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| <div></div> <div>ABU DHABI OIL CO., LTD (JAPAN)</div> | MUBARRAZ REDEVELOPMENT STUDY – SELECT STAGE (CONTRACT NO. DP-22-101) | | <div></div> |
| | COST ESTIMATION REPORT | | |
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ABU DHABI OIL CO., LTD. (JAPAN)

COST ESTIMATION REPORT

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| | | | | | |
| 0 | 20-10-22 | Issued for COMPANY Approval (IFA) | SR | RT | RT |
| B1 | 23-09-22 | Issued for Review (IFR) | SR | RT | RT |
| REV | DATE | DESCRIPTION | PREPARED BY | REVIEWED BY | APPROVED BY |

| | | | |
|------------------|-------------|---------------|---------|
| BTME Project No. | AET00842-00 | BTME Doc. No. | 7422001 |
|------------------|-------------|---------------|---------|





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1 INTRODUCTION

1.1 Project Background

Abu Dhabi Oil Co. Ltd. (Japan); hereafter referred as COMPANY, has been involved in development and oil production from three (3) fields, namely Mubarraaz, AR and GA since 1970's. Recently, COMPANY has also developed and started production from Hail oil field. These fields are located 60 to 100 km west of Abu Dhabi City.

Mubarraaz field, largest among the fields, is located in the southern part of the Arabian Gulf, 60 km west of the coast of Abu Dhabi at approximately 24°30' of north latitude and 53°40' of east longitude. Mubarraaz field consists of two major northeast-southwest anticlinal trends, each of which was further divided by subtle saddles into six separate structures, namely, AB, AA, B, CD, CB and MR-6, with no major faults. Oil is accumulated within the Cretaceous Thamama Group, which consists of Zones 2 to 6 at depths between 8,800 and 11,000 ft. subsea. The crude oil in the Thamama Group can be featured as highly under-saturated with relatively low solution gas-oil-ratios ("GOR"), indicating a medium to light oil in a range of approximately 35 API to 45 API in gravity.

Commercial production through Mubarraaz field commenced in May 1973. Electrical submersible pumps ("ESPs") have been successfully applied since 1975 to boost oil production from Mubarraaz Field. Production is realized through offshore production platforms (e.g. AAP, BAP, BBP, BDP, BFP, CAP, CDP and MR-1) located within the Mubarraaz field with final processing and export through Mubarraaz Island.

1.2 Project Description



COMPANY intends to re-develop Mubarraaz field to enhance oil production from current levels through new development planning. COMPANY, over the course of 2020 and 2021, had undertaken IDENTIFY and ASSESS (I&A) stage studies on multiple production profiles and was able to identify a set of production profiles and developmental options which are economically viable and bears merit to be forwarded for SELECT Stage Study.

COMPANY intends to undertake SELECT Study with to further evaluate the options identified and recommended by the I&A Stage Study, select the best scheme/concept based on technical, economical and risk evaluation and develop conceptual design for the selected concept.

The execution of this SELECT study will be managed by COMPANY. This study is awarded to BILFINGER TEBODIN Middle East, with an objective to perform the SELECT Study in full compliance with ADNOC's Value Assurance Process (VAP) as well as the requirements outlined.

1.3 Project Title

The title of the Project is "MUBARRAZ REDEVELOPMENT STUDY – SELECT STAGE (CONTRACT NO. DP-22-101)".

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2 DEFINITIONS & ABBREVIATIONS

2.1 Definitions

| | |
|------------|--|
| COMPANY | : Abu Dhabi Oil Company Ltd. (Japan) |
| CONSULTANT | : Bilfinger Tebodin Middle East |
| PROJECT | : Project for “MUBARRAZ REDEVELOPMENT STUDY – SELECT STAGE (CONTRACT NO. DP-22-101)” |
| SHALL | : The use of the word “shall” means mandatory requirement |
| SHOULD | : The use of the word “should” indicates a strong recommendation to comply with the requirements of this document. |
| VENDOR | : The party(s) which manufactures and/or supplies piping, equipment and services as may be required. |

2.2 Abbreviations

| Abbreviation | Description |
|--------------|---------------------------------|
| ADNOC | Abu Dhabi National Oil Company |
| ADOC | Abu Dhabi Oil Co., Ltd. (Japan) |
| ESP | Electrical Submersible Pump |
| FWST | Full Well Stream Transfer |
| I&A | Identify and Assess |
| IPR | Independent Project Review |
| LTDP | Long Term Development Plan |
| MPFM | Multiphase Flow Meter |
| PWT | Produced Water Treatment |
| TIC | Total Installed Cost |
| WHT | Well Head Tower |

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3 REFERENCE DOCUMENTS

| Sl. No. | Description | Document Number |
|---------|---|-----------------|
| 1 | Study Design Basis | 7344004 |
| 2 | Process Simulation Report | 3112101 |
| 3 | Process Adequacy Assessment Report | 7344010 |
| 4 | Mechanical Adequacy Assessment Report | 2144010 |
| 5 | Piping Adequacy Assessment Report | 2644010 |
| 6 | Material Adequacy Assessment Report | 1944010 |
| 7 | Electrical Adequacy Assessment Report | 4144010 |
| 8 | Instrumentation Adequacy Assessment Report | 4344010 |
| 9 | Civil / Structural Adequacy Assessment Report | 1344010 |
| 10 | Option Catalogue Report | 3132013 |
| 11 | Bottleneck Register | 3132012 |
| 12 | Technical Definition of Options | 3132014 |
| 13 | Cost Estimate Basis and Methodology | 7421001 |

4 PURPOSE OF DOCUMENT



The purpose of the document is as below:

- Present the cost estimate +/- 40% cost estimation to be carried out for all options.

5 LIST OF OPTIONS TO BE STUDIED

Below is the list of options studied as part of the Select Stage.

| Option 5 | Option 6 | Option 6a |
|---|---|---|
| <ul style="list-style-type: none"> •LTDP 1 •LTDP 2 Plateau •Step 1 4a1 •Step 1 4b2 •Step 2 5-1 | <ul style="list-style-type: none"> •LTDP 1 •LTDP 2 Plateau •Step 1 4a1 •Step 1 4b2 •Step 2 5-1 | <ul style="list-style-type: none"> •LTDP 1 •LTDP 2 Plateau •Step 1 4a1 •Step 1 4b2 •Step 2 5-1 |

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6 COST BREAKDOWN STRUCTURE



For each option, cost estimate is divided into following cost blocks. This cost estimate summary is presented in Attachment 1.

Table 1: Cost Breakdown Structure

| Sl. No. | Cost block description |
|---------|-------------------------------|
| L1 | CAP modifications |
| | AAP modifications |
| | BBP modifications |
| | BAP modifications |
| | BDP modifications |
| | BFP modifications |
| | CDP modifications |
| | CFP modifications |
| L2 | New Platform CDP |
| | New Platform CFP |
| L3 | New WHT-F (CDP) |
| | New WHT-D (CFP) |
| L4 | Connecting bridges |
| L5 | Mubarraz Island modifications |
| L6 | Subsea pipelines |
| L7 | Subsea cables |

Attachment 2 provides the detailed cost estimate for each of the above cost blocks for all options.

Attachment 3 is the back up estimate for electrical items used to build up the cost estimate for each cost block in Attachment 2.

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Attachment 4 is the back up estimate for instrumentation and control items used to build up the cost estimate for each cost block in Attachment 2. Attachment 5 is the cost estimate for Produced Water Treatment Package used to build up the cost estimate for each cost block in Attachment 2.

Attachment 6 is the cost estimate for rest of the equipment/packages used to build up the cost estimate for each cost block in Attachment 2.

7 TOTAL INSTALLED COST FOR IDENTIFIED OPTIONS

Total Installed cost (TIC) is defined as below:



TIC = Base Estimate + Contingency

Base Estimate = EPC cost + Total Client Indirect cost

The Total Installed Cost (TIC) for all the options with an accuracy of +/-40% is provided below:

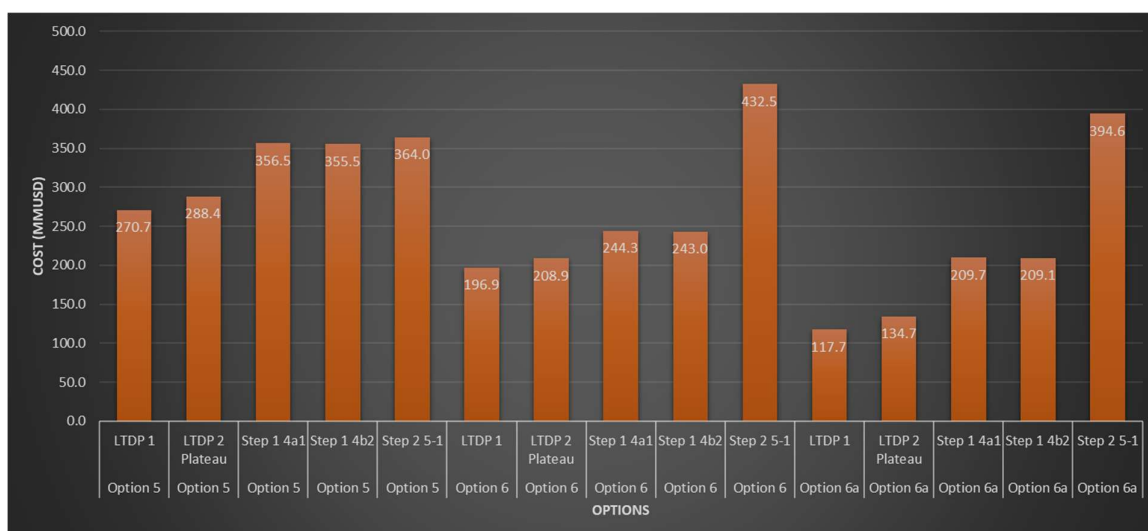
Table 2: Summary of Total Installed Cost (TIC) for all the Options

| Option No | Production Profile | TIC (MMUSD) |
|-----------|--------------------|-------------|
| Option 5 | LTDP 1 | 270.7 |
| Option 5 | LTDP 2 Plateau | 288.4 |
| Option 5 | Step 1 4a1 | 356.5 |
| Option 5 | Step 1 4b2 | 355.5 |
| Option 5 | Step 2 5-1 | 364 |
| Option 6 | LTDP 1 | 196.9 |
| Option 6 | LTDP 2 Plateau | 208.9 |
| Option 6 | Step 1 4a1 | 244.3 |
| Option 6 | Step 1 4b2 | 243 |
| Option 6 | Step 2 5-1 | 432.5 |
| Option 6a | LTDP 1 | 117.7 |
| Option 6a | LTDP 2 Plateau | 134.7 |
| Option 6a | Step 1 4a1 | 209.7 |

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| Option No | Production Profile | TIC (MMUSD) |
|-----------|--------------------|-------------|
| Option 6a | Step 1 4b2 | 209.1 |
| Option 6a | Step 2 5-1 | 394.6 |

Graphical comparison of the options is shown below:





Key exclusions in the above cost data is as below:

- Drillex

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8 ATTACHMENTS

| Attachment No. | Description |
|----------------|--|
| Attachment 1 | Summary of Cost Estimation |
| Attachment 2 | Detailed Cost Estimate for each cost block |
| Attachment 3 | Itemwise Cost estimate of Electrical Items |
| Attachment 4 | Itemwise Cost estimate for Instrumentation and Control |
| Attachment 5 | Cost Estimate for Produced Water Treatment Package |
| Attachment 6 | Cost Estimate for rest of equipment/packages |

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Attachment 1 – Summary of Cost Estimation

Legends:

- indicates maximum value among options
- input value
- CS Carbon steel
- CA Corrosion Allowance
- FWST Full Well Stream Transfer
- MI Mubarraz Island
- TPIA Third Party Inspection Agency

Attachment 1 Summary of Cost Estimation

| Option | | Cost | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a |
|---------|-------------------------------|-------|----------|----------------|------------|------------|------------|----------|----------------|------------|------------|------------|-----------|----------------|------------|------------|------------|
| Sl. No. | Cost block description | MMUSD | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 |
| L1 | CAP modifications | MMUSD | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | AAP modifications | MMUSD | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | BBP modifications | MMUSD | 0.0 | 0.0 | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 2.7 | 2.7 | 0.0 |
| | BAP modifications | MMUSD | 0.0 | 0.0 | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 2.7 | 2.7 | 0.0 |
| | BDP modifications | MMUSD | 0.0 | 2.7 | 2.7 | 2.7 | 2.7 | 0.0 | 2.7 | 2.7 | 2.7 | 2.7 | 0.0 | 2.7 | 2.7 | 2.7 | 2.7 |
| | BFP modifications | MMUSD | 0.0 | 2.7 | 2.7 | 2.7 | 2.7 | 0.0 | 2.7 | 2.7 | 2.7 | 2.7 | 0.0 | 2.7 | 2.7 | 2.7 | 2.7 |
| | CDP modifications | MMUSD | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 9.2 | 9.2 | 9.2 | 9.2 | 9.3 | 8.9 | 8.9 | 8.9 | 8.9 | 9.2 |
| | CFP modifications | MMUSD | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 9.6 | 9.6 | 9.7 | 9.7 | 9.7 | 9.2 | 9.2 | 9.3 | 9.3 | 9.6 |
| L2 | New Platform CDP | MMUSD | 85.2 | 88.9 | 98.0 | 96.4 | 101.9 | | | | | | | | | | |
| | New Platform CFP | MMUSD | 88.0 | 96.0 | 108.6 | 112.5 | 120.3 | | | | | | | | | | |
| L3 | New WHT-F (CDP) | MMUSD | | | | | | | | | | 60.4 | | | | | 60.4 |
| | New WHT-D (CFP) | MMUSD | | | | | | | | | | 65.6 | | | | | 65.6 |
| L4 | Connecting bridges | MMUSD | 27.5 | 27.5 | 27.5 | 27.5 | 27.5 | | | | | 27.5 | | | | | 27.5 |
| L5 | Mubarraz Island modifications | MMUSD | 34.9 | 34.9 | 46.0 | 42.3 | 45.2 | 50.3 | 56.2 | 71.3 | 72.5 | 70.4 | 43.0 | 50.4 | 61.9 | 63.0 | 65.8 |
| L6 | Subsea pipelines | MMUSD | 0.0 | 0.0 | 28.0 | 28.0 | 28.0 | 121.8 | 121.8 | 134.6 | 131.9 | 143.4 | 80.0 | 92.2 | 116.1 | 114.1 | 116.1 |
| L7 | Subsea cables | MMUSD | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | | | | | 33.9 | | | | | 33.9 |
| | TOTAL INSTALLED COST | MMUSD | 270.4 | 287.3 | 353.3 | 352.1 | 362.9 | 196.9 | 208.1 | 241.5 | 239.9 | 431.4 | 141.0 | 166.0 | 206.9 | 206.0 | 393.5 |

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Attachment 2 – Detailed Cost Estimate for Each Cost Block

