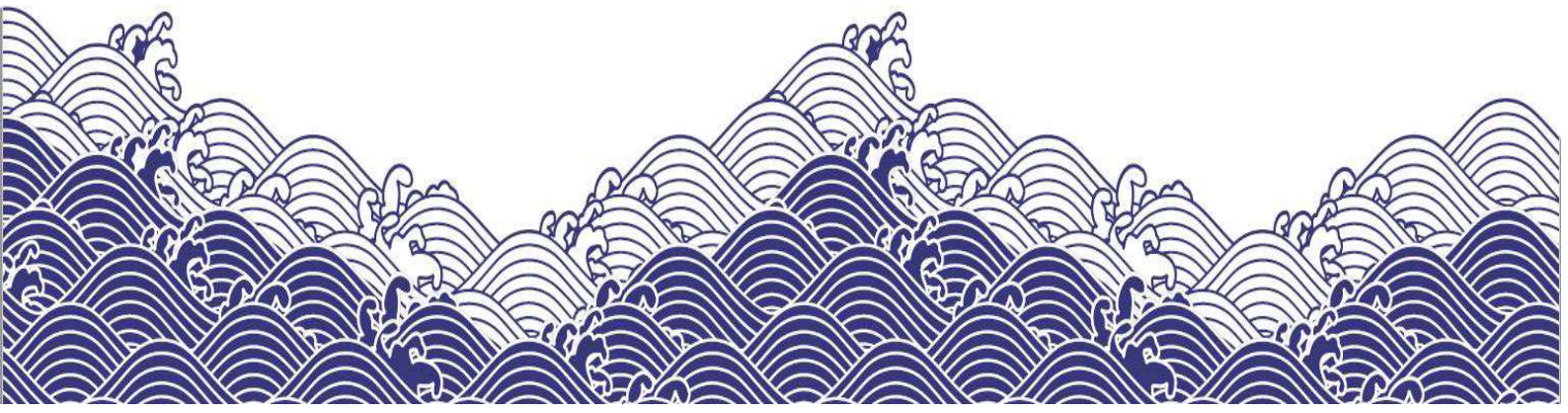
INPEX Australia Environment Plans - Source Control Capability and Arrangements report



INPEX Australia Environment Plans - Source Control Capability and Arrangements

Report

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RECORD OF AMENDMENT

Revision	Section	Amendment
1	4.6 (Table 4-5)	Environmental performance standards defining timelines for the capping stack mobilisation to the well location and deployment plan and relief well response model activities have been included as a result of the NOPSEMA assessment of the Offshore Facility (Operation) EP

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to:

- Present a summary of INPEX Australia's exploration and production (E&P) drilling; and operations activities in the Browse Basin.
- Present a summary of the worst credible well blowout scenarios (WCWBS) which could occur from exploration/production drilling activities and from the operation of production wells.
- Provide a detailed source control capability analysis, for the selected WCWBS.
- Define environmental performance outcomes (EPO) and environmental performance standards (EPS) for the source control capabilities and arrangements (preparedness), and the risk assessment of the implementation of the source control capability.
- Provide an implementation strategy for this source control arrangements and risk assessment report, including management of change processes and compliance reporting requirements.
- Ensure INPEX's description of source control capability and arrangements as related to Environment Plans (EP) is appropriately described, in accordance with the requirements of Section 3.1 of the NOPSEMA *Source control planning and procedures* Information Paper (N-04750-IP1979).

1.2 Limitations/out of scope

- Current in-force Ichthys Development Drilling Campaign WA-50-L EP (0000-AD-PLN-60003), from which the source control capability and evaluation content is derived.

This document does not include evaluation and response capability/arrangements associated with the following:

- Environmental risk assessment and spill prevention/control
  - The following elements are contained within each activity specific EP:
    - Detailed activity description
    - Activity specific oil spill hazard identification, including potential release rates, volumes, locations, hydrocarbon types etc.
    - Activity specific oil spill modelling, used to inform environmental risk assessment
    - Description and risk assessment of oil spills on environmental values and sensitivities
    - Evaluation of controls to prevent oil pollution from the described activity.
- Oil spill response
  - Oil spill response for all INPEX Australia EPs are managed under the Browse Regional Oil Pollution Emergency Plan (BROPEP) suite of documents
- Operational and scientific monitoring programs (OSMP)
  - The full OSMP capability requirement is addressed within the INPEX Australia Browse Regional Oil Pollution Emergency Plan (BROPEP) (X060-AH-PLN-70009 – Appendix A).

The inter-relationship of this document to other drilling and environmental documentation is presented in Table 1-1.

Table 1-1: Source Control Documentation Overview

Document title	Document number	Purpose
INPEX Australia Environment Plans - Source Control Capability and Arrangements Report (This document)	D021-AH-REP-70000	The EP Source Control Capability and Arrangements Report provides an evaluation of INPEX's source control capability and arrangements required to conduct a successful well-kill for exploration and production wells in the Browse Basin. This document also provides the environmental ALARP and acceptability statements and implementation strategy, to ensure the ongoing demonstration of source control capability and arrangements.
Loss of Well Integrity Response Plan (WIRP)	D021-AD-PLN-70023	The WIRP's objective is to prevent the escalation of any loss of well integrity and reinstate well integrity as soon as practicable. It: • provides an action plan to be taken in the case of a loss of well integrity from a production well; and • identifies and records the required readiness level for the preparation, equipment and services. It describes: – the requirements documented as checklists; and – checklists suitable for both planning and audit.
Well Operations Management Plan (WOMP)	0000-AD-PLN-60004	The WOMP describes the well activities and associated management systems for drilling and completion; suspension; intervention; and inspection maintenance and repair of Ichthys Brewster and Plover reservoir development wells within the WA-50-L production licence area.
INPEX Blowout Contingency Plan (BOCP)	D020-AD-PLN-10040	The purpose of the BOCP is to provide a plan for regaining control of a blowout, not blowout prevention. The BOCP specifies how INPEX will respond to a well control event where primary well control has been lost with potential, or real, complications with secondary well control, extending to the worst case scenario of an uncontrolled blowout with significant hydrocarbon release to the environment and loss of assets.

