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8 September 2017

Karen Gallagher
Environment Protection Authority

Sent via email: karen.gallagher@epa.nsw.gov.au

Re: Mayfield West Recycling Facility (SSD 7698) - Water Assessment

Dear Karen,

We received Stephen James', Acting Manager Regional Waste Compliance, Environment Protection Authority (EPA), letter of 28 August 2017 to the Department of Planning and Environment, relating to water management at the Mayfield West Recycling Facility.

This letter provides a proposed approach to addressing the matters raised.

1 Proposed water management

Water management at the recycling facility site is described in the *Mayfield West Recycling Facility Environmental Impact Statement* (EIS) (EMM 2016). The EIS provides water management commitments in line with the current approval and the Environment Protection Licence (EPL 20771) for the site.

More detailed water management information and additional commitments are provided in Section 3.9 of the *Mayfield West Recycling Facility Response to Submissions* (RTS) (EMM 2017). A water management conceptual model and corresponding control measures are provided in RTS Section 3.9.3. Control measures to ensure that pollutants do not impact the receiving environment (the Hunter River) are provided in RTS Table 3.15 based on each potential pathway in the conceptual model. A water and sediment monitoring program is presented in RTS Section 3.9.4 and contingency actions in RTS Section 3.9.5.

The RTS provides additional commitments based on the submissions received, including:

- only commercially available non-toxic flocculants will be used at the site;
- the trees will be removed from the perimeter drain and the perimeter drain will be sealed;
- the final sedimentation basin will be sealed;
- additional storage volume will be provided as part of the works to seal the drain and final sedimentation basin volume;
- the seven sedimentation basins in the perimeter drain will be upgraded. Poorly graded rock will be used to form the sedimentation basin dams (as opposed to the current sandbags);
- a bund will be erected around the segregated heavy waste processing and stockpiling area directing all runoff from the area to the perimeter drain;

- damaged concrete in the main processing shed will be repaired where liquids could infiltrate to groundwater;
- a Surface Water Monitoring and Mitigation Plan will be prepared that details:
  - meteorological monitoring;
  - water level monitoring;
  - validation monitoring;
  - routine monitoring; and
  - sediment monitoring.

  the plan will provide trigger values and responses, including treatment of site runoff prior to discharge and contingency measures.

As described in EIS Section 1.1, no liquid waste is (or is proposed to be) accepted by the facility – in accordance with EPL 20771.

As described in RTS Table 3.15, all waste is (and will continue to be) inspected prior to being accepted by the site and any loads containing liquids rejected.

Additional water management measures proposed in response to EPA's letter of 28 August 2017 are described below.

2 Additional water management

It is understood that the EPA remain concerned that the proposed management measures do not sufficiently reduce the risk from site discharge to the receiving environment, particularly from rain or dust suppression water that has contacted wastes stored externally in the segregated heavy waste processing and stockpiling area.

It is therefore proposed to implement the following additional water management measures:

