

Community Liaison Committee Briefing Paper

June 2007

1 INTRODUCTION

This briefing paper is for the Community Liaison Committee (CLC) for Orica's Botany Groundwater Cleanup Project (BGC Project). It provides a summary of the combined monitoring and progress report (Groundwater Cleanup Plan Progress Report No. 14), which was submitted to the Department of Environment and Climate Change (DECC, formerly the Department of Environment and Conservation [DEC]) on 31 May 2007.

Progress Report No.14 covers the period from 1 March 2007 to 31 May 2007 and reports progress against the requirements of the Notice of Clean Up Action (NCUA) and Orica's Groundwater Cleanup Plan (GCP). This briefing paper also includes updates on other groundwater matters of interest to the CLC that do not fall under the NCUA.

Complete copies of Progress Report No. 14 (including appendices) are provided to:

- The Department of Water and Energy (DWE);
- The DECC;
- NSW Health (South East Sydney and Illawarra Public Health Unit [SESIAHS] and Environmental Health Branch);
- City of Botany Bay Council (CoBB);
- CLC members who have requested a copy;
- Members of the Independent Monitoring Committee (IMC); and
- The Independent Compliance Auditor.

Copies of the report are available, on request, to all members of the CLC, are provided to CoBB and Randwick city libraries and will be made available on Orica's Botany Groundwater website: www.oricabotanygroundwater.com.

2 ADMINISTRATIVE AND COMPLIANCE STATUS

During this reporting period there have been no variations to the NCUA and no key NCUA milestones. Orica continues works and investigations in order to comply with requirements of the NCUA as outlined throughout this briefing paper.

3 GROUNDWATER AND SURFACE WATER MONITORING

Orica continues to regularly monitor groundwater and surface water within the Groundwater Extraction Exclusion Area (GEEA). The latest round of groundwater and surface water monitoring was completed in March 2007.

This monitoring investigates two key aspects: hydraulic monitoring and chemical monitoring. Results and discussions are provided in the URS report *Groundwater Treatment Plant, Quarterly Groundwater and Surface Water Monitoring Report, March 2007*. This report forms an appendix to Orica's Groundwater Cleanup Plan Progress Report No. 14. Key results of the December 2006 monitoring event are outlined below.

3.1 Hydraulic Monitoring Results

- **Hydraulic Containment**

- Hydraulic containment has significantly altered the natural groundwater flow regime in the areas near the Primary, Secondary and Botany Industrial Park (BIP) Containment Areas. Groundwater discharge to Penrhyn Estuary is now limited to rainfall that infiltrates the dunes and mixes with groundwater between Foreshore Road and the estuary.
- Results of water level monitoring at locations remote from the Secondary Containment Area (SCA), Primary Containment Area (PCA) and BIP indicate that effects of hydraulic containment are generally limited to areas adjacent to the containment lines.

This result is consistent with the hydraulic modelling but further monitoring is required to assess the long-term effects of extraction on areas not subject to the NCUA.

- **BIP Containment Line**

- Hydraulic containment at the BIP Containment Line was generally achieved during periods of extraction. However, operation of the Groundwater Treatment Plant (GTP) was not consistent during this period. Only the extraction wells along the north-western margin of this containment line operated for more than 66% of the monitoring period.
- Extraction wells on Second Street at the BIP operated for less than one third of the monitoring period and, as a result, hydraulic containment was generally not achieved at these wells.
- Monitoring data collected at, and adjacent to, the BIP containment line indicates that as capacity and reliability at the GTP are gradually improved, hydraulic containment will be achieved.

- **PCA**

- Hydraulic containment was excellent through the central and western portions of the PCA and intermittent at the eastern end of the containment line. Observations of water levels in the core of the Central Plume at the PCA indicate that significant mass removal occurred during the monitoring period.
- To ensure complete hydraulic containment occurs, repairs at an extraction well on the eastern side of the PCA containment line and consistent operation of the GTP are required. The consistent operation of the containment line is particularly important to ensure drawdown of the shallow aquifer near Springvale Drain and to minimise groundwater discharge to the drain.

- **SCA**

- Hydraulic containment was maintained for the entire monitoring period at all shallow aquifer locations where CHC contaminant concentrations exceed relevant water quality guidelines.
- For the deep aquifer at the SCA, hydraulic containment was partially achieved east of Floodvale Drain, and for the entire period on the central and western portions of SCA at all locations where CHC contaminant concentrations exceed the relevant water quality guidelines.
- A number of monitoring well locations demonstrated water levels that indicate over-pumping. Further adjustment of pumping rates/levels is required to minimise the rate of saline intrusion.

