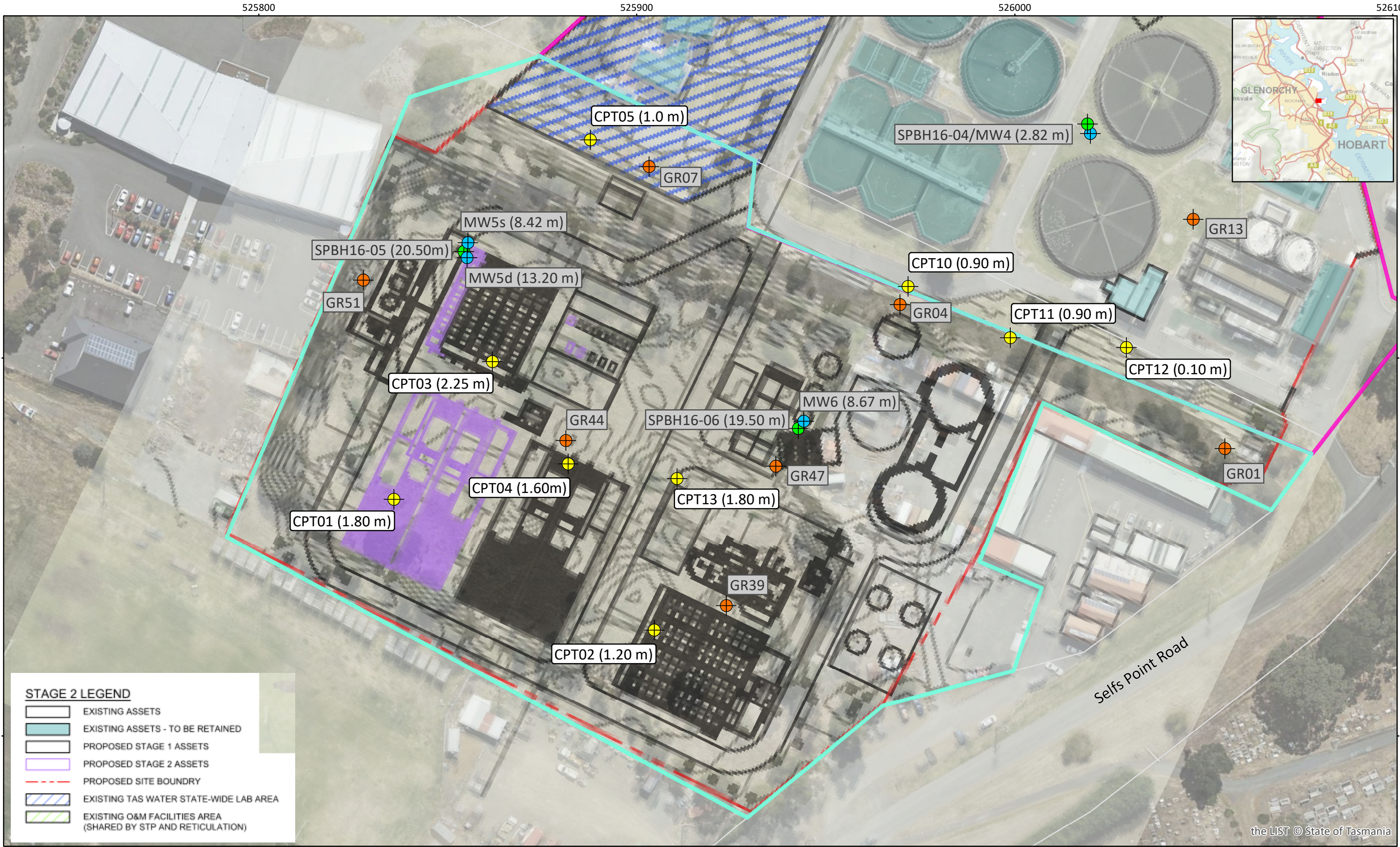
Heads of EPA Australia and NZ (2020). PFAS National Environmental Management Plan. January 2020.