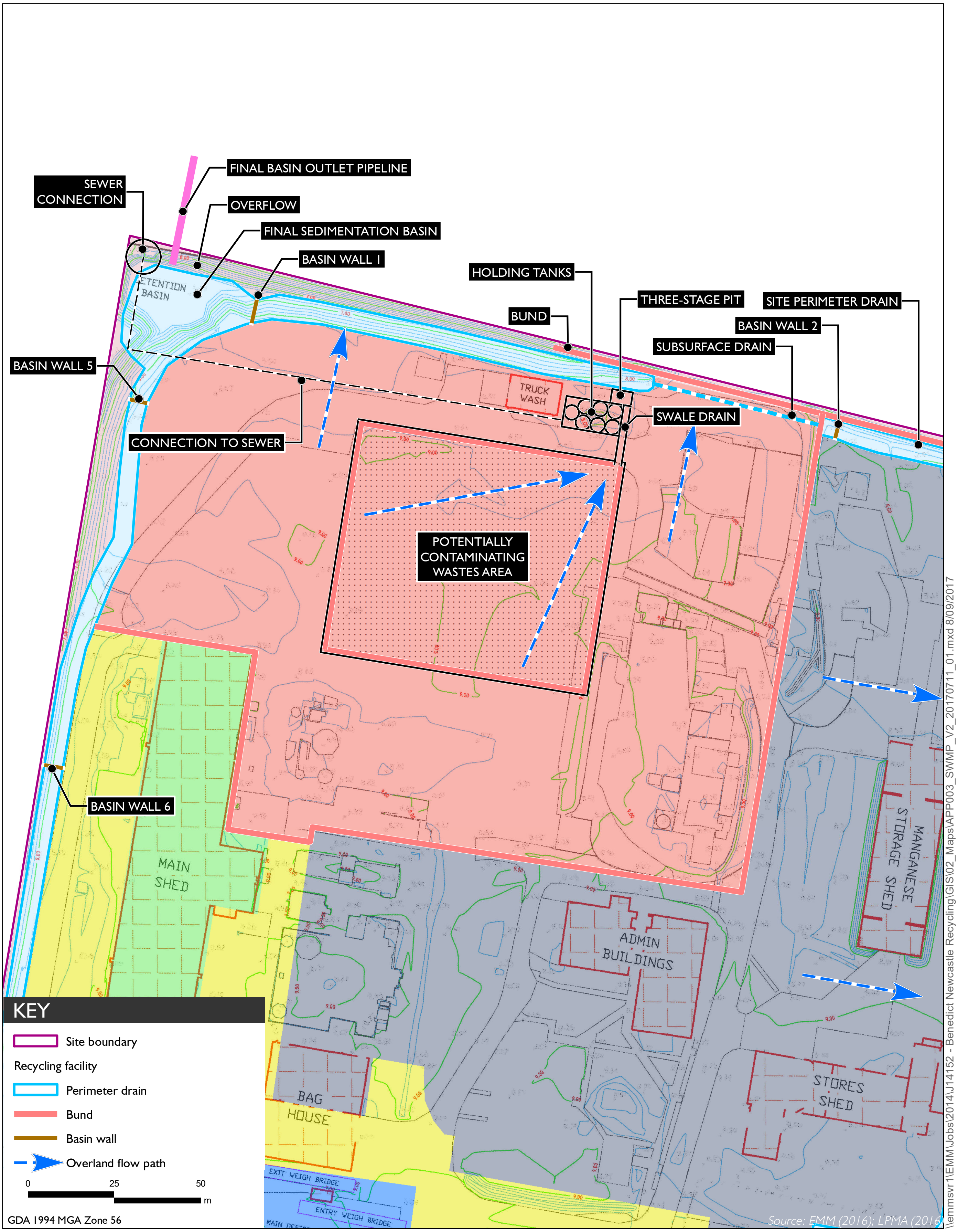
- collecting water that has contacted wastes stored externally (referred to here as 'potentially contaminating wastes') that could contaminate the water;
- testing of this collected water; and
- discharging this water to the existing perimeter drain if it is of appropriate quality or discharging it to the sewer as trade waste if it is not.

These measures are described in greater detail below.

2.1 Waste segregation

The following potentially contaminating wastes (based on the wastes listed in Condition L3.1 of EPL 20771) will be stored within a fully sealed and bunded designated potentially contaminating wastes area (see Figure 2.1):

- excavated natural material (where the waste does not contain any contaminant levels exceeding the limits for General Solid Waste stated in the EPA's Waste Classification Guidelines Part 1: Classifying Waste);



Potentially contaminating wastes area - water management

Recycling Facility, Mayfield West

Figure 2.1

- Soils that meet the CT1 thresholds for General Solid Waste in Table 1 of the Waste Classification Guidelines as in force from time to time with the exception of the maximum threshold values for contaminants specified in the “Other Limits” column;
- concrete batch plant waste;
- wood waste (untreated timber);
- basic oxygen slag;
- electric arc furnace;
- slag electric arc ladle;
- slag granulated blast; and
- furnace slag.

2.2 Water management from potentially contaminating wastes

All water from the potentially contaminating wastes area will drain to a sump from where it will flow along a swale to a three-stage pit. It will be automatically treated through three cells (Cells 1 to 3) by sedimentation, flocculation and pH adjustment. The water will be pumped from Cell 3 to holding tanks. The water quality of the water in the tanks will be tested and if it meets agreed water quality trigger values (see Section 2.3.3), it will be released to the site’s perimeter drain and flow to the final sedimentation basin for re-use onsite or release from site. If the water does not meet the agreed trigger values, it will be discharged as trade waste to the mains sewer.

2.2.1 Potentially contaminating wastes area

The potentially contaminating wastes area (5,200 m^2) will be sealed and bunded and be wholly within the wider segregated heavy waste processing and stockpiling area. It will be surround by a bund at least 100 mm high. The base of the potentially contaminating wastes area will be sealed with concrete or asphalt. A swale drain will carry water from this area to the three-stage pit.

