OPERATION ENVIRONMENTAL MANAGEMENT PLAN HCB WASTE REPACKAGING PLANT PROJECT

BOTANY INDUSTRIAL PARK

ORICA AUSTRALIA PTY LTD

REVISION: 4.2

DATE: 20 September 2016
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ABBREVIATIONS

BIP  Botany Industrial Park
CCO  Chemical Control Order
CEMP Construction Environmental Management Plan
CPRC Community Participation and Review Committee
DP&E NSW Department of Planning and Environment
DG Dangerous Good
DIPNR This NSW government department is now the DP&E
DMS (Orica Lotus Notes) Document Management System
EA Environmental Assessment
EDC Ethylene Dichloride
EHC Environmentally Hazardous Chemicals
EMP Environmental Management Plan
Enablon Orica SHEC Incident Management System
EPA NSW Environment Protection Authority
EPL Environmental Protection Licence
ERP Emergency Response Plan
ERS Emergency Response Service
FB Fire & Rescue NSW
HAZOP Hazard and Operability Study
HCB Hexachlorobenzene
HCBD Hexachlorobutadiene
HCE Hexachloroethane
HCl Hydrochloric Acid
HIPAP Hazardous Industry Planning Advisory Paper
IBC Intermediate Bulk Container
IRP (HCB) Independent Review Panel
KPI Key Performance Indicator
OBLC  OBLC Orica Botany Liaison Committee
OEMP  Operations Environmental Management Plan
PID   Photo Ionisation Detection
PPE   Personal Protection Equipment
QA    Quality Assurance
SHE   Safety, Health and Environment
SHECMS  Orica Safety, Health, Environment and Community Management System
TWA   Time Weighted Average
TWSA  Orica Trade Waste Services Agreement
UN    United Nations
VEC   Vapour Emissions Control
VOCs  Volatile Organic Carbons
WHS   Occupational Health and Safety
1. INTRODUCTION

1.1. Context and Background

This Operation Environmental Management Plan (OEMP) covers the operations of the Hexachlorobenzene (HCB) Waste Repackaging Plant (Store J) and HCB Wastes Stores at the Botany Industrial Park (BIP) site by Orica Australia Pty Ltd.

These activities, combined, are known as the Project.

The Project involves the transfer of waste from existing drums into new, UN-approved containers suitable for transport to a remote waste disposal facility. Repackaged waste is then held at approved Dangerous Goods (DG) stores across the BIP until the destruction destination can be secured (either in Australia or overseas).

The Repackaging Plant was commissioned in May 2007. It semi-automates HCB waste repackaging operations, improving the repackaging capacity and operator working conditions compared with previous manual repackaging methods. Full scale repackaging was completed in 2011. The Project is now in a maintenance phase of storage, inspection and periodic rounds of minor repackaging until a final destination is secured.

1.2. Approvals

An Environment Assessment for the Repackaging Plant Project was prepared and submitted to the now NSW Department of Planning and Environment (DP&E) in April 2006. Approval for construction and operation of the Repackaging Plant, pursuant to the NSW Environmental Planning and Assessment Act 1979 was received from the NSW Minister of Planning in August 2006 (Application no 06_0028), with conditions attached (Project Approval). A number of modifications have been processed since that time.

The Project Approval required that an OEMP be prepared and implemented as per the following extract.
1.3. Scope

This OEMP covers:

- Repackaging activities in Store J; and
- Storage of repackaged waste material in shipping containers and stores at the BIP.

This OEMP does not cover:

- Any disposal or destruction options for the HCB waste. Any transport activities outside the BIP as these are dependent on the disposal option; or
1.4. **Objectives**

The objectives of the OEMP are to:

- Ensure that the plant is operated in accordance with statutory environmental requirements, including licences, permits and approvals relevant to the plant;
- Ensure that the plant is operated in accordance with the commitments made in the EA for the project;
- Ensure that the plant is operated in such a way as to minimise any environmental impacts;
- Identify management roles, responsibilities and reporting requirements to ensure implementation of the OEMP; and
- Provide a user-friendly document detailing the environmental management framework, practices and procedures and additional information for use by all personnel involved in the operation of the Project.

1.5. **Audience**

The OEMP is intended for use by personnel involved with the Project including managers, operations personnel, contractors and auditors.

1.6. **Methodology**

The OEMP has been prepared in accordance with the *Guideline for the Preparation of Environmental Management Plans* (DIPNR 2004) and included review of the Project EA, and relevant licences, approvals and permits.

1.7. **Responsibility and Review**

The OEMP is not a static document and will be reviewed as follows:

- At least once per Orica financial year.
- If significant changes to the Project operations occur.
- Following an environmental incident.
- If environmental performance requires improvement.

The Legacy Operations Leader is responsible for ensuring that appropriate review and update of the OEMP occurs.
2. PROJECT DESCRIPTION

2.1. Overview

HCB was produced on the BIP site as a by-product from manufacture of chemical solvents and plastics from the 1960s to 1991. HCB is a bioaccumulative Class 6.1 material, a Scheduled Waste and Scheduled Poison (S7), and is also a suspected carcinogen. It is not flammable.

As a result of these historical operations, Orica has accumulated approximately 15,000 tonnes of waste materials (including contaminated packaging) contaminated with HCB and other chlorinated compounds. The waste material is corrosive so periodic repackaging at the BIP site is required for safe storage until a final disposal or destruction method is determined.

Since its commissioning in May 2007, the majority of HCB repackaging operations has taken place in the main Repackaging Plant (Store J). The Plant handles three main groups of wastes:

- High level solid waste (primarily HCB crystals with small amounts of liquids).
- High level liquid waste (primarily Hexachlorobutadiene or HCBD).
- Low level solid waste (HCB < 1wt%) such as contaminated soil, concrete, storage drums and pallets.

All HCB wastes are repackaged into UN approved containers including new 100 and 200 litre polythene lined metal drums for high level solid waste (HLW), 1m$^3$.

Intermediate Bulk Containers (IBCs) for high level waste or low level HCB- contaminated waste (LLW) such as shredded drums, 1m$^3$ plywood box with a woven bag liner (Composite IBC) for LLW such as spent catalyst and woven bags with a polythene liner (FIBC) for LLW such as used pallets.

Stock stocks and types are presented in Tables 2.1 and 2.2.

### Table 2.1: Waste Stock Summary

<table>
<thead>
<tr>
<th>Material</th>
<th>Container(s) used for repackaging$^1$</th>
<th>Waste mass$^2$ (t)</th>
<th>Organochlorine mass$^2$ (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorinated solvents byproduct wastes</td>
<td>100L, 200L steel drum, IBC$^3$</td>
<td>7,900</td>
<td>7,800</td>
</tr>
<tr>
<td>Vinlys byproduct wastes</td>
<td>IBC$^3$</td>
<td>1,800</td>
<td>1,700</td>
</tr>
<tr>
<td>Demolition wastes</td>
<td>Plywood box$^4$, IBC$^7$, 205 L steel drum</td>
<td>200</td>
<td>2</td>
</tr>
<tr>
<td>Contaminated process wastes</td>
<td>Plywood box$^4$, IBC$^7$, 205 L steel drum</td>
<td>1,700</td>
<td>400</td>
</tr>
<tr>
<td>Contaminated packaging wastes</td>
<td>Plywood box$^4$, Woven bag$^5$</td>
<td>2,300</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>13,900</td>
<td>9,900</td>
</tr>
</tbody>
</table>

Note 1: All repackaging containers are specifically approved for the dangerous goods that they contain.
Note 2: Mass rounded for reporting purposes only.
Note 3: IBC refers to Intermediate Bulk Container, 1000 litre, constructed of high density polythene (HDPE).
Note 4: Plywood boxes hold 1000 litres of solids and are approved for the containment of various low level wastes.
Note 5: Woven bags are specifically approved for the containment of contaminated wooden pallets.

