Taronga Wildlife Hospital, Sydney – Nutrition Centre

Operational Waste Management Plan

Date: December 2021
Revision: 01

Revision	Revision Date	Revision changes	Author	Organisation
00	*June 2020*	*Draft*	*Matthew Spooner*	*Taronga Conservation Society Australia*
01	*December 2021*	*Final*	*Kristine Marshall*	*Taronga Conservation Society Australia*

Site Overview

Taronga Zoo is situated within a medium density populated urban locality on the northern side of the Sydney Harbour foreshore. Taronga is committed to ensuring that the Zoo's environment is managed safely and effectively so that it can be appreciated by both present and future generations of local and overseas guests. The Zoo's mission is for a shared future for wildlife and people, and places strategic importance on environmental sustainability including reducing waste to landfill.

Taronga's Sustainability Commitment and Waste Management Policy highlight the Zoo's commitment to the promotion of effective waste management on site. The policy also provides the framework for all Taronga employees and contractors to promote and conduct effective waste management practices within the workplace & the surrounding environment. The zoo has a target of 90% diversion from landfill, and a commitment to circular economy initiatives. The recycling rate at Taronga Zoo Sydney in over the month of March 2021 was 85%, attributed to a complex pre and post source separation method including 14 recycling streams.

The Operational Waste Management Plan (OWMP) prescribed by this document relates specifically to the Taronga Wildlife Hospital- Nutrition Centre in Sydney (TWH-NC).

This Operational Waste Management Plan relates specifically to the methodology for waste management of the TWH-NC post construction. The management of construction waste is described in *Construction Management Plan: V2.*

Service of the Taronga Wildlife Hospital

To ensure the highest standards in waste management are achieved, Taronga has a contract with SUEZ Australia and alternative specialised agreements as required. Suez uses only authorised and lawful landfill, transfer station, processing and recycling facility sites that have the approval of relevant Government authorities. Similarly, any organisation performing services for Suez on a subcontractor basis will only use authorised and lawful disposal sites that hold all of the required licences and compliance material. Suez has achieved ISO 14001 (Environmental Management) certification and AS 4801 (Occupational Health and Safety) at its operations across NSW, ACT, Queensland, Western Australia, and South Australia.

Suez proactively advises and informs Taronga Zoo in respect of regulations and compliance, as well as the introduction of applicable new technology and practices relating to the processing and recycling of waste and residual materials generated by the Zoo.

The existing wildlife hospital facility and nutrition centre are currently serviced by SUEZ Australia. The opportunity to update the hospital facilities will allow for review and evolution of existing waste management practices and operations to suit the new specialised facility.

Operational Plan Intent

The operational plan is structured in a manner to achieve the following targets and practices:

- Identification and quantification of projected waste generation;
- Identification and formation of an effective plan of management for generation points and access to waste generated;
- Provision of point of generation separation practices for waste material, where viable;
- Provision of sustainable practices in the collection, storage and transport of separated and residual materials;
- Provision of a safe work environment in all waste management practices;
- Establishment of baseline targets by waste type to periodically measure waste generation rates and diversion from landfill;
- Regular review of waste management KPIs to ensure continuous and sustainable improvement in the Zoo's OWMP.

The success of the operational plan will rely substantially on the partnership of all stakeholders. These individuals and teams will all need to be inducted and trained where necessary in the delivery of the waste management practices proposed. They include:

- Taronga Zoo operational staff;
- SUEZ service and operations staff;
- Lab Tech Services Pty Ltd;
- A J Bush & Sons;
- Waste and recycling facilities;
- Transporters and equipment providers; and
- Visitors, administrative staff, external contractors, and other relevant stakeholders.

To ensure compliance with the OWMP it is critical that all of the above stakeholder groups are aware of their specific operational role in the Zoo's waste management plan. The level of success will be determined during scheduled reviews of the OWMP, and issues will be considered and acted upon accordingly. This scheduled review will include the Taronga Manager Environmental Sustainability and a senior representative from SUEZ.

A table nominating specific individuals to be engaged in the Waste and Recycling review of the OWMP as follows.

