ENVIRONMENTAL PROTECTION AUTHORITY

Assessment Report

Application Ref No.: EEZ100017

Technical Review and Analysis of Operational Activities associated with Marine Discharge Consent

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3	02/07/18	Drain Discharge clarified under 6.2.3 and issued as final to client	FB	BS	PW

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1.0 QUALIFICATIONS AND EXPERIENCE

My name is Frank Lyle Broomhead and I am a Senior Operations Consultant employed by Oil & Gas Solutions Pty Ltd for the purpose of undertaking a technical review and analysis on information specified in the OMV Marine Consent application no. EEZ100017.

I have previous experience in the Electrical and Instrument and Control field in the papermaking industry in Scotland, the steel industry in South Africa and the sugar refining industry in Swaziland before joining Shell B.P. Todd in New Zealand in 1974.

In 2010, I completed thirty-six years of service with Shell companies worldwide involved in both the onshore and offshore environments at a supervisory and senior management level.

I joined Shell BP Todd in 1974 as an Electrical and Instrument Control Supervisor at the Kapuni Field before making the transition to Production Operations in 1978 and working in the Maui Field as Operations Supervisor involved in the commissioning and start-up of the Maui Production Station (MPS).

I transferred to Petroleum Development Oman (PDO) in 1980 and was Production Supervisor at the onshore oil and gas facilities at Fahud and Qarn Alam.

I returned to New Zealand in 1984 as Kapuni Field Superintendent until 1987 when I moved to The Netherlands and joined Nederlandse Aardolie Maatschappij (NAM) BV as Onshore Platform Manager responsible for three gas and condensate platforms in the Dutch sector of the North Sea.

In 1990, I transferred to Shell Expro, Aberdeen as Offshore Installation Manager (OIM) on the Brent Delta. I remained there until 1993 when I returned to New Zealand and took the position of Maui Field Superintendent, responsible for Maui-A (MPA), Maui-B (MPB) and MPS. This included the manning, commissioning and steady state operation of the new Floating Production and Storage Offloading (FPSO) facility. I also transitioned MPB to a Not Normally Manned (NNM) installation.

In 1998 I left New Zealand to take a position on the Camisea Project in Peru as Onshore Coastal Facilities Manager based in Houston in the USA, where the design office for this project was located.

The Camisea project was later deferred so in 1998 I transferred to the Malampaya project as Platform Manager. The design office for this project was also in a Houston. I later relocated to Singapore where the construction of the Malampaya platform was being carried out and then to The Philippines where I was responsible for establishing the offshore procedures and business processes for the project, the technical training of local staff and the handover from Projects to Production Operations. I finished with the project in 2004 having achieved the position of Operations Manager, responsible for the onshore and offshore facilities.

In 2004, I transferred to the Sakhalin Energy Investment Company (SEIC) on the Sakhalin project in Russia and remained there until 2008 as Upstream Operations Readiness Manager, responsible for managing the handover of two offshore platforms, an onshore gas plant and two 800 km pipelines from Projects to Production Operations. I also established a suite of policies and procedures covering operations and maintenance, Permit to Work (PTW), Health, Safety and Environmental (HSE) in preparation for the handover from Project to steady state operations. In addition, I developed and implemented a technical competency system for local staff. I was also responsible for negotiating and managing the transition of the two pipelines and SEIC staff to Gazprom, a Russian energy company.

In 2008 I joined the North Caspian Operating Company (NCOC) Kashagan project in Kazakhstan charged with managing the transition of all responsibilities from the current operator to NCOC. I later became Technical Capability Manager, establishing a technical competency framework for local staff.

During this time I assisted the Shell Learning and Development department in The Hague in building competency profiles for technicians.

I was also involved with local government and other agencies associated with the project and technical competency training. I left Kazakhstan and Shell service in 2010.

From 2010 to 2016, I provided consultancy services through a third-party consultancy company Wood Group ODL as a Senior Operations Consultant. During this time, I provided services to Apache, Chevron and INPEX which covered the development of documentation management systems and I carried out a manning study for Bumi Armada. In addition, I project managed an offshore organisation and efficiency review on behalf of Wood Group ODL prior to a major reorganisation by Repsol – Talisman in Malaysia.