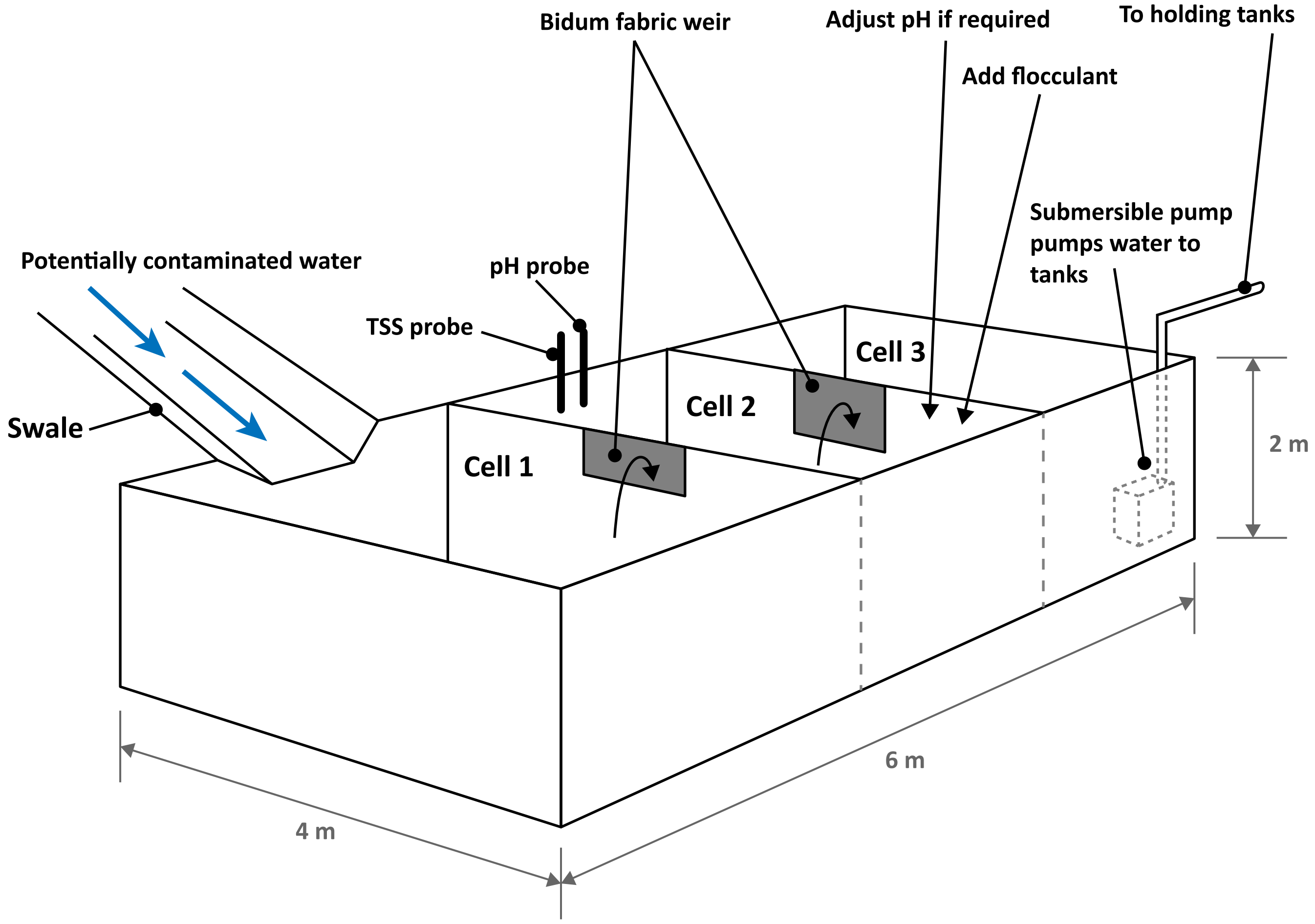
2.2.2 Three-stage pit

The three-stage pit (Figure 2.2) will be approximately 6 m long, 4 m wide and 2 m deep and have a capacity of about 40,000 L. Water from the bunded potentially contaminating wastes area will flow to Cell 1 of the three-stage pit. Some sedimentation will occur in Cell 1. Water will overflow from Cell 1 to Cell 2 through a bidum/geotextile filter that will remove sediment.

The water quality in Cell 2 will be monitored by a pH probe and a turbidity probe. The water will be automatically dosed with flocculent and acid/base based on the pH and turbidity readings. Water will overflow from Cell 2 to Cell 3 through another bidum/geotextile filter.

