

	REPORT No: EN.1591.61.PR024	Rev: 0
GROUNDWATER CLEANUP PLAN PROGRESS REPORT NO. 18		

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REVISION 0

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REVISION HISTORY

REV	STATUS	DATE	PREPARED	CHECKED	AUTHORISED
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LIST OF ACRONYMS

ACRONYM	DEFINITION
ADWG	Australian Drinking Water Guidelines
AHD	Australian Height Datum
ANZECC	Australia and New Zealand Environment and Conservation Council
BEW	Botany Environment Watch
BEREPA	Botany and Eastern Region Environment Protection Agency
BGC Project	Botany Groundwater Cleanup Project (hydraulic containment and treatment project as described in the EIS)
BLG	Below ground level
BGP	Botany Groundwater Project (entire set of activities pertaining to Orica's contamination of the BIP and environs)
BIP	Botany Industrial Park
BP	Bundle piezometer
CFM	Chloroform (trichloromethane)
CHC	Chlorinated hydrocarbon
cis-1,2-DCE	cis-1,2-dichloroethene
CoBB	City of Botany Bay
COPC	Chemical of potential concern
CTC	Carbon tetrachloride (tetrachloromethane)
CLC	Community Liaison Committee
DEC	Department of Environment and Conservation, incorporates the EPA and is now DECC
DECC	Department of Environment and Climate Change, formerly DEC
DIPNR	Department of Infrastructure, Planning and Natural Resources (former NSW Government department, separated into DoP and DNR)
DNAPL	Dense non-aqueous phase liquid
DNR	Department of Natural Resources (formerly part of DIPNR, now part of DWE)
DWE	Department of Water and Energy
DoD	Department of Defence
DoP	Department of Planning (formerly part of DIPNR)
EDC	Ethylene dichloride (1,2-dichloroethane)
EIAD	Environmental Impact Assessment Document
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
EP&A Act	Environment Planning and Assessment Act
GAC	Granulated activated carbon
GCP	Groundwater Cleanup Plan
GEA	Groundwater Embargo Area
GEEA	Groundwater Extraction Exclusion Area
GTA	General Terms of Approval
GTP	Groundwater Treatment Plant
HCB	Hexachlorobenzene
HCBD	Hexachlorobutadiene
HHRA	Human Health Risk Assessment
IMC	Independent Monitoring Committee

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ACRONYM	DEFINITION
ISCO	In Situ Chemical Oxidation
JBS	JBS Environmental Pty Ltd, an environmental consultancy
KBR	Kellogg, Brown and Root Pty Ltd, Engineering Contractor for many sub-projects of the BGP
KMH	KMH Consulting Pty Ltd, independent compliance auditor for the BGP
MoU	Memorandum of Understanding
NCUA	Notice of Clean Up Action
NHMRC	National Health and Medical Research Council
NSW	New South Wales
OEMP	Operational Environmental Management Plan
PCA	Primary Containment Area
PCE	Perchloroethylene (tetrachloroethene)
PFM	Planning Focus Meeting
PHA	Preliminary Hazard Analysis
PVDF	Poly vinylidene fluoride
QRA	Qualitative Risk Assessment
RAP	Remedial Action Plan
REF	Review of Environmental Factors
RO	Reverse osmosis
RTA	Roads and Traffic Authority
RWG	Regulatory Working Group
SCA	Secondary Containment Area
SCW	Scheduled Chemical Waste
SEPP	State Environmental Planning Policy
SESPHU	South East Sydney Public Health Unit
SPC	Sydney Ports Corporation
SSU	Steam Stripping Unit
SWC	Sydney Water Corporation
TBA	To be advised
1,1,2,2-TeCA	1,1,2,2-Tetrachloroethane
1,1,2-TCA	1,1,2-Trichloroethane
1,2,4-TCB	1,2,4-Trichlorobenzene
1,2,4,5-TeCB	1,2,4,5-Tetrachlorobenzene
TCE	Trichloroethene
TO	Thermal oxidiser
TWA TLV	Time Weighted Average Threshold Limit Value
TWSA	Trade Waste Service Agreement
URS	URS Australia Pty Ltd, Orica's principal environmental consultant on BGP
VC	Vinyl chloride (chloroethene)
VOC	Volatile organic compound
VSD	Variable speed drive

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EXECUTIVE SUMMARY

The NSW Environment Protection Authority (EPA), now part of the Department of Environment and Climate Change (DECC), issued Orica Australia Pty Ltd (Orica) with Notice of Clean Up Action (NCUA) No. 1030236 on 26 September 2003, under the Protection of the Environment Operations (POEO) Act 1997. This document is the eighteenth report submitted in accordance to NCUA Condition 4G.

Hydraulic Containment

The following is a summary of containment performance in the period January to February 2008. A detailed description of hydraulic containment is provided in Attachment A.

Botany Industrial Park (BIP) Containment Area

- Relatively consistent GTP and pump operation enabled hydraulic containment of the deep aquifer to be achieved during the monitoring period.
- Hydraulic containment of the shallow aquifer was achieved at the BIP containment line along First Street, despite target water table elevations being exceeded.
- Containment does not appear to have been achieved along sections of the Second Street portion of the containment line during the monitoring period.
- Containment is not required under the notice and the BIP line is operated as GTP capacity allows. Regardless, Orica considers containment at BIP important in order to effect low contaminant concentrations in Springvale Drain and Penrhyn Estuary.

Primary Containment Area (PCA)

- Relatively consistent GTP and pump operation enabled hydraulic containment of groundwater in the deep aquifer along the majority of the PCA to be achieved from between January to March 2008. However, based on the deep aquifer groundwater contours and hydrographs, containment may not have been achieved in the vicinity of extraction wells EWB05D and EWB13D for a period following the rain event in February 2008.
- In the shallow aquifer, hydrographs of some bores (e.g. MWB01S, MWB02S and MWB03S) show a slow response to pumping indicating that they are not directly connected to the layer of the aquifer where pumping is occurring. Geologic controls such as lower transmissivity units are the likely cause of this. Others hydrographs (e.g. MWB05S and MWB06S) indicate a moderate response to pumping, while some (e.g. MWB07S, MWB08S and MWB09S) are strongly influenced by groundwater extraction at nearby pumps, indicating that they are well connected to the zone where pumping is occurring.
- Orica has requested URS review the effectiveness of containment at PCA following rainfall events, particularly with respect to the shallow aquifer.

Secondary Containment Area (SCA)

- Hydraulic containment was generally achieved in both shallow and the deep aquifer at the SCA for the entire March 2008 monitoring period.
- The influence of pumping in the shallow aquifer is low to moderate especially at EWF01 to EWF03, EWF22 and EWF24 most probably because of the semi-

confining low transmissivity peat layer that separates the shallow and the deep aquifer where pumping is taking place.

