

# **Botany Mercury Independent Review**

## **SCOPE OF WORKS**

### **1. Introduction**

Orica (formerly ICI Australia) has operated a chemicals manufacturing facility at the Botany Industrial Park in Matraville since 1942. Orica still undertakes chemical production of chlorine at the site, an activity that is regulated by the provisions of Environment Protection Licence No. 2148. The NSW Environment Protection Authority (EPA) monitors compliance with the conditions set by the licence.

Elemental mercury was used at Orica's former chlor alkali plant at the site from 1945 until its closure in 2002. This resulted in mercury contamination of the soil and groundwater in the region of the plant. Remedial action is ongoing at the site to clean up contaminated soil and prevent any further impacts on groundwater.

The clean up is being regulated by the EPA under the Contaminated Land Management Act 1997 by a Management Order issued in early 2012. Orica has prepared an analysis of detailed remediation options which the EPA has approved. Orica must now submit a Remediation Action Plan, including a timeframe for completion of the works and ongoing community consultation. The works must be completed by the end of 2014.

The primary area of elemental mercury soil contamination is covered by an enclosure that controls airborne mercury emissions while the final plan to remediate the site is developed and approved. Orica's Environment Protection Licence includes strict conditions relating to mercury. Ambient air monitoring carried out by the company within the boundary of the premises indicates that mercury levels are low and meet licence limits and health standards.

Previous studies detected mercury in sediments in Penrhyn Estuary in Botany Bay near the Patricks Shipping Container Terminal that reached the site through a stormwater channel. The contamination was subsequently cleaned up but a ban on fishing in the estuary remains in place.

In response to concerns raised by community representatives, the EPA has been directed by the NSW Minister for the Environment to undertake an independent review of the environmental and health impacts from historic mercury emissions from Orica's former chlor alkali plant at Matraville.

The Botany Mercury Independent Review Steering Panel has been established to provide an opportunity for community involvement and to provide expert advice to inform and oversee the Review. The panel includes representatives from the EPA, NSW Ministry of Health, Office of Environment and Heritage, City of Botany Bay and Randwick Councils, an independent health expert and community members. The steering panel will inform and oversee the independent review. The steering panel will select suitable independent experts to conduct the review, evaluate the results of the investigation and its recommendations and communicate the findings to the community. If in the course of the review, it is established that other hazardous substances need to be investigated, the steering panel will ensure this is done.

### **2. Purpose**

The purpose of the review is to determine if there is a significant public health risk and the level of such health risk to the community associated with mercury release during the operation of Orica's former chlor alkali plant at Matraville from 1945 until 2002.

The review will determine if there are any sources of community exposure to mercury that are not currently being managed and controlled under a legislative instrument and ascertain if there are communities and/or individuals at risk and, in so doing, assist in reassuring the community that appropriate actions are or have been taken through current and legacy projects managed by Orica and regulated by the EPA at the Matraville site and provide recommendations.

### **3. Tasks**

Suitable experts will be engaged to perform the review which will require a number of stages:

#### **Stage 1 - Data and Information Collection and Review**

- Undertake a comprehensive independent review and analysis of the available data on the emission and distribution of mercury or mercury-contaminated material, addressing all the Community Concerns for Consideration as outlined below, and including an analysis of the extent and limitations of the data and information available
- Seek other information (e.g. confidential submissions from members of the public) that may be available about potential community exposure to mercury originating from the former chlor alkali plant
- Determine what further information (e.g. environmental sampling) is needed to assess the potential health risks to the community that are attributable to mercury emissions from the former plant
- Determine the appropriate criteria for risk assessment and environmental testing types, methodologies and locations to assist in determining the health risk including any seasonal variation, staged testing regime and appropriate quality assurance requirements
- Provide an Independent Review Report with recommendations concerning all abovementioned tasks.

#### **Stage 2 - Environmental Testing Regime**

- Conduct the appropriate environmental testing and analyses as determined by Stage 1 and make any necessary recommendations in regard to informing health risk assessments
- Identify any significant sources of mercury exposure which may cause possible short- and long-term impacts on the health of the local community from:
  - mercury within the ambient air
  - mercury contamination in soils at the site
  - mercury in soils outside the boundary of the site
  - mercury in groundwater.