I also provided consultancy services to OMV, again through the third-party consultancy company Wood Group ODL. I was not directly employed by OMV. The services provided covered the development of an Operations Readiness Assurance (ORA) Graduate Training toolkit for OMV corporate in Austria. This was a short-term assignment, conducted over 1 month in July/August 2012 and was completed on 17th August 2012. Under a separate assignment through Wood Group ODL, I also developed Performance Standards for Safety Critical Elements on for OMV corporate in Austria. This was also a short-term assignment, conducted over 1 month in May 2013 and was completed on 4th June 2013. I am not providing any ongoing support to OMV.

I have also worked independently on a review of BHP assurance processes on a mining project, assisting Lloyds Register Energy Drilling on developing an assurance process and for Woodside Energy in a 'cold eye' review of operating expenditure.

More recently, I have provided consultancy services to AWE Limited through a third-party consultancy company, Oil & Gas Solutions Pty Ltd. I was not directly employed by AWE Limited. The services provided covered the Operability & Maintainability review of the Front End Engineering Design of a new onshore natural gas processing facility, the Waitsia Gas Plant (WGP) in the Northern Perth Basin approximately 360km from Perth which will provide conditioning of raw gas to sales gas quality prior to export to gas distribution pipelines. This was a short-term consultancy assignment, conducted over 1 month in March 2017 and was completed on 31st March 2017. Under a separate assignment through Oil & Gas Solutions Pty Ltd, I also conducted an audit of the Computerised Maintenance Management System (CMMS) used on the current AWE Perth Basin Operational assets of Xyris and Dongara, also situated in the Northern Perth Basin. This was a short-term assignment and was conducted over a 2-week period in April/May 2018, with the work completed on 4th May 2018.

I was a member of the Instrument & Control panel (NZ) setting the curriculum for Instrument & Control apprenticeship schemes. I have presented papers in New Zealand on Dual-Skilling and in Kazakhstan on developing a technical competency framework.

My qualifications are:

a) New Zealand University Diploma in Industrial Production.

b) U.K. Full Technological Certificate (Credit) – Electrical Installation Work.

c) U.K. Technological Certificate (Credit) – Industrial Measurement & Control.

d) Management of Major Emergencies (Offshore Installation Manager assessment) – Health and Safety Executive U.K.

2.0 EXECUTIVE SUMMARY

In March 2018, OMV New Zealand Limited (OMV) applied for a Marine Discharge Consent EEZ100017 to permit the discharge of trace amounts of harmful substances from the deck drains of a Mobile Offshore Drilling Unit (MODU) associated with an Exploration and Appraisal Drilling (EAD) Program. Therefore, a discharge consent is required by regulation 16 of the Discharge and Dumping (D&D) Regulations 2015 from the Environmental Protection Authority (EPA). No other activities are the subject of this application.

OMV has been operating in New Zealand since 1999 when they became operators of the Maari Field with a 30% share in the Field. The Maari Field is New Zealand's largest oil field producing crude oil from the Maari, Mangehewa and Manaia reservoirs. Production from the Maari Field commenced in February 2009, with OMV now owning a 69% share in the Field.

Since OMV began operating in New Zealand it has expanded into a range of other assets through subsequent acquisitions. This initially included a 10% share in the Maui Field, which has since increased to 83.75% and 26% share in the Pohokura gas field and onshore production station. From the Maari Field (oil), Pohokura (gas) and Maui (gas), OMV is the largest producer of liquid hydrocarbons and the third largest natural gas producer in New Zealand.

OMV is actively searching for additional oil and gas resources within New Zealand and currently holds interests in nine Petroleum Exploration Permits (PEPs). OMV completed a development drilling campaign during 2014/2015 to further develop the Maari Field, which included the drilling of new production wells from the Maari Wellhead Platform.

In order to grow its portfolio and New Zealand's hydrocarbon reserves, OMV are proposing to undertake an EAD program starting in 2019. This includes the drilling of up to nine exploration wells and three appraisal wells within OMV permit areas. These wells are located within the Taranaki Basin, in six of the nine permit areas in which OMV holds interest.

OMV's PEP include a number of obligations, which require OMV to drill at least one well in each of these exploration permits or surrender the permit.

