

Our ref: IXOM Chlorine Liquefaction Plant (DA35/98-Mod-6)

Mr Ben Smith
Manufacturing Special Projects Manager
IXOM
16-20 Beauchamp Road
Matraville New South Wales 2036

3 November 2025

Subject: Hazards and Risk Assessment

Dear Mr Smith

The Department has undertaken a detailed review of the following documents submitted as part of DA35/98-Mod-6 and the submissions and advice received during the public exhibition period:

- Modification Report for the Chlorine Liquefaction Plant, revision 3 dated 13 August 2025
- Quantitative Risk Assessment, revision 2 dated 9 July 2025
- Dangerous Goods Transport Risk Assessment, revision 1 dated 28 March 2025

The Department requests you provide further information to address the detailed comments below. Your responses should be included in a Submissions Report.

A. Modification Report (revision 3, dated 13 August)

1. The alternatives to a new Chlorine Liquefaction Plant (CLP) within the existing Chlor-Alkali Plant (CAP) at Botany Industrial Park (BIP) (i.e. MOD 6) are listed in Section 2.5.2. However, the comparison of these alternatives is brief and as such, MOD 6 has not been fully justified against these alternatives in terms of the wider benefits and costs. Please provide sufficient justification in terms of the wider benefits and costs on why MOD 6 will be the best available option, including minimising chlorine transport distances, avoiding chlorine transport routes within highly populated urban areas and improving overall safety of the community.
2. From Section 5.2.2, we note that the Local Emergency Management Committee (LEMO) had been consulted. The LEMO responded that they will review MOD 6 during exhibition. However, no submission was provided by the LEMO and as such, the consultation outcomes remain open. Please reengage with the LEMO to close out the consultation and incorporate their comments and recommendations accordingly, if any.

B. Quantitative Risk Assessment Report (revision 2, dated 9 July 2025) - QRA

1. From Table 3.3, Note (b), based on consequence modelling of 25 ppm chlorine concentration within in the maximum discharge of 10,000 m³/hr from the 18.7 m scrubber stack height (i.e. the scrubber discharge specifications), it is understood that the concentration at ground level will not reach the chlorine toxic fatality, injury or irritation effects concentration (i.e. will not exceed AEGL-2 (10 minutes) = 2.8 ppm). Some details of this consequence modelling was provided by IXOM to the Department through separate correspondence. However, the consequence modelling assumptions and results are not provided in the QRA. To provide clarity to the public, please provide the consequence modelling assumptions and results, and verify that the modelling considers the worst-case weather conditions (i.e. those conditions which result in the furthest consequence distances).
2. From Appendix F of the QRA, it is understood that the total unavailability of the chlorine liquefaction building with scrubber is estimated to be up to 5% on an annual basis. That is, if a release were to occur within the building, there is a 5% probability that the building with scrubber will not be able to fully mitigate the release to the scrubber discharge specifications. The QRA considers such cases to be unmitigated outdoor ground level releases as though as the building and scrubber are not present. The Department considers this approach to be reasonably conservative, noting that there is still be some degree of mitigation afforded from the building as a passive enclosure compared to unmitigated outdoor releases. In recognising that the building with scrubber is a critical safeguard, further information should be provided to ensure that the maximum total unavailability of this safeguard will not exceed 5% throughout the life of MOD 6. As such, please provide further information and justification on how the 5% total unavailability will be verified in detailed engineering design, validated during construction/installation and tested prior to commissioning (SIL rating, scrubber performance testing, building leak testing, building integrity monitoring, etc.).
3. Please provide further information on the engineering design and/or continuous building integrity monitoring of the chlorine liquefaction building to ensure that any release of chlorine gas will not occur through gaps or cracks across the building fabric (i.e. walls, ceiling and floor) throughout the life of MOD 6. It is understood from MOD 6 report Appendix I: Remediation Action Plan, Section 5.1 that a vapour barrier will be installed below the floor to prevent ground contaminant ingress into the building. Will a similar vapour barrier be installed at the walls and ceiling to prevent chlorine gas egress from the building? Will the pressure difference between indoor and outdoor be constantly monitored to ensure negative

pressure within the building? Will chlorine sensors be located appropriately outside the building close to doors, vents and openings to detect leaks from the building?

