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25 February 2013

Mr Chris Ritchie
Team Leader – Industry Projects
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr Ritchie

Subject: **Villawood Soil Remediation Project**
Project Approval 09_0147
Modification Request 1

Further to our letter of 20 February 2013, Orica is pleased to provide further details in support of our application to modify the above Project Approval to clarify our proposal that untreated and treated water storage be in the form of in-ground, clay- and plastic-lined ponds.

Project Background

The project is the remediation of contaminated soil on part of a former chemical manufacturing facility owned by Orica at 2 Christina Road, Villawood. The site was used to formulate a wide range of agricultural and pharmaceutical chemicals until it was closed in 2000. These chemicals included DDT and other organochlorine pesticides which are persistent in the environment.

The soil will be remediated using a well-proven treatment process known as Directly-heated Thermal Desorption (DTD), which has been recently used on three large scale Sydney projects – the Allied Feeds and Lednez projects at Rhodes and the car park waste encapsulation project at Orica's Botany site – as well as on several smaller projects..

The amount of soil to be remediated at Villawood is of the order of 25,000 m^3.

The remediation works will allow the Site to be returned to a standard suitable for ongoing industrial use.

The project was subject to a comprehensive Environment Assessment, completed in February 2011.

The project was approved by the Department of Planning & Infrastructure (DPI) on 18 May 2012.

Water Management Requirements

The project activities can generate potentially contaminated water from the following sources:
System 3 will receive water from areas with high potential to contain contaminated materials, including:

- Rain water collected from excavation areas, stockpile areas, wash down areas and road surfaces;
- Water from the wheel washes used for cleaning the tyres of trucks hauling soil and from decontamination facilities;
- Rain water falling on the DTD plant concrete slab and other such plant areas;
- Water bled out of the DTD plant scrubber and evaporative cooler systems.

This is consistent with the EA Figure 7, reproduced below.