List of modifications

L1: Existing Platform Modifications Cost

| Option | Cost per unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a |
|--|---------------|----------|----------------|------------|------------|------------|-----------|----------------|------------|------------|------------|-----------|----------------|------------|------------|------------|
| Cost block description | MMUSD | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 |
| CAP modifications | | | | | | | | | | | | | | | | |
| ESP replacement (ESP cost not considered) | | | | | | | | | | | | | | | | |
| 8" Bypass Manifold | | | | | | | 7,771 | 7,771 | 7,771 | 7,771 | 7,771 | | | | | |
| MPFM | | | | | | | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | | | | | |
| Installation Barge cost | | | | | | | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | | | | | |
| Total Installed Cost | USD | - | - | - | - | - | 2,972,771 | 2,972,771 | 2,972,771 | 2,972,771 | 2,972,771 | - | - | - | - | - |
| AAP modifications | | | | | | | | | | | | | | | | |
| ESP replacement (ESP cost not considered) | | | | | | | | | | | | | | | | |
| 8" Bypass Manifold | | | | | | | 7,771 | 7,771 | 7,771 | 7,771 | 7,771 | | | | | |
| MPFM | | | | | | | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | | | | | |
| Installation Barge cost | | | | | | | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | | | | | |
| Total Installed Cost | USD | - | - | - | - | - | 2,972,771 | 2,972,771 | 2,972,771 | 2,972,771 | 2,972,771 | - | - | - | - | - |
| BBP modifications | | | | | | | | | | | | | | | | |
| ESP replacement (ESP cost not considered) | | | | | | | | | | | | | | | | |
| Installation Barge cost | | | | 2,665,000 | 2,665,000 | | | | 2,665,000 | 2,665,000 | | | | 2,665,000 | 2,665,000 | |
| Total Installed Cost | USD | - | - | 2,665,000 | 2,665,000 | - | - | - | 2,665,000 | 2,665,000 | - | - | - | 2,665,000 | 2,665,000 | - |
| BAP modifications | | | | | | | | | | | | | | | | |
| ESP replacement (ESP cost not considered) | | | | | | | | | | | | | | | | |
| Installation Barge cost | | | | 2,665,000 | 2,665,000 | | | | 2,665,000 | 2,665,000 | | | | 2,665,000 | 2,665,000 | |
| Total Installed Cost | USD | - | - | 2,665,000 | 2,665,000 | - | - | - | 2,665,000 | 2,665,000 | - | - | - | 2,665,000 | 2,665,000 | - |
| BDP modifications | | | | | | | | | | | | | | | | |
| ESP replacement (ESP cost not considered) | | | | | | | | | | | | | | | | |
| Installation Barge cost | | | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 |
| Total Installed Cost | USD | - | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | - | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | - | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 |
| BFP modifications | | | | | | | | | | | | | | | | |
| ESP replacement (ESP cost not considered) | | | | | | | | | | | | | | | | |
| Installation Barge cost | | | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 |
| Total Installed Cost | USD | - | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | - | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 | - | 2,665,000 | 2,665,000 | 2,665,000 | 2,665,000 |
| CDP modifications | | | | | | | | | | | | | | | | |
| ESP replacement (ESP cost not considered) | | | | | | | | | | | | | | | | |
| Interconnecting piping with new CDP platform | | 300,643 | 300,643 | 300,643 | 300,643 | 300,643 | | | | | | | | | | |
| Bypass manifold | | | | | | | 30,064 | 30,064 | 47,451 | 38,120 | 47,451 | 17,774 | 22,965 | 38,120 | 30,064 | 38,120 |
| MPFM | | | | | | | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | | | | | 300,000 |
| Pig Launcher | | | | | | | 59,844 | 59,844 | 80,994 | 66,828 | 86,189 | 36,801 | 40,495 | 66,828 | 59,844 | 66,828 |
| Risers | | | | | | | - | - | - | - | - | - | - | - | - | - |
| Deck Extension | | | | | | | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 |
| Installation Barge cost | | | | | | | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 |
| Total Installed Cost | USD | 300,643 | 300,643 | 300,643 | 300,643 | 300,643 | 9,209,132 | 9,209,132 | 9,247,669 | 9,224,171 | 9,252,863 | 8,873,799 | 8,882,684 | 8,924,171 | 8,909,132 | 9,224,171 |
| CFP modifications | | | | | | | | | | | | | | | | |
| ESP replacement (ESP cost not considered) | | | | | | | | | | | | | | | | |
| Interconnecting piping with new CDP platform | | 300,643 | 300,643 | 300,643 | 300,643 | 300,643 | | | | | | | | | | |
| Bypass manifold | | | | | | | 93,184 | 93,184 | 107,484 | 107,484 | 122,299 | 30,064 | 47,451 | 80,321 | 80,321 | 80,321 |
| MPFM | | | | | | | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | | | | | 300,000 |
| Pig Receiver | | | | | | | 91,012 | 91,012 | 122,551 | 101,458 | 122,551 | 53,424 | 60,812 | 101,458 | 91,012 | 101,458 |
| Pig Launcher | | | | | | | 146,006 | 146,006 | 178,166 | 178,166 | 178,166 | 59,844 | 80,994 | 143,236 | 143,236 | 143,236 |
| Instrumentation modifications | | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 |
| Risers | | | | | | | - | - | - | - | - | - | - | - | - | - |
| Deck Extension | | | | | | | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 | 3,444,224 |
| Installation Barge cost | | | | | | | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 | 5,375,000 |
| Total Installed Cost | USD | 500,643 | 500,643 | 500,643 | 500,643 | 500,643 | 9,649,426 | 9,649,426 | 9,727,425 | 9,706,332 | 9,742,239 | 9,162,557 | 9,208,481 | 9,344,239 | 9,333,792 | 9,644,239 |

L1: Existing Platform Modifications Cost

INSTALLATION BARGE COST PER LOCATION (Other than CDP and CFP)

| Item | | No of days | Rate/day (USD) | Total Cost (USD) |
|--|------------|------------|----------------|------------------|
| Survey Vessel | no of days | 1.0 | 40,000 | 40,000 |
| Installation Barge Mobilisation | no of days | 3.0 | 350,000 | 1,050,000 |
| Transportation Spread Mobilisation | no of days | 2.0 | 80,000 | 160,000 |
| Load-out and Seafastening of Jacket, Boat Landings & piles at yard | no of days | 1.0 | 20,000 | 20,000 |
| Transportation from Yard to Site | no of days | 2.0 | 20,000 | 40,000 |
| Installation of Facilities | no of days | 2.0 | 150,000 | 300,000 |
| Marine Operations Support | no of days | | 30,000 | - |
| Installation Barge Down Time =30% of installation time | no of days | 1.0 | 175,000 | 175,000 |
| Transportation Barge Down Time = 30% of Load out and transportation time | no of days | 1.0 | 20,000 | 20,000 |
| Installation Barge Demobilisation to Fabrication Yard | no of days | 2.0 | 350,000 | 700,000 |
| Transportation Barge Demobilisation | no of days | 2.0 | 80,000 | 160,000 |
| Total | USD | | | 2,665,000 |

INSTALLATION BARGE COST PER LOCATION (CDP and CFP)

| Item | | No of days | Rate/day (USD) | Total Cost (USD) |
|--|------------|------------|----------------|------------------|
| Survey Vessel | no of days | 1.0 | 40,000 | 40,000 |
| Installation Barge Mobilisation | no of days | 3.0 | 350,000 | 1,050,000 |
| Transportation Spread Mobilisation | no of days | 2.0 | 80,000 | 160,000 |
| Load-out and Seafastening of Jacket, Boat Landings & piles at yard | no of days | 3.0 | 20,000 | 60,000 |
| Transportation from Yard to Site | no of days | 2.0 | 20,000 | 40,000 |
| Installation of Facilities | no of days | 15.0 | 150,000 | 2,250,000 |
| Marine Operations Support | no of days | | 30,000 | - |
| Installation Barge Down Time =30% of installation time | no of days | 5.0 | 175,000 | 875,000 |
| Transportation Barge Down Time = 30% of Load out and transportation time | no of days | 2.0 | 20,000 | 40,000 |
| Installation Barge Demobilisation to Fabrication Yard | no of days | 2.0 | 350,000 | 700,000 |
| Transportation Barge Demobilisation | no of days | 2.0 | 80,000 | 160,000 |
| Total | USD | | | 5,375,000 |

MPFM

| Item | | | | Cost (USD) |
|------|-----|-----|---------|------------|
| MPFM | USD | 1.0 | 300,000 | 300,000 |

Risers

| Item | | | | Cost (USD) |
|--------|-----|-----|---|------------|
| Risers | USD | 1.0 | - | - |

included in pipeline cost

Annexure 1 to L1: Piping Cost in Existing Platforms modification

| SI .No. | Service | Size (inches) | Thickness (mm) | Cost/m (USD) | Length (m) | Material cost (USD) | TIC (USD) |
|---------|------------------------|---------------|----------------|--------------|------------|---------------------|-----------|
| 1 | Bypass manifold | 8 | 7.63 | 47.8 | 50 | 2,388 | 7,771 |
| 2 | Bypass manifold | 12 | 11.63 | 109.2 | 50 | 5,462 | 17,773.67 |
| 3 | Bypass manifold | 14 | 12.88 | 141.2 | 50 | 7,058 | 22,965 |
| 4 | Bypass manifold | 16 | 14.75 | 184.8 | 50 | 9,239 | 30,064 |
| 5 | Bypass manifold | 18 | 16.62 | 234.3 | 50 | 11,715 | 38,120 |
| 6 | Bypass manifold | 20 | 18.62 | 291.6 | 50 | 14,582 | 47,451 |
| 7 | Bypass manifold | 26 | 24.25 | 493.7 | 50 | 24,684 | 80,321 |
| 8 | Bypass manifold | 28 | 26.12 | 572.7 | 50 | 28,637 | 93,184 |
| 9 | Bypass manifold | 30 | 28.12 | 660.6 | 50 | 33,031 | 107,484 |
| 10 | Bypass manifold | 32 | 30.00 | 751.7 | 50 | 37,584 | 122,299 |
| 11 | Interconnecting Piping | 16 | 14.75 | 184.8 | 500 | 92,392 | 300,643 |

| Parameter / Location | | Unit | Item 1 |
|--|-------|--------------------|--------|
| Direct Cost | | | |
| Material cost | | USD | 2,388 |
| Piping Bulks | 50.0% | % of material cost | 1,194 |
| Instrumentation Bulks | 0.0% | % of material cost | - |
| Electrical Bulks | 0.0% | % of material cost | - |
| Structural Bulks | 0.0% | % of material cost | - |
| Others | 10.0% | % of material cost | 239 |
| 2 years operational spares | 0.0% | % of material cost | - |
| | | | |
| Installation Cost | 30.0% | % of material cost | 716 |
| Construction Cost | 5.0% | % of material cost | 119 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 48 |
| Direct Cost | | | 4,705 |
| | | | |
| Contractor Indirects | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 470 |
| Freight Cost | 7.0% | % of Material Cost | 167 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 48 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 470 |
| Total Contractor Indirect Cost | | | 1,156 |
| | | | |
| EPC Costs | 0.0% | | 5,861 |
| | | | |
| Client Indirects | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 147 |
| PMC + PMT | 7.0% | % of EPC Costs | 410 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 59 |
| Total Client Indirect Cost | | | 615 |
| Base Estimate | | | 6,476 |
| Contingency | 20.0% | % of Base Estimate | 1,295 |
| Total Installed Cost | | USD | 7,771 |

Annexure 3 to L1: Deck Extension cost for existing CDP and CFP

| Item | Qty | Unit Rate (USD) | Total Cost (USD) |
|--|--------------------|-----------------|------------------|
| Structural Materials | | | |
| Deck Extension | 50.0 | 1,500 | 75,000 |
| Grillage & Sea Fastening - Deck | 2.0 | 2,130 | 4,260 |
| Rigging/Installation Aids-Deck | 0.8 | 10,200 | 8,160 |
| Material Direct Cost | | | 87,420 |
| Material Indirect Cost | | 10.0% | 8,742 |
| Deck Extension | 50.0 | 3,000 | 150,000 |
| Grillage & Sea Fastening | 2.0 | 3,000 | 6,000 |
| Fabrication Cost | | | 156,000 |
| Installation Cost | Days / Tons | Rate/Day | |
| Installation Barge Mobilisation | 2.0 | 150,000 | 300,000 |
| Transportation Spread Mobilisation | 2.0 | 50,000 | 100,000 |
| Loadout & Seafastening of Topside Deck at Port | 2.0 | 15,000 | 30,000 |
| Transportation of Deck from Yard to Site | 2.0 | 15,000 | 30,000 |
| Installation of Deck | 4.0 | 75,000 | 300,000 |
| Brownfield Works at Offshore | 50.0 | 5,000 | 250,000 |
| Marine Operations Support | | 30,000 | - |
| Installation Barge Down Time @ 30% | 2.0 | 75,000 | 150,000 |
| Transportaion Barge Down Time @ 30% | 2.0 | 15,000 | 30,000 |
| Installation Barge Demobilisation to Fabrication Yard | 2.0 | 150,000 | 300,000 |
| Transportation Barge Demobilisation | 2.0 | 50,000 | 100,000 |
| Load-out and Installation of Structure | | | 1,590,000 |
| Installation Indirect Costs (10% of Load-out and installation of structure) | | 10.0% | 159,000 |
| Brownfield Works at Offshore | % of Material Cost | 10.0% | 8,742 |
| Commissioning Assistance Cost | % of Material Cost | 2.0% | 1,748 |
| Direct Cost | | | 2,011,652 |
| Contractor Indirects | | | |
| Detailed Engineering, including Construction Engineering | % of Direct Cost | 10.0% | 201,165 |
| Freight Cost | % of Material Cost | 7.0% | 6,119 |
| TPIA / Vendor Representative Cost | % of Material Cost | 2.0% | 1,748 |
| Construction Supervision & Project Management | % of Direct Cost | 10.0% | 201,165 |
| Contractor Markups & Profits | % of Direct Cost | 7.0% | 140,816 |
| Total Contractor Indirect Cost | | | 551,014 |
| EPC Costs | | | 2,562,666 |
| Client Indirects | | | |
| Studies + FEED | % of EPC Costs | 2.5% | 64,067 |
| PMC + PMT | % of EPC Costs | 7.0% | 179,387 |
| Project Insurance & Other Overheads | % of EPC Costs | 2.5% | 64,067 |
| Total Client Indirect Cost | | | 307,520 |
| Base Estimate | | | 2,870,186 |
| Contingency | % of Base Estimate | 20.0% | 574,037 |
| Total Installed Cost | | | 3,444,224 |