<table>
<thead>
<tr>
<th>Waste Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorinated solvents byproduct wastes</td>
<td>Hexachlorobenzene (HCB) with minor amounts of other chlorinated hydrocarbons stored in lined 200L drums. Dry, crystalline solid and mixtures of HCB and other materials classed as UN2729. Repackaged into 100L and 200L drums. Mixtures of HCB, hexachlorobutadiene (HCBD), hexachloroethane (HCE) and other chlorinated hydrocarbons stored in lined 200L drums. These wastes are primarily liquids repackaged into 205L drums.</td>
</tr>
<tr>
<td>Vinyls byproduct wastes</td>
<td>Polymerised materials that settled in tanks containing liquid light and heavy fractions from the Ethylene Dichloride (EDC) purification process streams. When the tanks were cleaned the polymers were removed and stored in 205L polythene lined steel drums and concrete tanks. The scheduled chemical concentrations vary between about 0.5% and &lt;0.1%. All of the wastes have been repackaged in 1000L polythene intermediate bulk containers. Wastes with a high proportion of free liquid have been repackaged in 205L polythene lined steel drums.</td>
</tr>
<tr>
<td>Demolition wastes</td>
<td>Redundant production equipment from the former Vinyls and Solvents Plants. Spent oxchlorinator catalyst from the former Vinyls Plant Contaminated blasting grit from routine maintenance of storage tanks formerly used for storage of EDC. Wastes from the demolition of the Solvents plant not listed under other categories, mainly, cable, fibreglass, small valves and lines. Largely carbonaceous material from various sources, including char containing about 0.4% hexachlorobenzene which arose from operation of a flash evaporator at the former Vinyls Plant, spent activated carbon containing about 0.003% HCB which arose from purification of hydrochloric acid from the former Solvents Plant, graphite process components, other carbonaceous residues from maintenance clean outs of the former Solvents and Vinyls Plants and storage tanks. All of this waste has now been repackaged into intermediate bulk containers.</td>
</tr>
<tr>
<td>Contaminated process wastes</td>
<td>Spent carbon arising from operation of the Vapour Emission Control (VEC) System for the old Steam Stripping Unit, and more recently from the operation of the VEC systems for Stores J and G/H. All spent carbon is repackaged into intermediate bulk containers as it is removed from the VEC. Solids and water collected from the former Solvents Plant Settling Tanks and pits that contain HCB, HCBD, HCE and other chlorinated hydrocarbons originally stored in 200L drums. All of this waste has now been repackaged into intermediate bulk containers. Effluent sludges containing about 0.08% HCB arising from periodic cleaning of the former Solvents and Vinyls Plants’ effluent settling pits. Stored in 200L drums. These are included under ‘Soil, Sludge, Concrete’ in the table above and account for nearly all the organochlorine content of that group. All of this waste has now been repackaged into intermediate bulk containers. CPWE Remediation wastes not suitable for treatment or disposal to landfill, transferred to HCB Stores. Primarily the Hypalon liner, filter canisters and activated carbon. Used personal protective equipment from re-drumming campaigns.</td>
</tr>
<tr>
<td>Contaminated packaging wastes</td>
<td>Pallets used for storing drums of waste. Whole pallets are strapped together in bundles and placed in woven bulkier bags. Broken up or shredded pallets are placed in Plywood box IBC. 200L and 205L steel drums previously containing the HCB waste, plus plastic overdrums and the plastic liners in the drums. This also includes crushed drums from past re-drumming campaigns. The old drums are mostly shredded as soon as they’re emptied of waste.</td>
</tr>
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</table>
2.2. Location

The BIP was formerly a single site (ICI Australia), however has been subdivided into a number of areas corresponding to the main chemical complexes on the site. These areas are owned by/leased to the various operators including Orica, Ixom, Qenos and Huntsman, as well as other non-manufacturing companies.

The HCB Repackaging Plant is located within an Orica area of the BIP, adjacent to existing HCB Stores A, B and C. The area is bounded by an elevated pipe bridge and the internal BIP roadway 2nd Street in the east, 1st Street (west of Store A), Springvale drain in the north and 12th Avenue in the south. The boundary of the Orica site within the BIP is effectively the fence running along 1st Street, 12th Avenue and 2nd Street.

The location of the HCB Stores within BIP and the transport routes from the Stores to the Repackaging Plant (Store J) is provided at Appendix 1.

BIP Neighbours

The nearest BIP neighbours are Qenos Alkatuff on the eastern side of 2nd St, (about 10m across the road from the Orica fence to the Qenos property boundary), and about 30m across 12th Ave south to the Qenos Site Utilities boundary.

External Neighbours

The Botany–Sydenham Goods Railway is the nearest BIP site boundary, running parallel to the BIP approximately 80 metres from the plant.

The Denison St boundary is approximately 500m away to the east. Eastlakes/Pagewood is about 500m away to the north. These are the nearest residential areas.

2.3. Operating Hours

When repackaging is required, the facility is able to operate 5 days per week, up to 8 hours per day. Maintenance activities may occur on the sixth day.

2.4. Security

The BIP is a secure site with controlled access for vehicles via a security gatehouse at Gate 3 and turnstile access for inducted personnel with swipe cards at other points. Access for visitors must be pre-arranged with security and visitors escorted from the security gate into the site by a BIP-induced person with a current access pass.

HCB wastes are Scheduled Wastes and Scheduled Poisons, hence must be kept secure from access by unauthorised personnel. A security system (intruder alarms to Gate 3 outside normal working hours) and fire detection system are provided for Store J. The store and container storage area are within a fenced area that is locked at the end of each working day. Security checks are made overnight as per the arrangements for other HCB Stores A, B & C.
2.5. Waste Stores

Repackaged wastes are stored at a number of approved locations on the BIP. These stores are maintained through the HCB Stores Management Procedure. The procedure outlines among other things, the following:

- Inspections (monthly) to assess physical condition of the Stores;
- Maintaining package integrity (any deteriorated or damaged package shall be assessed by the Logistics Coordinator as it is identified. It will be repaired or the contents will be transferred to new packaging);
- Labeling (all Stores and drums are to be correctly labeled);
- Stock control (all stock levels are maintained and recorded in a register);
- Emergency Response (refer section 4.7 for further detail); and
- Audits against the procedure.

2.6. Transport within BIP

Transport of pallets and containers takes place in daylight hours in accordance with the HCB Internal Transport Procedure. A Job Safety Environmental Risk Assessment (JSERA) shall be undertaken for any relocating activities which do not have a set procedure.

Pallets of drums, 1m³ 'IBC's and bulk HCB contaminated waste are transported by truck between stores, typically via the following routes:

- Stores I, F and D: 7th Avenue, 4th Street, 10th Avenue and 2nd Street
- Stores G/H and Stores K/L: 5th Street, 10th Avenue, 2nd Street
- Stores A, B and C are directly adjacent to Store J.

The procedure includes the following controls to minimise the likelihood and severity of any spills:

- Drums to be transported shall be sound and labeled with the type of waste.
- The truck shall have a sound steel tray and combing.
- The drums shall be transported in pallets no more than two high and must be secured to the chassis.
- The driver shall carry a two way radio or mobile phone to enable contact with the Logistics Coordinator.
- The truck shall be equipped with a fire extinguisher and absorbent media. In case of a spill, spill containment and trained personnel equipped to contain and clean up waste HCB spills shall be deployed to the location.

Drivers shall be trained in toxic properties of HCB, emergency and standard procedures and BIP vehicle speed limit and road rules.

2.7. HCB Waste Repackaging Plant

As of April 2011 all the wastes had been repackaged and are being stored and maintained across various stores. Minor repackaging campaigns are conducted as required at the HCB Repackaging Plant at Store J. Flow charts, indicative of the repackaging process, are presented in Appendix 2.
2.7.1 HCB Repackaging Plant (Store J)

The HCB repackaging process is a semi-automated materials handling facility. There is no chemical processing of the waste. Broadly the HCB Repackaging Plant consists of three repackaging lines inside a building with the following main activities:

- Receival areas where forklifts transfer waste packages to the repackaging lines.
- Drum emptying equipment (drum tippers for concentrated drummed waste, shredder and screw conveyor for drums and pallets).
- A liquid collection system consisting of a small baffled tank for the separation of liquid HCBD from water. Contaminated water is transferred to separating tanks prior to discharge through the site effluent system. The site effluent system includes 100 micron and 6 micron filters, as well as activated carbon filters.
- Conveyors for moving empty new packages and repackaged material.
- Weighing equipment.
- Palletiser
- Stretch wrapping and labeling.
- Load out area where forklifts transfer repackaged material from conveyor to shipping container storage area.