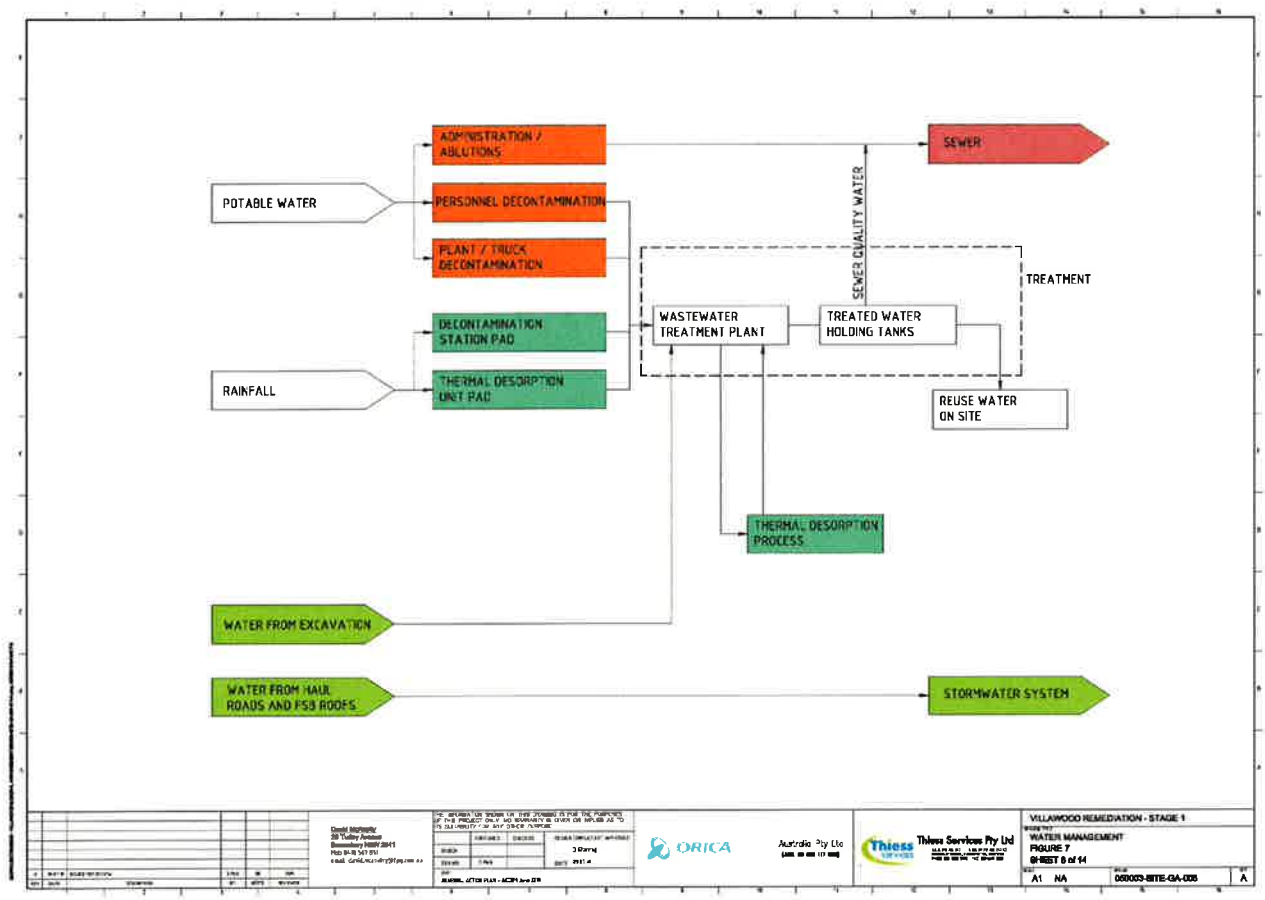

Figure 7 is a conceptual diagram. In order to be able to construct an appropriate water management facility, it is necessary to evaluate the potential volumes of water to be collected and processed and then to design a practicable project solution, which includes means of managing the various flows to and from the wastewater treatment plant.

A detailed Water Management Plan has been submitted to the EPA, DPI, Office of Water and Bankstown City Council. It shows that, based on the maximum envisaged area of excavation and other paved collection areas and a 250 mm rainfall event (which is larger than ever recorded in the area), a storage capacity of up to 1,500 m^3 is required for potentially contaminated, untreated water.

Additionally, because rainfall and other flows to the wastewater treatment plant are intermittent, upfront storage enables the plant to run continuously and reliably at a manageable flow rate. This avoids having an oversized plant that runs stop/start to process large flows one moment and nothing the next. Such a plant would be prone to significant maintenance issues.

With respect to what happens downstream of the wastewater treatment plant, it must be noted that Sydney Water requires non-detection of organochlorine pesticides in any discharge to the sewer system. To accommodate this, three separate storages are proposed one filling, one being tested and one discharging to sewer. No discharge to sewer is permitted without analytical results showing non-detect for the contaminants of concern. If contaminants are detected, the treated water is recycled to the untreated water storage tank. The volume of the three tanks is 3,600 m^3. This is similar to the system used by Thiess on the Rhodes projects

The capacity of the wastewater treatment plant is nominally 20 m^3/hour, which equates to about 60 hours, or 2 ½ days, storage in each holding tank on average, which is enough time to allow analytical results to come to hand before sewer discharge.

Design of the Storage Facilities

The large volumes of the storage tanks – up to 1,600 m^3 – and other constraints and considerations mean the most practical way of providing this capacity is in in-ground tanks in the form of clay- and HDPE-lined ponds.

This is not inconsistent with the EA. While Figure 7 refers to holding tanks, ponds are tanks by another name and the Remedial Action Plan, Appendix D of the EA, Section 16.2.3 suggests that storage before discharge could be in the form of a pit.

The storage ponds will be carefully constructed via a cut-to-fill exercise, along with a small amount of importation and placement of clay materials to line the ponds. An outline of construction methodology for the ponds is provided below:

- Remove existing out-of-service trade waste lines, locate potentially impacted stormwater infrastructure and complete any required modifications;
- Excavate base of pond and shape and compact walls;
- Inspect base of pond for any potential penetrating objects, such as steel or jagged concrete or rocks and remove as required;
- Import and place clay liner as required on areas with potential to penetrate pond liners;
- Place layer of geofabric on base of pond;
- Excavate anchor trenches around pond walls to 0.5 m depth x 0.5 m wide, or as required by geotechnical engineer;
- Place and weld layer of HDPE across pond, with sufficient overlap for anchor trenches; and
- Fill pond with 100 mm of clean water to stabilise.

The proposed design also includes primary sedimentation to recover a high proportion of fine particles to also improve reliability by avoiding potential blockages.

Environmental Assessment

Sustainability

The proposed in-ground tanks provide a practical, economical, and sustainable approach consistent with that used elsewhere:

- The sloping topography of the site suits the use of cut-and-fill to create the ponds, cutting roughly 1 m below the surface and using the soil to create perimeter walls approximately 1 m above the surface. For the tank alternative, it would be a massive civil works exercise to create level benches on the ground to position a series of tanks in a sensible arrangement.
- For the total storage capacity of approximately 100 off-the-shelf poly tanks would be needed, with a complex of interconnecting piping would provide significantly more opportunity for a loss of containment than the 4 proposed ponds.
- The ponds avoid the energy and materials used to create 100 tanks, the lead time is supplying them and the disruption to traffic of 100 wide loads.

