Appendix A: Change notice – Regulation 22

Interest holder	Tamboran B2 Pty Ltd	**EMP Title**	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	**Unique EMP ID**	ORI10-3	**Mod #**	8	**Date**	26 March 2025
Brief Description	Beetaloo MW EMP update on advice from DLPE to consolidate Regulation 22 notifications. The update includes converting to Tamboran's EMP template, rolling up the 7 modification notifications and this modification. The updated EMP and associated appendices is provided with this modification as a separate document. The following additional modifications have been included in this Regulation 22 notification: - Amendment to EMP in relation to offsite stormwater release criteria to provide consistency in stormwater discharge criteria across all Tamboran exploration and appraisal well sites. - Update of the Chemical List based on the current Chemical Risk Assessments provided in Appendix E. - Minor formatting and company detail updates. The Appendices have been compiled as follows: - Appendix A Bushfire Management Plans – Amungee NW Rev 4.0 (Mar 2025) and Velkerri 76 S2 Rev 3.0 (Mar 2025) - Appendix B Water extraction licence (current licence number GRF10285) - Appendix C Weed Management Plan (Rev 4.0, 10/10/2024) - Appendix D Engineering Drawing Layouts and Specs (no change) - Appendix E Chemical Risk Assessments (Beetaloo CRA Rev 10 and E.1 Condor CRA, E.2 Fusion CRA) - Appendix F Spill Management Plan (Rev 5.1, dated 6/03/2025) - Appendix G Wastewater Management Plan (Rev 2.2, dated 26/04/2024) - Appendix H Erosion and Sediment Control Plan (Rev 14, dated 06/03/2025) - Appendix I Methane Emission Management Plan (Rev 2, dated 15/03/2024) - Appendix J Water Monitoring Suite (no change) - Appendix K Land Condition Assessment (no change) - Appendix L Unexpected heritage finds procedure (Rev 1, dated 17/02/2025) - Appendix M ERA (no change) - Appendix N Stakeholder log (no change) - Appendix O Rehabilitation Plan (Amungee NW Rev 3 (Mar 2025) and Velkerri 76 S2 Rev 1 (Mar 2025)) - Appendix P Environmental Compliance (no change) - Appendix Q Emergency Response Plan (Rev 4.0, dated 22/10/2024)								
Geospatial files included?	N/A – no change to previously provided shapefiles								

Interest holder	Tamboran B2 Pty Ltd	**EMP Title**	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	**Unique EMP ID**	ORI10-3	**Mod #**	8	**Date**	26 March 2025

Does the proposed change result in a new, or increased, or potential or actual environmental impact or risk?	**If an INCREASE in the existing potential or actual environmental risk, is it provided for in the EMP?**	**Does the proposed change require additional mitigation measures to be included?**	**Has additional stakeholder engagement been conducted?**	**Does it require additional environmental performance standards and measurement criteria?**	**Does it affect compliances with Sacred Site Authority Certificates?**	**Does it affect current rehabilitation, weed fire, wastewater, erosion and sediment control, spill or emergency response plans?**	**Will the environmental outcome continue to be achieved, and will the impacts and risks be managed to ALARP and acceptable?**
No There are no new or increased environmental impacts or risks. The update of the Beetaloo MW EMP have already been assessed and Regulation 22 published. The revised discharge criteria have been discussed in the EMP and is evaluated to be ALARP and acceptable. There are no new or increased environmental impacts or risks through the addition of the new chemicals. The new chemical has been assessed to have a risk that is low and acceptable.	No No increased impact or risk with sufficient controls outlined in the EMP, including the spill management plan and wastewater management plan	No Existing mitigation measures are in place.	No Stakeholder engagement is not required as changes align with existing EMPs and ongoing activities.	No Environmental performance standards within the existing approved EMP are sufficient.	No Activity covered under the existing AAPA certificates.	No All management plans remain valid and appropriate. Update of management plans have been completed to align with the Beetaloo permit wide activities and are the current versions.	Yes Stormwater monitoring outlined in *Table 54: Environmental outcomes, performance standards and measurement criteria – Inland water environmental quality and aquatic ecosystems*, will be met.

Additional contextual information	Not applicable.

Interest holder	Tamboran B2 Pty Ltd	EMP Title	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	Unique EMP ID	ORI10-3	Mod #	8	Date	26 March 2025

Current EMP text	Amended EMP text
Executive summary Origin Energy B2 Pty Ltd (Origin) is a registered holder and the operator of exploration permits (EP) 98 and EP76, located in the Beetaloo Sub-basin. This Environment Management Plan (EMP) forms the basis of Origin's application to the Northern Territory (NT) Minister for Environment for the drilling, hydraulic fracture stimulation (HFS) and well testing of four additional exploration and appraisal (E&A) wells: two each at the existing Amungee NW and Velkerri 76 S2 sites (Figure 1). This will increase the number of E&A wells at Amungee NW and Velkerri 76 S2 to three each. Amungee NW is an existing site located on the Amungee Mungee pastoral station within EP98. It contains the existing Amungee NW-1H E&A well, which was drilled in 2015 and 2016 under the previously approved Beetaloo Sub-basin EP98 and EP117 Exploration Drilling EMP NT-2050-15-MP-0010. Also located on the Amungee Mungee station but within EP76, Velkerri 76 S2 was constructed under the approved 2019 Beetaloo Basin Velkerri 76 S2 Civil Construction EMP (NT-2050-15-MP-03) and contains the Velkerri 76 S2-1 E&A well which was drilled in 2021 under the approved Beetaloo Basin Drilling, Stimulation and Well Testing Program Velkerri 76 S2 EMP (NT-2050-15-MP-032). The four proposed additional E&A wells covered under this EMP are: • Amungee NW-2H and Amungee NW-3H at the Amungee NW location • Velkerri 76 S2-2H and Velkerri 76 S2-3H at the Velkerri 76 S2 location All wells target the Velkerri shale resource, though the Amungee NW is dry shale and the Velkerri 76 S2 wells are wet gas. The drilling, stimulation and well testing of the four E&A wells at the existing sites is considered an important step in confirming the technical and commercial feasibility of the Velkerri shale resource. The use of multi-well pads is likely to significantly reduce the environmental footprint of any potential development. The appraisal results collected from these wells will be used to: • Validate reservoir flows from the Velkerri target formation at the sites with multiple wells • Optimise HFS design and spacing between adjacent horizontal wells in a multi-well pad operation • Optimise multi-well pad layout of surface operations for a potential future development scenario with the core objective of minimising the environmental footprint, including minimising land clearance, maximising water re-use and reducing greenhouse gas (GHG) emissions • Determine optimal well spacing at a well pad to inform development of the Mechanical Earth Model (MEM) for a future potential development (subject to exploration success) • Demonstrate design requirements and operability of multi-well pad operations across all seasons in the Beetaloo Sub-basin • Assess the financial competitiveness in multi-well pad development scenario to inform Final Investment Decision for future development scenarios • Demonstrate no impact on groundwater quality at a well site in a multi-well pad operation • Collect additional data on flowback quality and quantity during a multi-well pad operation to assess options for minimising off-site wastewater disposal through future treatment and re-use • Provide key data as input into future production approvals, including footprint optimisation, flowback characterisation, GHG emission intensity and solid and liquid waste management. The EMP has been prepared in compliance with the NT Petroleum (Environment) Regulations 2016, Code of Practice: Onshore Petroleum Activities in the Northern Territory (referred to herein as the "Code of Practice") and the Exploration Agreements between Origin, Native Title holders and the Northern Land Council (NLC).	**Executive summary** Tamboran B2 Pty Ltd (Tamboran) is a registered holder and the operator of exploration permits (EP) 98 and EP76, located in the Beetaloo Sub-basin. This Environment Management Plan (EMP) was the basis of Tamboran's application to the Northern Territory (NT) Minister for Environment for the drilling, hydraulic fracture stimulation (HFS) and well testing at Amungee NW well site and Velkerri 76 S2 well site (Figure 1). This EMP covers two existing petroleum wells and four new exploration and appraisal (E&A) petroleum wells as follows: • Amungee NW (existing), Amungee NW-2H and Amungee NW-3H at the Amungee NW location • Velkerri 76 S2-1H (existing), Velkerri 76 S2-2H and Velkerri 76 S2-3H at the Velkerri 76 S2 location. The drilling, stimulation and well testing of the E&A wells on each of the exploration sites is considered an important step in confirming the technical and commercial feasibility of the Velkerri shale. The Amungee NW site is located in the dry gas window, with recent data acquired from the existing Amungee NW-1H E&A well confirming better than originally determined shale gas prospectively. The Velkerri 76 S2 is located in the wet gas window, with indicative results collected during the drilling of Velkerri 76 S2-1 confirming the presence of wet gas. The Amungee NW well site is an existing site located on the Amungee Mungee station within EP98. It contains the existing Amungee NW-1H E&A well, which was drilled in 2015 and 2016 under the previously approved Beetaloo Sub-basin EP98 and EP117 Exploration Drilling EMP (Origin-2015) and Amungee NW-1H EPT EMP (ORI7-2). Also located on the Amungee Mungee station but within EP76, Velkerri 76 S2 was constructed under the Beetaloo Basin Velkerri 76 S2 Civil Construction EMP (ORI4-1) and contains the Velkerri 76 S2-1 E&A well which was vertically drilled in 2021 under the approved Beetaloo Basin Drilling, Stimulation and Well Testing Program Velkerri 76 S2 EMP (ORI5-4). Following this, Velkerri 76 S2-1 well deferred the horizontal drilling section, hydraulic fracturing and well testing to the 2025/2026 period. This EMP update includes the regulated activities that are required to enable Tamboran to drill, stimulate, test, maintain and decommission the E&A wells on Amungee NW and Velkerri 76 S2 site within the 2022-2026 period. As at this date of this EMP version, there have been eight (8) regulation 22 notifications: • ORI10-3.1 Water bore location change (Amungee NW2) • ORI10-3.2 Change to HF fluids • ORI10-3.3 Change to completion fluids • ORI10-3.4 Bore infrastructure and EMP edits • ORI10-3.5 Roll up of remaining civil works for Velkerri 76 S2 well site including gravel pits, access tracks and associated activities • ORI10-3.6 Roll up of remaining DST activities for Velkerri 76 S2 drilling, stimulation and well testing activities • ORI10-3.7 Roll up of Amungee NW-1H EPT. • ORI10-3.8 Amungee Multi-well EMP update, including stormwater amendments and revised chemical risk assessment. All wells target the Velkerri shale resource, though the Amungee NW is dry shale and the Velkerri 76 S2 wells are wet gas. The drilling, stimulation and well testing of the E&A wells at the existing sites is considered an important step in confirming the technical and commercial feasibility of the Velkerri shale resource. The use of multi-well pads is likely to significantly reduce the environmental footprint of any potential development. The appraisal results collected from these wells will be used to: • Validate reservoir flows from the Velkerri target formation at the sites with multiple wells • Optimise HFS design and spacing between adjacent horizontal wells in a multi-well pad operation

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Current EMP text

The overall objective of the EMP is to ensure that the proposed activities, are carried out in a manner by which the environmental impacts and risks will be reduced to a level that is as low as reasonably practicable and are acceptable.

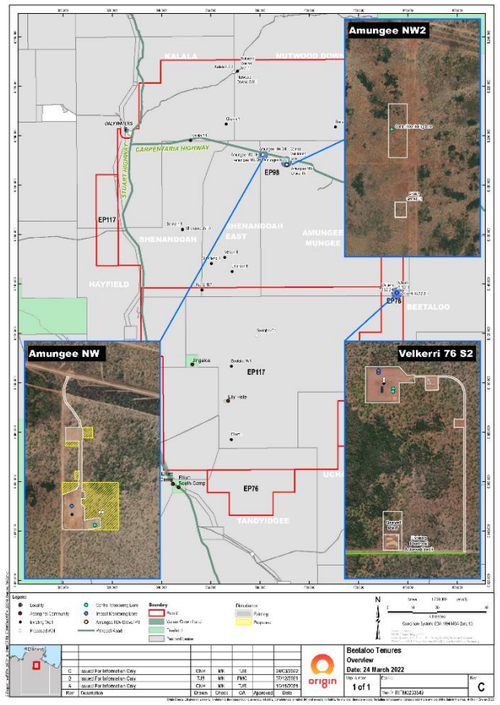

Figure 1: Location of Amungee NW and Velkerri 76 S2 well sites

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Chemical risk assessment

A chemical risk assessment has been completed for all chemicals to be used in drilling and HFS. All chemicals were considered low concern when standard chemical handling, storage and disposal practices were utilised. The chemicals and estimated quantities that may be added to the HFS proppant (sand) are shown in Table .

Table 4: Chemicals that may be added to the sand proppant during stimulation activities

Material name	Typical volume	Maximum volume	Unit	Storage area
Acetic Acid - 60% PH control	3,000	6,000	L	Stimulation chemical storage area
BE-9 Biocide	17,000	34,000	L	Stimulation chemical storage area
Caustic Soda Liquid pH control/ buffer	15,000	30,000	L	Stimulation chemical storage area
DCA-11001 Breaker Activator	5,000	10,000	L	Stimulation chemical storage area
DCA-13002 Breaker	300	600	kg	Stimulation chemical storage area
DCA-13003 Breaker	10,000	20,000	L	Stimulation chemical storage area
DCA-16001 Clay Stabiliser	42,000	84,000	L	Stimulation chemical storage area

Amended EMP text

- Optimise multi-well pad layout of surface operations for a potential future development scenario with the core objective of minimising the environmental footprint, including minimising land clearance, maximising water re-use and reducing greenhouse gas (GHG) emissions
- Determine optimal well spacing at a well pad to inform development of the Mechanical Earth Model (MEM) for a future potential development (subject to exploration success)
- Demonstrate design requirements and operability of multi-well pad operations across all seasons in the Beetaloo Sub-basin
- Assess the financial competitiveness in multi-well pad development scenario to inform Final Investment Decision for future development scenarios
- Demonstrate no impact on groundwater quality at a well site in a multi-well pad operation
- Collect additional data on flowback quality and quantity during a multi-well pad operation to assess options for minimising off-site wastewater disposal through future treatment and re-use
- Provide key data as input into future production approvals, including footprint optimisation, flowback characterisation, GHG emission intensity and solid and liquid waste management.

The EMP has been prepared in compliance with the NT Petroleum (Environment) Regulations 2016, Code of Practice: Onshore Petroleum Activities in the Northern Territory (referred to herein as the "Code of Practice") and the Exploration Agreements between Tamboran, Native Title holders and the Northern Land Council (NLC).

The overall objective of the EMP is to ensure that the proposed activities, are carried out in a manner by which the environmental impacts and risks will be reduced to a level that is as low as reasonably practicable and are acceptable.

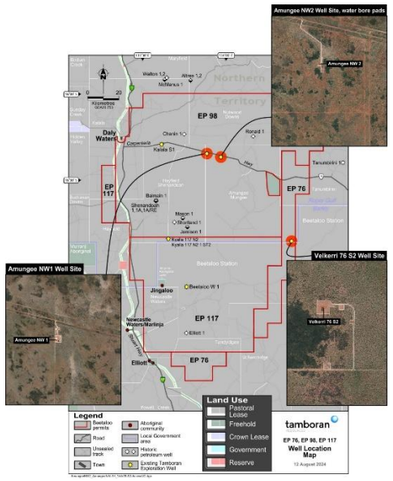

Figure 1: Location of Amungee NW, Amungee NW2 and Velkerri 76 S2 well sites

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Chemical risk assessment

A chemical risk assessment has been completed for all chemicals to be used in drilling and HFS. All chemicals were considered low concern when standard chemical handling, storage and disposal practices were used. The chemicals and estimated quantities that may be added to the HFS proppant (sand) are shown in Table 4.