Document title	Document number	Purpose
Source Control Emergency Response Plan (SCERP)	D020-AD-PRC-10036	The SCERP is designed as a subset of the BOCP, to support response preparations to well control emergencies and establish a process for responding to safely managing them using a standard uniform approach. It includes the equipment and procedures to address a range of well control scenarios necessitating immediate mobilisation of intervention equipment and personnel.
INPEX Capping Stack Logistics Plan	D020-AD-PRC-10039	The INPEX Logistics plan describes the mobilisation of the Wild Well Control international (WWCI) capping, debris clearance and dispersant equipment (Source Control Equipment) into Australia from point of origin (Singapore) through end delivery point in Australian waters.
INPEX Environment Plans • Offshore Facility Operations EP • Ichthys Development Drilling Campaign WA-50-L EP (future revision) • (future) exploration drilling EPs	X060-AH-REP-70007 0000-AD-PLN-60003 TBA	All INPEX EPs contain a detailed activity description and activity-specific oil spill scenarios. Specifically, INPEX EPs include the following: • a description of the activity-specific spill scenarios (including the potential well blowout release rates, volumes, locations, hydrocarbon types, etc.) • activity-specific oil spill modelling (used to inform environmental risk assessments) • an assessment of oil spills risks/impacts on environmental values and sensitivities • evaluations of controls to prevent well blowouts.
INPEX Australia - Browse Regional Oil Pollution Emergency Plan (BROPEP) suite of documents, including; • Basis of Design and Field Capability Assessment Report (BROPEP BOD & FCA) • Browse Regional Oil Pollution Emergency Plan – Incident Management Team Capability Assessment Report (BROPEP IMTCA)	X060-AH-REP-70016 X060-AH-REP-70015 X060-AH-PLN-70009	The BROPEP BOD & FCA report evaluates the oil spill field response capability required for all INPEX Australia's offshore petroleum exploration and production activities and associated oil spill risks. The BROPEP IMTCA report defines the required IMT capability needed to implement the field oil spill response. The BROPEP is the response document, used by the IMT, to activate and implement oil spill response capabilities during a spill scenario.

Document title	Document number	Purpose
• Browse Regional Oil Pollution Emergency Plan.		

2 INPEX AUSTRALIA EXPLORATION AND PRODUCTION ACTIVITIES OVERVIEW

INPEX Ichthys Pty Ltd, on behalf of the Ichthys Upstream Unincorporated Joint Venture Participants, is developing the Ichthys Field in the Browse Basin off the north west coast of Western Australia to produce condensate offshore for export to markets in Japan and elsewhere, and export gas for further processing at the Ichthys liquefied natural gas (LNG) plant in Darwin.

Initial development wells were drilled and the Ichthys LNG offshore facilities were installed and commissioned from 2014 through to 2018. The assets commenced production in July 2018 and now routinely ship cargoes of condensate from the FPSO to international customers and send gas to the Darwin plant via the Gas Export Pipeline.

The existing facilities consist of a subsea production system (SPS) (E.g., xmas trees (XT), manifolds, subsea control systems and umbilicals, risers and flowlines (URF), and the gas export riser base (GERB), which connect the wells to the Central Processing Platform (CPF) Ichthys Explorer and Floating Production Storage Offtake – (FPSO) Ichthys Venturer

The CPF/FPSO, GEP and onshore Ichthys LNG plant are collectively referred to as the Ichthys Project.

INPEX Australia's offshore exploration activities are focused on identification of additional petroleum reserves to tie-back into the Ichthys Project, either at the CPF/FPSO, or onto any of the five hot-tap-tees along the length of the GEP, within the Canning, Browse and Bonaparte basins. Therefore, exploration activities, including exploration/appraisal drilling, are generally located within the same geographic area as the Ichthys Project in Commonwealth waters between Broome and Darwin.

3 WORST CREDIBLE WELL BLOWOUT SCENARIOS

To determine source control capability requirements, an evaluation of current INPEX production, and near-future planned exploration wells has been undertaken. A summary of key well data is provided in Table 3-1.

As detailed in Table 3-1, the Plover reservoir has a higher gas flowrate potential than the Brewster reservoir and is therefore the worst-case scenario from a well kill perspective (Wild Well Control 2019).

Table 3-1: Comparison of well-blowout modelling data

Model	Brewster Production Phase 1	Plover Production Drilling Phase 2
Release location (coordinates)	13° 52′ 46.2″ S 123° 19′ 3.0″ E Approximately 35 km north west of Browse Island.	13° 54' 17.14" S 123° 09' 53.93" E Approximately 47 km north west of Browse Island.
Oil type	Brewster condensate	Plover condensate
Reservoir pressure (psia)	6020	6683
Gas flowrate (MMscf/day)	577	735
Oil flowrate (m^3/day)	3193	1082
Release duration (days)	80	108
Total release volume (m^3)	255,475	116,856
Well bore size - internal diameter (inches)	8.5″	8.5″
INPEX well blow-out OLGA modelling report document number	C020-AD-TCN-00023	X080-AD-TCN-10084

4 SOURCE CONTROL CAPABILITY AND ARRANGEMENTS EVALUATION

As described in INPEXs EPs, should a loss of well containment event occur during a drilling activity or from a producing well, a number of source control activities may be implemented depending on the specific circumstances of the loss of well containment.

For a production well, a range of loss of well integrity events are considered within the Loss of Well Integrity Response Plan (WIRP). Tier 1, Tier 2 and Tier 3 category events as described in API RP 754 / IOGP Report 456 are covered by the WIRP. The well intervention based response options covered by the WIRP include:

- relief well and / or capping stack.
- ROV intervention (light and heavy)
- well intervention – light well intervention (LWI) (DP vessel)
- well intervention – emergency disconnect package (EDP) /lower riser package (LRP) (MODU)

Source control activities for Tier 1 and 2 category events are presented in the following section.

4.1 Relief well and capping stack response options

A relief well plan for the INPEX Brewster and Plover wells has been finalised, utilising specific well kill modelling results to complete the relief well design. The modelling considers a number of factors including well geometry, reservoir pressure, temperature, permeability and reservoir fluid properties (as described in Table 3-1).

Depending on the loss of well containment scenario other source control activities may be required to assist in regaining control such as ROV based systems for seabed debris clearance, BOP intervention and/or well capping.

4.2 Summary of relief well analysis

INPEX engaged third-party specialist to undertake a relief well and dynamic well kill study for the Brewster and Plover production wells in WA-50-L (Add Energy 2019). The dynamic well kill portion of this study models a blowout rate for given subsurface and well architecture parameters and then models the kill rate for a given kill fluid density required to kill the well.

NORSOK D-010 Rev 5 (Standards Norway, 2021) Section 5.8.1 gives clear guidance on the assumptions to be used during dynamic well kill modelling and these are outlined as follows:

- expected values for reservoir parameters (pore pressure, permeability, porosity, net gross pay, etc.)
- expected top of reservoir depth
- expected productivity index / transient productivity index
- expected fluid type parameters, if oil is expected, but gas cannot be disregarded both cases shall be simulated
- mechanical skin is zero
- no restrictions in the flow path
- planned well design (hole size, casing setting depth, etc.).

The modelling and subsequent analysis of logistical requirements has determined the duration of relief well drilling as 80 days for a Brewster well and 108 days for a Plover well, with a single well kill achievable in both reservoirs. These durations are presented in the form of a response time model in Table 4-1, developed in accordance with the Australian Offshore Titleholders Source Control Guideline (APPEA 2021).