L2: Process Platforms (New CDP or CFP with WHT cost)

| Item | Remarks | Qty (Tons or no of days as applicable) | Unit Rate (USD) or % | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|---|-------------------------------|---|-------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | | | | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 |
| | | | | New CDP | New CDP | New CDP | New CDP | New CDP | New CFP | New CFP | New CFP | New CFP | New CFP |
| | | | | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) |
| Equipment Cost | | | | 10,814,128 | 12,078,496 | 15,155,183 | 14,631,494 | 13,838,269 | 11,417,594 | 14,118,823 | 18,410,207 | 19,762,243 | 18,332,275 |
| Piping Bulks | % of Equipment Cost | | | - | - | - | - | - | - | - | - | - | - |
| Instrumentation Bulks | % of Equipment Cost | | | - | - | - | - | - | - | - | - | - | - |
| Electrical Bulks | % of Equipment Cost | | | - | - | - | - | - | - | - | - | - | - |
| Structural Bulks | % of Equipment Cost | | | - | - | - | - | - | - | - | - | - | - |
| Others (including safety equipment) | % of Equipment Cost | | 10.0% | 1,081,413 | 1,207,850 | 1,515,518 | 1,463,149 | 1,383,827 | 1,141,759 | 1,411,882 | 1,841,021 | 1,976,224 | 1,833,228 |
| 2 years operational spares | % of Equipment Cost | | 2.0% | 216,283 | 241,570 | 303,104 | 292,630 | 276,765 | 228,352 | 282,376 | 368,204 | 395,245 | 366,646 |
| Total Equipment Material Cost | | | | 12,111,824 | 13,527,916 | 16,973,804 | 16,387,273 | 15,498,861 | 12,787,705 | 15,813,082 | 20,619,432 | 22,133,712 | 20,532,149 |
| Equipment Directs | | | | | | | | | | | | | |
| Installation Cost | % of Equipment Cost | | 30.0% | 3,244,239 | 3,623,549 | 4,546,555 | 4,389,448 | 4,151,481 | 3,425,278 | 4,235,647 | 5,523,062 | 5,928,673 | 5,499,683 |
| Construction Cost | % of Equipment Cost | | 20.0% | 2,162,826 | 2,415,699 | 3,031,037 | 2,926,299 | 2,767,654 | 2,283,519 | 2,823,765 | 3,682,041 | 3,952,449 | 3,666,455 |
| Commissioning Assistance cost | % of Equipment Cost | | 2.0% | 216,283 | 241,570 | 303,104 | 292,630 | 276,765 | 228,352 | 282,376 | 368,204 | 395,245 | 366,646 |
| Equipment Direct Cost | | | | 17,735,171 | 19,808,734 | 24,854,499 | 23,995,650 | 22,694,761 | 18,724,854 | 23,154,870 | 30,192,740 | 32,410,078 | 30,064,932 |
| | | | | | | | | | | | | | |
| STRUCTURAL MATERIALS | | | | | | | | | | | | | |
| Deck | Tons | 1,871 | 2,000 | 3,742,000 | 3,742,000 | 3,742,000 | 3,742,000 | 3,742,000 | 3,742,000 | 3,742,000 | 3,742,000 | 3,742,000 | 3,742,000 |
| Jacket | Tons | 532 | 2,000 | 1,064,000 | 1,064,000 | 1,064,000 | 1,064,000 | 1,064,000 | 1,064,000 | 1,064,000 | 1,064,000 | 1,064,000 | 1,064,000 |
| Piles | Tons | 309 | 2,000 | 618,000 | 618,000 | 618,000 | 618,000 | 618,000 | 618,000 | 618,000 | 618,000 | 618,000 | 618,000 |
| Anodes | Tons | 15 | 4,900 | 73,500 | 73,500 | 73,500 | 73,500 | 73,500 | 73,500 | 73,500 | 73,500 | 73,500 | 73,500 |
| Grout | Tons | | | - | - | - | - | - | - | - | - | - | - |
| Grillage & Sea Fastening - Deck | Tons | 75 | 2,130 | 159,409 | 159,409 | 159,409 | 159,409 | 159,409 | 159,409 | 159,409 | 159,409 | 159,409 | 159,409 |
| Grillage & Sea Fastening - Jkt & Piles | Tons | 34 | 2,130 | 71,653 | 71,653 | 71,653 | 71,653 | 71,653 | 71,653 | 71,653 | 71,653 | 71,653 | 71,653 |
| Rigging/Installation Aids-Deck | Tons | 30 | 10,200 | 305,347 | 305,347 | 305,347 | 305,347 | 305,347 | 305,347 | 305,347 | 305,347 | 305,347 | 305,347 |
| Rigging/Installation Aids-Jkt | Tons | 9 | 10,200 | 86,822 | 86,822 | 86,822 | 86,822 | 86,822 | 86,822 | 86,822 | 86,822 | 86,822 | 86,822 |
| Structural Material Cost | | | | 6,120,732 | 6,120,732 | 6,120,732 | 6,120,732 | 6,120,732 | 6,120,732 | 6,120,732 | 6,120,732 | 6,120,732 | 6,120,732 |
| Structural Material Indirect Cost | % of Structural Material Cost | | 10% | 612,074 | 612,074 | 612,074 | 612,074 | 612,074 | 612,074 | 612,074 | 612,074 | 612,074 | 612,074 |
| | | | | | | | | | | | | | |
| Fabrication of Structural Steel | | | | | | | | | | | | | |
| Jacket & Deck | Tons | 2,403 | 3,000 | 7,209,000 | 7,209,000 | 7,209,000 | 7,209,000 | 7,209,000 | 7,209,000 | 7,209,000 | 7,209,000 | 7,209,000 | 7,209,000 |
| Piles | Tons | 309 | 1,500 | 463,500 | 463,500 | 463,500 | 463,500 | 463,500 | 463,500 | 463,500 | 463,500 | 463,500 | 463,500 |
| Grillage & Sea Fastening | Tons | 108 | 3,000 | 325,440 | 325,440 | 325,440 | 325,440 | 325,440 | 325,440 | 325,440 | 325,440 | 325,440 | 325,440 |
| Fabrication of Structural Steel | | | | 7,997,940 | 7,997,940 | 7,997,940 | 7,997,940 | 7,997,940 | 7,997,940 | 7,997,940 | 7,997,940 | 7,997,940 | 7,997,940 |
| LOAD OUT AND INFRASTRUCTURE OF STRUCTURE | | | | | | | | | | | | | |
| Survey Vessel | no of days | 6.0 | 40,000 | 240,000 | 240,000 | 240,000 | 240,000 | 240,000 | 240,000 | 240,000 | 240,000 | 240,000 | 240,000 |
| Installation Barge Mobilisation | no of days | 3.0 | 350,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 |
| Transportation Spread Mobilisation | no of days | 2.0 | 80,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 |
| Load-out and Seafastening of Jacket, Boat Landings & piles at yard | no of days | 8.0 | 20,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 |
| Transportation from Yard to Site | no of days | 2.0 | 20,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Installation of Jacket | no of days | 4.0 | 175,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 |
| Piling Works | no of days | 10.0 | 175,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 |
| Grouting Works | no of days | 7.0 | 30,000 | 210,000 | 210,000 | 210,000 | 210,000 | 210,000 | 210,000 | 210,000 | 210,000 | 210,000 | 210,000 |
| ROV Spread | no of days | 5.0 | 12,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 |
| Installation of Transition Piece | no of days | 6.0 | 175,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 |
| Installation of Boat Landing, RP, CP including relocations of barge | no of days | 6.0 | 175,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 |
| Loadout & Seafastening of Topside Deck at Port | no of days | 5.0 | 20,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 |
| Transportation of Deck from Yard to Site | no of days | 2.0 | 20,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Installation of Deck | no of days | 5.0 | 150,000 | 750,000 | 750,000 | 750,000 | 750,000 | 750,000 | 750,000 | 750,000 | 750,000 | 750,000 | 750,000 |
| Marine Operations Support | no of days | | 30,000 | - | - | - | - | - | - | - | - | - | - |
| Installation Barge Down Time @ 30% | no of days | 10.0 | 175,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 | 1,750,000 |
| Transportaion Barge Down Time @ 30% | no of days | 6.0 | 20,000 | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 |
| Installation Barge Demobilisation to Fabrication Yard | no of days | 2.0 | 350,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 | 700,000 |
| Transportation Barge Demobilisation | no of days | 2.0 | 80,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 | 160,000 |
| LOAD OUT AND INFRASTRUCTURE OF STRUCTURE | | | | 10,090,000 | 10,090,000 | 10,090,000 | 10,090,000 | 10,090,000 | 10,090,000 | 10,090,000 | 10,090,000 | 10,090,000 | 10,090,000 |
| Commissioning Assistance Cost | % of Structural Material Cost | | 2.0% | 122,415 | 122,415 | 122,415 | 122,415 | 122,415 | 122,415 | 122,415 | 122,415 | 122,415 | 122,415 |
| Structural Direct Cost | | | | 24,943,161 | 24,943,161 | 24,943,161 | 24,943,161 | 24,943,161 | 24,943,161 | 24,943,161 | 24,943,161 | 24,943,161 | 24,943,161 |

L2: Process Platforms (New CDP or CFP with WHT cost)

| Item | Remarks | Qty (Tons or no of days as applicable) | Unit Rate (USD) or % | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|---|--|---|-------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | | | | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | |
| | | | | New CDP | New CDP | New CDP | New CDP | New CDP | New CFP | New CFP | New CFP | New CFP | New CFP | New CFP |
| | | | | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) |
| Electrical Items Cost | | | | 2,649,200 | 2,649,200 | 2,649,200 | 2,649,200 | 5,506,200 | 3,029,200 | 3,029,200 | 3,029,200 | 3,029,200 | 3,029,200 | 7,432,200 |
| Electrical Directs | | | | | | | | | | | | | | |
| Installation Cost | % of Electrical Items Cost | | 30.0% | 794,760 | 794,760 | 794,760 | 794,760 | 1,651,860 | 908,760 | 908,760 | 908,760 | 908,760 | 908,760 | 2,229,660 |
| Construction Cost | % of Electrical Items Cost | | 20.0% | 529,840 | 529,840 | 529,840 | 529,840 | 1,101,240 | 605,840 | 605,840 | 605,840 | 605,840 | 605,840 | 1,486,440 |
| Commissioning Assistance cost | % of Electrical Items Cost | | 2.0% | 52,984 | 52,984 | 52,984 | 52,984 | 110,124 | 60,584 | 60,584 | 60,584 | 60,584 | 60,584 | 148,644 |
| Electrical Direct Cost | | | | 4,026,784 | 4,026,784 | 4,026,784 | 4,026,784 | 8,369,424 | 4,604,384 | 4,604,384 | 4,604,384 | 4,604,384 | 4,604,384 | 11,296,944 |
| INSTRUMENTATION EQUIPMENT COST | | | | 1,100,000 | 1,100,000 | 1,100,000 | 1,100,000 | 1,100,000 | 1,100,000 | 1,100,000 | 1,100,000 | 1,100,000 | 1,100,000 | 1,100,000 |
| INSTRUMENTATION DIRECTS | | | | | | | | | | | | | | |
| Installation Cost | % of Instrumentation Equipment Cost | | | 330,000 | 330,000 | 330,000 | 330,000 | 330,000 | 330,000 | 330,000 | 330,000 | 330,000 | 330,000 | 330,000 |
| Construction Cost | % of Instrumentation Equipment Cost | | 30.0% | 220,000 | 220,000 | 220,000 | 220,000 | 220,000 | 220,000 | 220,000 | 220,000 | 220,000 | 220,000 | 220,000 |
| Commissioning Assistance cost | % of Instrumentation Equipment Cost | | 20.0% | 22,000 | 22,000 | 22,000 | 22,000 | 22,000 | 22,000 | 22,000 | 22,000 | 22,000 | 22,000 | 22,000 |
| Instrumentation Direct Cost | | | 2.0% | 1,672,000 | 1,672,000 | 1,672,000 | 1,672,000 | 1,672,000 | 1,672,000 | 1,672,000 | 1,672,000 | 1,672,000 | 1,672,000 | 1,672,000 |
| Total Material Cost (Equipment,Structural,Electrical,Instrumentation) | | | | 21,981,756 | 23,397,848 | 26,843,736 | 26,257,205 | 28,225,793 | 23,037,637 | 26,063,014 | 30,869,364 | 32,383,644 | 32,383,644 | 35,185,081 |
| Total Direct Cost | | | | 48,377,116 | 50,450,679 | 55,496,444 | 54,637,595 | 57,679,346 | 49,944,399 | 54,374,415 | 61,412,285 | 63,629,623 | 63,629,623 | 67,977,037 |
| CONTRACTOR INDIRECTS | | | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | % of Direct Cost | | 10.0% | 4,837,712 | 5,045,068 | 5,549,645 | 5,463,760 | 5,767,935 | 4,994,440 | 5,437,442 | 6,141,229 | 6,362,963 | 6,362,963 | 6,797,704 |
| Freight Cost | % of Material Cost | | 7.0% | 1,538,723 | 1,637,850 | 1,879,062 | 1,838,005 | 1,975,806 | 1,612,635 | 1,824,411 | 2,160,856 | 2,266,856 | 2,266,856 | 2,462,956 |
| TPiA / Vendor Representative Cost | % of Material Cost | | 2.0% | 439,636 | 467,957 | 536,875 | 525,145 | 564,516 | 460,753 | 521,261 | 617,388 | 647,673 | 647,673 | 703,702 |
| Construction Supervision & Project Management | % of Direct Cost | | 10.0% | 4,837,712 | 5,045,068 | 5,549,645 | 5,463,760 | 5,767,935 | 4,994,440 | 5,437,442 | 6,141,229 | 6,362,963 | 6,362,963 | 6,797,704 |
| Contractor Markups & Profits | % of Direct Cost | | 7.0% | 3,386,399 | 3,531,548 | 3,884,752 | 3,824,632 | 4,037,555 | 3,496,108 | 3,806,210 | 4,298,860 | 4,454,074 | 4,454,074 | 4,758,393 |
| Total Contractor Indirect Cost | | | | 15,040,182 | 15,727,491 | 17,399,979 | 17,115,302 | 18,113,747 | 15,558,376 | 17,026,766 | 19,359,562 | 20,094,529 | 20,094,529 | 21,520,459 |
| EPC Costs | Total Direct Cost + Total Contractor Indirect Cost | | | 63,417,298 | 66,178,170 | 72,896,423 | 71,752,897 | 75,793,093 | 65,502,775 | 71,401,181 | 80,771,847 | 83,724,152 | 83,724,152 | 89,497,496 |
| CLIENT INDIRECTS | | | | | | | | | | | | | | |
| Studies + FEED | % of EPC Costs | | 2.5% | 1,585,433 | 1,654,455 | 1,822,411 | 1,793,823 | 1,894,828 | 1,637,570 | 1,785,030 | 2,019,297 | 2,093,104 | 2,093,104 | 2,237,438 |
| PMC + PMT | % of EPC Costs | | 7.0% | 4,439,211 | 4,632,472 | 5,102,750 | 5,022,703 | 5,305,517 | 4,585,195 | 4,998,083 | 5,654,030 | 5,860,691 | 5,860,691 | 6,264,825 |
| Project Insurance & Other Overheads | % of EPC Costs | | 2.5% | 1,585,433 | 1,654,455 | 1,822,411 | 1,793,823 | 1,894,828 | 1,637,570 | 1,785,030 | 2,019,297 | 2,093,104 | 2,093,104 | 2,237,438 |
| Total Client Indirect Cost | | | | 7,610,077 | 7,941,382 | 8,747,572 | 8,610,349 | 9,095,173 | 7,860,335 | 8,568,143 | 9,692,624 | 10,046,899 | 10,046,899 | 10,739,701 |
| Base Estimate | EPC Costs + Total Client Indirect Cost | | | 71,027,375 | 74,119,552 | 81,643,995 | 80,363,246 | 84,888,266 | 73,363,110 | 79,969,324 | 90,464,471 | 93,771,051 | 93,771,051 | 100,237,197 |
| Contingency | % of Base Estimate | | 20.0% | 14,205,475 | 14,823,911 | 16,328,800 | 16,072,650 | 16,977,654 | 14,672,622 | 15,993,865 | 18,092,895 | 18,754,211 | 18,754,211 | 20,047,440 |
| Total Installed Cost | Base Estimate + Contingency | | | 85,232,850 | 88,943,463 | 97,972,795 | 96,435,896 | 101,865,920 | 88,035,732 | 95,963,189 | 108,557,366 | 112,525,262 | 112,525,262 | 120,284,637 |
| | | | MMUSD | 85.2 | 88.9 | 98.0 | 96.4 | 101.9 | 88.0 | 96.0 | 108.6 | 112.5 | 112.5 | 120.3 |