Current EMP text

DCA-17001 Corrosion Inhibitor	1,000	2,000	L	Stimulation chemical storage area
DCA-19001 Crosslinker	600	1,200	kg	Stimulation chemical storage area
DCA-19002 Crosslinker	10,000	20,000	L	Stimulation chemical storage area
DCA-23001 Friction Reducer	5,000	10,000	kg	Stimulation chemical storage area
DCA-23003 Friction Reducer	18,000	36,000	L	Stimulation chemical storage area
DCA-25005 Gelling Agent	35,000	70,000	kg	Stimulation chemical storage area
DCA-30001 Scale Inhibitor	15,000	30,000	L	Stimulation chemical storage area
DCA-32002 Surfactant	15,000	30,000	L	Stimulation chemical storage area
DCA-32014 Surfactant	200	400	L	Stimulation chemical storage area
FE-2 Buffer	200	400	kg	Stimulation chemical storage area
Hydrochloric Acid - 32%	50,000	150,000	L	Stimulation chemical storage area
100 Mesh Sand- Proppant	91,000	182,000	kg	Stimulation chemical storage area
40/70 Sand- Proppant	1,650,000	3,300,000	kg	Stimulation chemical storage area
30/50 Sand- Proppant	610,000	1,220,000	kg	Stimulation chemical storage area
Alcohols, C11-14-iso-, C13-rich,ethoxylated- Surfactant	5285	10570	L	Stimulation chemical storage area
Sodium (C14-16) olefin sulfonate - Surfactant	4658	9316	L	Stimulation chemical storage area
Diisobutyl glutarate - plasticiser	627	1254	L	Stimulation chemical storage area
Diisobutyl succinate - plasticiser	209	418	L	Stimulation chemical storage area
Diisobutyl adipate- plasticiser	179	358	L	Stimulation chemical storage area
sodium thiosulphate-stabilising agent	4763	9527	L	Stimulation chemical storage area
sodium sulphate stabilising agent	913	1827	L	Stimulation chemical storage area
sodium sulphite stabilising agent	794	1588	L	Stimulation chemical storage area
Ethylene Glycol- Crosslinker	5112	10225	L	Stimulation chemical storage area
Choline Chloride-Claystabiliser	10301	20603	L	Stimulation chemical storage area
Glutaraldehyde- Biocide	14930	29859	L	Stimulation chemical storage area
Ammonium Sulphate-Breaker	4479	8958	L	Stimulation chemical storage area
Polyacrylamide- Friction reducer	4479	8958	L	Stimulation chemical storage area
Sodium polyacrylate- gelling agent	746	1493	L	Stimulation chemical storage area
Sodium bisulfite- stabiliser	149	299	L	Stimulation chemical storage area
Alkyl Alcohol- surfactant	149	299	L	Stimulation chemical storage area
2-Propenoic acid, homopolymer, ammonium salt- biocide	149	299	L	Stimulation chemical storage area
Potassium persulfate-braker	149	299	L	Stimulation chemical storage area

Amended EMP text

Table 4: Chemicals that may be used on each well pad (based on 3 wells per pad)

Material name	Typical volume	Maximum volume	Unit	Storage area	Chemical composition	CAS Number	Chemical risk assessment report
Stimulation Chemicals							
Acetic acid - 60% pH control	3,000	9,000	L	Stimulation chemical storage area	Acetic acid	64-19-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
BE-9 biocide	17,000	17,000	L	Stimulation chemical storage area	Tributyl tetradecyl phosphonium chloride	81741-28-8	AECOM, 2024 – Appendix
Caustic soda liquid - pH control / buffer	15,000	45,000	L	Stimulation chemical storage area	Sodium hydroxide	1310-73-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
DCA-11001 breaker activator	5,000	15,000	L	Stimulation chemical storage area	Diethanolamine	111-42-2	AECOM, 2024a – Appendix E
DCA-13002 breaker	300	900	kg	Stimulation chemical storage area	Sodium persulfate	7775-27-1	AECOM, 2024a – Appendix E
DCA-13003 breaker	10,000	30,000	L	Stimulation chemical storage area	Chlorous acid, sodium salt Sodium chloride	7758-19-2 7647-14-5	AECOM, 2024a – Appendix E
DCA-16001 clay stabiliser	42,000	126,000	L	Stimulation chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
DCA-17001 corrosion inhibitor	1,000	3,000	L	Stimulation chemical storage area	Diethylene glycol Cinnamaldehyde Amine oxides, cocoalkyldimethyl Methanol Benzaldehyde Alcohols, C12-16, ethoxylated	111-46-6 104-55-2 61788-90-7 67-56-1 100-52-7 68551-12-2 7681-82-5	AECOM, 2024a – Appendix E

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Current EMP text

2-Ethoxy-naphthalene-surfactant	149	299	L	Stimulation chemical storage area
Sodium Gluconate- stabiliser	8576	17152	L	Stimulation chemical storage area
Boric -Crosslinker	4288	8576	L	Stimulation chemical storage area
Potassium Hydroxide- pH control	10745	21491	L	Stimulation chemical storage area
Mannanase- Cross linker	2	4	L	Stimulation chemical storage area
Ammonium Persulphate-breaker	7451	14902	L	Stimulation chemical storage area
Talc- buffer	384	769	L	Stimulation chemical storage area
Sodium Bromate- breaker	50441	100881	L	Stimulation chemical storage area
Hepta sodium phosphonate-Emulsifier	3176	6351	L	Stimulation chemical storage area
DISTILLATES, HYDROTREATED LIGHT- friction reducer	54231	108462	L	Stimulation chemical storage area
Guar Gum- Viscocity regulator	15141	30282	L	Stimulation chemical storage area
Polyoxyethylene nonylphenol ether- surfactant	4466	8933	L	Stimulation chemical storage area
Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite- biocide	4466	8933	L	Stimulation chemical storage area
1,6-Hexanediol- cross linker	447	893	L	Stimulation chemical storage area
Quartz or Organophilic phyllosilicate- proppant	1084	2167	L	Stimulation chemical storage area
HydroChloric Acid- pH control	44715	89430	L	Stimulation chemical storage area
N-Benzyl-Alkylpyridinium Chloride- pH control	28	57	L	Stimulation chemical storage area
Formic Acid- corrosion inhibitor	38	76	L	Stimulation chemical storage area
Sodium erythorbate- scaler prohibitor	334	668	L	Stimulation chemical storage area
Citric Acid- pH control	15878	31756	L	Stimulation chemical storage area
Acetic Acid- pH control	15878	31756	L	Stimulation chemical storage area
Isopropanol- clay management	83	167	L	Stimulation chemical storage area
Ethoxylated C12-C16 Alcohol - surfactant	57	114	L	Stimulation chemical storage area
Ethoxylated Decanol - surfactant	19	38	L	Stimulation chemical storage area
Cinnamaldehyde- biocide	57	114	L	Stimulation chemical storage area
Ethoxylated Tallow Alkyl Amine - surfactant	9	19	L	Stimulation chemical storage area
Methanol- corrosion inhibitor	2	4	L	Stimulation chemical storage area

Amended EMP text

					Sodium iodide		
DCA-19001 crosslinker	600	1,800	kg	Stimulation chemical storage area	Disodium octaborate tetrahydrate	12008-41-2	AECOM, 2024a – Appendix E
DCA-19002 crosslinker	10,000	30,000	L	Stimulation chemical storage area	Ulexite Ethylene glycol Crystalline silica, quartz	1319-33-1 107-21-1 14808-60-7	AECOM, 2024a – Appendix E
DCA-23001 friction reducer	5,000	15,000	kg	Stimulation chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
DCA-23003 friction reducer	18,000	54,000	L	Stimulation chemical storage area	Hydrotreated light petroleum distillate Ethoxylated branched C13 alcohol Sodium diacetate	64742-47-8 78330-21-9 126-96-5	AECOM, 2024a – Appendix E
DCA-25005 gelling agent	35,000	105,00	kg	Stimulation chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
DCA-30001 scale Inhibitor	15,000	45,000	L	Stimulation chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
DCA-32002 surfactant	15,000	45,000	L	Stimulation chemical storage area	Alcohols, C6-C12, ethoxylated propoxylated Alcohols, C10-C16, ethoxylated propoxylated	68937-66-6 69227-22-1	AECOM, 2024a – Appendix E
DCA-32014 surfactant	200	600	L	Stimulation chemical storage area	Hydrotreated light petroleum distillate Ethanol Fatty acids, tall-oil, ethoxylated C12-C15 Ethoxylated alcohols Amides, tall-oil fatty, N,N-bis(hydroxyethyl) Butyl alcohol Methanol	64742-47-8 64-17-5 61791-00-2 68131-39-5 68155-20-4 71-36-3 67-56-1	AECOM, 2024a – Appendix E
FE-2 buffer	200	600	kg	Stimulation chemical storage area	Citric acid	77-92-9	AECOM, 2024a – Appendix E
Hydrochloric acid - 32%	50,000	150,000	L	Stimulation chemical storage area	Hydrochloric acid (32%)	7647-01-0	AECOM, 2024a – Appendix E

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Current EMP text					Amended EMP text						
Polyacrylamide - friction reducer	49093	98186	L	Stimulation chemical storage area	Alcohols, C11-14-iso-, C13-rich, ethoxylated-surfactant	5,285	15,855	L	Stimulation chemical storage area	Alcohols, C11-14-iso-, C13-rich, ethoxylated	78330-21-9	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Polyethylene glycol trimethylnonyl ether - clay manager	87	173	L	Stimulation chemical storage area								
Water in Additive- stabiliser	66804	133607	L	Stimulation chemical storage area								
Potassium Sorbate Food Grade- corrosion inhibitor	14	29	L	Stimulation chemical storage area								
Mannanase (Mannan endo-1,4-beta-mannosidase)- cross linker	2	4	L	Stimulation chemical storage area	Sodium (C14-16) olefin sulfonate - surfactant	4,658	13,974	L	Stimulation chemical storage area	Sodium (C14-16) olefin sulfonate	68439-57-6	EHS Support, (2023) – Appendix E.1
Nonoxynol-9- surfactant	9	19	kg	Stimulation chemical storage area								
2-Ethylhexanol PO/EO polymer- stabiliser	9	19	kg	Stimulation chemical storage area								
Corn Oil- friction reducer	662	1325	kg	Stimulation chemical storage area	Diisobutyl glutarate - plasticiser	627	1,881	L	Stimulation chemical storage area	Diisobutyl glutarate	71195-64-7	EHS Support, (2023) – Appendix E.1
Sodium hypochlorite	10,000	30,000	L	Completion chemical storage area								
Sodium Chloride- weighting agent	15,000	30,000	kg	Completion chemical storage area								
ALDACIDE G Biocide	500	1,000	L	Completion chemical storage area								
OXYGON Oxygen scavenger	100	200	kg	Completion chemical storage area								
BARACOR 100 corrosion inhibitor	2,000	4,000	L	Completion chemical storage area								
CON-DET wetting agent	50	100	kg	Drilling chemical storage area								
SAPP- sodium Acid Phosphate cement treatment	50	100	kg	Drilling chemical storage area								
Bentonite- lubricant	3,000	6,000	kg	Drilling chemical storage area								
Caustic Soda-pH control	1,400	2,800	kg	Drilling chemical storage area								
EZ MUD DP or EZ MUD Liquid- drilling mud	2000	4,000	kg	Drilling chemical storage area								
ALDACIDE G Biocide	336	672	kg	Drilling chemical storage area								
STOPPIT Loss of circulation material	1,000	2,000	kg	Drilling chemical storage area								
Soda Ash- drill mud conditioner	350	700	kg	Drilling chemical storage area								
BARACOR 100 Corrosion inhibitor	250	500	kg	Drilling chemical storage area								
Sodium Chloride (Flossy Salt)- weighting agent and formation inhibitor	96,000	192,000	kg	Drilling chemical storage area								
Barite- weighting agent	500	1,000	kg	Drilling chemical storage area								
BARACARB loss of circulation material	500	1,000	kg	Drilling chemical storage area								
Citric Acid- pH control	500	1,000	kg	Drilling chemical storage area								
BARADEFOAM HP Drilling fluid/foam	500	1,000	kg	Drilling chemical storage area								
Sodium Bicarbonate- pH buffer	500	1,000	kg	Drilling chemical storage area								
					Diisobutyl adipate- plasticiser	179	537	L	Stimulation chemical storage area	Diisobutyl adipate	141-04-8	EHS Support, (2023) – Appendix E.1
					Sodium thiosulphate- stabilising agent	4,763	14,289	L	Stimulation chemical storage area	Sodium thiosulphate	7772-98-7	EHS Support, (2023) – Appendix E.1
					Sodium sulphate stabilising agent	913	2,739	L	Stimulation chemical storage area	Sodium sulphate	7757-82-6	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
					Sodium sulphite stabilising agent	794	2,382	L	Stimulation chemical storage area	Sodium sulphite	7757-83-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
					Ethylene glycol- crosslinker Anti-freeze	8,416	25,247	L	Stimulation chemical storage area	Ethylene glycol	107-21-1	AECOM, 2024a – Appendix E

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PERFORMATROL- polymer fluid system	500	1,000	kg	Drilling chemical storage area
SOURSCAV- mud additive treat H2S contamination	500	1,000	kg	Drilling chemical storage area
DRIL-N-SLIDE- Casing lubricant	500	1,000	kg	Drilling chemical storage area
STEELSEAL- corrosion inhibitor	500	1,000	kg	Drilling chemical storage area
BARAZAN D or BARAZAN D PLUS- viscosity increaser	4,150	8,300	kg	Drilling chemical storage area
PAC L Loss of circulation material	2,300	4,600	kg	Drilling chemical storage area
Potassium Chloride- weighting agent and formation inhibitor	22,500	45,000	kg	Drilling chemical storage area
GEM CP/GP Shale stabiliser	500	1,000	kg	Drilling chemical storage area
QUIK-FREE – drilling additive	500	1,000	kg	Drilling chemical storage area
BAROFIBRE, BAROFIBRE Superfine and BAROFIBRE COARSE Loss of circulation material	500	1,000	kg	Drilling chemical storage area
BaraBlend-657 Loss of circulation material	500	1,000	kg	Drilling chemical storage area
N-DRIL HT PLUS filtration control additive	500	1,000	kg	Drilling chemical storage area
DEXTRID LTE filtration control additive	4,600	13,800	kg	Drilling chemical storage area
BARABUF pH buffer	500	1,000	kg	Drilling chemical storage area
BORE-HIB shale stabiliser	500	1,000	kg	Drilling chemical storage area
BDF 933 or BaraLube W-933 drilling lubricant	864	1,728	kg	Drilling chemical storage area
BAROLIFT sweeping agent	500	1,000	kg	Drilling chemical storage area
OXYGON Oxygen scavenger	500	1,000	kg	Drilling chemical storage area
ENVIRO-THIN filtration control additive	500	1,000	kg	Drilling chemical storage area
Lime pH buffer	500	1,000	kg	Drilling chemical storage area
BDF 677 Clay stabiliser	4,770	9,540	kg	Drilling chemical storage area
BDF 988 Clay stabiliser	3,390	6,780	kg	Drilling chemical storage area
SARALINE 185V- Synthetic based mud	299,800	599,600	kg	Drilling chemical storage area
NOVATEC P emulsifier for SBM	13,110	26,220	kg	Drilling chemical storage area
NOVATEC S emulsifier SBM	5700	11,400	kg	Drilling chemical storage area
Calcium Chloride weighting agent SBM	37,000	74,000	kg	Drilling chemical storage area
VG SUPREME clay viscosifier SBM	11,350	22,700	kg	Drilling chemical storage area

Amended EMP text

							EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Choline chloride- clay stabiliser / clay swelling control (2-hydroxy-N,N,N-trimethylethanaminium chloride)	67,750	203,250	L	Stimulation chemical storage area	Choline chloride	67-48-1	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Glutaraldehyde- biocide	14,930	44,790	L	Stimulation chemical storage area	Glutaraldehyde	111-30-8	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Ammonium sulphate- breaker	4,479	13,491	L	Stimulation chemical storage area	Ammonium sulphate	7783-20-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Polyacrylamide- friction reducer	4,479	13,491	L	Stimulation chemical storage area	Polyacrylamide	25085-02-3	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Sodium polyacrylate- gelling agent	746	2,238	L	Stimulation chemical storage area	Sodium polyacrylate	9003-04-7	AECOM, 2024a – Appendix E

Current EMP text

M-I BAR weighting agent SBM	193,500	169,500	kg	Drilling chemical storage area
NOVATEC F emulsifier SBM	3,610	7,220	kg	Drilling chemical storage area
NOVATEC transferred emulsifier SBM	1770	1770	kg	Drilling chemical storage area
Waste drilling fluids	2,500	2,500	m^3	Drilling mud sump
Completion fluids	1.4	1.4	ML	Drilling mud sump/on-site tank
Condensate	160	320	KL	Condensate storage area
Diesel	250	500	KL	Diesel storage tanks
Hydraulic oil	1,000	3,000	L	Workshop
Engine oil	1,000	3,000	L	Workshop
Degreasers	100	300	L	Workshop
Flowback	<10	13.8	ML	Flowback tanks

Amended EMP text

							EHS Support, (2023) – Appendix E.1
Sodium bisulfite- stabiliser	149	447	L	Stimulation chemical storage area	Sodium bisulfite	7631-90-5	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Alkyl alcohol- surfactant	149	447	L	Stimulation chemical storage area	Alkyl alcohol	56-81-5	EHS Support, (2023) – Appendix E.1
2-Propenoic acid, homopolymer, ammonium salt- biocide	149	447	L	Stimulation chemical storage area	2-Propenoic acid, homopolymer, ammonium salt	9003-03-6	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Potassium persulfate- braker	149	447	L	Stimulation chemical storage area	Potassium persulfate	7727-21-1	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
2-Ethoxy-naphthalene- surfactant	149	447	L	Stimulation chemical storage area	2-Ethoxy-naphthalene	93-18-5	EHS Support, (2023) – Appendix E.1
Sodium gluconate- stabiliser	8,576	25,728	L	Stimulation chemical storage area	Sodium gluconate	527-07-1	EHS Support, (2023) – Appendix E.1
Boric acid- crosslinker	4,288	12,864	L	Stimulation chemical storage area	Boric acid	10043-35-3	EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2