This report is limited to statements lodged by OMV covering the following activity:

- Discharges of water from processing drainage from hazardous and non-hazardous deck drains on the MODU.

Therefore, the focus of this report is to provide information of the industry standards for hazardous and non-hazardous deck - drainage systems that would be required for the MODU chosen, review the operational effects associated with the activity listed, identify any gaps or conflicting information and best practices to assess if any issues should be brought to the attention of the Marine Consent Authority.

As mentioned above, the activity requires a Discharge Consent for the trace amounts of harmful substance from the deck drains of the MODU as stipulated by regulation 16 of the Discharge and Dumping (D&D) Regulations from the Environmental Protection Authority (EPA).

This report does not consider any issues associated with marine ecology or activities covered by an existing marine consent.

Alternative locations for the MODU were not considered as the MODU is governed by the location of the potential hydrocarbons areas. Other methods of avoiding discharge of harmful substances residue from deck drainage was also considered but was found not practical as it would involve collecting all

deck drainage water on the MODU and transporting it to a suitable disposal facility onshore. This would include potentially large volumes of rainwater. The reasons for discounting this approach are given in OMV Marine Discharge Consent Application – Deck Drainage document, section 3.9, page 47.

Selection and contracting of an appropriate MODU to undertake the EAD program has not occurred yet, therefore the specific options available for the onboard management of harmful substances and treatment of deck drainage prior to discharge is unknown at this stage. However, OMV has stated that it will place strict environmental and operational requirements on the MODU suppliers, prior to awarding the contract.

Where limits are placed on structural design or specifications of the MODU, they will be managed through the OMV New Zealand MODU selection process.

The specification of the deck drainage system (refer OMV Marine Discharge Consent Application – Deck Drainage document, section 3.2, page 33) and procedures (OMV Marine Discharge Consent Application – Deck Drainage document, section 3.3, page 35) to be used to manage and monitor the hazardous and non-hazardous drains stated in the OMV application appear to capture industry best practice. In addition to this, OMV is also recommending the use of covered and bunded pallets where additional storage space is required for harmful substances. These hard-covered spill pallets offer protection against direct exposure to rainwater (OMV Marine Discharge Consent Application – Deck Drainage document, section 3.2.2, page 34).

The selection of harmful substances to be used for the EAD program could not be verified at this stage but will be driven by operational needs of the MODU, the design of the well and the geology of the formation to be drilled. Nevertheless, OMV has reviewed the harmful substances used during previous drilling campaigns to inform this application.

Although briefly mentioned in the OMV Marine Discharge document, any other risks associated with mobilizing and demobilizing the MODU, drilling in the EEZ, or emergency response plans will be addressed through separate applications at a later date.

It is clear from the information supplied by OMV that it has established a strong presence in the Taranaki region since 1999 and is committed to developing long-term and meaningful relationships with the communities in which it operates. This is supported by the plans to engage a large number of groups in the Taranaki region with respect to this application for the deck drainage Discharge Consent.

OMV is committed to following industry best practice by adopting ‘Environmental Best Practice Guidelines’ for the Offshore Petroleum Industry, which has been developed by The Ministry for the Environment (MfE, 2006).

It is apparent in the application that OMV is committed to continuous improvement in Health, Safety, Security and Environment (HSSE) performance and acknowledges it as an integral part of managing the business. This covers compliance with applicable laws, regulations and standards, ensuring equipment integrity by carrying out regular maintenance, training of staff and regular monitoring and audits associated with OMV management systems.

In addition to this, OMV will implement an assurance program on the MODU to confirm that all critical systems are meeting their performance standards. This especially relates to the deck drainage system by implementing planned maintenance and regular calibration of the Oil in Water (OIW) in-line monitor. Visual checks will also be made on a daily basis to establish that no loss of containment has occurred and a daily monitoring regime will be established for the OWS and the OIW.

Training, competency and drills plus spill kits complete the systems and procedures being implemented by OMV.

OMV is aware of other regulatory approvals required for the EAD program but these will be addressed through separate applications at a later date.

OMV has applied the internationally accepted bowtie risk assessment methodology to assess risks specifically for the EAD program in regards to deck drainage and the potential for a harmful substance discharge. This provides a visual indication of the threats and controls that will be implemented.