Cell 3 will contain an submersible electric pump with a capacity of about 20 L/second. The pump will activate when Cell 3 is about one third full (ie when the water level is about 0.7 m from the base). The water will be pumped from Cell 3 to a series of holding tanks with greater than 230,400 L capacity.

The filters will be cleaned regularly. When required for maintenance, for example sediment removal, valves at the bottom of the walls between the cells will be opened to allow all water in the three-stage pit to drain to Cell 3 from where it can be pumped to the holding tanks.



Three-stage tank
Recycling Facility, Mayfield West
Application amendment
Figure 2.2

2.2.3 Holding tanks

Water from the three-stage pit will be pumped to a series of holding tanks.

The 'Blue Book' (*Managing Urban Stormwater Soils and Construction*, Vol. 1, 4th edition (Landcom 2004)) recommends that rainfall from a 90th-percentile or 95th-percentile five-day rainfall event (the design rainfall) is used to design water management systems in sensitive environments. As acknowledged by the EPA, the lower Hunter estuary is a "highly modified environment". Notwithstanding, the 90th-percentile five-day rainfall event for sensitive environments (52 mm rainfall over five days, 270,400 L in total) was used to determine the required capacity of the holding tanks. The holding tanks need a capacity of 230,400 L to capture all rainfall on the potentially contaminating wastes area (5,200 m^2) from the design rainfall, given that the three-stage pit holds 40,000 L. It is therefore proposed to install holding tanks with a capacity of at least 230,400 L. It is likely that seven 34,000-L tanks will be used.

The three-stage pit and holding tanks would add a further 270 m^3 of water storage to the currently available 4,480 m^3 already available at the site (see RTS Section 3.9.1ii).

2.2.4 Water release

The water quality in the tanks will be tested (see Section 2.2.5) prior to release. The monitoring results will be compared to agreed trigger values (see Section 2.3):

- the water will be released to the site's perimeter drain if the water quality is below the trigger values; or
- the water will be discharged under a trade waste agreement to the mains sewer in the north-west corner of the site if the water quality exceeds the trigger values.

Adoption of a design rainfall (as required by any water management system design) means that there will be infrequent occasions when the design rainfall is exceeded. It is noted that extreme rainfall events (ie greater than the design rainfall) significantly degrade the water quality in rivers as a result of the release of sediments and other contaminants from sources such as uncontained rural and urban runoff, overflow of sediment containment structures across the catchment (sized based on the design rainfall) and overflow of municipal sewerage systems. The impact of discharges from a specific site under these high-flow conditions is of less concern than discharges during low-flow conditions.

2.2.5 Analytical suites

The proposed analytical suites in the final sedimentation basin are listed in RTS Section 3.9.4. The same analytical suite would be initially monitored in the holding tanks as part of validation monitoring and the suite of parameters would be reduced during routine monitoring based on the results of the validation monitoring (see below). The full analytical suite is provided in Table 2.1.

Table 2.1 Analytical suites

Analytical suite	Description	Analytes
Suite 1	Physico-chemical parameters	pH Total suspended solids Oil and grease
Suite 2	Major ions	Electrical conductivity Calcium (Ca), magnesium (Mg), sodium (Na) and potassium (K) Chloride (Cl), sulfate (SO_4) and alkalinity Sulfide (S) Hardness
Suite 3	Nutrients	Total phosphorus Total nitrogen Nitrate/nitrite Ammonia
Suite 4	Metals and metalloids[1]	Aluminium (Al), silver (Ag), boron (B), beryllium (Be), bismuth (Bi), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), iron (Fe), gallium (Ga), mercury (Hg), lanthanum (La), manganese (Mn), molybdenum (Mo), nickel (Ni), lead (Pb), antimony (Sb), selenium (Se), tin (Sn), strontium (Sr), thallium (Tl), uranium (U), vanadium (V) and zinc (Zn) Chromium (VI)
Suite 5	Organics	Benzene, toluene, ethylbenzene and xylene (BTEX) Polyaromatic hydrocarbons (PAHs) Phenols Petroleum hydrocarbons (total recoverable hydrocarbons); Polychlorinated biphenyls (PCBs); Pesticides
Suite 6	Miscellaneous	Fluoride Cyanide Surfactants

Note: Dissolved concentration in water samples.

Two phases of monitoring in the holding tanks are proposed:

- initial validation monitoring considering a wide suite of parameters; and
- routine monitoring of parameters identified as being of potential concern during validation monitoring, with a wider suite measured less frequently to confirm (or otherwise) that the validation monitoring results are unchanged.