- **Surface Water-Groundwater Interaction** - A preliminary assessment of surface water-groundwater interaction between the BIP and PCA containment lines indicates that water levels at two monitoring wells near Springvale Drain were effectively reduced below the base of the drain due to a combination of hydraulic containment and low rainfall. A field program is currently being implemented to collect detailed monitoring data for shallow groundwater in the area. The data will be used to assess the potential of GTP operation to minimise shallow groundwater discharge to the drain.
- **Saline Intrusion** - Monitoring data collected downgradient of the SCA indicates that saline intrusion may be occurring in the shallow aquifer. The cause of the intrusion is likely to be a combination of low rainfall and the effects of hydraulic containment. Some saline intrusion is inevitable if hydraulic containment is to be reliably achieved. The GTP's design allows for the treatment of this saline water.

3.2 Chemical Monitoring Results

- **Southern Plumes**

- Overall, the distribution of volatile chlorinated hydrocarbons (CHCs) within the Southern Plumes recorded in March 2007 is similar to that reported in the December 2006 monitoring round.
- In general, concentrations of volatile CHCs in the shallow aquifer at the majority of sampled locations were stable or decreasing against historical data.
- Significant increases in concentrations of chloroform (CFM), tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride (VC) and ethylene dichloride (EDC) (including historical maximums) were detected at various off-site bundled piezometers (BP's) located at Discovery Cove, Penrhyn Estuary's sand dune, and in the Sydenham-Botany Goods Railway corridor.

- **Central Plume**

- CHCs concentrations in shallow groundwater are stable or decreasing within the Central Plume at those locations situated downgradient of McPherson Street and on the southern edge of Botany Road. Since June 2005, a continuous decrease of EDC concentrations in shallow groundwater is observed.
- The concentrations of EDC and TCE recorded at a BP located on and another slightly downgradient of the inferred Central Plume source area (at the BIP) demonstrated historical maximums. As the EDC concentration exceeds the compound's water solubility limit, it indicates that dense non-aqueous phase liquid (DNAPL) is likely to be present in this area.
- An indication of Central Plume migration is demonstrated by the significant increases in EDC, PCE, and TCE concentrations (including historical maximums) in the intermediate and deep aquifer at locations downgradient of McPherson Street.

- **Northern Plumes**

- In general, the March 2007 data indicates that CHC concentrations in shallow groundwater throughout the Northern Plumes, in particular EDC and carbon tetrachloride (CTC) that represent the majority of the contaminant mass, are stable or decreasing.
- Although there was considerable concentration variability, the distribution of volatile CHCs is generally consistent with that presented in the previous monitoring round.
- All of the principal CHCs were detected at historic maximum concentrations in at least two ports of a BP located downgradient of two inferred northern DNAPL source areas at the BIP.
- Maximum TCE and VC concentrations were recorded in the intermediate aquifer in the Northern Plumes area at three BPs located downgradient of the western margin of the BIP containment line. Increased CTC, CFM and PCE concentrations were also detected in the intermediate aquifer at one of these BPs.

- **Penrhyn Estuary**

- In general, volatile CHC concentrations in pore water within Penrhyn Estuary are significantly less than historical concentrations, although are similar to data from the previous monitoring event. However, an increase in VC concentration was detected at a BP located in the intertidal zone of the outer estuary. Concentrations of volatile CHCs in the shallowest ports in the estuary are significantly less than historical concentrations and are less than the ANZECC Trigger Values.
- Concentrations of the majority of key contaminants increased at depth at a BP located in the shoreline between Floodvale Drain and Springvale Drain.

- **Springvale and Floodvale Drains**

- Surface water concentrations of volatile CHCs were generally lower than the previous monitoring round for all sample locations with the exception of Springvale and Floodvale Drain outlets in Penrhyn Estuary.
- Historically surface water concentrations in Springvale Drain and Floodvale Drain have been greater at Southlands than at the drains' outlets in Penrhyn Estuary, but in this monitoring round the concentrations of PCE, TCE, CFM, VC and cis-1,2-DCE (but not EDC) were higher at the drains' outlets than at Southlands.
- With the exception of VC and CTC, the concentrations of all other volatile CHCs were less than the respective ANZECC Trigger Values. VC and CTC exceeded the ANZECC values in Springvale Drain, and VC exceeded the values at the Floodvale and Springvale Drain outlets in Penrhyn Estuary.
- The reduction in volatile CHC concentrations in Floodvale and Springvale Drain in the Southlands area (and subsequent discharge to Penrhyn Estuary) may be related to a decreasing interaction between shallow groundwater and the drains in the Southlands area (Central Plume). This is believed to be related to a combination of ongoing groundwater extraction and reduced rainfall lowering the water table.

