**COMMONWEALTH OF AUSTRALIA**

***Sections 226 and 708***

***Offshore Petroleum and Greenhouse Gas Storage Act 2006***

**VARIATION OF PIPELINE LICENCE WA-21-PL**

**(HALYARD FLOWLINE) (02-2024)**

I, **STEVEN ROBERT TAYLOR**, Delegate of the National Offshore Petroleum Titles Administrator, on behalf of the Commonwealth–Western Australia Offshore Petroleum Joint Authority hereby vary Pipeline Licence WA-21-PL, dated 20 January 2011 (the Licence), for which:

**Santos WA Southwest Pty Limited**

**(ACN 050 611 688)**

is the registered titleholder, as set out below.

The variation takes effect on the day on which this notice of variation is published in the *Australian Government Gazette*.

Made under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*  
of the Commonwealth of Australia

**STEVEN ROBERT TAYLOR**

DELEGATE OF THE TITLES ADMINISTRATOR

ON BEHALF OF THE COMMONWEALTH–WESTERN AUSTRALIAOFFSHORE PETROLEUM JOINT AUTHORITY

1. Annexure B is varied by deleting all the current text and replacing with the following:

The route of the Greater East Spar system of pipes is described in the table hereunder, commencing at the Halyard-2 Christmas Tree (**XT**) Connector and terminating at the western tie-in flange on the East Spar Manifold. Coordinates are based on Geodetic Datum of Australia (GDA94).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Main Halyard Flowline System Co-Ordinates** | | | | |
|  | **Feature Name** | **KP** | **Easting (m)** | **Northing (m)** |
| 1. | Halyard-2 XT Connector | 0.00 | 283 147 | 7 720 608 |
| 2. | Greater East Spar PLEM | 0.02 | 283 157 | 7 720 584 |
| 3. | Greater East Spar Subsea Cooling Skid | 0.05 | 283 171 | 7 720 557 |
| 4. | Halyard 10” Flowline KP0.0 | 0.06 | 283 175 | 7 720 553 |
| 5. | Halyard 10” Flowline KP1.0 | 1.00 | 283 612 | 7 719 875 |
| 6. | Halyard 10” Flowline KP2.0 | 2.00 | 284 204 | 7 719 160 |
| 7. | Halyard 10” Flowline KP3.0 | 3.00 | 284 361 | 7 718 445 |
| 8. | Halyard 10” Flowline KP4.0 | 4.00 | 284 811 | 7 717 553 |
| 9. | Halyard 10” Flowline KP5.0 | 5.00 | 285 263 | 7 716 662 |
| 10. | Halyard 10” Flowline KP6.0 | 6.00 | 285 715 | 7 715 771 |
| 11. | Halyard 10” Flowline KP7.0 | 7.00 | 286 086 | 7 714 869 |
| 12. | Halyard 10” Flowline KP8.0 | 8.00 | 286 535 | 7 713 976 |
| 13. | Halyard 10” Flowline KP9.0 | 9.00 | 286 985 | 7 713 084 |
| 14. | Halyard 10” Flowline KP10.0 | 10.00 | 287 434 | 7 712 191 |
| 15. | Halyard 10” Flowline KP11.0 | 11.00 | 287 881 | 7 711 297 |
| 16. | Halyard 10” Flowline KP12.0 | 12.00 | 288 330 | 7 710 405 |
| 17. | Halyard 10” Flowline KP13.0 | 13.00 | 288 778 | 7 709 512 |
| 18. | Halyard 10” Flowline KP14.0 | 14.00 | 289 226 | 7 708 619 |
| 19. | Halyard 10” Flowline KP15.0 | 15.00 | 289 674 | 7 707 729 |
| 20. | Halyard 10” Flowline KP15.6 | 15.59 | 290 088 | 7 707 280 |
| 21. | East Spar PLEM | 15.60 | 290 091 | 7 707 279 |
| 22. | East Spar Manifold western flange tie-in spool (end) | 15.61 | 290 101 | 7 707 291 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Route of Spar-2 Tie-in 8” Flowline Co-Ordinates** | | | | |
|  | **Feature Name** | **KP** | **Easting (m)** | **Northing (m)** |
| 1. | Spar-2 Christmas Tree (start) | 0.00 | 281 791 | 7 719 735 |
| 2. | Spar-2 8” Flowline | 1.00 | 282 605 | 7 720 276 |
| 3. | Spar-2 8” Flowline (end) (GES PLEM) | 1.68 | 283 154 | 7 720 585 |