A proposed request for further information has been included relating to the activity, comprising 4 clarifications (Refer to Appendix 3 - Clarification Register). These clarifications are included as an optional aid for the Marine Consent Authority, should they choose to request information we feel OMVs impact assessment is lacking. If the proposed clarifications are pursued by the Marine Consent Authority and a further assessment of the response from OMV is required, a second report will be drafted that reviews this information.

I deem that the key risks as stated in section 5.1 have been recognised, understood and addressed by OMV as part of their application. However, in some cases the level of detail is sparse and hence the request for further information should provide the necessary clarification in those areas and close the gaps.

Some proposed activities are in the early stages of planning and therefore certain information such as type of MODU, drain system configuration on the MODU and the chemicals to be used during the AED campaign is not available. OMV is committed to containing harmful discharges and has acknowledged this and has stated that these details will be provided to the EPA prior to the works.

The key considerations given in section 5.2 identify the areas that OMV must maintain to guarantee success in minimizing trace amounts of harmful substances entrained in water that runs off the decks to the deck drains.

3.0 INTRODUCTION

OMV has lodged an application with the EPA for a marine discharge consent associated with the Exploration and Appraisal Drilling program utilizing a Mobile Offshore Drilling Unit (EEZ100017).

The application is to cover the potential discharge of harmful substances through hazardous and non-hazardous deck drains on the MODU.

This activity is restricted by regulation 16 of the Discharge and Dumping (D&D) Regulations from the Environmental Protection Authority (EPA).

The EPA may obtain advice or information by commissioning any person to provide a report on any matter described in the activity to which an application relates.

The purpose and scope of this report is to:

- Review the marine consent application activity contained in the OMV Marine Discharge Consent – Deck Drainage for the Taranaki Basin document
- Provide a findings and recommendations report based on assessment of the contents contained in the documents and information received and through further requests for information
- Make an assessment of the responses received from OMV on further information requested.

4.0 ASSESSMENT APPLICATION

4.1 Documents Reviewed

The following documents issued by EPA were reviewed as part of this study:

- Environmental Protection Authority Application Form EPA0401, Marine Discharge Consent OMV New Zealand Limited, dated 27 March 2018
- OMV Marine Discharge Consent Application – Deck Drainage, Taranaki Basin. Document SLR Ref: 740.10078.00000
- Email on OGS Meeting Follow-up dated 11 May 2018 regarding the addition of Specific Questions from Ben Moginie, Advisor, EEZ Applications.

In addition, the following source documents were also used:

- Environmental Best Practice Guidelines for the Offshore Petroleum Industry, The Ministry for the Environment, 2006
- Exclusive Economic Zone and Continental Shelf (Environmental Effects – Discharge and Dumping) Regulations 2015, Environmental Protection Authority, New Zealand.

4.2 Information Principles

It is understood that more detailed information cannot be presented by OMV on the type of MODU that will be employed in the field, the range of drilling chemicals that will be used or the design of the deck drainage system as the project is currently in the early stages of planning. Therefore, there is no information or schematics concerning these areas provided by OMV.

It is possible that more than one MODU would be used under this marine discharge consent for the EAD program and that the program would commence in 2019 and continue through to 2025. In this case, it is assumed that all MODUs contracted for the EAD program would meet the same exacting standards.

Nevertheless, in my opinion the application has provided the best available information known to OMV at this time and more detail will be supplied to the EPA by OMV when the extent of the work is known. Any outstanding issues will be risk assessed as part of the final report and recommendations put forward making them a condition of the consent.

5.0 KEY RISKS AND CONSIDERATIONS

A MODU is self-contained with personnel accommodation and services but the generation (age) of the rig contracted for the work could affect deck drain design, deck space, location of liquid storage vessels and the type of liquid storage equipment e.g. fixed or transportable Intermediate Bulk Containers (IBCs) on the MODU.

To ensure that the MODU systems are operated and maintained correctly, it is important that the personnel are familiar with the MODU and are deemed competent in their area of expertise. This includes the maintenance and operation of the deck drain system and associated equipment, oil spill procedures, the deployment of oil spill equipment and the lines of communication between the field and those managing the spill event in the OMV emergency control centre.