A local programmable logic control system with an operator control panel at each repackaging line controls the materials handling equipment and tracks containers of repackaged material (via an indexing system commonly used in conveyor systems).

Store J is divided into 2 main sections:

- The north end is dedicated to HCB repackaging equipment (the “Repackaging Area”) and is capable of repackaging 60-75 tonnes of waste per day into UN approved containers. This operational area is partitioned from the rest of the warehouse to minimise noise, fume and dust emissions.
- The south end (“Warehouse Area”) is used for storing repackaged material ready to load into transport containers. There is space for up to 4 transport containers in the external storage area.

2.7.2. Repackaging Area Fume Extraction and Building Ventilation

Fume hoods installed over drum tipping points, shredder, hoppers and conveying equipment capture fumes and dust. These are vented to a 2-stage activated carbon unit connected to an extraction fan and stack. Pressure vacuum (PV) vents on the liquid recovery tank are also vented to this system.

Since commissioning, this system has been improved to include fine water sprays over the drum tipping hopper and a filter at the shredder conveyor.

During repackaging campaigns, emissions are tested (at monitoring points between the carbon beds and also in the stack as outlined in EPL2148) and the carbon replaced as required. Spent carbon is processed as waste in the Repackaging Plant.

To control the atmosphere in the Repackaging Area and also to ensure potentially contaminated air does not pass into the clean area, a building ventilation fan draws air from Store J through the Repackaging
Area and exhausts through a separate dual bed carbon adsorption system (i.e. independent of the fume extraction carbon beds) connected to the common stack.

Further detail is provided in the Air Quality Management Plan in Appendix 4.

2.7.4. Store J ‘Warehouse Area’

The Warehouse Area is separated from the Repackaging Area via a wall with access tunnels (the tunnel openings have PVC swing doors and the VEC system draws clean area from the warehouse through the tunnel into the repackaging area). Repackaged material passes through the doors of the tunnels to the clean area. Separate forklifts are used in the clean and repackaging areas to avoid contamination of the clean area.

Repackaged material is labeled, the pallets of drums stretch wrapped and pallets stacked in the warehouse pending placement into designated Stores or 20-foot transport containers. If wastes are being loaded into shipping containers for export are inspected by an independent cargo surveyor. The containers are then closed up, the surveyor places a seal on the doors and the container is labeled with the dangerous goods signage. A shipping container forklift moves the containers onto trucks or to the storage area as required.

2.7.5. Stores G/H

Store H has a temporary enclosure to provide protection from wind and rain during repackaging at that location. Store G has been enclosed and vented to the ventilation fan and activated carbon bed system. Repackaging of the materials held in these stores is complete, however the facility could be utilized for future repackaging if required. This would be done in consultation with the EPA. The Store remains a registered dangerous goods depot and waste store.

2.7.5. PPE and Worker Health Monitoring

Note that monitoring activities associated with worker health (i.e. within the Repackaging Plant) are not covered by this OEMP. These are addressed separately under Work Health and Safety regulatory risk assessment requirements.

2.8. Redundant Shipping Containers

The relocation of repackaged drums from shipping containers to Stores K/L means that many of the containers will no longer be required. As the containers are emptied, they are inspected by both Orica and an independent inspector prior to return to the owners. Contamination is not expected as the drums have been packaged in preparation for the proposed export. In the unlikely event the container is contaminated, it will remain onsite for decontamination.
3. STATUTORY REQUIREMENTS

3.1. Approvals and Licences

The Project operates under the approvals, licences and permits outlined in Table 3.1. These may be updated or revised from time to time. Orica maintains an obligations register which lists all the conditions under each of the approvals and licences.
Table 3.1: Statutory requirements summary

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Licence / Approval / Permit</th>
<th>Authority</th>
<th>Required for</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW Environmental Planning and Assessment Act 1979</td>
<td>Project Approval 06_0028 under Part 3A of the Act.</td>
<td>DP&amp;E</td>
<td>Construction and operation of plant.</td>
<td>Approval was granted in 2006 and has been modified on six occasions since to reflect changing nature of operation.</td>
</tr>
<tr>
<td>NSW Protection of the Environment Operations Act 1997</td>
<td>Environment Protection Licence (EPL no 2148)</td>
<td>NSW EPA</td>
<td>Operation of the HCB Repackaging Plant and repackaging activity at Stores G, H.</td>
<td>Licence was updated to cover new emission points associated with HCB Repackaging Plant and has been modified periodically to reflect changing nature of Project. This licence also covers a wide range of other activities on the Orica Botany site.</td>
</tr>
<tr>
<td>NSW Work Health and Safety Act 2011.</td>
<td>Major Hazard Facility</td>
<td>NSW WorkCover</td>
<td>Storage of HCB waste.</td>
<td>HCB included in Orica Botany Major Hazard Facility (MHF) licence despite not being a Schedule 15 chemical. A review of MHF requirements was initiated following the sale of the Chemicals business to Ixom.</td>
</tr>
</tbody>
</table>
4. MANAGEMENT SYSTEMS

4.1. Environmental Management Systems

Orica operates under an integrated corporate Safety, Health, Environment and Community Management System (SHECMS). Orica’s SH&E Policy defines the company’s overall objectives with respect to our operations. The Policy can be located via Orica’s intranet.

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Orica Policy

Environment

Orica understands that excellence in environmental performance is essential to our ongoing business success.

To manage our company responsibly, sustain growth, offer valuable products and services and maintain regulatory and community trust, we must embed environmental stewardship into everything we do. Our business plans will consider both the short and long-term impacts of our operations on the environment, and will support minimising our environmental footprint and legacies.

In particular, Orica will:

- Ensure that environmental management and stewardship is integrated into all aspects of our activities.
- Enable all people to know and understand their role in considering environmental management in their day-to-day work.
- Ensure environmental risks are identified, managed and monitored across all aspects of our operations.
- Ensure site-specific environmental management plans are in place for all our operations.
- Rehabilitate sites or areas disturbed by our activities.
- Comply with all applicable laws, regulations, licences, internal policies and contractual obligations as a minimum standard.
- Always look for opportunities to improve the environmental performance of our activities.
- Use our resources in an efficient and responsible manner, and minimize waste and the environmental footprint of our activities.
- Engage with our stakeholders in a proactive manner and through regular reporting of our environmental management and performance.
- Work with our customers to help them achieve their environmental goals.

Ian Smith
Managing Director and CEO
Orica Limited
July 2013
The SHECMS has been developed to manage the interaction between people and the work environment and to ensure sustained compliance with legislative requirements, the Orica Standards, Codes of Practice and other external standards. It consists of a series of Management Procedures which define the key requirements of the SHEC Policies and provides guidance on how the requirements can be met. The Management Procedures capture good practice across the company.

The requirements of the procedures are followed through local work instructions and local practice.

### 4.2. Operating Procedures

Detailed operating procedures have been developed covering all aspects of the Project. These are periodically reviewed and revised and are available to all personnel associated with the plant via Orica’s Lotus Notes Document Management System (DMS). The functionality of DMS allows for review, approval and distribution to relevant personnel. All staff have access to the DMS relevant to their roles. See also Section 4.11 (Document Control).

A list of operating procedures is given in Appendix 3. These may be subject to change during operations.

### 4.3. Training

All people working on the BIP undertake site induction and safety training. All people working on repackaging operations are trained in a plant specific induction appropriate for their role. Training includes as appropriate:

- Site familiarization;
- Operating procedures;
- Site environmental controls, monitoring and reporting requirements; and
- Emergency response.

Training is recorded including name of person trained, trainer details and date.

### 4.4. Roles and Responsibilities

The organisational structure for HCB Repackaging Plant is shown in Figure 4.1. Broad environmental management responsibilities for HCB Repackaging Plant personnel are summarised in Table 4.1. Specific responsibilities addressing requirements of approvals, licences and permits are detailed in the plans in subsequent sections of the OEMP.