- Hydraulic heads rose from 5 February owing the aquifer recharge from rainfall.

Chemical Monitoring

The following is a summary of the chemical monitoring results for the March monitoring event:

Southern Plumes

- The distribution of volatile CHCs in the shallow groundwater within the Southern Plumes recorded during the March 2008 monitoring event is generally consistent with that reported in previous monitoring rounds with the concentrations of carbon tetrachloride (CTC), chloroform (CFM), tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride (VC) and 1,2-dichloroethane (EDC) in the majority of sampled locations generally stable or decreasing against historical averages.
- It is suspected that samples from MWF15I and D may have been interchanged during the sample handling process, with the March 2008 results for sample MWF15I being more similar to the historical results from MWF15D, and vice versa. This will be verified using the results from the June 2008 monitoring round. However, for the purposes of this report, the parametric tests have been applied using the data as reported by the laboratory.

Central Plumes

- The distribution and concentrations of volatile CHCs in the Central Plume are generally similar to those reported in previous rounds, with the concentrations of EDC, PCE, TCE and VC in the majority of sampled locations generally stable or decreasing against historical averages.

Northern Plumes

- The distribution and concentrations of volatile CHCs in the Northern Plumes are generally similar to those reported in previous rounds with the concentrations of CHCs particularly EDC and CTC, which represent the majority of the contaminant mass, being generally stable or decreasing against historical averages.
- Concentrations of CFM, PCE, TCE and VC in the Northern Plumes were generally stable or decreasing when compared to historical data, with most recorded concentrations less than the laboratory limit of reporting (LOR).

Penrhyn Estuary

- In general, volatile CHC concentrations in pore water within Penrhyn Estuary were similar or lower than historical concentrations. The concentrations of volatile CHCs in the shallowest ports in Penrhyn Estuary were generally less than historical concentrations, with the exception of a significant increase of TCE at BP71A (1 m port). The concentrations of the volatile CHCs in the shallowest ports of all sampled bundled piezometers were less than the respective ANZECC (2000) Trigger Values.
- Concentrations of the key contaminants generally increased with depth, with significant increases noted at BP43 (2 m port) at high tide for PCE, VC and CFM. In some instances, concentrations of degradation compounds cis-1,2-

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dichloroethene (cis-1,2-DCE) and trans-1,2-DCE concentrations exceeded those of their parent compound (TCE).

Surface Water

- Surface water concentrations of total volatile CHCs in March 2008 were generally low and similar to the concentrations determined in previous monitoring rounds, with concentrations of all volatile CHCs less than the respective ANZECC (2000) Trigger Values.
- The proportion of EDC relative to total volatile CHCs was less than historically observed (<30%) along Springvale Drain, upstream and downstream of Southlands and at the Springvale Drain outlet. The proportion of EDC is approximately 50% in samples collected upstream and downstream of Southlands along Floodvale Drain.
- Concentrations of volatile CHCs (PCE, TCE, CFM, cis-1,2-DCE and CTC) in Springvale Drain were greater at the upstream boundary (SW046) than at the downstream boundary of Southlands (SW005). However, the sample from the realignment channel (SW049) had concentrations of EDC, cis-1,2-DCE and VC that were greater than those detected at either SW049 or SW005.

Implications for Human Health Risk Assessment (HHRA)

- There are no additional data presented in the March 2008 round of sampling with respect to the Western Margin of the Northern Plume that affect the conclusions of the HHRA and Addendum. That is, the groundwater contamination within the Northern Plumes near the western margin is not considered to pose an unacceptable risk to human health, assuming that groundwater is not extracted and used.
- Similarly, there are no additional data presented in the March 2008 Quarterly Monitoring Report that alter the conclusions of the HHRA with respect to existing commercial/industrial workers in areas above the main plumes. That is, the groundwater contamination within the main plumes is not considered to pose an unacceptable risk to human health, assuming that groundwater is not extracted and used.
- The conclusions presented within the HHRA associated with exposures within the estuary remain unchanged. That is, given the conservative nature of the range of assumptions and the safety factors applied to toxicity values, the risks to human health for all exposure scenarios are considered to be low. However, the assessment has identified worst-case exposure scenarios (particularly within the inner estuary) where the calculated risks exceed the target values.

GTP Operation

- To date the GTP has treated over 3.3 gigalitres of groundwater.
- Orica and Qenos are currently using treated water in cooling tower applications. In this reporting period, Solvay Interlox has re-commenced using the treated water. Use of treated water to feed the Demin Plants is awaiting resolution of some operational issues, which should be aided by successful operation of the BAF units.

- Modifications to the BAFs continue in order to increase plant reliability and run times. In this reporting period, there has been a reoccurrence of sulphide production by Sulphate Reducing Bacteria in units downstream of the BAFs. This led to severe fouling of the reverse osmosis units, which has proved very difficult to recover, limiting plant capacity. At these reduced rates, containment has still been achieved on the SCA and PCA lines. Significant operational effort has been expended which has identified techniques to recover the fouled RO units and also to devise techniques to limit the problem of sulphide production.
- The thermal oxidiser (TO) continues to operate within licence specifications (0.1 ng/m³). A trial was undertaken in February 2008 to evaluate dioxin concentrations in the stack gas during destruction of the recovered waste EDC from the SSU operation. The results with and without recovered waste EDC being destroyed are shown below. It is clear that this had no impact on the dioxin concentration in the stack.
- Orica are planing a mobilisation to Foreshore Road in June to effect repairs and preventative maintenance on the SCA systems.

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1 INTRODUCTION

The NSW Environment Protection Authority (EPA), now part of the Department of Environment and Climate Change (DECC), issued Orica Australia Pty Ltd (Orica) with Notice of Clean Up Action (NCUA) No. 1030236 on 26 September 2003, under the Protection of the Environment Operations (POEO) Act 1997. Since then the DECC has issued three variation notices as follows:

Notice under Protection of the Environment Act 1997	Date Issued
Notice of Cleanup Action (NCUA) No. 1030236	26 September 2003
<i>Variation NCUA No. 1033107</i>	17 February 2004
<i>Variation NCUA No. 1042957</i>	7 December 2004
<i>Variation NCUA No. 1052882</i>	2 February 2006

Condition 3 of the NCUA requires Orica to submit a Groundwater Cleanup Plan (GCP) by 31 October 2004 for consideration by the EPA. Condition 3 defines the issues to be addressed in the GCP within timeframes defined in Condition 4. Condition 3(e) defines requirements for a comprehensive monitoring plan, the results of which were to be reported to the EPA (under Condition 4G) on a quarterly basis.