- **Human Health**

- There is no additional groundwater and surface water data presented in Progress Report No. 14 that alters the conclusions of the Human Health Risk Assessment (HHRA) or Addendum with respect to:
 - The western margin of the Northern Plumes; and
 - Commercial/industrial workers in areas adjacent to Springvale Drain and Floodvale Drain, and other industrial and commercial areas.¹
- At Botany Golf Course VC was detected at a concentration of 2.78 mg/L in March 2007 at the shallowest port at one of BP. This concentration is greater than the value used in the HHRA. However, the identified VC concentration is significantly below the concentration detected in the September 2006 round (26.7 mg/L), which prompted the previously reported assessment of shallow pore water and soil gas at the BP and a nearby groundwater monitoring well in November 2006. This study found that although VC concentrations greater than HHRA values were detected in the shallowest groundwater profile at these locations, VC was not detected in soil vapour at any depth in the profile, hence the potential for exposure via vapour inhalation in the area has not changed as a result of the increased VC concentrations in shallow groundwater.
- At Penrhyn Estuary the March 2007 concentration of VC (0.35 mg/L) at the mouth of Floodvale Drain (at high tide) is similar to, but exceeds, the values used in the HHRA. (The concentration of VC at low tide was <0.01 mg/L.) Assessment of potential exposures within the inner estuary presented in the HHRA indicated that exposures to VC over a lifetime had the potential to result in calculated risk levels that exceeded the acceptable risk target. The increase in VC concentrations detected at the Floodvale Drain outlet in the inner estuary does not change this conclusion.

3.3 Recommendations for Groundwater and Surface Water Monitoring Program

URS has made the following recommendations following a review of data from the March 2007 groundwater and surface water monitoring program:

¹ Please note that Section 4.2 of this Paper provides information regarding a separate program to monitor air along Springvale Drain.

- A comparison of observed and modelled drawdown (a change in water table level in the aquifer due to pumping) should be completed during the June and/or September 2007 monitoring rounds pending consistent operation of all containment lines.
- Sampling and flow rate analysis should be undertaken for two extraction wells in the Central Plume (located within Southlands Block 2) to enable mass removal rates to be calculated. The assessment may be used to determine the ongoing requirements/benefits of pumping from the core of the Central Plume.
- Loggers/transducers at one monitoring well on Foreshore Road and another at Penrhyn Estuary require readjustment and the transducer of a groundwater monitoring well near the Botany and Foreshore Roads intersection should be replaced.
- Improved operation of three extraction wells at the western portion of SCA is required to ensure consistent hydraulic containment.
- Based on a review of water levels at monitoring wells on the eastern end of SCA, ongoing water level logging is unwarranted and the loggers should be re-deployed at alternate locations within the GEEA.
- A bollard or high visibility marker should be installed at a BP located adjacent to the Sydenham-Botany Goods Railway corridor east of Southlands to prevent the location being covered or blocked by site activities and to enable future groundwater monitoring to be conducted.

3.4 Residential Bore Monitoring

A total of 16 residential bores were sampled in May 2007. The results and subsequent reports will be provided to the DECC, DWE, NSW Health, CoBB and the residents as soon as practicable.

4 GROUNDWATER CLEANUP PLAN IMPLEMENTATION

4.1 Statutory and Landowner Approvals

There have been no BGC Project related modifications to Orica's Environment Protection Licence (EPL2148) during the reporting period. Key statutory and approvals activity in the period is as follows:

- In accordance with condition E17.1.2, Orica has regularly notified the DECC of dioxin monitoring results.
- Five rounds of ecological monitoring in Penrhyn Estuary have been conducted to date. Round 5 fieldwork has been effectively completed with the exception of the monthly bird monitoring which will be completed in June 2007. The final ecological report required under the licence will be issued shortly thereafter.
- Orica met with the DWE on 25 May 2007 to discuss the preparation of production bore licences for each of the three containment lines. Orica currently extracts groundwater in accordance with test bore licences. Since the beginning of extraction for the BGC Project, the DWE has advised Orica that permanent licences are best administered once steady extraction rates are confirmed.
- The final settlement plate monitoring event was completed in May 2007 with the exception of Foreshore Road settlements plates, which will be surveyed in June 2007. The final report will be submitted to the DECC and other relevant stakeholders once complete.

4.2 Air Monitoring and Human Health Risk Assessment

Regular air monitoring programs are scheduled, and the results are compared with the data assessed in the Consolidated HHRA. A summary of the current air emission programs is provided below.

