Amendment Report

Department initiated Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L9102/2017/1
Licence Holder	Chevron Australia Pty Ltd
ACN	086 197 757
File Number	DER2017/001839
Premises	Gorgon LNG Project Part of Crown Lease L077431, Certificate of Title Volume LR3168 Folio 315, Site 1 on Deposited Plan 409277; Part of Crown Lease L077428, Certificate of Title LR3158 Folio476, Site 5 on Deposited Plan 64220; Temporary Wastewater Injection Facilities Licence LIC00554/2009_1_43; Part of Revised Service Corridor Easement L641372, Certificate of Title Volume LR3142 Folio 58, Deposited Plan 91514; Part of Construction & Operations Support Infrastructure Licence 00058/2014_A4735851; Permanent Water Disposal Wells Licence L00016_2012/1_A1991085; Part of Road Infrastructure Licence Lic 00565/2009_1_31; CO2 Injection System Pipeline Easement L819294; Part of CO2 Injection Wells System Licence LIC_00564_2009_A1744377; and Support Infrastructure Licence (Old Airport East) 00333-2016_A6042022 BARROW ISLAND WA 6712 As defined by the premises boundary map in Schedule 1 and coordinates in DWER document: DWERDT940930
Date of Report	24 February 2025
Decision	Revised licence granted

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1. Decision summary

Licence L9102/2017/1 is held by Chevron Australia Pty Ltd (Chevron, licence holder) for the Gorgon LNG Project (the premises), located on Barrow Island.

This Amendment Report documents the delegated officer's assessment of risks to the environment and public health arising from the identification/presence of per- and poly-fluoroalkyl substances (PFAS) on Barrow Island within the prescribed premises boundary for L9102/2017/1. As a result of this assessment, revised licence L9102/2017/1 has been granted.

Previous decision and amendment reports for the licence will remain on the department's website for future reference and will act as a record of the department's decision making.

2. Purpose and scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the Department of Water and Environmental Regulation (DWER, department) has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at DWER Regulatory documents | Western Australian Government (www.wa.gov.au).

2.2 Amendment summary

The department has initiated an amendment to licence L9102/2017/1 to impose conditions to regulate the management of PFAS impacted soils and waters (groundwater, stormwater and wastewaters) at the premises. This amendment was initiated following notification by Chevron of the detection of low levels of PFAS within existing stockpiles of soil/fill material within the Gas Treatment Plant (GTP), groundwater and stormwater within and adjacent to the premises.

The existing licence has no management measures related to management of PFAS containing soils, leachate or potentially contaminated stormwater hence the department is initiating this amendment to assess the risks associated with PFAS detected within and surrounding the premises. The presence of PFAS creates additional source – pathway receptor linkages that have not previously been assessed under the Part V process.

Given the relevance the detection of PFAS has to the operational licence, the department is amending the licence to include controls related to PFAS effective immediately. This is aimed to ensure the prompt and effective implementation of management practices and investigations to mitigate the risk of impacts to receptors within the Barrow Island Class A Nature reserve.

2.2.1 Background

In 2010, Chevron created a single construction fill stockpile in Area 18 of the Gorgon Gas Development footprint, initially comprising material sourced during civil work associated with the construction of Gorgon. The stockpile was processed (crushed and blended) for structural fill and continued to be used as the main area for storing material reclaimed from other Gorgon civil activities. Material from around Barrow Island inclusive of outside the current premises boundary has since been added to the stockpile, including additional blending and grading for reuse. This largely occurred during the development stage of the project between 2013 and 2017. In 2016, the stockpile was relocated west of the Gorgon footprint to its current location in Area 19/20/20B (Chevron, 2023) as seen in Figure 6 of the licence.

In 2021, Chevron began a limited testing program of the material to support works associated with the Jansz-lo Compression project. The results of this testing identified low levels of PFAS in soil samples. Further sampling was conducted in 2022 to better understand the extent of potential impacts. The stockpiled material continued to be used as fill throughout these investigations to complete critical works at seven locations on Barrow Island. The stockpile was surveyed in 2022 with the surveyed volume being approximately 242,713 m^3 (Enpoint, 2023). One hundred soil samples were taken from 50 locations across the stockpile area, with both soil and soil-leachate being tested for the standard suite of PFAS compounds (n=28).

PFAS compounds were found in 15% of soil samples, all concentrations were below the human health investigation levels (HILs) for public open space and ecological guideline levels (EGVs) as per the PFAS National Environmental Management Plan (NEMP). Heads of EPAs Australia and New Zealand (HEPA 2022) does however acknowledge, that the indirect ecological guideline values may not be sufficiently protective of endangered, threatened or vulnerable reptiles and high ecological value sites from bioaccumulation risks. All soil leachate samples detected PFOS levels above the 99% species protection of marine/freshwater ecosystems (applicable to high conservation status ecosystems) and there were no exceedances of the PFOA EGV. Guideline values from the NEMP are detailed in Table 1 below.

Table 1: Ecological guideline values for soil, freshwater and interim marine (HEPA, 2020).

Exposure scenario	PFOS	PFOA
Ecological direct exposure for soil (All land uses)	1mg/kg	10mg/kg
Ecological indirect exposure for soil (All land uses)	0.01mg/kg	-
Ecological water quality for freshwater and interim marine 99% species protection - high conservation value systems	0.00023 µg/L[1]	19 µg/L
95% species protection - slightly to moderately disturbed systems	0.13 µg/L	220 µg/L

Note 1: The guideline value is nearly equal to the limit of reporting currently offered by commercial laboratories being 0.0002 µg/L

2.3 Legislative Context

2.3.1 Part V of the EP Act

The department was made aware of the presence of PFAS within the premises and near authorised discharge point L1 in June 2020 via notification from Chevron as per Section 72 (s72) of the EP Act. Chevron submitted an additional s72 notification in March 2022 reporting further detections of PFAS in groundwater bores within the GTP. Discharge point L1 serves as the authorised discharge point for wastewater within the stormwater holding pond (SWHP) (when specified water discharge quality limits are met). The s72 notifications relate to two incidents where water mixed with PFAS containing firefighting foam entered the potentially contaminated (Class 2) and uncontaminated (Class 3) stormwater drainage systems and was subsequently discharged into the environment.

Hydrostatic testing completed as part of Chevron's investigations into the presence of PFAS in groundwater identified that there was a likely leak in the shared lower liner for the SWHP and Oily Water Sump (OWS). Chevron subsequently initiated maintenance works on the OWS concrete structure (crack repairs and sealing at repair locations) and replaced the single upper liner with two 2mm HDPE liners with permeability of less than $1x10^{-9}$m/s. Chevron also installed an additional leak detection system with a low point sump and recovery system linked to an alarm at the process control system (PCS). Chevron has communicated to the department that similar maintenance works are scheduled for the SWHP in 2024, with expected completion to be in Q4 of 2024 (CAPL, 2024a).

More recently, Chevron submitted a s72 notification in June 2024 advising the department of the detection of low levels of PFAS and mercury within the Class 3 stormwater drains (designed for uncontaminated stormwater) that discharge to the terrestrial environment via stormwater ditches at the perimeter of the GTP. Seven autosamplers were installed in the Class 3 stormwater drains in late 2023/early 2024. The first rainfall event following the installation of approximately 7mm on 10 April 2024 triggered collection of samples from six of the seven autosamplers that were installed. Analytical results detected PFAS within all samples with PFOS concentrations ranging from 0.0030 to 0.0098 µg/L, all exceeding the 99% species protection of marine/freshwater ecosystems (applicable to high conservation status ecosystems). The sum of all PFAS analysed (n=29) ranged from 0.0389 µg/L to 0.169 µg/L. Mercury was also detected at three locations with levels ranging from 0.00004 mg/L to 0.00028 mg/L (CAPL, 2024b). Chevron has advised that additional investigations and monitoring is being conducted to identify potential sources of the contamination and assess any resulting environmental impacts. This includes inspection of the affected drains and removal of any sediments that could pose an environmental risk as part of their remedial actions. The department is currently reviewing the information provided and considers that the Area 20B PFAS containing soil stockpile within the GTP is one likely source of PFAS detection within the Class 3 drainage system.

2.3.2 Part IV of the EP Act

Ministerial Approval for the revised and expanded Gorgon Gas Development was granted on 10 August 2009 subject to conditions outlined in Ministerial Statement 800 (MS 800). MS 800 superseded Ministerial Statement 748 (MS 748) for the initial proposal, providing approval for both the initial, and the revised and expanded Gorgon Gas Development. The approval authorises the construction and operation of three 5 mtpa LNG processing trains, associated infrastructure and a CO_2 injection system to inject reservoir CO_2 into the Dupuy Formation on Barrow Island. Since the revised and expanded Gorgon Gas Development was approved, further minor changes have also been made and/or approved and updates to MS 800 made as necessary. This includes updates to MS 800 via MS 1002 which approve a fourth LNG train and a new Onshore Feed Gas Pipeline System located within the existing Onshore Feed Gas Pipeline Systems Corridor.