The length of the validation monitoring program for the holding tanks and the final sedimentation basin will be determined as part of the development of the Surface Water Monitoring and Mitigation Plan. A phased approach may be taken. For example, where a parameter is measured to be below the laboratory limit of reporting and the trigger value for the first five monitoring events it will be removed from the ongoing validation monitoring suite.

2.3 Trigger values

The development of trigger values to protect the Hunter River in accordance with the *National Water Quality Management Strategy Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ 2000) guidelines is described in RTS Section 3.9.4iii.

Further information on the application of these guidelines is provided below.

2.3.1 Application of ANZECC/ARMCANZ guidelines

The ANZECC/ARMCANZ (2000) guidelines provide numerical concentration trigger values and/or narrative statements to assess whether water quality meets water quality objectives to maintain or improve a designated water use or environmental value(s). These trigger values are tools to assist in protecting environmental values. Many undisturbed systems naturally exceed the ANZECC/ARMCANZ default trigger values and, therefore, exceedance of the values does not necessarily indicate a degraded system or potential for an impact.

The comparison of water quality results to site-specific trigger values is recognised as industry best practice, and promotes a holistic approach to water management. The comparison of waters to the guideline values needs to be considered within the context of the intent of the ANZECC/ARMCANZ (2000) guidelines, and not used as the only mechanism for determining whether an impact has the potential to occur.

The application of the trigger values needs to take into consideration the environment type, value and existing condition as well as the level of change that is considered acceptable. There are different guideline values for varying environmental conditions and degrees of change. The Hunter River is the receiving environment for water discharged from the recycling facility site. The most conservative environmental value in the Hunter River is considered to be aquatic ecosystem protection.

2.3.2 Protection levels

In the application of the ANZECC/ARMCANZ (2000) guidelines, the level of protection needs to be determined. This is based on both the existing baseline conditions and the level of change that is considered acceptable. Three levels of ecosystem conditions are recognised for aquatic ecosystems (ANZECC/ARMCANZ 2000):

- highly conservative: effectively unmodified or highly-valued ecosystem;
- slightly to moderately disturbed: relatively small but measurable human activity, although ecosystem integrity is largely retained; and
- highly disturbed: measurably degraded ecosystems of low ecological value.

As acknowledged by the EPA, the Hunter River adjacent to the recycling facility site area is considered to be highly disturbed.

The ecosystem protection and degree of acceptable change translates to the level of protection, which includes default trigger values for the protection of 99%, 95%, 90% and 80% of aquatic species. The trigger values for the protection of 99% of species relate to the most conservative trigger values and the 80% trigger values the least conservative values. ANZECC/ARMCANZ (2000) recommends that in the absence of site-specific trigger values, the default trigger values for the protection of 99% of species should be applied to highly conservative environments; while the trigger values for the protection of 95% of species should be applied to slightly to moderately disturbed environments.

2.3.3 Site-specific trigger values

The ANZECC/ARMCANZ (2000) default trigger values consider a wide range of species in Australia and New Zealand, are not site-specific, and do not consider the catchment geology. The exceedance of a guideline value is common and is often a product of the natural environment, ie water-rock hydrogeochemical interactions. ANZECC/ARMCANZ (2000) recognise this, stating:

> Some surface waters will contain concentrations of toxicants that may naturally exceed the default guideline trigger values tabulated in section 3.4 [of ANZECC/ARMCANZ (2000)]. Where this is the case and as recommended in section 3.4.3.2 [of ANZECC/ARMCANZ (2000)], new trigger values should be based on background (or baseline) data. (Note that 'background' in this case, refers to natural toxicant concentrations that are unrelated to human disturbance.)

Historical data for the Hunter River (for example, monitoring results for the lower Hunter presented in *The Terminal 4 (T4) Project Surface Water Assessment* (SMEC 2012)) show that the levels of some surface water quality parameters currently exceed the default ANZECC/ARMCANZ (2000) guidelines for slightly to moderately disturbed aquatic ecosystems.

The use of, site-specific trigger values derived using baseline data are a much more rigorous and accurate approach to assessing potential impacts.

It is noted that Section 2.2.1.9 of the ANZECC/ARMCANZ (2000) guidelines specifically state that:

> The guidelines have not been designed for direct application in activities such as discharge consents, recycled water quality or stormwater quality, nor should they be used in this way.

Nevertheless, the guidelines are considered a useful tool when developing discharge trigger values.