Springvale Drain Air Emission Monitoring

As reported previously, EDC concentrations exceeding those considered in the Consolidated HHRA were detected during air monitoring along Springvale Drain in October 2005. This led to further sampling in 2006 during which a decrease in CHC concentrations was found. A new sampling program has recently been developed in consultation with the DECC, NSW Health and WorkCover to provide evidence to support the hypothesis that decreased groundwater levels as a result of pumping of the PCA and BIP lines and the GTP's increased operational capacity have corresponded to this observation.²

It is likely that a reduction in the concentration of volatile CHCs in the drain will lead to a lower risk profile for the workers in the area. Although it can be inferred from surface water CHC concentrations that there has been a decrease in shallow groundwater discharge to the drain, only limited water level measurements are available to support this conclusion.

The new sampling program's objectives are:

- to determine whether the current risk profile for Southlands and businesses adjacent to the drain are within acceptable guidelines for workers; and
- to determine whether the pump and treat system is capable of reducing the groundwater levels to render and maintain risk profiles at acceptable levels for businesses adjacent to the drain and future workers on Southlands.

To achieve the objectives, the following scope was developed:

- Develop a water level monitoring network to assess the interaction of groundwater and Springvale Drain;
- Assess risks to workers along Springvale Drain based on ambient air data collected during a six month program;
- Review and refine the model of surface water concentrations vs. ambient air data, which will be used to calculate target surface water concentrations that are considered to result in acceptable levels of risk associated with inhalation exposures in workplaces adjacent to the drain; and
- Assess potential short-term exposures that could result in increased discharge of shallow groundwater to the drain and increased concentrations of volatile CHCs in air when the GTP is not operating.

The first round of air monitoring occurred in May 2007 and the installation of the hydraulic monitoring network commenced in the first week of June 2007. Orica will provide regular updates to the regulatory authorities and stakeholders as results become available. The program is expected to continue until November 2007.

4.3 Primary and Secondary Containment Area Projects

Plans for a combined PCA line flow meter were completed in this reporting period, and installation is imminent.

Since early February 2006, as many pumps as possible have been operating at the SCA on Foreshore Road in order to effect containment across the entire line in both the shallow and deep aquifers. A series of investigations/works are underway at the SCA in this reporting period including:

- **Biological Fouling** – As reported previously, thick sludge in the sumps of many of the shallow wells along the SCA has resulted in reduced pump performance or failure.

² Note that data obtained through this air sampling program is separate to the data collected under the hydraulic and chemical monitoring program reported in Section 3.

Biological fouling in the wells will be difficult to totally eliminate. The eventual solution is likely to consist of an effective maintenance and cleaning program as well as possibly some operational and/or equipment changes. In the previous Progress Report, it was noted that Orica was trialling ways to minimise the frequency of the pump cleaning. A summary of the trial results to date is provided below:

- ***Installation of a thermocouple on the casing of one of the shallow pumps:***
This work was done to determine what the minimum operating speed is for the pumps to maintain a sufficient flow of water to effect cooling of the pump motor. The determination of site-specific values, as opposed to the default values that were being used, would allow the pumps to operate longer as they begin to foul before operators manually shut them down to prevent pump damage.
- ***Installation of a mono pump (progressive cavity pump) in a well affected by fouling:*** Mono pumps are capable of pumping the biological material without hindrance. A mono pump was installed in a shallow monitoring well in February 2007. Since that time, the pump has operated exceptionally well, and has not been subject to the low power issues that the installed standard pumps are experiencing. The materials of construction may not be suitable for site conditions in the long-term, hence in June 2007, the pump will be removed and examined before decisions are made regarding the broader use of mono pumps.
- **Header Pipes and Leakages**
 - Several leaks have been detected in the SCA pipes that join the top of the pumps to the transfer pipe. These locations were immediately patched to continue operation of the containment line. A systematic change out of all headers is proposed.
 - Traffic barriers have been installed along the entire length of the containment line at Foreshore Road to facilitate the works.
 - The precise cause of the leaks is uncertain, however, it may be related to biological deposits observed on the headers pipe connections, which may be creating sulphuric acid resulting in pitting corrosion. Samples have been collected for analysis.
 - Orica is currently examining the root causes of the problem in order to develop corrective actions, including control measures to minimise biological accumulation within pipework as well as replacement of carbon steel pipeline sections with a material that will resist these unexpected operating conditions.
 - URS has advised that a shutdown of less than three weeks is not likely to compromise hydraulic containment. It is anticipated that pumps west of Floodvale Drain will be inoperable for less than 14 days.