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	Potassium hydroxide- pH control	10,745	32,235	L	Stimulation chemical storage area	Potassium hydroxide	1310-58-3	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
	Mannanase- crosslinker	2	6	L	Stimulation chemical storage area	Mannanase	37288-54-3	EHS Support, (2023) – Appendix E.1
	Ammonium persulphate- breaker Diammonium peroxidisulphate – Oxidizing viscosity breaker	7,451	22,353	L	Stimulation chemical storage area	Ammonium persulphate	7727-54-0	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
	Talc- buffer/ Filler for encapsulate	384	1,152	L	Stimulation chemical storage area	Talc, Magnesium Silicate	14807-96-6	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
	Sodium bromate- breaker	50,441	151,323	L	Stimulation chemical storage area	Sodium bromate	7789-38-0	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
	Hepta sodium phosphonate- Emulsifier	3,176	9,528	L	Stimulation chemical storage area	Hepta sodium phosphonate	22042-96-2	AECOM, 2024a – Appendix E EHS Support, (2023) –

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							Appendix E.1
Distillates, hydrotreated light- friction reducer/slurry agent	54,231	162,693	L	Stimulation chemical storage area	Distillates, hydrotreated light	64742-47-8	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Guar gum- viscosity regulator	15,141	45,423	L	Stimulation chemical storage area	Guar gum	9000-30-0	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Poly-oxyethylene nonylphenol ether- surfactant	4,466	13,398	L	Stimulation chemical storage area	Poly-oxyethylene nonylphenol ether	9016-45-9	EHS Support, (2023) – Appendix E.1
Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite- biocide	4,466	13,398	L	Stimulation chemical storage area	Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
1,6-Hexanediol- cross linker	447	1,341	L	Stimulation chemical storage area	1,6-Hexanediol	629-11-8	EHS Support, (2023) – Appendix E.1
Hydrochloric acid- pH control	44,715	134,145	L	Stimulation chemical storage area	Hydrochloric acid	7647-01-0	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1

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	N-Benzyl-alkylpyridinium chloride- pH control	28	84	L	Stimulation chemical storage area	N-Benzyl-alkylpyridinium chloride	68909-18-2	EHS Support, (2023) – Appendix E.1
	Formic acid- corrosion inhibitor	2,001	6,002	L	Stimulation chemical storage area	Formic acid	64-18-6	EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
	Sodium erythorbate- scaler prohibitor/Reducing Agent	2,001	6,002	L	Stimulation chemical storage area	Sodium erythorbate	6381-77-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
	Citric acid- pH control	15,878	47,634	L	Stimulation chemical storage area	Citric acid	77-92-9	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
	Acetic acid- pH Buffer	15,878	47,634	L	Stimulation chemical storage area	Acetic acid	64-19-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
	Isopropanol- clay management	83	249	L	Stimulation chemical storage area	Isopropanol	67-63-0	AECOM, 2024a – Appendix E EHS Support, (2023) –

Current EMP text

Amended EMP text

							Appendix E.1
Ethoxylated C12-C16 alcohol - surfactant	57	171	L	Stimulation chemical storage area	Ethoxylated C12-C16 alcohol	68551-12-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Ethoxylated decanol - surfactant	19	57	L	Stimulation chemical storage area	Ethoxylated decanol	26183-52-8	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Cinnamaldehyde- biocide / Corrosion inhibitor	1,000	3,000	L	Stimulation chemical storage area	Cinnamaldehyde	104-55-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Ethoxylated tallow alkyl amine - surfactant	9	27	L	Stimulation chemical storage area	Ethoxylated tallow alkyl amine	61791-26-2	EHS Support, (2023) – Appendix E.1
Methanol- corrosion inhibitor	2	6	L	Stimulation chemical storage area	Methanol	67-56-1	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Polyacrylamide - friction reducer	49,093	147,279	L	Stimulation chemical storage area	Polyacrylamide	9003-05-08	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2004 –

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							Appendix E.2
Polyethylene glycol trimethylnonyl ether - clay manager/ Emulsifier	748	2,243	L	Stimulation chemical storage area	Polyethylene glycol trimethylnonyl ether	127087-87-0	EHS Support, (2023) – Appendix E.1 AECOM, 2024 - Appendix E.2
Water in additive- stabiliser	66,804	200,412	L	Stimulation chemical storage area	Water in additive	7732-18-5	EHS Support, (2023) – Appendix E.1
Potassium sorbate food grade- corrosion inhibitor	14	42	L	Stimulation chemical storage area	Potassium sorbate	24634-61-5	EHS Support, (2023) – Appendix E.1
Mannanase (Mannan endo-1,4-beta-mannosidase)- cross linker	2	6	L	Stimulation chemical storage area	Mannanase (Mannan endo-1,4-beta-mannosidase)	37288-54-3	EHS Support, (2023) – Appendix E.1
Nonoxynol-9- surfactant/Emulsifier	51	153	L	Stimulation chemical storage area	Nonoxynol-9	26571-11-9	EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
2-Ethylhexanol PO/EO polymer- stabiliser	9	27	L	Stimulation chemical storage area	2-Ethylhexanol PO/EO polymer	64366-70-7	EHS Support, (2023) – Appendix E.1
Corn oil- friction reducer	662	1,986	L	Stimulation chemical storage area	Corn oil	8001-30-7	EHS Support, (2023) – Appendix E.1
Proprietary – SCI-1F Scale inhibitor	19,357	58,071	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Proprietary – surface coating	44	131	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to	Proprietary	AECOM, 2024b –

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					human health and the environment. Chemicals were PBT and calculated below the risk thresholds.		Appendix E.2
Sodium carbonate – pH buffer	78.5	236	L	Stimulation chemical storage area	Sodium carbonate	497-19-8	AECOM, 2024b – Appendix E.2
Proprietary – improves surface and interfacial tension	292	876	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Proprietary – surfactant	7,592	22,776	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Alkyl Pyridines Quat – Corrosion inhibitor	128	384	L	Stimulation chemical storage area	Alkyl Pyridines Quat	68909-18-2	AECOM, 2024b – Appendix E.2
Polymer/s - Isotridecanol, ethoxylated – Emulsifier	5,742	17,225	L	Stimulation chemical storage area	Isotridecanol, ethoxylated	69011-36-5	AECOM, 2024b – Appendix E.2
HCL-15B – Hydrochloric acid Blend – mineral acid	76,201	228,603	L	Stimulation chemical storage area	Hydrochloric acid	7647-01-0	AECOM, 2024b – Appendix E.2
Proprietary - Emulsifier	8,614	25,842	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Didecyldimethyl-ammonium Chloride - Biocide	1,936	5,807	L	Stimulation chemical storage area	Didecyldimethyl-ammonium Chloride	7173-51-5	AECOM, 2024b – Appendix E.2
Benzalkonium Chloride – Biocide	1,936	5,807	L	Stimulation chemical storage area	Benzalkonium Chloride	8001-54-5	AECOM, 2024b – Appendix E.2
Proprietary – Improve surface and interfacial tension	1,022	3,066	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2

Current EMP text	Amended EMP text							
	Proprietary – Improve surface and interfacial tension	341	1,022	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
	Completion chemicals							
	Sodium chloride- weighting agent	15,000	45,000	kg	Completion chemical storage area	Sodium chloride	7647-14-5	AECOM, 2024a – Appendix E
	ALDACIDE G biocide	500	1,500	L	Completion chemical storage area	Glutaraldehyde Methanol	111-30-8 67-56-1	AECOM, 2024a – Appendix E
	OXYGON Oxygen scavenger	100	300	kg	Completion chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	BARACOR 100 corrosion inhibitor	2,000	6,000	L	Completion chemical storage area	Ethanol, 2,2'-oxybis-, reaction products with ammonia, morpholine derivatives residues Methanol Nitrilotriacetic acid, trisodium salt monohydrate	68909-77-3 67-56-1 5064-31-3	AECOM, 2024a – Appendix E
	Sodium Hypochlorite 10 – 30% cleaner	10,000	30,000	L	Completion chemical storage area	Sodium hypochlorite Sodium Hydroxide Water	7681-52-9 1310-73-2 7732-18-5	AECOM, 2024a – Appendix E
	Drilling chemicals							
	CON-DET wetting agent	50	150	kg	Drilling chemical storage area	Amides, coco, N,N-bis (hydroxyethyl) Benzenesulfonic acid, dimethyl-, sodium salt Isopropanol Potassium pyrophosphate Potassium hydroxide	68603-42-9 1300-72-7 67-63-0 7320-34-5 1310-58-3	AECOM, 2024a – Appendix E
	SAPP- sodium acid phosphate cement treatment	50	150	kg	Drilling chemical storage area	DISODIUM PYROPHOSPHATE	7758-16-9	AECOM, 2024a – Appendix E
	Bentonite- lubricant	3,000	9,000	kg	Drilling chemical storage area	Crystalline silica, quartz Crystalline silica, cristobalite Crystalline silica, tridymite	14808-60-7 14464-46-1 15468-32-3	AECOM, 2024a – Appendix E
	Caustic Soda-pH control	1,400	4,200	kg	Drilling chemical storage area	Sodium hydroxide	1310-73-2	AECOM, 2024a – Appendix E

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EZ MUD DP or EZ MUD Liquid- drilling mud	2000	6,000	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
ALDACIDE G biocide	336	1,008	kg	Drilling chemical storage area	Glutaraldehyde Methanol	111-30-8 67-56-1	AECOM, 2024a – Appendix E
STOPPIT loss of circulation material	1,000	3,000	kg	Drilling chemical storage area	Crystalline silica, quartz	14808-60-7	AECOM, 2024a – Appendix E
Soda Ash- drill mud conditioner	350	1,050	kg	Drilling chemical storage area	Sodium carbonate	497-19-8	AECOM, 2024a – Appendix E
BARACOR 100 corrosion inhibitor	250	750	kg	Drilling chemical storage area	Ethanol, 2,2'-oxybis-, reaction products with ammonia, morpholine derivatives residues Methanol Nitrilotriacetic acid, trisodium salt monohydrate	68909-77-3 67-56-1 5064-31-3	AECOM, 2024a – Appendix E
Sodium chloride (flossy salt)- weighting agent and formation inhibitor	96,000	288,000	kg	Drilling chemical storage area	Sodium chloride	7647-14-5	AECOM, 2024a – Appendix E
Barite- weighting agent	500	1,500	kg	Drilling chemical storage area	Crystalline silica	14808-60-7	AECOM, 2024a – Appendix E
BARACARB loss of circulation material	500	1,500	kg	Drilling chemical storage area	Crystalline silica, quartz	14808-60-7	AECOM, 2024a – Appendix E
Citric acid- pH control	500	1,500	kg	Drilling chemical storage area	Citric acid	5949-29-1	AECOM, 2024a – Appendix E
BARADEFOAM HP drilling fluid/foam	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
Sodium bicarbonate- pH buffer	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
PERFORMATROL- polymer fluid system	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E

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	SOURSCAV- mud additive treat H2S contamination	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	DRIL-N-SLIDE- casing lubricant	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	STEELSEAL- corrosion inhibitor	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	BARAZAN D or BARAZAN D PLUS- viscosity increaser	4,150	12,450	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	PAC L loss of circulation material	2,300	6,900	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	Potassium chloride- weighting agent and formation inhibitor	22,500	67,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	QUIK-FREE – drilling additive	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	BAROFIBRE, BAROFIBRE super fine and BAROFIBRE coarse loss of circulation material	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	BaraBlend-657 Loss of circulation material	500	1,500	kg	Drilling chemical storage area	Crystalline silica, quartz	14808-60-7	AECOM, 2024a – Appendix E
	N-DRIL HT PLUS filtration control additive	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	DEXTRID LTE filtration control additive	4,600	13,800	kg	Drilling chemical storage area	Tetrahydro-3,5-dimethyl-1,3,5-thiadiazine-2-thione	533-74-4	AECOM, 2024a – Appendix E

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	BARABUF pH buffer	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	BDF 933 or BaraLube W-933 drilling lubricant	864	2,592	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	BAROLIFT sweeping agent	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	OXYGON oxygen scavenger	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	ENVIRO-THIN filtration control additive	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
	Lime pH buffer	500	1,500	kg	Drilling chemical storage area	Calcium hydroxide	1305-62-0	AECOM, 2024a – Appendix E
	Calcium chloride	37,000	111,000	kg	Drilling chemical storage area	Calcium chloride	10043-52-4	AECOM, 2024a – Appendix E
	Sodium bromide	8,160	24,480	kg	Drilling chemical storage area	Sodium bromide	7647-15-6	AECOM, 2024a – Appendix E
	Evolube TR	14,500	43,500	L	Drilling chemical storage area	Triethylene glycol, monobutyl ether 2-Butoxyethanol Diethanolamine	143-22-6 111-76-2 111-42-2	AECOM, 2024a – Appendix E
	Radiagreen EME	4,800	14,400	L	Drilling chemical storage area	Fatty esters Specialities	Proprietary	AECOM, 2024a – Appendix E
	Radiagreen EBL	4,800	14,400	L	Drilling chemical storage area	Fatty esters Specialities	Proprietary	AECOM, 2024a – Appendix E
	Polydrill	7,500	22,500	kg	Drilling chemical storage area	SULPHONATED ORGANIC POLYMER	Proprietary	AECOM, 2024a – Appendix E

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Alpine spotting beads	1,000	3,000	kg	Drilling chemical storage area	Styrene	100-42-5	AECOM, 2024a – Appendix E
Barite- weighting agent	354,000	1,062,000	kg	Drilling chemical storage area	Barium sulfate Crystalline silica Mica-group minerals	7727-43-7 14808-60-7 12001-26-2	AECOM, 2024a – Appendix E
Bio-Paq high temp filtration control	1,134	3,402	kg	Drilling chemical storage area	Starch, carboxymethyl ether, sodium salt	9063-38-1	AECOM, 2024a – Appendix E
Brine-Pac XTS corrosion inhibitor	3,400	10,200	L	Drilling chemical storage area	2-methylbut-3-yn-2-ol	115-19-5	AECOM, 2024a – Appendix E
Calcium chloride - salinity	180,000	540,000	kg	Drilling chemical storage area	calcium chloride	10043-52-4	AECOM, 2024a – Appendix E
CF Desco deflocculant	2,270	6,810	kg	Drilling chemical storage area	Tannins, sulfo-methylated crystalline silica, respirable powder	68201-64-9 14808-60-7	AECOM, 2024a – Appendix E
Chek-Loss fibrous LCM	1,360	4,080	kg	Drilling chemical storage area	Cellulose	9004-34-6	AECOM, 2024a – Appendix E
Citric acid - pH control	1,360	4,080	L	Drilling chemical storage area	Citric acid	77-92-9	AECOM, 2024a – Appendix E
Ecco-Temp high temp extender	8,000	24,000	L	Drilling chemical storage area	Triethanolamine	102-71-6	AECOM, 2024a – Appendix E
Flowzan viscosifier	5,000	15,000	kg	Drilling chemical storage area	Contains no hazardous ingredients according to GHS.	N/A	AECOM, 2024a – Appendix E
KEN-SEAL™ PLUS - high temperature filtration control agent	4,000	12,000	Kg	Drilling chemical storage area	Copolymer, sodium salt, dimethylacrylamide, acrylamidomethyl propane, sulfonic	Proprietary	AECOM, 2024a – Appendix E
Mil-Lime (Calcium hydroxide) alkalinity	1,361	4,080	L	Drilling chemical storage area	calcium di-hydroxide	1305-62-0	AECOM, 2024a – Appendix E
Magnesium oxide pH buffer	7,500	22,500	kg	Drilling chemical storage area	magnesium oxide	1309-48-4	AECOM, 2024a – Appendix E
Mil-bio SEA 98 biocide	1,800	5,400	L	Drilling chemical storage area	THPS	55566-30-8	AECOM, 2024a – Appendix E
Mil-carb LCM / bridging	5,000	15,000	kg	Drilling chemical storage area	Limestone crystalline silica, respirable powder	1317-65-3 14808-60-7	AECOM, 2024a – Appendix E

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Milstarch filtration control	5,000	15,000	kg	Drilling chemical storage area	Starch	9005-25-8	AECOM, 2024a – Appendix E
Navi-Lube lubricant	16,650	49,950	L	Drilling chemical storage area	Distillates, (petroleum), hydrotreated light Diethylene glycol monobutyl ether Benzene, mono-C10-13-alkyl derivatives, fractionation bottoms, heavy ends, sulfonated, sodium salts Petroleum distillates, hydrotreated heavy naphthenic Benzenesulfonic acid, C10-14-alkyl derivatives, sodium salts	64742-47-8 112-34-5 148520-82-5 64742-52-5 69669-44-9	AECOM, 2024a – Appendix E
New-Drill Plus shale stabiliser	1,000	3,000	kg	Drilling chemical storage area	2-Propenoic acid, polymer with 2-propenamide, sodium salt	25987-30-8	AECOM, 2024a – Appendix E
Noxygen XT oxygen scavenger	884	2,652	kg	Drilling chemical storage area	2,3-didehydro-3-O-sodio-D-erythro-hexono-1,4-lactone	6381-77-7	AECOM, 2024a – Appendix E
Ova Col 110 HC cloud point glycol	13,000	39,000	kg	Drilling chemical storage area	Glycol Ether	9004-77-7	AECOM, 2024a – Appendix E
Potassium chloride salt / shale stabiliser	41,000	123,000	kg	Drilling chemical storage area	potassium chloride	7447-40-7	AECOM, 2024a – Appendix E
Potassium hydroxide pH source	1,250	3,750	kg	Drilling chemical storage area	potassium hydroxide	1310-58-3	AECOM, 2024a – Appendix E
Pyro-Trol II HT filtration control	25	75	kg	Drilling chemical storage area	Copolymer of acrylamide and 2-acrylamide-2-2methyl propane sulfonic acid	Proprietary	AECOM, 2024a – Appendix E
Pyro-Vis II HT viscosifier	1,400	4,200	kg	Drilling chemical storage area	t-Butyl alcohol	75-65-0	AECOM, 2024a – Appendix E
Soda ash pH and hardness control	1,000	3,000	kg	Drilling chemical storage area	sodium carbonate	497-19-8	AECOM, 2024a – Appendix E