Annexure 1 to L2: New CDP + WHT combined Platform Equipment Cost

| Item | Option | Unit | Quantity | Size / Capacity per unit | Cost/Item | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|------|---------------------------------------|---------|----------|---|-----------|----------|----------------|------------|------------|------------|
| | Description | | | | USD | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 |
| 1 | New CDP 3 phase separator | ft | 1 | 10.2 D x 20.3 L | 2,055,266 | x | | | | |
| | | | 1 | 10.8 D x 21.6 L | 2,329,017 | | x | | | |
| | | | 1 | 12.5 D x 24.9 L | 3,345,600 | | | x | | |
| | | | 1 | 12.5 D x 24.9 L | 3,345,600 | | | | x | |
| | | | 1 | 12.1 D x 24.3 L | 3,171,833 | | | | | x |
| 2 | New CDP Production Oil Transfer Pumps | BPD | 2 | 16,942 | 155,148 | x | | | | |
| | | | 2 | 20,201 | 172,422 | | x | | | |
| | | | 2 | 30,501 | 220,779 | | | x | | |
| | | | 2 | 25,325 | 197,469 | | | | x | |
| | | | 2 | 30,770 | 221,945 | | | | | x |
| 3 | New PWT package | BPD | 1 | 14,023 | 7,016,895 | x | | | | |
| | | | 1 | 17,341 | 7,972,966 | | x | | | |
| | | | 1 | 24,650 | 9,895,860 | | | x | | |
| | | | 1 | 22,707 | 9,418,791 | | | | x | |
| | | | 1 | 20,242 | 8,750,381 | | | | | x |
| 4 | Pig Launcher for CDP to CFP pipeline | in, ft | 1 | - | - | x | | | | |
| | | | 1 | - | - | | x | | | |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | 40,495 | | | x | | |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | 40,495 | | | | x | |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | 40,495 | | | | | x |
| 5 | Instrument Air compressor | Nm3/h | 2 | 40 | 124,001 | x | | | | |
| | | | 2 | 40 | 124,001 | | x | | | |
| | | | 2 | 40 | 124,001 | | | x | | |
| | | | 2 | 40 | 124,001 | | | | x | |
| | | | 2 | 40 | 124,001 | | | | | x |
| 6 | Closed Drain Drum | ft | 1 | 4.93D x 12.31L | 237,714 | x | | | | |
| | | | 1 | 4.93D x 12.31L | 237,714 | | x | | | |
| | | | 1 | 4.93D x 12.31L | 237,714 | | | x | | |
| | | | 1 | 4.93D x 12.31L | 237,714 | | | | x | |
| | | | 1 | 4.93D x 12.31L | 237,714 | | | | | x |
| 7 | Closed Drain pump | BPD | 1 | 754.7 | 33,111 | x | | | | |
| | | | 1 | 754.7 | 33,111 | | x | | | |
| | | | 1 | 754.7 | 33,111 | | | x | | |
| | | | 1 | 754.7 | 33,111 | | | | x | |
| | | | 1 | 754.7 | 33,111 | | | | | x |
| 8 | Corrosion Inhibitor Package | ft, LPH | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | x | | | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | | x | | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | | | x | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | | | | x | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | | | | | x |
| 9 | Emulsion Breaker Package | ft, LPH | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | x | | | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | | x | | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | | | x | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | | | | x | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226,320 | | | | | x |
| 10 | Fire water Pump | BPD | 2 | 42,857 | 170,102 | x | | | | |
| | | | 2 | 42,857 | 170,102 | | x | | | |
| | | | 2 | 42,857 | 170,102 | | | x | | |
| | | | 2 | 42,857 | 170,102 | | | | x | |
| | | | 2 | 42,857 | 170,102 | | | | | x |
| 11 | MFPM | - | 1 | - | 300,000 | | | | | |
| | | | 1 | - | 300,000 | | | | | |
| | | | 1 | - | 300,000 | | | | | |
| | | | 1 | - | 300,000 | | | | | |
| | | | 1 | - | 300,000 | | | | | |
| 12 | Monorails | - | 4 | 5 Ton | 30,000 | x | | | | |
| | | | 4 | 5 Ton | 30,000 | | x | | | |
| | | | 4 | 5 Ton | 30,000 | | | x | | |
| | | | 4 | 5 Ton | 30,000 | | | | x | |
| | | | 4 | 5 Ton | 30,000 | | | | | x |

Annexure 1 to L2: New CDP + WHT combined Platform Equipment Cost

| Item | Option | | Quantity | Size / Capacity per unit | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|------|---------------------------------------|---------|----------|---|------|------------|----------------|------------|------------|------------|
| | Description | | | | | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 |
| 1 | New CDP 3 phase separator | ft | 1 | 10.2 D x 20.3 L | USD | 2,055,266 | - | - | - | - |
| | | | 1 | 10.8 D x 21.6 L | USD | - | 2,329,017 | - | - | - |
| | | | 1 | 12.5 D x 24.9 L | USD | - | - | 3,345,600 | - | - |
| | | | 1 | 12.5 D x 24.9 L | USD | - | - | - | 3,345,600 | - |
| | | | 1 | 12.1 D x 24.3 L | USD | - | - | - | - | 3,171,833 |
| 2 | New CDP Production Oil Transfer Pumps | BPD | 2 | 16,942 | USD | 310,297 | - | - | - | - |
| | | | 2 | 20,201 | USD | - | 344,844 | - | - | - |
| | | | 2 | 30,501 | USD | - | - | 441,557 | - | - |
| | | | 2 | 25,325 | USD | - | - | - | 394,937 | - |
| | | | 2 | 30,770 | USD | - | - | - | - | 443,890 |
| 3 | New PWT package | BPD | 1 | 14,023 | USD | 7,016,895 | - | - | - | - |
| | | | 1 | 17,341 | USD | - | 7,972,966 | - | - | - |
| | | | 1 | 24,650 | USD | - | - | 9,895,860 | - | - |
| | | | 1 | 22,707 | USD | - | - | - | 9,418,791 | - |
| | | | 1 | 20,242 | USD | - | - | - | - | 8,750,381 |
| 4 | Pig Launcher for CDP to CFP pipeline | in, ft | 1 | - | USD | - | - | - | - | - |
| | | | 1 | - | USD | - | - | - | - | - |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | USD | - | - | 40,495 | - | - |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | USD | - | - | - | 40,495 | - |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | USD | - | - | - | - | 40,495 |
| 5 | Instrument Air compressor | Nm3/h | 2 | 40 | USD | 248,002 | - | - | - | - |
| | | | 2 | 40 | USD | - | 248,002 | - | - | - |
| | | | 2 | 40 | USD | - | - | 248,002 | - | - |
| | | | 2 | 40 | USD | - | - | - | 248,002 | - |
| | | | 2 | 40 | USD | - | - | - | - | 248,002 |
| 6 | Closed Drain Drum | ft | 1 | 4.93D x 12.31L | USD | 237,714 | - | - | - | - |
| | | | 1 | 4.93D x 12.31L | USD | - | 237,714 | - | - | - |
| | | | 1 | 4.93D x 12.31L | USD | - | - | 237,714 | - | - |
| | | | 1 | 4.93D x 12.31L | USD | - | - | - | 237,714 | - |
| | | | 1 | 4.93D x 12.31L | USD | - | - | - | - | 237,714 |
| 7 | Closed Drain pump | BPD | 1 | 754.7 | USD | 33,111 | - | - | - | - |
| | | | 1 | 754.7 | USD | - | 33,111 | - | - | - |
| | | | 1 | 754.7 | USD | - | - | 33,111 | - | - |
| | | | 1 | 754.7 | USD | - | - | - | 33,111 | - |
| | | | 1 | 754.7 | USD | - | - | - | - | 33,111 |
| 8 | Corrosion Inhibitor Package | ft, LPH | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | 226,320 | - | - | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | 226,320 | - | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | 226,320 | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | - | 226,320 | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | - | - | 226,320 |
| 9 | Emulsion Breaker Package | ft, LPH | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | 226,320 | - | - | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | 226,320 | - | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | 226,320 | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | - | 226,320 | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | - | - | 226,320 |
| 10 | Fire water Pump | BPD | 2 | 42,857 | USD | 340,204 | - | - | - | - |
| | | | 2 | 42,857 | USD | - | 340,204 | - | - | - |
| | | | 2 | 42,857 | USD | - | - | 340,204 | - | - |
| | | | 2 | 42,857 | USD | - | - | - | 340,204 | - |
| | | | 2 | 42,857 | USD | - | - | - | - | 340,204 |
| 11 | MFPM | - | 1 | - | USD | - | - | - | - | - |
| | | | 1 | - | USD | - | - | - | - | - |
| | | | 1 | - | USD | - | - | - | - | - |
| | | | 1 | - | USD | - | - | - | - | - |
| | | | 1 | - | USD | - | - | - | - | - |
| 12 | Monorails | - | 4 | 5 Ton | USD | 120,000 | - | - | - | - |
| | | | 4 | 5 Ton | USD | - | 120,000 | - | - | - |
| | | | 4 | 5 Ton | USD | - | - | 120,000 | - | - |
| | | | 4 | 5 Ton | USD | - | - | - | 120,000 | - |
| | | | 4 | 5 Ton | USD | - | - | - | - | 120,000 |
| | TIC | | | | USD | 10,814,128 | 12,078,496 | 15,155,183 | 14,631,494 | 13,838,269 |

Annexure 2 to L2: New CFP + WHT combined Platform Equipment Cost

| Item | Option | Unit | Quantity | Size / Capacity per unit | Cost/Item | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|------|---------------------------------------|---------|----------|--|-----------|----------|----------------|------------|------------|------------|
| | Description | | | | USD | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 |
| 1 | New CDP 3 phase separator | ft | 1 | 10.5 D x 21.0 L | 2190003 | x | | | | |
| | | | 1 | 11.8 D x 23.6 L | 3002699 | | x | | | |
| | | | 1 | 13.8 D x 27.6 L | 4715778 | | | x | | |
| | | | 1 | 14.4 D x 28.9 L | 5175593 | | | | x | |
| | | | 1 | 13.8 D x 27.6 L | 4715778 | | | | | x |
| 2 | New CDP Production Oil Transfer Pumps | BPD | 2 | 16,416 | 152240 | x | | | | |
| | | | 2 | 22,443 | 183661 | | x | | | |
| | | | 2 | 31,767 | 226232 | | | x | | |
| | | | 2 | 34,056 | 235876 | | | | x | |
| | | | 2 | 33,371 | 233018 | | | | | x |
| 3 | New PWT package | BPD | 1 | 15,462 | 7441520 | x | | | | |
| | | | 1 | 22,103 | 9267212 | | x | | | |
| | | | 1 | 32,557 | 11699563 | | | x | | |
| | | | 1 | 36,692 | 12572494 | | | | x | |
| | | | 1 | 32,135 | 11608059 | | | | | x |
| 4 | Pig Launcher for CDP to CFP pipeline | in, ft | 1 | | 0 | x | | | | |
| | | | 1 | | 0 | | x | | | |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft | 60812 | | | x | | |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft | 60812 | | | | x | |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft | 60812 | | | | | x |
| 5 | Instrument Air compressor | Nm3/h | 2 | 40 | 124001 | x | | | | |
| | | | 2 | 40 | 124001 | | x | | | |
| | | | 2 | 40 | 124001 | | | x | | |
| | | | 2 | 40 | 124001 | | | | x | |
| | | | 2 | 40 | 124001 | | | | | x |
| 6 | Closed Drain Drum | ft | 1 | 5.42D x 13.54L | 287634 | x | | | | |
| | | | 1 | 5.42D x 13.54L | 287634 | | x | | | |
| | | | 1 | 5.42D x 13.54L | 287634 | | | x | | |
| | | | 1 | 5.42D x 13.54L | 287634 | | | | x | |
| | | | 1 | 5.42D x 13.54L | 287634 | | | | | x |
| 7 | Closed Drain pump | BPD | 1 | 754.7 | 33111 | x | | | | |
| | | | 1 | 754.7 | 33111 | | x | | | |
| | | | 1 | 754.7 | 33111 | | | x | | |
| | | | 1 | 754.7 | 33111 | | | | x | |
| | | | 1 | 754.7 | 33111 | | | | | x |
| 8 | Corrosion Inhibitor Package | ft, LPH | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | x | | | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | | x | | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | | | x | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | | | | x | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | | | | | x |
| 9 | Emulsion Breaker Package | ft, LPH | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | x | | | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | | x | | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | | | x | | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | | | | x | |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | 226320 | | | | | x |
| 10 | Fire water Pump | BPD | 2 | 42,857 | 170102 | x | | | | |
| | | | 2 | 42,857 | 170102 | | x | | | |
| | | | 2 | 42,857 | 170102 | | | x | | |
| | | | 2 | 42,857 | 170102 | | | | x | |
| | | | 2 | 42,857 | 170102 | | | | | x |
| 11 | MFPM | - | 1 | - | 300000 | | | | | |
| | | | 1 | - | 300000 | | | | | |
| | | | 1 | - | 300000 | | | | | |
| | | | 1 | - | 300000 | | | | | |
| | | | 1 | - | 300000 | | | | | |
| 12 | Monorails | - | 4 | 5 Ton | 30000 | x | | | | |
| | | | 4 | 5 Ton | 30000 | | x | | | |
| | | | 4 | 5 Ton | 30000 | | | x | | |
| | | | 4 | 5 Ton | 30000 | | | | x | |
| | | | 4 | 5 Ton | 30000 | | | | | x |