<table>
<thead>
<tr>
<th>Role</th>
<th>General Responsibility</th>
</tr>
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<tbody>
<tr>
<td>Legacy Operations Lead</td>
<td>Ensure SHEC policy is implemented.</td>
</tr>
<tr>
<td></td>
<td>Ensure all activities meet legislative requirements.</td>
</tr>
<tr>
<td></td>
<td>Approve allocation of environmental resources, including training.</td>
</tr>
<tr>
<td></td>
<td>Incident investigation and corrective action closeout</td>
</tr>
<tr>
<td>Operations Coordinator</td>
<td>Ensure SHEC policy is implemented.</td>
</tr>
<tr>
<td></td>
<td>Definition and provision of required training (including environmental training).</td>
</tr>
<tr>
<td></td>
<td>Ensure all activities meet legislative requirements.</td>
</tr>
<tr>
<td></td>
<td>Ensure and verify competence of any contractors.</td>
</tr>
<tr>
<td></td>
<td>Incident investigation and corrective action closeout.</td>
</tr>
</tbody>
</table>
### 4.5. Communications and Information

Orica has an open and transparent approach to community consultation. Community feedback and involvement is encouraged through a comprehensive communication framework that uses:

- Signage;
- Fact sheets/frequently asked questions/technical summaries;
- Website [http://www.orica.com](http://www.orica.com);
- Community engagement meetings;
- Site tours; and
- 1800 025 138 (freecall number)

### 4.6. Stakeholder and Community Liaison

Throughout the duration of the Project extensive consultation is undertaken with a range of stakeholders including:

- NSW DP&E;
- NSW EPA;
- NSW Health;
- NSW WorkCover;
- City of Botany Bay Council; and
- Community

The community engagement group, the Orica Botany Liaison Committee (OBLC) formerly called the CPRC, was established in 1997 under the HCB Waste Management Plan to "receive, request and distribute information; consult the local community; participate in relevant processes; and review and advise the NSW EPA and Orica on relevant proposals, including monitoring and implementation of the management plan.

The OBLC, comprising representatives of local community groups, local industry, independent experts, local and state government and Orica continues to meets regularly. The committee provides an inclusive
consultation process so that any member of the public can become involved.

As per the requirements of the Project Approval, regular updates are made to the website: [http://www.orica.com](http://www.orica.com)

### 4.7. Emergencies and Pollution Incidents

The Project operates under the Orica Botany Major Hazard Facility Emergency Response Plan (ERP). The ERP is designed to meet the Industry Emergency Planning Guidelines Hazardous Industry Planning Advisory Paper: No. 1 Industry Emergency Planning Guidelines, the NSW Environmentally Hazardous Chemicals Act, 1985 and the Work Health and Safety Regulation 2011 – Major Hazard facility requirements. It addresses scenarios, inventories, controls, actions, responsibilities and training requirements with respect to the management of emergencies and is tested at regular intervals.

In accordance with Section 5.7A of the POEO Act 1997, Orica Botany may implement the Pollution Incident Response Management Plan (PIRMP). The PIRMP incorporates the NSW EPA’s Environmental guidelines: Preparation of pollution incident response management plans and outlines the processes to prevent and minimise the risk of pollution incidents and ensure comprehensive and timely information is provided to relevant authorities and stakeholders.

The PIRMP is integrated with the ERP and is available to all personnel via the Botany Legacy DMS. The PIRMP is tested at least once per year. Personnel with responsibilities under the Plans are trained in their requirements.

Orica also trains personnel to follow the basic principles below in managing an incident:

- Protect people / environment / property;
- Notify your supervisor immediately;
- Combat the incident if it is safe to do so.

All incidents at Orica sites are reported, investigated and managed using the Orica SH&E Reporting Management Information System (Enablon). Enablon includes allocation of actions and action tracking capacity. The reporting tool is used for EPA and any other internal reporting requiring incident information or statistics. All Project personnel can raise an incident. The Legacy Operations Leader is responsible for monitoring and closeout of actions for the Project.

### 4.8. Emergency Contact

For externally detected incidents, the National Emergency Response Service (ERS) can be contacted at any time on 1800 033 111. This number is displayed on labels affixed to transport containers (but it is not required on shipping containers being transported to port for export) and can also be accessed via the community hotline (1800 025 138) displayed on signage at strategic positions along BIP fencing and entrance points.

On receiving a call affecting the Project, the ERS would notify the HCB Repackaging Plant Operator who would initiate shutdown procedures and / or the ERP as required.
4.9. Complaints

Complaints from community members are treated as per any other incident, and are documented using the same process as described for incident reporting. All complaints are investigated and documented. Any corrective measures are tracked for completion.

The BIP maintains a Community Hotline for complaints, enquiries and feedback (1800 025 138). Complaint details (name of person making complaint, contact details, nature of complaint) are entered into a register by the person receiving the complaint and allocated to the relevant Operations Leader for investigation and response.

4.11. Document Control

New documents are circulated in draft form for comment to relevant Orica project personnel. Once approved, the new document is saved to the Botany Legacy Operations DMS. A revision number and date is allocated.

Documents for revision are circulated for review by relevant Orica project personnel. Once finalised, the revision is saved to the Botany Legacy Operations DMS. The revision status and date of the document is altered accordingly. A copy of the superseded document should be systematically retained.

When a new document is saved to the DMS or any document is revised, personnel affected by the document, or their superiors, are made aware of the change by the Operations Coordinator.

The DMS can be used to check the revision status of all documents in the system and all project personnel have access to it. All project personnel have access to the DMS relevant for their work.

All final records and reports associated with the Project shall be saved on the L: drive or in the Plant Dossier on the DMS.
5. MANAGEMENT OF ENVIRONMENTAL IMPACTS

5.1. Overview

The EA for the project identified areas where a potential environmental impact could occur. To minimise potential adverse impacts, environmental management processes and control measures applicable to the Project have been developed by:

- Preparation of the project EA which identified and committed to a number of safeguards and control measures to control environmental impacts from the HCB Repackaging Plant. Orica notes that this OEMP has been reviewed to reflect current operations, rather than full scale repackaging as specified in the EA. As such some of the controls have been amended.
- Reviews during the detail design process including HAZOPs, risk assessments, fire safety study, machinery safety studies, trials to ensure materials handling equipment operated successfully and laboratory testing to determine the efficacy of the carbon beds for scrubbing exhaust air from the ventilation system.
- Conditions of Project Approval and the EPL which set the statutory framework and limits within which the plant must operate.

In some cases there is negligible or very minor potential for an adverse environmental impact (e.g. visual amenity) and no specific management activities occur. For other categories detailed management and monitoring activities occur and a specific management plan is in place to ensure that control measures function as designed, and that monitoring is in place to demonstrate that required environmental performance is achieved (e.g. air quality).

Table 5.1 summarises the main controls in place to minimise potential impacts and also provides the reference to more detailed management plans where relevant.

5.2. Monitoring of Controls

The implementation of the environmental management controls is monitored through regular plant inspections, monitoring programmes and incident investigations (as required). These activities are either part of general plant operation activities and are covered by standard operating procedures, or are defined in specific management plans where relevant.

Key Performance Indicators (KPI) are defined for many of the potential impact areas and are used to monitor compliance. These are summarised in Table 5.1 and specific management plans where relevant.

5.3. Responsibilities

Responsibilities for the management of each environmental impact category are specified in Table 5.1 and, also in specific management plans where relevant.
### Table 5.1: Summary of management of potential environmental impacts.