5.1 Key Risks

The key risks and considerations are given below:

Key Risks:

- Contracting an aged semi-submersible drilling rig with a history of integrity issues
- Irregular maintenance and calibration of the Oily Water Separator and Oil in Water monitor
- Inadequate MODU deck drainage system (an adequate and preferred deck drainage system, including all controls and functionality is described in section 6.2 and shown in Appendix 1 - Key Elements of a MODU Drainage System)
- No coaming on the peripheries of the open deck areas
- Design of bunds, coaming and hard-covered bunded pallets for hazardous areas are not able to contain the maximum potential volume of harmful substances in the storage vessels held in the governed area (Refer to Appendix 3 - Clarification Register, No. 1)
- Gaps in technical skills and oil spill response
- Poorly designated non-hazardous areas.

5.2 Key Considerations

- Visible commitment by OMV management in maintaining the integrity and reliability of structures and equipment by providing the processes and tools to achieve this, including adequate financial resources to support the planned activities
- Applying a robust and structured approach to the planning and execution of the EAD program and support activities
- Employing competent and experienced staff at all levels within the organisation
- Ensuring service contract staff and equipment meet OMV standards. This ensures a degree of consistency in the quality of work carried out on the MODU and the standard of the equipment brought onto the rig to execute the planned activities
- Carrying out regular emergency exercises on the MODU and also between the MODU, support vessels, and the OMV emergency control centre

- Ensuring that any on-site repair or modification work to the MODU or any of its critical systems is subject to a review and if required re-classification by a recognised certifying authority e.g. Det Norske Veritas (DNV) or Lloyds Register (LR) to guarantee compliance

- Valid class certificates for the duration of the EAD campaign with no conditions of class placed on the MODU.

6.0 EVALUATION OF INFORMATION

6.1 Marine Discharge from MODU Deck Drains

A range of chemicals are anticipated to be used during the EAD campaign and the current application for a Marine Discharge Consent covers for the planned discharge of harmful substances via the hazardous and non-hazardous deck drain system on a MODU.

As OMV is in the early planning phase of identifying and securing a MODU, the full details of the deck drainage system cannot be provided.

Also, a comprehensive list of chemicals products, hazardous classifications, physical properties, maximum volumes and frequency of discharge cannot be provided for the same reason. OMV has reviewed previous drilling campaigns in an effort to identify harmful substances.

6.2 Deck Drainage System

A typical deck drainage system is designed to manage the potential loss of containment of a harmful substance from discharging to the marine environment.

A schematic of a preferred and adequate drain system, showing the separation between non-hazardous drains and hazardous drains and the systems, controls and treatment measures is shown in Appendix 1 - Key Elements of a MODU Drainage System.

OMV will focus on MODUs that have its open deck areas fitted with coaming on their peripheries that act as bund walls (Refer OMV Marine Discharge Consent document para 3.2.1 page 33). This prevents any rainwater, deluge water or wash-down water from discharging directly over the side to the sea. Open deck areas are identified as either hazardous areas or non-hazardous areas.

Non-hazardous deck drains do not normally discharge directly to the sea but flow into a settling tank where any harmful substances are skimmed off by an automated level control system and routed to the hazardous drain system.

It can be seen from Appendix 1 - Key Elements of a MODU Drainage System that harmful substance storage will take place in bunded areas, which are only connected to the hazardous drain system. Operations and handling of harmful substances also occur in areas where any release would be captured and only flow to the hazardous drain system. This system consists of multi-chambered settling or collection tanks. From here the water is put through an Oily Water Separator (OWS) fitted with an inline Oil-in-Water (OIW) monitor. The OWS only allows water to be discharged overboard when the discharge has less than 15 ppm OIW content in accordance with Marine Pollution (MARPOL) standards, which is typically 15 ppm prior to discharge overboard.

If the content is greater than 15 ppm then the contaminated water is redirected back to the settling tank where further separation occurs until the stream has OIW concentrations of less than 15 ppm. This system will meet the criteria set by regulations 17 and 18 of D&D Regulations that are classified as permitted activities.