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Sodium bicarbonate pH and hardness control	1,000	3,000	kg	Drilling chemical storage area	sodium hydrogen carbonate	144-55-8	AECOM, 2024a – Appendix E
Sodium chloride - salt	54,400	163,200	kg	Drilling chemical storage area	sodium chloride	7647-14-5	AECOM, 2024a – Appendix E
W.O. defoam defoamer	600	1,800	L	Drilling chemical storage area	1-Hexanol, 2-ethyl-	104-76-7	AECOM, 2024a – Appendix E
Xan-Plex D viscosifier	3,000	9,000	kg	Drilling chemical storage area	Contains no hazardous ingredients according to GHS.	N/A	AECOM, 2024a – Appendix E
TEQ-LUBE II - lubricant	14,400	43,200	kg	Drilling chemical storage area	Poly(oxy-1,2-ethanediyl),α-hydro-ω-hydroxy- Ethane-1,2-diol, ethoxylated	25322-68-3	AECOM, 2024a – Appendix E
TEQ-LUBE II - lubricant	14,400	43,200	kg	Drilling chemical storage area	Poly(oxy-1,2-ethanediyl), α-(9Z)-9-octadecen-1-yl-ω-hydroxy-, phosphate	39464-69-2	AECOM, 2024a – Appendix E
NEW-THIN – Polymeric thinner	4,680	14,040	kg	Drilling chemical storage area	Contains no hazardous ingredients according to GHS.	N/A	AECOM, 2024a – Appendix E
LC-LUBE -lubricant (graphite)	9,090	27,270	kg	Drilling chemical storage area	Natural graphite	7782-42-5	AECOM, 2024a – Appendix E
MAX-GUARD EA	26,000	78,000	L	Drilling chemical storage area	Poly[oxy(methyl-1,2-ethanediyl)], α-(2-aminomethylethyl)-ω-(2-aminomethylethoxy)-	9046-10-0	AECOM, 2024a – Appendix E
					Acetic acid	64-19-7	AECOM, 2024a – Appendix E
MAX-GUARD PLUS	26,000	78,000	L	Drilling chemical storage area	Reaction mass of 7-azatridecane-1,13-diamine and hexamethylenediamine	Proprietary	AECOM, 2024a – Appendix E
					acetic acid	64-19-7	AECOM, 2024a – Appendix E
					hexamethylenediamine	124-09-4	AECOM, 2024a – Appendix E
					cyclohex-1,2-ylenediamine	694-83-7	AECOM, 2024a – Appendix E
MAX-GUARD PLUS A	26,000	78,000	L	Drilling chemical storage area	1,2-Ethanediamine, N-(2-aminoethyl)-	111-40-0	AECOM, 2024a – Appendix E

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					acetic acid	64-19-7	AECOM, 2024a – Appendix E
SARALINE 185V	18,603	55,809	kg	Drilling chemical storage area	Distillates (Fischer-Tropsch), C8-26 - Branched and Linear	848301-67-7	AECOM, 2024a – Appendix E
Proppants*							
100 mesh sand- proppant	91,000	273,000	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Quartz or organophilic phyllosilicate- proppant	1,084	3,252	L	Stimulation Chemical storage area	Quartz or organophilic phyllosilicate	14808-60-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
40/70 sand- proppant	,650,000	4,950,000	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
30/50 sand- proppant	610,000	1,830,000	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 as 20/40
* Proppants are sand which is inert. They do not require special chemical bunding but are co-located in the stimulation chemical storage area, within the well pad bund. Residual proppant from a stimulation campaign is often used to assist with chemical spills on the well pad, where contaminated spill material is removed.							
Silicon dioxide (quartz/sand) 100 sand	,757,614	14,272,842	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024b – Appendix E.2
Silicon dioxide (quartz/sand) 40/70	,435,287	16,305,860	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024b – Appendix E.2

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3.11.1 Chemical types and quantities

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Table 16 Anticipated chemical volumes use in the drilling and stimulation process

Material name	Typical volume	Maximum volume	Unit	Storage area
Acetic Acid - 60% PH control	3,000	6,000	L	Stimulation chemical storage area
BE-9 Biocide	17,000	34,000	L	Stimulation chemical storage area
Caustic Soda Liquid pH control/ buffer	15,000	30,000	L	Stimulation chemical storage area
DCA-11001 Breaker Activator	5,000	10,000	L	Stimulation chemical storage area
DCA-13002 Breaker	300	600	kg	Stimulation chemical storage area
DCA-13003 Breaker	10,000	20,000	L	Stimulation chemical storage area
DCA-16001 Clay Stabiliser	42,000	84,000	L	Stimulation chemical storage area
DCA-17001 Corrosion Inhibitor	1,000	2,000	L	Stimulation chemical storage area
DCA-19001 Crosslinker	600	1,200	kg	Stimulation chemical storage area
DCA-19002 Crosslinker	10,000	20,000	L	Stimulation chemical storage area
DCA-23001 Friction Reducer	5,000	10,000	kg	Stimulation chemical storage area
DCA-23003 Friction Reducer	18,000	36,000	L	Stimulation chemical storage area
DCA-25005 Gelling Agent	35,000	70,000	kg	Stimulation chemical storage area
DCA-30001 Scale Inhibitor	15,000	30,000	L	Stimulation chemical storage area
DCA-32002 Surfactant	15,000	30,000	L	Stimulation chemical storage area
DCA-32014 Surfactant	200	400	L	Stimulation chemical storage area
FE-2 Buffer	200	400	kg	Stimulation chemical storage area
Hydrochloric Acid - 32%	50,000	150,000	L	Stimulation chemical storage area
100 Mesh Sand- Proppant	91,000	182,000	kg	Stimulation chemical storage area
40/70 Sand- Proppant	1,650,000	3,300,000	kg	Stimulation chemical storage area
30/50 Sand- Proppant	610,000	1,220,000	kg	Stimulation chemical storage area

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Cleaning Chemicals and Spill Response							
Soda ash – sodium carbonate	3,750	11,250	kg	Stimulation Chemical storage area	Sodium carbonate - spill response in event acid spill	497-19-8	AECOM, 2024b – Appendix E.2
Flush fluid - distillates (petroleum), hydrotreated	1,500	4,500	L	Stimulation Chemical storage area	Distillates (petroleum), hydrotreated - equipment cleaning	64742-47-8	AECOM, 2024b – Appendix E.2

3.11.1 Chemical types and quantities

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Table 17: Anticipated chemical volume and storage used in the drilling and stimulation process at each site

Material name	Typical volume	Maximum volume	Unit	Storage area	Chemical composition	CAS Number	Chemical risk assessment report
Stimulation Chemicals							
Acetic acid - 60% pH control	3,000	9,000	L	Stimulation chemical storage area	Acetic acid	64-19-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
BE-9 biocide	17,000	17,000	L	Stimulation chemical storage area	Tributyl tetradecyl phosphonium chloride	81741-28-8	AECOM, 2024 – Appendix
Caustic soda liquid - pH control / buffer	15,000	45,000	L	Stimulation chemical storage area	Sodium hydroxide	1310-73-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
DCA-11001 breaker activator	5,000	15,000	L	Stimulation chemical storage area	Diethanolamine	111-42-2	AECOM, 2024a – Appendix E
DCA-13002 breaker	300	900	kg	Stimulation chemical storage area	Sodium persulfate	7775-27-1	AECOM, 2024a – Appendix E
DCA-13003 breaker	10,000	30,000	L	Stimulation chemical storage area	Chlorous acid, sodium salt Sodium chloride	7758-19-2 7647-14-5	AECOM, 2024a – Appendix E

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Current EMP text					Amended EMP text						
Alcohols, C11-14-iso-, C13-rich,ethoxylated-Surfactant	5285	10570	L	Stimulation chemical storage area	DCA-16001 clay stabiliser	42,000	126,000	L	Stimulation chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
Sodium (C14-16) olefin sulfonate - Surfactant	4658	9316	L	Stimulation chemical storage area	DCA-17001 corrosion inhibitor	1,000	3,000	L	Stimulation chemical storage area	Diethylene glycol Cinnamaldehyde Amine oxides, cocoalkyldimethyl Methanol Benzaldehyde Alcohols, C12-16, ethoxylated Sodium iodide	111-46-6 104-55-2 61788-90-7 67-56-1 100-52-7 68551-12-2 7681-82-5	AECOM, 2024a – Appendix E
Diisobutyl glutarate - plasticiser	627	1254	L	Stimulation chemical storage area								
Diisobutyl succinate - plasticiser	209	418	L	Stimulation chemical storage area								
Diisobutyl adipate-plasticiser	179	358	L	Stimulation chemical storage area								
sodium thiosulphate-stabilising agent	4763	9527	L	Stimulation chemical storage area	DCA-19001 crosslinker	600	1,800	kg	Stimulation chemical storage area	Disodium octaborate tetrahydrate	12008-41-2	AECOM, 2024a – Appendix E
sodium sulphate stabilising agent	913	1827	L	Stimulation chemical storage area								
sodium sulphite stabilising agent	794	1588	L	Stimulation chemical storage area	DCA-19002 crosslinker	10,000	30,000	L	Stimulation chemical storage area	Ulexite Ethylene glycol Crystalline silica, quartz	1319-33-1 107-21-1 14808-60-7	AECOM, 2024a – Appendix E
Ethylene Glycol-Crosslinker	5112	10225	L	Stimulation chemical storage area								
Choline Chloride-Claystabiliser	10301	20603	L	Stimulation chemical storage area	DCA-23001 friction reducer	5,000	15,000	kg	Stimulation chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
Glutaraldehyde- Biocide	14930	29859	L	Stimulation chemical storage area								
Ammonium Sulphate-Breaker	4479	8958	L	Stimulation chemical storage area	DCA-23003 friction reducer	18,000	54,000	L	Stimulation chemical storage area	Hydrotreated light petroleum distillate Ethoxylated branched C13 alcohol Sodium diacetate	64742-47-8 78330-21-9 126-96-5	AECOM, 2024a – Appendix E
Polyacrylamide- Friction reducer	4479	8958	L	Stimulation chemical storage area								
Sodium polyacrylate-gelling agent	746	1493	L	Stimulation chemical storage area								
Sodium bisulfite- stabiliser	149	299	L	Stimulation chemical storage area	DCA-25005 gelling agent	35,000	105,00	kg	Stimulation chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
Alkyl Alcohol- surfactant	149	299	L	Stimulation chemical storage area								
2-Propenoic acid, homopolymer, ammonium salt- biocide	149	299	L	Stimulation chemical storage area								
Potassium persulfate-braker	149	299	L	Stimulation chemical storage area	DCA-30001 scale Inhibitor	15,000	45,000	L	Stimulation chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
2-Ethoxy-naphthalene-surfactant	149	299	L	Stimulation chemical storage area								
Sodium Gluconate-stabiliser	8576	17152	L	Stimulation chemical storage area	DCA-32002 surfactant	15,000	45,000	L	Stimulation chemical storage area	Alcohols, C6-C12, ethoxylated propoxylated Alcohols, C10-C16, ethoxylated propoxylated	68937-66-6 69227-22-1	AECOM, 2024a – Appendix E
Boric -Crosslinker	4288	8576	L	Stimulation chemical storage area								
Potassium Hydroxide- pH control	10745	21491	L	Stimulation chemical storage area	DCA-32014 surfactant	200	600	L	Stimulation chemical storage area	Hydrotreated light petroleum distillate Ethanol Fatty acids, tall-oil, ethoxylated C12-C15 Ethoxylated alcohols	64742-47-8 64-17-5 61791-00-2 68131-39-5 68155-20-4	AECOM, 2024a – Appendix E
Mannanase- Cross linker	2	4	L	Stimulation chemical storage area								
Ammonium Persulphate-breaker	7451	14902	L	Stimulation chemical storage area								
Talc- buffer	384	769	L	Stimulation chemical storage area								

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Sodium Bromate- breaker	50441	100881	L	Stimulation chemical storage area
Hepta sodium phosphonate- Emulsifier	3176	6351	L	Stimulation chemical storage area
DISTILLATES, HYDROTREATED LIGHT- friction reducer	54231	108462	L	Stimulation chemical storage area
Guar Gum- Viscocity regulator	15141	30282	L	Stimulation chemical storage area
Polyoxyethylene nonylphenol ether- surfactant	4466	8933	L	Stimulation chemical storage area
Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite- biocide	4466	8933	L	Stimulation chemical storage area
1,6-Hexanediol- cross linker	447	893	L	Stimulation chemical storage area
Quartz or Organophilic phyllosilicate- proppant	1084	2167	L	Stimulation chemical storage area
HydroChloric Acid- pH control	44715	89430	L	Stimulation chemical storage area
N-Benzyl-Alkylpyridinium Chloride- pH control	28	57	L	Stimulation chemical storage area
Formic Acid- corrosion inhibitor	38	76	L	Stimulation chemical storage area
Sodium erythorbate- scaler prohibitor	334	668	L	Stimulation chemical storage area
Citric Acid- pH control	15878	31756	L	Stimulation chemical storage area
Acetic Acid- pH control	15878	31756	L	Stimulation chemical storage area
Isopropanol- clay management	83	167	L	Stimulation chemical storage area
Ethoxylated C12-C16 Alcohol - surfactant	57	114	L	Stimulation chemical storage area
Ethoxylated Decanol - surfactant	19	38	L	Stimulation chemical storage area
Cinnamaldehyde- biocide	57	114	L	Stimulation chemical storage area
Ethoxylated Tallow Alkyl Amine - surfactant	9	19	L	Stimulation chemical storage area
Methanol- corrosion inhibitor	2	4	L	Stimulation chemical storage area
Polyacrylamide - friction reducer	49093	98186	L	Stimulation chemical storage area
Polyethylene glycol trimethylnonyl ether - clay manager	87	173	L	Stimulation chemical storage area

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					Amides, tall-oil fatty, N,N-bis(hydroxyethyl) Butyl alcohol Methanol	71-36-3 67-56-1	
FE-2 buffer	200	600	kg	Stimulation chemical storage area	Citric acid	77-92-9	AECOM, 2024a – Appendix E
Hydrochloric acid - 32%	50,000	150,000	L	Stimulation chemical storage area	Hydrochloric acid (32%)	7647-01-0	AECOM, 2024a – Appendix E
Alcohols, C11-14-iso-, C13-rich, ethoxylated- surfactant	5,285	15,855	L	Stimulation chemical storage area	Alcohols, C11-14-iso-, C13-rich, ethoxylated	78330-21-9	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Sodium (C14-16) olefin sulfonate - surfactant	4,658	13,974	L	Stimulation chemical storage area	Sodium (C14-16) olefin sulfonate	68439-57-6	EHS Support, (2023) – Appendix E.1
Diisobutyl glutarate - plasticiser	627	1,881	L	Stimulation chemical storage area	Diisobutyl glutarate	71195-64-7	EHS Support, (2023) – Appendix E.1
Diisobutyl succinate - plasticiser	209	627	L	Stimulation chemical storage area	Diisobutyl succinate	925-06-4	EHS Support, (2023) – Appendix E.1
Diisobutyl adipate- plasticiser	179	537	L	Stimulation chemical storage area	Diisobutyl adipate	141-04-8	EHS Support, (2023) – Appendix E.1
Sodium thiosulphate- stabilising agent	4,763	14,289	L	Stimulation chemical storage area	Sodium thiosulphate	7772-98-7	EHS Support, (2023) – Appendix E.1
Sodium sulphate stabilising agent	913	2,739	L	Stimulation chemical storage area	Sodium sulphate	7757-82-6	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1