Contact name	Title	Contact
Nick Boyle	Director, Welfare, Conservation and Science	nboyle@zoo.nsw.gov.au
Rodd Stapley	Taronga Zoo Director of Asset Management	rstapley@zoo.nsw.gov.au
Bridget Corcoran	Taronga Manager Environmental Sustainability	bcorcoran@zoo.nsw.gov.au
Scott Bayliss	Collections C&I Manager - Sydney	scott.bayliss@suez-env.com.au

Operational Plan

Taronga's overall waste management operation is a daily service conducted 365 days per year and is inclusive of public holidays. Waste operators are scheduled for work daily on a rotating roster basis. It is the waste operator's responsibility to ensure that all waste management bins are serviced daily, and all bins are placed on a bin washing schedule to maintain suitable levels of hygiene and to reduce the risk of unacceptable odours.

Listed below is a ***Table 4.1*** outlining the Zoo's existing collection schedule which will also apply to TWH operations. For specific management of individual waste streams refer to Annexure 1.

Table 4.1 SUEZ service schedule for key waste streams

Item Collection	Collection Frequency
General Waste including food organics waste	Daily (Mon – Sun), rear loader only travels to waste processing and recycling centre at full capacity
Cardboard and paper	Daily (Mon-Sun), Compactor only serviced when full
Compostable Packaging	Daily (Mon – Sun), combined with back of house organics and transported to large commercial composting facility
Fish waste from Great Southern Oceans exhibit	Once per week, transported to commercial composting facility
Back of house food organics waste	Twice per week, transported to commercial composting facility
Animal Waste (manure, bedding)	Daily (Monday- Sunday), transported to commercial composting facility
Meat waste (from Nutrition Centre)	On call – when bin full, transported to meat protein recycling facility Collected by A J Bush & Sons
Green waste	On call - when bin full, transported to a green waste recovery centre
Metal	On call - when bin full, transported to a recovery centre
Anatomical Waste	Once per week and on call if needed
Clinical/Medical Waste	Once per week
Biosecurity/Quarantine Waste	Once per week or as needed – collected by separate driver and taken to SteriHealth
Pharmaceutical Waste	On call- for expired drugs
Chemical Waste	Once per month or as needed. Collected by Lab Tech Services.

Waste Identification and Quantification

Table 4.2 indicates the typical waste profile that will be generated during normal operations.

Table 4.2 Workspace, waste type and average quantity of waste material

Workspace	Waste type	Bin Size	Collection frequency	Estimated quantity per week**

Wildlife Hospital Treatment	1. General waste 2. Comingled recyclables 3. Animal waste 4. Clinical waste 5. Anatomical waste 6. Sharps 7. Pharmaceutical Waste	240 litre (120L for food organics & pharmaceutical	Weekly/On call	50-100 kgs
Animal Wards	1. Animal waste 2. General waste 3. Comingled recyclables	240 litre / type	Daily	50-100 kgs
Wildlife Intensive Care	1. Animal waste 2. General waste 3. Comingled recyclables	240 litre / type	Daily	50-100 kgs
Public viewing and circulation	1. General waste 2. Comingled Recyclables 3. Compostable packaging	240 litre / type	Daily	175 kgs
Marine Wildlife Facility	1. General waste 2. Comingled Recyclables 3. Animal Waste 4. Organics	240 litre / type (120L for food organics)	Daily	50-100 kgs
Pathology and Necropsy	1. General waste 2. Comingled Recyclables 3. Compostable packaging 4. Clinical waste 5. Anatomical waste 6. Chemical Waste	240 litre / type 5 Litre Container	Daily Weekly/On call Monthly	100- 175 kgs
Nutrition Centre	1. General waste 2. Comingled Recyclables 3. Compostable packaging 4. Organics 5. Meat/Anatomical Waste	240 litre / type (120L for food organics, 10L for meat or anatomical waste)	Daily	175 kg

*** Quantity is an average projection in kilograms calculated over a seven day period. These projections may be further refined once staff and guest numbers have been finalised. Where there is a Co-mingled recyclable, Paper/cardboard & General waste service, this will be collectively known as an 'internal recycling station'.*

Waste management categories that will drive recycling and diversion from landfill

The material targeted for recycling or disposal has been listed in the following ***Table 4.3.*** Additional detail on the collection, transport and end-use for each material stream is described in Annexure 1.