MS 800 contains conditions that need to be considered in the assessment of emissions and discharges from the premises and the imposition of regulatory controls. Ministerial conditions relevant to the assessment of emissions and discharges and the imposition of regulatory controls associated with stormwater and runoff management and wastewater disposal are detailed in Table 2 below.

Table 2: Consideration of MS 800 conditions relevant to this amendment

Overview	Delegated Officer considerations
Condition 7 Requires the submission and implementation of a Terrestrial and Subterranean Environment Protection Plan (TSEPP). The objectives of the Plan are to:	The delegated officer has reviewed the TSEPP and noted that the plan sets out management measures to minimise environmental impacts including but not limited to solid and liquid waste management, surface water management, leak and spill

Overview	Delegated Officer considerations
i. To reduce the adverse impacts from the construction and operation of the terrestrial facilities as far as practicable; and ii. To ensure that construction and operation of the terrestrial facilities does not cause Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint, including below the surface of the land.	management, and light, noise and vibration management. The design and operation of the stormwater and runoff system is detailed in the plan which manages inflows from stormwater runoff, process water, and firewater. The drainage system segregates stormwater into four classes depending on level of contamination and its origin which informs treatment and disposal pathways. The plan also identifies that the management of solid and liquid waste (with the exception of stormwater) is covered by the Solid and Liquid Waste Management Plan. The Delegated Officer has considered this plan, in addition to the outcome of the risk assessment in determining regulatory controls relating to potential impacts to the terrestrial and subterranean environment.
<u>Condition 30</u> Requires the submission and implementation of a Solid and Liquid Waste Management Plan (SLWMP). The objectives of the Plan are to: i. ensure all proposal-related solid and liquid wastes are either removed from Barrow Island or, if not, that all practicable means are used to ensure that waste disposal does not cause Material or Serious Environmental Harm to Barrow Island and its surrounding waters'; ii. ensure discharges from any wastewater treatment plant, reverse osmosis plant, or other process water are disposed of via deep well injection, unless otherwise authorised by the Minister; and iii. ensure any deep well injection of Proposal related liquid wastes is conducted in a manner that will not cause Material or Serious Environmental Harm to subterranean fauna and their habitats on Barrow Island.	The delegated officer has reviewed the SLWMP and notes that the following management measures are relevant to the assessment of this amendment: • the plan references the Part V licence as a regulatory instrument for injection of liquid waste via deep well disposal. The operational licence L9107/2017/1 has conditions relating to minimising the risk of contaminated water impacting the freshwater aquifer. This includes a high-pressure alarm system for the PWD wells and pressure monitoring at the PWD and TWIP wells. The waste management measures detailed in the plan have been considered in the determination of the risk associated with waste management related to the application. Waste management measures specified in the plan will not be included on the licence to avoid duplication with MS 800.
<u>Condition 8</u> Requires the submission of a Terrestrial and Subterranean Environmental Monitoring Program (TSEMP). The objective of the Plan is to TSEMP is to: i. establish a statistically valid ecological monitoring program to detect any Material or Serious Environmental Harm to the ecological elements outside the Terrestrial Disturbance Footprint.	The delegated officer has reviewed the TSEMP and noted that the plan specifies biennial vegetation monitoring, annual fauna (mammals and land birds) and surface water landform monitoring and twice-yearly groundwater (superficial aquifer) monitoring requirements. The plan specifies the indicative groundwater monitoring locations are surrounding the GTP and deep well injection locations, parameters are unspecified within the plan although the plan states suites are based on risk assessment and include: • selected physical parameters; • selected metals; • selected nutrients; and/or

Overview	Delegated Officer considerations
	• selected contaminants of concern. MS 800 and the TSEMP is the primary instrument for regulating monitoring of the terrestrial and subterranean environment. The environmental monitoring requirements described in the TSEMP have been considered in the determination of risk associated with potential emissions and discharges associated with this amendment.

It is noted that the current approved TSEPP and SLWMP were endorsed before the detection of PFAS on the premises. The detection of PFAS represents a new environmental risk not previously considered therefore it is expected that Chevron will submit an updated TSEPP and SLWMP as required by Condition 36 of MS 800. Additionally, review and update of the Commonwealth TSEPP (2023) should be considered as it addresses the potential impacts of PFAS on EPBC listed matters.

2.3.3 Contaminated Sites Act 2003

In June 2022, the Gorgon GTP site, including the area of the construction fill stockpile, (and an associated buffer around the Gorgon GTP site) was reported under the *Contaminated Sites Act 2003* (CS Act) by Chevron as operator of the Gorgon Joint Venture using a Form 1 submission, as a potentially contaminated site resulting from substances (including PFAS) in soil, drainage and groundwater above background concentrations. The reported site is currently being assessed by the department's contaminated sites branch and is awaiting classification.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and pathways

The key PFAS emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 3 below.

Table 3: Identification of PFAS emissions, sources and potential pathways

Emission	Sources	Potential pathways
Leachate containing PFAS	Area 20B PFAS containing soil stockpile. PFAS containing soils within the premises (unknown areas) inclusive of soils underlying infrastructure Future use of potentially PFAS containing soils for construction works around the premises	Infiltration to soils and groundwater

Emission	Sources	Potential pathways
PFAS containing stormwater	Area 20B PFAS containing soil stockpile	Direct discharge to land and infiltration to groundwater or overland flow
	Leaks from stormwater containment infrastructure	Infiltration to soils and groundwater
	Discharge of PFAS containing stormwater from the SWHP to discharge point L1	Direct discharge to land and infiltration to groundwater or overland flow
PFAS containing wastewater	Disposal of PFAS containing water via deep well injection	Fracturing of the receiving formation and overlying confining unit or loss of well integrity causing discharge to the fresh-water aquifer
PFAS containing soils	Area 20B PFAS containing soil stockpile Potential PFAS containing soils within the premises (unknown areas) inclusive of soils underlying infrastructure	Air / windborne pathway Physical movement of soils

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the licence holder from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 4 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)).

Table 4: Sensitive environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
Managed Lands and Waters	The Gorgon Gas Project is located within the Barrow Island Nature Reserve (BINR), a Class A Nature Reserve. Marine waters surrounding the north, west and south sides of Barrow Island form part of the Barrow Island Marine Management Area (including the Bandicoot Bay Conservation Area ~13 km to the south of the GTP). An exclusion zone exists on the east side of the island adjacent to the GTP for the Barrow Island Port Area. The Barrow Island Marine Park is located on the west side of the island (~10 km from the GTP) and incorporates the Western Barrow Island Sanctuary Area.
Threatened Ecological Communities and Priority Ecological Communities	Priority Ecological Communities for Triodia angusta dominated creekline vegetation and Coastal dune native tussock grassland dominated by Whiteochloa airoides are located in smaller areas to the north, south and west of the premises.
Threatened / priority flora	Three species of priority flora are located on Barrow Island west of the premises.
Threatened / priority fauna	A considerable number of threatened and priority fauna are known to

Environmental receptors	Distance from prescribed activity
(terrestrial and marine)	occur on Barrow Island including a number species that are listed under the Biodiversity Conservation Act 2016 (WA) (BC Act) and the Threatened (Vulnerable) Species list of the EPBC Act. Some of these species are known to occur within or adjacent to the premises. Green and flatback turtles (both listed as vulnerable under the BC Act and EPBC Act) nest on Barrow Island. Flatback turtle rookies are recorded near the premises (300 m away).
Threatened / priority fauna (subterranean)	Barrow Island is recognized as being of high conservation significance for subterranean fauna communities at state, national and international levels. The subterranean fauna demonstrates high level of endemicity and species diversity and includes one of only two stygal vertebrate species occurring in Australia (Barrow Cave Gudgeon, *Mileringa justitia*, previously listed as *M. veritas*). Twelve of the species are listed under the BC Act and the Barrow Cave Gudgeonis listed as vulnerable under the EPBC Act. 13 stygofauna taxa were recorded in monitoring bores at the terminal tanks (approximately 1 km north of the GTP and 2.5 km north of the PWD wells). The karstic limestone layer which is believed to be Giralia Calcarenite is known to contain many cavities and solution tubes that provide habitat for stygofauna. It is located beneath the surficial soil layer at the premises. Beneath this layer is a band of siliceous silty sand which creates a barrier for subterranean fauna as there are no cavities or large pore spaces to allow movement. It is considered unlikely to encounter populations of subterranean fauna beneath this layer.
Groundwater	There is one shallow unconfined freshwater aquifer predominantly within Tertiary limestone on Barrow Island. This freshwater aquifer forms a lens of relatively fresher groundwater floating upon denser, saline ground water at depths between 9 m and 53 m and supports subterranean fauna. The groundwater system is linked to the marine ecosystem (<100 m from the premises).
Barrow Group Formation	The Barrow Group Formation is an underground confined saline aquifer situated at depths between 1,200 m and 1,900 m below the surface and is divided into three separate formations: the Flacourt, Malouet and Flag Sandstone. The components of the Barrow Group Formation behave as a single, hydraulically connected unit; however, the Barrow Group Formation is hydraulically separated from the shallow unconfined Tertiary limestone by a thick sequence (more than 1,000 m) of low permeability material (lower Gearle siltstone). Water quality is highly alkaline and saline (total dissolved solids approximately >30,000 mg/L) and is considered to be saturated with hydrocarbons therefore does not support any significant environmental values. It is generally characterised as containing stable minerals with a very low proportion of soluble metals. The aquifer provides process water for oil field operations on Barrow Island.