Table 4-1: Summary of time response model for Brewster and Plover reservoirs

Activity	Brewster Reservoir (days)	Plover Reservoir (days)
Relief well MODU mobilisation	28	28
Relief well construction	36	64
Ranging and intercept (incl. kill)	16	16
Total duration	80	108

The MODU used to drill the relief well will need a NOPSEMA accepted Safety Case Revision (SCR). A total of 28 days has been scheduled for the development, submission and acceptance of the SCR by NOPSEMA. An indicative schedule for the SCR approval is as follows:

- Day 0-1 – MODU(s) identification
- Day 1-2 – SCR development schedule created. Engagement meeting with NOPSEMA held to advise of submission schedule and request all attempts be made to assess SCR as a matter of priority
- Day 2-16 – SCR developed including HAZID with contractor personnel. Partially populated SCR template used as a starting point
- Day 16 – SCR submitted to NOPSEMA
- Day 16-23 – SCR Request For Further Written Information (RFFWI) received
- Day 26 – SCR resubmitted to NOPSEMA
- Day 28 – SCR accepted by NOPSEMA.

INPEX have prepared Scope of Validation templates for both Capping Stack Installation and Relief Well Drilling campaigns.

INPEX tracks the availability of MODUs capable of drilling a relief well on a monthly basis. The register includes whether the vessel currently has a valid Australian safety case and is provided to key source control team members. In addition, on a quarterly basis the latest edition of the register will be reviewed as part of exploration and production drilling EP quarterly risk reviews.

4.3 Relief well supply base capabilities and mud requirements

If required, drilling a relief well will necessitate supporting a MODU and other source control operations. INPEX operates an existing supply base in Broome which has previously supported a two MODU operations during the Phase 1 Ichthys development drilling campaign and will have sufficient arrangements in place for the Phase 2 Ichthys development drilling. At times, INPEX will likely also be supporting other exploration drilling operations in the region at the same time. Broome is now established as a mature oilfield supply centre with at least one liquid mud plant and cement plant in place. If additional resources or lay down area was required, INPEX operates a supply base in Darwin for its production operations which could also be utilised in the event of a source control operation.

Modelling shows that the well is killed relatively quickly (within 45 minutes) and liquid requirements are easily accommodated by typical relief well candidate MODUs operating in the country. Mud/kill fluid will be supplied through the above-mentioned supply bases.

4.4 Summary of capping stack feasibility analysis

High energy gas wells located in relatively shallow water (as seen in the Browse Basin) can present challenges with safe vertical access due to the resulting surface boil and Lower Explosion Limit (LEL) hydrocarbons associated with a well blowout. This in turn can preclude the deployment of a capping stack. This being said, INPEX are a member of a capping stack consortium and have access to a primary 15,000 psi, 18 ¾" capping stack in Singapore and the equivalent as secondary in Aberdeen. Because of this, INPEX undertook a capping study with the provider of this stack (Wild Well Control 2019).

This study involved computational fluid dynamics modelling to show the behaviour of the stack as it is landed on a flowing well with expected Plover reservoir properties (Plover reservoir has higher gas pressure than Brewster reservoir and is therefore a worst-case scenario). The study found that "the capping stack is able to move through the discharge plume in a controlled manner and can potentially be landed on the wellhead" (Wild Well Control 2019).

The study (Wild Well Control 2019) then looked at the behaviour of the subsea plume as it rises in the water column and then the dispersion of any gas at the sea surface, in order to infer if vertical access is possible. It was determined that with assumed current and wind conditions, the plume would be displaced 50 m downstream of the well centre but the 10% LEL radius extends up to 60 m upwind. This means that, if limited to 10% LEL, the closest a construction vessel could get to the well centre is 10 m. Therefore, deployment of the capping stack could be possible subject to crane capacity on the selected construction vessel.

While direct vertical access has been determined as not possible for the modelled Plover discharge rate, there are influences that would likely reduce the discharge rate and thus enable vertical access. These are outlined as follows:

- The situation may be a drilled kick escalating to blowout meaning less net pay and possibly non-Plover reservoir (being of lower quality)
- There may be wellbore flow restrictions which are likely to occur from:
  - Drill-string remaining in the hole (drilled kick/dropped drill-string) partial closure of BOP due to activation during/after the event from MODU or vessel
  - flowing zone collapse/bridging.

4.5 Assessment of capping stack deployment duration

Opting for capping as the primary means of containment yields a reduction in the time to contain the well. An operational analysis of capping stack mobilisation by air and vessel (sea freight) has been conducted and the options detailed in the INPEX Capping Stack Logistics Plan (D020-AD-PRC-10039). Vessel mobilisation has been assessed as the quickest option and is outlined in Table 4-2 below.

Table 4-2: Time to contain well – deployment of capping stack – vessel freight option

Item	Maximum duration (days)	Comments
Stack up and test capping stack in Singapore and ready for load out	4	Based on previous stack-up and testing of capping stack in Singapore. Concurrently source construction vessel in region which has Australian Vessel Safety Case.
Continue to source and mobilise construction vessel to Singapore	10	Typical response time based on market knowledge of suitably rated vessels with Australian Vessel Safety Cases. An appropriate vessel will be identified on INPEX register, updated monthly, tracking the location and availability of HLVs in the SE Asian region.
Load out capping stack on to construction vessel from Singapore	1	Based on logistics plan from provider
Transit capping stack directly to licence area	7	Typical sailing time from Singapore to WA-50-L with some minor allowance for weather on route.
Deployment of capping stack onto well and shut-in of well	7	Assumes vertical assess is possible with an allowance for unfavourable metocean conditions during deployment
Total	29	

Running in parallel with the above timeframe, a SCR for a capping stack deployment vessel would also be developed and submitted to NOPSEMA for acceptance. An indicative schedule for the SCR approval is as follows:

- Day 0-1 – vessel(s) identification
- Day 1-2 – SCR development schedule created. Engagement meeting with NOPSEMA held to advise of submission schedule and request all attempts be made to assess SCR as a matter of priority
- Day 2-12 – SCR developed including HAZID with contractor personnel
- Day 12 – SCR submitted to NOPSEMA
- Day 12-19 – SCR RFFWI received
- Day 21 – SCR resubmitted to NOPSEMA
- Day 22 – SCR accepted by NOPSEMA

INPEX tracks the availability of vessels capable of deploying a capping stack on a monthly basis. The register includes whether the vessel currently has a valid Australian safety case and is provided to key source control team members. In addition, on a quarterly basis the latest edition of the register will be reviewed as part of exploration and production Drilling EP quarterly risk reviews.

4.6 Evaluation of source control capability and arrangements

Table 4-3 presents an evaluation of the applicability of various source control options.

Table 4-4 presents further information regarding the environmental benefits and merit in improving the implementation of source control activities (i.e. implementing controls to a greater extent or within a faster timeframe and associated cost benefit considerations).

Table 4-5 presents the environmental performance outcomes, environmental performance standards and measurement criteria, related to the preparedness and implementation of source control activities.

