NSW GOVERNMENT
Department of Planning

MAJOR PROJECT ASSESSMENT: Hexachlorobenzene (HCB) Waste Repackaging Plant, Matraville

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

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EXECUTIVE SUMMARY

The Proponent (Orica Australia Pty Ltd) proposes to construct and operate an automated HCB re-packaging plant at its existing site located at 16-20 Beauchamp Road in the Botany Industrial Park, Matraville, approximately 3 kilometres east of Sydney airport. The Botany Industrial Park is a 73-hectare industrial site of which the Proponent's existing operations occupy approximately 40 percent. The site is located near the western boundary of the Botany Industrial Plant, contained within Lot 11 DP1039919.

The proposed HCB waste repackaging plant would transfer HCB waste from deteriorating drums into containers suitable for transport off-site. Effectively, the new repackaging line would automate the manual repackaging process which occurs now. It would provide the necessary repackaging capacity to enable removal of HCB waste off-site for destruction. Therefore, this proposal represents the first step towards the removal and ultimate destruction of the Proponent's HCB waste.

The key environmental planning issues for the project relate to air quality impacts (and related human health effects) and hazards and risk impacts.

Air emissions from the project have the potential to contain a range of toxic volatile and semi-volatile chlorinated organic compounds and therefore it is necessary that stringent control and monitoring of emissions be undertaken to ensure concentration levels well below the recommended safe concentration limit. To this end, the Proponent has committed to several mitigation measures such as the use of two activated carbon beds, a carbon reserve extending beyond the monitoring interval and weekly monitoring. The DEC agrees with this approach and has recommended conditions that the Department has adopted which ensure thorough control and monitoring of air emissions. In addition to this, the Department has recommended process shut-down requirements in the event of an emission exceedence and the inclusion of a pre-operation trial to ensure environmental compliance.

While air emissions is a key issue of concern for this proposal, the Department acknowledges that this issue is closely related to community concerns regarding human health impacts and a desire to be kept informed of the environmental performance of the proposal. As a result the Department of Health has reviewed the proposal, including the Human Health Impact Assessment, and has concluded that provided the DEC's recommended conditions are implemented then the risk to resident's health appears negligible.

In light of the close proximity of built-up urban areas to the site, it is of critical importance that the HCB wastes are stored, handled and managed with an acute focus on safety. Preliminary assessment of the hazards posed by the project suggests that it is possible to undertake the project well within acceptable risk limits, however, this is dependent on the Proponent's vigilant application of comprehensive fire safety measures, emergency response planning, overarching safety management and periodic auditing of these systems to ensure strict compliance. The Department recommends that all of these approaches be imposed on the project to ensure that public safety is protected at all times.

In relation to community concerns regarding the communication of environmental performance, the Department has recommended comprehensive conditions that would require the Proponent to provide regular, up-to-date monitoring results to the community. This includes conditions that would require the Proponent to provide copies of relevant licences, permits and approvals, as well as the details of audits / reviews conducted as relevant to the project.

On balance, the Department considers that the proposed HCB repackaging plant is development that would be of benefit to the State of New South Wales. It would represent the first step in the ultimate removal and destruction of HCB waste process. The project has also been considered by the Department of Environment and Conservation, the Department of Health and the Independent Review Panel, all of whom also generally agree that the project could be undertaken in a manner protective of the environment and the local community.

Overall, the proposed HCB repackaging project could be approved subject to the effective implementation of the Proponent's Statement of Commitments and the Department's recommended Instrument of Approval.

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1. BACKGROUND

1.1 Location

The Proponent (Orica Australia Pty Ltd) proposes to construct and operate an automated HCB re-packaging plant at its existing site located at 16-20 Beauchamp Road in the Botany Industrial Park, Matraville, approximately 3 kilometres east of Sydney airport. The Botany Industrial Park is a 73-hectare industrial site of which the Proponent's existing operations occupy approximately 40 percent.

The site is located near the western boundary of the Botany Industrial Plant, contained within Lot 11 DP1039919.

Figure 1: Site Location (marked yellow, reproduced from the Proponent's Environmental Assessment)

1.2 Existing Site

The site for the HCB repackaging plant is located adjacent to Stores A, B and C where the majority of the HCB waste is presently stored. The site was selected by the Proponent because it is:

- close to the main HCB stores thereby reducing the risk associated with transporting HCB across site for repackaging;
- the only unencumbered plot of land of suitable size near to the stores;
- close to both road and rail thereby not precluding off-site waste transport options; and
- serviced by existing infrastructure (such as water, electricity, effluent, etc).

The land upon which the project is proposed is owned by the Proponent. It is zoned 4(a) – Industrial in the *Botany Local Environment Plan 1995*. Development for the purposes of industry is permitted within this zone.

1.3 Previous Planning Approvals

In 2001 the Proponent lodged a development application with the Department to construct and operate a HCB waste destruction facility at the Proponent's BIP site. The Proponent withdrew its development application after an Independent Review Panel conducted a review of the proposal and recommended that alternative remote sites in New South Wales be pursued as a first and preferred option for the location of the proposed HCB destruction facility.

1.4 Surrounding Land Use

The site is located within the Botany Industrial Park (BIP). Industrial sites bound the BIP to the north, south and west. Residential dwellings exist adjacent to the eastern boundary of the BIP and are also located beyond industrial sites to the north and west. The nearest residential premises are approximately 700 meters to the east and west of the site.

2. PROPOSED DEVELOPMENT

2.1 Project Description

The Proponent proposes to construct and operate a HCB waste repackaging plant and a new store 'J' adjacent to the existing HCB Stores A, B and C. The HCB waste repackaging plant would transfer HCB waste from deteriorating drums into containers suitable for transport off-site. Effectively, the new repackaging line would automate the manual repackaging process which occurs now.