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Current EMP text					Amended EMP text							
Water in Additive- stabiliser	66804	133607	L	Stimulation chemical storage area	Sodium sulphite stabilising agent	794	2,382	L	Stimulation chemical storage area	Sodium sulphite	7757-83-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Potassium Sorbate Food Grade- corrosion inhibitor	14	29	L	Stimulation chemical storage area								
Mannanase (Mannan endo-1,4-beta-mannosidase)- cross linker	2	4	L	Stimulation chemical storage area								
Nonoxynol-9- surfactant	9	19	kg	Stimulation chemical storage area								
2-Ethylhexanol PO/EO polymer- stabiliser	9	19	kg	Stimulation chemical storage area								
Corn Oil- friction reducer	662	1325	kg	Stimulation chemical storage area								
Sodium hypochlorite	10,000	30,000	L	Completion chemical storage area								
Sodium Chloride- weighting agent	15,000	30,000	kg	Completion chemical storage area								
ALDACIDE G Biocide	500	1,000	L	Completion chemical storage area								
OXYGON Oxygen scavenger	100	200	kg	Completion chemical storage area								
BARACOR 100 corrosion inhibitor	2,000	4,000	L	Completion chemical storage area								
CON-DET wetting agent	50	100	kg	Drilling chemical storage area								
SAPP- sodium Acid Phosphate cement treatment	50	100	kg	Drilling chemical storage area								
Bentonite- lubricant	3,000	6,000	kg	Drilling chemical storage area								
Caustic Soda-pH control	1,400	2,800	kg	Drilling chemical storage area								
EZ MUD DP or EZ MUD Liquid- drilling mud	2000	4,000	kg	Drilling chemical storage area								
ALDACIDE G Biocide	336	672	kg	Drilling chemical storage area								
STOPPIT Loss of circulation material	1,000	2,000	kg	Drilling chemical storage area								
Soda Ash- drill mud conditioner	350	700	kg	Drilling chemical storage area								
BARACOR 100 Corrosion inhibitor	250	500	kg	Drilling chemical storage area								
Sodium Chloride (Flossy Salt)- weighting agent and formation inhibitor	96,000	192,000	kg	Drilling chemical storage area								
Barite- weighting agent	500	1,000	kg	Drilling chemical storage area								
BARACARB loss of circulation material	500	1,000	kg	Drilling chemical storage area								
Citric Acid- pH control	500	1,000	kg	Drilling chemical storage area								
BARADEFOAM HP Drilling fluid/foam	500	1,000	kg	Drilling chemical storage area								
					Ethylene glycol- crosslinker Anti-freeze	8,416	25,247	L	Stimulation chemical storage area	Ethylene glycol	107-21-1	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
					Choline chloride- clay stabiliser / clay swelling control (2-hydroxy-N,N,N-trimethylethanaminium chloride)	67,750	203,250	L	Stimulation chemical storage area	Choline chloride	67-48-1	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
					Glutaraldehyde- biocide	14,930	44,790	L	Stimulation chemical storage area	Glutaraldehyde	111-30-8	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
					Ammonium sulphate- breaker	4,479	13,491	L	Stimulation chemical storage area	Ammonium sulphate	7783-20-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1

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Sodium Bicarbonate- pH buffer	500	1,000	kg	Drilling chemical storage area
PERFORMATROL- polymer fluid system	500	1,000	kg	Drilling chemical storage area
SOURSCAV- mud additive treat H2S contamination	500	1,000	kg	Drilling chemical storage area
DRIL-N-SLIDE- Casing lubricant	500	1,000	kg	Drilling chemical storage area
STEELSEAL- corrosion inhibitor	500	1,000	kg	Drilling chemical storage area
BARAZAN D or BARAZAN D PLUS- viscosity increaser	4,150	8,300	kg	Drilling chemical storage area
PAC L Loss of circulation material	2,300	4,600	kg	Drilling chemical storage area
Potassium Chloride- weighting agent and formation inhibitor	22,500	45,000	kg	Drilling chemical storage area
GEM CP/GP Shale stabiliser	500	1,000	kg	Drilling chemical storage area
QUIK-FREE – drilling additive	500	1,000	kg	Drilling chemical storage area
BAROFIBRE, BAROFIBRE Superfine and BAROFIBRE COARSE Loss of circulation material	500	1,000	kg	Drilling chemical storage area
BaraBlend-657 Loss of circulation material	500	1,000	kg	Drilling chemical storage area
N-DRIL HT PLUS filtration control additive	500	1,000	kg	Drilling chemical storage area
DEXTRID LTE filtration control additive	4,600	13,800	kg	Drilling chemical storage area
BARABUF pH buffer	500	1,000	kg	Drilling chemical storage area
BORE-HIB shale stabiliser	500	1,000	kg	Drilling chemical storage area
BDF 933 or BaraLube W-933 drilling lubricant	864	1,728	kg	Drilling chemical storage area
BAROLIFT sweeping agent	500	1,000	kg	Drilling chemical storage area
OXYGON Oxygen scavenger	500	1,000	kg	Drilling chemical storage area
ENVIRO-THIN filtration control additive	500	1,000	kg	Drilling chemical storage area
Lime pH buffer	500	1,000	kg	Drilling chemical storage area
BDF 677 Clay stabiliser	4,770	9,540	kg	Drilling chemical storage area
BDF 988 Clay stabiliser	3,390	6,780	kg	Drilling chemical storage area
SARALINE 185V- Synthetic based mud	299,800	599,600	kg	Drilling chemical storage area

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Polyacrylamide- friction reducer	4,479	13,491	L	Stimulation chemical storage area	Polyacrylamide	25085-02-3	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Sodium polyacrylate- gelling agent	746	2,238	L	Stimulation chemical storage area	Sodium polyacrylate	9003-04-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Sodium bisulfite- stabiliser	149	447	L	Stimulation chemical storage area	Sodium bisulfite	7631-90-5	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Alkyl alcohol- surfactant	149	447	L	Stimulation chemical storage area	Alkyl alcohol	56-81-5	EHS Support, (2023) – Appendix E.1
2-Propenoic acid, homopolymer, ammonium salt- biocide	149	447	L	Stimulation chemical storage area	2-Propenoic acid, homopolymer, ammonium salt	9003-03-6	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Potassium persulfate- braker	149	447	L	Stimulation chemical storage area	Potassium persulfate	7727-21-1	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
2-Ethoxy-naphthalene- surfactant	149	447	L	Stimulation chemical storage area	2-Ethoxy-naphthalene	93-18-5	EHS Support, (2023) – Appendix E.1
Sodium gluconate- stabiliser	8,576	25,728	L	Stimulation chemical storage area	Sodium gluconate	527-07-1	EHS Support, (2023) –

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NOVATEC P emulsifier for SBM	13,110	26,220	kg	Drilling chemical storage area
NOVATEC S emulsifier SBM	5700	11,400	kg	Drilling chemical storage area
Calcium Chloride weighting agent SBM	37,000	74,000	kg	Drilling chemical storage area
VG SUPREME clay viscosifier SBM	11,350	22,700	kg	Drilling chemical storage area
M-I BAR weighting agent SBM	193,500	169,500	kg	Drilling chemical storage area
NOVATEC F emulsifier SBM	3,610	7,220	kg	Drilling chemical storage area
NOVATEC transferred emulsifier SBM	1770	1770	kg	Drilling chemical storage area
Waste drilling fluids	2,500	2,500	m^3	Drilling mud sump
Completion fluids	1.4	1.4	ML	Drilling mud sump/on-site tank
Condensate	160	320	KL	Condensate storage area
Diesel	250	500	KL	Diesel storage tanks
Hydraulic oil	1,000	3,000	L	Workshop
Engine oil	1,000	3,000	L	Workshop
Degreasers	100	300	L	Workshop
Flowback	<10	13.8	ML	Flowback tanks

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							Appendix E.1
Boric acid- crosslinker	4,288	12,864	L	Stimulation chemical storage area	Boric acid	10043-35-3	EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Potassium hydroxide- pH control	10,745	32,235	L	Stimulation chemical storage area	Potassium hydroxide	1310-58-3	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Mannanase- crosslinker	2	6	L	Stimulation chemical storage area	Mannanase	37288-54-3	EHS Support, (2023) – Appendix E.1
Ammonium persulphate- breaker Diammonium peroxidisulphate – Oxidizing viscosity breaker	7,451	22,353	L	Stimulation chemical storage area	Ammonium persulphate	7727-54-0	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Talc- buffer/ Filler for encapsulate	384	1,152	L	Stimulation chemical storage area	Talc, Magnesium Silicate	14807-96-6	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Sodium bromate- breaker	50,441	151,323	L	Stimulation chemical storage area	Sodium bromate	7789-38-0	AECOM, 2024a – Appendix E

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							EHS Support, (2023) – Appendix E.1
Hepta sodium phosphonate- Emulsifier	3,176	9,528	L	Stimulation chemical storage area	Hepta sodium phosphonate	22042-96-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Distillates, hydrotreated light- friction reducer/slurry agent	54,231	162,693	L	Stimulation chemical storage area	Distillates, hydrotreated light	64742-47-8	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Guar gum- viscosity regulator	15,141	45,423	L	Stimulation chemical storage area	Guar gum	9000-30-0	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Poly-oxyethylene nonylphenol ether- surfactant	4,466	13,398	L	Stimulation chemical storage area	Poly-oxyethylene nonylphenol ether	9016-45-9	EHS Support, (2023) – Appendix E.1
Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite- biocide	4,466	13,398	L	Stimulation chemical storage area	Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
1,6-Hexanediol- cross linker	447	1,341	L	Stimulation chemical storage area	1,6-Hexanediol	629-11-8	EHS Support, (2023) –

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							Appendix E.1
Hydrochloric acid- pH control	44,715	134,145	L	Stimulation chemical storage area	Hydrochloric acid	7647-01-0	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
N-Benzyl-alkylpyridinium chloride- pH control	28	84	L	Stimulation chemical storage area	N-Benzyl-alkylpyridinium chloride	68909-18-2	EHS Support, (2023) – Appendix E.1
Formic acid- corrosion inhibitor	2,001	6,002	L	Stimulation chemical storage area	Formic acid	64-18-6	EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Sodium erythorbate- scaler prohibitor/Reducing Agent	2,001	6,002	L	Stimulation chemical storage area	Sodium erythorbate	6381-77-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Citric acid- pH control	15,878	47,634	L	Stimulation chemical storage area	Citric acid	77-92-9	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Acetic acid- pH Buffer	15,878	47,634	L	Stimulation chemical storage area	Acetic acid	64-19-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1

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							AECOM, 2024b – Appendix E.2
Isopropanol- clay management	83	249	L	Stimulation chemical storage area	Isopropanol	67-63-0	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Ethoxylated C12-C16 alcohol - surfactant	57	171	L	Stimulation chemical storage area	Ethoxylated C12-C16 alcohol	68551-12-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Ethoxylated decanol - surfactant	19	57	L	Stimulation chemical storage area	Ethoxylated decanol	26183-52-8	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Cinnamaldehyde- biocide / Corrosion inhibitor	1,000	3,000	L	Stimulation chemical storage area	Cinnamaldehyde	104-55-2	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
Ethoxylated tallow alkyl amine - surfactant	9	27	L	Stimulation chemical storage area	Ethoxylated tallow alkyl amine	61791-26-2	EHS Support, (2023) – Appendix E.1
Methanol- corrosion inhibitor	2	6	L	Stimulation chemical storage area	Methanol	67-56-1	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1

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	Polyacrylamide - friction reducer	49,093	147,279	L	Stimulation chemical storage area	Polyacrylamide	9003-05-08	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 AECOM, 2004 – Appendix E.2
	Polyethylene glycol trimethylnonyl ether - clay manager/ Emulsifier	748	2,243	L	Stimulation chemical storage area	Polyethylene glycol trimethylnonyl ether	127087-87-0	EHS Support, (2023) – Appendix E.1 AECOM, 2024 - Appendix E.2
	Water in additive- stabiliser	66,804	200,412	L	Stimulation chemical storage area	Water in additive	7732-18-5	EHS Support, (2023) – Appendix E.1
	Potassium sorbate food grade- corrosion inhibitor	14	42	L	Stimulation chemical storage area	Potassium sorbate	24634-61-5	EHS Support, (2023) – Appendix E.1
	Mannanase (Mannan endo-1,4-beta-mannosidase)- cross linker	2	6	L	Stimulation chemical storage area	Mannanase (Mannan endo-1,4-beta-mannosidase)	37288-54-3	EHS Support, (2023) – Appendix E.1
	Nonoxynol-9- surfactant/Emulsifier	51	153	L	Stimulation chemical storage area	Nonoxynol-9	26571-11-9	EHS Support, (2023) – Appendix E.1 AECOM, 2024b – Appendix E.2
	2-Ethylhexanol PO/EO polymer- stabiliser	9	27	L	Stimulation chemical storage area	2-Ethylhexanol PO/EO polymer	64366-70-7	EHS Support, (2023) – Appendix E.1
	Corn oil- friction reducer	662	1,986	L	Stimulation chemical storage area	Corn oil	8001-30-7	EHS Support, (2023) –

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Current EMP text	Amended EMP text

							Appendix E.1
Proprietary – SCI-1F Scale inhibitor	19,357	58,071	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Proprietary – surface coating	44	131	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Sodium carbonate – pH buffer	78.5	236	L	Stimulation chemical storage area	Sodium carbonate	497-19-8	AECOM, 2024b – Appendix E.2
Proprietary – improves surface and interfacial tension	292	876	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Proprietary – surfactant	7,592	22,776	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Alkyl Pyridines Quat – Corrosion inhibitor	128	384	L	Stimulation chemical storage area	Alkyl Pyridines Quat	68909-18-2	AECOM, 2024b – Appendix E.2
Polymer/s - Isotridecanol, ethoxylated – Emulsifier	5,742	17,225	L	Stimulation chemical storage area	Isotridecanol, ethoxylated	69011-36-5	AECOM, 2024b – Appendix E.2
HCL-15B – Hydrochloric acid Blend – mineral acid	76,201	228,603	L	Stimulation chemical storage area	Hydrochloric acid	7647-01-0	AECOM, 2024b – Appendix E.2
Proprietary - Emulsifier	8,614	25,842	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Didecyldimethyl-ammonium Chloride - Biocide	1,936	5,807	L	Stimulation chemical storage area	Didecyldimethyl-ammonium Chloride	7173-51-5	AECOM, 2024b – Appendix E.2

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Benzalkonium Chloride – Biocide	1,936	5,807	L	Stimulation chemical storage area	Benzalkonium Chloride	8001-54-5	AECOM, 2024b – Appendix E.2
Proprietary – Improve surface and interfacial tension	1,022	3,066	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Proprietary – Improve surface and interfacial tension	341	1,022	L	Stimulation chemical storage area	Based on the CRA, the chemical is of low concern to human health and the environment. Chemicals were PBT and calculated below the risk thresholds.	Proprietary	AECOM, 2024b – Appendix E.2
Completion chemicals							
Sodium chloride- weighting agent	15,000	45,000	kg	Completion chemical storage area	Sodium chloride	7647-14-5	AECOM, 2024a – Appendix E
ALDACIDE G biocide	500	1,500	L	Completion chemical storage area	Glutaraldehyde Methanol	111-30-8 67-56-1	AECOM, 2024a – Appendix E
OXYGON Oxygen scavenger	100	300	kg	Completion chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
BARACOR 100 corrosion inhibitor	2,000	6,000	L	Completion chemical storage area	Ethanol, 2,2'-oxybis-, reaction products with ammonia, morpholine derivatives residues Methanol Nitrilotriacetic acid, trisodium salt monohydrate	68909-77-3 67-56-1 5064-31-3	AECOM, 2024a – Appendix E
Sodium Hypochlorite 10 – 30% cleaner	10,000	30,000	L	Completion chemical storage area	Sodium hypochlorite Sodium Hydroxide Water	7681-52-9 1310-73-2 7732-18-5	AECOM, 2024a – Appendix E
Drilling chemicals							
CON-DET wetting agent	50	150	kg	Drilling chemical storage area	Amides, coco, N,N-bis (hydroxyethyl) Benzenesulfonic acid, dimethyl-, sodium salt Isopropanol Potassium pyrophosphate Potassium hydroxide	68603-42-9 1300-72-7 67-63-0 7320-34-5 1310-58-3	AECOM, 2024a – Appendix E
SAPP- sodium acid phosphate cement treatment	50	150	kg	Drilling chemical storage area	DISODIUM PYROPHOSPHATE	7758-16-9	AECOM, 2024a – Appendix E

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Bentonite- lubricant	3,000	9,000	kg	Drilling chemical storage area	Crystalline silica, quartz Crystalline silica, cristobalite Crystalline silica, tridymite	14808-60-7 14464-46-1 15468-32-3	AECOM, 2024a – Appendix E
Caustic Soda-pH control	1,400	4,200	kg	Drilling chemical storage area	Sodium hydroxide	1310-73-2	AECOM, 2024a – Appendix E
EZ MUD DP or EZ MUD Liquid- drilling mud	2000	6,000	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
ALDACIDE G biocide	336	1,008	kg	Drilling chemical storage area	Glutaraldehyde Methanol	111-30-8 67-56-1	AECOM, 2024a – Appendix E
STOPPIT loss of circulation material	1,000	3,000	kg	Drilling chemical storage area	Crystalline silica, quartz	14808-60-7	AECOM, 2024a – Appendix E
Soda Ash- drill mud conditioner	350	1,050	kg	Drilling chemical storage area	Sodium carbonate	497-19-8	AECOM, 2024a – Appendix E
BARACOR 100 corrosion inhibitor	250	750	kg	Drilling chemical storage area	Ethanol, 2,2'-oxybis-, reaction products with ammonia, morpholine derivatives residues Methanol Nitrilotriacetic acid, trisodium salt monohydrate	68909-77-3 67-56-1 5064-31-3	AECOM, 2024a – Appendix E
Sodium chloride (flossy salt)- weighting agent and formation inhibitor	96,000	288,000	kg	Drilling chemical storage area	Sodium chloride	7647-14-5	AECOM, 2024a – Appendix E
Barite- weighting agent	500	1,500	kg	Drilling chemical storage area	Crystalline silica	14808-60-7	AECOM, 2024a – Appendix E
BARACARB loss of circulation material	500	1,500	kg	Drilling chemical storage area	Crystalline silica, quartz	14808-60-7	AECOM, 2024a – Appendix E
Citric acid- pH control	500	1,500	kg	Drilling chemical storage area	Citric acid	5949-29-1	AECOM, 2024a – Appendix E
BARADEFOAM HP drilling fluid/foam	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
Sodium bicarbonate- pH buffer	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values	Proprietary	AECOM, 2024a – Appendix E