Table 4-3: Evaluation of applicability of source control response options

Source control response technique	Likelihood of success	Considered for implementation
Site survey	Site survey involves the use a response vessel and ROV to conduct visual/sonar observations, to determine the condition of well and BOP and search for any debris, following the source control event. This information is required, to enable the source control team to conduct detailed planning for all source control activities. A detailed assessment of the logistical resources required to implement this response strategy are described in Table 4-4	Yes
Debris clearance	Debris clearance involves the use of response vessel(s) with cranes/lifting equipment and work-class ROVs, equipped with cutting tools, to cut and relocate/recover debris on the seabed, to enable other response strategies such as BOP intervention, capping stack deployment and mooring a relief well MODU to occur safety. A detailed assessment of the logistical resources required to implement this response strategy are described in Table 4-4	Yes
BOP intervention	BOP intervention involves the use of response vessels and work-class ROVs with tooling to enable an additional hydraulic power source to power some BOP functions. The BOP intervention tooling can be used to attempt to close the shear-rams of the BOP to stop the flow from the well and/or unlatch the Lower Marine Riser Package to allow its removal for the installation of the capping stack. A detailed assessment of the logistical resources required to implement this response strategy are described in Table 4-4	Yes
Capping stack	A capping stack response involves the use of a heavy lift vessel (HLV) to lower and latch the capping stack on the blowing well, to stop the flow from the well. A detailed assessment of the logistical resources required to implement this response strategy are described in Table 4-4	Yes
Capping stack – offset installation equipment	INPEX is aware of new technology developed by Saipem and marketed by Oil Spill Response Limited (OSRL) in the form of Offset Installation Equipment (OIE). The OIE is designed to deploy a capping stack on a blowing well where vertical access is not possible. It is essentially a mobile subsea crane which is used to perform debris clearance and then pick up a capping stack from a subsea parking stand and deploy it, though the discharge plume and on to a blowing well.	No

	INPEX do not believe that the proactive gaining of access to this equipment for the planned operations in WA-50-L is in line with ALARP principles for the following reasons: • Mobilisation: the equipment is stored in Trieste, Italy and is believed to include nearly 170 packages with a shipping weight of 300 t. The carrier itself is 14 m x 13 m x 10 m in dimension and as such, mobilisation can only be undertaken by sea, not by air. Further consideration has been made to assess the possibility of airfreighting the equipment. The equipment would require disassembly in order to be of an appropriate size to travel by aircraft. Disassembly of just the carrier is predicted to result in approximately 43 packages. These would then require to be transported in around 20 aircraft given the size of the packages. On this basis, the potential to airfreight the equipment in order to decrease the mobilisation time from Italy to Australia has been discounted given the time-saving gained by airfreighting is lost due to the additional time required for disassembly and reassembly. Whether by sea or air, the long mobilisation duration erodes the time saving realised by capping relative to a conventional relief well kill. • Deployment mass: the deployment mass is understood to be up to 300 t. This is roughly three times the mass of a 15,000 psi 18 ¾" BOP style capping stack. It is understood that a 400t crane is quoted as the minimum requirement for the installation vessel and it is stated that this is what was used during a field deployment trial. INPEX participated in an OIE workshop with other titleholders in May 2019, and at that time it was stated that the original equipment manufacturer of the OIE identified a minimum 600t crane vessel as being required. It was then noted from a marine advisor participating in the workshop that due to the overturning moment during the deployment of the OIE carrier, significant re-ballasting operations would be required, and this would likely necessitate a much larger vessel to maintain stability during the lift. The crane rating of such a vessel was stated at 900t. Nonetheless, despite the stated true minimum crane rating, it is noted that there are other minimum specifications, notably around the "active/passive anti roll system" and "ballasting capacity sufficient to minimise the installation and recover time of the OIS" which call for a specialised and likely large vessel. This vessel would be more specialised and larger, and thus less readily available than a vessel suitable for a standard capping stack deployment in the case of vertical access being possible. This greatly reduces the number of candidate vessels in the region, let alone those with current Australian Vessel safety cases. Less readily available means a longer response time and a further demonstration that OIE is not ALARP when compared to a relief well kill in the case were vertical access for capping is not possible. • Debris clearance capabilities: it is understood that that OIE can perform some debris clearance tasks, including lifting debris up to 160 t. While this may be sufficient to remove a LMRP from a BOP, it is unclear what capabilities exist for the clearance work prior to this operation including but not limited to the deployment of super shears to sever riser and the like, if required.	

	• Local fabrication: the OIE scope of supply excludes some significant equipment including but not limited to three gravity anchors and a subsea parking stand for the capping stack. It is understood that this fabrication would require up to 500t of steel and it is estimated that even a significant supply hub such as Darwin would struggle with the scale of this fabrication. This may drive the sourcing of this fabrication to a regional hub such as Singapore which could place this fabrication on the critical path and further erode the time saving realised by capping relative to a conventional relief well kill. • Exclusion zone: while theoretically vertical access is not required with OIE, access into 500 m is required for the initial deployment of the carrier and support operations with ROVs during capping operations. With unfavourable metocean conditions and a high energy blowout, even this may be difficult, particularly with at least 5 vessels being required (2 x anchor handers on either side of boil for initial deployment, 1 x survey, 1 x construction, 1 x air supply). Relief well planning performed for WA-50-L has spud locations 2,000 m away from the blowing well centre which is well beyond the downwind/down current extent of 10% LEL radius of 1,100 m. • Localised soil conditions: The unique carbonate shallow soils present in the Browse Basin have posed significant challenges to well structural design to date and it is understood they are out with the acceptable range verified by Saipem as part of the design validation for the OIE anchors. While this does not preclude the use of the OIE, a revised anchor design needs to be generated in order to achieve the required 50 t capacity of each of the three anchors if they are to be deployed in the Browse Basin. • Drag chain contact with seabed: For stability, the carrier requires a drag chain to be in contact with the seabed at all times. Ichthys drill centres are surrounded by a complex array of SPS infrastructure. The transit of the carrier, and its drag chain would need to be carefully evaluated, at the time of the blow-out, to determine if it was safe to attempt to run the drag chain through possible approach corridors without causing additional damage and possible gas/oil releases to the environment, through additional damage to existing subsea infrastructure. These corridors may be incompatible with the prevailing metocean conditions and the resulting surface boil location and geometry, thereby preventing the safe conduct of the activity. • Contractual arrangements: It is understood that OSRL have been unable to negotiate post event contractual terms with Saipem as the Original Equipment Manufacturer of the OIE. Existing contractual agreements only cover training and maintenance of the system however ultimately Saipem would need to operate the system. This is seen to be a significant issue as such contracts would need to be brokered during mobilisation.	