Combined with the strategic deployment of bins will be signage on each bin that clearly indicates what may or may not be disposed within the nominated bin. Public facing bins at Taronga include best-practice signage developed alongside the NSW EPA and SUEZ, including colour coding and real-life images as examples of what can go in each bin. Most public facing bins have covers, which feature cut outs shaped like the items which should go in, for example a bottle-shaped cut out for the yellow commingled bin. Back of house (BoH) bins generally include signage or stickers in line with best practice also. Taronga is in the process of developing new signage for front of house bins, which may include translations in simplified Chinese to further assist with achieving recycling outcomes.

All bins are colour coded to comply with Australian Standards for mobile garbage bins. (i.e., general waste has a dark green or black body with a red lid whilst co-mingled recycling bins will have a dark green or black body with a yellow lid. The front of each bin and the waste management stations have a general waste or a recycling sticker with pictures of items to accommodate visitors who may be unable to read English or lack reading & literacy skills.

Table 4.3 *Indicates the typical colour coding of the bins that will be used for the Taronga Wildlife Hospital-Nutrition Centre for the various waste streams*

General waste (external)	Red lid, dark green or black base 240 litre bins
Co-mingled recyclables (external)	Yellow lid, dark green or black base 240 litre bins
Office recycle stations (internal)	Red lid, black base; yellow lid, black base; blue bin, black base 60L bins
Food organics waste	burgundy lid, dark green or black base 240 litre bins
Animal/ Meat waste	Brown 120 or 240 litre bins
Paper & cardboard recyclables	Blue 240 litre bins Blue 1100 litre bins
Chemical Waste	5 Litre Plastic containers

For reference purposes photographs of the nominated bins have been displayed in ***Appendix 1****.*

Throughout its overall operations Taronga is striving towards a 90% diversion from landfill rate by 2025. Taronga achieved 90% diversion in 2018 but following the closure of the Camelia processing facility, separated organics from the mixed general waste stream could not be diverted from landfill. As a result, Taronga's recycling rate was 85% in March 2021. Taronga is now working closely with Suez to find a recovery solution for the organic waste that is generated front of house and currently going to landfill.

TWH will be striving towards a minimum of an 80% diversion rate to ensure that the 90% diversion rate is achieved. This is a conservative target, and it is anticipated that a greater percentage of waste will be diverted from TWH, in particular once all the waste system and processes are operational and subsequent to undertaking regular waste audit and education.

Additional practices that will assist in achieving the reduction targets will be the targeted procurement of products that are sustainably packaged and are recyclable. Taronga has initiated several projects aimed at reducing the consumption of single-use plastics on both zoo sites, for example in the food and retail space. Taronga eliminated 80% of single use plastics from food and retail by 2019, and work was undertaken with suppliers to reduce plastic but also explore packaging and materials that are compostable, reusable or recyclable; and to eliminate unnecessary items that create litter such as straws. Taronga has also installed four 'Return and Earn' container collection points onsite, in cooperation with the NSW EPA container deposit scheme. To date, over 2 million containers have been recycled through these collection points.

Monitoring of the OWMP

To ensure efficient, responsible, and sustainable waste management practices, TWH employees will be allocated responsibility for regular monitoring the content of waste and recyclable materials being placed in bins. This will assist with target and KPI management and minimise the potential for contamination and inappropriate disposal activities. To accurately measure whether diversion targets are being met, Taronga's Manager Environmental Sustainability meets with SUEZ every month to evaluate waste tonnage data broken down by material streams, including overall percentage diversion from landfill. Taronga also performs an annual review alongside SUEZ to ensure contract KPIs are being met. If there is repeated contamination of material streams from TWH, an audit can be performed to ascertain how the bin numbers, size, locations and/or empty frequency can be modified to ensure that diversion targets are being met.

To further reduce landfilling of waste generated, the service provider must- if available and if it is financially viable- propose lawful disposal alternatives that will offer additional diversion opportunities of waste materials to either re-use, processing and/or recycling.

In the event of any incident or emergency, it will need to be referred to and managed in accordance with the Taronga Zoo Emergency Response and Pollution Incident Response Management Plan.

Management of Generation points

SUEZ has worked with Taronga in finalising the location of the bins within the Development. The positions of bins have been illustrated in the Appendix 2. The bins have been positioned within a suitable proximity of the waste generation points (allowing for maximum waste capture and minimising the risks of contamination and liability issues). The nominated positions of the bins allow for:

- Ease of access and the safe transfer of the bin to the designated collection point; and
- The need to minimise the risks associated with workplace injuries, public liability and containment.