1. Annexure C “Basis of Design” is varied by updating the items in bold and italics:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| General Details | | | | | | | | | | | | |
| 1. | Pipeline Name (meaningful to industry) | | | Halyard Flowline | | | | | | | | |
| ***2.*** | ***Total Length of Pipeline (km)*** | | | ***17.4 (approximate)*** | | | | | | | | |
| ***3.*** | ***Start point Description*** | | | ***Halyard-2 Christmas Tree Connector*** | | | | | | | | |
| ***4.*** | ***‘Start Point of Pipeline Coordinates (GDAA94)***   1. ***Northing:*** 2. ***Easting:*** | | | ***Zone 50***  ***283 147 mN***  ***7 720 608 mE*** | | | | | | | | |
| ***5.*** | End Point Description | | | East Spar Manifold | | | | | | | | |
| ***6.*** | ‘End’ Point of Pipeline Coordinate (GDA94)   1. Northing: 2. Easting: | | | Zone 50  7 707 290.800 mN  290 101.200 mE | | | | | | | | |
| ***7.*** | Substance to be Conveyed: | | | Wet Gas and Condensate | | | | | | | | |
| ***8.*** | Characteristics of Substance to be Conveyed;   1. Gas Composition: | | | |  |  | | --- | --- | | Methane (C1) | 87.24 (mol %) | | Ethane (C2) | 4.98 (mol %) | | Propane (C3) | 1.92 (mol %) | | Butane (C4) | 0.87 (mol %) | | Pentane (C5) | 0.42 (mol %) | | Hexane (C6) | 0.26 (mol %) | | Heptane (C7) | 0.15 (mol %) | | Water (H20) | 0.00 (mol %) | | Carbon Dioxide (CO2) | 3.23 (mol %) | | Nitrogen (N2) | 0.93 (mol %) | | Helium (He) | 0.00 (mol %) | | Mercury (Hg) | 0.00 (mol %) | | Hydrogen Sulphide (H2S) | 0.00 (mol %) | |  |  | | | | | | | | | |
| Design Details | | | | Halyard -1 10” Flowline | Spar-2 8” Flowline | | GES PLEM | | GES SCS | ***Halyard-2 6” Tie-In Spool*** | | GES PLEM – SCS 6” Tie-In Spool |
| ***9.*** | Pipe Dimensions | | Outside Diameter (mm) | 328.9 | 268.1 | | 168.3 | | 168.3 | ***168.3*** | | 168.3 |
| Inside Diameter (mm) | 254 | 203.2 | | 139.7 | | 146.3 | ***131.8*** | | 131.8 |
| Length of Pipeline (km) | 15.554 | 1.679 | | 0.05 | | 0.94 | ***0.019 to 0.026*** | | 0.022 (±0.003) |
| ***10.*** | Nominal Wall Thickness | | Standard Wall (mm) | 37.3 | 32.5 | | 14.3 | | 11.0 | ***18.3*** | | 18.3 |
| Heavy Wall (mm) | 37.5 | N/A | | N/A | | N/A | ***N/A*** | | N/A |
| ***11.*** | Design  N.B. Assumes nominal contents density of  114 kg/m3 | | Initial Design Capacity (TJ/d) | 99.0 | 95 | | 150 | | 150 | ***95 (90 MMscf/d)*** | | 150 |
| Max Design Capacity (TJ/d) | 250 | 317 | | 164 | | 164 | ***150 (141 MMscf/d)*** | | 150 |
| Design life (years) | 20 | 20 | | 20 | | 20 | ***10*** | | 20 |
| Erosional Velocity (m/s) | 50 | 40 | | 40 | | 40 | ***40*** | | 40 |
| ***12.*** | Pipeline Corrosion Allowance | | Internal (mm) | NIL | NIL | | NIL | | NIL | ***NIL*** | | NIL |
| External (mm) | NIL | NIL | | NIL | | NIL | ***NIL*** | | NIL |
| ***13.*** | Pipe Steel Specification and grade | | Pipeline | API 17J Duplex 2101 (7.2 mm thick) | API Spec 17J Duplex 2101 | | UNS 31803, 22% Cr Duplex 2205 | | UNS 31803, 22% Cr Duplex 2205 | ***UNS 31803, 22% Cr Duplex 2205*** | | UNS 31803, 22% Cr Duplex 2205 |
