

PLAN

**STORM WATER MANAGEMENT PLAN
(DMSB)**

PLN-AUS-HSSEQ-010



REVISION	DATE	AMENDMENT SUMMARY	REVIEWER	APPROVER
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STORM WATER MANAGEMENT PLAN (DMSB) PLN-AUS-HSSEQ-010

SCOPE

ASCO has established this Storm Water Management Plan to ensure all matters within the scope of all operational requirements provides adequate protection of the environment and to ensure storm water system is maintained to guarantee appropriate safeguards are in place for the Environment and protection of marine waters.

PURPOSE

ASCO has established this Storm Water Management Plan to ensure all matters within the scope of all operational requirements provides adequate protection of the environment and to ensure storm water system is maintained to guarantee appropriate safeguards are in place for the Environment and protection of marine waters.

The plan sets out the aims of ASCO and highlights the commitment to identify and manage all aspects of this plan. Storm water is surface run-off from rain and storm events that enters the drainage system. It carries many pollutants, including leaves, sediment, oil and other hydrocarbons, that can be major cause of pollution in the harbour surrounding the DMSB, and can have detrimental effect on marine life and environment. ASCO will monitor and implement this plan to limit and minimise any impact on the surrounding local marine environment.

REFERENCE DOCUMENTS

DOCUMENT TITLE	INTERNAL/EXTERNAL
Environmental Aspects Impacts	Internal
Environmental Review	Internal
Environmental Monitoring and Measurement	Internal
Hazard Identification and Control	Internal
PPE Standards - Australia	Internal
Planned Inspections	Internal
Service Improvement Process (SID)	Internal
Spill Management Plan - AUS	Internal
Task Based Risk Assessment (TBRA)	Internal

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ABBREVIATIONS

ABBREVIATION	MEANING
AIMS	ASCO Integrated Management Systems
DMSB	Darwin Marine Supply Base
DP	Darwin Port
GIP	Grated Inlet Pit
MEX	Facilities Management IT Solution Centre
ODD	Open Unlined Drain
SPEL	Underground Storm Water Treatment Chamber
TBRA	Task Based Risk Assessment
TFR	Treatment Flow

ROLES & RESPONSIBILITIES

ROLE	RESPONSIBILITIES
Marine Supply Base Manager	To oversee the implementation of this Plan. To monitor the activities of Facility Users to ensure compliance with this plan.
MSB Coordinator & Facility Coordinator	Ensure competent advice and support is provided to Facility Users in meeting the requirements of this plan. To monitor controls in relation to this plan ensuring all Facility Users are compliant. To promptly report all non-conformances to BU Manager and HSSEQ Department. To organise contractors to service, inspect and repair any storm water drains as per MEX requirements.
HSSEQ Department	To review update and implement all changes to this plan. To monitor all DMSB personnel and Facility users in relation to compliance with this procedure Carry out site assessments in relation to this plan.
DMSB Stakeholders	Will cooperate and assist with the Plan. To follow all instruction in relation to this plan To promptly report all non-conformances to DMSB Management.

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OBJECTIVE

- Prevent adverse impact on the surrounding water ways
- Educate staff about preventing storm water pollution
- Maintain housekeeping to prevent waste from entering the stormwater pits
- Maintenance plan is to be enforced to guarantee to ensure critical fail safes are maintained
- All non-conformances to be actioned and resolved in a timely manner utilising the ASCO SID process

POTENTIAL IMPACTS

- Contamination of environment, water and habitat
- Contamination from poor handling, storage and spillage of chemicals, oils, fuels, bulk metal ores, sewage and other wastes, including litter
- Mud plant activities.

PERFORMANCE

- No waste products to enter storm water pits
- No significant impact on surrounding water ways
- No significant impact on environment and marine life
- Raise core staff of awareness to ensure compliance with contents of this plan
- Monthly stormwater inspection as part of the ASCO Planned Inspection process
- Waste bins to have bungs fitted
- Full waste bins to be at least 10m away from drains.