#### **Stage 3 - Health Risk Assessment for Public Health Concerns**

- Implement recommendations of Stage 2 - Environmental Testing Regime conduct a health risk assessment, including any necessary clinical testing, to identify any significant routes and significant doses of exposure including the identification of vulnerable populations, actively taking children into account, to protect health

- Determine if there is a significant risk to human health and make any necessary recommendations about population-based testing for mercury exposure and/or for clinical assessment for mercury exposure/poisoning of population groups deemed to be at significant risk
- Make any necessary recommendations regarding public health risks and assessment of individual health risks.

#### **Stage 4 - Health Risk Assessment for Individuals**

- Implement sampling regime and conduct individual health risk assessment activities including population-based testing for mercury exposure and clinical assessment of mercury exposure/poisoning of population groups deemed to be at significant risk as determined by Stage 3 - Health Risk Assessment for Public Health Concerns
- Determine if there is a significant risk to human health and make any necessary further recommendations.

#### **4. Community Concerns for Consideration in Stage 1 - Data and Information Review (not exhaustive)**

The following issues of community concern must be included for consideration by the Stage 1 - Data and Information Review:

- What criteria should be used in the assessment of risk from mercury contamination from Orica's former chlor alkali plant?
- Is the presence of mercury above pre-habitation background levels an indicator that further sampling and analysis are required to establish actual contamination levels?
- What is the risk, and possible short- and long-term impacts, on human health and the environment from Orica's former chlor alkali plant associated with mercury emissions from 1945 until the plant closed in 2002, outside the boundary of the site in the ambient air, soils, groundwater and surface water?
- What is the risk to human health and the environment outside the boundary of the site from mercury contamination currently in soils inside the site?
- Have previous reports adequately identified the level of risk of mercury contamination outside the boundary of the site? What was the nature and findings of previous contamination testing in air, soils, groundwater and surface water?
- What types of sampling should be performed?
- What methodologies should be used for sampling?
- Where should sampling be conducted?
- Should air quality be measured in people's homes? If so which homes? Should concerned community members be offered testing?
- What is the appropriate season to perform monitoring for gaseous mercury emissions?
- Should roadside drains be tested for elemental and gaseous mercury?
- Are there anode sludge dumps at:
  - Anderson Street and surrounding area including the abandoned block of overgrown land at the back of a school
  - Heffron Park

- Franklin Street / Wassell Street
- Anderson Street
- What is the risk from anode sludge dump sites?
- Should Port Botany shore line, Penrhyn Estuary and the delta fan that enters the estuary be tested? Should the fishing ban in Penrhyn Estuary continue? If so why?
- What is the risk of mercury contamination associated with the use of Malabar Headland as a waste site?
- What is the risk from other potential sources of mercury in the area? i.e.:
  - Mercury from Bunnerong Power Station
  - Ash from the power station used as fill across the Port Botany area
  - Any other potential sources of mercury.
- Confidential representations made to the review by community stakeholders, including former and current workers, to present information and knowledge of Orica work practices and health status.
- What does the groundwater monitoring associated with the groundwater treatment plant tell us about mercury contamination of groundwater?

## 5. Definitions

For the purposes of this Review:

**Clinical testing** - testing of an individual patient for the purpose of assessing that individual's risk, diagnosis or progression of disease.

**Environmental Testing** - the use of analytical chemistry and other techniques to study the environment to monitor and investigate levels of pollutants in the atmosphere, soil, surface and ground waters and other specific settings, to identify any significant routes and significant doses of exposure including the identification of susceptible populations and environmental receptors using established methodologies and criteria.

**Population testing** - testing of defined groups of individuals in a standardised and reproducible manner in order to assess the extent of exposure to mercury in the populations represented by those groups. Its purpose is not to test for toxicity (i.e. disease caused by exposure) in individuals.