4.4 Groundwater Treatment Plant

Although the GTP has been operating since January 2006, several commissioning challenges remain. The following is an update on Orica's progress of overcoming and addressing these challenges in order to maximise the GTP on-line time and throughput:

- **Biological Fouling in the Air Strippers** – In order to prevent the fungal growth, the groundwater is not being acidified prior to stripping. This has stopped the fungal growth, but has allowed mineral fouling to occur. Regardless, the air strippers are continuing to demonstrate good contaminant removal rates, however, regular mechanical cleaning is required. Trials are underway to determine if an intermediate acidification regime can prevent both fungal and mineral fouling.
- **Biological Fouling in Stripped Water Treatment Plant** – It has been previously reported that a chloramine dosing system had been installed to control biological accumulation

within the stripped water treatment plant. The consistent dosing of chloramine has allowed much better run times before cleaning is required. However, the secondary reverse osmosis (RO) units are still suffering from limited run lengths. Trials are still being undertaken to optimise the RO units using a range of operating parameters, including feed pH and internal backpressure adjustment.

- **Decreased Treated Volume due to a Pressure Drop** - In early May 2007, a high pressure drop difference was observed in a section of the stripped water treatment plant. Investigations identified that the granulated activated carbon (GAC) had become bound like cement causing a high pressure difference. The precise cause is yet to be determined, however, it is likely to be associated with polymer carried over from the Actiflo (dissolved iron removal) units. Cleaning with a caustic solution removed the fouling. Unfortunately, during the subsequent backwashing of the GAC vessels removed material fouled the cartridge filters. An international shortage of cartridge filters (none available until August 2007) has led to a short term decrease in volumetric capacity. Fortunately, Orica has been successfully trialling cleaning techniques and has been able to refine these to keep the plant operational. Orica's international procurement team has found replacement filters, and arrangements will be made with the supplier to ensure delays do not happen again.
- **Chloramine Discharge** – The DECC has indicated that the ongoing discharge of chloramines at current concentrations into Bunnerong Canal is unacceptable. Since the last Progress Report, Orica has been investigating ways to minimise or eliminate chloramines from the permeate. The most promising solution currently being trialled is the installation of a sodium metabisulphite dosing system. However, this will result in the creation and discharge of ammonia, which is also strictly regulated. The DECC has indicated it will increase the ammonia discharge limit, but will require Orica to enter into a Pollution Reduction Program to reduce ammonia discharges.
- **BIP Containment Line** – The BIP containment line has been effectively commissioned and has been operating relatively consistently in this reporting period. Some disruptions of pumping have been caused by regular low power trips of several pumps. Work is underway to reduce the frequency of low power trips. Further adjustments to the pumping rates will occur over the next three months until steady state level set points are determined.
- **Thermal Oxidiser (TO) and Dioxin Air Emissions** – The TO has been successfully commissioned and is operating within licence specifications. A final commissioning report was provided to the then DEC on 19 March 2007. In accordance with the DECC licence conditions, the frequency of stack emission testing has decreased from once per month to once every second month. A total of five stack samples have been collected and analysed for dioxins since 1 January 2007. All were within the specified licence limit of 0.1 ng/m³.
- **Odour Monitoring** - Over an 18 month period, the area surrounding the GTP was monitored for odour levels. Five sites were chosen to represent the four points of the compass plus one at source. The sites were monitored over six sessions, two prior to commissioning of the GTP and four after. The individual observations showed that during the entire study (before and after commissioning of the GTP), there was always a background odour present in the environment, and this did not depend on the plant's operational status or wind direction. Although throughout the entire study the background odour was too weak to be identified, there were three occasions where its intensity was greater than the recognition threshold. These three events recognised the odour to be characteristic of cereal, sewage, and soil, respectively, and on all occasions the odour source was upwind of the plant. On this basis, it is unlikely that operation of the GTP contributed to these observed odours. This completes the GTP odour monitoring program.
- **Beneficial Use of Treated Water** – The Orica ChlorAlkali Plant and Qenos are now regularly receiving treated water from the GTP for use in their cooling towers and trials are continuing with the Qenos Demin Plant. Solvay Interlox began taking water on 4 June 2007.

4.5 Operating Data Summary

Since startup in late January 2006, the GTP has treated approximately 1,409,500 kL of groundwater and destroyed approximately 204 tonnes of CHCs. A summary of the aggregate data from the Steam Stripping Unit and GTP since the commencement of groundwater remediation on 28 October 2004 to the end of March 2007 is provided below:

Total water treated to date:	1,460 ML
Total recovered CHCs :	330 tonnes

4.6 DNAPL Source Area Investigations

There have been no further DNAPL source area investigations in this reporting period.