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources and potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

The Delegated Officer has identified controls considered to be critical to maintaining an acceptable level of risk, and has incorporated into the licence as regulatory controls. Justification for these controls is documented and justified in Table 5.

The conditions in the revised licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 5. Risk assessment of potential emissions and discharges from the Premises operation

Risk Event				Risk rating[1] C = consequence L = likelihood	Conditions[2] of licence	Justification for regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impacts**	**Potential receptors**			
Storage of PFAS containing soil stockpile in area 20B within the GTP	Leachate containing PFAS	Pathway: Infiltration to soils and groundwater Impact: PFAS contamination of soil, groundwater, and/or health impacts to flora and fauna including subterranean fauna	Flora and fauna within the Class A Nature Reserve Subterranean fauna Underlying soils Groundwater ~ 9m below surface	C = Major L = Likely **High Risk** See section 3.3 for detailed risk assessment	Condition 14: Infrastructure Monitoring of the Class 3 Drainage system Condition 17: Requirement to prepare and submit an Environmental management, maintenance, and operating plan in accordance with the PFAS NEMP	See section 3.3 for detailed risk assessment
	PFAS containing stormwater	Pathway: Runoff/Direct discharge to land and infiltration to groundwater or overland flow. Impact: contamination of soil, groundwater, and/or health impacts to flora and fauna.	Flora and fauna within the Class A Nature Reserve Subterranean fauna Underlying soils Groundwater ~ 9m below surface			
	PFAS containing soils	Pathway: Air/windborne pathway carrying PFAS containing soils outside of the GTP footprint with potential to leach PFAS into the groundwater Impact: PFAS contamination of soil, groundwater, and/or health impacts to flora and fauna.	Flora and fauna within the Class A Nature Reserve Soils Groundwater ~ 9m below surface Subterranean fauna	C = Major L = Rare **Medium Risk**	Condition 17: Requirement to prepare and submit an Environmental management, maintenance, and operating plan in accordance with the PFAS NEMP.	As per section 3.3 below, the delegated officer determined that a management plan should be prepared for the stockpile to address the essential functional requirements outlined in the PFAS NEMP, inclusive of dust mitigation. The delegated officer considers this measure appropriate with the intent that, upon receipt of the plan, the department will condition identified risk-reduction measures through an additional CEO-initiated amendment.
		Pathway: Physical movement of stockpiled soil (i.e. for reuse) Impact: PFAS contamination of soil, groundwater, and/or health impacts to flora and fauna.		C = Major L = Rare **Medium Risk**	Condition 16: Requirement for the PFAS containing soil stockpile in area 20B to be sampled and found to have no detectable levels of PFAS.	The delegated officer has determined to restrict the reuse and deposition of the PFAS containing soil stockpile in area 20B to prevent any spread of PFAS containing soils to maintain an acceptable level of risk. Condition 16 has been imposed to ensure that the PFAS containing soil stockpile in area 20B is tested for PFAS in accordance with the PFAS NEMP before being moved to other locations on the premises. The soil must be found to have no detectable levels of the specified PFAS compounds in soil prior to movement. The delegated officer notes that this decision aligns with Chapter 12.1.2 of the PFAS NEMP screening risk assessment for soil reuse, as soil-leachate sampling of the stockpile (as summarised in section 3.3.2) detected PFOS above the EGV for 99% species protection value for high conservation ecosystems.
Potentially PFAS containing soils within the premises (unknown areas) inclusive of soils underlying infrastructure	Leachate containing PFAS PFAS containing stormwater	Pathway: Infiltration to soils and groundwater Impact: PFAS contamination of soil, groundwater, and/or health impacts to flora and fauna.	Flora and fauna within the Class A Nature Reserve Soils Groundwater ~ 9m below surface Subterranean fauna	C = Major L = Possible **High Risk**	Condition 18: Requirement to prepare and submit an Investigation and Management Plan Condition 21: Soil movement register	Due to the uncertainty regarding when the stockpile became contaminated with PFAS and where potentially PFAS containing soil from the stockpile has been used on Barrow Island for construction works, there is considered to be a high risk of PFAS migration to the environment from unidentified and uncontrolled locations on the premises. Given the high mobility and persistence of PFAS in the environment, it is crucial to identify all areas where potentially PFAS containing soil has been utilised on the premises in order to assess the risk of PFAS migration and apply any necessary controls to prevent PFAS migration into the environment. Condition 18, requiring the licence holder to prepare an Investigation and Management Plan (IMP) to identify, assess, manage, remove and/or treat PFAS contamination within the premises has been included in the licence to address this risk. Upon receipt of the IMP, the department will review the findings and assess the

Risk Event				Risk rating[1] C = consequence L = likelihood	Conditions[2] of licence	Justification for regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impacts**	**Potential receptors**			
						identified management measures. It is the intent that the department will progress another CEO-initiated amendment to condition management actions required to control any newly identified risk events from source-pathway receptor linkages following receipt and review of the IMP. Any identified timeframes for removal and or treatment of PFAS containing soils and waters will also be assessed at this time. Additionally, the delegated officer has determined that a condition be included requiring the licence holder to maintain a Soil Movement Register to document the origin, destination, and volume of all soil and fill materials used on the premises. This register will establish a record to trace the movement of materials, ensuring accountability and providing an audit trail that can be referred to in the event of any future contamination concerns.
Storage of PFAS containing water within existing containment infrastructure (SWHP and OWS)	PFAS containing stormwater and wastewater	Pathway: Leaks from the wastewater and stormwater infrastructure (SWHP and OWS) leading to infiltration to underlying soils and groundwater Impact: PFAS contamination of soils and groundwater and/or health impacts to flora and fauna.	Groundwater ~ 9m below surface Subterranean fauna Soils	C = Major L = Rare **Medium Risk**	Condition 1: Infrastructure and Equipment operational requirements	Following review of the s72 incidents as described in section 2.3.1 the delegated officer identified that currently there is currently no requirement to maintain permeability of the GTP stormwater infrastructure specified in the licence however maintenance of this infrastructure is critical to maintaining an acceptable level of risk of releasing PFAS (and other contaminants) to the environment. Therefore, the delegated officer has included a requirement to maintain the infrastructure with a minimum as constructed permeability. The specified permeability is consistent with the requirements detailed in the original works approval under which the infrastructure was constructed. Additionally, a requirement to maintain a leak detection system connected to a visual or audible alarm has also been added to the licence as an additional contingency for detecting leaks from the stormwater infrastructure, as early detection is a necessary to prevent ongoing/prolonged leakage and associated impact.
Discharge of stormwater from the SWHP to discharge point L1	PFAS containing stormwater	Pathway: Infiltration to soils and groundwater Impact: PFAS contamination of soil, groundwater, marine environment and/or health impacts to flora and fauna.	Flora and fauna within the Class A Nature Reserve Soils Groundwater ~ 9m below surface Subterranean fauna Marine environment	C = Minor L = Rare **Low Risk**	Condition 8: Discharge to land limit for the stormwater holding pond Condition 9: Monitoring of discharges to land (Table 14)	Given that PFAS has been previously detected within stormwater storage infrastructure, the delegated officer considers it necessary to condition PFAS testing of the stormwater holding pond prior to every discharge at authorised discharge point L1. This requirement in conjunction with the introduction of a discharge limit, being the limit of reporting for the standard suite of PFAS compounds, is essential to ensure PFAS is not discharged to land therefore maintaining an acceptable level of risk for stormwater discharge to the environment from this infrastructure. The introduction of PFAS into the stormwater system increases the environmental consequence rating from what was assessed in the original grant of the licence, but the application of the additional monitoring and discharge controls are expected to ensure the risk of PFAS impacts associated with this activity remain low.
Disposal of PFAS containing water via deep well injection	PFAS containing stormwater and wastewater	Pathway: Fracturing of the receiving formation and overlying confining unit or loss of well integrity causing discharge to the fresh-water aquifer Impact: contamination of the freshwater aquifer and health impacts to subterranean fauna	Groundwater within shallow fresh-water aquifer Groundwater dependent ecosystems Subterranean fauna	C = Major L = Rare **Medium Risk**	Condition 14: Process monitoring (existing) Condition 15: Groundwater monitoring Condition 26: Annual Environmental Report	The risk of deep well injection impacting the shallow freshwater aquifer and subterranean fauna was previously assessed for the grant of L9102/2017/1, with existing condition 14 for process monitoring included on the licence in accordance with this assessment. The disposal of PFAS containing wastewater via deep well injection has however only been assessed in the event of stormwater becoming impacted by PFAS from contaminated material storage at the waste transfer station from ad hoc emergency events (DWER, 2021). In contrast, this assessment is for potential ongoing discharge of PFAS containing wastewater from the stormwater holding pond via deep well injection. Considering the existing wastewater stream authorised to be discharged downhole primarily consists of produced water with contaminants such as BTEX compounds, hydrocarbon, MEG and H_2S, the delegated officer does not consider the addition of PFAS containing waters will significantly alter the risk deep well injection activities pose of impacting receptors. Currently well head pressure monitoring is conditioned within the licence at the injection wells as a control to confirm the integrity of the wells (significant increase in pressure is indicative of an integrity issue). Additionally, via the TSEMP required under MS800 Chevron monitors groundwater within the shallow aquifer via groundwater bores surrounding the injection wells biannually. The delegated officer notes that there is no requirement for Chevron to monitor for PFAS within the management plan, additionally there is no requirement for Chevron to report groundwater monitoring results to the department – only reporting of adverse changes (as considered by Chevron) is required