Any oil that collects in the slops tanks is normally transferred to IBCs for removing to shore for disposal at a consented facility. It is unclear how the solids recovered in the collection tanks is handled and disposed of (Refer to Appendix 3 - Clarification Register, Clarification Register, No. 2)

There may be a need to install temporary drain plugs (refer to Appendix 1 - Key Elements of a MODU Drainage System) in specific areas during certain operations such as bunkering. A procedure would be developed covering this activity and the Permit to Work (PTW) system would be used to control the risks associated with the installation and removal of the plugs. Drains can also be temporarily

blocked with plugs to prevent discharge into the deck drain system while clean-up activities are being carried out.

It is possible that some of the MODUs contracted for the EAD program will route drainage from non-hazardous areas directly overboard and not through a treatment system as shown in Appendix 1 - Key Elements of a MODU Drainage System. This would mean that these areas would have to be clearly demarcated and no harmful substances handled or stored in non-hazardous areas.

If additional storage is required, OMV is recommending the use of hard covered and bunded pallets as shown in Appendix 2 - Hard Covered and Bunded Pallets. These would be located in bunded hazardous areas.

In exceptional circumstances, it is noted in the application ((Refer OMV Marine Discharge Consent document section 3.2.3 page 34) that the deck drain system could be by-passed due to two primary situations which cause an excessive amount of water to be present;

1. The deluge system is activated by the detection of fire or heat by the automated monitoring system on board the MODU. In this case, the fire pumps would quickly deliver large volumes of seawater to the affected area via the deluge system causing the deck drainage systems to become overloaded. In this event, the deck drainage systems may have to be by-passed. Another cause could be as a result of a faulty fire or heat detector but in this case, the volume of water would not be delivered for a sustained period.

2. Extended torrential rain is experienced, which again could overload the deck drainage system to the extent that the stability of the MODU is at risk. In this scenario the decision to discharge deck drainage directly overboard would be made by the Offshore Installation Manager (OIM).

The application also states that valves that would allow the discharge of the contents directly overboard by by-passing the OWS are normally padlocked shut, managed under a Permit to Work system and recorded in the open / locked close isolation register. The status of these valves can only be changed by the OIM. This is industry best practice. Any direct overboard discharge from the hazardous areas would also be recorded in the Oil Record Book as required by the D&D Regulations.

As part of best practice, it is important to confirm that any critical systems meet their performance standard by carrying out certain assurance tasks such as:

- Adherence to the Planned Maintenance Routines (PMRs), including OWS and OIW monitor
- Regular calibration of the OIW in-line monitor. (Refer to Appendix 3 - Clarification Register, Clarification Register, No. 3)
- Maintaining adequate spares for critical pieces of equipment
- Implementing regular additional water quality checks by competent personnel as specified in operational procedures. (Refer to Appendix 3 - Clarification Register, Clarification Register, No 4)
- Stock management and maintenance of a harmful substance register as required by the Emergency Spill Response Plan (ESRP).

The team responsible for managing spills, including the use of procedures for notification, containment, isolating, cleaning, disposing and reporting of any loss of containment to deck would be trained, assessed and drilled.

The training should be included in the MODU emergency exercise plans with the roles and responsibilities clearly defined.

A loss of containment to the deck will require the substance to be contained and cleaned-up using spill kits that are strategically located around the MODU. The details concerning the spill kits, contents and locations will be provided in the ESRP and the Oil Spill Contingency Plan for the MODU.

6.2.1 Possible Discharge Substances

At this stage in activity planning, no specific chemicals have been selected for use. However, as mentioned in OMV Marine Discharge Consent document, section 3.4.2, paragraph 1, OMV has reviewed data from previous drilling campaigns to use in the application.

In addition, OMV would confirm all chemicals to be used, including their potential for ecotoxicity and other hazard characteristics. Full details would be provided to EPA prior to work commencing.

6.2.2 Discharges from Machinery Space

Machinery that has the potential to discharge harmful substances would normally be enclosed in a bunded area with the discharge routed to the non-hazardous drain system and separated via a settling tank. Temporary plugs can also be fitted to allow absorbent spill pads to be used to mop up the spillage before removing the plug and washing down the bunded area. The volume of any harmful substance accumulating in the machinery bunded area would generally be negligible.