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					according to the competent authority		
PERFORMATROL- polymer fluid system	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
SOURSCAV- mud additive treat H2S contamination	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
DRIL-N-SLIDE- casing lubricant	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
STEELSEAL- corrosion inhibitor	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
BARAZAN D or BARAZAN D PLUS- viscosity increaser	4,150	12,450	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
PAC L loss of circulation material	2,300	6,900	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
Potassium chloride- weighting agent and formation inhibitor	22,500	67,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
QUIK-FREE – drilling additive	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
BAROFIBRE, BAROFIBRE super fine and BAROFIBRE coarse loss of circulation material	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
BaraBlend-657 Loss of circulation material	500	1,500	kg	Drilling chemical storage area	Crystalline silica, quartz	14808-60-7	AECOM, 2024a – Appendix E

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N-DRIL HT PLUS filtration control additive	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
DEXTRID LTE filtration control additive	4,600	13,800	kg	Drilling chemical storage area	Tetrahydro-3,5-dimethyl-1,3,5-thiadiazine-2-thione	533-74-4	AECOM, 2024a – Appendix E
BARABUF pH buffer	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
BDF 933 or BaraLube W-933 drilling lubricant	864	2,592	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
BAROLIFT sweeping agent	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
OXYGON oxygen scavenger	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
ENVIRO-THIN filtration control additive	500	1,500	kg	Drilling chemical storage area	Contains no hazardous substances in concentrations above cut-off values according to the competent authority	Proprietary	AECOM, 2024a – Appendix E
Lime pH buffer	500	1,500	kg	Drilling chemical storage area	Calcium hydroxide	1305-62-0	AECOM, 2024a – Appendix E
Calcium chloride	37,000	111,000	kg	Drilling chemical storage area	Calcium chloride	10043-52-4	AECOM, 2024a – Appendix E
Sodium bromide	8,160	24,480	kg	Drilling chemical storage area	Sodium bromide	7647-15-6	AECOM, 2024a – Appendix E
Evolube TR	14,500	43,500	L	Drilling chemical storage area	Triethylene glycol, monobutyl ether 2-Butoxyethanol Diethanolamine	143-22-6 111-76-2 111-42-2	AECOM, 2024a – Appendix E
Radiagreen EME	4,800	14,400	L	Drilling chemical storage area	Fatty esters Specialities	Proprietary	AECOM, 2024a – Appendix E

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Radiagreen EBL	4,800	14,400	L	Drilling chemical storage area	Fatty esters Specialities	Proprietary	AECOM, 2024a – Appendix E
Polydrill	7,500	22,500	kg	Drilling chemical storage area	SULPHONATED ORGANIC POLYMER	Proprietary	AECOM, 2024a – Appendix E
Alpine spotting beads	1,000	3,000	kg	Drilling chemical storage area	Styrene	100-42-5	AECOM, 2024a – Appendix E
Barite- weighting agent	354,000	1,062,000	kg	Drilling chemical storage area	Barium sulfate Crystalline silica Mica-group minerals	7727-43-7 14808-60-7 12001-26-2	AECOM, 2024a – Appendix E
Bio-Paq high temp filtration control	1,134	3,402	kg	Drilling chemical storage area	Starch, carboxymethyl ether, sodium salt	9063-38-1	AECOM, 2024a – Appendix E
Brine-Pac XTS corrosion inhibitor	3,400	10,200	L	Drilling chemical storage area	2-methylbut-3-yn-2-ol	115-19-5	AECOM, 2024a – Appendix E
Calcium chloride - salinity	180,000	540,000	kg	Drilling chemical storage area	calcium chloride	10043-52-4	AECOM, 2024a – Appendix E
CF Desco deflocculant	2,270	6,810	kg	Drilling chemical storage area	Tannins, sulfo-methylated crystalline silica, respirable powder	68201-64-9 14808-60-7	AECOM, 2024a – Appendix E
Chek-Loss fibrous LCM	1,360	4,080	kg	Drilling chemical storage area	Cellulose	9004-34-6	AECOM, 2024a – Appendix E
Citric acid - pH control	1,360	4,080	L	Drilling chemical storage area	Citric acid	77-92-9	AECOM, 2024a – Appendix E
Ecco-Temp high temp extender	8,000	24,000	L	Drilling chemical storage area	Triethanolamine	102-71-6	AECOM, 2024a – Appendix E
Flowzan viscosifier	5,000	15,000	kg	Drilling chemical storage area	Contains no hazardous ingredients according to GHS.	N/A	AECOM, 2024a – Appendix E
KEN-SEAL™ PLUS - high temperature filtration control agent	4,000	12,000	Kg	Drilling chemical storage area	Copolymer, sodium salt, dimethylacrylamide, acrylamidomethyl propane, sulfonic	Proprietary	AECOM, 2024a – Appendix E
Mil-Lime (Calcium hydroxide) alkalinity	1,361	4,080	L	Drilling chemical storage area	calcium di-hydroxide	1305-62-0	AECOM, 2024a – Appendix E
Magnesium oxide pH buffer	7,500	22,500	kg	Drilling chemical storage area	magnesium oxide	1309-48-4	AECOM, 2024a – Appendix E

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Mil-bio SEA 98 biocide	1,800	5,400	L	Drilling chemical storage area	THPS	55566-30-8	AECOM, 2024a – Appendix E
Mil-carb LCM / bridging	5,000	15,000	kg	Drilling chemical storage area	Limestone crystalline silica, respirable powder	1317-65-3 14808-60-7	AECOM, 2024a – Appendix E
Milstarch filtration control	5,000	15,000	kg	Drilling chemical storage area	Starch	9005-25-8	AECOM, 2024a – Appendix E
Navi-Lube lubricant	16,650	49,950	L	Drilling chemical storage area	Distillates, (petroleum), hydrotreated light Diethylene glycol monobutyl ether Benzene, mono-C10-13-alkyl derivatives, fractionation bottoms, heavy ends, sulfonated, sodium salts Petroleum distillates, hydrotreated heavy naphthenic Benzenesulfonic acid, C10-14-alkyl derivatives, sodium salts	64742-47-8 112-34-5 148520-82-5 64742-52-5 69669-44-9	AECOM, 2024a – Appendix E
New-Drill Plus shale stabiliser	1,000	3,000	kg	Drilling chemical storage area	2-Propenoic acid, polymer with 2-propenamide, sodium salt	25987-30-8	AECOM, 2024a – Appendix E
Noxygen XT oxygen scavenger	884	2,652	kg	Drilling chemical storage area	2,3-didehydro-3-O-sodio-D-erythro-hexono-1,4-lactone	6381-77-7	AECOM, 2024a – Appendix E
Ova Col 110 HC cloud point glycol	13,000	39,000	kg	Drilling chemical storage area	Glycol Ether	9004-77-7	AECOM, 2024a – Appendix E
Potassium chloride salt / shale stabiliser	41,000	123,000	kg	Drilling chemical storage area	potassium chloride	7447-40-7	AECOM, 2024a – Appendix E
Potassium hydroxide pH source	1,250	3,750	kg	Drilling chemical storage area	potassium hydroxide	1310-58-3	AECOM, 2024a – Appendix E
Pyro-Trol II HT filtration control	25	75	kg	Drilling chemical storage area	Copolymer of acrylamide and 2-acrylamide-2-2methyl propane sulfonic acid	Proprietary	AECOM, 2024a – Appendix E

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Pyro-Vis II HT viscosifier	1,400	4,200	kg	Drilling chemical storage area	t-Butyl alcohol	75-65-0	AECOM, 2024a – Appendix E
Soda ash pH and hardness control	1,000	3,000	kg	Drilling chemical storage area	sodium carbonate	497-19-8	AECOM, 2024a – Appendix E
Sodium bicarbonate pH and hardness control	1,000	3,000	kg	Drilling chemical storage area	sodium hydrogen carbonate	144-55-8	AECOM, 2024a – Appendix E
Sodium chloride - salt	54,400	163,200	kg	Drilling chemical storage area	sodium chloride	7647-14-5	AECOM, 2024a – Appendix E
W.O. defoam defoamer	600	1,800	L	Drilling chemical storage area	1-Hexanol, 2-ethyl-	104-76-7	AECOM, 2024a – Appendix E
Xan-Plex D viscosifier	3,000	9,000	kg	Drilling chemical storage area	Contains no hazardous ingredients according to GHS.	N/A	AECOM, 2024a – Appendix E
TEQ-LUBE II - lubricant	14,400	43,200	kg	Drilling chemical storage area	Poly(oxy-1,2-ethanediyl),α-hydro-ω-hydroxy- Ethane-1,2-diol, ethoxylated	25322-68-3	AECOM, 2024a – Appendix E
TEQ-LUBE II - lubricant	14,400	43,200	kg	Drilling chemical storage area	Poly(oxy-1,2-ethanediyl), α-(9Z)-9-octadecen-1-yl-ω-hydroxy-, phosphate	39464-69-2	AECOM, 2024a – Appendix E
NEW-THIN – Polymeric thinner	4,680	14,040	kg	Drilling chemical storage area	Contains no hazardous ingredients according to GHS.	N/A	AECOM, 2024a – Appendix E
LC-LUBE -lubricant (graphite)	9,090	27,270	kg	Drilling chemical storage area	Natural graphite	7782-42-5	AECOM, 2024a – Appendix E
MAX-GUARD EA	26,000	78,000	L	Drilling chemical storage area	Poly[oxy(methyl-1,2-ethanediyl)], α-(2-aminomethylethyl)-ω-(2-aminomethylethoxy)-	9046-10-0	AECOM, 2024a – Appendix E
					Acetic acid	64-19-7	AECOM, 2024a – Appendix E
MAX-GUARD PLUS	26,000	78,000	L	Drilling chemical storage area	Reaction mass of 7-azatridecane-1,13-diamine and hexamethylenediamine	Proprietary	AECOM, 2024a – Appendix E
					acetic acid	64-19-7	AECOM, 2024a – Appendix E
					hexamethylenediamine	124-09-4	AECOM, 2024a – Appendix E

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					cyclohex-1,2-ylenediamine	694-83-7	AECOM, 2024a – Appendix E
MAX-GUARD PLUS A	26,000	78,000	L	Drilling chemical storage area	1,2-Ethanediamine, N-(2-aminoethyl)-	111-40-0	AECOM, 2024a – Appendix E
					acetic acid	64-19-7	AECOM, 2024a – Appendix E
SARALINE 185V	18,603	55,809	kg	Drilling chemical storage area	Distillates (Fischer-Tropsch), C8-26 - Branched and Linear	848301-67-7	AECOM, 2024a – Appendix E
Proppants*							
100 mesh sand- proppant	91,000	273,000	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
Quartz or organophilic phyllosilicate- proppant	1,084	3,252	L	Stimulation Chemical storage area	Quartz or organophilic phyllosilicate	14808-60-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
40/70 sand- proppant	,650,000	4,950,000	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1
30/50 sand- proppant	610,000	1,830,000	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024a – Appendix E EHS Support, (2023) – Appendix E.1 as 20/40
Silicon dioxide (quartz/sand) 100 sand	,757,614	14,272,842	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024b – Appendix E.2

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Silicon dioxide (quartz/sand) 40/70	,435,287	16,305,860	kg	Stimulation Chemical storage area	Sand	14808-60-7	AECOM, 2024b – Appendix E.2
* Proppants are sand which is inert. They do not require special chemical bunding but are co-located in the stimulation chemical storage area, within the well pad bund. Residual proppant from a stimulation campaign is often used to assist with chemical spills on the well pad, where contaminated spill material is removed.							
Cleaning Chemicals and Spill Response							
Soda ash – sodium carbonate	3,750	11,250	kg	Stimulation Chemical storage area	Sodium carbonate - spill response in event acid spill	497-19-8	AECOM, 2024b – Appendix E.2
Flush fluid - distillates (petroleum), hydrotreated	1,500	4,500	L	Stimulation Chemical storage area	Distillates (petroleum), hydrotreated - equipment cleaning	64742-47-8	AECOM, 2024b – Appendix E.2

3.13.5 Stormwater

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Table 22: Stormwater release and re-use limits

Monitoring parameter	Release limit	Limit basis
Electrical conductivity	1,300 µs/cm	Irrigation salinity values used due to the absence of adjacent watercourses, with the protection of soils the most relevant environmental Value (EV). The guideline was based on the irrigation water salinity ratings for moderately sensitive crops. (Sources from Table 9.2.5 of the ANZEC Guidelines (2000) Volume 3, Chapter 9, Primary Industries) Sodium adsorption ratio (SAR) of stormwater is anticipated to be low, well below <20. Receiving soils are sandy loam (as described in section 4.1.3), with SAR in irrigation water >20 permissible which will not increase the sodicity of soils (Sources from Table 9.2.6 ANZEC Guidelines (2000) Volume 3, Chapter 9, Primary Industries)
pH	6.5 – 9.5	Limit based upon the background surface water quality data[1] and Table 8.2.8 of the ANZECC Guidelines 2000

3.13.5 Stormwater

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Table 22: Stormwater release and re-use limits

Monitoring parameter	Release limit	Limit basis
Off-site release and dust suppression		
Amenity	• No visible oil, grease or other hydrocarbons. • No visible foams caused by surfactants and detergents. • No visible abnormal discoloration.	
Electrical conductivity	1,300 µs/cm	The limit of 1,300 µs/cm was chosen as it aligns with the EC of the Gum Ridge formation (the main source of water used on proposed sites) and the ANZECC short term irrigation guideline value for moderately sensitive crops (Table 9.2.5 of the ANZEC Guidelines (2000) Volume 3, Chapter 9, Primary industries). The proposed EC limit is underpinned by modelling designed to assess the changing soil salinities and the potential for impact on the receiving vegetation types, including Eucalyptus, Acacia, Melaleuca species and native grasses which are common to the area. Many of these species have been shown to have a moderate to high tolerance to salinity.

Current EMP text			Amended EMP text		
		volume 2 Aquatic ecosystems – rationale and background information			The results of the modelling indicates the maximum root zone salinity will be in the order of 1.6 dS/m (for a sandy loam) to 1.7 dS/m (for a clay). This is below the likely vegetation root zone salinity of the vegetation types in the area. Also, the sodium adsorption ratio (SAR) for the Gum Ridge Formation was calculated at 2, which when combined with the EC values, indicates that the release of stormwater based on the revised release criteria is unlikely to cause soil structural issues. The adopted discharge criteria are widely used by Tamboran at its other operational sites on EP 117, EP 98 and EP 76, with no negative effects on soil properties or native vegetation.
				pH	5.2 – 9.0	The minimum pH is reflective of observed regional rainfall pH levels, with pH levels of 5.24 observed at Daly Waters on March 20, 2024. Tamboran has observed pH levels on its enclosed tank lids and sediment basins around the pH of 5 level. Given the large volume of rainwater that falls on a site in a very short period, the pH in the sediment basin is anticipated to be low, before increasing as they interact with the receiving soils. This has been observed in sediment basins onsite, with pH increasing from 5.2 to 6.5 over several hours after a rainfall event due to the low buffer capacity of rainwater. Given the existing pH of rainwater is approximately 5.2, we believe this to be an appropriate release limit for storm water.

4.2 Biological environment

The description of the biological environment of the existing Amungee NW site has been described previously in the Beetaloo Sub-basin, EP98 and 117 Exploration Drilling EMP (NT-2050-15-MP-0010) and the Beetaloo Sub-basin Amungee NW-1H EMP (NT-2050-35-PH-0018).

The existing biological environment for Velkerri 76 S2 was described in the Beetaloo Basin Velkerri 76 S2 Civil Construction EMP (NT-2050-15-MP-3-1) and the Beetaloo Basin Drilling, Stimulation and Well Testing Program Velkerri 76 S2 EMP (NT-2050-15-MP-032). https://depws.nt.gov.au/__data/assets/pdf_file/0008/735317/ep76-s2-origin-velkerri-civils-approved-emp.pdf

All previously approved EMPs are available at https://depws.nt.gov.au/onshore-gas/environment-management-plan/approved-emps.

An additional environmental land condition report was recently completed by AECOM (2021) (Appendix K) which covers the additional disturbance areas at Amungee NW proposed under this EMP.

4.2 Biological environment

The description of the biological environment of the Amungee NW well site has been described previously in the Beetaloo Sub-basin, EP98 and 117 Exploration Drilling EMP (NT-2050-35-PH-0018) and the Beetaloo Sub-basin Amungee NW-1H EMP (ORI7-2).

The existing biological environment for Velkerri 76 S2 was described in the Beetaloo Basin Velkerri 76 S2 Civil Construction EMP (ORI4-1) and the Beetaloo Basin Velkerri 2019-2024 Drilling, Stimulation and Well Testing Program Velkerri 76 S2 EMP (ORI5-4).

All previously approved EMPs are available at NT Onshore-gas/Approved-EMPs.

The environmental land condition reports are presented in Appendix K.1 and Appendix K.2.