Existing HCB waste would be transported by truck from existing HCB stores within the Proponent's site to the proposed repackaging line. Here the drums would be manually opened and the contents of the drums checked. If low-level HCB waste (pallets, personal protective equipment, empty drums), then the drums would be placed on the shredding line where the material would be significantly reduced in size and loaded into new drums. The drums would then be manually lidded, transferred to the wash-down station and then moved to Store J for storage. Wash-down waste water would be transferred to the existing waste water treatment plant as permitted in an agreement with Sydney Water.

If the contents of the drum are high-level HCB waste, then the contents would be emptied via an automated system into a feed hopper, screened and transferred into a waste liquid storage tank for decanting. When the storage tank is near full, it would be emptied into containers, containers transferred to the wash-down station and from there transferred to Store J for storage. Emptied drums and material caught by the screening process would be transferred to the shredding line for packing per the low-level HCB waste repackaging method.

The clean drums and containers in the Store J would then be placed in 20 foot transport containers capable of storing up to 15 tonnes each. Once full, the shipping containers would be moved to a fenced, secure hard-stand area to the south of Store J for interim storage prior to removal off-site.

The Proponent intends to operate the plant 5 days per week and would transfer containers on Saturdays. It would be anticipated that should the Proponent have to export the waste material, then the plant would process on average 300 tonnes of waste per week in order to have all the waste repackaged within 12 months of commencing operation. If export was not possible then the processing rate would be less.

The project also includes the demolition of stores E and H. Store E consists of six storage tanks filled with demolition material generated during the closure of the Solvents Plant and the demolition of the Hexa Store at the Chlorine Plant. These materials consist of low-level HCB waste such as contaminated soil, concrete, foundations, slabs, etc. The material would be loaded into containers and transferred to the repackaging plant for repackaging into containers suitable for transport off-site.

Store H consists of 32 concrete storage tanks containing polymerised tars and lights, including vinyl chloride and ethylene dichloride. The tanks would be demolished after the contents have been transferred into drums and transported to the repackaging line for re-packing and transport off-site.

2.2 Project Need

Over the past thirty years there have been several attempts to identify a means of destroying the HCB waste located at the Proponent's BIP site. In recent years, a Commission of Inquiry and an Independent Review Panel have conducted assessments and made recommendations with regards to future HCB waste disposal options.

The Proponent has adopted these recommendations and identified three potential future options for HCB waste removal / destruction. The options currently under investigation include:

- construction and operation of a HCB waste destruction facility at a remote site in regional New South Wales;
- export of HCB waste to an existing overseas facility for destruction; and
- indefinite storage until approval for removal and destruction is obtained (the Proponent's least preferred option).

Through the course of investigations, it has become evident that the capacity of the present manual repackaging process would not meet the capacity requirements of any disposal method requiring waste transport off-site. Hence, a new automated repackaging facility is required to provide the necessary capacity to enable removal of HCB waste off-site for destruction.

The proposed re-packaging facility is therefore the first step towards the removal and ultimate destruction of the Proponent's HCB waste.

3. STATUTORY CONTEXT

3.1 Major Project

The project is declared to be a Major Project under *State Environmental Planning Policy (Major Projects) 2005* because it is development for the purpose of a hazardous waste facility that transfers, stores or disposes of solid or liquid waste classified in the *Australian Dangerous Goods Code* or medical, cytotoxic or quarantine waste that handles more than 1000 tonnes per year of waste (Schedule 1 Clause 27(5)). The project would therefore be assessed and determined by the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979*.

3.2 Permissibility

The *Botany Local Environment Plan 1995* applies to the site and zones the land 4(a) Industrial. Development for the purposes of industry is permissible with consent within this zone.

3.3 Minister's Approval Power

The major projects application and Environmental Assessment were placed on public exhibition from Wednesday 26 April 2006 to Wednesday 31 May 2006 and submissions invited in accordance with Section 75H of the Act. The Department has met all its legal obligations so that the Minister can make a determination about the project.

4. CONSULTATION AND ISSUES RAISED

4.1 Introduction

The Department received six submissions on the project, with submissions being received from the Department of Environment and Conservation, Department of Health, City of Botany Bay Council, Randwick City Council (two) and one from the public.

In addition to its own assessment of the proposal, the Department referred a copy of the application and accompanying Environmental Assessment to the Independent Review Panel for consideration and recommendations. A full copy of the Panel's comments on the application is provided as Appendix C.

4.2 Consideration by the Independent Review Panel

The Independent Review Panel recommends that the proposed repackaging facility be approved subject to the imposition of a number of conditions of approval, as follows:

1. weekly monitoring of carbon adsorbers to be supplemented with continuous VOC monitoring of emissions during the first three months of operation;
2. ambient air monitoring surveys to be undertaken downwind of the Store J building and Store H tanks after commissioning to determine the extent of fugitive emissions from these sources, if any;
3. regular odour patrols to be undertaken by persons not normally working on the Botany Industrial Park site during the earthworks phase of the construction of the re-packaging plant and during the demolition of Store H tanks;
4. an environmental risk assessment of operations to be carried out between three and six months after commissioning has been completed and any risk management recommendations be implemented; and
5. a soil survey for dioxins and other relevant contaminants to be undertaken in the immediately-affected residential vicinity should a fire occur in stores D, F, G, H or I before they are cleared of HCB wastes.