6.2.3 Harmful Substance Dilution Calculations

It is noted in the OMV Marine Discharge Consent document, section 3.7, page 42 that to provide a worst-case assessment, the maximum total volume of any harmful substances left behind as a residue on the deck following clean-up is 250ml and this volume is immediately entrained within the deck drainage system. This is noted to be a conservative assumption. As stated, any substance contained on the deck would pass to the settling tank in the drainage system and be diluted further.

A loss of containment of any harmful substance on the deck will be contained and cleaned-up using spill kits. Therefore, the volume of any residue on the deck following clean-up of 250ml is considered to be reasonable worst-case assumption. It is noted that this volume has been used to determine the concentrations of harmful substances that would be discharged after dilution in the deck drainage system settling tank, with results presenting a negligible ecotoxicity risk.

In the most likely scenario, a loss of containment of any harmful substance would occur in a hazardous deck area and the substance would be diluted in the settling tank prior to being discharged. In a worst-case scenario, the loss of containment could occur in a non-hazardous deck area which may be directly discharged to the sea (without dilution) or diluted in a settling tank in the non-hazardous drain system prior to being discharged (if using the preferred deck drainage system as shown in Appendix 1 - Key Elements of a MODU Drainage System)

7.0 ASSESSMENT OF BARRIERS

OMV has applied the internationally accepted bowtie risk assessment methodology to assess the risks specifically for the EAD program in regards to deck drainage and the potential for a harmful substance discharge (Refer OMV Marine Discharge document, section 3.8, page 46).

It provides a visual representation of the potential hazards in an activity and the proactive and reactive hazard management that will be implemented during the EAD program.

8.0 CONCLUSIONS

Based on a review and analysis of the information provided by OMV, it is my opinion that there are no perceived residual risks that cannot be mitigated or managed that the Marine Consent Authority should be aware of when making a decision.

A comprehensive outline of the risk assessment methodology applied by OMV clearly shows the threats and the mitigating measures to be put in place to manage the hazards associated with deck drainage and a harmful substance discharge.

Nevertheless, I have raised 4 points for clarification which are noted in the report and listed in a Clarifications Register under Appendix 3 - Clarification Register. The questions have been assigned a significance level to guide the Marine Consent Authority, with 2 points for clarification assigned a RED level and 2 points of clarification assigned an AMBER level.