It is proposed to develop site-specific trigger values using historical data (RTS Table 3.18). This will include using data from Government monitoring programs for the lower Hunter River. Any data that can be provided by EPA would be of assistance. As noted in RTS Table 3.18, ANZECC/ARMCANZ (2000) default trigger values will be applied where there is insufficient reference data to derive site-specific water quality objectives.

ANZECC/ARMCANZ (2000) describes potential the sources of information for determining the reference condition, and therefore appropriate triggers values, as follows:

> The reference condition for sites that may or may not be disturbed at present can be defined in terms of these sources of information: historical data collected from the site being assessed; spatial data collected from sites or areas nearby that are uninfluenced (or not as influenced) by the disturbance being assessed; or data derived from other sources.

Low flow in the low Hunter River is considered to be 2 GL/day (23,000 L/second) (Hunter River Salinity Trading Scheme) and greater that 10 GL/day (116,000 L/second) when the river is in flood. Lower Hunter River monitoring data is a suitable reference dataset because a) it is the largest river in the catchment with no other rivers suitable as a reference site and b) runoff from the site (which will all be captured) is insignificant compared to the flow in the river so that there will be very large dilution factors for any site runoff released. Runoff from the site will not appreciably change the water quality of the river.

The conservative approach described above, ie using site-specific water quality trigger values or default ANZECC/ARMCANZ (2000) trigger values where site-specific water quality trigger values cannot be derived, is used to determine the acceptability of discharges from large projects in NSW, such as the NorthConnex Project.

2.4 Surface Water Monitoring and Mitigation Plan

The development of a Surface Water Monitoring and Mitigation Plan is proposed in the RTS. This plan would be expanded to include the management, treatment, monitoring and release of water from the potentially contaminating wastes area.

3 Recycling facility site

As described in EIS Section 1.4, the expanded recycling facility would provides a range of environmental benefits including:

- diverting recyclable and reusable wastes from lower order uses and landfill, including co-mingled wastes for which there are few recycling alternatives in the Lower Hunter region;
- by diverting these wastes from landfill, the preserving space within local landfills, including the Summerhill Waste Management Centre, for general waste (putrescible) extending the life of these landfills;
- producing ready-to-use recycled materials (eg aggregates), assisting construction firms and government agencies (including councils) to meet their environmental commitments to use recycled materials; and
- producing segregated recycled materials (eg ferrous and non-ferrous metals, and plastics) for further processing.

The EIS also discusses the *NSW Waste Avoidance and Resource Recovery Strategy 2014–21* (WARR Strategy) in Section 1.4. As you would be aware, since this time the EPA has released the consultation draft of the *Waste and Resource Recovery Infrastructure Strategy* [WARRIS] *2017–2021*. In regard to recycling generally, the report states:

> Increased investment in resource recovery infrastructure is good for public health, the environment and the economy. Investment in resource recovery creates jobs and stimulates innovative technology. Successfully meeting our diversion targets would result in an estimated additional 1590 jobs in the NSW economy; energy savings equivalent to the energy usage of 1.49 million households each year; water savings equivalent to 5392 olympic-sized swimming pools each year and greenhouse gas benefits equivalent to removing 530,971 cars from the road each year.

The WARRIS provides a summary of the available and required recycling capacity in regional NSW, including in the Hunter and Central Coast. This identifies the need for the capacity to process 461,000 tpa of C&D waste in the region. The EPA state, “[a]t least four small C&D Waste Processing facilities are required to minimise inert waste disposal”.

The required additional recycling capacity needs to be located somewhere and, as stated in EIS Section 1.4, the Mayfield West site is ideal because:

- it is centrally located in Newcastle;
- it is accessible from the Lower Hunter Region from roads suitable for heavy vehicle use;
- it is located in an existing industrial precinct and the closest residential receivers are remote - approximately 0.5 km south of the site on the far side of Industrial Drive;
- the activities performed on site are generally not visible from publically accessible locations;
- it enables the productive land use of a site that is only suitable to a small range of uses, due to previous contamination; and
- the recycling facility is already operating at the site without complaint.

We believe that the proposed expansion of the Mayfield West Recycling Facility EIS is an important part of meeting the community need in the Hunter and Central Coast identified by the EPA in the WARRIS and it is in an ideal location.

We believe that the additional water management measures proposed provide an additional level of assurance that the recycling facility will not adversely impact the downstream environment and we trust that the will EPA consider the wider environmental benefits of the facility in considering the adequacy of the proposed additional water management measures.

Yours sincerely

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