4. From the report, it is understood that the risk of the overall IXOM facility comprising of the existing CAP and new CLP up to MOD 6, both normal (excludes chlorine cylinder and drum filling, only chlorine tanker filling) and contingent (includes chlorine, drum and tanker filling) modes of operation, complies with both the individual risk criteria (fatality, injury and irritation) and societal risk criteria in HIPAP 4. However, when compared to the existing CAP up to MOD 5, it is noted that MOD 6 will still result in an increase in societal risk for both modes of operation and a shift in the individual fatality risk contour towards the southern direction for contingent mode of operation. Please provide reasons why these increase and shift in risks are noted in the results even when the QRA already takes into account the risk reduction benefits of the chlorine liquefaction building with scrubber. Please also describe the major risk contributors leading to these increase and shift in risks and identify additional strategies or safeguards (those not already taken into account in the QRA) which can further reduce the risks from these major risk contributors to as low as reasonably practicable.

C. Dangerous Goods Transport Risk Assessment (revision 1, dated 28 March 2025) - DG TRA

1. Please provide the consequence modelling results for the scenarios in Table 5.1 for the worst-case weather conditions (i.e. those conditions which result in the furthest consequence distances) and verify that these results are generally consistent with the chlorine cylinder, drum and tanker release scenarios in the QRA.
2. In the report, the cumulative individual fatality risk contours for DG transport including future chlorine transport associated with MOD 6 along Denison Street report appears to reach only up to the Corish Circle and Smith Street intersection at the northern-end and not up to the Wentworth Avenue intersection further north. Please extend the scope of the DG TRA to include the entirety of Denison Street up to Wentworth Avenue intersection at the northern-end and Beauchamp Road intersection at the southern-end to align with the coverage of DG TRA for the Vopak Bulk Liquids Storage Facility up to MP 06_0089 MOD 2.
3. From the report, it is understood that IXOM intends to use existing routes for the transport of chlorine cylinder and drums by flatbed trucks and chlorine bulk tankers. The existing bidirectional route comprises of an internal route within BIP between the IXOM facility to BIP Gate 3 and an external route from BIP Gate 3 entering/exiting Denison Street. The DG TRA is conducted based on this existing route. However, the DG TRA did not investigate alternative routes which may avoid or reduce DG transport risks along Denison Street. For example:

- a. only using the southern portion between BIP Gate 3 and Beauchamp Road for both trucks and tankers to avoid highly populated areas along Wentworth Avenue; or
 - b. in combination with item C3a above, using a BIP Gate available at the southern-end of Denison Street and closer to the IXOM facility instead of the centrally located BIP Gate 3 to avoid most of Denison Street. The route between the IXOM facility to this southern BIP Gate via Fourth Avenue is also the shortest, most direct internal route within BIP and would avoid future operations along the central and northern portions of BIP.
4. Given the above, please investigate and report on the feasibility of these alternative routes, including reporting on the consultation with BIP and the future proponents of the formerly operated Qenos and Indorama facilities, especially on the benefits of using the internal Fourth Avenue to avoid undue constraints (e.g. internal traffic) to future operations within BIP.
 5. After investigating the alternative routes in item C3 above and if IXOM still intends to use BIP Gate 3, please provide further justification and verify that the DG transport traffic count assumptions adopted in the DG TRA remains the worst-case scenario up to MOD 6, and that the actual DG transport traffic count in practice including increases associated with MOD 6 remains below the assumptions (i.e. the overall DG TRA remains conservative).

If you have any questions, please contact Deana Burn on 02 9274 6453 or via email at deana.burn@planning.nsw.gov.au.

Yours sincerely,



Joanna Bakopanos

A/Director, Industry Assessments
as delegate for the Planning Secretary