The recommended instrument of approval incorporates conditions to address the first four of the Panel's recommendations as follows:

1. the instrument of approval requires weekly and continuous monitoring of volatile organic compounds to the satisfaction of the DEC, with the potential for the DEC to agree to reduced frequency of monitoring once the Proponent has demonstrated acceptable performance;
2. within 90 days of the commencement of operation of the project, the Proponent is required to undertake an air emissions performance audit, to confirm that the air quality impacts of the project are no worse than that predicted in the Environmental Assessment. This program requires consideration of both point source and fugitive emissions (from the Store J building and Store H tanks);
3. the Proponent is required to make arrangements for independent odour patrols during the demolition of the Store H tanks; and
4. the Proponent is required to commission a comprehensive environmental audit into the project within six months of the commencement of operation, and then annually on the anniversary of the commencement of operation. This audit will identify environmental risks, and propose additional mitigation measures for those risks.

The Department considers that the issue of possible soil surveys following a fire on the site is a matter that should be considered and re-assessed in the unlikely event that such an incident did occur. The recommended instrument of approval includes requirements for the Proponent to develop safety management measures, particularly through a Fire Safety Study, HAZOP Study, Emergency Plan and Safety Management System to ensure that the risk of a fire on the site is minimised. In this context, and in light of the outcomes of the Preliminary Hazard Analysis for the proposal, the Department is satisfied that the risk of a fire is very low.

However, if a fire were to occur, the Department considers that the need for soil testing would need to be considered in the context of the situation, particularly with respect to the scale, nature, intensity and duration of the fire incident and the prevailing meteorological conditions at the time. It is not considered appropriate to automatically require soil testing without first assessing whether tests are necessary and without have a clear direction on how the test results are intended to inform further ameliorative action.

Further, the Department considers that in the event that such an incident does occur, with actual off-site impacts, it is most appropriately dealt with through mechanisms other than the land use planning system – for example, through New South Wales legislation relating to emergency response, pollution control (and clean-up) and contaminated land. It would not be constructive to attempt to take on the roles of these separate legislative schemes through a planning approval.

4.3 Submissions from Public Agencies

The Department of Environment and Conservation and Department of Health were supportive of the project, subject to the imposition of conditions to manage potential environmental impacts. Both submissions gave particular focus to air emissions and their management. The contents of each submission is summarised below:

Department of Environment and Conservation (DEC)

- the DEC is satisfied that all environmental issues that are likely to have been foreseen have been adequately dealt with in the Environmental Assessment;
- the DEC considers the re-drumming proposal as a positive action that would facilitate the ultimate destruction and / or removal of HCB wastes from the site;
- specific conditions relating to air quality impacts and noise impacts that should be included in the Instrument of Approval for the project.

Department of Health (NSW Health)

- notes stores of low level HCB and redrumming waste (Stores D, F, G, H and I) would be removed and repackaging and storing would take place inside a new store, Store J, to the rear of the BIP at a greater distance from residential areas than present;
- notes Store J would be fitted with two-stage activated carbon filtration to eliminate impact on local air quality and existing Stores E and H would be similarly protected by fabric and activated carbon filters until the re-packaging and storage activities in those two stores are transferred to Store J;
- potential exposure to chemicals by nearby residents associated with the operation of the proposed plant would be likely to be less than that associated with present repackaging / storage activities;
- should the DEC's recommended conditions concerning monitoring, recording and notification of chemical discharges and appropriate operating procedures be followed then the risk to resident's health from exposure to chemicals being repackaged would appear to be negligible.

4.4 Submissions from Local Government

Submissions received from both the City of Botany Bay Council and Randwick City Council did not object to the proposal. However, both councils highlighted the need for the project to have specific conditions that enforce strict environmental controls and monitoring regimes that are regularly reviewed for compliance. The contents of each council's submission is summarised below:

City of Botany Bay

- monitoring and reporting of air emissions is a key aspect of the project which needs to be regularly communicated with the community;
- emission limits should be consistent for each pollutant across all emission points and should reflect world's best practise;
- cumulative air emissions should be monitored, reported and communicated;
- an emergency response plan should specify incident communication timeframes and be integrated with the BIP site environmental plan;
- proposal may potentially restrict development of the Orica Southlands area;
- impact on the Botany Sydenham Goods Railway and proposed container movements associated with Port Botany Expansion;
- mitigation of fire risks;
- monitoring of repackaging plant worker health;
- waste management plan for managing demolition materials; and
- timeframes for assessment and remediation of land on which the existing stores are located.

Randwick City Council

- does not object to the proposal in that it intends to improve handling and storage of HCB and reduces associated risks from the current repackaging operation, provided appropriate controls / monitoring / reporting;
- concern regarding continued long term storage of HCB at the BIP in close proximity to residential premises;
- the Proponent has a poor track record in environmental matters; and
- requests a proper risk assessment and the identification of additional risks posed to the local community as a result of facility malfunction.

4.5 Submissions from the Public

A single submission was received from the public and its contents are summarised below:

- concern regarding long-term storage of HCB;
- the HCB Waste Management Plan is outdated and requires reviewing;
- concern regarding residual waste in the drums and waste water management;
- concern over mercury levels in Store E and treatment;
- concerns regarding security and emergency response on the site;
- air quality impacts, in particular monitoring, odour and communication of monitoring results;
- health impacts associated with the project;
- auditing of environment and safety plans; and
- concern regarding the Proponent's long term intention for the proposed plant.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

After consideration of the Environmental Assessment and the issues raised in submissions, the Department has identified the key issues to be air quality impacts (and associated human health implications) and hazards and risk impacts (land use safety planning).

All other issues are considered to be minor and have been addressed as part of the Proponent's Statement of Commitments.

5.1 Air Quality Impacts

Issues

The main issue raised with regards to air quality impacts is the need to ensure stringent control and monitoring of repackaging plant emissions. Emissions from the project have the potential to contain a range of toxic volatile and semi-volatile chlorinated organic compounds and therefore it is necessary that emissions remain at concentration levels well below the recommended safe concentration limit.

The Proponent conducted an air quality assessment in accordance with a number of applicable guidelines including the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005)*. Particular focus was given to point source and fugitive emissions that may be generated during the demolition and re-packaging activities.