Annexure 2 to L2: New CFP + WHT combined Platform Equipment Cost

| Item | Option | | Quantity | Size / Capacity per unit | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|------|---------------------------------------|---------|----------|--|------|----------|----------------|------------|------------|------------|
| | Description | | | | | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 |
| 1 | New CDP 3 phase separator | ft | 1 | 10.5 D x 21.0 L | USD | 2190003 | - | - | - | - |
| | | | 1 | 11.8 D x 23.6 L | USD | - | 3002699 | - | - | - |
| | | | 1 | 13.8 D x 27.6 L | USD | - | - | 4715778 | - | - |
| | | | 1 | 14.4 D x 28.9 L | USD | - | - | - | 5175593 | - |
| | | | 1 | 13.8 D x 27.6 L | USD | - | - | - | - | 4715778 |
| 2 | New CDP Production Oil Transfer Pumps | BPD | 2 | 16,416 | USD | 304480 | - | - | - | - |
| | | | 2 | 22,443 | USD | - | 367322 | - | - | - |
| | | | 2 | 31,767 | USD | - | - | 452464 | - | - |
| | | | 2 | 34,056 | USD | - | - | - | 471753 | - |
| | | | 2 | 33,371 | USD | - | - | - | - | 466037 |
| 3 | New PWT package | BPD | 1 | 15,462 | USD | 7441520 | - | - | - | - |
| | | | 1 | 22,103 | USD | - | 9267212 | - | - | - |
| | | | 1 | 32,557 | USD | - | - | 11699563 | - | - |
| | | | 1 | 36,692 | USD | - | - | - | 12572494 | - |
| | | | 1 | 32,135 | USD | - | - | - | - | 11608059 |
| 4 | Pig Launcher for CDP to CFP pipeline | in, ft | 1 | - | USD | 0 | - | - | - | - |
| | | | 1 | - | USD | - | 0 | - | - | - |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft | USD | - | - | 60812 | - | - |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft | USD | - | - | - | 60812 | - |
| | | | 1 | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft | USD | - | - | - | - | 60812 |
| 5 | Instrument Air compressor | Nm3/h | 2 | 40 | USD | 248002 | - | - | - | - |
| | | | 2 | 40 | USD | - | 248002 | - | - | - |
| | | | 2 | 40 | USD | - | - | 248002 | - | - |
| | | | 2 | 40 | USD | - | - | - | 248002 | - |
| | | | 2 | 40 | USD | - | - | - | - | 248002 |
| 6 | Closed Drain Drum | ft | 1 | 5.42D x 13.54L | USD | 287634 | - | - | - | - |
| | | | 1 | 5.42D x 13.54L | USD | - | 287634 | - | - | - |
| | | | 1 | 5.42D x 13.54L | USD | - | - | 287634 | - | - |
| | | | 1 | 5.42D x 13.54L | USD | - | - | - | 287634 | - |
| | | | 1 | 5.42D x 13.54L | USD | - | - | - | - | 287634 |
| 7 | Closed Drain pump | BPD | 1 | 754.7 | USD | 33111 | - | - | - | - |
| | | | 1 | 754.7 | USD | - | 33111 | - | - | - |
| | | | 1 | 754.7 | USD | - | - | 33111 | - | - |
| | | | 1 | 754.7 | USD | - | - | - | 33111 | - |
| | | | 1 | 754.7 | USD | - | - | - | - | 33111 |
| 8 | Corrosion Inhibitor Package | ft, LPH | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | 226320 | - | - | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | 226320 | - | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | 226320 | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | - | 226320 | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | - | - | 226320 |
| 9 | Emulsion Breaker Package | ft, LPH | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | 226320 | - | - | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | 226320 | - | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | 226320 | - | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | - | 226320 | - |
| | | | 1 | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH | USD | - | - | - | - | 226320 |
| 10 | Fire water Pump | BPD | 2 | 42,857 | USD | 340204 | - | - | - | - |
| | | | 2 | 42,857 | USD | - | 340204 | - | - | - |
| | | | 2 | 42,857 | USD | - | - | 340204 | - | - |
| | | | 2 | 42,857 | USD | - | - | - | 340204 | - |
| | | | 2 | 42,857 | USD | - | - | - | - | 340204 |
| 11 | MFPM | - | 1 | - | USD | - | - | - | - | - |
| | | | 1 | - | USD | - | - | - | - | - |
| | | | 1 | - | USD | - | - | - | - | - |
| | | | 1 | - | USD | - | - | - | - | - |
| | | | 1 | - | USD | - | - | - | - | - |
| 12 | Monorails | - | 4 | 5 Ton | USD | 120000 | - | - | - | - |
| | | | 4 | 5 Ton | USD | - | 120000 | - | - | - |
| | | | 4 | 5 Ton | USD | - | - | 120000 | - | - |
| | | | 4 | 5 Ton | USD | - | - | - | 120000 | - |
| | | | 4 | 5 Ton | USD | - | - | - | - | 120000 |
| TIC | | | | | USD | 11417594 | 14118823 | 18410207 | 19762243 | 18332275 |

L3: Well Head Tower Cost

| Item | Remarks | Qty (Tons or no of days as applicable) | Unit Rate (USD) or % | Option 6 | Option 6 | Option 6a | Option 6a |
|--|-------------------------------|---|-------------------------|---------------------|---------------------|---------------------|---------------------|
| | | | | Step 2 5-1 | Step 2 5-1 | Step 2 5-1 | Step 2 5-1 |
| | | | | CDP | CFP | CDP | CFP |
| | | | | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) |
| Equipment Cost | | | | | | | |
| Closed Drain Drum | | 1 | 84,521 | 84521 | 84521 | 84521 | 84521 |
| Closed Drain Pumps | | 2 | 12,609 | 25218 | 25218 | 25218 | 25218 |
| Chemical Injection Packages | | 2 | 226,320 | 452639 | 452639 | 452639 | 452639 |
| MPFM | | 1 | 300,000 | 300000 | 300000 | 300000 | 300000 |
| Monorails | | 3 | 30,000 | 90000 | 90000 | 90000 | 90000 |
| Equipment Cost | | | | 952378 | 952378 | 952378 | 952378 |
| Piping Bulks | % of Equipment Cost | | 50.0% | 476189 | 476189 | 476189 | 476189 |
| Instrumentation Bulks | % of Equipment Cost | | 40.0% | 380951 | 380951 | 380951 | 380951 |
| Electrical Bulks | % of Equipment Cost | | 20.0% | 190476 | 190476 | 190476 | 190476 |
| Structural Bulks | % of Equipment Cost | | | 0 | 0 | 0 | 0 |
| Others (including safety equipment) | % of Equipment Cost | | 10.0% | 95238 | 95238 | 95238 | 95238 |
| 2 years operational spares | % of Equipment Cost | | 2.0% | 19048 | 19048 | 19048 | 19048 |
| Total Equipment Material Cost | | | | 2114280 | 2114280 | 2114280 | 2114280 |
| Equipment Directs | | | | | | | |
| Installation Cost | % of Material Cost | | 30.0% | 634284 | 634284 | 634284 | 634284 |
| Construction Cost | % of Material Cost | | 20.0% | 422856 | 422856 | 422856 | 422856 |
| Commissioning Assistance cost | % of Material Cost | | 2.0% | 42286 | 42286 | 42286 | 42286 |
| Equipment Direct Cost | | | | 3213706 | 3213706 | 3213706 | 3213706 |
| | | | | | | | |
| STRUCTURAL MATERIALS | | | | | | | |
| Deck | Tons | 1310 | 2,000 | 2619400 | 2619400 | 2619400 | 2619400 |
| Jacket | Tons | 426 | 2,000 | 851200 | 851200 | 851200 | 851200 |
| Piles | Tons | 309 | 2,000 | 618000 | 618000 | 618000 | 618000 |
| Anodes | Tons | 15 | 4,900 | 73500 | 73500 | 73500 | 73500 |
| Grout | Tons | | | 0 | 0 | 0 | 0 |
| Grillage & Sea Fastening - Deck | Tons | 52 | 2,130 | 111586 | 111586 | 111586 | 111586 |
| Grillage & Sea Fastening - Jkt & Piles | Tons | 29 | 2,130 | 62588 | 62588 | 62588 | 62588 |
| Rigging/Installation Aids-Deck | Tons | 21 | 10,200 | 213743 | 213743 | 213743 | 213743 |
| Rigging/Installation Aids-Jkt | Tons | 7 | 10,200 | 69458 | 69458 | 69458 | 69458 |
| Structural Material Cost | | | | 4619476 | 4619476 | 4619476 | 4619476 |
| Structural Material Indirect Cost | % of Structural Material Cost | 10% | | 461948 | 461948 | 461948 | 461948 |
| | | | | | | | |
| Fabrication of Structural Steel | | | | | | | |
| Jacket & Deck | | 1735 | 3000 | 5205900 | 5205900 | 5205900 | 5205900 |
| Piles | | 309 | 1500 | 463500 | 463500 | 463500 | 463500 |
| Grillage & Sea Fastening | | 82 | 3000 | 245316 | 245316 | 245316 | 245316 |

L3: Well Head Tower Cost

| Item | Remarks | Qty (Tons or no of days as applicable) | Unit Rate (USD) or % | Option 6 | Option 6 | Option 6a | Option 6a |
|---|-------------------------------------|---|-------------------------|---------------------|---------------------|---------------------|---------------------|
| | | | | Step 2 5-1 | Step 2 5-1 | Step 2 5-1 | Step 2 5-1 |
| | | | | CDP | CFP | CDP | CFP |
| | | | | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) |
| Fabrication of Structural Steel | | | | 5914716 | 5914716 | 5914716 | 5914716 |
| LOAD OUT AND INFRASTRUCTURE OF STRUCTURE | | | | | | | |
| Survey Vessel | no of days | 6 | 40000 | 240000 | 240000 | 240000 | 240000 |
| Installation Barge Mobilisation | no of days | 3 | 350000 | 1050000 | 1050000 | 1050000 | 1050000 |
| Transportation Spread Mobilisation | no of days | 2 | 80000 | 160000 | 160000 | 160000 | 160000 |
| Load-out and Seafastening of Jacket, Boat Landings & piles at yard | no of days | 8 | 20000 | 160000 | 160000 | 160000 | 160000 |
| Transportation from Yard to Site | no of days | 2 | 20000 | 40000 | 40000 | 40000 | 40000 |
| Installation of Jacket | no of days | 4 | 175000 | 700000 | 700000 | 700000 | 700000 |
| Piling Works | no of days | 10 | 175000 | 1750000 | 1750000 | 1750000 | 1750000 |
| Grouting Works | no of days | 7 | 30000 | 210000 | 210000 | 210000 | 210000 |
| ROV Spread | no of days | 5 | 12000 | 60000 | 60000 | 60000 | 60000 |
| Installation of Transition Piece | no of days | 6 | 175000 | 1050000 | 1050000 | 1050000 | 1050000 |
| Installation of Boat Landing, RP, CP including relocations of barge | no of days | 6 | 175000 | 1050000 | 1050000 | 1050000 | 1050000 |
| Loadout & Seafastening of Topside Deck at Port | no of days | 5 | 20000 | 100000 | 100000 | 100000 | 100000 |
| Transportation of Deck from Yard to Site | no of days | 2 | 20000 | 40000 | 40000 | 40000 | 40000 |
| Installation of Deck | no of days | 5 | 150000 | 750000 | 750000 | 750000 | 750000 |
| Marine Operations Support | no of days | | 30000 | 0 | 0 | 0 | 0 |
| Installation Barge Down Time @ 30% | no of days | 10 | 175000 | 1750000 | 1750000 | 1750000 | 1750000 |
| Transportaion Barge Down Time @ 30% | no of days | 6 | 20000 | 120000 | 120000 | 120000 | 120000 |
| Installation Barge Demobilisation to Fabrication Yard | no of days | 2 | 350000 | 700000 | 700000 | 700000 | 700000 |
| Transportation Barge Demobilisation | no of days | 2 | 80000 | 160000 | 160000 | 160000 | 160000 |
| LOAD OUT AND INFRASTRUCTURE OF STRUCTURE | | | | 10090000 | 10090000 | 10090000 | 10090000 |
| Commissioning Assistance Cost | % of Structural Material Cost | | 2.0% | 92390 | 92390 | 92390 | 92390 |
| Structural Direct Cost | | | | 21178530 | 21178530 | 21178530 | 21178530 |
| | | | | | | | |
| Electrical Items Cost | | | | 5506200 | 7432200 | 5506200 | 7432200 |
| Electrical Directs | | | | | | | |
| Installation Cost | % of Electrical Items Cost | | 30.0% | 1651860 | 2229660 | 1651860 | 2229660 |
| Construction Cost | % of Electrical Items Cost | | 20.0% | 1101240 | 1486440 | 1101240 | 1486440 |
| Commissioning Assistance cost | % of Electrical Items Cost | | 2.0% | 110124 | 148644 | 110124 | 148644 |
| Electrical Direct Cost | | | | 8369424 | 11296944 | 8369424 | 11296944 |
| | | | | | | | |
| INSTRUMENTATION EQUIPMENT COST | | | | 1100000 | 1100000 | 1100000 | 1100000 |
| INSTRUMENTATION DIRECTS | | | | | | | |
| Installation Cost | % of Instrumentation Equipment Cost | | 30.0% | 330000 | 330000 | 330000 | 330000 |
| Construction Cost | % of Instrumentation Equipment Cost | | 20.0% | 220000 | 220000 | 220000 | 220000 |
| Commissioning Assistance cost | % of Instrumentation Equipment Cost | | 2.0% | 22000 | 22000 | 22000 | 22000 |
| Instrumentation Direct Cost | | | | 1672000 | 1672000 | 1672000 | 1672000 |
| | | | | | | | |
| Total Material Cost | | | | 13339956 | 15265956 | 13339956 | 15265956 |
| Total Direct Cost | | | | 34433660 | 37361180 | 34433660 | 37361180 |
| | | | | | | | |

L3: Well Head Tower Cost

| Item | Remarks | Qty (Tons or no of days as applicable) | Unit Rate (USD) or % | Option 6 | Option 6 | Option 6a | Option 6a |
|--|--|---|-------------------------|---------------------|---------------------|---------------------|---------------------|
| | | | | Step 2 5-1 | Step 2 5-1 | Step 2 5-1 | Step 2 5-1 |
| | | | | CDP | CFP | CDP | CFP |
| | | | | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) | Total Cost (USD) |
| CONTRACTOR INDIRECTS | | | | | | | |
| Detailed Engineering, including Construction Engg. | % of Direct Cost | | 10.0% | 3443366 | 3736118 | 3443366 | 3736118 |
| Freight Cost | % of Material Cost | | 7.0% | 933797 | 1068617 | 933797 | 1068617 |
| TPIA / Vendor Representative Cost | % of Material Cost | | 2.0% | 266800 | 305320 | 266800 | 305320 |
| Construction Supervision & Project Management | % of Direct Cost | | 10.0% | 3443366 | 3736118 | 3443366 | 3736118 |
| Contractor Markups & Profits | % of Direct Cost | | 7.0% | 2410357 | 2615283 | 2410357 | 2615283 |
| Total Contractor Indirect Cost | | | | 10497686 | 11461456 | 10497686 | 11461456 |
| EPC Costs | Total Direct Cost + Total Contractor Indirect Cost | | | 44931346 | 48822636 | 44931346 | 48822636 |
| | | | | | | | |
| CLIENT INDIRECTS | | | | | | | |
| Studies + FEED | % of EPC Costs | | 2.5% | 1123284 | 1220566 | 1123284 | 1220566 |
| PMC + PMT | % of EPC Costs | | 7.0% | 3145195 | 3417585 | 3145195 | 3417585 |
| Project Insurance & Other Overheads | % of EPC Costs | | 2.5% | 1123284 | 1220566 | 1123284 | 1220566 |
| Total Client Indirect Cost | | | | 5391763 | 5858717 | 5391763 | 5858717 |
| | | | | | | | |
| Base Estimate | EPC Costs + Total Client Indirect Cost | | | 50323109 | 54681353 | 50323109 | 54681353 |
| | | | | | | | |
| Contingency | % of Base Estimate | | 20.0% | 10064622 | 10936271 | 10064622 | 10936271 |
| | | | | | | | |
| Total Installed Cost | Base Estimate + Contingency | | | 60387731 | 65617624 | 60387731 | 65617624 |
| | | | MMUSD | 60 | 66 | 60 | 66 |