This document is the eighteenth report submitted in accordance to NCUA Condition 4G. The reporting interval for this report is 1 January 2008 to 31 March 2008, however if more recent and relevant information is available it is also included.

Progress Report No	Date	Comment
1	Wednesday 25 February 2004	Submitted on schedule
2	Monday 17 May 2004	Submitted on schedule
3	Friday 20 August, 2004	Submitted on schedule
4	Thursday 18 November 2004	Submitted on schedule
5	Wednesday 16 February 2005	Submitted on schedule
6	Tuesday 17 May 2005	Submitted on schedule
7	Monday 15 August 2005	Submitted on schedule
8	Wednesday 30 November 2005	Submitted on schedule
9	Tuesday 28 February 2006	Submitted on schedule
10	Wednesday 31 May 2006	Submitted on schedule
11	Thursday 31 August 2006	Submitted on schedule
12	Thursday 30 November 2006	Submitted on schedule
13	Wednesday 28 February 2007	Submitted on schedule
14	Thursday 31 May 2007	Submitted on schedule
15	Friday 31 August 2007	Submitted on schedule
16	Friday 30 November 2007	Submitted on schedule
17	Friday 29 February 2008	Submitted on schedule
18	Friday 30 May 2008	Current Report

Previous reports are available at the relevant section of the new website oricabotanytransformation.com and a distribution list is provided at the beginning of this document.

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2 COMPLIANCE SUMMARY

2.1 Notice of Cleanup Action (NCUA)

A summary of the compliance status against current NCUA (including variation notices) condition requirements is provided below:

Cond.	Summary of Requirement	Status	Reference Documents / Comments
3A	Commence preparation of GCP by 30/09/2003	Achieved.	Commenced on 26/09/2003
3B	Prepare and submit GCP by 31/10/2003 covering matters listed	Achieved.	GCP submitted 31/10/2003. EPA authorisation of GCP on 17/02/2004 by Variation Notice No.1033107.
4A	Commence implementation of GCP by 16/03/2004	Achieved.	Work commenced immediately after submission of GCP, in anticipation of its approval.
4B	Commence containment works within primary containment area within 14 days of receipt of all approvals and complete such work within 90 days.	Achieved.	Extraction commenced 28/10/2004. Orica letter of 29/10/2004, DECC letter 10/11/2004.
4BA	At least once every 3 months during GCP implementation report on effectiveness of hydraulic containment works.	Ongoing compliance.	Most recent data provided in Section 3.1 of this report.
4C	Complete identification of the locations of the DNAPL sources by 31 May 2004.	Ongoing compliance.	No further work in this reporting period.
4D	Complete containment of DNAPL sources by 30/11/2004.	Achieved	Orica submission regarding compliance submitted 30/11/2004. DEC letter of 06/01/2005 has stated in-principle acceptance and requested further information. Orica submitted requested information on 27/01/2005. DEC provided letter of compliance on 07/09/2005.
4D	Remove DNAPL sources to the maximum extent practicable by 31 October 2005.	Achieved	Progress included in Section 4.2 of this report.
4E	Reduce the concentrations within the primary containment area to the maximum extent practicable by 31/10/2005, with an 80% target on July 2002 levels.	Achieved	Letter of compliance (to maximum extent practicable requirements of the Condition) received on 1 February 2006.
4F	Establish a secondary containment area by 31/10/2004.	Achieved.	Commenced extraction 29/10/2004. Orica letter of 29/10/2004, DEC letter of 10/11/2004 (confirmed in DEC letter of 06/01/2005).
4G	Implement monitoring program and report at the end of February, May, August and November of each year.	Ongoing compliance.	Summary of monitoring program results for this reporting period provided in Section 3 of this report. Details are provided in Attachment A.
5	Remedial measures to ensure groundwater and surface water flows into Botany Bay and Penrhyn Estuary achieve ANZECC Guidelines for	Work in progress.	Discussion on latest findings provided in Section 3.2 and Attachment A of this report.

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Cond.	Summary of Requirement	Status	Reference Documents / Comments
	slightly to moderately disturbed ecosystems.		
6	Emission controls from works and measures required by the NCUA strictly controlled through adoption of best practice. Works and operations to be carried out in a controlled and competent manner.	Ongoing monitoring being performed.	A discussion on GTP emission compliance provided in Section 5 of this report.
7	Orica to make all reasonable attempts to obtain consent for work on premises not occupied by Orica and related companies. Notify EPA within 7 days if refusal to grant access.	Ongoing compliance.	Ongoing access to third party premises sought as required.
7A	Updating of GCP to take account of developments.	Ongoing compliance.	The GCP remains relevant in terms of the overall groundwater containment and remedial strategy. The Groundwater and Surface Water Monitoring Plan was agreed for 2006 and a revised Plan was submitted and agreed with former DEC (now DECC) for 2007. Discussion of the current plan and its implementation is provided in Section 3 of this report. Orica, in conjunction with its consultants, is preparing a proposed plan for monitoring for 2008 for review with DECC.
7B	Orica to monitor groundwater in any other area likely to have been, or to be, impacted by the contaminants.	Ongoing compliance.	The mid-year round of residential bore monitoring was conducted in early May 2008. Results will be reported to the residents, DECC and CLC when the reports are available.
7C	7B monitoring is to: a) Determine the spatial distribution of the contaminants; and b) Monitor changes in the spatial contamination and distribution of the contaminants.	Ongoing compliance.	Refer to comments on 7B.
7D	Monitoring results to be provided to the EPA as soon as possible after results become available to Orica.	Ongoing compliance.	Important results are provided to DECC as soon as possible. The quarterly progress reports are the primary mode of reporting monitoring data.
7E	Orica must consider best practice technology in the remediation of DNAPL and groundwater containing dissolved phase contamination.	Ongoing compliance.	DNAPL overseas mission completed in April 2005. Orica representatives have attended Battelle conference on "Remediation of Chlorinated and Recalcitrant Compounds" in Monterey, California in May 2008.
7F	Orica must provide an annual written report to DECC on actions required by 7E. First report to be provided no later than 28 February 2006.	Ongoing compliance.	Annual detailed update provided in Attachment B of Progress Reports 13 and 17.