Risk Event				Risk rating[1] C = consequence L = likelihood	Conditions[2] of licence	Justification for regulatory controls
Source/Activities	Potential emission	Potential pathways and impacts	Potential receptors			
						by the TSEMP. The continuous injection of PFAS containing wastewater has not been considered within the Part IV assessment. Consequently, the relevant approved management plans do not account for the injection of PFAS containing water downhole. Since the injection of wastewater from the Gorgon project is also managed under the Part V licence, the delegated officer has determined to condition groundwater monitoring of the shallow aquifer as an additional measure to ensure early detection of any potential environmental impacts. Monitoring is to be conducted at existing groundwater bores not currently specified within the licence, and trigger limits have been set as the limit of reporting for PFAS, hydrocarbons and mercury. All monitoring results are to be submitted to the department annually within the Annual Environmental Report together with analysis of trends and any exceedance of trigger values which may indicate contamination. This reporting enables the department to detect any change in hydrocarbon, PFAS, or mercury concentration in groundwater— selected indicative markers that could signify issues with well integrity. It is anticipated that Part IV management plans will also be updated to consider the risks posed from the presence of PFAS within the premises.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

3.3 Detailed risk assessment for storage of the PFAS containing soil stockpile in area 20B at the GTP

3.3.1 Overview of risk event

The risk event assessed is the storage of PFAS containing fill material within the GTP resulting in releases of low levels of PFAS into groundwater and surface waters which has potential to impact flora and fauna inclusive of subterranean fauna within the A class nature reserve.

3.3.2 Identification and general characteristics of emission

Per- and poly-fluoroalkyl substances (PFAS) are manufactured chemicals that are not naturally occurring in the environment. The PFAS compounds of most concern are perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexanesulfonic acid (PFHxS) which are collectively known as perfluoroalkyl acids (PFAAs), and are resistant to physical, chemical, and biological degradation and are very stable. All other PFAS compounds are precursors and can transform to PFAAs in the environment (HEPA 2020).

PFAS compounds are soluble in water and readily leach from PFAS containing soils into surface water and groundwater, potentially resulting in detrimental impacts to soil and water quality of these effected ecosystems. PFAS present in soils and water can transfer to organisms within the food chain and can be transferred from organism to organism as they accumulate, potentially posing a risk of causing adverse effects to human and environmental health, even at low concentrations (HEPA 2020).

As per section 2.2.1 sampling of the Area 20B PFAS containing soil stockpile on the premises was conducted by Enpoint in 2022. A total of 100 samples were taken from 50 locations throughout the stockpile area. Both soil and soil leachate tests were conducted. Soil leachate testing is able to detect PFAS when the PFAS content of the soil is below the LOR for the soil analysis method.

PFAS compounds were detected in 15 of the 100 soil samples. Among these detections, eight different PFAS compounds were identified out of the 28 compounds tested. PFOS was detected in eight samples, with a maximum concentration of 0.0016 mg/kg. This represents 0.16% of the direct exposure EGV and 16% of the indirect exposure EGV, as outlined in Table 1. PFOA was detected in two samples, with a maximum concentration of 0.0003 mg/kg, equivalent to 0.003% of the direct exposure pathway EGV per Table 1.

PFAS compounds were detected in 100% of the soil leachate samples, with 15 different PFAS compounds identified. All eight PFAS compounds found in the soil samples were also present in the leachate samples. A summary of the results is presented in Table 6 for the compounds detected in soil leachate.

Table 6: Summary of PFAS detection in soil leachate in µg/L

PFAS	Detected %	LOR	Median	Mode	Mean	Max
6:2 FTS	31	0.0010	0.0010	0.0010	0.0034	0.1000
8:2 FTS	14	0.0010	0.0010	0.0010	0.0012	0.0080
FOSA	3	0.0005	0.0005	0.0005	0.0005	0.0023
PFBA	50	0.0020	0.0020	0.0020	0.0028	0.0088
Pfbs	35	0.0005	0.0005	0.0005	0.0007	0.0069
PFDA	23	0.0005	0.0005	0.0005	0.0005	0.0009

PFAS	Detected %	LOR	Median	Mode	Mean	Max
PFHpA	96	0.0005	0.0017	0.0009	0.0020	0.0178
PFHpS	3	0.0005	0.0005	0.0005	0.0005	0.0011
PFHxA	89	0.0005	0.0020	0.0005	0.0028	0.0214
PFHxS	38	0.0005	0.0005	0.0005	0.0010	0.0144
PFHxS and PFOS	100	0.0002	0.0039	0.0038	0.0059	0.0552
PFNA	13	0.0005	0.0005	0.0005	0.0005	0.0025
PFOA	97	0.0005	0.0018	0.0012	0.0023	0.0132
PFOS[1]	100	0.0002	0.0037	0.0025	0.0052	0.0524
PFPeA	92	0.0005	0.0024	0.0005	0.0034	0.0257
PFPeS	3	0.0005	0.0005	0.0005	0.0006	0.0032

Note 1: The EGV for 99% species protection for high conservation ecosystems (0.00023 µg/L) is only marginally higher than the limit of reporting.

3.3.3 Pathways

There are two pathways for migration of PFAS into the environment following rainfall; infiltration to soils and groundwater directly surrounding the stockpile and overland flow of stormwater runoff. Stormwater at the GTP, is managed via the stormwater drainage system (SDS) which manages inflows from stormwater run-off, process water, and firewater. The SDS segregates stormwater into four classes:

- Class 1: Contaminated run-off;
- Class 2: Potentially contaminated run-off consisting of areas designated to have a lower likelihood of contamination compared to Class 1 areas.
- Class 3: On-site uncontaminated runoff;
- Class 4: Intercepted off-site uncontaminated runoff.

The delegated officer has reviewed the stormwater drainage system at the GTP and identified that the area where the Area 20B PFAS containing soil stockpile is situated within the class 3 drainage system area. Runoff from this system is discharged to the terrestrial environment via stormwater ditches at the perimeter of the GTP.

3.3.4 Description of potential adverse impacts from the emission

Depth to groundwater on Barrow Island is variable between 9 m and 53 m and discharges to the ocean. There is potential for PFAS to leach into underlying soils and groundwater following rainfall events, and for the PFAS to enter the Class 3 stormwater system, which discharges to the environment surrounding the GTP. Table 6 shows that the soil-leachate results from the stockpiled material significantly exceed the guideline value for 99% freshwater species protection for PFOS, with all results being above 0.00026 µg/L. Additionally recent PFAS detections within the class 3 drainage system as described in section 2.3.1, indicate that runoff from stockpiled material could be the source of PFAS detected within stormwater currently discharged to the terrestrial environment from this drainage system. Given that groundwater supports subterranean fauna of high conservation significance (as described in section 3.1.2), if PFOS leaches into the groundwater, it could cause significant habitat degradation, adversely affecting stygofauna health and potentially proving toxic.