<table>
<thead>
<tr>
<th>Aspect / impact</th>
<th>Potential Impact</th>
<th>Controls</th>
<th>Monitoring</th>
<th>KPI</th>
<th>Responsibility</th>
<th>Approval reference</th>
<th>EPL reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air quality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission of gases / vapours (chlorinated hydrocarbons including HCB, HCBD, HCE).</td>
<td>All repackaging activities occur in controlled buildings.</td>
<td>Fan failure alarms (audible and visible).</td>
<td>Comply with EPL</td>
<td>Legacy Operations Leader.</td>
<td>2.4 – 2.10 3.1 – 3.3</td>
<td>P1, L2, M2, E5.</td>
<td></td>
</tr>
<tr>
<td>Odours.</td>
<td>AQMP (Appendix 4)</td>
<td></td>
<td></td>
<td>Legacy Operations Leader.</td>
<td>2.2.</td>
<td>O5.</td>
<td></td>
</tr>
<tr>
<td><strong>Surface waters</strong></td>
<td>Contamination of surrounding area (e.g. Springvale Drain)</td>
<td>Segregation of potentially contaminated and clean areas using bunding and kerbing. All process areas are hardstanding. Contaminated areas directed to effluent system. BIP site and HCB transport procedures include container integrity checks, steel sheeting on truck trays, covers on loads, rigid vehicles, speed limits. Spill cleanup equipment and procedures.</td>
<td>Regular plant logs. Monitoring and diversion for treatment (if required) of BIP effluent (common to other HCB stores and other areas of BIP). No incidents / spills resulting in contamination. Compliance with Trade Waste Service Agreement Specifications.</td>
<td></td>
<td></td>
<td>2.15, 2.16, 2.23.</td>
<td>L1.1, O5.</td>
</tr>
<tr>
<td>Aspect / impact</td>
<td>Potential Impact</td>
<td>Controls</td>
<td>Monitoring</td>
<td>KPI</td>
<td>Responsibility</td>
<td>Approval reference</td>
<td>EPL reference</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------</td>
<td>----------</td>
<td>------------</td>
<td>-----</td>
<td>----------------</td>
<td>-------------------</td>
<td>---------------</td>
</tr>
</tbody>
</table>
| Soil and groundwater | Contamination of surrounding soil / groundwater. | Segregation of potentially contaminated and clean areas using bunding and kerbing.  
All process areas are hardstanding.  
Contaminated areas directed to effluent system.  
BIP site and HCB transport procedures include inspection of containers before transferring to vehicle, speed limits.  
Proper use of approved Dangerous Goods Stores.  
Spill cleanup equipment and procedures. | Regular plant logs.  
Monitoring and diversion for treatment (if required) of BIP effluent (common to other HCB stores and other areas of BIP). | No incidents / spills resulting in contamination. | 2.15, 2.16, 2.23. | 2.15, 2.16, 2.23. | L1.1, O4 and O5. |
| Noise and Vibration | Offense to surrounding receptors. | Most processing equipment inside buildings.  
Fans shielded by buildings.  
Noise Management Plan (Appendix 5). | Operations during standard hours only.  
Noise survey was carried out during commissioning period with all equipment operating.  
Periodic community noise monitoring (not exclusive to HCB, rather for all activities on BIP). | No noise complaints.  
Comply with EPL conditions. | BIP Site Engineer. | 2.13, 2.14. | L5. |
| Waste | Potential contamination due to inappropriate disposal. | Plant designed to generate minimal waste.  
All scheduled waste goes back through Repackaging process, or sent to licenced waste facility.  
EPA approved Online Waste Tracking.  
Wastes to be sent off site are classified. | All wastes to be sent off site are classified.  
No scheduled waste to go offsite unless to facility licenced to receive it.  
Stock levels recorded. | All waste held or disposed of to facilities lawfully permitted to receive it. | Legacy Operations Leader. | 2.17 – 2.21. | O4, E5.6. |
<table>
<thead>
<tr>
<th>Aspect / impact</th>
<th>Potential Impact</th>
<th>Controls</th>
<th>Monitoring</th>
<th>KPI</th>
<th>Responsibility</th>
<th>Approval reference</th>
<th>EPL reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic</td>
<td>Increased traffic loading on local road network.</td>
<td>Required traffic loading is negligible compared with existing BIP and local traffic loading. BIP site and specific HCB transport procedures. Any movements for waste relocations to occur on internal BIP roads only.</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Notes:
1. No specific impacts were identified for Land Use Planning, Visual Amenity, Flora and Fauna or Cultural Heritage due to the site being highly industrialised.
2. Acid Sulfate soils were not detected during the construction period so will not be an issue during the operational phase.
6. REPORTING AND AUDITING

The EPL and the Project Approval contain various reporting and audit requirements for the HCB Repackaging Plant (some of which duplicate each other). The timing, scope and responsibility for reports and audits are summarised in this section of the OEMP.

6.1. Reporting

Many of the reporting requirements associated with the project have been completed. These include pre-construction studies, pre-commissioning, repackaging trials plans and reports, relocation management plans and Air Quality Performance Verification Report. The following reports are still required and are prepared in accordance with the Project Approval, EPL and EHC Act Licence:

- EPL Annual Returns for EPA due 18 September each year.
- EHC Act Licence Annual Report due 20 August each year.
- Immediate notification in the event of an incident with the potential to cause environmental harm (or requiring an investment of >$10,000 to manage and clean up).
- Written incident reports (within 7 days of an incident occurring).

For some aspects of the required reporting, HCB Repackaging Plant information is integrated into reports already submitted to the relevant authority, rather than being a standalone report.

In the event a repackaging campaign or export is to occur the reporting requirements will change. This will be done in consultation with the EPA and DP&E.

6.2. Auditing

The conditions of the Project Approval require that the following audits be carried out by independent auditors approved by the Director-General:

- an Environment Audit; and
- a Hazard Audit.

A Hazard Audit was last conducted in 2015. Environmental audits were conducted in late 2007 and late 2008 and have been suspended until full scale repackaging or export movements commence. Orica will continue to liaise with the DP&E on these requirements from time to time.

6.3. Internal Inspections and Audits

Orica conducts monthly inspections and an annual internal audit in accordance with the HCB Store Management Procedure.

Orica also completes internal reviews against the requirements of EPL 2148, Project Approval 06_0028 and EHC Act Licence 26 at least once per year.

Refer to Table 6.1 for additional details and responsibility. Note that this may change from time to time as agreed with EPA or DP&E. Tables 6.2 and 6.3 provide examples of internal Inspection and Audit checklists.
<table>
<thead>
<tr>
<th>Audit</th>
<th>Scope</th>
<th>Orica Responsibility</th>
<th>Auditor</th>
<th>Responsibility for Organising Audit</th>
<th>Frequency</th>
<th>Reporting</th>
<th>Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Audit</td>
<td>As per Hazardous Industry Planning Advisory Paper No. 5 - Hazard Audit Guidelines.</td>
<td>Arrange auditor. Action recommendations</td>
<td>Independent, qualified person approved by the Director General of NSW DP&amp;E.</td>
<td>Legacy Operations Leader.</td>
<td>Every 3 years or as otherwise agreed by DP&amp;E. Completed in 2008 and 2015.</td>
<td>Provide report to DP&amp;E within 1 month of completion of audit.</td>
<td>Project Approval Condition 3.8</td>
</tr>
<tr>
<td>Audit</td>
<td>Scope</td>
<td>Orica Responsibility</td>
<td>Auditor</td>
<td>Responsibility for Organising Audit</td>
<td>Frequency</td>
<td>Reporting</td>
<td>Ref</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td>--------------------------------------------------------</td>
<td>-------------------</td>
<td>---------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>HCB Store Audit</td>
<td>All HCB Stores as per HCB Store Management Procedure checklists.</td>
<td>Conduct audit as per checklists. Action recommendations.</td>
<td>HCB Stores / Logistics Coordinator.</td>
<td>Legacy Operations Leader.</td>
<td>Once per Orica financial year.</td>
<td>Completed Checklists maintained on record.</td>
<td>HCB Store Management Procedure</td>
</tr>
<tr>
<td>HCB Compliance Review</td>
<td>EPL 2148 and Project Approval 06_0028, active CEMPs (as relevant) and this OEM.</td>
<td>Conduct audit as per checklists. Action recommendations.</td>
<td>EMS Lead.</td>
<td>Legacy Operations Leader.</td>
<td>Once per Orica financial year.</td>
<td>Completed Checklists maintained on record.</td>
<td>EPL 2148 and Project Approval 06_0028, active CEMPs (as relevant) and this OEM.</td>
</tr>
</tbody>
</table>
### Table 6.2: Inspection checklist template example