**Significant** – if in the steering panel's judgement exposure could result in a potential or real health impact.

## 6. Work schedule and deliverables

### Stage 1 - Data and Information Review

- A completed Stage 1 - Data and Information Review Report, including conclusions and recommendations and environmental testing types, methodologies and locations, in accordance with the scope of works, shall be submitted to the Botany Mercury Independent Review Steering Panel within one month of commencement of the Stage 1 - Data and Information Review , unless otherwise agreed
- The Stage 1 - Data and Information Review Report shall outline the methodologies used to formulate conclusions and recommendations

- Present a summary of the report and recommendations to the Botany Mercury Independent Review Steering Panel and a community meeting.

### **Stage 2 - Environmental Testing Regime**

- A completed Stage 2 - Environmental Testing Regime Report, carried out in accordance with the recommendations of the Stage 1 - Independent Data and Information Review Report and the scope of works and as required in direction from the Steering Panel, including identification of any significant routes and significant doses of exposure and susceptible populations, shall be submitted to the Botany Mercury Independent Review Steering Panel within one month of commencement of the Stage 2 - Environmental Testing Regime, unless otherwise agreed
- The Stage 2 - Environmental Testing Regime Report shall outline the methodology used to perform the environmental testing and analyses and formulate conclusions and recommendations
- Present a summary of the report and recommendations to the Botany Mercury Independent Review Steering Panel and a community meeting.

### **Stage 3 - Health Risk Assessment for Public Health Concerns**

- If recommended by the Steering Panel following consideration of Stages 1 and 2 a completed Stage 3 - Health Risk Assessment for Public Health Concerns Report, carried out in accordance with the recommendations of Stages 1 and 2 and the scope of works, including identification of significant risks to human health and any recommendations about population-based testing or clinical assessment for mercury exposure, shall be submitted to the Botany Mercury Independent Review Steering Panel within one month of commencement of the Stage 3 - Health Risk Assessment for Public Health Concerns, unless otherwise agreed
- The Stage 3 - Health Risk Assessment for Public Health Concerns Report shall outline the methodology used to perform the health risk assessment, testing and analyses and formulate conclusions and recommendations
- Present a summary of the report and recommendations to the Botany Mercury Independent Review Steering Panel and a community meeting.

### **Stage 4 - Health Risk Assessment for Individuals**

- If recommended by the Steering Panel following consideration of Stages 1, 2 and 3 a completed Stage 4 - Health Risk Assessment for Individuals Report, including evaluation of sampling regime and health risk assessment activities, shall be submitted to the Botany Mercury Independent Review Steering Panel within one month of commencement of the Stage 4 - Health Risk Assessment for Individuals, unless otherwise agreed
- The Stage 4 - Health Risk Assessment for Individuals Report shall outline the methodology used to perform the sampling regime and health risk assessment activities, testing and analyses and formulate conclusions and recommendations
- Present a summary of the report and recommendations to the Botany Mercury Independent Review Steering Panel and a community meeting.

## **7. Available documentation**

Schedule and documents to be provided.

## 8. Project expenses

The Reviewer/s will be engaged by the Environment Protection Authority and report to the Botany Mercury Independent Review Steering Panel which is chaired by the Environment Protection Authority.

The Reviewer shall provide an estimate of cost of the work prior to commencement.

The Panel shall review and approve the costs for the Independent Reviewer and any variations.

## 9. Qualifications for experts

The outcomes of Stages 1 and 2 of the review will inform the precise nature of the qualifications and expertise required for conducting the Stage 3 and 4 health risk assessments, although it is likely that expertise in mercury toxicology will be required.