3.3.5 Key Findings

The Delegated Officer has reviewed the information regarding storage of the Area 20B PFAS containing soil stockpile at its current location within the GTP and has found:

1. Stockpiled material leachability exceeds the relevant PFOS 99% EGV for freshwater.
2. The current surface water management as described in section 3.3.3, allows for stormwater runoff from the stockpile and discharge to the environment surrounding the GTP.
3. PFAS has recently been detected in stormwater samples within the Class 3 drainage system with PFOS results exceeding the 99% EGV for freshwater as described in section 2.3.1 and the stockpiled material appears to be a likely source.
4. There are no management measures currently conditioned in the licence to prevent infiltration of leachable contaminants within the stockpile to soils and groundwater.
5. The existing groundwater monitoring program as per the TSEMP does not include PFAS.

3.3.6 Consequence likelihood and overall rating of risk event

The delegated officer has determined that the consequence of PFAS contamination of groundwater underlying the GTP from direct infiltration and from surface water runoff is **major** due to the known leachability of the stockpiled soil, conservation significance of the subterranean fauna, Barrow Island being classed a Class A nature reserve and the persistence of PFAS within the environment.

The delegated officer had also determined that habitat degradation from PFAS contamination impacting subterranean fauna will probably occur in most circumstances given that PFAS has already been detected within groundwater at the GTP and the detections of PFAS from stockpile soil leachate tests. Additionally, the recent detections of PFAS within the Class 3 drainage system indicate that runoff from the stockpile is leaching PFAS and reporting to the Class 3 drainage system which discharges to the terrestrial environment. Therefore, the likelihood is considered to be **likely.**

The Delegated Officer has applied the consequence and likelihood ratings described above to the Risk Criteria table in the Guidance Statement: Risk Assessments (DWER 2020) and determined that the overall rating for the risk of storage of the Area 20B PFAS containing soil stockpile within the GTP is **high.**

3.3.7 Additional regulatory controls

Given the high-risk rating associated with the storage of PFAS containing soil at Area 20B and the prolonged presence of the stockpile at the GTP, the delegated officer deems it critical to impose specified action conditions that the licence holder must complete by a designated date. These conditions do not alter the current risk level of the activity but are aimed at reducing or managing the ongoing risks associated with the stockpile.

The delegated officer is therefore including condition 17, which requires the licence holder to prepare an Environmental Management, Maintenance, and Operating Plan in accordance with Chapter 10.3.11 of the PFAS NEMP for the Area 20B PFAS containing soil stockpile within the GTP. The plan must include management measures that meet the essential functional requirements described in section 10.2.2 of the PFAS NEMP, applicable to stockpiling, storage, and containment facilities. The purpose of this condition is to ensure that the licence holder identifies feasible management measures in line with PFAS best management practices as outlined in the PFAS NEMP to prevent migration of PFAS from the stockpile into the environment. Given the size of the existing stockpile, the delegated officer recognises that implementing measures such as a leachate control barrier may not be possible for an in-situ

facility. Therefore, the licence holder needs to ensure that the identified management measures within the plan are sufficient to minimise the potential for leachate generation. The licence holder is expected to provide adequate justification within the plan for how the identified control measures will effectively minimise and mitigate the risk to PFAS migration into the environment.

The condition requires the preparation and submission of the plan to the department within three months of the amendment issue. Upon receipt, the department will review the identified management measures and initiate a second CEO-initiated amendment to condition any identified measures deemed essential for reducing the risk associated with the storage of the Area 20B PFAS containing soil stockpile.

Due to the recent s72 Report by the licence holder submitted in May 2024 were PFAS and mercury were detected in the Class 3 drainage system (as described in section 2.3.1 of this decision report), the delegated officer considers it necessary to condition ongoing monitoring of stormwater within the Class 3 drainage system at the GTP. As this drainage system discharges to the environment outside of the GTP it is necessary to evaluate the contaminant load of the system to inform future decision making. Accordingly, monitoring for the standard suite of PFAS, hydrocarbons, and mercury has been incorporated within Condition 14. As sampling of the system is only possible following rainfall events of a certain significance, the delegated officer has determined that sampling for each internal catchment is to be conducted monthly, provided a discharge of stormwater from the class 3 drainage system occurs in that month. The sampling locations align with the current autosampler locations, as referred to in section 2.3.1, and the delegated officer considers these locations appropriate for targeting each catchment within the system, as depicted in Figure 8 of the issued Licence. Results are to be reported in the annual environmental report as per condition 26, and the licence holder is also obligated under s72 of the EP Act to report discharges of waste not in accordance with the licence to the department. Discharge of emissions from the Class 3 drainage system have not been authorised within the licence. The delegated officer acknowledges that taking multiple samples during rainfall events would be ideal for calculating mass discharge rates, although a single monthly sample provides a representative snapshot of the discharge quality.

Condition 15 has also been included in the licence requiring quarterly groundwater monitoring of eight bores surrounding the Area 20B PFAS containing soil stockpile. The monitoring will target the underlying aquifer, testing for the standard suite of PFAS compounds at ultra trace level and additional physical parameters as specified within Table 10 of the licence. The eight groundwater bores were recently constructed by the licence holder, and a well installation report has been reviewed by the department. This monitoring is necessary to determine the degree of PFAS contamination (if any) of the shallow unconfined aquifer and to provide a means for ongoing detection of any leaching of PFAS which may occur. By assessing the current contamination levels and monitoring changes over time, the department can evaluate the ongoing risk posed by the stockpile to inform future decision making. Monitoring can additionally serve as an indicator of the effectiveness of any management actions implemented to mitigate PFAS leaching from the stockpile. The limit of reporting has been set as a trigger level for PFAS compounds at these monitoring wells. If trigger levels are exceeded the licence holder is required to provide details on any investigations or actions taken in relation to the exceedance in the Annual Environmental Report.

In addition, due to the high risk of environmental impacts from the storage of the Area 20B PFAS containing soil stockpile as described in this section, and the unknown origin of PFAS within the stockpiled material as described in section 2.2.1, the delegated officer considers it essential to restrict the movement of the stockpiled soil. This is to prevent further spread of PFAS that could impact the flora and fauna within the A class nature reserve. Hence, the inclusion of condition 16 which restricts deposition of any soil sourced from the Area 20B stockpile, prior to being tested for PFAS in accordance with the PFAS NEMP and found to have no detectable levels of the specified PFAS compounds in soil tests. This condition prevents further spread of PFAS within the premises and into the environment by ensuring

that PFAS containing soils are not inadvertently being utilised for construction activities.

Furthermore, the delegated officer has determined to include a condition to ensure that if PFAS-containing materials are brought onto the premises, it must be done in a manner that will not result in the discharge of PFAS into the environment hence, the inclusion of condition 19. The department acknowledges that despite being phased out there are currently no restrictions on PFAS-containing firefighting foams in Western Australia and that PFAS-containing materials, including firefighting foams, may be necessary for fire suppression purposes. Therefore, this condition is included to prevent further accidental releases of firefighting foams and/or PFAS containing firewater (from new sources) from maintenance or following emergency events.

4. Consultation

Table 7 provides a summary of the consultation undertaken by the department.

Table 7: Consultation

Consultation method	Comments received	Department response
Licence holder was provided with the draft amendment on 24 June 2024 and a second draft was sent on 31 October 2024	A summary of the licence holder responses received on 1 August and 25 November 2024 is provided in Appendix 1	Summary provided in Appendix 1

5. Decision

Based on this assessment, the delegated officer has determined to amend the licence as outlined in section 3. The reasons for this decision are:

- There is currently a high risk of the Area 20B PFAS containing soil stockpile impacting the shallow groundwater aquifer which serves as habitat to conservation significant subterranean fauna communities known for their high level of endemicity and species diversity.
- The Area 20B PFAS containing soil stockpile at the GTP is currently not being managed in accordance with the NEMP, there are currently no barriers to prevent infiltration and stormwater runoff is being released to the environment providing pathways for migration of PFAS into the environment.
- There is uncertainty regarding the use and location of potentially PFAS containing soils for construction works within the premises, including underlying infrastructure.
- There is no regulatory requirement for Chevron to monitor for PFAS within groundwater nor report groundwater monitoring data to the department.
- There are management limitations of the Area 20B PFAS containing soil stockpile due to the volume of material and isolated location of Barrow Island, making removal impracticable.

The delegated officer notes that the specified action conditions included within this amendment do not decrease the current risk PFAS poses to receptors. However, these conditions are intended to guide the licence holder in identifying practical risk reduction controls in accordance with the PFAS NEMP. Risk reduction controls which are identified through implementation of the specified action conditions, along with any others the delegated officer deems necessary, will be conditioned within the licence at a later date through CEO-initiated amendment/s to lower the risk to receptors the presence of PFAS within the premises

poses.

6. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

6.1 Summary of amendments

Table 8 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 8: Summary of licence amendments

Condition no.	Proposed amendments
Definitions	Included definitions for; Assessment of site contamination NEPM, AS/NZS 5667.11, LOR, PFAS NEMP, Quarterly, soil movements, Standard suite of PFAS compounds and ultra trace analysis.
Condition 1 Table 2	Added requirement to maintain the hydraulic conductivity of the OWS and SWMP to be equal to or less than $1x10^{-9}$ m/s.
	Added requirement to maintain an alarm system on the leak detection system for the SWHP and OWS.
Schedule 2 Table 14	Added requirement to sample the stormwater holding pond for PFAS prior to every discharge at L1.
Condition 8 Table 5	Added emission limit for water within the SWHP for PFAS being above the defined limits of reporting.
Condition 14	Inclusion of monitoring requirements for the Class 3 drainage system.
Condition 15 Table 10	Inclusion of groundwater monitoring requirements for 8 monitoring wells surrounding the GTP: GW-GTP30 to GW-GTP37 and four wells surrounding the PWD and TWIP wells: DWD-Q46-B1-MW02, DWD-Q56-B2-MW03, GW-RD05-MW02 and GW-RD05-MW03.
Condition 16	Specified action condition included to ensure material sourced from the Area 20B PFAS containing soil stockpile is not deposited within the premises prior to being tested for PFAS and confirmed that soil samples are below the LOR for PFAS in soil.
Condition 17	Specified action condition requiring the licence holder to prepare an Environmental management, maintenance and operating plan in accordance with the PFAS NEMP.
Condition 18	Specified action condition requiring the licence holder to prepare and submit an investigation and management plan related to the presence of PFAS within the premises.
Condition 19	Condition restricting the licence holder in bringing PFAS containing material or substances onto the premises that may result in a discharge into the environment.

Condition no.	Proposed amendments
Condition 20	Amended records condition to ensure records are kept for: sampling in accordance with condition 16, monitoring in accordance with condition 15 and the soil movement register.
Condition 21	Condition to record all soil movements within the premises via a Soil Movement Register
Condition 26	Amended Annual Environmental Reporting condition to include sampling data in accordance with condition 16 and monitoring data, including trigger level exceedance investigation data, in accordance with condition 15.
Schedule 1: Premises Maps	Amended to include figure captions for each existing map
	Amended to include Figure 7: Map of groundwater monitoring well locations
	Amended to include Figure 8: Map of class 3 drainage monitoring locations
Schedule 3: Monitoring Table 16	Amended to include the standard suite of PFAS compounds as a parameter for the stormwater holding pond
Schedule 3: Monitoring Table 15	Amended to include Table 15: Standard suite of PFAS compounds and associated LOR for soil and water samples

References

1. Chevron Australia Pty Ltd (CAPL) 2023, *Supporting Document* (correspondence to DWER), Perth, Western Australia
2. Chevron Australia Pty Ltd (CAPL) 2024a, Email correspondence to DWER, Perth, Western Australia (DWERDT900658)
3. Chevron Australia Pty Ltd (CAPL) 2024b, s72 waste discharge notification form submitted to DWER, Perth, Western Australia DWERDT962297
4. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
7. DWER 2021, Amendment Report: Application for Licence amendment to L9102/2017/1, Perth Western Australia. Available online at: https://www.der.wa.gov.au/images/documents/our-work/licences-and-works-approvals/Decisions_/L9102-2017-1_AR.pdf
8. Enpoint 2023, *Stockpile Assessment Area 19/20 – Gorgon Gas Treatment Plant, Barrow Island,* Perth, Western Australia (DWERDT808163)
9. Heads of EPAs Australia and New Zealand (HEPA) 2020, *PFAS National Environmental Management Plan Version 2.0*, Australia.

Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Definitions (PFAS NEMP)	• Recommend deleting "Version 2.0 - January 2020" and replacing it with "as amended from time to time" as per the definition of the ASC NEPM.	The definition of the PFAS NEMP has been updated.
Definitions	• Recommend defining "PFAS contaminated" (as per EP act and ASC NEMP) and "PFAS containing" to clarify the meaning of the terms and differences between them and to remove uses of "PFAS impacted" throughout the licence and decision report to reduce potential ambiguity within both the licence and the Decision Report. • Additionally recommended consistency when referring to the stockpile at the GTP as the Area 20B fill material stockpile.	The delegated officer has determined to use PFAS containing throughout the licence and decision report for clarity when referenced and to remove any potential ambiguity. All references to the stockpile at the GTP have been updated to Area 20B PFAS containing soil stockpile.
Table 5: Discharge to land limits	• Request that the discharge to land limits for PFOA and PFOS compounds should be amended to the guideline values established in the NEMP, to ensure consistency with the NEMP opposed to specifying the limit as the laboratory LOR per Table 17. • Comment that Revision 4.1 of the TSEPP includes restrictions of discharges from the SWHP to the Class 3 Drainage until the water quality does not exceed the EGV's within the PFAS NEMP Version 2.0, unless a site-specific ecological risk assessment of this discharge has been undertaken inclusive of management measures to negate any associated unacceptable risk which will be documented in an Auditor endorsed report and include consultation with state and commonwealth regulators where relevant . • Note that the inclusion of the PFAS discharge to land limits, CAPL may in future apply to amend these limits following development of a risk-based site specific discharge criteria that would prevent unacceptable ecological risks from discharges to receptors.	The delegated officer does not consider the guideline values within the NEMP as suitable discharge criteria to the environment. Noting that these guideline values are not intended to be discharge limits, they are tier 1 values for risk assessments and not considered appropriate for this application. If an application is made in future to amend these limits by the licence holder a further assessment will be conducted on the appropriateness of the proposed limits. In regard to the revised management plans referred to in the licence holder's response to the draft amendment, the delegated officer notes that these plans have not yet been approved by the department. As a result, the updated management measures within these plans will not be taken into account in the risk assessment or when setting conditions.

Condition	Summary of Licence Holder's comment	Department's response
Condition 15 Table 10: Groundwater Monitoring	• Comment that Revision 2.2 of the TSEMP was recently submitted to DCEEW and DWER EPA Services and this version includes PFAS, mercury and hydrocarbons as monitoring parameters for "at risk sites" and reporting of these results is required within the Annual Environmental Performance Report. • Comment that these groundwater monitoring conditions of the at risk sites duplicate existing Part IV commitments via the TSEMP, and recommends removal of groundwater monitoring under the licence. • Request to reference the monitoring wells surrounding the Area 20B PFAS containing soil stockpile as GW-GTP-30 – GW-GTP-37, surrounding the TWIP wells as DWD-Q46-B1-MW02 and DWD-Q56-B2-MW03 and surrounding the PWD wells as GW-RD05-MW02 and GW-RD05-MW03. • Requests that in-field non-NATA accredited analysis is permitted for measurements of SWL, pH and EC. • Requests groundwater monitoring to be changed from quarterly to biannually as variations in levels and concentrations do not appear to be linked to quarterly seasons referencing the Barrow Island Hydrogeological study.	All references to the groundwater monitoring wells have been updated to align with the licence holder's naming conventions as requested. As above, revised measures within management plans required under MS 800 have not been taken into account by the department when setting conditions as they have not been reviewed. Therefore, the groundwater monitoring conditions are to remain within the licence. Additionally, in regard to reporting, as per the risk assessment table the delegated officer noted the limited groundwater reporting requirements under MS800, hence the required reporting requirements conditioned within condition 26. In order to retain consistency within the licence the delegated officer has determined to retain the existing analysis methods within the licence, noting that infield analysis of the parameters is acceptable if within the licence holder's documented internal procedures. Quarterly monitoring was conditioned to ensure timely response to indications of contamination via leaching (surrounding the Area 20B PFAS containing soil stockpile) or loss of well integrity (surrounding the injection wells) which is unaffected by biannual seasonal shifts in groundwater. After consideration, the delegated officer deems it necessary to include notification requirements following sampling events where PFAS is detected in wells and where mercury and/or TRH is detected at the monitoring wells surrounding the deep well injection sites. Therefore, trigger limits have been included within the condition and Condition 24 has been included to require the licence holder to notify the CEO in the event of these substances being detected within the groundwater.
Condition 16	• Requested clarification of the intended scope and purpose of the condition and expressed a desire to recommend alternative wording to meet DWER's objective without causing operational issues. • Queried if the condition was intended to apply to movements of in situ earth/soil/sand even with limited lateral extent such as for roadworks, digging	The delegated officer considers that the purpose of the condition has been adequately described in section 3.3.7 of this decision report. To prevent restricting safety critical activities as described, required maintenance and critical projects, the delegated officer has determined to alter the condition to only apply to