STORM WATER DRAINAGE SYSTEM

DMSB has been built on reclaimed land enabling construction of two storm water drainage pits on the east and west sides of the base. The pits drain into separators capturing any solid foreign objects and treating storm water before releasing into the harbour. Sluice valves are located at numerous points along the drainage pits enabling flow control of hazardous / contaminated spills.

Potential sources of surface or groundwater contamination and increased/decreased flow include:

- Sediment laden run off from unsealed areas and areas of bulk material storage
- Storm water discharges
- Interruption to natural drainage flows
- Sediment disturbance through dredging and vessel movements in the harbour.

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Management of water effects will be undertaken in accordance with the following principles:

- Implementation of DMSB Spill Response Plan
- ASCO will ensure general clean ups are undertaken and that catchment areas are kept free of contaminants, as per MEX.

SURFACE GRADING

The DMSB is graded to retain all storm water and surface runoff within the site. The site has been graded towards the centre of the site from the wharf edge, and all pavements are drained by a piped underground storm water system.

The DMSB site has a perimeter open drain on the north and west boundary to cut off the flow from DP land and convey it to Darwin Harbour along the same drainage path as it currently takes. This flow discharges to the harbour through an existing culvert in the rock wall formed by dredge pipes. In this way, the responsibility for existing storm water flow and quality from DP controlled land is kept separate from the DMSB system.

CHEMICAL AND MUD DUCT DRAINAGE

The chemical and mud ducts are provided with a grated sump pit located at the low point towards the centre of each duct, which is connected to the main underground storm water network via a drainage line. Storm water flows entering the ducts during a rainfall event, will be captured by the grated pits and conveyed to the underground storm water network and treatment unit provided at the downstream end of the system.

A sluice valve is provided on each of the drainage lines from the service ducts, to isolate the ducts from the main storm water network in the event of a spill or for maintenance operations. These valves will remain open, to allow water to flow into Storm water system, until loading commences. When loading starts the valves will be closed. In the event of a significant rain event the service ducts are to be checked for water build up. The sluice valves maybe required to be opened to allow water into the storm water system.

The chemical and mud duct drainage has a bunded wall around the tanks. After a rain event the accumulated fluids can only be discharged into the humeceptor. The humeceptor will require regular checking for contaminants and cleaned as required. The storage area for ISO tanks will be individually bunded for the different type of chemicals. Fluids will be tested for water quality prior to discharge into a holding tank. Fluid will again be tested in holding tank for water quality before discharge to storm water system.

DANGEROUS GOODS WASTE BUNDS

Separate treatment of storm water runoff from the dangerous goods waste bunds is provided with in the DMSB. Runoff from the bunded areas for these two sites will be captured and drained to a treatment device humeceptor, before entering the underground storm water network. Sluice valves are provided on the drainage lines from each of the bunded areas, to isolate these areas from the main storm water network in the event of a spill or for maintenance operations. Bunds are monitored when rain events occur with the valve opened to allow excess water into the storm water drain.

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STORM WATER MAINTENANCE

Maintenance is performed at minimum every twelve months depending on site conditions, and environmental factors (potential rainfall and sediment levels).

EXTREME WEATHER

Major Storm

During events of lower frequency and higher intensity, the hydraulic capacity of either the pipe or the pit inlet may be exceeded, either of which may cause the depth of water above the pit inlet to increase, in turn driving more flow into the pit and more flow through the pipe.

Boundary Drainage

The boundary between the DMSB and the DP land is separated by an unlined drain (OUD) cause way to capture the surge of storm water runoff or any direct threat to the DMSB storm water drains from DP land. Visual inspection will be conducted as per MEX to ensure integrity and soundness and to report any breaches of contaminated matter. Repairs and maintenance requirements will be reported to DP through the MEX system as the cause way is within their jurisdiction.

Environment

The DMSB has been designed and constructed so that storm water drains directly into underground separators' then into the harbour. Surface water runoff for the Darwin Marine Supply Base is collected into storm water collection pits that run through the separators.

Marine Waters

Water quality in Darwin Harbour is dependent on tides, seasons and location within the harbour. The marine waters around the marine supply base, in common with most other estuarine systems, are subject to significant seasonal fluctuations in salinity and temperature.