**HCB STORE INSPECTION CHECKLIST**

<table>
<thead>
<tr>
<th>Stores</th>
<th>Standard</th>
<th>Findings and actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging</td>
<td>No leaks or corrosion</td>
<td></td>
</tr>
<tr>
<td>Pallet racks</td>
<td>Structurally sound</td>
<td></td>
</tr>
<tr>
<td>Storm water ingress</td>
<td>No stormwater</td>
<td></td>
</tr>
<tr>
<td>Water collection pit</td>
<td>Pump to settling tanks</td>
<td></td>
</tr>
<tr>
<td>Signs:</td>
<td>In place and legible</td>
<td></td>
</tr>
<tr>
<td>Scheduled waste</td>
<td>Every door</td>
<td></td>
</tr>
<tr>
<td>Restricted access</td>
<td>Every door</td>
<td></td>
</tr>
<tr>
<td>EIP</td>
<td>Every door</td>
<td></td>
</tr>
<tr>
<td>Door numbers</td>
<td>Every door</td>
<td></td>
</tr>
<tr>
<td>Depot number</td>
<td>At approaches</td>
<td></td>
</tr>
<tr>
<td>Store name</td>
<td>At approaches</td>
<td></td>
</tr>
<tr>
<td>Doors</td>
<td>Secure, locked and exit lights operating</td>
<td></td>
</tr>
<tr>
<td>Fire Indicator Panel inspection</td>
<td>Inspection and service on schedule</td>
<td></td>
</tr>
<tr>
<td>Fire fighting equipment inspection</td>
<td>Inspection and service on schedule</td>
<td></td>
</tr>
<tr>
<td>Housekeeping</td>
<td>No litter, access for people and vehicles</td>
<td></td>
</tr>
<tr>
<td>Grass and plants</td>
<td>No fire or security hazard</td>
<td></td>
</tr>
<tr>
<td><strong>CTU Depot</strong></td>
<td><strong>Standard</strong></td>
<td><strong>Findings and actions</strong></td>
</tr>
<tr>
<td>Housekeeping</td>
<td>No litter, access for people and vehicles</td>
<td></td>
</tr>
<tr>
<td>Grass and plants</td>
<td>No fire or security hazard</td>
<td></td>
</tr>
<tr>
<td>Depot number</td>
<td>At approaches</td>
<td></td>
</tr>
<tr>
<td><strong>Master keys</strong></td>
<td><strong>All Accounted for</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Spill kit</strong></td>
<td><strong>Available for use</strong></td>
<td></td>
</tr>
<tr>
<td><strong>PPE Stock</strong></td>
<td><strong>Adequate supply</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 6.3: Audit checklist template example

**INTERNAL ANNUAL AUDIT CHECKLIST**

**HCB STORE MANAGEMENT PROCEDURE**

**AUDIT Nº:**

**DATE:**

**AUDIT CONDUCTED BY:**

<table>
<thead>
<tr>
<th>CLAUSE</th>
<th>ITEM</th>
<th>COMPLIANCE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Is there an HCB Store record system?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>Is there a copy of the current chemical control order?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.12, 5.13</td>
<td>Have the necessary atmospheric and personnel sampling and analyses been conducted during the last re-drumming campaign?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.11</td>
<td>Have the results from the most recent atmospheric testing been recorded?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.6</td>
<td>Have the necessary inspections been conducted and recorded?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.9</td>
<td>Has the integrity of the packaging been maintained?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.4</td>
<td>Have the personnel responsible for issuing clearances for the HCB Store been trained and assessed in the requirements of the HCB Store?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.4</td>
<td>Was the correct level of personal protective equipment specified on the Permit?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.16</td>
<td>Is the HCB Store labelled in accordance with the chemical control order?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3</td>
<td>Has there been a simulated emergency in the HCB Store? Are there any records of the simulation?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1, 5.4, 5.8</td>
<td>Are maintenance activities controlled by Permit to work? AND Are the Permits issued by an authorised person?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 2.    INDICATIVE PROCESS FLOW CHART
APPENDIX 3. LIST OF RELEVANT OPERATING PROCEDURES

The list of operating procedures relevant for the project at the time of writing of this Plan are presented below. The latest revision of all relevant and current procedures is available in the Orica Lotus Notes DMS. These can be accessed by Orica personnel as required.

Operating Procedures

- OEM01 Operating Manual, ALTAIR® 4 – Four Gas Multigas Detector
- SOP Development, Risk Assessment, Review, Training and Competency Assessment
- SOP01-HCB Stores Pallet Racking Installation, Dismantling and Operations
- SOP02 Internal Transport Procedure
- SOP03 HCB Store Management Procedure
- SOP04 Settling Tanks
- SOP05 Isolate and restore power in Store J switch room.
- SOP06 HCB Wastes Stores Forklift Truck Training
- SOP07 - Settling tank cleaning
- SOP08 - FLT LPG Leaks Check
- SOP09 VCM Contaminated Wastes Management
- SOP10 - Bundwater Tank Level
- SOP12 Loading and unloading of HCB wastes Containers
- SOP14 Correct use and disposal of PPE
- SOP15 Drum Repackaging Operation
- SOP18-Standard Drums Lidding Operations
- SOP22 VEC System operation
- SOP24 Panel View operation
- SOP26 Decontamination and Repackaging of HCB Contaminated Materials
- SOP27 Compaction of Decontaminated HCB Steel Drums
- SOP28 Machine guarding system
- SOP29 Multigas meter calibration and use
- SOP30 Drum recycling

Checksheets and Logsheets

- HCB Stores - Weekly Checksheet
- HCB Stores Monthly Inspection
- HCB Waste Packages- Repackaging and Tracking Log Sheet
- PID BUMP TEST AND/OR CALIBRATION RECORD, STORE J
- ROUTINE DAILY OPERATOR CHECKS
- Startup Check list HCB Rep-packaging Plant
- Store doors reed switch test sheet
- Used Drum Batch Sheet
- Used Drum Sampling Batch Sheet
  Wastes Stores Safety Shower Checks
APPENDIX 4. AIR QUALITY MANAGEMENT PLAN

The primary environmental risks relate to the emission of airborne contaminants from the repackaging plant. To verify that emissions that may be generated by the repackaging process are effectively controlled, the following measures shall be applied.

A4.1 Emission controls

A4.1.1 VECS

There are two VECS in the repackaging plant. One covers the building air, and the other, vapour and dust extraction air from processing equipment. Each VECS consists of a fabric filter and two stage activated carbon beds in series (refer Figure A4.1), with ducting combined after the carbon beds into a common stack discharging to atmosphere 12m above ground level (EPL 2148 monitoring point 26). Each system has its own suction fan with the filter and carbon on the fan discharge side. Both the building and dust hood fans have a capacity of 6000 m³/hr, a total of 12000 m³/hr giving about 2.5 air changes per hour for the repackaging building.

The fans draw air through a pair of conveyor tunnels into the repackaging plant building from the clean warehouse area of Store J. Doors are kept closed during operations. There are airlocks for transferring wastes and materials into and out of the repackaging plant. The air pollution controls have proven very effective in controlling discharge and fugitive emissions during the full scale repackaging campaign between 2007 and 2011.

Bed life varies with the type and quantity of wastes processed. A PID analyser is installed in the plenum chamber between the carbon beds on the two lines (EPL 2148 monitoring points 29 and 30). The PID runs continuously during repackaging operations, and during these periods has the readings checked twice daily. The VOCs measured at these interstage points (VOCs as Tetrachloroethene) act as a predictive “marker” for break-through of contaminants. If the specified trigger levels are exceeded then corrective actions are implemented (refer Section A4.3).

Failure of either fan on the VECS is indicated by an alarm. If a fan fails the process will be stopped, exposed wastes resealed and the building vacated till the air extraction system is restored.

A4.1.2 Safe start up, operation and shutdown

Standard Operating Procedures (SOP), primarily covered under SOP 15 – Drum Repackaging Line Operation, SOP 22 – VECS System Operation and HCB Plant Operator Check Sheets, have been established for the safe start up, operation and shutdown of the repackaging plant. The procedures provide step by step guides for plant operators to undertake and the check sheets allow verification that the steps have been followed and equipment is functioning correctly. The steps and checks include:

- Check the operation of airlocks and doors;
- Prepare VECS for start up;
  - Check that baffles on extraction hoods are open to their correct position;
  - Check that the bypass suction valve between the building vent fan and the Extraction Hood fan is closed and locked;
- Check pre-filter and charging beds are fitted prior to running;
- Start the Building vent fan and check for surging or noisy operation;
- Turn on main and fan switches;
- Check bed and filter pressures;
- Check alarms (failure of fans trigger alarms and divert flow to the internal of the building);
- Check fan pressures;
- Check air compressor;
- Conduct visual inspections of vapour emission control systems to identify any potential leaks;
  - Calibrate (bump and zero check) PID instruments at Points 29 and 30;
  - Complete a VECS run period prior to commencement of repackaging wastes; and
  - Report any out of specification results to management for action.