	The OIE is an extremely complex spread of equipment and as outlined above, comes with attendant risks, any of which if realised, may preclude its deployment. Fortunately, the system has not been used to respond to an actual source control event but that makes it, as yet, unproven. Comparing this with a well-established source control method of intersection with a relief well and dynamic well kill, it is seen that the proactive gaining of access to OIE is not ALARP for operations in WA-50-L or other near-by exploration drilling activities.	
Relief well	A relief well can be drilled to intercept the original wellbore close to the reservoir. Kill fluid is then pumped through the relief well into the original well-bore, to provide an overbalance pressure to the reservoir, and stop the flow of hydrocarbons from the well. To conduct the relief well, a MODU with support vessels is required. In addition, extra vessels with additional drilling fluid and pumping equipment may be required, for the well kill activity. Following the well kill, the MODU will use the relief well to isolate and abandon both wells. A detailed assessment of the logistical resources required to implement this response strategy are described in Table 4-4	Yes
Use of relief well injection spool	INPEX is aware of new technology developed by Trendsetter Engineering in the form of the Relief Well Injection Spool (RWIS). The RWIS is a spool piece with side outlets installed below the BOP of the relief well which facilitates the connection of more surface pumping resources. These additional resources can deliver greater kill fluid rates to the relief well. As all WA-50-L development wells can be killed with a single relief well using mud pumping resources available on standard MODUs, the use of the relief well injection spool would not be required.	No
Subsea dispersant injection	SSDI involves the use of an ROV, to inject dispersant directly into the hydrocarbon stream flowing from the damaged well. The outcome of SSDI is a significant increase of entrainment of oil in the water column. By increasing the proportion of hydrocarbons becoming entrained, there will be a reduction in hydrocarbons arriving on the ocean surface, and an associated reduction in hydrocarbons evaporating into the atmosphere. Modelling results (RPS 2019) indicates that under a worst-case blowout scenario, VOC concentrations (from oil evaporating into the atmosphere) are likely to exceed safe exposure thresholds within 1 km of the release location. The workforce onboard vessels conducting source control activities such as BOP intervention, debris clearance and capping stack installation could therefore be exposed to VOCs, and if gas monitoring indicated exposure had exceeded the VOC thresholds, the vessel would be required to cease the activity move out of the area. In effect, VOC exposure may impact the feasibility of debris clearance/capping stack installation and ultimately limit available source control options to drilling a relief well.	Yes

	Modelling results (RPS 2019) also concluded that SSDI would eliminate the risk of VOCs exceeding exposure thresholds. Therefore, the use of SSDI to significantly reduce the VOC risk to source control vessels/workers may contribute to the feasibility of capping stack, instead of a well kill via relief well, which would take several more months to achieve. A detailed assessment of the logistical resources required to implement this response strategy are described in Table 4-4.	

Table 4-4: Source control arrangements and capability evaluation

Source control element	Can a greater response effort be implemented?	Can the time to respond be improved?	Justification for increased response effort/reduced response time
A vessel with an observation or work-class ROV is required to undertake the site survey and record / report visual observations of the well location and surrounding area and will be in Broome within 7 days. The location and availability of support vessels with ROVs will be tracked on a register which is updated on a monthly basis.	Only a single vessel with a single ROV is required for site survey activities. Additional vessels and/or ROV's will not result in any better information being provided to the source control team, to facilitate ongoing source control planning. Therefore, a single vessel and ROV is appropriate.	A support vessel with ROV would be identified from within Australia and would be expected to arrive and commence mobilisation activities in Broome, within 7 days. INPEX's drilling support vessels and Ichthys Field support vessels are not required to be equipped with ROVs. The cost of maintaining a vessel with full ROV spread and ROV crew at all times on a support vessel is estimated to be ~$65,000 a day and not considered ALARP given the cost and many vessels with ROVs can be made available on short notice within the region. Typically, several support vessels with ROVs are located in the NW region, with additional vessels around Australia / SE Asian region capable of completing the site survey. To track and identify capable support vessels and ROVs, the most practicable option is to maintain an up to date register of suitable available support vessels.	No additional site survey response capability required.
A Construction Support Vessel (CSV) with lifting equipment of 150t lifting capacity and work-class ROVs will be utilised, if required, for debris clearance and will be in WA-50-L within 17 days.	Only a single CSV equipped with work class ROVs and lifting equipment rated for 150t is required for debris clearance.	A CSV with lifting equipment rated for approximately 150t with a work-class ROV would be identified and contracted from within Australia or the SE Asian region within 10 days and would arrive in the licence area within 17 days.	No additional debris clearance vessel response capability required.

Source control element	Can a greater response effort be implemented?	Can the time to respond be improved?	Justification for increased response effort/reduced response time
The location and availability of a CSV with suitable lifting equipment and work-class ROVs will be tracked on a register which is updated on a monthly basis. The status of vessel safety cases will also be maintained on the register.		A vessel with a reduced lifting capacity may be used for debris clearance if available and post debris clearance planning using the information presented by the site survey team. Identification and contracting/mobilisation will typically commence when initial source control planning begins. Response time could be improved by maintaining a CSV on stand-by. However, until site survey activities have been conducted and results evaluated by the source control team, it is unknown if debris clearance is even required. Therefore, the large costs of maintaining a CSV on stand-by (~$225,000 per day) are not considered ALARP, especially given CSVs with ROVs can be made available within the region. To ensure the availability, the most practicable option is to maintain an up to date register of suitable, available vessels and their safety case status.	
Debris clearance ROV tooling is required for debris clearance activities. The AMOSC subsea first response tool-kit (SFRT), is located in Perth and will be in Broome within 3 days. Wild Well Control Inc (WWCI) debris clearance equipment is available in	Debris clearance equipment such as drill pipe and riser cutting shears are specifically designed tools for specific tasks, which typically only need to be utilised once during the debris clearance activity. Primary and redundancy equipment is available through the AMOSC and WWCI contracts. There is no benefit to increasing the quantities or capabilities of debris clearance equipment.	Debris clearance equipment will be mobilised when the initial source control planning begins. The AMOSC SFRT can be mobilised, by road to Broome, within 3 days. The WWCI debris clearance equipment can be mobilised by air to Broome within 5 days.	No additional debris clearance tooling capability required.

Source control element	Can a greater response effort be implemented?	Can the time to respond be improved?	Justification for increased response effort/reduced response time
Singapore, with back-up equipment based in the United Kingdom. Primary equipment will be in Broome within 5 days.		The debris clearance tooling will likely arrive in Broome before the debris clearance vessel, and whilst site survey and initial source control planning is still occurring. If the debris clearance vessel is mobilising directly to the licence area, a small charter vessel can rapidly mobilise the debris clearance tooling from Broome to WA-50-L. Therefore, maintaining additional debris clearance equipment in Broome is not considered ALARP.	
Support vessel with work-class ROVs and BOP intervention tooling (hot stabs) are required for the BOP intervention activity. The location and availability of support vessels with work-class ROVs will be tracked on a register which is updated on a monthly basis and a support vessel with work-class ROVs and BOP intervention tooling will be in Broome within 10 days.	Only a single vessel equipped with a work-class ROV is required for BOP intervention. BOP intervention uses standard hot-stabs, routinely used on offshore facilities. This type of tooling is readily available and will be mobilised with the BOP intervention vessel and ROV spread. There is only a single BOP during well drilling, therefore additional vessels and ROVs will provide no benefit to the BOP intervention activity.	A support vessel with work-class ROV will mobilise from within Australia and commence mobilisation activities in Broome (including gas detection system), within 10 days. Depending on the outcome of site survey activities, debris clearance may be required prior to attempting BOP intervention. However, under some circumstances, BOP intervention could occur without debris clearance. Therefore, mobilisation within 10 days is appropriate. If the site survey vessel is using a work-class ROV instead of an observation class ROV, the site survey vessel with work-class ROV would be capable of attempting BOP intervention, eliminating the requirement to mobilise a second vessel. INPEX's drilling support vessels and Ichthys Field support vessels are not required to be equipped with ROVs.	No additional BOP intervention tooling response capability required.