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Cond.	Summary of Requirement	Status	Reference Documents / Comments
7G	Orica must review the need to revise the HHRA in light of relevant monitoring data.	Ongoing compliance.	See 7H
7H	All reports submitted to DECC must include an assessment of the potential risk to human health.	Ongoing compliance.	All reports now submitted to DECC include relevant appraisal of potential risk to human health and hence identify any requirement to update the HHRA.
7I	By 30 April 2006, Orica must prepare and submit to DEC, a monitoring plan for all necessary input parameters to the HHRA.	Achieved.	Plan submitted on 30 April 2006.
7J	Orica must provide copies of reports issued under 7F and 7H to DWE, SESPHU, NSW Health, and CoBB within 7 days of submission to DECC.	Ongoing compliance.	Ongoing compliance
7K	Orica must inform the community of developments by: a) A community forum agreed to by the DECC. b) Provision of a quarterly newsletter to people residing within a 1 km radius of BIP. c) Maintenance of a website in which copies of relevant reports are posted.	Ongoing compliance.	a) The CLC meets quarterly (see Section Error! Reference source not found. of this report) b) See Section Error! Reference source not found. c) www.oricabotanygroundwater.com has been updated and replaced with www.oricabotanytransformation.com
8	Works and measures under voluntary agreement must not compromise the efficacy of measures under the notice.	Ongoing compliance.	Orica has since discontinued bioremediation trials because sufficient data had been obtained to assess the efficacy of bioremediation, and the PCA interim hydraulic containment was interfering with the flow of groundwater through the trials area. Orica proposed and DEC agreed to defer installation of a zero valent iron permeable reactive barrier wall.
8A	Provide additional information as detailed to DEC by 16/03/2004.	Achieved.	Issued by Orica 16/03/2004, received by DEC 17/03/2004 due to courier error. Additional information on PCA extraction design progressively provided in accordance with Orica's response of 16/03/2004.

2.2 Environmental Protection Licence No. 2148 (EPL2148)

Orica reports compliance against EPL2148 requirements via the submission of the annual return in September each year. For the past two years, Orica has also been subject to an independent audit by KMH Consulting. The audit reports are available on the relevant section of the new website oricabotanytransformation.com. There were no licence modifications relevant to the GTP operation made in the period

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January to March 2008. However the following items pursuant to the licence conditions and relevant to the GTP operation were progressed as follows:

- E12.2.4 - The final ecological monitoring report was completed by URS and issued to Orica. A copy will be posted on oricabotanytransformation.com. The results of this program have been detailed in previous GTP progress reports and presented to the CLC by URS in late 2007. The draft report was made available for the review of the independent auditor in 2007.
- E5 Part A – On 27 May 2008, Orica consulted with the combined (Community Liaison Committee (CLC) and Independent Monitoring Committee (IMC) with respect to the requirement for further independent audits of licence conditions. The IMC suggested at least one more round would be appropriate given that the GTP is not yet consistently operating at design rates for complete hydraulic containment at all three containment lines. The DECC has taken the advice of the IMC members on notice and will inform Orica of its decision shortly.
- Section 5 M2.1 - Dioxin stack testing results have all been under the required licence limit. In light of this performance, DECC is considering revising the testing frequency.

2.3 Other Licences and Statutory Approvals

A summary of compliance status against other approvals relevant to the project is provided in the table below.

Licence / Statutory Approval	Comments
Conditions under Part V of the Water Act	<ul style="list-style-type: none"> • Groundwater and surface water monitoring conducted during this reporting period was undertaken in accordance with the program developed in response to condition E12.2.3 of EPL2148. A summary of the results is provided in Section 3 of this report. • In this reporting period, further settlement monitoring has taken place and will be reported shortly. This will conclude the settlement-monitoring program unless pumping scenarios warrant further investigation.
Conditions from Sydney Water Corporation	<ul style="list-style-type: none"> • These conditions require that Orica maintain a register of accidents, incidents and potential incidents with actual or potential significant off-site impacts on people, property, or the biophysical environment. Orica maintains an incident register for the GTP in the internal Safety Health and Environment Incident Management database. • Orica obtained the Subdivider/Developer Compliance Certificate under Division 9 Section 73 of the <i>Sydney Water Act 1994</i> for the BGC Project on 19 January 2006.
Conditions from Sydney Ports Corporation	<ul style="list-style-type: none"> • The licence with Sydney Ports Corporation (SPC) for the discharge of excess treated water to the Bunnerong Stormwater Channel was finalised in January 2006 and subsequently executed by Sydney Ports and provided to Orica on 25 August 2006. Ultimately this discharge will be a backup only as Orica intends to maximise the reuse of treated water.

3 QUARTERLY MONITORING EVENT

NCUA condition 3B(e) requires Orica to implement a comprehensive monitoring program within the defined area (formerly named as the Groundwater Protection Zone 1 by the then DIPNR (subsequently DNR and now part of DWE), and now referred to as the Groundwater Exclusion Extraction Area [GEEA]) to:

- monitor changes in concentrations of the substances in the contaminant plumes;
- monitor changes in the spatial distribution of contaminant plumes in the sub-surface;
- gauge groundwater levels to assess effectiveness of hydraulic containment; and
- monitor concentrations in groundwater and surface water discharges to Botany Bay and Penrhyn Estuary for comparison against the Australian and New Zealand Guidelines for Marine and Fresh Water (2000) trigger values for protection of slightly to moderately disturbed ecosystems.

Orica and DEC (now DECC) subsequently agreed the content and scope of the *GTP Groundwater and Surface Water Monitoring Plan* (URS 2005a). On an annual basis DECC and Orica meet to discuss the effectiveness of the monitoring program and revise monitoring requirements as appropriate. Orica will shortly submit a revised program for DECC review with the intent of implementing it in the September 2008 monitoring event.

Orica engaged URS to complete a quarterly monitoring event in March 2008 in accordance with the agreed monitoring plan. Results and discussions were provided in the URS report *Groundwater Treatment Plant (GTP) Quarterly Groundwater and Surface Water Monitoring Report, March 2008*. This report is bound separately as Attachment A. The remainder of this section has effectively been transcribed from the URS report.

3.1 Hydraulic Containment

The following is a summary of containment performance in the period January to February 2008. A detailed description of hydraulic containment is provided in Appendix A.

Botany Industrial Park (BIP) Containment Area

- Relatively consistent GTP and pump operation enabled hydraulic containment of the deep aquifer to be achieved during the monitoring period.
- Hydraulic containment of the shallow aquifer was achieved at the BIP containment line along First Street, despite target water table elevations being exceeded.
- Containment does not appear to have been achieved along sections of the Second Street portion of the containment line during the monitoring period.
- Containment is not required under the notice and the BIP line is operated as GTP capacity allows. Regardless, Orica considers containment at BIP important in order to effect low contaminant concentrations in Springvale Drain and Penrhyn Estuary.