The assessment employed dispersion modelling to determine the predicted worst-case ground level pollutant concentrations. The modelling used proposed maximum emission limits and compared these against the relevant air quality criteria. The proposed maximum emission limits were, where applicable, based on occupational exposure limits established by the National Occupational Health and Safety Commission.

The air quality impact assessment concluded that the proposed maximum emission limits would not result in any exceedances of the relevant air quality criteria, being at around 3 percent of the relevant assessment criteria for Store J. Predicted emission levels at sensitive receptors were found to be significantly lower again. Store E and H showed similar performance.

The assessment examined the cumulative impact of the emissions from each store on ground level concentrations. The assessment concluded that the cumulative impact of ground level concentrations would not exceed the relevant air quality criteria.

The worst-case operating scenario was also examined as part of the assessment. This study estimated the concentration levels of HCB, HCBD and HCE pollutant emissions in the event that the air treatment system was not functional and assumed emissions comprised solely of either HCB, HCBD or HCE pollutants. Under these conditions, the assessment criteria would be exceeded for both HCBD and HCB pollutants.

Consideration

The Department is satisfied that the assessment undertaken of potential air quality impacts from the proposal is adequate, and concurs with the Proponent's conclusion that the results of the monitoring indicate that the proposed maximum emission limits would not result in any exceedances of the relevant air quality criteria. It should be highlighted that the modelling was based on occupational exposure limits (i.e. air concentration limits that ensure that air is acceptable for workers to breathe) and that actual concentrations of emissions are anticipated to be significantly lower.

Exceedance was however predicted when considering the worst-case operating scenario of no air treatment of Store J and 100 percent HCB, HCBD or HCE pollutant emission. The Proponent included this scenario as part of its hazard analysis of the project, adopting a conservative approach by assuming emissions to consist solely of HCB, HCBD or HCE.

The hazard study concluded that the likelihood of this scenario occurring was very unlikely because the event would require:

- the first carbon bed to be saturated with either hydrocarbons or water from the carbon bed fire water injection system; and
- sampling failing to detect a break-through; and
- that there is incorrect material, the bed is saturated or there is no carbon in the second bed.

Secondly, the study concluded that the injury risk criteria would not be exceeded under this scenario and therefore no acute effects would be experienced at sensitive receptors such as nearby residences or schools.

The Proponent has committed to mitigation measures to prevent this scenario from occurring. The measures include conducting monitoring on a weekly basis between the carbon beds and after the last carbon bed during operation of the plant to detect early contaminant break-through of the beds. Each carbon bed would contain a reserve of carbon that would extend well beyond the monitoring intervals to provide a suitable safety margin in the event that break-through occurs.

The proposed mitigation measures are reinforced by the conditions included in the recommended Instrument of Approval. On advice from the DEC, the Department has included a range of monitoring conditions and shut-down requirements that require the process to cease in the event that a break-through limit has been exceeded. This includes a requirement that the Proponent prepare emergency and safety plans that incorporate the safe shut-down of the proposed plant. Such plans would be submitted to the Director-General for approval prior to the commencement of commissioning.

The Department has also recommended that a pre-operation trial be undertaken using spiked material that would represent the material to be repackaged, thereby allowing the control and monitoring elements of the process to be assessed prior to operation. The Proponent would only be able to commence operation once the environmental performance of the facility has met the requirements of the EPA.

Similar monitoring conditions have been applied to Store E and H. The Proponent has also committed to a number of mitigation measures to ensure that emissions would not exceed the relevant air quality criteria for these stores. Provided the mitigation measures are implemented and the recommended Instrument of Approval is adopted, the Department concurs with this assessment.

While air emission is the key issue of concern for this proposal, the Department acknowledges that this issue is closely related to community concerns regarding human health impacts and a desire to be kept informed of the environmental performance of the proposal.

To this end, the Department required that a Human Health Impact Assessment be undertaken as part of the Environmental Assessment for the proposal. The assessment considered the potential exposures and risks to human health in off-site areas associated with:

- the existing HCB storage / repackaging operations; and
- the construction and operation of the proposed repackaging facility.

The assessment concluded that the construction, operation and potential up-set conditions associated with the proposal are considered to be low and acceptable. In particular, the assessment notes that the potential off-site impacts of the proposed facility are considered to be lower than the impacts of the existing manual repackaging operation. The Department of Health concurred with this assessment, concluding that provided the DEC's recommended conditions are implemented then the risk to resident's health appears negligible.

In relation to community concerns regarding the communication of environmental performance, the Department has recommended comprehensive conditions that would require the Proponent to provide regular, up-to-date monitoring results to the community. In addition, the Proponent would be required to provide copies of relevant licences, permits and approvals, as well as the details of audits / reviews conducted as relevant to the project. These conditions are in addition to the existing communication that already occurs between the Proponent, CPRC and the community.

5.2 Hazards and Risk Impacts

Issues

The Preliminary Hazard Analysis for the project identifies a series of potential incidents that may occur on the site, including several spill scenarios, on-site fires or explosions initiated internally or externally (for example, sabotage) and failure of pollution control equipment or ventilation leading to a release of materials.

Through a largely qualitative assessment, the Proponent has demonstrated that none of the potential incidents on the site would generate a fatality or injury risk above the Department's established land use safety criteria. In relation to irritation risk, the Proponent identified that a spill of material in store H, with subsequent ignition, had the potential to generate a significant off-site impact (irritation) and this scenario was therefore subject to more detailed quantitative analysis.

Modelling of a fire scenario in store H suggests that combustion products (principally hydrogen chloride) would generate an irritation effect in residential areas along Denison Street (about 140 metres from such an incident) and potentially further depending on meteorology. Although the consequence of this particular incident would be significant, the potential for the incident to occur would be extremely low given the preventative controls to be applied by the Proponent. Taking these controls into account, the Proponent has calculated that the likely irritation risk to off-site receptors on Denison Street is in the order of 8×10^{-6} per year, which is well below the Department's established land use safety criterion of 50×10^{-6} per year (irritation risk).