Source control element	Can a greater response effort be implemented?	Can the time to respond be improved?	Justification for increased response effort/reduced response time
		The cost of maintaining a vessel with a work class ROV and ROV crew at all times is estimated to be ~$65,000 a day and is not considered ALARP (given the cost and the availability of vessels with ROVs can be made available on short notice within the region). Typically, several support vessels with work-class ROVs are located in the NW region, with additional vessels around Australia / SE Asian region with the capability of completing a BOP intervention. To ensure the availability, the most practicable option is to maintain an up to date register of suitable, available support vessels.	
Capping stack – primary located in Singapore and secondary in the United Kingdom will be mobilised from Singapore and be available in WA-50-L within 22 days.	INPEX are a member of a capping stack consortium and have access to a primary 15,000 psi, 18 ¾" capping stack in Singapore and the equivalent as secondary in Aberdeen. INPEX and WWCI have reviewed the capping stack interface with the selected BOP, and have identified the required connections and its availability, and that anticipated pressures are within the operating parameters of the capping stack. INPEX are also conducting a landing study, to plan how to safely lower and latch the capping stack onto the BOP. As there is only a single BOP, only a single capping stack is required.	A breakdown of the individual steps and durations for capping stack mobilisation (22 days) are provided in Table 4-2 and Table 4-4. An operational assessment and deployment planning study conducted by WWCI, determined a one (1) day difference between air and sea freight logistics options (longer by air). In addition, various uncertainties and risks to schedule were identified with the air freight option including handling restrictions at airports and wharfs. Another significant concern for stack up and testing of the capping stack in Australia is the reduced presence of original equipment manufacturer (OEM) and access to parts.	No additional capping stack response capability required.

Source control element	Can a greater response effort be implemented?	Can the time to respond be improved?	Justification for increased response effort/reduced response time
	As INPEX have access to primary and back-up capping stacks, sufficient redundancy is available, should any issues arise during stack up, testing, mobilisation, deployment and activation of the primary capping stack.	As a result, the capping stack will be stacked up and tested in Singapore due to the established infrastructure and Subject Matter Experts (SMEs) based in Singapore. WWCI conduct an annual stack up of the capping stack capturing lessons learned to improve the preparation time for mobilisation to field.	
A HLV with a work class ROV and minimum lifting capacity of 120t would be mobilised to Singapore, to receive the capping stack and ancillary equipment, then deploy to the licence area. The HLV will be used to land the capping stack on the blowing well and be in WA-50-L within 22 days. INPEX will maintain a register, updated on a monthly basis, of the location and availability of all HLVs in the SE Asian region. The register will maintain status of safety cases.	As there is only a single BOP and single capping stack, only a single HLV is required.	A breakdown of the individual steps and durations for capping stack mobilisation (22 days) including sourcing of an appropriate HLV vessel are provided in Table 4-4 Identification and contracting/mobilisation and planning will commence when initial source control planning begins. Response time could be improved by maintaining a HLV on stand-by. However, until site survey and other activities have been conducted and results evaluated by the source control team, it is unknown if capping stack deployment will be possible. Therefore, the large costs of maintaining a HLV on stand-by (~$225,000 per day) are not considered ALARP, especially given HLVs with ROVs can be made available within the region. To ensure the availability, the most practicable option is to maintain an up to date register of suitable, available HLVs and their safety case status.	No additional HLV response capability required.
A single MODU would be required to drill a relief well in an absolute worst-case scenario.	Approximate relief well locations have been identified around each drill centre in the WA-50-L licence area.	The time to contain the well has been conservatively assessed as 80 days (Brewster) and 108 days (Plover) based on an absolute worst-case discharge.	No additional relief well response capability required.

Source control element	Can a greater response effort be implemented?	Can the time to respond be improved?	Justification for increased response effort/reduced response time
INPEX will maintain a register, updated on a monthly basis, of the location and availability of all MODUs internationally. The register will maintain status of safety cases. The register will include: • name, contractor, stacking status (cold/warm/on contract/yard) • operator (if on contract) • type • water depth capability • BOP pressure rating and # ram cavities • maximum personnel on board • mud pump, crane, helideck, variable deck load and top drive specifications • base oil, bulk and liquid mud storage capacities • vessel safety case status and jurisdiction.	Metocean and seasonal environmental conditions will be considered in final relief well location selection. Preliminary designs have been completed for optimal interception of a blowing well and completing a dynamic kill for the worst-case scenario.	The relief well design and plan will be optimized to intersect the blowing well and to complete a dynamic kill. The relief well cannot be drilled to a shallower depth (less drilling time), and intercept the original well at a shallower depth, as there would not be sufficient hydrostatic head pressure and drilling fluid weight in a shallower relief well to successfully kill the original well. Should the original MODU still be functional (however without BOP), a study would be conducted, and if practicable to implement, to have the MODU pre-drill the top-hole section of the relief well, prior to the arrival of the relief well drilling rig. INPEX has signed the APPEA MoU for mutual assistance between Titleholders. This MoU requires Titleholders to make 'best endeavours' to release and transfer drilling units and well-site services between operators in a source control event.	

Source control element	Can a greater response effort be implemented?	Can the time to respond be improved?	Justification for increased response effort/reduced response time
INPEX will also maintain its subscription to the APPEA MoU.			
Relief well long-lead items (LLIs) and equipment has been identified, e.g. casing and well-head. INPEX drilling logistics team maintain a register of all drilling equipment to ensure relief well stocks are available.	The required consumables are available and tracked, as part of routine Ichthys development drilling. Specifically, spares maintained include: • wellhead system • conductor • surface casing • intermediate casing • relief well conduit Miscellaneous equipment such as crossovers can be manufactured locally within Australia in relatively short timeframes. This would be undertaken using pre-existing arrangements that INPEX has in place for the manufacture of such consumables.	The response time to access the relief well equipment (including miscellaneous equipment items such as crossovers etc that may be required and can be fabricated locally), will not be a critical path activity during the relief well drilling, as a standard logistics supply chain for INPEX development drilling activities, involving the Drilling Supply Base in Broome (and back-up base in Darwin) and standard supply vessels, will continue to be utilised.	No additional relief well long lead equipment capability required.
A single SSDI spread would be required to implement SSDI. This equipment includes the dispersant stockpile and injection wands.	There is no requirement for additional/duplicate SSDI spreads. A single SSDI spread will be able to successfully inject dispersant into the well stream at the optimal ratio of approximately 100:1, which has been demonstrated to reduce VOC concentrations below safe levels (RPS 2019).	SSDI will only be activated when modelled and/or field measurements predict that VOC concentrations are likely to be exceeded during other source control activities such as BOP intervention, debris clearance or capping stack deployment and installation.	No additional SSDI capability required.