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Primary Containment Area (PCA)

- Relatively consistent GTP and pump operation enabled hydraulic containment of groundwater in the deep aquifer along the majority of the PCA to be achieved from between January to March 2008. However, based on the deep aquifer groundwater contours and hydrographs, containment may not have been achieved in the vicinity of extraction wells EWB05D and EWB13D for a period following the rain event in February 2008.
- In the shallow aquifer, hydrographs of some bores (e.g. MWB01S, MWB02S and MWB03S) show a slow response to pumping indicating that they are not directly connected to the layer of the aquifer where pumping is occurring. Geologic controls such as lower transmissivity units are the likely cause of this. Others hydrographs (e.g. MWB05S and MWB06S) indicate a moderate response to pumping, while some (e.g. MWB07S, MWB08S and MWB09S) are strongly influenced by groundwater extraction at nearby pumps, indicating that they are well connected to the zone where pumping is occurring.
- Orica has requested URS review the effectiveness of containment at PCA following rainfall events, particularly with respect to the shallow aquifer.

Secondary Containment Area (SCA)

- Hydraulic containment was generally achieved in both shallow and the deep aquifer at the SCA for the entire March 2008 monitoring period.
- The influence of pumping in the shallow aquifer is low to moderate especially at EWF01 to EWF03, EWF22 and EWF24 most probably because of the semi-confining low transmissivity peat layer that separates the shallow and the deep aquifer where pumping is taking place.
- Hydraulic heads rose from 5 February owing the aquifer recharge from rainfall.

3.2 Chemical Monitoring

Southern Plumes

The distribution of volatile CHCs in the shallow groundwater within the Southern Plumes recorded during the March 2008 monitoring event is generally consistent with that reported in previous monitoring rounds with the concentrations of carbon tetrachloride (CTC), chloroform (CFM), tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride (VC) and 1,2-dichloroethane (EDC) in the majority of sampled locations generally stable or decreasing against historical averages.

It is suspected that samples from MWF15I and D may have been interchanged during the sample handling process, with the March 2008 results for sample MWF15I being more similar to the historical results from MWF15D, and vice versa. This will be verified using the results from the June 2008 monitoring round. However, for the purposes of this report, the parametric tests have been applied using the data as reported by the laboratory.

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Central Plumes

The distribution and concentrations of volatile CHCs in the Central Plume are generally similar to those reported in previous rounds, with the concentrations of EDC, PCE, TCE and VC in the majority of sampled locations generally stable or decreasing against historical averages.

Northern Plumes

The distribution and concentrations of volatile CHCs in the Northern Plumes are generally similar to those reported in previous rounds with the concentrations of CHCs particularly EDC and CTC, which represent the majority of the contaminant mass, being generally stable or decreasing against historical averages.

Concentrations of CFM, PCE, TCE and VC in the Northern Plumes were generally stable or decreasing when compared to historical data, with most recorded concentrations less than the laboratory limit of reporting (LOR).

Penrhyn Estuary

In general, volatile CHC concentrations in pore water within Penrhyn Estuary were similar or lower than historical concentrations. The concentrations of volatile CHCs in the shallowest ports in Penrhyn Estuary were generally less than historical concentrations, with the exception of a significant increase of TCE at BP71A (1 m port). The concentrations of the volatile CHCs in the shallowest ports of all sampled bundled piezometers were less than the respective ANZECC (2000) Trigger Values. Concentrations of the key contaminants generally increased with depth, with significant increases noted at BP43 (2 m port) at high tide for PCE, VC and CFM. In some instances, concentrations of degradation compounds cis-1,2-dichloroethene (cis-1,2-DCE) and trans-1,2-DCE concentrations exceeded those of their parent compound (TCE).

Surface Water

Surface water concentrations of total volatile CHCs in March 2008 were generally low and similar to the concentrations determined in previous monitoring rounds, with concentrations of all volatile CHCs less than the respective ANZECC (2000) Trigger Values.

The proportion of EDC relative to total volatile CHCs was less than historically observed (<30%) along Springvale Drain, upstream and downstream of Southlands and at the Springvale Drain outlet. The proportion of EDC is approximately 50% in samples collected upstream and downstream of Southlands along Floodvale Drain. Concentrations of volatile CHCs (PCE, TCE, CFM, cis-1,2-DCE and CTC) in Springvale Drain were greater at the upstream boundary (SW046) than at the downstream boundary of Southlands (SW005). However, the sample from the realignment channel (SW049) had concentrations of EDC, cis-1,2-DCE and VC that were greater than those detected at either SW049 or SW005.

Implications for Human Health Risk Assessment (HHRA)

There are no additional data presented in the March 2008 round of sampling with respect to the Western Margin of the Northern Plume that affect the conclusions of the HHRA and Addendum. That is, the groundwater contamination within the

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Northern Plumes near the western margin is not considered to pose an unacceptable risk to human health, assuming that groundwater is not extracted and used. Similarly, there are no additional data presented in the March 2008 Quarterly Monitoring Report that alter the conclusions of the HHRA with respect to existing commercial/industrial workers in areas above the main plumes. That is, the groundwater contamination within the main plumes are not considered to pose an unacceptable risk to human health, assuming that groundwater is not extracted and used.

The conclusions presented within the HHRA associated with exposures within the estuary remain unchanged. That is, given the conservative nature of the range of assumptions and the safety factors applied to toxicity values, the risks to human health for all exposure scenarios are considered to be low. However, the assessment has identified worst-case exposure scenarios (particularly within the inner estuary) where the calculated risks exceed the target values.

Recommendations

On the basis of the results of the March 2008 program, URS made the following recommendations:

- Ongoing detailed review of hydraulic containment of the shallow aquifer at the BIP containment line is required to minimise the potential for loss of containment.
- Review of the target levels and pumping rates along PCA at EWB05D and EW13D should be undertaken to limit future potential for loss of containment in this area of the containment line following high rainfall events.
- Review of the pumping regime for the shallow aquifer along the SCA to limit future potential for loss of containment following high rainfall events.
- In view of the limited containment in the shallow aquifer at PCA due to subdued response to pumping in the deep aquifer, installation of pumps in the shallow aquifer should be considered.
- The 30 m port at BP91 was reported to be blocked in both the September 2007 and March 2008 monitoring rounds. It is suggested that this port be removed from the program if samples are not able to be collected in the next two monitoring rounds.
- Ongoing monitoring of surface water variability monitoring in Penrhyn Estuary and in Floodvale and Springvale Drains is recommended to assess impacts / improvements in surface water quality in response to pumping at the hydraulic containment lines. In particular, the monitoring of surface water at the realignment channel along Springvale Drain should be closely monitored.

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4 OTHER ENVIRONMENTAL ACTIVITIES

Other groundwater and surface water monitoring and data acquisition activities that have been undertaken in this reporting period pursuant to, or that have relevance to the agreed monitoring plan and conditions of the NCUA, are detailed below.

4.1 Air Monitoring and Human Health Risk Assessment

It was reported in Progress Report No.6 that the draft *Consolidated Human Health Risk Assessment 2005* (URS, 2005b) was prepared by URS and submitted to the DEC on 31 March 2005 with copies provided also to NSW Health and Prof. Brian Priestly (Monash University) from the Australian Centre for Human Health Risk Assessment for independent review. Following a request from the DEC, the draft report was released publicly.