4.7 DNAPL Removal Projects

A detailed update on the DNAPL removal projects was provided with Progress Report No. 13. In this reporting period the following has occurred:

- Orica has agreed to co-fund research at the University of Western Australia into an innovative technology called electrokinetics, which could assist in delivering treatment solutions into low permeability layers.
- Laboratory bench-scale testing of in situ chemical oxidation is continuing in the USA. Results to date indicate a positive outcome in oxidising all targeted compounds, and preferred application methods have been identified. A surfactant/solvent mixture is also being evaluated, and appears to achieve significant increases in DNAPL dissolution.
- Detailed design of the proposed thermal treatment field trials in the former Solvents Plant area at BIP is progressing. Representatives of a USA-based technology provider visited the site in April 2007 to attend design meetings and to meet with the DECC. The technology that will be applied has been reviewed, and GTP treatment of extracted CHCs vapour and groundwater will occur.

4.8 Mercury in Groundwater

As previously reported, mercury was used in the operation of the former Chlorine Plant at the BIP, which was demolished earlier this year. Orica has been investigating soil and groundwater in the vicinity and downgradient of the plant for potential mercury contamination.

Sampling commenced last year at the BIP, with more conducted this year in the industrial area south-west of the BIP. Mercury has been detected in the investigation area, including in some of the new offsite groundwater monitoring wells located in industrial properties. The results have been shared with landowners at the monitoring locations and the DECC.

Orica has spoken with landowners in the investigation area (which is within the GEEA) and confirmed that they are not using groundwater. There are no residential properties in the investigation area. More sampling is now being undertaken to provide data for a risk assessment. The results of that assessment should be available in the coming months.

A timeline for the next steps is currently being prepared for the DECC and will be shared with the CLC at their June meeting.

Orica has previously undertaken mercury investigations. In the early 1990s Orica found mercury in sediment and biota (including oysters, fish and crabs) in Penrhyn Estuary. Some of this mercury is likely to have come from historic BIP effluent discharges to stormwater, which travelled to the estuary via Springvale Drain back in the days before the site was connected to the sewer and a proper site effluent system was in use. In the early 1970s, site effluent disposal to the drain was stopped and was rerouted to the sewer.

A human health risk assessment prepared for Penrhyn Estuary in 2004 concluded that there is no unacceptable risk to recreational users of the estuary due to mercury in the sediment. However, it did conclude that there could be an unacceptable risk to children if they consumed

large quantities of fish caught exclusively from the estuary. The State Government subsequently introduced a fishing ban in the estuary in late 2004.

5 COMMUNITY CONSULTATION

5.1 Program Initiatives

CLC Meetings

A quarterly CLC meeting was held on 20 March 2007. Presentations were made by the then DEC and Orica on the progress of the Cleanup Project, and by Ken Holmes of KMH Environmental on the 2006 independent compliance audit. The following table summarises key matters raised by members of the CLC at the meeting, and action taken or planned as a result (please note that this information has been summarised from draft minutes not yet endorsed by the CLC):

Matter Raised by CLC	Action Taken or Planned
Two additional IMC tasks were agreed as listed in Section 5.2 below. A combined meeting of the IMC and CLC was also requested.	A combined meeting of the IMC and CLC was held on Wednesday 2 May.
Mercury testing of groundwater in residential areas (i.e. beyond the area of the current Orica mercury investigations).	DECC was asked to consider whether it would undertake groundwater tests for mercury and to report back to the CLC.
Layout of IMC financial reports to show spending in each Orica financial year.	Orica to check dates of IMC invoices and list against the Orica financial year (1 October - 30 September) in future IMC financial reports.
Interest in the international application of thermal DNAPL treatment technology.	Orica to provide links to relevant websites relating to thermal treatment, including case studies and sites that are utilising the technology.
Considerable discussion was held regarding the development of the Financial Assurance. The CLC requested further information about how the \$14.4M value had been established.	<ul style="list-style-type: none"> • Orica to provide detail of the Ernst & Young evaluation and to ask Ernst & Young to present at the next CLC meeting, if appropriate. • DEC to provide additional details regarding how they assessed the Ernst & Young report. • Orica to provide information about its public liability cover in relation to the groundwater contamination and cleanup project.
Members discussed their concerns about the cumulative impacts on Penrhyn Estuary and agreed to write a letter to NSW Fisheries and NSW Health requesting advice on the tolerable monthly intake levels for fish and marine life caught in Botany Bay (as has been done in Sydney Harbour and Georges River).	Two CLC members have agreed to draft a letter to NSW Fisheries and NSW Health, and with the assistance from the CLC Chair, to issue the letter on behalf of the CLC.
Some members expressed dissatisfaction in the wording of GCP Progress Report No. 13 and asked DECC to advise if they considered the report to be acceptable. Specific concerns related to: <ul style="list-style-type: none"> • Salinity; 	It was agreed at the meeting that these concerns would be listed for Orica so that a reply could be provided. Correspondence from the Botany Bay and Catchment Alliance (BBACA) has since been received and Orica has prepared a reply. Comments from DECC and NSW Health have been requested