L4: Connecting Bridges

| Item | Remarks | New CDP to ex CDP | New CFP to ex CFP | Unit Rate (USD) or % | New CDP to ex CDP | New CFP to ex CFP |
|---|-------------------------------|--|--|----------------------|-------------------|-------------------|
| | | Qty (Tons or no of days as applicable) | Qty (Tons or no of days as applicable) | | Total Cost (USD) | Total Cost (USD) |
| STRUCTURAL MATERIALS | | | | | | |
| Deck | Tons | 273 | 187 | 2,000 | 546,455 | 374,000 |
| Jacket | Tons | 435 | 290 | 2,000 | 870,000 | 580,000 |
| Piles | Tons | 495 | 330 | 2,000 | 990,000 | 660,000 |
| Anodes | Tons | 24 | 16 | 4,900 | 117,600 | 78,400 |
| Grillage & Sea Fastening - Deck | Tons | 11 | 7 | 2,130 | 23,279 | 15,932 |
| Grillage & Sea Fastening - Jkt & Piles | Tons | 37 | 25 | 2,130 | 79,236 | 52,824 |
| Rigging/Installation Aids-Deck | Tons | 4 | 3 | 10,200 | 44,591 | 30,518 |
| Rigging/Installation Aids-Jkt | Tons | 7 | 5 | 10,200 | 70,992 | 47,328 |
| Structural Material Cost | | | | | 2,742,153 | 1,839,003 |
| Structural Material Indirect Cost | % of Structural Material Cost | 10.0% | 10.0% | | 274,216 | 183,901 |
| | | | | | | |
| Fabrication of Structural Steel | | | | | | |
| Jacket & Deck | Tons | 708 | 477 | 3,000 | 2,124,682 | 1,431,000 |
| Piles | Tons | 495 | 330 | 1,500 | 742,500 | 495,000 |
| Grillage & Sea Fastening | Tons | 48 | 32 | 3,000 | 144,387 | 96,840 |
| Fabrication of Structural Steel | | | | | 3,011,569 | 2,022,840 |
| LOAD OUT AND INFRASTRUCTURE OF STRUCTURE | | | | | | |
| Survey Vessel | no of days | | | 40,000 | - | - |
| Installation Barge Mobilisation | no of days | 3.0 | 3.0 | 350,000 | 1,050,000 | 1,050,000 |
| Transportation Spread Mobilisation | no of days | 2.0 | 2.0 | 80,000 | 160,000 | 160,000 |
| Load-out and Seafastening of Jacket, Boat Landings & piles at yard | no of days | | | 20,000 | - | - |
| Transportation from Yard to Site | no of days | | | 20,000 | - | - |
| Installation of Jacket | no of days | | | 175,000 | - | - |
| Piling Works | no of days | | | 175,000 | - | - |
| Grouting Works | no of days | | | 30,000 | - | - |
| ROV Spread | no of days | | | 12,000 | - | - |
| Installation of Transition Piece | no of days | | | 175,000 | - | - |
| Installation of Boat Landing, RP, CP including relocations of barge | no of days | | | 175,000 | - | - |
| Loadout & Seafastening of Topside Deck at Port | no of days | 3.0 | 3.0 | 20,000 | 60,000 | 60,000 |
| Transportation of Deck from Yard to Site | no of days | 2.0 | 2.0 | 20,000 | 40,000 | 40,000 |
| Installation of Bridge | no of days | 3.0 | 3.0 | 150,000 | 450,000 | 450,000 |
| Marine Operations Support | no of days | | | 30,000 | - | - |
| Installation Barge Down Time @ 30% | no of days | 1.0 | 1.0 | 175,000 | 175,000 | 175,000 |
| Transportaion Barge Down Time @ 30% | no of days | 1.0 | 1.0 | 20,000 | 20,000 | 20,000 |
| Installation Barge Demobilisation to Fabrication Yard | no of days | 2.0 | 2.0 | 350,000 | 700,000 | 700,000 |
| Transportation Barge Demobilisation | no of days | 2.0 | 2.0 | 80,000 | 160,000 | 160,000 |
| LOAD OUT AND INFRASTRUCTURE OF STRUCTURE | | | | | 2,815,000 | 2,815,000 |
| Commissioning Assistance Cost | % of Material Cost | | | 2.0% | 54,844 | 36,781 |
| Structural Direct Cost | | | | | 8,897,782 | 6,897,525 |
| | | | | | | |
| Total Material Cost | | | | | 2,742,153 | 1,839,003 |
| Total Direct Cost | | | | | 8,897,782 | 6,897,525 |
| | | | | | | |
| CONTRACTOR INDIRECTS | | | | | | |
| Detailed Engineering, including Construction Engg. | % of Direct Cost | | | 10.0% | 889,779 | 689,753 |
| Freight Cost | % of Material Cost | | | 7.0% | 191,951 | 128,731 |
| TPIA / Vendor Representative Cost | % of Material Cost | | | 2.0% | 54,844 | 36,781 |
| Construction Supervision & Project Management | % of Direct Cost | | | 10.0% | 889,779 | 689,753 |
| Contractor Markups & Profits | % of Direct Cost | | | 7.0% | 622,845 | 482,827 |
| Total Contractor Indirect Cost | | | | | 2,649,198 | 2,027,845 |
| EPC Costs | Direct + Indirect Cost | | | | 11,546,980 | 8,925,370 |
| | | | | | | |
| CLIENT INDIRECTS | | | | | | |
| Studies + FEED | % of EPC Cost | | | 2.5% | 288,675 | 223,135 |
| PMC + PMT | % of EPC Cost | | | 7.0% | 808,289 | 624,776 |
| Project Insurance & Other Overheads | % of EPC Cost | | | 2.5% | 288,675 | 223,135 |
| Total Client Indirect Cost | | | | | 1,385,639 | 1,071,046 |
| | | | | | | |
| Base Estimate | EPC + Client Indirect | | | | 12,932,619 | 9,996,416 |
| | | | | | | |
| Contingency | % of Base Estimate | | | 20.0% | 2,586,524 | 1,999,284 |
| | | | | | | |
| Total Installed Cost | Base Estimate + Contingency | | | | 15,519,143 | 11,995,700 |
| | | | | | | |
| | | | | MMUSD | 15.5 | 12.0 |

L5: Mubarratz Island Modifications Cost

| Item | Option | Unit | Quantity | Size / Capacity | Size / Capacity | Size / Capacity | Cost/Item | Cost/Item | Cost/Item | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a | |
|------|---|--------|----------|-----------------|--|--|-----------|------------|------------|------------|----------------|------------|------------|------------|----------|----------------|------------|------------|------------|-----------|----------------|------------|------------|------------|---|
| | Description | | | Option 5 | Option 6 | Option 6a | Option 5 | Option 6 | Option 6a | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | |
| 1 | Pig Receiver for CFP to MI pipeline | in, ft | 1 | - | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19.5 ft x 19.5 ft | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 17 ft | - | 226,350 | 91,012 | | | | | | x | | | | | x | | | | | |
| | | | 1 | - | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19.5 ft x 19.5 ft | Major Barrel Dia: 24 in Major x Minor Barrel Length: 17 ft x 17 ft | - | 226,350 | 122,551 | | | | | | | x | | | | | x | | | | |
| | | | 1 | - | Major Barrel Dia: 36 in Major x Minor Barrel Length: 21.5 ft x 21.5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 19 ft | - | 281,020 | 220,809 | | | | | | | | x | | | | | | x | | |
| | | | 1 | - | Major Barrel Dia: 36 in Major x Minor Barrel Length: 21.5 ft x 21.5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 19 ft | - | 281,020 | 220,809 | | | | | | | | | | x | | | | | x | |
| | | | 1 | - | Major Barrel Dia: 36 in Major x Minor Barrel Length: 17.5 ft x 21.5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 19 ft | - | 231,151 | 220,809 | | | | | | | | | | | | x | | | | |
| 2 | New Mubarraz Slug catcher | ft | 1 | - | 11.5 D x 23.0 L | 8.5 D x 17.1 L | - | 2,838,200 | 1,204,787 | | | | | | x | | | | | | x | | | | |
| | | | 1 | - | 12.1 D x 24.3 L | 10.5 D x 21 L | - | 3,171,833 | 2,190,003 | | | | | | | x | | | | | | x | | | |
| | | | 1 | - | 14.1 D x 28.2 L | 13.1 D x 26.2 L | - | 4,943,012 | 3,992,193 | | | | | | | | x | | | | | | x | | |
| | | | 1 | - | 14.1 D x 28.2 L | 13.1 D x 26.2 L | - | 4,943,012 | 3,992,193 | | | | | | | | | x | | | | | | x | |
| | | | 1 | - | 14.1 D x 28.2 L | 13.4 D x 26.9 L | - | 4,943,012 | 4,194,298 | | | | | | | | | | | | x | | | | |
| 3 | New Mubarraz 3 Phase Separator | ft | 1 | - | 13.1 D x 26.2 L | 9.5 D x 19 L | - | 3,992,193 | 1,648,740 | | | | | | x | | | | | | x | | | | |
| | | | 1 | - | 14.8 D x 29.5 L | 11.8 D x 23.6 L | - | 5,413,520 | 3,002,699 | | | | | | | | x | | | | | x | | | |
| | | | 1 | - | 17.4 D x 34.8 L | 15.4 D x 30.8 L | - | 8,510,678 | 6,299,110 | | | | | | | | | x | | | | | x | | |
| | | | 1 | - | 17.4 D x 34.8 L | 15.4 D x 30.8 L | - | 8,510,678 | 6,299,110 | | | | | | | | | | x | | | | | x | |
| | | | 1 | - | 17.4 D x 34.8 L | 15.7 D x 31.5 L | - | 8,510,678 | 6,570,009 | | | | | | | | | | | | x | | | | |
| 4 | Sweet Gas Compressor | MSCFD | 1 | 5,100.0 | 5,100.0 | 5,100.0 | 8,413,900 | 8,413,900 | 8,413,900 | x | | | | | x | | | | | | x | | | | |
| | | | 1 | 5,100.0 | 5,100.0 | 5,100.0 | 8,413,900 | 8,413,900 | 8,413,900 | | x | | | | | | x | | | | | x | | | |
| | | | 1 | 5,100.0 | 5,100.0 | 5,100.0 | 8,413,900 | 8,413,900 | 8,413,900 | | | x | | | | | | x | | | | | x | | |
| | | | 1 | 5,100.0 | 5,100.0 | 5,100.0 | 8,413,900 | 8,413,900 | 8,413,900 | | | | x | | | | | | x | | | | | x | |
| | | | 1 | 5,100.0 | 5,100.0 | 5,100.0 | 8,413,900 | 8,413,900 | 8,413,900 | | | | | x | | | | | | x | | | | | x |
| 5 | Sour Gas Compressor | MSCFD | 1 | - | - | - | - | - | - | | | | | | | | | | | | | | | | |
| | | | 1 | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | |
| | | | 1 | 3,200.0 | 3,200.0 | 3,200.0 | 4,518,618 | 4,518,618 | | | | x | | | | | | | x | | | | | x | |
| | | | 1 | 3,200.0 | 3,200.0 | 3,200.0 | 4,518,618 | 4,518,618 | | | | | | | | | | | | x | | | | | |
| | | | 1 | 3,200.0 | 3,200.0 | 3,200.0 | 4,518,618 | 4,518,618 | | | | | x | | | | | | | | x | | | | x |
| 6 | New PWT package on Mubarraz Island | BPD | 1 | - | 18,849.0 | 8,350.0 | - | 8,383,047 | 5,137,248 | | | | | | x | | | | | | x | | | | |
| | | | 1 | - | 36,357.0 | 25,859.0 | - | 12,503,284 | 10,185,162 | | | | | | | | x | | | | | x | | | |
| | | | 1 | 12,448.0 | 67,770.0 | 57,274.0 | 6,531,685 | 18,188,780 | 16,436,744 | | | | x | | | | | | x | | | | x | | |
| | | | 1 | 15,395.0 | 74,503.0 | 64,000.0 | 7,422,109 | 19,349,102 | 17,572,816 | | | | | x | | | | | | | | | x | | |
| | | | 1 | 10,198.0 | 62,096.0 | | 51,597.0 | 5,793,626 | 17,256,250 | 15,435,831 | | | | | | x | | | | | x | | | | x |
| 7 | Electrical modifications | | 1 | - | - | - | - | 25,563,891 | 25,563,891 | 25,563,891 | x | x | x | x | x | x | x | x | x | x | x | x | x | | |
| 8 | Instrumentation & Control modifications | | 1 | - | - | - | - | 925,000 | 925,000 | 925,000 | x | x | x | x | x | x | x | x | x | x | x | x | x | | |