Cessation of repackaging and the shutting down of the repackaging line and VECS, either planned or in response to an unplanned event, is done in a controlled manner, consistent with the aforementioned SOPs, to ensure that waste material in process does not act as an ongoing source of emissions. Before leaving the repackaging plant, the following tasks shall be completed:

- Run the contents of the hopper and conveyor into drums and secure lids;
- Clean up any loose material, place into drums and secure lids; and
- Ensure all packages waiting to be processed are appropriately sealed.

## A4.2 Air quality monitoring

Air quality monitoring at the repackaging plant must be carried out in accordance with EPL 2148. Tables A4.1 and A4.2 present the monitoring required at the repackaging plant during operations.

### Table A4.1: Point 26 - Common stack from building housing the repackaging plant – discharge to air (as specified by EPL 2148).

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Limit ( \text{mg/m}^3 )</th>
<th>Ref cond / oxy correction/ Avg period</th>
<th>Frequency</th>
<th>Sample method</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCB</td>
<td>0.002</td>
<td></td>
<td></td>
<td>TM-34</td>
</tr>
<tr>
<td>HCBD</td>
<td>0.21</td>
<td></td>
<td></td>
<td>TM-34</td>
</tr>
<tr>
<td>Hexachloroethane</td>
<td>9.7</td>
<td>dry, 273K, 101.3kPa</td>
<td>Special frequency 14(^1)</td>
<td>TM-34</td>
</tr>
<tr>
<td>Total Volatile Organic Compounds</td>
<td>10</td>
<td></td>
<td></td>
<td>TM-34</td>
</tr>
<tr>
<td>Total solids</td>
<td>10</td>
<td></td>
<td></td>
<td>TM-15</td>
</tr>
</tbody>
</table>

Note 1: Special Frequency 14 requires monitoring to be undertaken at Point 26 at the frequencies specified below, but only when repackaging is being undertaken in the HCB repackaging store:

- Once during the first week of every plant restart following a shutdown period of greater than 3 months and every quarter thereafter.
- If restart monitoring coincides with scheduled quarterly monitoring, then the single scheduled monitoring event fulfils both restart and quarterly test requirements.
Table A4.2: Points 29, 30, 33 and 34 – repackaging plant interstage points between the two activated charcoal filters on the extraction pipes 1 and 2 (as specified by EPL 2148).

<table>
<thead>
<tr>
<th>Monitoring Point No.</th>
<th>Description</th>
<th>Pollutant</th>
<th>Limit (mg/m³)</th>
<th>Ref cond / oxy correction/ Avg period</th>
<th>Frequency</th>
<th>Sample method</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>Store J interstage point between the two activated charcoal filters on extraction pipe 1.</td>
<td>VOCs as Tetrachloroethene</td>
<td>340</td>
<td>NA</td>
<td>Special frequency 14¹</td>
<td>Special Method 6</td>
</tr>
<tr>
<td>30</td>
<td>Store J interstage point between the two activated charcoal filters on extraction pipe 2.</td>
<td>VOCs as Tetrachloroethene</td>
<td>340</td>
<td>NA</td>
<td>Special Frequency 14¹</td>
<td>Special Method 6</td>
</tr>
<tr>
<td>33</td>
<td>Store J interstage point between the two activated charcoal filters on the extraction pipe 1. (Note - this is the same as Point 29).</td>
<td>VOCs as Tetrachloroethene</td>
<td>340</td>
<td>NA</td>
<td>Special Frequency 14¹</td>
<td>TM-34</td>
</tr>
<tr>
<td>34</td>
<td>Store J interstage point between the two activated charcoal filters on the extraction pipe 2. (Note - this is the same as Point 30).</td>
<td>VOCs as Tetrachloroethene</td>
<td>340</td>
<td>NA</td>
<td></td>
<td>TM-34</td>
</tr>
</tbody>
</table>

Note 1: Special Frequency 14 requires monitoring to be undertaken at the frequencies specified below, but only when repackaging is being undertaken in the HCB repackaging plant. The monitoring frequencies for 29, 30, 33 and 34 are defined as follows:

a) Points 33 and 34 (Store J) is defined as monitoring
   - Once during the first week of every plant restart following a shutdown period of greater than 3 months and every quarter thereafter.
   - If restart monitoring coincides with scheduled quarterly monitoring, then the single scheduled monitoring event fulfils both restart and quarterly test requirements.

b) Points 29 and 30 (Store J) is defined as monitoring
   - Continuous operation of the monitoring apparatus with operator checks and results recorded two times daily.

Random monitoring of targeted semivolatile chlorinated hydrocarbons in ambient air shall also occur at various locations for occupational hygiene purposes.

**A4.3 Corrective actions - VECS breakthrough plan**

Based on the likely compounds in the waste, tetrachloroethylene (i.e.: perchloroethylene - PCE, with chemical formula C₂Cl₄) has been selected as a suitable organic compound equivalent for VOC measurement at the repackaging plant VECS interstage monitoring points (Points 29, 30, 33 and 34). The pollutant was selected in part due to its high vapour pressure, relative to the primary contaminants of concern (HCB, HCBD, HCE). PCE will pass through the first carbon filter prior to the other contaminants and therefore act as an early (or predictive) marker of contaminant breakthrough.
A number of action levels and responses shall be adopted to ensure the lead and lag carbon beds are adequately filtering emissions prior to discharge to air. Concentrations recorded above the specified concentrations indicate that the first carbon bed is experiencing partial or complete saturation. Monitoring is also undertaken at the repackaging plant stack (EPL 2148 Point 26 - discharge to air) to verify that both carbon beds are functioning correctly.

The breakthrough plan is outlined in Table A4.3. Where monitoring (specified in Section A4.2) detects pollutants at concentrations above the specified action level, Orica shall undertake the specified response.

**Table A4.3: VECS Breakthrough Plan**

<table>
<thead>
<tr>
<th>Monitoring point number</th>
<th>Action Level</th>
<th>Concentration</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>29, 30, 33, 34</td>
<td>1 (VOCs as PCE)</td>
<td>140 mg/m³ (20 ppm)</td>
<td>Check PID unit functionality.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If reading valid, undertake bump test and calibration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If reading valid, consider undertaking sample and laboratory analysis (TM-34) to verify result.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If result confirmed cease repackaging works, clean up material in process, shut down VECS in accordance with SOP 22 – VEC System Operation, and investigate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Consider replacing lead and lag carbon bed with new or regenerated carbon (unless another cause can be identified).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restart VECS in accordance with SOP 22 – VEC System Operation.</td>
</tr>
<tr>
<td></td>
<td>2 (VOCs as PCE)</td>
<td>240 mg/m³ (35 ppm)</td>
<td>Cease repackaging works, clean up material in process.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check PID unit functionality.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If reading valid, undertake bump test and calibration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If reading valid, undertake sample and laboratory analysis (TM-34) to verify result.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If results confirmed, shut down VECS in accordance with SOP 22 – VEC System Operation and investigate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Replace lead and lag carbon bed with new or regenerated carbon (unless another cause can be identified).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restart VECS in accordance with SOP 22 – VEC System Operation procedure.</td>
</tr>
<tr>
<td>Monitoring point number</td>
<td>Action Level</td>
<td>Concentration</td>
<td>Response</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------</td>
<td>---------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| 31                       | 3<sup>1</sup> | (VOCs as PCE) 340 mg/m<sup>3</sup> (50 ppm) | Cease repackaging works, clean up material in process, shut down VECS in accordance with SOP 22 – VEC System Operation.  
Check PID unit functionality.  
If reading valid, undertake bump test and calibration.  
If reading valid, undertake sample and laboratory analysis (TM-34) to verify result.  
If reading valid, notify the EPA<sup>3</sup>  
If results are valid, replace lead and lag carbon bed with new or regenerated carbon (unless another cause can be identified).  
Only recommence operations once written approval is received from the EPA.  
Restart VECS in accordance with SOP 22 – VEC System Operation procedure. |
| 26                       | 3<sup>1</sup> | HCB 0.002 mg/m<sup>3</sup>  
HCBD 0.21 mg/m<sup>3</sup>  
HCE 9.7 mg/m<sup>3</sup>  
Total VOCs 10 mg/m<sup>3</sup>  
Total solids 10 mg/m<sup>3</sup> | Cease repackaging works, clean up material in process, shut down VECS in accordance with shut down procedure and notify the EPA<sup>3</sup>.  
Verify results and investigate cause.  
If results are valid, replace lead and lag carbon bed with new or regenerated carbon (unless another cause can be identified).  
Only recommence operations once written approval is received from the EPA.  
Restart VECS in accordance with SOP 22 – VEC System Operation procedure. |

Note 1: Action Level 3 is the 100 percentile licensed concentration limit specified in EPL 2148.