Prof. Priestly completed the independent review and provided comments in a letter to the DEC on 11 May 2005. Generally the comments were overwhelmingly positive and strongly supported the findings of the risk assessment.

Regular air monitoring programs are scheduled, and the results are compared with the data assessed in the Consolidated Human Health Risk Assessment. A summary of the current air emission programs is provided below. Some of these are a requirement of the aforementioned monitoring plan, whilst others have been undertaken in response to recent groundwater and surface water analytical results.

Springvale Drain Air Monitoring

It was reported in Progress Report No.10 that, following the detection of EDC in ambient air at concentrations exceeding those considered in the consolidated human health risk assessment, further sampling was being performed in order to:

- a) better quantify the variability of the air emissions results (if possible); and
- b) assess any potential risk to workers in the vicinity of the drain.

A sampling program was devised in consultation with DECC, NSW Health and WorkCover. The program's objectives were as follows:

- 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 GTP is capable of reducing the groundwater levels to render and maintain risk profiles at acceptable levels for businesses adjacent to the drain.

To achieve the objectives, the following scope was developed:

- develop a water level monitoring network adjacent to Springvale Drain suitable for detailed assessment of the interaction of groundwater and Springvale Drain. The monitoring network will be designed to assess the influence of recharge events as well as GTP operation on shallow groundwater discharge to the drain;
- assess risks to workers along Springvale Drain based on ambient air data collected during a six-month program to assess the effectiveness of the GTP operation in reducing shallow groundwater discharge to the drain and associated inhalation exposures;

- review the relationship between surface water concentrations and ambient air data to refine the volatilisation model. The volatilisation model, once refined, will be utilised 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 acute or short-term exposures that may occur in the event that the GTP is not operating resulting in increased discharge of shallow groundwater to the drain and increased concentrations of volatile CHCs in air. This assessment will aim to identify a maximum short-term exposure period which may be considered acceptable on the basis of acute or short-term risks to workers.

In summary, the operation of the containment lines (and consequent drawdown of the water table) does have significant impact on reducing the discharge of shallow groundwater into Springvale Drain (with observed beneficial effects on surface water quality in Penrhyn Estuary), and hence has some mitigating effect on the risk profiles for adjacent lands.

At the time of writing, over 12 monthly air-monitoring events had been completed with *no* samples outside of Southlands exceeding the long-term human health threshold limits outlined in the consolidated HHRA (URS 2005b).

In this reporting period, planning had commenced to infill the Springvale Drain re-alignment channel and Southlands ponds as a matter of priority, as monitoring has identified them as a primary source of the vapours. KBR and JBS have been engaged to design the remedial system, which will commence with a trial extraction in July 2008. URS have been engaged to complete a review of environmental factors (REF) and assist in obtaining the relevant planning permission.

Orica expect this program to be well advanced by the submission of the next quarterly report in August 2008.

4.2 DNAPL Source Area Depletion Projects

The following has occurred in this reporting period:

- Work is continuing to finalise the laboratory report for the In Situ Chemical Oxidation (ISCO) bench-scale trials conducted by VeruTEK Technologies, Inc. (Connecticut, USA).
- Three representatives from Orica attended the 6th International Conference on the Remediation of Chlorinated and Recalcitrant Compounds, held in Monterey, California, on 19-22 May 2008. A large number of presentations and posters on DNAPL source area evaluation and treatment were attended, along with follow-up discussions with a variety of expert researchers and practitioners in these fields. In addition, meetings were held with North American consultants who have been engaged by Orica to assist in the DNAPL source area depletion projects.

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5 GROUNDWATER TREATMENT PLANT OPERATION

The GTP has been operating since January 2006. In this time, several operating challenges have been presented to Orica. The following is an update of Orica's progress in overcoming and addressing these challenges in order to improve the GTP on-line time and throughput.

5.1 Air Strippers

It has been reported in previous GCP Progress Reports that the air stripping system was suffering from biological fouling caused by the growth of a filamentous fungus within the stripping cabinets. Under the GTP's original operating regime, the groundwater entering the air strippers was acidified to prevent the build-up of inorganic precipitants such as aluminium and iron. However, it was found that these acidic conditions encouraged opportunistic growth of the filamentous fungus.

In this reporting period, investigation of new fungicides has been undertaken and results will be made available in future Progress Reports.

Work on the use of chlorine dioxide as a sterilising agent and the Clean-In-Place system have not progressed due to competing plant priorities.

5.2 Stripped Water Treatment Plant (SWTP)

Previously it has been reported that changes were made to the pH and bicarbonate alkalinity in the Actiflo units to improve iron and aluminium removal and give greater pH stability. These optimised conditions continue to give good iron and aluminium concentrations at the Reverse Osmosis (RO) feed, however, the extended RO run times previously observed have not continued, probably due to issues associated with the development of the Biological Aerated Filters.

The extension of the single Biologically Aerated Filter (BAF) to five BAF units was carried out. Unfortunately, it was found that the counter-current configuration (air flow up, water flow down) did not result in adequate hydraulic performance.

Consequently, a modification was made to change one BAF unit into a co-current unit (both air and water flow upwards). This unit has demonstrated the required hydraulic performance. Whilst only limited information about the organic removal performance is available, encouraging results have been obtained. To further these investigations, additional units have been converted to co-current flow and additional zeolite media has been added (the co-current arrangement allows for extra material to fit into the vessels).

Unfortunately, during these trials, there has been a reoccurrence of sulphide production by Sulphate Reducing Bacteria in units downstream of the BAFs. This led to severe fouling of the reverse osmosis units, which has proved very difficult to recover, limiting plant capacity. At these reduced rates, containment has still been achieved on the SCA and PCA lines. Significant operational effort has been expended which has identified techniques to recover the fouled RO units and also to devise techniques to limit the problem of sulphide production.

At the time of publishing, works were continuing and updates will be provided in future Progress Reports.

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5.3 Chloramine in the Permeate

As has been previously reported, chloramine has been used to control biological fouling in the SWTP. Sodium metabisulphite is dosed to excess treated water, to remove chloramine, but this unfortunately produces ammonia. The DECC requires Orica to undertake an Ammonia Pollution Reduction Program (PRP) to minimise ammonia discharge.

In this reporting period, following discussions with Amcor, information was provided on the likely dilution expected in the stormwater canal (the discharge point for excess treated water) due to water added by Amcor through pumping groundwater at Snape Park, Maroubra. The data shows that at least 50% dilution is expected.

The most significant work undertaken as part of the PRP has been the ongoing BAF trials. It is expected that reduction in the organic content of the water will lead to a reduced chloramine demand and hence reduced ammonia concentrations in the excess water discharged.