| Riser | N/A | N/A | | N/A | | N/A | ***N/A*** | | N/A |
| ***14.*** | Joint type (welded, Mechanical etc) | | | Mechanical Graylock connectors | | | | | | | | |
| ***15.*** | Pipe Free Span (m) at Location (KP) | | | Not Applicable | | | | | | | | |
| ***16.*** | Yield Strength of Pipe Steel   1. Burst Pressure: 2. Collapse Pressure 3. Failure Pressure | | | 1. MPag    1. MPag    2. 2848 kN | | | | | | | | |
| Temperature and Pressure Details | | | | Halyard -1 10” Flowline | | Spar-2 8” Flowline | | GES PLEM | GES SCS | | ***Halyard-2 6” Tie-In Spool*** | GES PLEM – SCS 6” Tie-In Spool |
| ***17.*** | Design Temperature | Pipeline (0C) | | 110 | | 110 | | 121 | 121 | | ***121*** | 121 |
| Facilities (0C) | | 55 | | 55 | | 55 | 55 | | ***55*** | 55 |
| ***18.*** | Maximum Operating Temperature | Pipeline (0C) | | 98 | | 105 | | 105 | 105 | | ***105*** | 105 |
| Facilities/stations (0C) | | 55 | | 55 | | 55 | 55 | | ***55*** | 55 |
| ***19.*** | Minimum Operating Temperature | Pipeline (0C) | | -20 | | -20 | | -18 | -18 | | ***-18*** | -18 |
| Facilities/stations (0C) | | -18 | | -20 | | -20 | -20 | | ***-20*** | -20 |
| ***20.*** | Design Pressure (MPag) | | | 22.8 | | 22.8 | | 34.5 | 22.8 | | ***34.5*** | 34.5 |
| ***21.*** | Inlet Pressure Range (MPag) | | | 6.0 to 21.2 | | 6.0 to 21.5 | | 6.0 to 21.5 | 6.0 to 21.5 | | ***6.0 to 21.5*** | 6.0 to 21.5 |
| ***22.*** | Outlet Pressure Range (MPag) | | | 6.0 to 21.2 | | 6.0 to 21.5 | | 6.0 to 21.5 | 6.0 to 21.5 | | ***6.0 to 21.5*** | 6.0 to 21.5 |
| ***23.*** | Maximum Allowable Operating Pressure (MPag) | | | 22.8 at 1100C | | 22.8 at 1100C | | 22.8 at 1100C | 22.8 at 1100C | | ***22.8 at 1100C*** | 22.8 at 1100C |
| ***24.*** | Field Test Pressure   1. Proposed Field Test Pressure: 2. Minimum Field Test Pressure [ ] x MAOP   = [ ] MPag | | | 22.80  Minimum Field Test Pressure [1.10] x MAOP  = 25.08 MPag | | | | | | | | |
| Pipeline Coatings | | | | | | | | | | | | |
| ***25.*** | Protective External Coating Specification and Thickness (mm): | | | API 17 J; outer sheath MDPE 8 mm | | | | | | | | |
| ***26.*** | Weight Coating Design Specification and Thickness (mm): | | | None | | | | | | | | |
| ***27.*** | Field Joint Coating: | | | Not Applicable | | | | | | | | |
| ***28.*** | Pipe-to-Pipe Joint Coating: | | | NORSOK M-501 System 7 | | | | | | | | |
| Control Monitoring | | | | | | | | | | | | |
| ***29.*** | Pressure and Flow Controls Description: | | | Located on Halyard Well and John Brookes Platform | | | | | | | | |
| ***30.*** | Safety and Emergency Shutdown Description: | | | Located on Halyard Well and John Brookes Platform | | | | | | | | |
| ***31.*** | Telemetry Control: | | | SCADA or equivalent located on John Brookes Platform | | | | | | | | |