Condition	Summary of Licence Holder's comment	Department's response
	a hole to expose infrastructure for maintenance, buried infrastructure and cut and fill activities for new infrastructure installation. • Noted that the condition effectively restricts all earthworks occurring on site, which is impractical and presents a significant safety risk, and does not achieve an improved environmental outcome. • Noted that the condition prevents backfilling of excavations associated with maintenance and critical infrastructure which will impact water and utility supply, the ability to meet essential process safety standard and creates secondary risks of fauna entrapment and personnel safety. • Commented that the condition would hinder the execution of current and future essential projects that involve the reuse of PFAS containing soils within the premises, noting that soil management plans have been developed for ongoing projects and that the soil management processes have been endorsed by a Contaminated Site Auditor as not posing any unacceptable risk to ecological receptors. • The licence holder acknowledged the limitations on importing material due to quarantine constraints and noted that the current condition deviates from the risk-based approach required under the WA CS Act and the ASC NEPM. • Noted that the condition is inconsistent with previous correspondence with the department authorising reuse of potentially impacted soils for safety critical activities. • Note that the condition assumes any detectable PFAS presence results in contamination, which should instead be assessed through standardised methods based on scientific evidence of toxicity. • The Soil Disturbance Procedure includes measures for identifying and managing contaminated soils, assessing reuse options to avoid unacceptable risks, and maintaining records of soil movements. Implementing the TSEPP and Soil Disturbance Procedure supports risk determination in line with PFAS NEMP guidance.	the Area 20B PFAS containing soil stockpile. The delegated officer acknowledges that there are likely multiple PFAS source areas within the GTP although this amendment is to manage the known sources (i.e. the stockpile) with the intent that the IMP required under Condition 18 will identify other sources of PFAS contamination within the premises, which can then be managed via the appropriate processes if required. Hence, the delegated officer considers reducing the scope of the condition acceptable on the basis that the stockpiled material is known to contain PFAS. The department maintains that the licence holder must keep records of all soil movements within the premises including the spatial extent and GPS coordinates of all soil deposits. Therefore, the requirement for a soil movement register as per condition 21 has been included within the licence.

Condition	Summary of Licence Holder's comment	Department's response
Condition 17	• Recommended alternative wording for the condition, so that the plan is developed in accordance with the NEMP, removing references to the specific chapters and replacing details of how the essential functioning requirements will be met with general stockpiling, storage and containment references. • Licence holder states the alternative wording ensures the plan is developed in accordance with the guiding principles of the NEMP, taking into account a risk-based management approach for any identified contaminated materials. • Licence holder notes the assessment conducted for the Area 20B PFAS containing soil stockpile and the conclusion that the stockpiled material does not represent an unacceptable risk to human health or the environment.	The NEMP chapters were specified within the condition to provide clear and detailed guidance to the Licence Holder regarding the department's expectations for the report. The delegated officer considers that specifying these chapters ensures that the plan is developed in accordance with the NEMP, and addresses all pathways of PFAS migration into the environment and will be retained within the condition.
Condition 18	• Recommended the wording of the IMP inclusions should be altered to only include measures to remove or treat PFAS contaminated soil and water rather than PFAS containing soils and waters. The licence holder notes that the identification of measures to remove or treat PFAS contaminated soil and water needs to occur as part of a risk-based formal contaminated site management process and that steps to assess potentially contaminated areas within the Premises are underway, through preparation of the Preliminary Site Investigation (PSI). Additionally technical studies are in advanced stages of development and completion to demonstrate understanding of impacts to ecological receptors, If the site assessment identifies unacceptable risk to these receptors, any remediation undertaken will be in accordance with the requirements of the CS Act, the DWER Contaminated Sites Guidelines, ASC NEPM and the PFAS NEMP.	The delegated officer has determined to retain the original wording of the condition, as it only requires the identification of measures to remove or treat PFAS-containing soil and water, without mandating the implementation of these measures at this stage. Regarding the CS Act, it is important to note that the Act is primarily concerned with identifying, managing, recording, and remediating existing contamination. In contrast, the conditions within the amendment aim to prevent any further contamination from occurring. Therefore, the presence of PFAS within the premises is appropriately managed under the EP Act, which addresses emissions and discharges that could lead to new contamination, while the CS Act focuses on managing legacy contamination.
Condition 19 and 20 (since removed)	• Request to remove the construction requirements for the wells as the licence holder has completed the design, construction and installation of the groundwater monitoring wells in accordance with the requirements specified in Table 11 and prepared a report on the installation and sampling which has been provided.	The delegated officer has reviewed the submitted report detailing the well design and construction. It has been determined that the eight monitoring wells were constructed generally in accordance with ASTM D5092/D5092M-16, as well as the other relevant requirements of the condition. This includes the provision of construction logs, installation surveys, and a well network map. Based on this, the delegated officer is satisfied that the licence holder has fulfilled the requirements of proposed conditions 19 and 20, and these conditions have been removed from the licence.

Condition	Summary of Licence Holder's comment	Department's response
Condition 19 (previously 21)	• Request clarity of the intent of the "PFAS containing substances or material" wording within this condition is to prevent PFAS containing firefighting foams from being brought onto the Premises. The licence holder acknowledges that PFAS is present in a broad range of substances and recommend this condition is removed noting additional commitments made in their newly revised TSEPP including implementation of a hazardous materials management procedure	The intent of the condition is to ensure that no PFAS-containing substances or materials are brought onto the premises that could potentially be discharged into the environment. This includes items such as firefighting foams, PFAS-impacted soils, and other commonly recognised sources of PFAS. The inclusion of the phrase "which may result in a discharge to the environment" was included to account for items containing PFAS, like objects coated with Teflon, water-resistant clothing, and personal care products, which are not typically considered capable of discharging PFAS into the environment.
Condition 21 (previously 22(d))	• Recommends amended wording to only record the quantities and spatial extent of PFAS-contaminated fill material that is deposited on the premises rather than all soil movements within the premises.	The delegated officer considers it necessary to record all soil and fill movements within the premises due to the uncertainty regarding what areas within the premises are impacted with PFAS. Further justification is included within section 3.2 of this Decision Report.
Decision Report		
Throughout	• The licence holder has provided factual corrections on s72 reports, management plans and updated information on sensitive receptors.	The delegated officer has made these factual corrections throughout the Decision report as they were deemed appropriate. Considerations regarding updated Part IV management plans have been addressed previously in this table. The delegated officer notes that several comments on the decision report are duplicates of those made regarding the licence, which have already been addressed above and are not repeated.
Section 2.3.1	• The licence holder provided additional information in regards to determining potential sources of PFAS within the Class 3 drainage system noting that preliminary investigations identified the potential sources of PFAS to be from historical foam system testing, stormwater run-off from ground at the GTP site, leaks and spills to grade in proximity to the Class 3 drainage system and historical earthwork activities and notes that the Area 20B PFAS containing soil stockpile must be considered within the overall context of PFAS presence within the greater GTP.	As per section 2.2 of this report, the amendment was initiated due to PFAS being detected within soil/fill material within the premises, groundwater and stormwater. Since the commencement of the amendment additional information has been provided by Chevron as investigations are ongoing related to the s72 reports and those being conducted under the CS Act. While this additional information has been considered by the delegated officer the Area 20B PFAS containing soil stockpile remains one of the key

Condition	Summary of Licence Holder's comment	Department's response
		drivers to this amendment. Additionally, the conditions and risk assessment extend beyond the stockpile, addressing other potential contamination sources across the premises to ensure risks of PFAS migration from other sources are appropriately managed.
3.3.7 (last sentence)	• Notes that all firefighting foam skids on the GTP have been changed to non PFAS containing foam, although residual levels of PFAS remain within the skids and associated pipe despite significant cleaning of the systems. Notes that while controls are in place to prevent releases of firewater during testing, this is not possible in an emergency event where water impacted by residual PFAS levels could be released into the environment.	The delegated officer acknowledges that the release of residual PFAS remains possible following emergency events.
2nd Draft Consultation		
Condition	**Summary of Licence Holder's comment**	**Department's response**
Definitions (Soil or fill movement)	• Recommends minor wording change to clarify range of operational activities considered a soil or fill movement recognising there is no benefit of tracking movements where relocation does not occur.	The delegated officer has updated the condition with Chevron's recommended wording as it aligns with the soil or fill movements intended to be captured within Condition 21.
Condition 14: Table 9	• Request removal of reference to the PFAS NEMP for PFAS analysis, as the NEMP provides broad advice on methodology and includes standard and non-standard methods which are subject to change, therefore the inclusion of its reference does not provide clarity to what methods are approved. Chevron states that they use NATA accredited laboratories which use analytical methods consistent with *Consolidated Quality Systems Manual (QSM) for Environmental Laboratories (DoD & DoE, 2021).* • Request Mercury be changed to Total Mercury • Request TRH laboratory method to be inclusive of silica gel cleanup, where TRH is detected as this methos is required to ensure the results reflect petroleum hydrocarbons, rather than hydrocarbons from non-petroleum sources (naturally occurring) • The installation of autosamplers in Class 3 drains, completed in late 2023/early 2024, is part of a trial program subject to ongoing refinement. CAPL has included a footnote to Figure 8 stating, "monitoring locations are subject to change, on the provision that they remain representative of the relevant stormwater catchment," to support continuous improvement. • Chevron acknowledges that autosamplers may occasionally experience	Reference to the PFAS NEMP for PFAS analysis has been removed from the methodology column. Requests to update Mercury to Total Mercury and inclusion of silica gel cleanup methodology have been accepted and the licence has been updated. The delegated officer considers it acceptable to allow some flexibility for the class 3 drainage system monitoring locations, provided that at least one monitoring location is maintained within each stormwater catchment. Accordingly, a footnote has been added to Table 9. Where sampling locations differ to what is specified within the licence, details must be provided within the Annual Environmental Report including the associated catchment area, this is reflected in updates to Condition 26. Regarding the requested changes to the sampling frequency of the Class 3 drainage system, the delegated officer notes that autosamplers have not