The project application was also accompanied by a Construction Safety Study and a Hazard and Operability Study prepared in accordance with the Department's guidelines for these documents.

Consideration

The Department is satisfied that the Proponent has adequately demonstrated that the project could be undertaken within acceptable risk criteria. Key to achieving these criteria will be the consistent and vigilant application of the risk mitigation and management measures outlined by the Proponent in the Environmental Assessment.

With respect to management, the Department highlights that the Proponent is particularly versed in the management and handling of HCB wastes, having been responsible for the wastes for a number of decades. The Proponent is familiar with the nature of the wastes and potential hazards, and has developed a detailed safety management framework and philosophy for the wastes. The development of comprehensive emergency response and safety management frameworks specific to this project would complement existing systems and ensure that HCB wastes continue to be managed with the utmost focus on safety. The Department further recommends that all of these systems be subject to periodic review, through formal hazard auditing in accordance with the Department's guidelines.

In terms of physical risk mitigation approaches, the Department considers that focus should be placed on pollution control equipment and the prevention of fire as these two aspects of the project pose the greatest potential for incidents with significant consequence. As noted earlier, the DEC has recommended comprehensive monitoring of discharge points and any break-through in activated carbon beds. In addition, the Department strongly recommends that any approval granted by the Minister incorporate shut-down requirements in the event of activated carbon bed break-through or pollution control failure. Conditions to this effect have been recommended by the DEC and are included in the instrument of approval.

The Department considers that fire safety on the site is of paramount importance, given the potential for off-site irritation effects to local residents should a major fire occur. This issue is most relevantly and practically dealt with through the design stage of the project in a Fire Safety Study, prepared in accordance with the Department's guidelines. This approach has been reflected in the recommended conditions of approval.

The Department has reviewed the Construction Safety Study and Hazard and Operability (HAZOP) Study submitted by the Proponent, and considers that these documents are adequate. It does, however, recommended that the Minister require the Proponent to implement the findings and recommendations of those studies, to ensure that all appropriate risk mitigation and management measures are implemented.

6. CONCLUSION

The Department has assessed the Environmental Assessment, Statement of Commitments and submissions on the proposal, and is satisfied that the impacts of the proposal can be mitigated and managed to ensure an acceptable level of environmental performance.

The project effectively is about replacing a manual process that presently occurs with an automated process capable of meeting the capacity requirements for HCB waste removal and destruction off-site. The project is the first step in the ultimate removal of HCB waste from Botany.

The Department is satisfied with the level of assessment undertaken by the Proponent. This included an Air Quality Assessment, Preliminary Hazard Analysis and Human Health Impact Assessment. The findings of these assessments concluded that predicted air emissions would be well within the relevant air quality criteria and that the likelihood of a worst-case operating scenario impacting on the local community would be very unlikely and would not cause any acute health impacts. The health assessment further concluded that the potential off-site impacts of the proposal are less than that of the existing manual repackaging process.

The Department of Health and DEC agreed with these assessments, with the DEC recommending a number of conditions with regards to air emission controls and monitoring requirements that have been adopted in the recommended Instrument of Approval. This includes a pre-operation trial to confirm that the proposal would meet the environmental performance levels described in the Environmental Assessment.

The Proponent has also included a series of environmental mitigation measures that would be undertaken to ensure environmental compliance. The Department believes that the implementation of these measures in conjunction with the recommended Instrument of Approval would ensure that the environmental impacts of the project would be negligible.

7. RECOMMENDATION

The Department recommends that the Minister for Planning consider the findings and recommendations of the Departments report and approve the proposal, subject to the recommended conditions of approval.

APPENDIX A – RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

APPENDIX C – INDEPENDENT REVIEW PANEL

Background

HCB Waste Storage

When the Independent Review Panel (IRP) recommended in 2004 that the Geomelt destruction process for hexachlorobenzene (HCB) waste be carried out at a remote NSW location in preference to the Botany site, Orica withdrew its application for the Botany site. Orica committed to the destruction of the waste.

It has since pursued two main options: establishing Geomelt on a remote NSW site and exporting the waste to an established, overseas high-temperature incinerator. A third option of longer-term storage on the site until approval can be gained for destruction is not preferred by Orica.

There are more than 14,000 tonnes of HCB wastes currently in storage at the Botany Industrial Park (BIP) where Orica's premises are located. The wastes arose from the activities over many years of the former ICI corporation in Australia, the originator of many of the activities now carried out on the BIP.

The waste is stored in nine (9) locations on the BIP designated from A to I in a variety of forms. Most is crystalline HCB, but many other wastes contaminated to varying degrees with HCB and related chlorinated chemicals make up the total. These wastes are both corrosive and toxic and are therefore difficult to handle and store. The majority of the materials are non-flammable but combustible if other sources of fuel are present. A small amount is flammable. Orica has an existing program for re-drumming and storing these wastes, as required by the rate of deterioration of the existing packaging, which mostly consists of 200-litre steel drums.

Application for New Re-packaging and Storage Facilities

Orica has now applied for consent under Part 3A of the EP&A Act 1979 to install a plant at Botany to re-package the complete stock of the HCB waste which it has been decided to destroy. There are other HCB and related waste materials on the Botany premises, mainly as low-concentration land contaminants, which are not included in this application.

The application covers:

- a plant and processes for physically removing the wastes in their various forms from existing containers and repackaging them in new containers suitable for removal from the site; and
- a new storage area (Store J) to hold the re-packaged waste.

No chemical reprocessing or destruction of waste is involved in the plant and processes proposed under this application.

