Q&A: Orica Mercury Independent Review Stage Two

What is the Orica Mercury Independent Review?

In January 2013, the NSW Environmental Protection Agency (EPA) announced that it would conduct an independent review of all information around historical mercury emissions around Botany Industrial Park. The comprehensive review is being overseen by a steering panel, which includes representatives from the EPA, community, Randwick and Botany councils, the Office of Environment and Heritage, NSW Health, an expert toxicologist and an independent chemical engineer.

Independent experts have been contracted for each stage of the review process to assess any potential off-site mercury impacts around the company's former chlor-alkali plant. A thorough analysis of available data, including information from the community, was undertaken to determine if anything further is needed to assess the risk.

The review is assessing the potential for health risks to the adjacent community associated with mercury emissions from the former plant. If, in the course of the review, it is established that other hazardous substances need to be investigated, this will be done.

What were the key recommendations of Stage One of the Review?

In December 2013, the EPA announced the findings of stage one of the review, conducted by independent experts CDM Smith Australia. They found that the risk of off-site soil contamination around the Botany Industrial Park is low, and that there is no evidence of illegal off-site dumping of mercury waste from the chlor-alkali plant that operated at Botany between 1944 and 2002. However to provide additional reassurance to the community, CDM Smith recommended a program of environmental testing on publicly-owned land (parks, reserves, easements, verges) and private residences within a 1.5 kilometre radius of the former chlor-alkali plant at Botany Industrial Park.

How many locations are being sampled?

Enough samples are being collected to provide a reliable scientific assessment of the potential risk of contamination in the residential suburbs around the former plant. A summary table of all test locations can be found in Table 1 – Summary of sampling and analysis program.

In addition, sampling of mercury vapour levels are being conducted during soil sampling and in stormwater drains, and fish and sediment sampling is being conducted in Penrhyn Estuary.

Which public parks are being sampled?

Nineteen parks and reserves are being sampled at 80 sampling points. A list of all sites and details of the sampling areas within sites can be found in Table 2 – Summary of sampling in parklands.

What private land is being sampled?

During Stage One of the review, local residents were invited to complete a questionnaire and indicate whether they felt their land should be sampled.

All single-dwelling residents who have expressed an interest will be invited to opt-in to the sampling program. If some of these landowners decide not to take up this option, other sites may be considered.

Why are stormwater drains being sampled?

Stage One confirmed the historical evidence that mercury entered Springvale Drain during the operation of the former chlor-alkali plant.

The sediments in Springvale Drain have been remediated, but this current round of mercury vapour sampling will assess the potential for significant presence of mercury in other stormwater drains around the former plant.

Who is carrying out the sampling and how are samples being taken?

Sampling is being carried out by expert independent consultants WSP Environmental. Qualified environmental scientists are undertaking the following:

Soil – All sampling locations are drilled to a maximum depth of half a metre using hand augers (similar in appearance to a large corkscrew) which minimises the impact on residents.

Sediment – Twenty samples from the surface layer of sediments beneath Penrhyn Estuary are being collected and analysed. Samples are collected by a combination of wading from the water's edge and from a boat using a dredge sampler.

Fish and Shellfish (Biota) – Biotic sampling is being conducted within Penrhyn Estuary. As the uptake of mercury can vary within and between species it is important to collect tissue samples from a variety of fish at different stages of their life cycles. Approximately 70 replicate tissue samples are being taken, which will comprise of 10 individuals each from seven fish species – sea mullet, yellowfin bream, silver biddy, dusky flathead, flat-tail mullet, sand mullet and toad fish.

Air – In order to provide site-wide coverage of potential ambient atmospheric mercury vapour concentrations, sampling is being carried out at each of the soil testing locations as well as from drain openings down-gradient of the former chlor-alkali plant. Analysis is carried out 1 metre above each soil sampling location and 5 centimetres above each open borehole using a hand-held, highly sensitive Lumex 915 Gas Analyzer. The device is also be lowered approximately 0.5 to 1 metres below each drain grate, as well as at the drain opening and 1 metre above to provide an idea of the risk of vapours emanating from the drains.

A summary table of the sampling and analysis program being undertaken can be found Table 1 – Summary of sampling and analysis program.

Will the soil and air sampling pose a health risk to the community?

This is very unlikely. Localised sampling poses a very low risk of releasing any significant emissions into the air or significantly disturbing existing surfaces.

Why are the fish and sediments in Penrhyn Estuary being sampled?

Contaminated stormwater from the former plant was discharged into Penrhyn Estuary during its operation.

The Estuary has been sampled previously for a range of contaminates, including mercury. This current round of sampling of biota and sediments will be compared against the results of previous sampling to establish a trend line and confirm the results from previous sampling which indicated that mercury within biota in the Estuary is decreasing.

What fish species are being sampled?

The fish species to be sampled are the same as those collected in previous studies. This will ensure a true comparison of all the previous and current data. The species to be sampled are:

- sea mullet (Mugil cephalus)
- yellowfin bream (Acanthopagrus australis)
- silver biddy (Gerres subfasciatus)
- dusky flathead (Platycephalus fuscus)
- flat-tail mullet (Liza argentea)
- sand mullet (Myxus elongatus)
- toad fish (Tetractenos hamiltoni).

If mercury levels are low in Penrhyn Estuary, will the fishing ban be lifted?

No. The fishing ban in Penrhyn Estuary is in place because of the presence of many contaminants resulting from past industrial activities in and around the Botany area.

Further information on fishing bans in Botany Bay can be found at the NSW Department of Primary Industries pages on Botany Bay and Georges River (http://www.dpi.nsw.gov.au/fisheries/info/closures/rec-sw-loc/central-coast-index/botany-bay-and-georges-river).