8.5 Monitoring

Table 34: Monitoring program summary

Monitoring program	Purpose	Monitoring points	Parameters	Frequency	Investigation thresholds	Instrument calibration	Reference document
Stormwater	Manage stormwater collected within bunds during activities	Chemical storage areas	Field EC and pH	Prior to release	Off-site release and dust suppression limits: • pH 6-9 • EC 1300µs/cm	Instrument calibrated before use. pH probe calibrated with a two point calibration using a pH buffer of 7 and 10. EC meter	N/A

8.5 Monitoring

Table 34: Monitoring program summary

Monitoring program	Purpose	Monitoring points	Parameters	Frequency	Investigation thresholds	Instrument calibration	Reference document
Stormwater	Manage stormwater collected within bunds during activities	Chemical storage areas	Field EC and pH	Prior to release	Off-site release and dust suppression limits: • pH 5.2 – 9.0 • EC 1300 µs/cm	Instrument calibrated before use. pH probe calibrated with a two point calibration using a pH buffer of 7 and 10. EC meter	N/A

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Current EMP text

						calibrated with a 1413µs/cm (or similar) standard	

Appendix F Spill Management Plan

Spill Management Plan Appendix A Chemical volumes per well and storage areas (based on maximum 3 wells per pad)

Material name	Typical volume	Maximum volume	Unit	Storage area
Acetic Acid - 60% PH control	3,000	6,000	L	Stimulation chemical storage area
BE-9 Biocide	17,000	34,000	L	Stimulation chemical storage area
Caustic Soda Liquid pH control/ buffer	15,000	30,000	L	Stimulation chemical storage area
DCA-11001 Breaker Activator	5,000	10,000	L	Stimulation chemical storage area
DCA-13002 Breaker	300	600	kg	Stimulation chemical storage area
DCA-13003 Breaker	10,000	20,000	L	Stimulation chemical storage area
DCA-16001 Clay Stabiliser	42,000	84,000	L	Stimulation chemical storage area
DCA-17001 Corrosion Inhibitor	1,000	2,000	L	Stimulation chemical storage area
DCA-19001 Crosslinker	600	1,200	kg	Stimulation chemical storage area
DCA-19002 Crosslinker	10,000	20,000	L	Stimulation chemical storage area
DCA-23001 Friction Reducer	5,000	10,000	kg	Stimulation chemical storage area
DCA-23003 Friction Reducer	18,000	36,000	L	Stimulation chemical storage area
DCA-25005 Gelling Agent	35,000	70,000	kg	Stimulation chemical storage area
DCA-30001 Scale Inhibitor	15,000	30,000	L	Stimulation chemical storage area
DCA-32002 Surfactant	15,000	30,000	L	Stimulation chemical storage area
DCA-32014 Surfactant	200	400	L	Stimulation chemical storage area
FE-2 Buffer	200	400	kg	Stimulation chemical storage area
Hydrochloric Acid - 32%	50,000	150,000	L	Stimulation chemical storage area
100 Mesh Sand- Proppant	91,000	182,000	kg	Stimulation chemical storage area
40/70 Sand- Proppant	1,650,000	3,300,000	kg	Stimulation chemical storage area
30/50 Sand- Proppant	610,000	1,220,000	kg	Stimulation chemical storage area
Alcohols, C11-14-iso-, C13-rich,ethoxylated- Surfactant	5285	10570	L	Stimulation chemical storage area
Sodium (C14-16) olefin sulfonate - Surfactant	4658	9316	L	Stimulation chemical storage area
Diisobutyl glutarate - plasticiser	627	1254	L	Stimulation chemical storage area

Amended EMP text

						calibrated with a 1413µs/cm (or similar) standard	

Appendix F Spill Management Plan

Appendix A Chemical volumes per well and storage areas (based on maximum 3 wells per pad)

NOTE: In accordance with the Code, a chemical risk assessment has been completed on all listed chemicals, which have been verified to not be toxic and persistent and bioaccumulative.

Material name	Typical volume	Maximum volume	Unit	Storage area	Hazardous (Y/N)
Acetic acid – 60%	3,000	9,000	L	Stimulation chemical storage area	No
BE-9 Biocide	17,000	51,000	L	Stimulation chemical storage area	Yes
Caustic Soda Liquid	15,000	45,000	L	Stimulation chemical storage area	No
DCA-11001 Breaker activator	5,000	15,000	L	Stimulation chemical storage area	Yes
DCA-13002 Breaker	300	900	kg	Stimulation chemical storage area	Yes
DCA-13003 Breaker	10,000	30,000	L	Stimulation chemical storage area	Yes
DCA-16001 Clay Stabiliser	42,000	126,000	L	Stimulation chemical storage area	No
DCA-17001 Corrosion inhibiter	1,000	3,000	L	Stimulation chemical storage area	Yes
DCA-19001 Crosslinker	600	1,800	kg	Stimulation chemical storage area	Yes
DCA-19002 Crosslinker	10,000	30,000	L	Stimulation chemical storage area	Yes
DCA-23001 Friction reducer	5,000	15,000	kg	Stimulation chemical storage area	No
DCA-23003 Friction reducer	18,000	54,000	L	Stimulation chemical storage area	No
DCA-25005 Gelling agent	35,000	105,000	kg	Stimulation chemical storage area	No
DCA-30001 Scale inhibitor	15,000	45,000	L	Stimulation chemical storage area	No
DCA-32002 Surfactant	15,000	45,000	L	Stimulation chemical storage area	Yes
DCA-32014 Surfactant	200	600	L	Stimulation chemical storage area	Yes
FE-2 Buffer	200	600	kg	Stimulation chemical storage area	No
Hydrochloric acid – 32%	50,000	150,000	L	Stimulation chemical storage area	Yes
Alcohols, C11-14-iso-, C13-rich,ethoxylated- Surfactant	5,285	15,855	L	Stimulation chemical storage area	Yes
Sodium (C14-16) olefin sulfonate - Surfactant	4,658	13,974	L	Stimulation chemical storage area	Yes
Diisobutyl glutarate - plasticiser	627	1,881	L	Stimulation chemical storage area	No
Diisobutyl succinate - plasticiser	209	627	L	Stimulation chemical storage area	No
Diisobutyl adipate- plasticiser	179	537	L	Stimulation chemical storage area	No
Sodium thiosulphate- stabilising agent	4,763	14,289	L	Stimulation chemical storage area	No
Sodium sulphate stabilising agent	913	2,739	L	Stimulation chemical storage area	No
Sodium sulphite stabilising agent	794	2,382	L	Stimulation chemical storage area	No
Ethylene glycol- crosslinker	5,112	15,336	L	Stimulation chemical storage area	Yes

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Diisobutyl succinate - plasticiser	209	418	L	Stimulation chemical storage area
Diisobutyl adipate- plasticiser	179	358	L	Stimulation chemical storage area
sodium thiosulphate- stabilising agent	4763	9527	L	Stimulation chemical storage area
sodium sulphate stabilising agent	913	1827	L	Stimulation chemical storage area
sodium sulphite stabilising agent	794	1588	L	Stimulation chemical storage area
Ethylene Glycol- Crosslinker	5112	10225	L	Stimulation chemical storage area
Choline Chloride- Claystabiliser	10301	20603	L	Stimulation chemical storage area
Glutaraldehyde- Biocide	14930	29859	L	Stimulation chemical storage area
Ammonium Sulphate- Breaker	4479	8958	L	Stimulation chemical storage area
Polyacrylamide- Friction reducer	4479	8958	L	Stimulation chemical storage area
Sodium polyacrylate- gelling agent	746	1493	L	Stimulation chemical storage area
Sodium bisulfite- stabiliser	149	299	L	Stimulation chemical storage area
Alkyl Alcohol- surfactant	149	299	L	Stimulation chemical storage area
2-Propenoic acid, homopolymer, ammonium salt- biocide	149	299	L	Stimulation chemical storage area
Potassium persulfate- braker	149	299	L	Stimulation chemical storage area
2-Ethoxy-naphthalene- surfactant	149	299	L	Stimulation chemical storage area
Sodium Gluconate- stabiliser	8576	17152	L	Stimulation chemical storage area
Boric -Crosslinker	4288	8576	L	Stimulation chemical storage area
Potassium Hydroxide- pH control	10745	21491	L	Stimulation chemical storage area
Mannanase- Cross linker	2	4	L	Stimulation chemical storage area
Ammonium Persulphate- breaker	7451	14902	L	Stimulation chemical storage area
Talc- buffer	384	769	L	Stimulation chemical storage area
Sodium Bromate- breaker	50441	100881	L	Stimulation chemical storage area
Hepta sodium phosphonate- Emulsifier	3176	6351	L	Stimulation chemical storage area
DISTILLATES, HYDROTREATED LIGHT- friction reducer	54231	108462	L	Stimulation chemical storage area

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Choline Chloride- Clay stabiliser	10,301	30,903	L	Stimulation chemical storage area	No
Glutaraldehyde- biocide	14,930	44,790	L	Stimulation chemical storage area	Yes
Ammonium sulphate- breaker	4,479	13,491	L	Stimulation chemical storage area	Yes
Polyacrylamide- friction reducer	4,479	13,491	L	Stimulation chemical storage area	No
Sodium polyacrylate- gelling agent	746	2,238	L	Stimulation chemical storage area	No
Sodium bisulfite- stabiliser	149	447	L	Stimulation chemical storage area	No
Alkyl alcohol- surfactant	149	447	L	Stimulation chemical storage area	Yes
2-Propenoic acid, homopolymer, ammonium salt- biocide	149	447	L	Stimulation chemical storage area	Yes
Potassium persulfate-breaker	149	447	L	Stimulation chemical storage area	Yes
2-Ethoxy-naphthalene-surfactant	149	447	L	Stimulation chemical storage area	Yes
Sodium gluconate- stabiliser	8,576	25,728	L	Stimulation chemical storage area	No
Boric -crosslinker	4,288	12,864	L	Stimulation chemical storage area	Yes
Potassium hydroxide- pH control	10,745	32,235	L	Stimulation chemical storage area	Yes
Mannanase- crosslinker	2	6	L	Stimulation chemical storage area	Yes
Ammonium persulphate-breaker	7,451	22,353	L	Stimulation chemical storage area	Yes
Talc- buffer	384	1,152	L	Stimulation chemical storage area	No
Sodium bromate- breaker	50,441	151,323	L	Stimulation chemical storage area	Yes
Hepta sodium phosphonate-emulsifier	3,176	9,528	L	Stimulation chemical storage area	No
Distillates, hydrotreated light-friction reducer	54,231	162,693	L	Stimulation chemical storage area	No
Guar gum- viscosity regulator	15,141	45,423	L	Stimulation chemical storage area	No
Poly-oxyethylene nonylphenol ether- surfactant	4,466	13,398	L	Stimulation chemical storage area	Yes
Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite- biocide	4,466	13,398	L	Stimulation chemical storage area	Yes
1,6-Hexanediol- cross linker	447	1,341	L	Stimulation chemical storage area	Yes
Hydrochloric acid- pH control	44,715	134,145	L	Stimulation chemical storage area	Yes
N-benzyl-alkyl pyridinium chloride- pH control	28	84	L	Stimulation chemical storage area	Yes
Formic acid- corrosion inhibitor	38	114	L	Stimulation chemical storage area	Yes
Sodium erythorbate- scaler prohibitor	334	1,002	L	Stimulation chemical storage area	No
Citric acid- pH control	15,878	47,634	L	Stimulation chemical storage area	No
Acetic acid- pH control	15,878	47,634	L	Stimulation chemical storage area	No
Isopropanol- clay management	83	249	L	Stimulation chemical storage area	Yes

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Guar Gum- Viscocity regulator	15141	30282	L	Stimulation chemical storage area
Polyoxyethylene nonylphenol ether- surfactant	4466	8933	L	Stimulation chemical storage area
Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite- biocide	4466	8933	L	Stimulation chemical storage area
1,6-Hexanediol- cross linker	447	893	L	Stimulation chemical storage area
Quartz or Organophilic phyllosilicate- proppant	1084	2167	L	Stimulation chemical storage area
HydroChloric Acid- pH control	44715	89430	L	Stimulation chemical storage area
N-Benzyl-Alkylpyridinium Chloride- pH control	28	57	L	Stimulation chemical storage area
Formic Acid- corrosion inhibitor	38	76	L	Stimulation chemical storage area
Sodium erythorbate- scaler prohibitor	334	668	L	Stimulation chemical storage area
Citric Acid- pH control	15878	31756	L	Stimulation chemical storage area
Acetic Acid- pH control	15878	31756	L	Stimulation chemical storage area
Isopropanol- clay management	83	167	L	Stimulation chemical storage area
Ethoxylated C12-C16 Alcohol - surfactant	57	114	L	Stimulation chemical storage area
Ethoxylated Decanol - surfactant	19	38	L	Stimulation chemical storage area
Cinnamaldehyde- biocide	57	114	L	Stimulation chemical storage area
Ethoxylated Tallow Alkyl Amine - surfactant	9	19	L	Stimulation chemical storage area
Methanol- corrosion inhibitor	2	4	L	Stimulation chemical storage area
Polyacrylamide - friction reducer	49093	98186	L	Stimulation chemical storage area
Polyethylene glycol trimethylnonyl ether - clay manager	87	173	L	Stimulation chemical storage area
Water in Additive- stabiliser	66804	133607	L	Stimulation chemical storage area
Potassium Sorbate Food Grade- corrosion inhibitor	14	29	L	Stimulation chemical storage area

Amended EMP text

Ethoxylated C12-C16 alcohol - surfactant	57	171	L	Stimulation chemical storage area	Yes
Ethoxylated decanol - surfactant	19	57	L	Stimulation chemical storage area	Yes
Cinnamaldehyde- biocide	57	171	L	Stimulation chemical storage area	Yes
Ethoxylated tallow alkyl amine - surfactant	9	27	L	Stimulation chemical storage area	Yes
Methanol- corrosion inhibitor	2	6	L	Stimulation chemical storage area	Yes
Polyacrylamide - friction reducer	49,093	147,279	L	Stimulation chemical storage area	No
Polyethylene glycol trimethylnonyl ether - clay manager	87	261	L	Stimulation chemical storage area	Yes
Water in additive- stabiliser	66,804	200,412	L	Stimulation chemical storage area	No
Potassium sorbate food grade- corrosion inhibitor	14	42	L	Stimulation chemical storage area	No
Mannanase (Mannan endo-1,4-beta-mannosidase)- cross linker	2	6	L	Stimulation chemical storage area	Yes
Nonoxynol-9- surfactant	9	27	L	Stimulation chemical storage area	Yes
2-Ethylhexanol PO/EO polymer- stabiliser	9	27	L	Stimulation chemical storage area	No
Corn oil- friction reducer	662	1,986	L	Stimulation chemical storage area	No
AL-Cl-1F - HT Acid Corrosion Inhibitor	1,022	3,066	L	Stimulation chemical storage area	Yes
AL-FE-1F - Iron Control	2,001	6,002	L	Stimulation chemical storage area	Yes
BFL-1F - Low Buffer	2,000	6,000	L	Stimulation chemical storage area	Yes
BHE-01F - Encapsulated AP	173	519	L	Stimulation chemical storage area	Yes
BIO-GQ510 - Biocide 5/10 Glut Quat	38,715	116,144	L	Stimulation chemical storage area	Yes
CSA-1F - Clay Control (70% Choline)	96,786	290,358	L	Stimulation chemical storage area	No
HCL-15B - 15% HCL	508,008	1,524,023	L	Stimulation chemical storage area	Yes
SFT-NE-1F - Flowback Surfactant (NE)	48,666	145,997	L	Stimulation chemical storage area	Yes
BFH-1F - High Buffer	2,000	6,000	L	Stimulation chemical storage area	Yes
FRP-BL1F - HVFR Anionic (Freshwater)	114,830	344,490	L	Stimulation chemical storage area	Yes
LGA-01F - Guar Gel Concentrate	13,594	40,781	L	Stimulation chemical storage area	Yes
SCI-1F - Scale Inhibitor	96,786	290,358	L	Stimulation chemical storage area	No
XLB-C1F - Instant Cross-linker	3,263	9,788	L	Stimulation chemical storage area	Yes
Sodium chloride	15,000	45,000	kg	Completion chemical storage area	No
ALDACIDE G	500	1,500	L	Completion chemical storage area	Yes
OXYGON	100	300	kg	Completion chemical storage area	No
BARACOR 100	2,000	6,000	L	Completion chemical storage area	Yes
Sodium Hypochlorite 10–30%	10,000	30,000	L	Completion chemical storage area	Yes