| ***32.*** | Pigging Facilities   1. General Facilities: 2. Description of Pigging Facilities: | | | Not Applicable  Not Applicable | | | | | | | | |
| ***33.*** | Provisions for cathodic protection of the pipeline: | | | Sacrificial Al-Zn-In Anodes at flowline end fittings | | | | | | | | |
| ***34.*** | Cathodic Potential Monitoring: | | | Not Applicable | | | | | | | | |
| ***35.*** | Cathodic Protection Test Posts: | | | Not Applicable | | | | | | | | |
| Valves & Inline Facilities | | | | | | | | | | | | |
| ***36.*** | Fittings, Valves and Flanges specifications  a) Fittings:  b) Valves:  c) Flanges:  ***d) Halyard-2 Spool:*** | | | ASME B16.5; ASME VIII; DNV OS F101  API 6D; DNV OS F101  ASME B16.5; ASME VII; DNV OS F101  ***ASME B31.8*** | | | | | | | | |
| ***37.*** | Mainline Valves   1. Number of: 2. Type: 3. Location (at KP): 4. Details of Mainline Valves: | | | 0 | | | | | | | | |
| ***38.*** | Location of future Off-take Tees (at KP): | | | None | | | | | | | | |
| ***39.*** | Number of Pipeline Inlet Facilities: | | | 0 | | | | | | | | |
| ***40.*** | Pipeline Inlet Facilities Description: | | | Not Applicable | | | | | | | | |
| ***41.*** | Number of Pipeline Outlet Facilities: | | | 0 | | | | | | | | |
| ***42.*** | Pipeline Outlet Facilities Description: | | | Not Applicable | | | | | | | | |
| ***43.*** | Compressor Stations (if applicable)   1. Number of: 2. Location (at KP)|: | | | 0 | | | | | | | | |
| ***44.*** | Other Inline Facilities: | | | None | | | | | | | | |
| Crossings & Pipeline Stabilisation | | | | | | | | | | | | |
| ***45.*** | Location of the crossing: | | | Not Applicable | | | | | | | | |
| ***46.*** | Pipeline Crossing Type: | | | Not Applicable | | | | | | | | |
| ***47.*** | Crossings Design Standard: | | | Not Applicable | | | | | | | | |
| ***48.*** | Minimum Earth Cover or Other Means of Stabilisation: | | | None | | | | | | | | |
| ***49.*** | Anchoring Details: | | | Not Applicable | | | | | | | | |
| Pipeline Management | | | | | | | | | | | | |
| ***50.*** | Environmental Design Criteria Description: | | | 100 year cyclonic criteria | | | | | | | | |
| ***51.*** | Marine Growth Allowance (mm): | | | None | | | | | | | | |
| ***52.*** | Risk Management Description: | | | DNV OS F101 | | | | | | | | |
| PLEM-ES Manifold Tie-in Spool (Rigid Pipe) | | | | | | | | | | | | |
| ***53.*** | Pipe Outside Diameter (mm) | | | 355.6 mm | | | | | | | | |
| ***54.*** | Pipe Wall Thickness (mm) | | | 19.05 mm | | | | | | | | |
| ***55.*** | Pipe Steel Grade and Specification: | | | Duplex Stainless Steel AA 928 UNS31803 | | | | | | | | |
| ***56.*** | Pipe Length (m): | | | 15 | | | | | | | | |
| ***57.*** | Design Pressure (MPag): | | | 22.8 | | | | | | | | |
| ***58.*** | Design Temperature (0C): | | | 55 | | | | | | | | |
| ***59.*** | Design Code: | | | ASME B 31.8 | | | | | | | | |

1. The WA-21-PL Pipeline Route Map at Annexure A is deleted and replaced with the maps at **Attachment 1**.

**Attachment 1**