How long until the results are announced?

The Mercury Review Steering Panel will oversee the process of reviewing and announcing the results of WSP Environmental's sampling program.

Initial data from the sampling conducted on public land is expected to be available in March 2015.

WSP Environmental's full report, which will include the sampling results from private and public land, analysis and recommendations, will be available in the second quarter of 2015. (*Note:* the location of private residences sampled will not be made public.)

Who is paying for the Mercury Review?

Orica is paying for the work carried out in each stage of the review. The NSW Environmental Protection Agency (EPA) engages independent consultants who are selected by the Mercury Review Steering Panel and reimbursed by Orica.

More information

To find out more information about Stage Two of the Mercury Review, contact WSP Environmental at 8907 0900 or au.wspenvironmental@wspgroup.com, or contact the EPA at 131 555 or info.botany@epa.nsw.gov.au.

To receive regular updates about the EPA's regulatory work associated with the Botany Industrial Park, community members can sign up to the EPA Botany Area Community Information Group by sending an email to info.botany@epa.nsw.gov.au.

A more extensive Q&A list can be found in the EPA public information session notes (www.epa.nsw.gov.au/resources/epa/mercrevpis.pdf)

Table 1 - Summary of sampling and analysis program

Aspect	Sampling locations	Analytical suite
Soil assessment		
Residential properties	33 residential properties – 2 soil bores (hand auger) per site making 66 boreholes. 2 samples per borehole totalling 132 samples for analysis.	268 primary + 26 QA/QC tests for Mercury
Road verges	68 bores (hand auger) with 2 samples per location totalling 136 samples	20 primary + 2 QA/QC test for Lead, Chromium, PAH and PCBs
Parklands	80 boreholes from 18 public parks and reserves (2 to 15 locations per park) - 2 samples collected from each borehole totalling 160 samples for analysis	160 primary + 16 QA/QC tests for Mercury
Mercury vapour assessment		
Residential properties and parklands	Field screening using a hand held mercury meter at each borehole location (184 boreholes in total). Screening at 0.1m bgl in the hole and at 1m above the ground surface	No analysis required – field data
Storm water drainage network	Selected accessible drainage openings along road verges in the local area will be screened for fugitive mercury vapour emissions.	No analysis required – field data
Sediment assessment		
Sediments of Penrhyn Estuary	20 samples collected at approximately 220 to 300m increments from drainage openings on Foreshore Road, to the airport. Samples collected from the upper 0.05m of sediment from a combination of wading and boat access.	20 samples + 26 QA/QC tests for Mercury 2 samples methyl mercury (following receipt of initial results)
Biota testing		
Middle trophic species (fish) from Penrhyn Estuary	1 day of work using netting techniques in the estuary. Allowance made for capture of up to 70 fish for analysis.	70 samples for total mercury

Table 2 - Summary of sampling in parklands

Park Name	Area (m^2)	Number of sampling points	Approximate testing grid (m)	Rationale
Mutch Park	129,305	8	125	Large park approximately 1.5km from the FCAP. Therefore a low sampling density selected.
Pioneers Park	119,247	7	130	Large park more than 1.5km from the FCAP. Therefore a low sampling density selected.
Grace Campbell Reserve	12,915	0	-	Has been previously tested.
Rhodes Street Reserve	11,196	4	55	Medium sized park approximately 0.5km from the FCAP. Therefore a relatively intensive sampling density selected
Purcell Park	16,467	4	65	Medium sized park within 1km from the FCAP. Therefore a moderate sampling density selected.
Barwon Park	33,459	6	75	Medium sized park within 1.5km from the FCAP. Therefore a moderate sampling density selected.
Jauncey Place Reserve	1,640	2	30	Small park within 1km of the FCAP. Minimum of two samples chosen.
Garnet Jackson Reserve	28,190	5	75	Medium sized park approximately 1.5km from the FCAP. Therefore a moderate sampling density selected.
Nagle Park	33,276	6	75	Medium sized park just outside the 1.5km distance from the FCAP. A moderate sampling density was applied.
Heffron Park	455,087	15	175	Very large park more than 1km from the FCAP. Therefore low sampling density chosen.
Franklin Street	2,593	2	35	Small park more than 1.5km from

Park Name	Area (m^2)	Number of sampling points	Approximate testing grid (m)	Rationale
Reserve				the FCAP. Minimum of two samples chosen. Potential background location to the south east as it is a significant distance from the source and unlikely to be subject to filling.
Muller Reserve	1,024	2	25	Small park more than 1km from the FCAP. Minimum of two samples chosen.
Baird Reserve	1,159	2	25	Small park within 1km of the FCAP. Minimum of two samples chosen.
Grace Campbell Crescent Reserve 1 (Northern)	1,482	2	25	Small park within 0.5km of the FCAP. Minimum of two samples chosen.
Grace Campbell Crescent Reserve 2 (Southern)	513	2	15	Small park within 0.5km of the FCAP. Minimum of two samples chosen.
Nielsen Street Reserve	469	2	15	Small park within 0.5km of the FCAP. Minimum of two samples chosen.
Rabaul Reserve	1,787	2	30	Small park more than 1.5km from the FCAP. Minimum of two samples chosen. Possible background location to the east as it is a significant distance from the source and unlikely to be subject to filling.
Sir Joseph Banks Park	195,435	5	200	Very large park more than 1.5km from the site therefore a very low sampling density applied. Possible background location to south west due to distance from the site.
Hensley Athletics Field	26,528	4	80	Medium sized park approximately 1.0km from the FCAP, significantly reworked in development of the athletics field.

Park Name	Area (m^2)	Number of sampling points	Approximate testing grid (m)	Rationale
Total		80		

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