There are several significant aspects to this application for a re-packaging plant and store:

- The HCB waste stored at Botany must be continual re-packaged to maintain it in a safe condition for storage and handling.
- This results in an expansion of the total amount of waste to be destroyed each time it is re-packaged, since the old containers and materials used in re-packaging add to the stock. The expansion is currently about 500 drums per year.
- The waste also needs to be re-packaged for transport, to meet different specifications depending on whether its ultimate fate is destruction at a remote NSW location or overseas.
- The waste will also need to be re-packaged at a faster rate than required by the present rate of deterioration once a destruction process commences.
- As pointed out by the IRP, the risk of long-term storage at Botany presents greater risks than attempting destruction by Geomelt on the Botany site.

IRP Involvement

The application is before the Department of Planning for consideration. The IRP has been asked to comment on the application. However, the IRP was already working to specific Terms of Reference that include consideration of interim storage arrangements. In the circumstances, preparation of this chapter has been brought forward to

provide separate comment and appraisal of aspects of the proposal as set out in the Environmental Assessment (EA) accompanying the application under Part 3A.

The IRP has considered those aspects it considers significant from environmental and strategic perspectives. This chapter should not be construed as a comprehensive appraisal of all aspects of the application as required under Part 3A.

Issues Addressed by IRP

The issues the IRP considers it should address are:

- The general strategy implicit in the proposal
- Control of emissions, especially to atmosphere
- Risk assessment
- Monitoring of impacts

Strategy

The application is consistent with the overall strategy of destruction of the HCB waste in a safe and environmentally sound manner as soon as practicable. Re-packaging is necessarily an ongoing process if the waste is to be held in a relatively safe and environmentally sound way.

Until a method of destruction is agreed upon by all relevant parties with general community support, the waste must continue to be held at Botany. When it is removed from Botany for destruction, it will need to be packaged in a manner acceptable for such transport. The proposal will ensure that the re-packaging is in accordance with necessary transport standards.

As discussed below, there is a residual and very remote risk of an aircraft or road-tanker crash discharging a load of burning fuel into stored HCB waste, resulting in fairly wide dispersion of pollution. If long-term storage had been envisaged a bunker-style store may have been warranted. But as disposal is intended in the near future, only relatively short-term storage at Botany is needed. In any case, the proposal reduces the likelihood of this risk by re-configuring the disposition of waste storage at Botany, as discussed further below.

Emissions

Process and Operations

The proposal for re-packaging operations and storage involves:

- Transporting wastes from other stores to the new re-packaging facility.
- Emptying wastes from existing packaging in the new, fully-enclosed re-packaging building, adjacent to the store in which re-drumming is currently carried out.
- Decanting liquids from existing waste containers and either re-packaging them for disposal or transferring them to other appropriate treatment on site.
- Shredding residual contaminated wastes such as drums, pallets, PPE wastes, etc, for re-packaging.
- Re-packaging the wastes into:
    - 80 – 200 litre open-top rigid plastic drums (dry concentrated HCB)
    - 17,500 litre ISO containers (liquid organic waste)
    - 1 cubic metre 'bulkiboxes' or 200 litre polyethylene-lined steel drums (low level HCB-contaminated wastes, including shredded drums and pallets)
- Demolishing Store H, which consists of concrete tanks holding flammable chlorinated wastes. This will be initially an in-situ process. Water layers will be decanted for treatment in the existing groundwater treatment plant on site. The flammable organic layer will be pumped out and transferred to the re-packaging plant. The contaminated concrete tanks will be cut using high pressure water, broken up, transferred to the re-packaging plant for processing through the shredder and storage in new containers.
- Demolishing Store E, which consists of steel tanks containing demolition material: The tanks will be cut up and the demolition material crushed and screened in situ. Coarse material will be loaded into containers in situ for storage at Store J, while screened material will be transported to the re-packaging plant for shredding.
- Cleaning, plastic wrapping and palletizing new packages of waste as appropriate for loading into steel shipping containers

- Storing re-packaged materials, in containers ready for off-site shipment, adjacent to the re-packaging building.

More detail and drawings are available in the EA and its Appendices.

Emission control

There is potential for emissions to the atmosphere from the re-packaging plant and processes in normal operation. The likely emissions are:

- HCB as particles,
- other chlorinated organic compounds as vapours or particles,
- volatile organic compounds,
- particles, and
- odours.

The proposed mechanism of control is to capture emissions at the process points and/or in the building in ventilation air. This will then be cleaned by fabric filtration followed by activated carbon adsorption before discharge to the atmosphere through stacks. This is a sound mechanism for the duty proposed. It should be capable of effectively reducing emissions to minimal levels if properly designed, operated and maintained.

Two components are proposed for the ventilation systems to effect capture of emissions:

- one drawing an air flow initially through the clean storage area (Store J) and then through the general ('dirty') re-packaging process area; and
- the other drawing air through extraction hoods in the re-packaging process area positioned at the points where drums are opened & emptied, at the crusher and where new containers are filled. The vent from the decanting tank will also be connected to this ventilation system.

The air from both ventilation components will be passed firstly through fabric filters and they through a two-stage carbon adsorption bed. It is proposed to monitor contaminants in the air stream between the first and second beds on a weekly basis to ensure that the carbon adsorbent beds are changed before 'break through' of contaminants occurs.

The air pollutants to be captured and removed are essentially chlorinated organic compounds in vapour and particulate form, other volatile organic compounds, particles and odours. In principle the system proposed should be capable of effectively capturing and removing these pollutants. It is, of course, vitally important that ventilation air is cleaned of any particulates present in fabric filters before entering the adsorption beds, since the effectiveness of the adsorption process would be compromised if fine particles were to clog the fine pores in the adsorbent material. The filters, as well as the adsorbers, will need close attention in operation.