An update on progress under the PRP was submitted to the DECC in April 2008.

5.4 NATA Accreditation

The GTP laboratory is seeking accreditation from the National Analytical Testing Authority (NATA) to facilitate sampling and analysis for a range of analytes in accordance to the licence conditions. On Tuesday 13 May 2008, the NATA Assessment team visited the GTP laboratory to conduct an accreditation assessment. An Interim Report on Initial Assessment included a number of minor items that Orica is addressing at the time of writing.

NATA advised Orica that it can take up to six weeks for the final report, and then another four to six weeks following a satisfactory application (i.e. resolution of issues) before accreditation is given.

Updates will be provided in future Progress Reports.

5.5 Thermal Oxidiser and Dioxin Air Emissions

The thermal oxidiser (TO) has been successfully commissioned and is operating within licence specifications (0.1 ng/m³).

A trial was undertaken in February 2008 to evaluate dioxin concentrations in the stack gas during destruction of the recovered waste EDC from the SSU operation. The results with and without recovered waste EDC being destroyed are shown below. It is clear that this had no impact on the dioxin concentration in the stack.

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Date	Stack Emission Results (dioxin TEQ, ng/m ³)
February 2008	0.013 (without SSU condensate)
February 2008	0.013 (with SSU condensate)
April 2008	0.021

5.6 Operational Performance

An average of 3.7 ML/day of contaminated groundwater was extracted and treated by the GTP from 1 January to 31 March 2008.

5.7 Operating Data Summary

A summary of the aggregate data from the SSU and GTP since the commencement of groundwater remediation on 28 October 2004 to the end of May 2008 is provided below:

Total water treated to date:	3.3 GL
Total recovered and/or destroyed CHCs:	570 tonnes

The treated volume reported in the previous GTP Progress Report No. 17 was erroneous due to an incorrect formula in the calculating spreadsheet. This has since been cross-checked and corrected.

5.8 Beneficial Reuse of Treated Water

The GTP began supplying the Orica ChlorAlkali plant with treated water in December 2006. Qenos is regularly receiving treated water for use in cooling towers and trials on the use of treated water to feed the Site Utilities Demin Plant have been performed. Solvay Interlox commenced use of treated water from the GTP in June 2007.

Orica and Qenos are currently using treated water in cooling tower applications. In this reporting period, Solvay Interlox has re-commenced using the treated water. Use of treated water to feed the Demin Plants is awaiting resolution of some operational issues, which should be aided by successful operation of the BAF units.

There have been no further significant developments in this reporting period.

5.9 Temporary Aquifer Storage and Recovery

The use of the Steam Stripping Unit (SSU) as a backup to the operation of the GTP was noted in the Botany Groundwater Cleanup Project EIS and the Joint Determining Authority Report. However the SSU was not originally designed to treat contaminated groundwater and, towards completion of the GTP construction, the SSU was showing evidence of severe corrosion requiring constant maintenance and repairs. Additionally, the plant is substantially older than the GTP and does not meet current environmental best practices.

Hence, a series of options were examined and temporary aquifer storage and recovery (TASR) was identified as the most suitable alternative. In the event of a

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significant GTP failure (i.e., that would necessitate a GTP shutdown for more than three or four weeks) TASR would be employed to collect contaminated groundwater from critical locations (such as the SCA and the Springvale Drain spear points) and re-inject the water upgradient of the BIP containment line. This would allow Orica to maintain containment in critical areas while repairs were performed on the GTP. Once the GTP was operational again, the water would be re-collected at the downgradient BIP containment line.

The groundwater cleanup works are being conducted under the NCUA. State Environmental Planning Policy 55 - Remediation of Land specifies that all works in response to a Notice of Clean Up Action are permissible without development consent. As such, installation of the TASR system is to be assessed and approved under Part 5 of the *Environment, Planning and Assessment Act 1979*.

The following has occurred in this reporting period:

- The REF has been completed and will be submitted shortly following this report. A copy will be placed on the Orica Botany website.
- Groundwater modelling detailed in the REF demonstrates that for an injection period of four months, groundwater from the injection wells is fully contained on the BIP upgradient of the 2nd Street containment line. The distance travelled by particles during the injection period is relatively short and the extent of up and cross gradient flow is minor.
- Detailed design and planning for the trial injection had been completed and preparations for the field trial were well underway, pending project approval.
- KBR had commenced detailed design and materials sourcing for the full-scale system. The trial system is designed to upgrade to full scale should it be successful.

5.10 Mobilisation to Foreshore Road – June 2008

A large-scale maintenance mobilisation to Foreshore Road is planned to commence in early June 2008 in order to perform a series of repairs and preventative maintenance works on the SCA containment line. Planned works include the following:

- Short sleeves will be installed in two shallow groundwater wells in order to prevent oxygenation of the water in the well. It has been suggested by some of the project hydrogeologists that oxygenation of the water may be encouraging biological fouling that has been observed in the shallow pumps. The sleeves are being custom made by Johnson Well Screens Australia Pty Ltd.
- Following the successful operation of a progressive cavity mono pump in the typically fouling service in the shallow wells, two additional mono pumps are being installed to extend the trial of these units.
- Faulty transducers will be checked, repaired or replaced.
- Faulty variable speed drives will be inspected and repaired or replaced.

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6 COMMUNITY CONSULTATION

This section provides a consolidated update in response to Condition 7K of the NCUA, which specifies how Orica must inform the community of developments in the remediation of groundwater, and information regarding the wider consultation activities, which are undertaken by Orica to obtain community feedback regarding the BGC Project. Orica supports a two-way communication process with our local community and this section incorporates feedback received from the community during the reporting period.

6.1 Community Liaison Committee (CLC)

CLC Meetings

A quarterly CLC meeting was held on 1 April 2008. Orica's presentation, based on the Briefing Paper prepared for this meeting, provided updates on the Temporary Aquifer Storage & Recovery project, the Springvale Drain vapour monitoring program and the mercury investigations relating to the former ChlorAlkali Plant. The DECC provided feedback on Orica's progress under the NCUA as well as detailed responses to queries that the community had posed at CLC meeting in December 2007.