Matter Raised by CLC	Action Taken or Planned
<ul style="list-style-type: none"> • Vinyl chloride results; • Contaminant concentrations remaining largely unchanged; • Potential risk to recreational users of the Bay and Penrhyn Estuary; and • Environmental impacts of discharges to Brotherson Dock. 	on some matters. Orica has sought comment from those agencies.
CLC requested information on the outcomes of the risk assessment prepared for Mutch Park and surrounds.	<p>At the March CLC meeting it was agreed that Paul Shepherd from CoBB would ask IMC member Prof Brian Priestly to write to Sydney Water requesting a copy of the Mutch Park and surrounds risk assessment and to prepare a summary for the CLC.</p> <p>Orica subsequently discussed this action with John Kent (CLC Chair) and Paul Shepherd and recommended that it not be an IMC task as Mutch Park is not part of the Botany Groundwater Cleanup Project, and thus not within the scope of the IMC's work. Orica agreed to seek Sydney Water permission (as landowner) to provide a presentation of the outcomes of the risk assessment at the May CLC/IMC meeting. Permission was granted and the presentation was provided at the combined CLC/IMC meeting held on 2 May.</p>
Possibility to increase use of the website to seek community feedback.	Orica to look into the possibility of encouraging feedback from people who visit the Orica websites (once the new site Botany Transformation Projects site is developed).

In addition to the feedback received at the March CLC meeting, Orica has responded to community queries in this reporting period regarding the takeover bid, which was rejected by Orica.

CLC Newsletter

CLC Newsletter No. 24 was distributed in March 2007 after being reviewed by the CLC. It included updates on GTP operations (including dioxin results, control of biofouling using chloramines and water recycling), results of the November 2006 residential bore monitoring event, drain safety awareness, IMC tasks, mercury investigations and feedback from the December 2006 CLC meeting.

5.2 Independent Monitoring Committee

As detailed in previous reports, the IMC is a panel of experts which has been established (in consultation with the CLC) to report to the CLC with appraisals of the operations of the GTP. The table below lists outstanding IMC tasks. All completed IMC tasks are listed on the project website: www.oricabotanygroundwater.com.

Task #	IMC Task Description	Status
9	Prof Acworth to be asked to attend the proposed Orica/ Sydney Ports workshop (Action from 12 Dec 06 CLC meeting for Sydney Ports and Orica to arrange a workshop for after March 2007. Orica and Sydney Ports to contact the CLC and the Ports Development Community Consultative Committee in advance of	OUTSTANDING Raised by CLC on 12 December 2006.

Task #	IMC Task Description	Status
	the workshop to request any questions).	A date for this workshop is yet to be confirmed.
14	The CLC requests that Dr Chris Clunies-Ross and Dr Mark Hibberd meet with Dr John Lear from Orica to develop the scope, costs and benefits of a project to research the formation of dioxin at the Groundwater Treatment Plant. Orica will arrange the meeting.	TO BE DISCUSSED Raised by the CLC on 2/05/07. Provided to the CLC on 14 June 2007.
15	The CLC asks each of the IMC members to advise if, in their opinion, there are any aspects of the existing air and water monitoring, reported in the quarterly Orica Progress Reports, that are not needed, or if there is any additional monitoring that IMC members think would be beneficial going forward. Each member is to make comments relevant to their area of expertise only. Orica notes that the scope of task 15 is very broad. To assist with this task, Orica offers each of the IMC members a briefing on the scope and development of the current monitoring programs relevant to each of the IMC members' area of expertise. Orica suggests that any IMC recommendations for a change to monitoring are supported by detail of the reason for the change and the intended resulting benefits to the Botany Groundwater Cleanup Project.	OUTSTANDING Raised by the CLC on 2/05/07.
16	The CLC asks that Prof Ian Acworth meet with Paul Shepherd, Greg Dasey from URS, Erwin Benker from the Department of Environment and Climate Change DECC and Orica to discuss his recommendation for additional groundwater monitoring south of the Secondary Containment Line. Orica will arrange the meeting. It was noted that this task could be discussed at the proposed mid-year workshop with Sydney Ports to discuss groundwater matters. A date for that workshop is yet to be confirmed.	OUTSTANDING Raised by the CLC on 2/05/07. Meeting to be held on 15 June 2007.

5.3 Communication Tools

Community Street Meetings

No community street meetings were held by Orica in the reporting period.