Fugitive Emissions

The stated assumption in the design of the main re-packaging processing area is that there will be "…no fugitive emissions from the re-packaging plant" (EA page 5-3). This may need to be checked in operation.

The air flow proposed is 8,000 cubic metres per hour (m^3/h) total (4000 m^3/h for each component). From dimensions and drawings provided in the EA, the volume of the process area appears to be about 5,000 cubic metres (m^3), so there will only be about one and a half air changes per hour. This may not be enough to maintain a negative pressure on all parts of the building at all times, especially if it is constructed as a traditional warehouse-style structure. Further, the hood design to achieve a high efficiency of collection at individual operations in the building will be important, since a hood-face area of only 2.2 square metres will be available in the extraction system, if the generally accepted minimum hood-face velocity of 0.5 metres per second is maintained.

Careful design and operation may result in the effective absence of fugitive emissions from the operation, but this should not be relied upon on the basis of design considerations alone. Ambient air monitoring immediately downwind of the re-packaging plant should be carried out for a limited period after start-up to ensure there is near to complete capture of contaminants from the re-packaging and storage operations. Similar external monitoring

was undertaken for the existing re-packaging operations in Store A in 2004/2005 as described on pages 2-1 and 2-2 of Appendix H (Human Health Impact Assessment) of the EA.

Emissions from Tank Demolition

It is proposed to individually enclose the concrete tanks in Store H during demolition, size reduction and packaging using a tent. Ventilation air will then be extracted from the tented enclosure through a fabric filter and two-stage carbon adsorber with weekly testing for organic emissions between adsorber stages, as in the main re-packaging area. This is again acceptable in principle, but, since the operation will continue for about a year, the efficiency of capture should also be checked by downwind ambient monitoring as described above for the main re-packaging area.

A similar control is proposed for Store E, but using filters without carbon adsorbers given the absence of volatile materials in these tanks. Discharges to atmosphere will be checked for any volatile emissions and mitigation measure implemented if any are detected. Since this operation is only anticipated to last for 15 days spread over a one year period, ambient downwind monitoring is not warranted.

Odours

Odours may arise from routine emissions from re-packaging and storage in the Store J building. Provided fugitive emissions are well contained the carbon adsorbers should provide adequate control to avoid off site detection.

Odours may also arise from disturbance of odorous materials during the construction phase and during the demolition of the tanks in Store H. These are effectively unable to be quantified and monitored. Regular downwind patrols should be undertaken by appropriately skilled and sensitive persons who do not normally work on the Botany site during the construction phase and the demolition of Store H to detect any odour problems at an early stage. Appropriate remedial action can be devised should any odour problems emerge.

Effluent and Wastes

The new re-packaging building will be equipped with a completely contained impervious floor so that all internal drainage and spillage will be collected and treated appropriately. The organic phase of liquid effluents from the process will be re-packaged for destruction. The relatively small amounts of aqueous liquids from the operation will be treated through the existing site waste water treatment processes (including carbon filtration) and discharged to sewer in accordance with the Trade Waste Services Agreement with Sydney Water. Sludges will be recovered and packaged for destruction.

All contaminated areas will be covered to prevent ingress of stormwater.

Secondary wastes and spent activated carbon from the adsorbers will be re-packaged for destruction. Construction waste, such as soils will be analysed and disposed of in accordance with DEC requirements.

Risk Assessment

Analyses in the EA

The Preliminary Hazard Analysis (PHA) and the Health Risk Assessment (HRA) in the EA systematically and thoroughly review and assess likely risks and health impacts associated with the proposed re-packaging and storage plant, including from:

- spillage of materials during on-site transport,
- failure of emission control equipment,
- fires arising from the re-packaging operations, and
- catastrophic external impact.

These are demonstrated to be lower than the risks associated with existing storage and re-packaging operations and acceptable in terms of the Department of Planning hazard assessment criteria.

The methodology of assessment is appropriate. Thirty four potential risk scenarios were identified in the PHA and prioritized for risk management. The PHA indicates that Orica will proceed to a final hazard analysis once design has been finalized, using HAZOP-type studies.

Air quality modelling has been undertaken using the Calpuff model with meteorological data from nearby Sydney Airport. This is an appropriate modelling tool for the Botany location. Emissions from the stacks during routine operations have been modelled for the relevant compounds, assuming that emission concentrations will be at the occupational exposure limits for the compound. Maximum ground-level concentrations as 15 significant local receptors have been determined. In fact, actual ground-level concentrations should be significantly lower than modelled due to the capacity of the fabric-filtration/carbon-adsorption cleaning train to effectively remove most of the pollutants.

Normal Operation

Emissions have been modelled to determine community exposure from the new re-packaging plant stack (Store J building), the store E stack and the store H stack for twelve (12) key pollutants. All are demonstrated to be conservatively below acceptable criteria for normal operation. The HRA also concludes there is no adverse health impact during normal operation.

The modelling assumes there are no fugitive emissions. Should testing as discussed above indicate that fugitive emissions are occurring the modelling outcomes should be revisited; however, given the predictions are generally much lower than the recommended air quality criteria, it is unlikely that the acceptable air quality would be exceeded, even if there were some fugitive emissions.

Abnormal Operation

Abnormal operation was taken in the PHA and HRA to be complete failure of the carbon adsorbers, a situation which could only continue for one week without coming to attention, given the emission testing regime proposed. The emissions for upset conditions have been modelled in the PHA and analysed in the HRA. The analyses indicate no adverse health impact for key pollutants (HCB, HCBD and mercury).

The case of a fire in the new re-packaging plant or Store J arising from an internal accident or unplanned operation was considered in the HRA, drawing upon previous analyses undertaken for the Botany Geomelt proposal. In that previous analysis, a fire in Store D, adjacent to Denison Street, caused by the spillage and ignition of the contents of an LPG tank such as carried by fork-lift trucks, was shown to have potential health impacts (mainly of an irritation-nature) on residents in Denison Street.