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
Prof Acworth to reiterate his reasoning why further monitoring is suggested south of the SCA	Discussed at IMC/CLC combined meeting held 27 May. In response, the CLC progressed the arrangements for the Sydney Ports/Orica workshop to be chaired by CoBB.
Dr Hibberd/Dr Clunies-Ross to prepare final documentation for Task 17	Final report prepared and distributed to the CLC 23 May. Task is now complete.
The DECC to consider Dr McCracken's recommendation regarding the reporting and monitoring requirements of less volatile pollutants (see Task 21) as relevant to DECC responsibilities	The DECC will report back at the 17 June 2008 CLC meeting
IMC members are to advise on the need for ongoing validation audit and environmental review in accordance with Orica's EPL condition E5 at the May combined CLC/IMC meeting	Comment was provided by the IMC and noted by the DECC
Combined IMC/CLC meeting to be arranged for May	Meeting held 27 May
Orica to provide copies of the BGC project acronyms at CLC meetings	Copies will be available each CLC meeting
Progress arrangements for the Sydney Ports/Orica workshop	Orica to forward outcomes from the combined IMC/CLC meeting to all and CoBB to progress

The next CLC meeting is scheduled for 17 June 2008.

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CLC Newsletter

CLC Newsletter No. 28 was distributed in March 2008 after being reviewed by the CLC. It included updates on: groundwater treatment and containment, the Independent Monitoring Committee (IMC) the CLC, the November 2007 residential bore monitoring event, groundwater webpages, Orica's rainwater tank rebate program and the mercury investigations relating to the former ChlorAlkali Plant.

A draft of CLC Newsletter No. 29 will be issued to the CLC for comment in the first week of June 2008 and will be finalised and distributed prior to the June CLC meeting.

6.2 Independent Monitoring Committee (IMC)

The IMC and CLC met for a combined meeting on 27 May. The community was well-represented and all IMC members attended. Recent tasks were discussed and progress was made towards planning a joint Sydney Ports/Orica workshop to be chaired by CoBB. The IMC also provided comment on the need for a further validation audit, environmental review as required in section s.5 of the EPL, known as Task 22.

The IMC also held their own meeting on 27 May after the combined CLC meeting. They noted that the relevant IMC members would provide input to questions/issues for the Sydney Ports/Orica workshop.

The table below indicates the one outstanding IMC task and one in progress. All completed IMC tasks are listed on the project website: www.oricabotanytransformation.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 the workshop to request any questions).	OUTSTANDING Raised by CLC on 12 Dec 06. The workshop is now to be hosted and chaired by the CoBB. Workshop invitees and issues were progressed at the IMC/CLC meeting of 27 May 08. Relevant IMC members to provide input to questions/issues to raise at the workshop.
21	Orica to share the requirements of its Environment Protection Licence, Trade Waste Service Agreement and Ammonia Pollution Reduction Program for the GTP, along with recent results for each, with Dr McCracken in order to better describe the inputs and outputs from the GTP treatment process. Dr McCracken to provide feedback to the CLC following review of this information.	INTERIM REPORT provided 26 Feb 08 McCracken stated that the report he provided is a progress report

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6.3 Communication Tools

Community Street Meetings

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

Community Workshops

No groundwater-specific community workshops were held in this reporting period. Orica still plans to hold another workshop on water recycling once the various recycling initiatives have been further developed. As an interim measure, Orica prepared an insert to the March/April CLC Newsletter that provided an update on the progress of Orica's Treated Water Recycling Program.

Further planning on the combined workshop with Sydney Ports to discuss the interface of the groundwater cleanup and the Port Development was held at the combined CLC and IMC meeting held on 27 May 2008.

Newspaper Columns

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

- *Column 76: 25 March 2008:* Groundwater treatment, Botany site bus tour and results for the November residential bore monitoring event;
- *Column 77: 29 April 2008:* Groundwater treatment, 2008 Harding Orica Prize recipients and the Botany Transformation website; and
- *Column 78: 27 May 2008:* Groundwater cleanup project, Car Park Waste Encapsulation and a reminder that Orica's rainwater tank rebate program ends on 30 June 2008.

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.

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

- Groundwater Cleanup Plan Progress Report No.17 and Appendices;
- Recent newspaper columns;
- March 2008 CLC newsletter;
- CLC Briefing Paper, April 2008 2007; and
- Presentation materials from 1 April CLC Meeting.

Orica released another new webpage for the BGC Project during this reporting period: for the Recycled Water project. An email feedback feature established on the website, at the request of the Community Liaison Committee (CLC), allows browsers to comment on the CLC's activities and achievements. This email feedback feature is found on the pages dedicated to the CLC.

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All documents available on the previous site have been copied to the new website and additional reports have been uploaded. Viewers accessing the old site will be automatically redirected to the new site. Changeover to the new website has meant that website visitor data is still unavailable this quarter.

1800 Number

Orica continues to operate the free-call number, 1800 025 138. The majority of calls during this reporting period related to Orica's Rainwater Tank Rebate Program. Other calls included queries relating to sponsorship of community events, air monitoring, sediment monitoring, bore testing, BIP issues (including a complaint about rabbits) and requests for site tours. The Arncliffe Community Centre advised that they no longer wished to receive the CLC Newsletters.

E-mail Feedback

Several e-mails were received in this reporting period from viewers of the Orica Botany Groundwater website. There were several requests for information about sediment monitoring and remediation technologies, queries about Orica's rainwater tank rebate, several requests for BIP site and GTP tours and one BIP-related complaint about rabbits. Another email that was received provided a CLC member's thoughts on CLC processes and the 2020 Forum.

Provision of Reports (Part d of Condition 7K)

Part d of Condition 7K requires Orica to provide the community forum (i.e., the CLC) and the local libraries in the local government areas of Botany Bay and Randwick copies of reports provided to the EPA under the NCUA. This continues to be done.

6.4 Outreach Projects

As detailed in previous reports, 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. A brief update on matters occurring in this reporting period is provided for each of the Outreach Projects below.

Residential Bore Monitoring – 17 residential bores were tested in the May monitoring event. Results will be provided to owners of the tested bores and will be submitted to the DECC. They will be reported in a future CLC Newsletter. The next round of residential bore testing is scheduled to take place in early November 2008.

Rainwater Tank Rebate Program – At the time of writing, 969 tanks had either been installed or approved for installation. The program will end on 30 June 2008.

Ronnie Harding/Orica Prize – Orica funds two annual prizes named in honour of Dr Ronnie Harding, which are awarded to the on-campus and off-campus (correspondence) students with the best academic records in graduating from Masters of Environmental Management courses at the University of NSW. Orica instituted these prizes, each valued at \$1,000, in recognition of the outstanding voluntary services of Dr Ronnie Harding as Chair of the Community Liaison Committee from 1996 to 2005.

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This year, the recipient for the on-campus prize is Mr Tim Palmer. Mr Cameron Allen is the 2008 recipient for the distance prize.

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7 REFERENCES

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ATTACHMENT A – QUARTERLY MONITORING REPORT – MARCH 2008.

Groundwater Treatment Plant (GTP) Quarterly Groundwater and Surface Water Monitoring Report, March 2008, URS Australia Pty Ltd, 30 March 2008. Separately bound report.

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