Vehicle access and waste transfer

Four and one collection points have been allocated for General & Recycle Waste and Animal Waste respectively. These collection points, illustrated in Appendix 3, have been determined to ensure the minimal possibility of injury or spillage subject to the attached SWMS template in ***Annexure 3***. This SWMS has been specifically prepared for the work and will be distributed to the relevant stakeholders and training delivered during site induction and scheduled toolbox meetings.

As is the case with the Zoo's current waste management collections, the waste management vehicles collecting from the zoos internal service roads will enter and exit via the Backyard to Bush Perimeter Fence Gate. After the collection of the waste from Upper Australia, all waste management vehicles will head to 'Styx Yard', the Taronga Zoo common waste storage zone, via Bradleys Head Road.

Review of the OWMP

This OWMP will be reviewed at the time which Taronga's waste service contract is renewed, approximately every five years.

Existing Waste Management Methodology

The following information outlines the existing waste management practices throughout the Taronga Zoo site. It is intended that the TWH waste management plan be incorporated into this existing scheme.

Bin stations

In front of house (public areas), Taronga has approximately 50 x 240 litre bins on site for general waste collection, 35 x 240 litre bins for compostable packaging, and 50 x 240 litre bins for co-mingled recycling. These bins generally sit together at recycle stations (1 x recycling bin, 1 x compostable packaging bin and 1 x general waste bin). There are also 6 recycle stations within Taronga's Food Market (which is the primary food outlet on site).

In addition to the above Suez places general waste and recycling bins on site (as requested) for special events and concerts. Additional coverage of 240 litre bins are required to cover peak periods. These are requested from Suez as required.

Suez's collection activities extend to bin stations located at Athol Hall and the Ferry Wharf.

Animal Waste

Animal waste is collected in 240 litre bins, which are emptied each day into a mini rear-loader and stockpiled at Taronga's waste transfer area. There are approximately 120 animal waste bins located around the site at animal precincts (90 x 240L and 30 x 120L). Suez's staff will collect these bins each morning prior to the zoo's opening.

The material is transported to Suez's Organics processing facility at Lucas Heights where the material is blended with other products and processed into compost for re-use.

Compostable packaging

The food packaging, straws and coffee cups sold onsite are fully compostable so can be

recovered in these bins. There are approximately 35 public facing (FoH) bins dedicated to compostable packaging that is sold onsite at Taronga's retail and food outlets. These bins are collected by Suez on a regular basis and transported to Earthpower commercial composting facility in Camelia.

Fish waste and BoH organics

Fish waste from the preparation of food for marine mammals is placed in 2 x 120L bins and emptied once per week by Suez. Back of house food organics (kitchens preparation waste, café food preparation waste, animal food preparation waste) is also collected in dedicated bins and transported offsite by Suez twice per week. Fish waste and BOH organics is currently transported to the Earthpower facility to be recovered as compost.

Meat waste

Meat waste from animal food preparation is picked up by A J Bush & Sons and delivered to their rendering facility to be recycled into protein meals and tallow.

Co-mingled recyclables

Co-mingled recyclable bins are emptied into an 8m³ rear loading compaction vehicle. This material is then transported off site as required in full truck loads (variable based on Zoo patronage, each day in peak periods or 2 to 3 times per week in non-peak periods). Material is then sorted at the recycling facility to maximise the amount of recycling material.

Paper and Cardboard

Taronga Zoo's cardboard and paper is collected in separate blue bins and cardboard cages. The contents of the bins and cages are emptied daily into a 23 cubic metre on-site compactor. Once the compactor is full, the paper and cardboard is transported to either Visy Recycling or Orora Recycling (lawful recycling facilities).

Green waste

Material is collected by Taronga Zoo staff and placed into a dedicated skip bin. When full, this bin is then transported by SUEZ to the SUEZ's Ryde transfer station, where it is bulked up with other green waste and then transported by walking floor trailers to SUEZ's facility at Eastern Creek. There it is processed into a range of re-useable mulches and compost.

Bulk waste

Non-recyclable materials such as construction waste, fibrous plant material like bamboo, broken equipment, miscellaneous materials, etc. are placed into a general waste bulk bin. When full, this bin is transported by SUEZ to SUEZ's Artarmon transfer station, where it is bulked up with other general waste products and transported to either of SUEZ's landfill sites at Eastern Creek or Lucas Heights.