L5: Mubarraz Island Modifications Cost

| Item | Option | | Quantity | Size / Capacity | Size / Capacity | Size / Capacity | | | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a | | | |
|------|---|--------|----------|-----------------|--|--|--|--|-------|-----------|----------------|------------|------------|------------|-----------|----------------|------------|------------|------------|-----------|----------------|------------|------------|------------|-----------|---|---|
| | Description | | | Option 5 | Option 6 | Option 6a | | | | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | | | |
| 1 | Pig Receiver for CFP to MI pipeline | in, ft | 1 | - | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19.5 ft x 19.5 ft | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 17 ft | | | USD | - | - | - | - | - | 226,350 | - | - | - | - | 91,012 | - | - | - | - | | | |
| | | | 1 | - | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19.5 ft x 19.5 ft | Major Barrel Dia: 24 in Major x Minor Barrel Length: 17 ft x 17 ft | | | USD | - | - | - | - | - | 226,350 | - | - | - | - | - | 122,551 | - | - | - | | | |
| | | | 1 | - | Major Barrel Dia: 36 in Major x Minor Barrel Length: 21.5 ft x 21.5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 19 ft | | | USD | - | - | - | - | - | - | 281,020 | - | - | - | - | - | 220,809 | - | - | | | |
| | | | 1 | - | Major Barrel Dia: 36 in Major x Minor Barrel Length: 21.5 ft x 21.5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 19 ft | | | USD | - | - | - | - | - | - | 281,020 | - | - | - | - | - | 220,809 | - | - | | | |
| | | | 1 | - | Major Barrel Dia: 36 in Major x Minor Barrel Length: 17.5 ft x 21.5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 19 ft | | | USD | - | - | - | - | - | - | - | 231,151 | - | - | - | - | - | 220,809 | - | - | | |
| 2 | New Mubarraz Slug catcher | ft | 1 | - | 11.5 D x 23.0 L | 8.5 D x 17.1 L | | | USD | - | - | - | - | - | 2,838,200 | - | - | - | - | 1,204,787 | - | - | - | - | | | |
| | | | 1 | - | 12.1 D x 24.3 L | 10.5 D x 21 L | | | USD | - | - | - | - | - | - | 3,171,833 | - | - | - | - | 2,190,003 | - | - | - | | | |
| | | | 1 | - | 14.1 D x 28.2 L | 13.1 D x 26.2 L | | | USD | - | - | - | - | - | - | - | 4,943,012 | - | - | - | - | 3,992,193 | - | - | | | |
| | | | 1 | - | 14.1 D x 28.2 L | 13.1 D x 26.2 L | | | USD | - | - | - | - | - | - | - | - | 4,943,012 | - | - | - | - | 3,992,193 | - | - | | |
| | | | 1 | - | 14.1 D x 28.2 L | 13.4 D x 26.9 L | | | USD | - | - | - | - | - | - | - | - | - | 4,943,012 | - | - | - | - | 4,194,298 | - | - | |
| 3 | New Mubarraz 3 Phase Separator | ft | 1 | - | 13.1 D x 26.2 L | 9.5 D x 19 L | | | USD | - | - | - | - | - | 3,992,193 | - | - | - | - | 1,648,740 | - | - | - | - | | | |
| | | | 1 | - | 14.8 D x 29.5 L | 11.8 D x 23.6 L | | | USD | - | - | - | - | - | - | 5,413,520 | - | - | - | - | 3,002,699 | - | - | - | | | |
| | | | 1 | - | 17.4 D x 34.8 L | 15.4 D x 30.8 L | | | USD | - | - | - | - | - | - | - | 8,510,678 | - | - | - | - | 6,299,110 | - | - | | | |
| | | | 1 | - | 17.4 D x 34.8 L | 15.4 D x 30.8 L | | | USD | - | - | - | - | - | - | - | - | 8,510,678 | - | - | - | - | 6,299,110 | - | - | | |
| | | | 1 | - | 17.4 D x 34.8 L | 15.7 D x 31.5 L | | | USD | - | - | - | - | - | - | - | - | - | 8,510,678 | - | - | - | - | 6,570,009 | - | - | |
| 4 | Sweet Gas Compressor | MSCFD | 1 | 5100 | 5100 | 5100 | | | USD | 8,413,900 | - | - | - | - | - | 8,413,900 | - | - | - | - | 8,413,900 | - | - | - | - | | |
| | | | 1 | 5100 | 5100 | 5100 | | | USD | - | 8,413,900 | - | - | - | - | - | 8,413,900 | - | - | - | - | 8,413,900 | - | - | - | | |
| | | | 1 | 5100 | 5100 | 5100 | | | USD | - | - | 8,413,900 | - | - | - | - | - | 8,413,900 | - | - | - | - | 8,413,900 | - | - | | |
| | | | 1 | 5100 | 5100 | 5100 | | | USD | - | - | - | 8,413,900 | - | - | - | - | - | 8,413,900 | - | - | - | - | 8,413,900 | - | - | |
| | | | 1 | 5100 | 5100 | 5100 | | | USD | - | - | - | - | 8,413,900 | - | - | - | - | - | 8,413,900 | - | - | - | - | 8,413,900 | - | - |
| 5 | Sour Gas Compressor | MSCFD | 1 | - | - | - | | | USD | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| | | | 1 | - | - | - | | | USD | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| | | | 1 | 3200 | 3200 | 3200 | | | USD | - | - | - | 4,518,618 | - | - | - | - | - | 4,518,618 | - | - | - | - | - | - | - | |
| | | | 1 | - | 3200 | 3200 | | | USD | - | - | - | - | - | - | - | - | - | - | 4,518,618 | - | - | - | - | - | - | - |
| | | | 1 | 3200 | 3200 | 3200 | | | USD | - | - | - | - | - | 4,518,618 | - | - | - | - | 4,518,618 | - | - | - | - | 4,518,618 | - | - |
| 6 | New PWT package on Mubarraz Island | BPD | 1 | 0 | 18849 | 8350 | | | USD | - | - | - | - | - | - | 8,383,047 | - | - | - | - | 5,137,248 | - | - | - | - | | |
| | | | 1 | 0 | 36357 | 25859 | | | USD | - | - | - | - | - | - | - | ##### | - | - | - | - | ##### | - | - | - | | |
| | | | 1 | 12448 | 67770 | 57274 | | | USD | - | - | 6,531,685 | - | - | - | - | - | ##### | - | - | - | - | ##### | - | - | - | |
| | | | 1 | 15395 | 74503 | 64000 | | | USD | - | - | - | - | 7,422,109 | - | - | - | - | ##### | - | - | - | - | ##### | - | - | |
| | | | 1 | 10198 | 62096 | 51597 | | | USD | - | - | - | - | - | 5,793,626 | - | - | - | ##### | - | - | - | - | ##### | - | - | |
| 8 | Electrical modifications | 0 | 1 | - | - | - | | | USD | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | | | |
| 9 | Instrumentation & Control modifications | 0 | 1 | - | - | - | | | USD | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | 925,000 | | | | |
| | TIC | | | | | | | | MMUSD | 34.90 | 34.90 | 45.95 | 42.32 | 45.22 | 50.34 | 56.22 | 71.34 | 72.51 | 70.36 | 42.98 | 50.40 | 61.85 | 62.99 | 65.84 | | | |

L6: Subsea Cables



| | Unit | Rate | 1 | 2 |
|--|--------------------|---------|-----------------|--------------|
| Cable details | | | | |
| Service | | | Subsea cable | Subsea cable |
| From | | | Mubarraz Island | new CFP |
| To | | | new CFP | new CDP |
| Voltage | kV | | 33 | 13 |
| Size | | | 3Cx95 sq.mm | 3Cx95 sq.mm |
| Length | m | | 35,000 | 12,500 |
| Margin on length | % of length | 20.0% | 42,000 | 15,000 |
| Material Cost | | | | |
| Unit Material cost | USD/m | | 168 | 168 |
| Total Material cost | USD | | 7,056,000 | 2,520,000 |
| Other miscellaneous cost | % of material cost | 20.0% | 1,411,200 | 504,000 |
| Total Material cost | USD | | 8,467,200 | 3,024,000 |
| Installation days | | | | |
| Lay vessel | no. of days | | 22 | 20 |
| Survey vessel | no. of days | | 12 | 8 |
| Testing and commissioning equipment | no. of days | | 5 | 5 |
| Cargo vessel | no. of days | | 22 | 20 |
| Installation cost | | | | |
| Lay vessel | USD | 185,000 | 4,070,000 | 3,700,000 |
| Survey vessel | USD | 130,000 | 1,560,000 | 1,040,000 |
| Testing and commissioning equipment | USD | 30,000 | 150,000 | 150,000 |
| Cargo vessel | USD | 60,000 | 1,320,000 | 1,200,000 |
| Total installation cost | USD | | 7,100,000 | 6,090,000 |
| Direct Cost | USD | | 15,567,200 | 9,114,000 |
| Contractor Indirects | | | | |
| Detailed Engineering, including Construction Engg. | % of Direct Cost | 10.0% | 1,556,720 | 911,400 |
| Freight Cost | % of Material Cost | 7.0% | 592,704 | 211,680 |
| TPIA / Vendor Representative Cost | % of Material Cost | 2.0% | 169,344 | 60,480 |
| Construction Supervision & Project Management | % of Direct Cost | 10.0% | 1,556,720 | 911,400 |
| Total Contractor Indirect Cost | | | 3,875,488 | 2,094,960 |
| EPC Costs | | | 19,442,688 | 11,208,960 |
| Client Indirects | | | | |
| Studies + FEED | % of EPC Costs | 2.5% | 486,067 | 280,224 |
| PMC + PMT | % of EPC Costs | 7.0% | 1,360,988 | 784,627 |
| Project Insurance & Other Overheads | % of EPC Costs | 1.0% | 194,427 | 112,090 |
| Total Client Indirect Cost | | | 2,041,482 | 1,176,941 |
| Base Estimate | | | 21,484,170 | 12,385,901 |
| Contingency | % of Base Estimate | 0.0% | - | - |
| Total Installed Cost | USD | | 21,484,170 | 12,385,901 |
| Total Installed Cost | MMUSD | | 21.5 | 12.4 |

L7: Subsea Pipelines

| Sl.No. | Service | From | To | Size | Thickness | Cost (USD) | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a |
|----------------------|-------------------|--------|-------------|-------|-----------|--------------|------------|----------------|------------|------------|------------|-------------|----------------|-------------|-------------|-------------|------------|----------------|-------------|-------------|-------------|
| | | | | | | | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 |
| | | | | | | | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) |
| 1 | Well Fluid (FWST) | ex CDP | new CFP | 12 | 11.63 | 26,612,492 | | | | | | | | | | | 12,500 | | | | |
| 2 | Well Fluid (FWST) | ex CDP | new CFP | 14 | 12.88 | 28,009,493 | | | 12,500 | 12,500 | 12,500 | | | | | | | 12,500 | | | |
| 3 | Well Fluid (FWST) | ex CDP | new CFP | 16 | 14.75 | 30,118,338 | | | | | | 12,500 | 12,500 | | | | | | | 12,500 | |
| 4 | Well Fluid (FWST) | ex CDP | new CFP | 18 | 16.62 | 32,106,267 | | | | | | | | | 12,500 | | | | | 12,500 | 12,500 |
| 5 | Well Fluid (FWST) | ex CDP | new CFP | 20 | 18.62 | 34,843,647 | | | | | | | | 12,500 | | 12,500 | | | | | |
| 6 | Well Fluid (FWST) | ex CFP | Mub. Island | 16 | 14.75 | 53,409,026 | | | | | | | | | | | 35,000 | | | | |
| 7 | Well Fluid (FWST) | ex CFP | Mub. Island | 20 | 18.62 | 64,157,620 | | | | | | | | | | | | 35,000 | | | |
| 8 | Well Fluid (FWST) | ex CFP | Mub. Island | 26 | 24.25 | 83,992,655 | | | | | | | | | | | | | 35,000 | 35,000 | 35,000 |
| 9 | Well Fluid (FWST) | ex CFP | Mub. Island | 28 | 26.12 | 91,667,132 | | | | | | 35,000 | 35,000 | | | | | | | | |
| 10 | Well Fluid (FWST) | ex CFP | Mub. Island | 30 | 28.12 | 99,770,943 | | | | | | | | 35,000 | 35,000 | | | | | | |
| 11 | Well Fluid (FWST) | ex CFP | Mub. Island | 32 | 30.00 | 108,536,929 | | | | | | | | | | 35,000 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| Sl.No. | Service | From | To | Size | Thickness | Cost/m (USD) | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a |
| | | | | | | | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 | LTDP 1 | LTDP 2 Plateau | Step 1 4a1 | Step 1 4b2 | Step 2 5-1 |
| | | | | | | | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) | Cost (USD) |
| 1 | Well Fluid (FWST) | ex CDP | new CFP | 12 | 11.63 | 26,612,492 | - | - | - | - | - | - | - | - | - | - | 26,612,492 | - | - | - | - |
| 2 | Well Fluid (FWST) | ex CDP | new CFP | 14 | 12.88 | 28,009,493 | - | - | 28,009,493 | 28,009,493 | 28,009,493 | - | - | - | - | - | - | 28,009,493 | - | - | - |
| 3 | Well Fluid (FWST) | ex CDP | new CFP | 16 | 14.75 | 30,118,338 | - | - | - | - | - | 30,118,338 | 30,118,338 | - | - | - | - | - | - | 30,118,338 | - |
| 4 | Well Fluid (FWST) | ex CDP | new CFP | 18 | 16.62 | 32,106,267 | - | - | - | - | - | - | - | - | 32,106,267 | - | - | - | 32,106,267 | - | 32,106,267 |
| 5 | Well Fluid (FWST) | ex CDP | new CFP | 20 | 18.62 | 34,843,647 | - | - | - | - | - | - | - | 34,843,647 | - | 34,843,647 | - | - | - | - | - |
| | | | | | | | | | | | | | | | | | 53,409,026 | - | | | |
| | | | | | | | | | | | | | | | | | - | 64,157,620 | | | |
| 8 | Well Fluid (FWST) | ex CFP | Mub. Island | 26 | 24.25 | 83,992,655 | - | - | - | - | - | - | - | - | - | - | - | - | 83,992,655 | 83,992,655 | 83,992,655 |
| 9 | Well Fluid (FWST) | ex CFP | Mub. Island | 28 | 26.12 | 91,667,132 | - | - | - | - | - | 91,667,132 | 91,667,132 | - | - | - | - | - | - | - | - |
| 10 | Well Fluid (FWST) | ex CFP | Mub. Island | 30 | 28.12 | 99,770,943 | - | - | - | - | - | - | - | 99,770,943 | 99,770,943 | - | - | - | - | - | - |
| 11 | Well Fluid (FWST) | ex CFP | Mub. Island | 32 | 30.00 | 108,536,929 | - | - | - | - | - | - | - | - | - | 108,536,929 | - | - | - | - | - |
| Total Installed Cost | | | | USD | USD | | - | - | 28,009,493 | 28,009,493 | 28,009,493 | 121,785,470 | 121,785,470 | 134,614,590 | 131,877,210 | 143,380,577 | 80,021,518 | 92,167,113 | 116,098,922 | 114,110,993 | 116,098,922 |
| Total Installed Cost | | | | MMSUD | MMUSD | | - | - | 28 | 28 | 28 | 122 | 122 | 135 | 132 | 143 | 80 | 92 | 116 | 114 | 116 |