ENVIRONMENTAL ASPECTS & IMPACTS REGISTER

An Environmental Aspects and Impacts Register will be prepared that includes Aspects and Impacts related to DMSB Activities. Environmental concerns arising due to DMSB activities that can interact with the local environment such as, discharge to water or air, noise or light or vibration and will be risk assessed utilising the Aspects and Impacts Procedure to ensure appropriate controls are established. An impact refers to any change to the physical environment, whether adverse or beneficial, wholly or partially resulting from a DMSB activity. The Aspects and Impacts Register will be compiled by undertaking an initial environmental risk assessment to identify issues and impacts of past and present activities.

SPEL STORMSCEPTOR

DMSB site has two SPEL Stormceptor storm water treatment systems for the treatment and capture of contaminated surface runoff from impervious catchments that have high vehicular and heavy industry traffic with the potential of suspended solids and constant oil and fuel leaks. The focal point of the SPEL Stormceptor system is the high standard of its treatment efficacy to capture suspended solids, sediment, hydrocarbons (fuel/oil/grease), heavy metals and nutrients from both nominated catchments in order to improve the quality of the surface water runoff to comply with the specified requirements for the DMSB.

The SPEL Stormceptor is a gravity, passive storm water treatment device that treats storm water through two chambers. Low velocity flow produces quiescent conditions enabling separation of the pollutants in all flow events. Contaminated water cannot flow directly across the surface before effective separation has taken place. Treatment flow (TFR) is diverted into the primary chamber of the SPEL Stormceptor where sediment and hydrocarbons separate. Flow continues into the secondary separation chamber and through a high-reticulated coalescing filter media filtering and separating fine particulate suspended solids, nutrients and hydrocarbons. SPEL Stormceptor tanks contain an immersed inlet dip pipe to extinguish flames and prevent inflammable vapours from passing through to the drainage system. It also prevents mosquito breeding.

SPEL Stormceptor contains two chambers that ensure sediment capture does not impact on hydrocarbon capture. It is mounted into the secondary chamber, providing a coalescing process for the separation of smaller oil droplets. Incorporated in the secondary chamber prevents the coalescer from being blocked by large amounts of heavy sediment that are separated in the primary chamber. It can be simply lifted out for cleaning during routine maintenance. The Maintenance Programme is as per MEX planning requirements and inspections.

MONITOR & REVIEW

The Storm Water Management Plan will be continually monitored to ensure full compliance with local and territory legislations, and as a minimum a full review will be conducted annually to ensure compliance.

NON-CONFORMANCES

All non-conformances, uncontrolled areas, objectives and performance standards not maintained will be investigated utilising the ASCO Service Improvement Process (SID) to ensure all non-conformances are investigated and suitable measures imposed to ensure satisfactory outcome.

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APPENDIX A - CONTROL FOR THE MANAGEMENT OF STORM WATER

CONTROLS	MONITORING	CORRECTIVE ACTIONS
Ensure no foreign matter enter drainage pits	Discussions with personnel regarding foreign matter observed in drainage pits Inspections by DMSB Facility Coordinator	Discuss in LiveSafe conversations to remind personnel
The prevention of spills entering the drainage pits	Discussions with personnel regarding foreign matter observed in drainage pits Inspections by DMSB Facility Coordinator	Discussing at LiveSafe conversations meetings highlights quick response to spills Suitable spill response container
Hazardous waste bunded areas	Discussions with personnel regarding foreign matter observed in drainage pits Inspections by DMSB Facility Coordinator	Discuss in LiveSafe conversations to remind personnel
Mud Duts Valves Mud Plant bunded Area	Random check of equipment Random Inspection of bunded area for cracking/holes as per MEX inspections	Ensure that all personnel are aware of the requirement for all valves and bunded walls to be inspected Housekeeping in all areas
Interceptors kept clean and free of foreign matters.	Random check of equipment Random Inspection of area for foreign matters Maintenance as per DP MEX system.	Maintenance performed annually or when required Vacuum truck removing any build-up of oils/ hydrocarbons or foreign matter.