Source control element	Can a greater response effort be implemented?	Can the time to respond be improved?	Justification for increased response effort/reduced response time
(Note – support vessels with work-class ROVs for SSDI are the same types of vessels as those required for BOP intervention).	Injecting additional dispersant into the well-stream will not result in any greater/beneficial reduction in VOC concentrations in the atmosphere. Based on a worst-case oil release rate of 20,000 bbl/day (3193 m3/day), at 100:1 treatment ratio, the dispersant requirement is 32 m3/day. For a worst case (complex) activity, 30 days of SSDI could be required. Therefore, a worst-case total of ~1000 m3 dispersant could be required. SSDI would generally not be required to commence mobilisation onto a vessel in Broome until approximately day 10 of a response (aligning with BOP intervention/debris clearance mobilisation activities). The SSDI spread maintained by AMOSC in WA includes 500 m3 of Slick-Gone-NS dispersant and can be mobilised to Broome within 10 days. Therefore, 50% of the total worst-case dispersant requirement for a worst credible SSDI response can be mobilised outside of critical path timeframes.	The SFRT/SSDI spread is located in Western Australia and maintained by AMOSC. This equipment is rapidly able to be mobilised to Broome, the SFRT / SSDI spread is not anticipated to be on the critical path. As such, response time for SSDI spread readiness/mobilisation is determined to be appropriate/ALARP.	

Source control element	Can a greater response effort be implemented?	Can the time to respond be improved?	Justification for increased response effort/reduced response time
	Additional Australian and global dispersant stockpiles can be mobilised, should it be estimated that the AMOSC 500 m3 will be used up. Additional dispersant would not be required until a minimum of ~day 25 of the response, and therefore any additional dispersant stocks could be easily mobilised by vessel or aircraft to Broome within the required timeframe. INPEX maintains access to the global dispersant stockpile through INPEX Corporations membership with OSRL. Therefore, INPEX has access to sufficient dispersant for a worst case (30 day) SSDI activity.		

Table 4-5: Environmental performance outcomes, standards and measurement criteria for source control preparedness arrangements

Environmental Performance Outcome	Environmental Performance Standard	Measurement Criteria
INPEX will be prepared and ready to respond to source control events.	INPEX will maintain registers as described in Table 4-4 updated on a monthly basis, of the location and availability of support vessels, CSVs, HLVs and MODUs, including their capabilities (ROVs/crane capacity etc) and safety case status and jurisdiction.	Vessel and MODU registers.
	INPEX will maintain a register of relief well long lead items.	Relief well long lead items register.
	INPEX will maintain contracts for suitable debris clearance equipment. Debris clearance equipment will be able to be mobilised to Broome within 5 days.	Records of contracts for debris clearance equipment.
	INPEX will maintain a contract for a SSDI spread, which can be mobilised to Broome within 10 days. The SSDI spread will contain a minimum of 500 m^3 of dispersant.	Records of contract for SSDI spread.
	INPEX will maintain its OSRL membership, to ensure access to the global dispersant stockpile.	Records of INPEX OSRL membership.
	INPEX will maintain contracts for suitable capping stack equipment. The capping stack equipment will be: • identified as fit for purpose, capable of being lowered and latched onto the selected BOP, utilising a single HLV • rated to achieve a well-kill, based on the expected pressures of the reservoir • primary stack available to be mobilised onto a HLV within 5 days • primary and secondary capping stack maintained in a suitable state of readiness.	Records of contracts for capping stack equipment.

	INPEX will continue to subscribe to the APPEA MoU.	Record of APPEA MoU.
	INPEX will participate in the DISC steering committee for the development and submission of a SC template for a generic vessel including the activity of deploying a capping stack from this vessel.	Meeting minutes and records of attendance.
	Source control team will maintain preparedness through training and exercises to validate source control logistical arrangements and ensure the source control team: • understand the source control planning documents/procedures • understand their defined roles and responsibilities • validate communications with external source control service providers.	Records of training and exercises for the source control team.
	INPEX will maintain a contract with WWCI, for the provision of personnel to: • provide technical expertise to the INPEX source control team • provide in-field supervision of source control activities.	WWCI contract.
	Prior to spudding; source control documentation will be approved and in place in accordance with the WOMP, including: • Drilling Browse Basin Emergency Response Plan • Source Control Emergency Response Plan • Blowout Contingency Plan – Browse Basin Wells • Well Control Modelling Service Report • Capping Stack Deployment and Installation Procedure.	Records confirm source control planning documentation was approved prior to spudding.

INPEX will re-gain control of a well within 80 days (Brewster)/108 days (Plover) of any source control event, through implementation of the environmental performance standards.	In the event of a loss of well control, conduct a site survey of well-head infrastructure, to inform source control planning activities. A vessel to undertake the site survey will be mobilised to Broome within 7 days.	Records of site survey.
	In the event conditions allow for the safe deployment and installation of the capping stack, INPEX will mobilise, deploy and install the capping stack in accordance with response time model detailed in Table 4-2: Time to contain well – deployment of capping stack (vessel freight option)	Records of capping stack feasibility report. Daily drilling report.
	INPEX will mobilise relief well MODU and drill, intercept and regain control of the well, in accordance with the time frames detailed in Table 4-1: Summary of time response model for Brewster and Plover reservoirs.	Daily drilling report.
	The source control team will utilise the source control planning documentation to develop and implement a source control plan. The source control plan will: • evaluate, define and schedule source control activities • utilise the asset registers to identify and safely mobilise suitable assets within the minimum timeframe possible • evaluate the potential to use the site survey vessel/ROV for BOP Intervention • evaluate the potential to use the original MODU to drill top-hole sections for any relief wells.	Source control plan documentation.
	The source control team will develop a SIMOPs plan, to support the source control plan. The SIMOPs plan will specify:	Records confirm SIMOPs plan developed and implemented.

	• licence area entry requirements, including DP checks • exclusion zones • minimum vessel separations • communications requirements and frequencies SIMOPs planning meetings.	
No incidents of loss of hydrocarbons to the marine environment as a result of a vessel collision during source control activities.	If debris clearance and wet-storage is required, the source control team will use existing site survey data to identify temporary wet storage areas which are not sensitive benthic habitats.	Records confirm any identified wet-storage areas do not contain sensitive benthic habitats.
Impacts to the shallow water column through use of SSDI will be reduced to ALARP through the implementation of the Environmental Performance Standard.	SSDI will only be activated when: • Air quality monitoring and/or modelling determines there is a credible risk of atmospheric VOC concentrations exceeding safe exposure thresholds for source control activities; and • There is a requirement to conduct source control activities in the zone where atmospheric VOCs may present a hazard to the safety of workers, and • Air quality monitoring and/or modelling of gas levels and lower explosive limits determines source control activities including SSDI could be safety conducted.	Records of: • Air quality monitoring and/or modelling demonstrating a credible risk of atmospheric VOC concentrations exceeding safe exposure thresholds for source control activities • SSDI injection occurring concurrently with source control activities.
	SSDI injection concentration will initially be set at 100:1 (based on best estimate of well flow-rate at the time of the blow-out). Effectiveness of SSDI will be monitored through ongoing measurement of VOC concentrations on the surface, by source control vessels. If VOC exposure thresholds are exceeded, SSDI ratio will be incrementally increased, until VOC concentrations are below safe exposure thresholds.	Records of SSDI injection ratio Records of atmospheric VOC concentration monitoring during source control activities.