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Current EMP text

Mannanase (Mannan endo-1,4-beta-mannosidase)- cross linker	2	4	L	Stimulation chemical storage area
Nonoxynol-9- surfactant	9	19	L	Stimulation chemical storage area
2-Ethylhexanol PO/EO polymer- stabiliser	9	19	L	Stimulation chemical storage area
Corn Oil- friction reducer	662	1325	L	Stimulation chemical storage area
Sodium hypochlorite	10,000	30,000	L	Completion chemical storage area
Sodium Chloride- weighting agent	15,000	30,000	kg	Completion chemical storage area
ALDACIDE G Biocide	500	1,000	L	Completion chemical storage area
OXYGON Oxygen scavenger	100	200	kg	Completion chemical storage area
BARACOR 100 corrosion inhibitor	2,000	4,000	L	Completion chemical storage area
CON-DET wetting agent	50	100	kg	Drilling chemical storage area
SAPP- sodium Acid Phosphate cement treatment	50	100	kg	Drilling chemical storage area
Bentonite- lubricant	3,000	6,000	kg	Drilling chemical storage area
Caustic Soda-pH control	1,400	2,800	kg	Drilling chemical storage area
EZ MUD DP or EZ MUD Liquid- drilling mud	2000	4,000	kg	Drilling chemical storage area
ALDACIDE G Biocide	336	672	kg	Drilling chemical storage area
STOPPIT Loss of circulation material	1,000	2,000	kg	Drilling chemical storage area
Soda Ash- drill mud conditioner	350	700	kg	Drilling chemical storage area
BARACOR 100 Corrosion inhibitor	250	500	kg	Drilling chemical storage area
Sodium Chloride (Flossy Salt)- weighting agent and formation inhibitor	96,000	192,000	kg	Drilling chemical storage area
Barite- weighting agent	500	1,000	kg	Drilling chemical storage area
BARACARB loss of circulation material	500	1,000	kg	Drilling chemical storage area
Citric Acid- pH control	500	1,000	kg	Drilling chemical storage area
BARADEFOAM HP Drilling fluid/foam	500	1,000	kg	Drilling chemical storage area
Sodium Bicarbonate- pH buffer	500	1,000	kg	Drilling chemical storage area
PERFORMATROL- polymer fluid system	500	1,000	kg	Drilling chemical storage area

Amended EMP text

CON-DET	50	150	kg	Drilling chemical storage area	No
SAPP	50	150	kg	Drilling chemical storage area	No
Bentonite	3,000	9,000	kg	Drilling chemical storage area	No
Caustic soda	1,400	4,200	kg	Drilling chemical storage area	No
EZ MUD DP or EZ MUD Liquid	2,000	6,000	kg	Drilling chemical storage area	No
ALDACIDE G	336	1008	kg	Drilling chemical storage area	Yes
STOPPIT	1,000	3,000	kg	Drilling chemical storage area	No
Soda ash	350	1050	kg	Drilling chemical storage area	Yes
BARACOR 100	250	750	kg	Drilling chemical storage area	Yes
Sodium chloride (flossy salt)	96,000	288,000	kg	Drilling chemical storage area	No
Barite	500	1,500	kg	Drilling chemical storage area	No
BARACARB	500	1,500	kg	Drilling chemical storage area	Yes
Citric acid	500	1,500	kg	Drilling chemical storage area	Yes
BARADEFOAM HP	500	1,500	kg	Drilling chemical storage area	No
Sodium Bicarbonate	500	1,500	kg	Drilling chemical storage area	No
PERFORMATROL	500	1,500	kg	Drilling chemical storage area	Yes
SOURSCAV	500	1,500	kg	Drilling chemical storage area	No
DRIL-N-SLIDE	500	1,500	kg	Drilling chemical storage area	No
STEELSEAL	500	1,500	kg	Drilling chemical storage area	Yes
BARAZAN D or BARAZAN D Plus	4,150	12,450	kg	Drilling chemical storage area	No
PAC L	2,300	6,900	kg	Drilling chemical storage area	Yes
Potassium chloride	22,500	67,500	kg	Drilling chemical storage area	No
QUIK-FREE	500	1,500	kg	Drilling chemical storage area	No
BAROFIBRE, BAROFIBRE Superfine and BAROFIBRE COARSE	500	1,500	kg	Drilling chemical storage area	No
BaraBlend-657	500	1,500	kg	Drilling chemical storage area	Yes
N-DRIL HT Plus	500	1,500	kg	Drilling chemical storage area	Yes
DEXTRID LTE	4,600	13,800	kg	Drilling chemical storage area	No
BARABUF	500	1,500	kg	Drilling chemical storage area	No
BDF 933 or BaraLube W-933	864	2,592	kg	Drilling chemical storage area	Yes
BAROLIFT	500	1,500	kg	Drilling chemical storage area	No
OXYGON	500	1,500	kg	Drilling chemical storage area	No
ENVIRO-THIN	500	1,500	kg	Drilling chemical storage area	No
Lime	500	1,500	kg	Drilling chemical storage area	Yes
Calcium chloride	37,000	111,000	kg	Drilling chemical storage area	Yes
Sodium bromide	8,610	24,480	kg	Drilling chemical storage area	Yes
Evolube TR	14,500	43,500	L	Drilling chemical storage area	Yes
Radiagreen EME	4,800	14,400	L	Drilling chemical storage area	Yes
Radiagreen EBL	4,800	14,400	L	Drilling chemical storage area	Yes
Polydrill	7,500	22,500	kg	Drilling chemical storage area	Yes
Alpine spotting beads	1,000	3,000	kg	Drilling chemical storage area	Yes

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Current EMP text

SOURSCAV- mud additive treat H2S contamination	500	1,000	kg	Drilling chemical storage area
DRIL-N-SLIDE- Casing lubricant	500	1,000	kg	Drilling chemical storage area
STEELSEAL- corrosion inhibitor	500	1,000	kg	Drilling chemical storage area
BARAZAN D or BARAZAN D PLUS- viscosity increaser	4,150	8,300	kg	Drilling chemical storage area
PAC L Loss of circulation material	2,300	4,600	kg	Drilling chemical storage area
Potassium Chloride- weighting agent and formation inhibitor	22,500	45,000	kg	Drilling chemical storage area
GEM CP/GP Shale stabiliser	500	1,000	kg	Drilling chemical storage area
QUIK-FREE – drilling additive	500	1,000	kg	Drilling chemical storage area
BAROFIBRE, BAROFIBRE Superfine and BAROFIBRE COARSE Loss of circulation material	500	1,000	kg	Drilling chemical storage area
BaraBlend-657 Loss of circulation material	500	1,000	kg	Drilling chemical storage area
N-DRIL HT PLUS filtration control additive	500	1,000	kg	Drilling chemical storage area
DEXTRID LTE filtration control additive	4,600	13,800	kg	Drilling chemical storage area
BARABUF pH buffer	500	1,000	kg	Drilling chemical storage area
BORE-HIB shale stabiliser	500	1,000	kg	Drilling chemical storage area
BDF 933 or BaraLube W-933 drilling lubricant	864	1,728	kg	Drilling chemical storage area
BAROLIFT sweeping agent	500	1,000	kg	Drilling chemical storage area
OXYGON Oxygen scavenger	500	1,000	kg	Drilling chemical storage area
ENVIRO-THIN filtration control additive	500	1,000	kg	Drilling chemical storage area
Lime pH buffer	500	1,000	kg	Drilling chemical storage area
BDF 677 Clay stabiliser	4,770	9,540	kg	Drilling chemical storage area
BDF 988 Clay stabiliser	3,390	6,780	kg	Drilling chemical storage area
SARALINE 185V- Synthetic based mud	299,800	599,600	kg	Drilling chemical storage area
NOVATEC P emulsifier for SBM	13,110	26,220	kg	Drilling chemical storage area
NOVATEC S emulsifier SBM	5700	11,400	kg	Drilling chemical storage area

Amended EMP text

Barite - weighting agent	354,000	1,062,000	kg	Drilling chemical storage area	No
Bio-Paq HT - filtration control	1,134	3,410	kg	Drilling chemical storage area	Yes
Brine-Pac XTS - corrosion inhibitor	3,400	10,200	L	Drilling chemical storage area	Yes
Calcium chloride - salinity	180,000	540,000	kg	Drilling chemical storage area	Yes
CF Desco - deflocculant	2,270	6,810	kg	Drilling chemical storage area	Yes
Chek Loss - fibrous LCM Cellulose	1,360	4,080	kg	Drilling chemical storage area	No
Citric acid - pH control	1,361	4,083	L	Drilling chemical storage area	Yes
Ecco-Temp - HT extender	8,000	24,000	L	Drilling chemical storage area	Yes
Flowzan - viscosifier	5,000	15,000	kg	Drilling chemical storage area	No
KEM-SEAL™ PLUS – high temperature filtration control agent	4,000	12,000	Kg	Drilling chemical storage area	No
Mil-Lime alkalinity	1,361	4,083	L	Drilling chemical storage area	Yes
Magnesium oxide - pH buffer	7,500	22,500	kg	Drilling chemical storage area	No
Mil-bio SEA 98 - biocide	1,800	5,400	L	Drilling chemical storage area	Yes
Mil-carb - LCM / bridging	5,000	15,000	kg	Drilling chemical storage area	No
Milstarch filtration control	5,000	15,000	kg	Drilling chemical storage area	No
Navi-Lube - lubricant	16,650	49,980	L	Drilling chemical storage area	Yes
New-Drill Plus - shale stabiliser	1,000	3,000	kg	Drilling chemical storage area	No
Noxygen XT - oxygen scavenger	880	2,660	kg	Drilling chemical storage area	No
Ova Col 110 HC - cloud point glycol	13,000	39,000	kg	Drilling chemical storage area	Yes
Potassium chloride salt / shale stabiliser	40,800	122,500	kg	Drilling chemical storage area	Yes
Potassium hydroxide - pH source	1,250	3,750	kg	Drilling chemical storage area	Yes
Pyro-Trol II - HT filtration control	25	75	kg	Drilling chemical storage area	No
Pyro-Vis II - HT viscosifier	1,400	4,200	kg	Drilling chemical storage area	Yes
Soda ash - pH and hardness control	1,000	3,000	kg	Drilling chemical storage area	Yes
Sodium bicarbonate - pH and hardness control	1,000	3,000	kg	Drilling chemical storage area	No
Sodium chloride - salt	54,400	163,300	kg	Drilling chemical storage area	No
W.O. defoam - defoamer	600	1,820	L	Drilling chemical storage area	Yes
Xan-Plex D - viscosifier	3,000	9,000	kg	Drilling chemical storage area	No
TEQ-LUBE II - lubricant (25322-6-3)	14,400	43,200	kg	Drilling chemical storage area	Yes
TEQ-LUBE II - lubricant (39464-69-2)	14,400	43,200	kg	Drilling chemical storage area	Yes
NEW-THIN - Polymeric thinner	4,680	14,040	kg	Drilling chemical storage area	No
LC-LUBE - lubricant (graphite)	9,090	27,270	kg	Drilling chemical storage area	No

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Current EMP text

Calcium Chloride weighting agent SBM	37,000	74,000	kg	Drilling chemical storage area
VG SUPREME clay viscosifier SBM	11,350	22,700	kg	Drilling chemical storage area
M-I BAR weighting agent SBM	193,500	169,500	kg	Drilling chemical storage area
NOVATEC F emulsifier SBM	3,610	7,220	kg	Drilling chemical storage area
NOVATEC transferred emulsifier SBM	1770	1770	kg	Drilling chemical storage area
Waste drilling fluids	2,500	2,500	m^3	Drilling mud sump
Completion fluids	1.4	1.4	ML	Drilling mud sump/on-site tank
Condensate	160	320	KL	Condensate storage area
Diesel	250	500	KL	Diesel storage tanks
Hydraulic oil	1,000	3,000	L	Workshop
Engine oil	1,000	3,000	L	Workshop
Degreasers	100	300	L	Workshop
Flowback	<10	13.8	ML	Flowback tanks

Amended EMP text

MAX-GUARD EA	26,000	78,000	L	Drilling chemical storage area	Yes
MAX-GUARD PLUS	26,000	78,000	L	Drilling chemical storage area	Yes
MAX-GUARD PLUS A	26,000	78,000	L	Drilling chemical storage area	Yes
SARALINE 185V	18,603	55,809	kg	Drilling chemical storage area	Yes
General operation chemicals					
Diesel	250	750	KL	Diesel storage tanks	Yes
Hydraulic oil	1,000	3,000	L	Workshop	Yes
Engine oil	1,000	3,000	L	Workshop	Yes
Degreasers	100	300	L	Workshop	Yes
Waste drilling fluids	2,500	7,500	m^3	Drilling mud sump	Yes
Completion fluids	1.4	4.2	ML	Drilling mud sump	No
Condensate	10	10	KL	Drilling chemical storage area	Yes
Flowback	~10.8 ML per well		ML	Flowback tanks	Yes
Proppants*					
100 mesh sand	91,000	273,000	kg	Stimulation chemical storage area	No
Quartz or organophilic phyllosilicate- proppant	1,084	3,252	L	Stimulation chemical storage area	No
40/70 sand	1,650,000	4,950,000	kg	Stimulation chemical storage area	No
30/50 sand	610,000	1,830,000	kg	Stimulation chemical storage area	No
Silicon dioxide (quartz/sand) 100% Sand	4,757,614	14,272,842	kg	Stimulation chemical storage area	No
Silicon dioxide (quartz/sand) 40/70	5,435,287	16,305,860	kg	Stimulation chemical storage area	No
* Proppants are sand which is inert. They do not require special chemical bunding but are co-located in the stimulation chemical storage area, within the well pad bund. Residual proppant from a stimulation campaign is often used to assist with chemical spills on the well pad, where contaminated spill material is removed.					
Cleaning chemicals and spill response					
Soda ash – sodium carbonate	3,750	11,250	kg	Stimulation chemical storage area - spill response for acid spills	Yes
Flush fluid - distillates (petroleum), hydrotreated	1,500	4,500	L	Stimulation chemical storage area - Equipment cleaning	Yes

Appendix E Chemical Risk Assessment (revised)

AECOM (2023). *Beetaloo Exploration and Appraisal Program - Hydraulic Fracturing Chemical Risk Assessment.* Dated June 2023.

Appendix E.1 Chemical Risk Assessment – Condor

EHS Support (2023). *Hydraulic Stimulation Chemical Risk Assessment Tamboran Resources Northern Territory Tenements*, dated 12 January 2023.

Appendix E Chemical Risk Assessment

AECOM Australia Pty Ltd. 2024a. *Beetaloo Exploration and Appraisal Program - Hydraulic Fracturing Chemical Risk Assessment*, Rev 10, prepared for Tamboran Resources, 26 November 2024.

Appendix E.1 - EHS Support. 2023. *Hydraulic Stimulation Chemical Risk Assessment – Tamboran Resources Northern Territory Tenements*, Prepared for Condor Energy, January 2024.

Appendix E.2 – AECOM Australia Pty Ltd. 2024b. *Beetaloo Exploration and Appraisal Program – Chemical Risk Assessment*, prepared for Fusion Technologies (Australia) Pty Ltd, Septenber 2024.

Appendix H Erosion and Sediment Control Plan

Section 7.3 new section

Appendix H Erosion and Sediment Control Plan

Section 7.3 ESC Trigger Action Response Plan

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- Action:
  - On establishment of each exploration well pad, undertake jar testing work to determine anticipated settling rate of sediments on site. This will inform flocculent dosing requirements as required.

Interest holder	Tamboran B2 Pty Ltd	EMP Title	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	Unique EMP ID	ORI10-3	Mod #	8	Date	26 March 2025

Current EMP text	Amended EMP text

	• Where monitoring has indicated weather condition have impacted the integrity of the erosion and sediment controls, operators must adopt one of the treatment plans from section 6.0 to mitigate the impacts of rainfall and ensure that the ESC devices are reinstated as soon as physically practicable after the event.
	• Inspection of all ESC devices across the worksite and physical water quality testing (physical parameters only) at the well pad sediment basin should be conducted prior to discharge of water offsite. Water quality discharge indicators include:
	• No visible oil, grease or other hydrocarbons. No visible foams caused by surfactants and detergents. No visible abnormal discoloration.
	  • pH: Between 5.2 – 9.0[1]
	  • EC: 1,300 µS/cm.[2]
	[1] *The proposed minimum pH is reflective of observed regional rainfall pH levels, with pH levels of 5.24 observed at Daly Waters on March 20, 2024. Tamboran has observed pH levels on its enclosed tank lids and sediment basins around the pH of 5 level. Given the large volume of rainwater that falls on a site in a very short period, the pH in the sediment basin is anticipated to be low, before increasing as they interact with the receiving soils. This has been observed in sediment basins onsite, with pH increasing from 5.2 to 6.5 over several hours after a rainfall event due to the low buffer capacity of rainwater. Given the existing pH of rainwater is approximately 5.2, we believe this to be an appropriate release limit for stormwater.*
	[2] *The proposed limit of 1,300 µs/cm was chosen as it aligns with the EC of the Gum Ridge formation (the main source of water used on proposed sites) and the ANZECC short term irrigation guideline value for moderately sensitive crops (Table 9.2.5 of the ANZEC Guidelines (2000) Volume 3, Chapter 9, Primary industries).*
	The proposed EC limit is underpinned by modelling designed to assess the changing soil salinities and the potential for impact on the receiving vegetation types, including Eucalyptus, Acacia, Melaleuca species and native grasses which are common to the area. Many of these species have been shown to have a moderate to high tolerance to salinity.
	The results of the modelling indicate the maximum root zone salinity will be in the order of 1.6 dS/m (for a sandy loam) to 1.7 dS/m (for a clay). This is below the likely vegetation root zone salinity of the vegetation types in the area. Also, the sodium adsorption ratio (SAR) for the Gum Ridge Formation was calculated at 2, which when combined with the EC values, indicates that the release of stormwater based on the revised release criteria is unlikely to cause soil structural issues.
	The adopted discharge criteria are widely used by Tamboran at its other operational sites on EP 117, EP 98 and EP 76, with no negative effects on soil properties or native vegetation.