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	operational issues (e.g., failing to activate) and recommends including a footnote to reflect this limitation. • Chevron clarifies that monthly sampling will occur only when sufficient stormwater triggers the autosamplers, in alignment with DWER's Decision Document. However, they note that some discharges may occur without triggering the autosamplers.	been specified as the sampling method. This provides flexibility for a physical spot sample to be collected if the autosamplers are not activated during a discharge event. Given that only one sample is required per month where a discharge occurs, the delegated officer considers this frequency to be appropriately achievable.
Condition 15: Table 10	• Recommended updating the wording of analysis methods from Chevron documented to licence holder approved for consistency • Same request as per Table 9 related to removal of reference to the PFAS NEMP for PFAS analysis • Same request as per Table 9 related to TRH laboratory method to be inclusive of silica gel cleanup • Request Mercury be changed to Total Mercury • Request to update monitoring well labelling	The wording of the analysis methodology has been updated for consistency, and as above Mercury has been updated to Total Mercury and the silica gel cleanup method has been included within a footnote. Reference to the PFAS NEMP for PFAS analysis has been removed from the methodology column. Additionally, the monitoring wells labels has been updated as per the provided Figure.
Condition 16	• Chevron notes that not all wastes are transferred through the waste transfer station so recommends omission of this detail in item (d).	Reference to soils being relocated to the waste transfer station has been removed, and wording has been updated to ensure soil is transferred into sealed containers prior to removal off island.
Condition 21	• Chevron request limiting soil movement tracking to PFAS-impacted fill only but acknowledges the delegated officer's rationale for requiring records of all soil movements due to uncertainty about PFAS impact areas. CAPL suggests amended wording to exclude soil confirmed as PFAS-free (below the LOR) to reduce unnecessary administrative burden. • Recommends removing the ambiguous term "type" as it adds no value to the condition's intent. • Requests combining these items to streamline requirements, focusing on "source area, destination area, and volume," which aligns with the DWER Decision Document. • Suggests simplifying wording to "time period for each transfer" to achieve the intended outcome while reducing administrative effort.	As per the Table 5, the delegated officer considers it necessary to track all soil movements and the required register will establish a record to trace the movement of materials, providing an audit trail that can be referred to if any future contamination concerns arise (whether they are related to PFAS or other contaminants). The delegated officer does not consider it burdensome to track the movements of soil confirmed as below the LOR for the specified PFAS compounds. Referring to the requirements of the condition, the delegated officer has determined it appropriate to remove the term type from the condition and simplify the requirements to recording volume, source area, destination area and time period for soil and fill movements as defined.
Condition 24	• Chevron has recommended the removal of the reporting condition due to the	The intent of the condition was to ensure prompt

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	immediate reporting (7 days) having limited value due to the following considerations: • meeting requirements under 24(c) and (d) within this timeframe is not feasible, as investigations require data validation, potential re-sampling, and extended actions such as identifying impact sources, implementing management measures, and conducting contaminated site investigations, which may take several months. • Chevron views groundwater results and associated actions are best reported in the Annual Environmental Report and note reporting requirements under Condition 24 are duplicative of those in Condition 27 (revised to 26), which already mandates annual reporting for groundwater monitoring, including data interpretation and comparison to historical trends and emission limits. • Condition 17 already requires actions under the Environmental Management, Maintenance, and Operating Plan for the Area 20B stockpile which will encompass environmental monitoring, reporting and criteria for assessing risks to receptors inclusive of groundwater. • Condition 18 already requires actions to investigate, manage, and potentially remove PFAS and other contaminants from the premises Inclusive of annual reporting commitments and investigations and reporting will encompass groundwater as part of the receiving environment. • Proposed LOR trigger levels have already been exceeded for several PFAS compounds at the groundwater monitoring wells at the TWIP, PWD and Area 20B stockpile and, therefore, Condition 24 in its current form is likely to be triggered after every quarterly monitoring event. • Chevron therefore recommends removing the condition and including the requirements of 24(c) and 24(d) into the annual environmental report (condition 26) with some minor amendments.	reporting of potential impacts to groundwater and to provide the department with oversight of the investigations and actions taken by the Licence Holder. The delegated officer acknowledges that as exceedance of the proposed trigger levels has already occurred for some locations, the proposed reporting condition may be of limited value. Reporting of monitoring trends, tracking against trigger levels and outcomes of exceedance investigations and management responses to these within the Annual Environmental Report is viewed as an appropriate reporting mechanism for the department to maintain oversight of potential groundwater impacts. The delegated officer additionally notes that the department is able to request the licence holder to produce records of monitoring programs in accordance with condition 22(d) therefore has the option to request data more frequently if deemed appropriate. In accordance with this condition the department intends to request the most recent monitoring records following the grant of the amendment to confirm the current status of the monitoring locations. Condition 26 reporting requirements have been expanded to require additional information relating to groundwater trigger level exceedances.
Condition 27 (revised to 26) Table 11	• Chevron recommends removing the requirement under Condition 16 to provide a record of fill material that has been deposited (from the Area 20B PFAS containing soil stockpile). Noting that tracking of soil confirmed to be 'clean' does not provide any environmental benefit but, instead, introduces unnecessary administrative burden.	The delegated determined to remove this requirement within the Annual Environmental Report as it will be captured within the soil movement register, per Condition 21 which must be available to be produced to an inspector or the CEO as required per condition 22(d).
Schedule 1	• Chevron has provided an updated Premises Boundary Map to amend the boundary, ensuring it covers the entire Class 3 drainage system for the GTP,	All figures have been updated and the premises boundary amended.

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	and that the sampling locations defined in Figure 8 are within the prescribed Premises Boundary. • Updated Maps for Figures 6 and 8 have also been provided for accuracy.	
Schedule 3: Table 14	• Chevron has requested that the sampling methods for PFAS be updated to align with the sampling requirements outlined in Tables 10 and 14.	Sampling methods have been updated for consistency.
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Throughout	• Recommended consistency when referring to the stockpile at the GTP as the Area 20B soil stockpile.	References have been updated where necessary.
Table 5	• Typographic error identified where PFAS should be referenced within the air/ windborne pathway for PFAS containing soils.	Typographic error has been corrected.
Section 3	• Chevron recommends removing Table 6 (Summary of PFAS detection in soil leachate) and replacing it with the direct soil analysis results from the Enpoint Report (2022), due to the unreliability of the testing as advised by the Contaminated Sites Branch and reflected in Condition 16; they also suggest clarifying that 15 of 100 samples detected PFAS directly in soil, and amending subsequent references in section 3.3.4 to indicate that PFAS was detected at or above LOR in 15 samples and that subsequently the key findings and other references to the leachate tests should be amended to reflect this. • Chevron acknowledges their obligation to report discharges under s72 of the EP Act and understands from the 10 September 2024 meeting with DWER that surface water monitoring results will be shared until a licence condition is in place, with additional reporting for the Class 3 drainage system required only if substantial changes in monitoring results occur. • CAPL requests the removal of the reference to emergency events from justification for Condition 19 *Given the acknowledgement from DWER that the release of residual PFAS remains possible following emergency events*	The delegated officer determines the need to update the decision report and risk assessment throughout the draft consultation process where clarifications are required or where information is outdated. While the delegated officer acknowledges that there is a level of uncertainty with regard to the reliability of leachate testing, it is considered that the leachate results within the Enpoint Report (2022) remain relevant to the assessment as the leachate method is able to detect PFAS when the PFAS content of the soil is below the LOR for the soil analysis. The delegated officer deemed it appropriate to include both the soil and soil leachate results in section 3.3. The delegated officer notes the comments made regarding s72 reporting. The delegated officer has determined to update the wording within section 3.3.7 in reference to justification for Condition 19 to clarify the intent of the condition is to prevent new sources of PFAS entering the environment and not residual PFAS.