5 IMPLEMENTATION

An implementation strategy is described within all INPEX EPs. The implementation strategy addresses the following:

- overview of the INPEX Business Management System, including HSE management systems/processes
- leadership and commitment including Environment Policy
- capability and competency including the organisational team and responsibilities associated with the implementation of the EP
- documentation, information and data management related to the EP
- risk management process used within the EP
- operate and maintain; specific processes/systems required for EP implementation
- management of change, including the specific change management process for the EP
- stakeholder engagement, including processes for ongoing engagement and consultation with stakeholders potentially affected by the EP
- contractors and suppliers, including selection and management processes
- security and emergency management
- incident investigation and lessons learned, which also includes monthly and annual performance reporting.
- monitor, review and audit; defining the processes to ensure ongoing compliance and continual improvement of the EP
- management review, including senior management review of the EP.

Within the implementation strategy of each EP, only some elements are relevant to this document. The following are considered necessary to include as stand-alone processes within this document:

- source control arrangements testing
- review of source control arrangements process
- management of change process
- annual performance reporting requirements
- management review process.

The details of these are provided in the following sections.

5.1 Source control arrangements testing

Environmental performance outcomes, standards and measurement criteria relating to testing of source control arrangements associated with INPEX exploration and production wells in the Browse Basin are presented in Table 5-1.

Table 5-1: Environmental performance outcome, standards and measurement criteria for testing response arrangements

Environmental performance outcome	Performance standards	Measurement criteria
INPEX will be prepared and ready to respond to source control events.	INPEX IMT and drilling source control team will conduct a well blow-out exercise in the Browse Basin biennially. The objectives of this exercise will include as a minimum: practice the interface between the source control team and IMT • source control team verification of availability of rigs, vessels and equipment • source control team verification of logistics plan • to verify source control response timelines as specified in Table 4-4.	Exercise records demonstrate that a Browse Basin well-kill exercise has been conducted biennially.
	INPEX source control team will conduct an annual source control logistics desktop validation exercise. The objectives of this exercise will include: • source control team verification of availability of rigs, vessels and other required source control equipment, specified in Table 4-4. • source control team verification of a logistics plan which meets the source control response timelines specified in Table 4-4.	Exercise reports demonstrate objectives have been tested annually.

5.2 Review of source control arrangements and risk assessment

An environmental risk register for each EP is maintained and will be reviewed and updated quarterly. The quarterly environmental risk review process will be implemented to assess internal and external changes that may affect the performance outcome and standards as associated with the activity. Changes could include availability of source control response MODUs/vessels or other source control relevant information.

This document will be reviewed following any events requiring its activation, in order to identify any lessons learned, or other relevant triggers for review.

Environmental performance outcomes, standards and measurement criteria relating to source control capability and arrangements reviews and updates to this document are presented in Table 5-2.

Table 5-2: Environmental performance outcome, standards and measurement criteria for updating this source control document

Environmental performance outcome	Performance standards	Measurement criteria
INPEX will be prepared and ready to respond to source control events.	This document will be reviewed and updated if necessary, following any INPEX source control team exercise or incident in which any source control capability used/activated.	Records demonstrate a review and update (if necessary) of this document.
	If new source control related information, which could affect source control capability and arrangements (such as MODU/vessel availability issues) is identified through the quarterly risk review process, the information will be assessed using New Information Risk Assessments and/or the Management of Change process. Depending on the outcome of the risk assessment and/or change assessment, this document will be updated as necessary.	Records demonstrate quarterly risk reviews consider source control risk elements.
	This document will be reviewed and updated if necessary, based on findings from the annual management review and annual performance report.	Records demonstrate a review and update (if necessary) of this document.

5.3 Management of Change

Changes to INPEX documents are managed in accordance with a business-wide standard, and related procedures and guidelines. Where a change to management of an activity is proposed, it will be logged. Internal notification will be communicated via a management of change (MoC) request. The request will identify the proposed change(s) along with the underlying reasons and highlight potential areas of risk or impact. In accordance with the INPEX business rules, it is mandatory to undertake an environmental risk assessment in every case for changes that could affect the environment, including source control risks and response arrangements.

The MoC request will be managed by an environmental adviser who will then determine the necessary approval/endorsement pathway, in consultation with the environmental approvals coordinator. Minor changes (such as updating a document or process) that do not invoke a revision trigger are made in document reviews from time to time.

In accordance with Regulation 17 of the OPGGS (E) Regulations 2009, a revision of an EP will be submitted to NOPSEMA where:

- a change is considered to represent a new activity
- a change is considered to represent a significant modification to, or a new stage of, an existing activity
- a change will create a significant new environmental impact or risk
- a change will result in a series of new (or increased) environmental impacts or risks that, together, will result in a significant new environmental impact or risk, or a significant increase in an existing environmental impact or risk.

The MoC request process will be periodically checked against NOPSEMA guidance to ensure ongoing compliance and will be undertaken as part of the management review process described in Section 5.5.

As this documents is an integrated element EPs associated with exploration and production wells, the MoC process is also applicable to this documents. Therefore, where an MoC is required for changes to this document, the INPEX EP MoC template will be used to formally record/document the change.

When a new or revised EP is required to be re-submitted to NOPSEMA, and the new or revised EP also requires/results in changes to this document, the updated version of this document will be submitted, with the new/revised EP, to NOPSEMA.

5.4 Annual performance reporting

In accordance with Regulation 14(2) of the OPGGS (E) Regulations 2009, INPEX will undertake a review of its compliance with the environmental performance outcomes and standards set out in this document and will provide a written report of its findings to NOPSEMA on an annual basis.

The annual reporting period for this document will be from the 01 January to 31 December of each calendar year. The submission date for the environmental performance report will be 01 April each calendar year.

Any findings from the Annual Performance Report will be included on an INPEX action tracking register.

5.5 Management review

Management reviews of this document shall assess whether:

- control measures detailed in this document are effective in maintaining source control preparedness and response capability to an ALARP and acceptable level
- implementation of the MoC process has been applied consistently and appropriately, ensuring source control preparedness and response capability and arrangements remain ALARP and at acceptable levels, commensurate with INPEX's activities and source control risks
- any changes in legislation, NOPSEMA guidance or other matters relating to source control preparedness and response have been taken into consideration in relation to this document.

Where the documented findings of the management reviews have implications for this document, it will be updated in accordance with Table 5-2Table 5-2.

6 REFERENCES

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Document Endorsement and Approvals

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Name	Title

Electronic Endorsement and Approval

Electronic approval of this document complies with the issued INPEX Electronic Approval Standard (0000-A9-STD-60011) and records evidence that the applicable person has either endorsed and/or approved the content contained within this document. The reviewers of this document are recorded in the CDS.

Name	Title	Date and Time	Action
Roy Quaden	Well Integrity and Assura	31/01/22 11:21	Endorser
Simon Zoller	General Manager Drilling	31/01/22 12:38	Approver