To be eligible the applicant must demonstrate, to the EPA's satisfaction, in their application and any associated examination and interview that they have at least those qualifications required for accreditation under the NSW Contaminated Site Auditor Scheme under the *Contaminated Land Management Act 1997* which are:

- a) any conflicts of interest must be declared; where previous assessment work has been undertaken for Orica, details must be provided, this would be assessed by the panel and may exclude applicants from participation
- b) a relevant bachelor's or higher degree from a recognised college or university
- c) at least five years' broad experience in contaminated site assessment and remediation involving a wide range of contamination in various media, including at least two years of relevant experience in Australia and two years as a supervisor or project manager
- d) a good understanding of:
  - i. contaminated site assessment
  - ii. soil sampling, and soil sampling design and methodology
  - iii. groundwater sampling, and groundwater sampling design and methodology
  - iv. interpretation of analytical data
  - v. quality assurance and quality control procedures
  - vi. assessment of contaminant exposure pathways and risks
- e) a good understanding of the impacts of contaminated sites on:
  - i. the environment
  - ii. public health
  - iii. worker health
- f) a good understanding of NSW legislation relating to contaminated sites, environment protection and planning
- g) a good understanding of national and NSW guidelines, policies and legislation relating to contaminated sites
- h) a good understanding of the methods and tools used for assessing, remediating and managing contaminated sites

i) access to a support team with expertise in any of the following areas in which the applicant is not expert:

- health risk assessment
- community consultation
- geotechnology and hydrogeology
- environmental and analytical chemistry
- soil science
- ecotoxicology and toxicology
- contaminant fate and transport
- exposure assessment
- data evaluation
- environmental sampling
- risk evaluation
- remedial technologies and associated requirements.

(Applicants must give details of their access to technical resources, including services and personnel in each of the above areas. Australian-based resources are preferred. All support team members must have appropriate academic qualifications and a thorough knowledge of relevant Australian guidelines and policies. Detailed curriculum vitae for all support team members, both external and internal, will be required prior to accreditation together with a consent letter from suppliers of external resources. At each renewal of accreditation, confirmation of the composition of the support team and their willingness to continue in their role will be required. Applicants must allocate each of their support team to one or more of the specific areas of expertise listed above.)

j) an up-to-date knowledge of relevant scientific literature;

k) access to an insurance policy for professional liability that will cover their work (minimum \$5 million)

(Applicants must satisfy the EPA that they will have insurance cover in respect of any liability or claims for damages for professional negligence on their part arising out of activities under this scope of works. Insurance cover for not less than \$5 million with provision for reinstatement would generally be acceptable to the EPA. The insurance policy may be written on either an occurrence basis or a claims-made basis. However, for insurance written on a claims-made basis the EPA would expect the policy to have unlimited retroactivity and the cover to be maintained in respect of the applicant for a minimum of two years after the applicant ceases working under this scope of works. It is the applicant's responsibility to ensure that their insurance coverage meets these requirements.)

l) proven high standards of integrity and objectivity – successful applicants will be required to complete the declaration in Appendix 1 to this effect.

## APPENDIX 1

### Declaration for an applicant to the Botany Mercury Independent Review

(Strike through the non-applicable response)

Have you ever been refused a licence, permit or authority under any environment protection or planning legislation or had any such licence, permit or authority revoked or withdrawn either in Australia or elsewhere? Yes / No

Has any company of which you are or were, at the relevant time, a director or officer been refused a licence, permit or authority under any environment protection or planning legislation or had any such licence, permit or authority revoked or withdrawn in Australia? Yes / No

Has any company of which you are or were, at the relevant time, a director or officer been refused a licence, permit or authority under any environment protection or planning legislation or had any such licence, permit or authority revoked or withdrawn in relation to overseas sites or projects for which you have been directly involved? Yes / No

Have you been convicted of or are you presently charged with committing an offence under any environment protection or planning legislation or other laws either in Australia or elsewhere? Yes / No

Has any company of which you are or were, at the relevant time, a director or officer been convicted of or been presently charged with committing an offence under any environment protection or planning legislation or other laws in Australia? Yes / No

Has any company of which you are or were, at the relevant time, a director or officer been convicted of or been presently charged with committing an offence under any environment protection or planning legislation in relation to overseas sites or projects for which you have been directly involved? Yes / No

Are you aware of any circumstances that may detrimentally affect your ability to fulfil the obligations of this scope of works? Yes / No

If you have answered Yes to any of the above, please provide details (attach extra pages if there is insufficient space below). Yes / No

(Signature)

(Date)

(Print name)