The HRA concluded that once Store J was established a fire could result in "acute and chronic exposures [which are] low and acceptable". Should a fire occur in any of Stores D, F, G, H or I the previous HRA had recommended that the site emergency response plan should "include a provision to assess the concentrations of dioxins in surface soil and dusts in the nearest residential areas…and undertake remedial action as required to ensure long-term exposures to dioxins remains below the recommended TDI [tolerable daily intake] for all residents." Once these stores have been cleared of HCB wastes as a result of this project they will not longer present this potential health risk.

The HRA also examined multiple pathway exposure for adults, young children and infants and concluded that potential health impacts from the proposed re-packaging operations and the new Store J were negligible for both normal and abnormal operations (ie failure of carbon adsorbers).

Catastrophic Event

The most serious and the most unlikely risk associated with the existing and proposed storage is the crash of a fuel tanker or aircraft into the Orica site. A sudden release of a large quantity of burning fuel from such an incident could result in a substantial fire within one of the existing HCB stores and dissemination of unburned HCB with products of partial combustion over the surrounding area in a resultant plume of combustion products. Absolute protection against such a risk on Orica's Botany site is not feasible.

As pointed out in the PHA, replacement of the eight existing storage locations on the site with the proposed single store at one location will significantly reduce the likelihood of any such crash impacting HCB material. The amount of waste material disseminated in such a scenario would tend to be proportional to the amount of fuel released rather than the amount of waste stored, so concentration in one location should not add to the magnitude of any consequences. The assumption of proportionality would not apply to the small component of inflammable material in the wastes, which will also be stored in Store J.

However, the most significant reduction in this remote risk is achieved by removing the stored HCB wastes from the site at the earliest possible time. The IRP statement in its original findings (2004, p vii), that "…continued storage poses a greater risk than on-site treatment", arose in part from concern about the risks of long term storage, should this be entertained as a serious option. The re-packaging proposal is an essential component preparatory to the removal of the wastes from the site, whether for destruction at a remote location in NSW or elsewhere outside Australia. It therefore makes a significant contribution to the reduction of this serious but very unlikely risk.

Further Risk Management

The risk analyses carried out for the Environmental Assessment have focused on toxic impacts from normal and abnormal operations. They have been guided by the Preliminary Hazard Analysis and the Health Risk Assessment following the Department of Planning and Department of Health requirements.

The IRP understands that a Final Hazard Analysis will be developed when the designs have been further advanced. However, it is recommended that a separate environmental risk analysis be carried out shortly after commissioning of the process has been completed. There are two reasons for this:

- the focus on major hazards in the PHA and HRA may not always give adequate emphasis to environmental impacts which do not involve potential significant human health impacts; and
- experience shows that most process upsets and non-routine operations arise from unforeseen sets of events, not identified in analyses of the type undertaken before operation commences, including HAZOP-type assessments. Once operational experience becomes available more scenarios for upsets can typically be identified and risk management thereby improved.

Monitoring

Routine monitoring of a range of operational parameters should be undertaken by Orica to ensure smooth and reliable operation of the re-packaging process. These do not need to be specified in the Consent or Environment Protection Licence in the opinion of the IRP.

The key parameter is the monitoring of carbon adsorbers for chlorinated organic contaminants at the Store J building and the Store H enclosures. The monitoring should be undertaken both between the two stages and at the discharge point. The proposed weekly frequency should be adequate, dependent on adsorber design, once the operation of the plant has settled down after commissioning. However, it is recommended that continuous monitoring of VOCs be used initially, say for several months, to establish the regularity of the operating pattern in terms of load on the adsorbers. Intermittent high loadings of volatile materials, such as solvents which may be in some of the mixed wastes, could contribute to accelerated exhaustion of the capacity of the adsorber to remove chlorinated compounds and odours. Once the variability in loadings presented to the adsorbers has been established weekly testing as p proposed should be adequate. A possible pointer to high volatile loads on the adsorbers may be variability in the amounts of organic liquid being collected from the waste water decanter.

Ambient air monitoring surveys downwind of the Store J building and the Store H tanks during demolition and re-packaging should be undertaken to determine extent of fugitive emissions from these operations. The surveys should be carried out after operations have settled into a smooth pattern following commissioning.

Regular odour surveys during certain phases of the operations should be used to supplement conventional air quality monitoring.

Conclusion & Recommendations

The proposed re-packaging and storage proposal as submitted by Orica is an appropriate response to the management of HCB wastes at the site.

It is recommended it be approved as submitted with a few additional requirements:

- Weekly monitoring of carbon adsorbers be supplemented with continuous VOC monitoring of emissions during the first three months of operation;
- Ambient air monitoring surveys be undertaken downwind of the Store J building and Store H tanks after commissioning to determine the extent of fugitive emissions from these sources, if any;

- Regular odour patrols be undertaken by persons not normally working on the BIP site during the earthworks phase of the construction of the re-packaging plant and during the demolition of Store H tanks;
- An environmental risk assessment of operations be carried out between three and six months after commissioning has been completed and any risk management recommendations be implemented; and
- A soil survey for dioxins and other relevant contaminants to be undertaken in the immediately-affected residential vicinity should a fire occur in stores D, F, G, H or I before they are cleared of HCB wastes.

The IRP anticipates that the Department of Environment and Conservation will impose a series of detailed operational requirements on the site Environment Protection Licence to regulate the environmental performance of the proposed activities. The IRP has considered a draft instrument prepared by DEC and does not believe any of the above recommendations are inconsistent with that draft.

APPENDIX D – ENVIRONMENTAL ASSESSMENT