Odour

The water that is likely to enter the contaminated water storage tank is unlikely to have any discernible odour. The main contaminant is DDT and its metabolites which only have a slight almost sweet odour. The DDT and its breakdown compounds DDD and DDE are very insoluble in water and will be largely removed by primary sedimentation and then fed to the DTD plant.

The Air Quality Impact Assessment, Appendix H of the EA, concluded that odour concentrations would be well within the relevant limits. It considered odour arising from the face of excavations, rather than from the surface of a pond, but the surface area of the open excavations is up to 4,000 m^2, compared with the surface area of the untreated water pond of 800 m^2, which will make a negligible contribution to odour. Odour control systems, such as odour neutralising sprays, will be available if any odour is detected

Orica notes that on the Rhodes projects, where the contaminants were more odorous, open ponds were used.

Disturbance of Contaminated Soil

The ponds will be constructed within the footprint of the ISZ 3 area, which does not contain any concentrations in excess of the Risk-Based Site Wide Criteria, as determined by the Human Health Risk Assessment for the Site. Nonetheless, it is the design intention to reuse any material excavated from pond bases for construction of pond walls, thereby ensuring that the bulk of excavated material remains in the excavation area. Any surplus materials will be temporarily stockpiled and sampled, prior to reuse elsewhere on the site.

Pond bases and walls will be covered in impervious HDPE plastic for the duration of the project, thereby preventing potential erosion and eliminating the potential spread of this material to downstream areas. At completion of the works, the ponds will be emptied and plastic liners disposed of to a licensed waste disposal facility. The pond walls will be reused to backfill the ponds back to grade, and the area will be regressed.

Potential for Overflow to the Environment

The use of ponds does not increase the potential for loss of containment of contaminated water because:

- As noted above, pond capacity has been based on highly conservative rainfall data – a 250 mm rainfall event;
- Additionally, the excavation areas can contain at least 250 mm of direct rainfall without any discharge to the untreated water storage pond;
- During rainfall events the wastewater treatment plant will continue to treat water at a rate of approximately 480 m^3 per day;
- The treated water storage ponds provide an additional 3,500m^3 of storage, which could be used for untreated water storage in emergencies; and
- Procedures will be in place to shut down or manage water sources that may cause a discharge from the site including stopping the transfer of water purged from the DTD plant and stopping the pumping from excavations or collection areas.
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In consideration of the above, the probability of an overflow from either excavation areas or storage ponds is extremely low.

To provide further security:

- The ponds will be operated close to empty but in all circumstances at least 300 mm below the top and there will also be a high and a high-high alarm in the untreated (contaminated) water pond;
- The ponds will be subject to daily visual inspection;
- There is approximately 150 m3 of storage on the site in the form of existing, serviceable tanks and bunds; and
- As a last resort, offsite transport and disposal of liquid waste is available, but is not desirable due to the high additional cost, additional carbon footprint, and increased risk of an offsite environmental impact during transport.

Related Works

There has been no change to the collection of water and its discharge to sewer.

The Water Management Plan identifies potential impacts on water quality and details the management measures that will be implemented to minimise the risk of these impacts occurring. The specific goals of the Plan are to:

- Minimise the risk of water coming into contact with contaminated materials;
- Identify areas which pose a risk of generating contaminated water;
- Contain all water falling within these areas;
- Transfer all potentially contaminated water to a primary storage;
- Treat all potentially contaminated water through an onsite Wastewater Treatment Plant; and
- Ensure only water meeting approved discharge criteria is released from the Site.

Summary

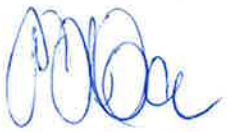
Since Project Approval, the concept designs in the EA have been turned into detailed designs.

For reasons of practicality, sustainability and cost, Orica proposes to use in-ground, clay- and HDPE-lined ponds for water storage.

Orica believes this is consistent with the concepts in the EA and provides for enhanced performance of the remediation facilities but the EA does not make it clear that water storage tanks will be open ponds. Hence, the DPI has requested that Orica seek a Modification to the Project Approval.

The ponds have no negative environmental impact and the increased storage they provide over above-ground fabricated tanks provides additional confidence in the project's environmental performance with respect to the ability to capture potentially contaminated water, the reliability of the wastewater treatment plant and the capacity to store and validate the quality of treated water before discharge to sewer.

Yours faithfully



Peter O'Dea
Project Manager

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Encl.: Site layout drawing GSW-REV-20.02.13
Request to Modify a Major Project form