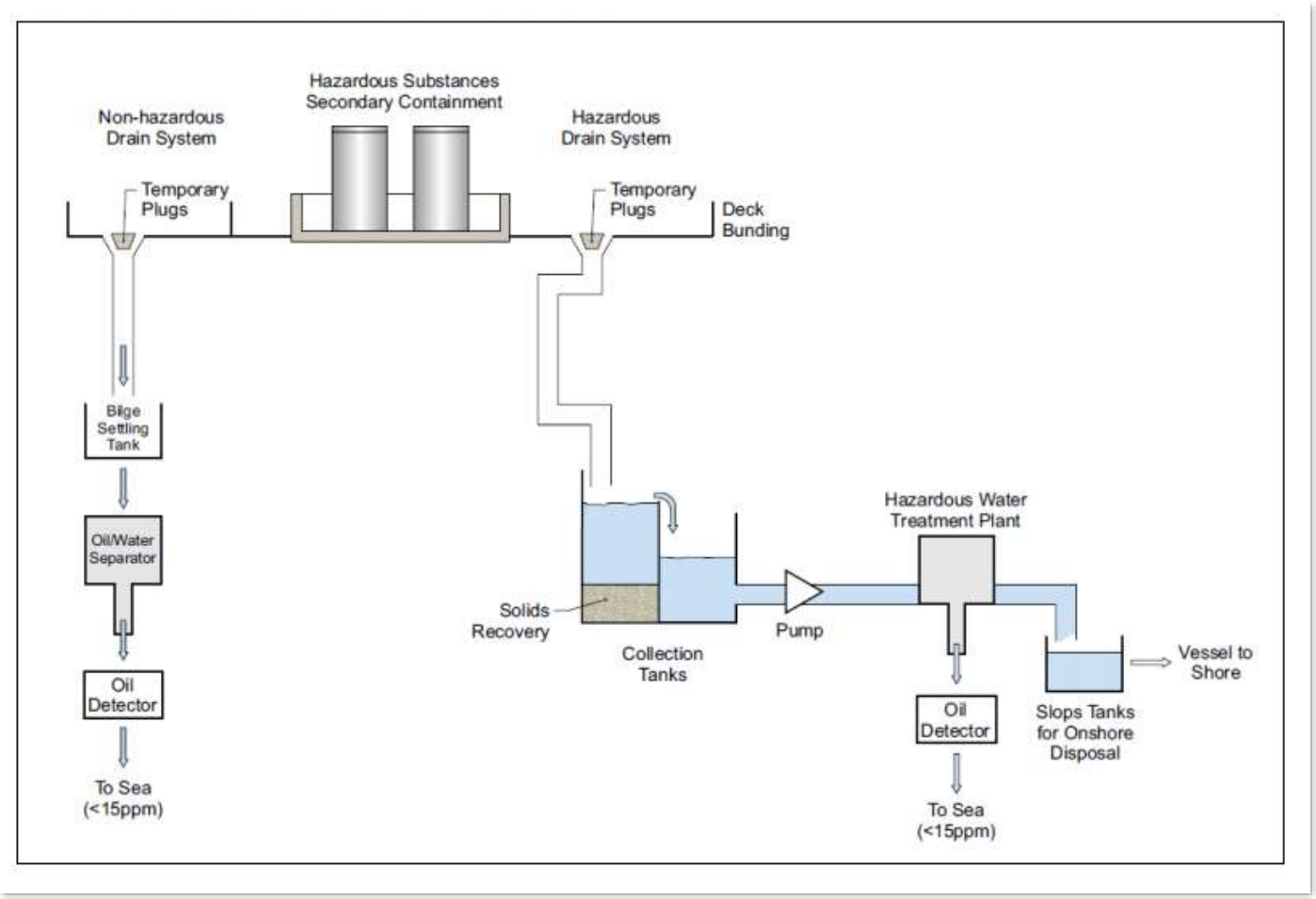
As a minimum, answers to those questions assigned as RED require a response before I can confirm that the activities associated with using a semi-submersible drilling rig are acceptable and pose no risk.

In the final conclusion, a risk matrix will be developed as part of the final report and any activities deemed to be of low risk can be mitigated by the EPA by making them a condition of the consent. Any medium or high-risk items will be addressed accordingly.

OMV has stated that the following documents and plans will be developed in the future:

- An approved activity – specific Emergency Spill Response Plan (EARP) for EAD activities
- An approved project specific Oil Spill Contingency Plan (OSCP).

APPENDIX 1 - KEY ELEMENTS OF A MODU DRAINAGE SYSTEM



APPENDIX 2 - HARD COVERED AND BUNDED PALLETS

OMV Marine Discharge Consent, section 3.2.2, figure 2

APPENDIX 3 - CLARIFICATION REGISTER

A summary of the points for clarification is tabled below. Please note that references in bold text relate to the OMV Marine Discharge Consent application no. EEZ100017. For completeness, the relevant section in this report is also is referenced.

All questions have been assigned a significance level to guide the Marine Consent Authority based on the following:

RED: Obtaining answers to these questions is critical to understanding the proposed activities

AMBER: Obtaining answers to these questions would be valuable in understanding the proposed activities

GREEN: Obtaining answers to these questions would provide insight towards understanding the proposed activities.

No.	REFERENCE #	CLARIFICATION	LEVEL	STATUS	RESPONSE
1	5.1, Bullet 5, p 10 **No Reference**	Confirm that the design of all bunds, coaming and hard-covered bunded pallets for hazardous areas will contain the maximum volume of harmful substances stored in all vessels or containers held in the governed area in the event of leak/rupture.		Open	
2	6.2, para 7, p 12 **No Reference**	How are the solids collected and where do the solids go as they build up in the collection tank?		Open	
3	6.2, para 13, bullet 2, p13 **3.3.2, bullet 2, page 36**	Will the MODU have automated alarms to monitor oil-in-water content prior to discharge, if not what method or system will be used?		Open	
4	6.2, para 13, bullet 4, p13 **3.3.2, bullet 3, page 36**	Will the regular water checks be carried out on the MODU or sent onshore for analysis?		Open	