Community Workshops

No groundwater specific community workshops have been held in the reporting period. Two workshops have been held this year to discuss Orica's plans to remediate and develop the Southlands property on McPherson Street, Banksmeadow. Ensuring the ongoing implementation of the BGC Project is a key requirement of the Southlands project and this has been discussed at those workshops.

As noted in the previous progress report, Orica plans to hold another workshop on water recycling this year and has committed to holding a combined workshop with Sydney Ports to discuss the interface of the groundwater cleanup and the Port Development.

A second combined meeting of the CLC and IMC will also be held this year. These workshops have not yet been scheduled.

Newspaper Columns

Four newspaper columns were published in both the *Southern Courier* and *St George and Sutherland Shire Leader* since the last quarterly report. These columns incorporate information on a range of Orica projects. Reporting on the BGC Project was as follows:

- *Column 63: 27 February 2007:* dioxin monitoring, mercury investigations and the November 2006 residential bore monitoring results;
- *Column 64: 27 March 2007:* GTP operations, feedback from March CLC meeting and an invitation to participate in the May 2007 residential bore monitoring event;
- *Column 65: 24 April 2007:* progress of groundwater treatment, invitation to combined meeting of the IMC and CLC on 2 May and a reminder of the upcoming residential bore monitoring; and,
- *Column 66: 29 May 2007:* biological corrosion of pipes at the SCA and the need for barriers at Foreshore Road during repair and maintenance works, fouling of the activated carbon filters at the GTP and feedback from the combined meeting of the CLC and IMC.

Website

The website is an important tool which provides immediate access to information about the BGC Project and supports Orica's commitment to open and transparent communication. Maintenance of the website is now a requirement under Part c of Condition 7K of the NCUA.

The following material has been posted on the website during the reporting period:

- Groundwater Cleanup Plan Progress Report No.13 and Appendices;
- Recent newspaper columns;
- March CLC newsletter;
- Ecological Monitoring Report No. 3;
- Measurement of Gaseous Vinyl Chloride Through the Soil Profile at Botany Golf Course;
- Environmental Survey, Surface Emission Sampling - Exell Street;
- Penrhyn Estuary Surface Water Monitoring, Monthly Data February 2006 - February 2007;
- CLC Briefing Paper, March 2007;
- Presentation materials from March 2007 CLC Meeting;
- Settlement Monitoring Report No. 2;
- Prof Ian Acworth reports on groundwater re-injection (IMC Task No. 10);
- Prof Ian Acworth reports on historical groundwater abstraction (IMC Task No. 7); and
- IMC members' comments on BGC project progress and questions that CLC should be asking to Orica (IMC Tasks No. 12 and 13).

Between 28 February 2007 and 28 May 2007, 11,550 website visits were recorded (up from 8,983 in the previous reporting period). Orica is continuing work on the Botany Transformation Projects website to provide information about more recent projects. The groundwater website will be linked to this page once established. Orica will seek feedback on the new web format as each of the project pages are made live.

1800 Number

Orica continues to operate the free-call number, 1800 025 138. There were about 50 calls received relating to the BGC Project in this reporting period compared to 70 in the previous quarter. The majority of calls related to the Rainwater Tank Rebate and Residential Bore Monitoring Programs. Calls were also received regarding upcoming community workshops and meetings, groundwater contamination and potential health risks and State Government groundwater management zones.

E-mail Feedback

Orica has continued to provide an e-mail feedback through the Orica Botany Groundwater website. Two e-mails were received in this reporting period regarding bore water use.

5.4 Outreach Projects

Orica operates a number of outreach programs in the local community. The programs have been developed to respond specifically to community concerns surrounding the groundwater contamination issue. Below is a brief update on each project for this reporting period.

Residential Bore Monitoring – Results from the November 2006 residential bore monitoring round were shared in the March 2007 CLC Newsletter and residential bore testing was conducted in the first week of May 2007.

Rainwater Tank Rebate Program – At the time of writing 940 tanks had either been installed or approved for installation.

Local Air Quality Monitoring – The second report for this program (which presents results from the September 2006 monitoring round) has just been finalised at the time of writing and will be presented to the participating Schools shortly. Results will be reported in the June CLC Newsletter and to the June CLC meeting. Three rounds of VOC monitoring remain to be completed. It is envisaged that these results will be reported in one report at the end of next year.

Schools Program – MyRiveR Cooks – As noted in previous progress reports, the Orica Community Foundation has funded an environmental education program called “MyRiveR Cooks” run by Oz GREEN. Orica hosted a two-day session of this program at the end of March this year. Banksmeadow Public School, Randwick Boys High School and the Malek Fahd Islamic School from Bankstown participated in this event.