Note –: any items that contain scrap metal or that are made of metal are placed in a dedicated scrap metal bin which is transported to a metal recycling facility when full.

Medical and Clinical waste

Medical and Clinical waste at Taronga Zoo is managed by SUEZ. It is collected in appropriate containers and transported for necessary treatment and disposal.

Anatomical Waste

Anatomical waste is managed by SUEZ. It is collected in distinctive bins and transported for incineration and disposal. This type of waste is generally stored in a freezer until collected. If bins become full an additional collection can be arranged by SUEZ.

Pharmaceutical Waste

Pharmaceutical waste is taken for disposal when required, this includes removal of all expired drugs.

Biosecurity/Quarantine Waste

Quarantine regulations apply to biosecurity waste. A separate driver from Suez collects this isolated bin and takes to SteriHealth for treatment and disposal.

Chemical Waste

Stored in the provided reusable 5 litre plastic containers by Lab Tech Services. The chemical waste is stored in a cabinet designed to store chemicals and is bunded to catch any potential spills. Lab Tech Services picks up the chemical waste either monthly or as needed and transports it back to their facility for relevant treatment and disposal.

Other waste types

- *Asbestos (Special waste as per NSW EPA classification system)*

Asbestos will be managed in accordance with *CWIO Asbestos Management Plan for Taronga Zoo*.

- *Grease Trap Waste*

SUEZ services the grease traps for both Taronga and Epicure Catering. The pits are serviced on a scheduled basis as determined by Sydney Water. The grease trap residue is transported by SUEZ in dedicated tankers to Earthpower for processing, recycling and disposal.

- *Styrofoam*

Styrofoam boxes used in fruit and vegetable deliveries for animal food are sorted by the Nutrition team and those in good condition are sent back to the suppliers for reuse.

- *Other miscellaneous wastes*

From time-to-time, there may be the need for other specialised waste collections. In such cases SUEZ will assess and provide the Zoo with a proposal, prior to collection and transport of these waste products to an appropriate lawful facility.

- *Container Deposit Scheme (NSW)*

There are four Container Collection points at Taronga as part of the NSW Government Container Deposit Scheme (CDS). Three of these are Donation Stations that are located within the zoo grounds, and the 4th being a Reverse Vending Machine that is publicly accessible 24/7 outside of the zoo's secure perimeter.

Disposal bins provided by SUEZ

All waste and recycling activities are carried out in accordance with the guidelines and laws of the NSW EPA. In all cases only lawful and approved waste facilities are utilised.

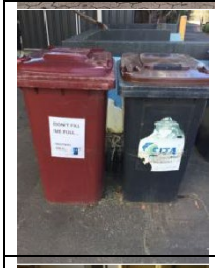
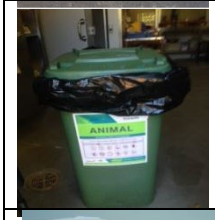
Transfer area

1. Animal Waste - 2 x 5 cubic metre bins
2. Steel - 1 x 23 cubic metres
3. Bulk waste - 1 x 23 cubic metres
4. Green Waste - 1 x 23 cubic metres
5. Cardboard Compactor - 23 cubic metres
6. 100 x spare 240 litre bins as spares and for change over purposes

Transport vehicles

1. 4 x 2 rear loaders (animal waste/compostable packaging/general waste)
2. 1 x 2 tonne Pantech truck with tail gate lifter (cardboard/paper/beverage containers)

APPENDIX 1 : (BIN TYPES NOMINATED IN TABLE 4.2)

Image	Waste stream
 	Paper / cardboard - 120 lt blue bin Secure - 240 lt blue bin yellow lid
	**Office Space – recycle station** Recyclables- 60Lt bin – yellow lid Paper/cardboard – 60Lt blue lid General waste – 60lt red lid
 	**Public Space - recycle station** General waste -240 Lt bin Recyclables – 240 Lt bin
 	Animal and green waste - 240Lt bin
	Biological waste – 240 Lt bin
	Medical sharps waste -5L

	Biosecurity Waste
	Clinical Waste
	Anatomical Waste
	Chemical Waste
	Chemical Waste Storage

Level 2 – Waste Collection

Level 3 - Waste Collection