Note 2: EPL 2148 specifies the following shutdown requirements in the event the 100 percentile licensed concentration limits are exceeded:

a) If the break-through limit at monitoring/discharge points 29 or 30 is exceeded after completion of commissioning, the HCB repackaging facility must shutdown as soon as practical after the exceedance is reported (twice daily checks are undertaken during operation). The licensee must only restart the HCB repackaging facility after the carbon bed is replaced with a new or regenerated activated carbon bed. Replacement carbon is not required in the event that the exceedance is found to be a technical error and is unjustified.

b) If any concentration limit described in condition L2.3 (shown in Table 5 above as Action Level 3) at monitoring/discharge point 26 is exceeded after completion of commissioning, the HCB repackaging facility must shutdown on receipt of the relevant monitoring data. The licensee can only restart the HCB repackaging facility after receiving written approval from the EPA.

Note 3: If on receipt of a certificate of laboratory analysis, the laboratory analysis results demonstrate that the concentration of any discharge parameter has exceeded a limit specified in condition L2.3 for any of the monitoring / discharge Points 26, 29, 30, 33, 34, 40, 41 or 42 then the licensee must notify the EPA within 24 hours of receipt of the certificate.
Figure A4.1: Activated carbon bed design.
APPENDIX 5. NOISE MANAGEMENT PLAN

A 5.1. Responsible Person

The BIP Environment Engineer is responsible for the overall Noise Management Plan.

The Legacy Operations Leader is responsible for monitoring equipment (fans etc) to ensure that it is in reasonable mechanical condition and operating correctly, hence minimising noise generation.

A 5.2. Objectives

The objectives of the Noise Management Plan are to:

- Ensure no unacceptable off-site noise impacts as a result of the HCB Repackaging Plant operations
- Meet relevant requirements of the EPL 2148 and Conditions of the Project Approval for the HCB Repackaging Plant

Note that Work Health and Safety management of noise exposures is not specifically covered by this plan.

A 5.3. Requirements

The following Condition of the Project Approval is relevant to operational noise:

Operation Noise

2.13 The Proponent shall design, construct, operate and maintain the project to ensure that the noise contributions from the project to the background acoustic environment do not exceed the maximum allowable noise contributions specified in Table 3, at those locations and during those periods indicated. The maximum allowable noise contributions apply under wind speeds up to 3 ms⁻¹ (measured at 10 metres above ground level), and under temperature inversion conditions of up to 3 °C/100.

Table 3 - Maximum Allowable Noise Contribution

<table>
<thead>
<tr>
<th>Location</th>
<th>Day</th>
<th>Evening</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7:00 am to 6:00 pm</td>
<td>6:00 pm to 10:00 pm</td>
<td>10:00 pm to 7:00 am (Monday to Saturdays)</td>
</tr>
<tr>
<td>Nearest affected receivers surrounding the repackaging plant and Stores E and H</td>
<td>L_Aeq(15 minutes)</td>
<td>L_Aeq(15 minutes)</td>
<td>L_Aeq(10 minute)</td>
</tr>
<tr>
<td></td>
<td>35 dB(A)</td>
<td>35 dB(A)</td>
<td>35 dB(A)</td>
</tr>
</tbody>
</table>

Note Store E materials were relocated. No repackaging occurred at this location. This is consistent with overall EPL and BIP Noise Reduction Program requirements. Potentially affected receivers are the rail corridor or residential areas in Denison St.
A 5.4. Controls

The main noise controls are the enclosure of equipment in buildings or other enclosures, and plant location at rear of BIP reduces the potential for noise impact in adjacent residential areas.

- On the railway side of the Store J, Stores A, B and C provide an effective noise barrier.
- Design standard of 82 dB(A) for new plant and equipment. This applies to the sum of all noises in any work area. Hence, where several potentially noise items may be co-located, their individual noise limits are significantly lower than 82 dB(A).
- Low speed equipment selected where possible.
- Sandwich panel walls used for re-packaging area.

Equipment is inspected as part of regular plant logs and maintained in accordance with manufacturer recommendations.

A 5.5. Monitoring

A noise survey was carried out during the Projects commissioning period with all equipment running. (Ref: Occupational Noise Survey HCB Repackaging Process Orica (Australia) Pty Ltd Matraville, NSW Project No.: 3763/S11301/07 Date of Survey: April 2007 Date Of Issue: May 2007). This concluded (pg 6):

“Measurements taken outside the HCB Repackaging building were influenced by other sources on the BIP site rather than the HCB processes. Hence the acoustic controls utilised in the construction of the HCB building appear to be attenuating the noise generated by the repackaging operation”.

No changes have occurred to the facility since the study, which would have an upward influence on noise.

Monthly noise surveys are conducted to demonstrate compliance with the noise limits set out in EPL 2148. These surveys assess the total noise impact from BIP operations, including the Project.
**APPENDIX 6. WASTE MANAGEMENT PLAN**

**A 6.1. Responsible Person**

The Legacy Operations Leader is responsible for implementation of the Waste Management Plan (WMP).

**A 6.2. Objectives**

The objectives of the plan are to:

- Minimise the generation of waste; and
- Ensure waste is disposed of in an appropriate and lawful manner.

**A 6.3. Requirements**

The following Condition of the Project Approval is relevant to waste management

**Waste Generation and Management**

2.17 All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.

This is consistent with the requirements of EPL 2148 and EHC Act Licence No. 26.

**A 6.4. Controls**

**A 6.4.1. Solid wastes**

The main control is the design of the plant, i.e. all waste generated by the process is repackaged via the packaging line for eventual disposal.

Any wastes contaminated with HCB or HCB related compounds (such as carbon or PPE) classed as hazardous are required to be managed as per the HCB waste (i.e.: packaged and managed until final destruction destination secured).

There are minimal waste streams generated that require off-site disposal. However these wastes will be subject to testing, classification, segregation and disposal to a licenced landfill. Orica typically engages SITA for its waste transport and disposal.

**A 6.4.2. Liquid wastes**

**Store J**

The process uses minimal water and the buildings are designed to prevent ingress of water, hence liquid wastes are minimal. Any water applied within Store J would be potentially contaminated with HCB and other chlorinated compounds, and in the case of a fire, also with acidic combustion products such as HCl. Any potentially contaminated areas are fully sealed and bunded, with drainage directed to the Store A effluent pit (27m3 maximum capacity) and then via an overflow weir on to the Store A bund which has a free capacity of 388m3 (after taking into account the volume occupied by stored drums in Store A. If store A were empty the capacity would be much larger).
Hence any spills or firewater applied inside the Store J will flow via the effluent pit to the Store A bunded area.

There is no rainwater collection by the Store A effluent containment system and store housekeeping checklists include checks of level, hence the available containment capacity is unlikely to be compromised. Rainwater from roofed store areas or other clean area hard surfaces is directed to the storm water system.

Depending on the amount and magnitude of contamination, contaminated water may be able to be released from the Store A bund at a controlled rate for treatment by the existing HCB effluent system which includes HCB separation, particulate filters and carbon filters for chlorinated hydrocarbon removal.

HCB contaminated materials from the effluent system will be packaged and disposed of via the same disposal process as other HCB wastes.

As for the existing stores, only uncontaminated rainwater (from Store J roof) can flow to stormwater drains. Stormwater is discharged to the existing BIP system, as is the existing stormwater run-off from the area.

**A 6.5. Monitoring**

Wastes being sent off are classified in accordance with EPA’s Waste Classification Guidelines.

No scheduled waste to go offsite unless to facility licenced to receive it. Stock levels, test results and transport records are maintained.

Regular plant logs are maintained. Monitoring and diversion for treatment (if required) of BIP effluent (common to other HCB stores and other areas of BIP).
APPENDIX 7. REFERENCES


Project Approval 06_0028 and modifications 1-6, under Section 75J of the Environmental Planning and Assessment Act 1979.