National Environmental Protection (Assessment of Site Contamination) Measure 1999 (amended 2013)

Tasmanian Government (1994). Environmental Management and Pollution Control Act 1994 (EMPCA).



|                                                                                                                                                                                    |                                                                                                       |                            |                                                                                                                                  |                                                         |                                                                                                                                    |                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><div>Legend</div><div>Site Boundaries</div><div><div></div> New Town Bay Wetlands</div><div><div></div> Existing STP site</div><div><div></div> Cadastral parcels</div></div> | <div><div>N</div><div></div></div> <div><div>0</div><div>40</div><div>80</div><div>Meters</div></div> | <div>Scale = 1:1,500</div> | <div>Site:</div> <div>Selfs Point STP Concept Design</div> <div>10-12 Selfs Point Road, New Town,</div> <div>TAS (JN21327)</div> | <div>Client:</div> <div>ERA Planning for TasWater</div> | <div>Title:</div> <div>50% Concept Design Stage 2</div> <div>Site Layout Plan</div> <div>Drawing # 0089-DWG-SELST01-GA-C-001</div> | <div><div>Figure 1</div><div>Coordinate System: GDA2020 MGA Zone 55</div><div>Projection: Transverse Mercator</div><div>Datum: GDA 2020</div><div>Scale Factor: 0.9996</div><div>Units: Meter</div></div> |
|                                                                                                                                                                                    |                                                                                                       |                            | <div>Date: 02 March 2022</div> <div>Size: A3    Version: A</div>                                                                 | <div>Drawn: MU</div> <div>Approved: EH/LF</div>         | <div><div><div></div></div><div>elgin</div><div>associates</div></div>                                                             |                                                                                                                                                                                                           |



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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Legend</b> <div><div><b>GHD 2021</b><ul style="list-style-type: none"><li>Test pit/bore</li></ul></div><div><b>EM&amp;C 2016</b><ul style="list-style-type: none"><li>Surface soil NATA analysed</li><li>Soil bore</li><li>Groundwater well</li></ul></div><div><b>Site Boundaries</b><ul style="list-style-type: none"><li>New Town Bay Wetlands</li><li>Existing STP site</li><li>Cadastral parcels</li></ul></div></div> <div><div><div>0</div><div>25</div><div>50</div></div><div>Meters</div></div> <div><div>Site:</div><div>Selfs Point STP Concept Design<br/>10 Selfs Point Road, New Town,<br/>TAS (JN21327)</div><div><div>Date: 02 March 2022</div><div>Size: A3    Version: A</div></div></div> <div><div>Client:</div><div>ERA Planning for TasWater</div><div><div>Drawn: MU</div><div>Approved: EH/LF</div></div></div> <div><div>Title:</div><div>50% Concept Design Stage 2 and<br/>Previous Investigations (Southern)<br/>Drawing # 0089-DWG-SELST01-GA-C-001</div><div><div></div><div>elgin<br/>associates</div></div></div> <div><div><b>Figure 2</b></div><div>Coordinate System: GDA2020 MGA Zone 55<br/>Projection: Transverse Mercator<br/>Datum: GDA 2020<br/>Scale Factor: 0.9996<br/>Units: Meter</div></div> |
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|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Legend</b><br><b>GHD 2021</b><br>+ Test pit/bore<br><b>EM&amp;C 2016</b><br>+ Surface soil NATA analysed<br>+ Soil bore<br>+ Groundwater well | <b>Site Boundaries</b><br>New Town Bay Wetlands<br>Existing STP site<br>Cadastral parcels | <b>Figure3</b><br>Coordinate System: GDA2020 MGA Zone 55<br>Projection: Transverse Mercator<br>Datum: GDA 2020<br>Scale Factor: 0.9996<br>Units: Meter |
| <b>Legend</b><br>+ Test pit/bore<br>+ Surface soil NATA analysed<br>+ Soil bore<br>+ Groundwater well                                            |                                                                                           | <b>Figure3</b><br>Coordinate System: GDA2020 MGA Zone 55<br>Projection: Transverse Mercator<br>Datum: GDA 2020<br>Scale Factor: 0.9996<br>Units: Meter |

**Legend**

**GHD 2021**

+ Test pit/bore

**EM&C 2016**

+ Surface soil NATA analysed

+ Soil bore

+ Groundwater well

**Site Boundaries**

New Town Bay Wetlands

Existing STP site

Cadastral parcels

N

Scale = 1:900

0 25 50 Meters

Site:

Selfs Point STP Concept Design

12 Selfs Point Road, New Town, TAS (JN21327)

Date: 02 March 2022

Size: A3 Version: A

Client:

ERA Planning for TasWater

Drawn: MU

Approved: EH/LF

Title:

50% Concept Design Stage 2 and Previous Investigations (Southern)

Drawing # 0089-DWG-SELST01-GA-C-001