Annexure to L7: Pipeline

| | Unit | Rate | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 7 | 8 | 9 | 10 |
|--|---------------------|----------------|--------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Pipeline details | | | | | | | | | | | | | | |
| Service | | | Partially Stabilised Oil | Well Fluid (FWST) | Well Fluid (FWST) | Well Fluid (FWST) | Well Fluid (FWST) | Well Fluid (FWST) | Well Fluid (FWST) | Well Fluid (FWST) | Well Fluid (FWST) | Well Fluid (FWST) | Well Fluid (FWST) | Well Fluid (FWST) |
| From | | | ex CDP | ex CDP | ex CDP | ex CDP | ex CDP | ex CDP | ex CDP | ex CFP | ex CFP | ex CFP | ex CFP | ex CFP |
| To | | | new CFP | new CFP | new CFP | new CFP | new CFP | new CFP | new CFP | Mub. Island | Mub. Island | Mub. Island | Mub. Island | Mub. Island |
| Size | inch | | 14 | 12 | 14 | 16 | 18 | 20 | 16 | 20 | 26 | 28 | 30 | 32 |
| Thickness | mm | | 12.88 | 11.63 | 12.88 | 14.75 | 16.62 | 18.62 | 14.75 | 18.62 | 24.25 | 26.12 | 28.12 | 30.00 |
| Length | m | | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 |
| Margin on length | % of length | 20.0% | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 42,000 | 42,000 | 42,000 | 42,000 | 42,000 | 42,000 |
| Tonnage | Tonnes | | 1,694 | 1,311 | 1,694 | 2,217 | 2,812 | 3,500 | 6,209 | 9,799 | 16,587 | 19,244 | 22,197 | 25,257 |
| Anodes | Tonnes | 1.0% | 17 | 13 | 17 | 22 | 28 | 35 | 62 | 98 | 166 | 192 | 222 | 253 |
| Material Cost | | | | | | | | | | | | | | |
| Line pipe Material cost | USD/Ton | 1,250 | 2,138,443 | 1,655,014 | 2,138,443 | 2,799,473 | 3,549,556 | 4,418,451 | 7,838,525 | 12,371,663 | 20,941,701 | 24,295,472 | 28,023,762 | 31,886,376 |
| Coating | % of line pipe cost | 20.0% | 427,689 | 331,003 | 427,689 | 559,895 | 709,911 | 883,690 | 1,567,705 | 2,474,333 | 4,188,340 | 4,859,094 | 5,604,752 | 6,377,275 |
| Other miscellaneous cost | % of line pipe cost | 25.0% | 534,611 | 413,753 | 534,611 | 699,868 | 887,389 | 1,104,613 | 1,959,631 | 3,092,916 | 5,235,425 | 6,073,868 | 7,005,940 | 7,971,594 |
| Total Material cost | USD | | 3,100,742 | 2,399,770 | 3,100,742 | 4,059,236 | 5,146,856 | 6,406,754 | 11,365,861 | 17,938,911 | 30,365,467 | 35,228,435 | 40,634,454 | 46,235,244 |
| Installation days | | | | | | | | | | | | | | |
| Lay vessel | days | | 18 | 18 | 18 | 19 | 19 | 20 | 35 | 36 | 38 | 39 | 39 | 40 |
| Diving support vessel | days | | 30 | 29 | 30 | 30 | 31 | 32 | 32 | 34 | 36 | 36 | 37 | 37 |
| Testing and commissioning equipment | days | | 12 | 12 | 12 | 12 | 13 | 13 | 17 | 18 | 19 | 19 | 19 | 20 |
| Trench vessel | days | not applicable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Survey vessel | days | | 19 | 18 | 19 | 19 | 20 | 20 | 21 | 22 | 23 | 23 | 24 | 24 |
| Cargo vessel | days | | 18 | 18 | 18 | 19 | 19 | 20 | 35 | 36 | 38 | 39 | 39 | 40 |
| Installation cost | | | | | | | | | | | | | | |
| Lay vessel | USD | 500,000 | 9,000,000 | 9,000,000 | 9,000,000 | 9,500,000 | 9,500,000 | 10,000,000 | 17,500,000 | 18,000,000 | 19,000,000 | 19,500,000 | 19,500,000 | 20,000,000 |
| Diving support vessel | USD | 150,000 | 4,500,000 | 4,350,000 | 4,500,000 | 4,500,000 | 4,650,000 | 4,800,000 | 4,800,000 | 5,100,000 | 5,400,000 | 5,400,000 | 5,550,000 | 5,550,000 |
| Testing and commissioning equipment | USD | 30,000 | 360,000 | 360,000 | 360,000 | 360,000 | 390,000 | 390,000 | 510,000 | 540,000 | 570,000 | 570,000 | 570,000 | 600,000 |
| Trench vessel | USD | 150,000 | - | - | - | - | - | - | - | - | - | - | - | - |
| Survey vessel | USD | 150,000 | 2,850,000 | 2,700,000 | 2,850,000 | 2,850,000 | 3,000,000 | 3,000,000 | 3,150,000 | 3,300,000 | 3,450,000 | 3,450,000 | 3,600,000 | 3,600,000 |
| Cargo vessel | | 60,000 | 1,080,000 | 1,080,000 | 1,080,000 | 1,140,000 | 1,140,000 | 1,200,000 | 2,100,000 | 2,160,000 | 2,280,000 | 2,340,000 | 2,340,000 | 2,400,000 |
| Total installation cost | USD | | 17,790,000 | 17,490,000 | 17,790,000 | 18,350,000 | 18,680,000 | 19,390,000 | 28,060,000 | 29,100,000 | 30,700,000 | 31,260,000 | 31,560,000 | 32,150,000 |
| Direct Cost | USD | | 20,890,742 | 19,889,770 | 20,890,742 | 22,409,236 | 23,826,856 | 25,796,754 | 39,425,861 | 47,038,911 | 61,065,467 | 66,488,435 | 72,194,454 | 78,385,244 |
| Contractor Indirects | | | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | % of Direct Cost | 10.0% | 2,089,074 | 1,988,977 | 2,089,074 | 2,240,924 | 2,382,686 | 2,579,675 | 3,942,586 | 4,703,891 | 6,106,547 | 6,648,843 | 7,219,445 | 7,838,524 |
| Freight Cost | % of Material Cost | 7.0% | 217,052 | 167,984 | 217,052 | 284,147 | 360,280 | 448,473 | 795,610 | 1,255,724 | 2,125,583 | 2,465,990 | 2,844,412 | 3,236,467 |
| TPIA / Vendor Representative Cost | % of Material Cost | 2.0% | 62,015 | 47,995 | 62,015 | 81,185 | 102,937 | 128,135 | 227,317 | 358,778 | 607,309 | 704,569 | 812,689 | 924,705 |
| Construction Supervision & Project Management | % of Direct Cost | 10.0% | 2,089,074 | 1,988,977 | 2,089,074 | 2,240,924 | 2,382,686 | 2,579,675 | 3,942,586 | 4,703,891 | 6,106,547 | 6,648,843 | 7,219,445 | 7,838,524 |
| Total Contractor Indirect Cost | | | 4,457,215 | 4,193,933 | 4,457,215 | 4,847,178 | 5,228,588 | 5,735,959 | 8,908,100 | 11,022,284 | 14,945,985 | 16,468,246 | 18,095,992 | 19,838,221 |
| EPC Costs | | | 25,347,957 | 24,083,703 | 25,347,957 | 27,256,414 | 29,055,445 | 31,532,712 | 48,333,961 | 58,061,195 | 76,011,453 | 82,956,681 | 90,290,446 | 98,223,465 |
| Client Indirects | | | | | | | | | | | | | | |
| Studies + FEED | % of EPC Costs | 2.5% | 633,699 | 602,093 | 633,699 | 681,410 | 726,386 | 788,318 | 1,208,349 | 1,451,530 | 1,900,286 | 2,073,917 | 2,257,261 | 2,455,587 |
| PMC + PMT | % of EPC Costs | 7.0% | 1,774,357 | 1,685,859 | 1,774,357 | 1,907,949 | 2,033,881 | 2,207,290 | 3,383,377 | 4,064,284 | 5,320,802 | 5,806,968 | 6,320,331 | 6,875,643 |
| Project Insurance & Other Overheads | % of EPC Costs | 1.0% | 253,480 | 240,837 | 253,480 | 272,564 | 290,554 | 315,327 | 483,340 | 580,612 | 760,115 | 829,567 | 902,904 | 982,235 |
| Total Client Indirect Cost | | | 2,661,536 | 2,528,789 | 2,661,536 | 2,861,924 | 3,050,822 | 3,310,935 | 5,075,066 | 6,096,425 | 7,981,203 | 8,710,452 | 9,480,497 | 10,313,464 |
| Base Estimate | | | 28,009,493 | 26,612,492 | 28,009,493 | 30,118,338 | 32,106,267 | 34,843,647 | 53,409,026 | 64,157,620 | 83,992,655 | 91,667,132 | 99,770,943 | 108,536,929 |
| Contingency | % of Base Estimate | 0.0% | - | - | - | - | - | - | - | - | - | - | - | - |
| Total Installed Cost | USD | | 28,009,493 | 26,612,492 | 28,009,493 | 30,118,338 | 32,106,267 | 34,843,647 | 53,409,026 | 64,157,620 | 83,992,655 | 91,667,132 | 99,770,943 | 108,536,929 |
| Total Installed Cost | MMUSD | | 28.0 | 26.6 | 28.0 | 30.1 | 32.1 | 34.8 | 53.4 | 64.2 | 84.0 | 91.7 | 99.8 | 108.5 |

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Attachment 3 – Itemwise Cost Estimate of Electrical Items

Attachment 3: Itemwise Cost estimate of Electrical Items

New Platform at CFP



| | | Cost | Option 5 (all profiles except Step 2 5-1) | | Option 5 (Step 2 5-1) | | Option 6 (Step 2 5-1 only) | | Option 6a (Step 2 5-1 only) | | Remarks |
|---|------|----------|--|-----------|--------------------------|-----------|-------------------------------|-----------|--------------------------------|-----------|---------|
| ITEM DESCRIPTION | UNIT | USD/Unit | Quantity | Cost | Quantity | Cost | Quantity | Cost | Quantity | Cost | - |
| 8 MVA (6.9/33kV) Power Transformer | Nos. | 140,000 | 1 | 140,000 | 1 | 140,000 | | - | | - | |
| 5 MVA (6.9/33kV) Power Transformer | Nos. | 140,000 | | - | | - | 1 | 140,000 | 1 | 140,000 | |
| 13.8kV , 60 Hz, 800A, 31.5 kA ,1Sec Switchgear panel (1 incomers, 1 bus coupler, 13 outgoins) | Nos. | 840,000 | 1 | 840,000 | 1 | 840,000 | 1 | 840,000 | 1 | 840,000 | |
| 460V, 60Hz , 2000A, 31.5 kA ,1Sec switchgear panel | Nos. | 270,000 | 1 | 270,000 | 1 | 270,000 | 1 | 270,000 | 1 | 270,000 | |
| 1000 kVA Distribution transformer (13.8kV/460V) | Nos. | 748,000 | 1 | 748,000 | 1 | 748,000 | 1 | 748,000 | 1 | 748,000 | |
| 240V, 60 Hz, AC UPS system | Nos. | 540,000 | 1 | 540,000 | 1 | 540,000 | 1 | 540,000 | 1 | 540,000 | |
| 110V, 60Hz, DC UPS system | Nos. | 180,000 | 1 | 180,000 | 1 | 180,000 | 1 | 180,000 | 1 | 180,000 | |
| ESP transformer 300kVA (13.8/2.3kV-1.2kV) | Nos. | 409,000 | | - | 7 | 2,863,000 | 7 | 2,863,000 | 7 | 2,863,000 | |
| VFD for ESPs | Nos. | 220,000 | | - | 7 | 1,540,000 | 7 | 1,540,000 | 7 | 1,540,000 | |
| New E & I Container (4m x 16 m) | Nos. | 211,200 | 1 | 211,200 | 1 | 211,200 | 1 | 211,200 | 1 | 211,200 | |
| Subsea Cable,33kV | Mtr. | 168 | 38500 | | 38500 | | 38500 | | 38500 | | |
| POWER INFEED BOX | | | | | | | | | | | |
| Power in feed box suitable for outdoor installation shall be suitable to cater AC Power from external source. 1No. 150A, MCCB shall be provided within this infeed box. Power in feed box shall be EEx'd', IIB, T3, IP65 with enclosure material suitable for harsh marine environment. Explosion proof plug and socket (150A) arrangement shall be provided as part of the infeed box. | Nos. | 50,000 | 2 | 100,000 | 2 | 100,000 | 2 | 100,000 | 2 | 100,000 | |
| Total Material Cost | USD | - | | 3,029,200 | | 7,432,200 | | 7,432,200 | | 7,432,200 | |

New Platform at CDP

| | | Cost | Option 5 (all profiles except Step 2 5-1) | | Option 5 (Step 2 5-1) | | Option 6 (Step 2 5-1 only) | | Option 6a (Step 2 5-1 only) | | Remarks |
|---|------|----------|--|-----------|--------------------------|-----------|-------------------------------|-----------|--------------------------------|-----------|---------|
| ITEM DESCRIPTION | UNIT | USD/Unit | Quantity | Cost | Quantity | Cost | Quantity | Cost | Quantity | Cost | - |
| 13.8kV , 60 Hz, 400A, 31.5 kA ,1Sec Switchgear panel (1 incomers, 1 bus coupler, 9 outgoins) | Nos. | 600,000 | 1 | 600,000 | 1 | 600,000 | 1 | 600,000 | 1 | 600,000 | |
| 460V, 60Hz , 800A, 100 kA ,1Secswitchgear panel | Nos. | 270,000 | 1 | 270,000 | 1 | 270,000 | 1 | 270,000 | 1 | 270,000 | |
| 1000 kVA Distribution transformer (13.8kV/460V) | Nos. | 748,000 | 1 | 748,000 | 1 | 748,000 | 1 | 748,000 | 1 | 748,000 | |
| 240V, 60 Hz, AC UPS system | Nos. | 540,000 | 1 | 540,000 | 1 | 540,000 | 1 | 540,000 | 1 | 540,000 | |
| 110V, 60Hz, DC UPS system | Nos. | 180,000 | 1 | 180,000 | 1 | 180,000 | 1 | 180,000 | 1 | 180,000 | |
| ESP transformer 300kVA (13.8/2.3kV-1.2kV) | Nos. | 409,000 | | - | 3 | 1,227,000 | 3 | 1,227,000 | 3 | 1,227,000 | |
| ESP transformer 550kVA (13.8/2.3kV-1.2kV) | Nos. | 750,000 | | - | 1 | 750,000 | 1 | 750,000 | 1 | 750,000 | |
| VFD for ESPs | Nos. | 220,000 | | - | 4 | 880,000 | 4 | 880,000 | 4 | 880,000 | |
| New E & I Container (4m x 16 m) | Nos. | 211,200 | 1 | 211,200 | 1 | 211,200 | 1 | 211,200 | 1 | 211,200 | |
| Subsea Cable, 13.8kV | Mtr. | 270 | 13350 | | 13350 | | 13350 | | 13350 | | |
| POWER INFEED BOX | | | | | | | | | | | |
| Power in feed box suitable for outdoor installation shall be suitable to cater AC Power from external source. 1No. 150A, MCCB shall be provided within this infeed box. Power in feed box shall be EEx'd', IIB, T3, IP65 with enclosure material suitable for harsh marine environment. Explosion proof plug and socket (150A) arrangement shall be provided as part of the infeed box. | Nos. | 50,000 | 2 | 100,000 | 2 | 100,000 | 2 | 100,000 | 2 | 100,000 | |
| Total Material Cost | USD | - | | 2,649,200 | | 5,506,200 | | 5,506,200 | | 5,506,200 | |

Mubarraz Island

| | | Cost | Option 5 (all profiles) | | | | Option 6 (all profiles) | | Option 6a (all profiles) | | Remarks |
|---|------|------------|----------------------------|------------|--|--|----------------------------|------------|-----------------------------|------------|---------|
| ITEM DESCRIPTION | UNIT | USD/Unit | Quantity | Cost | | | Quantity | Cost | Quantity | Cost | - |
| 6.9kV, 60 Hz , 1250A, 40 kA ,1Sec Switchgear panel (2 incomers, 1 bus coupler, 8 outgoins) | Nos. | 660,000 | 1 | 660,000 | | | 1 | 660,000 | 1 | 660,000 | |
| 460V, 60Hz , 3250A, 50 kA ,1Sec switchgear panel | Nos. | 178,000 | 1 | 178,000 | | | 1 | 178,000 | 1 | 178,000 | |
| 8 MVA (6.9/33kV) Power Transformer | Nos. | 140,000 | 1 | 140,000 | | | 1 | 140,000 | 1 | 140,000 | |
| 5 MVA (6.9/33kV) Power Transformer | Nos. | 140,000 | | - | | | | - | | - | |
| 2.5 MVA (6.9/0.460kV) Distribution transformer | Nos. | 193,000 | 1 | 193,000 | | | 1 | 193,000 | 1 | 193,000 | |
| 460V ,3250A , 50 °C Copper Bus Duct | Mtr. | 1,600 | 50 | 80,000 | | | 50 | 80,000 | 50 | 80,000 | |
| 240V, 60 Hz, AC UPS system | Nos. | 540,000 | 1 | 540,000 | | | 1 | 540,000 | 1 | 540,000 | |
| 110V, 60Hz, DC UPS system | Nos. | 180,000 | 1 | 180,000 | | | 1 | 180,000 | 1 | 180,000 | |
| GTG (7 MW) | Nos. | 21,512,891 | 1 | 21,512,891 | | | 1 | 21,512,891 | 1 | 21,512,891 | |
| Substation Building size (30X20M) | Nos. | 1,980,000 | 1 | 1,980,000 | | | 1 | 1,980,000 | 1 | 1,980,000 | |
| POWER INFEED BOX | | | | | | | | | | | |
| Power in feed box suitable for outdoor installation shall be suitable to cater AC Power from external source. 1No. 150A, MCCB shall be provided within this infeed box. Power in feed box shall be EEx'd', IIB, T3, IP65 with enclosure material suitable for harsh marine environment. Explosion proof plug and socket (150A) arrangement shall be provided as part of the infeed box. | Nos. | 50,000 | 2 | 100,000 | | | 2 | 100,000 | 2 | 100,000 | |
| Total Material Cost | USD | - | | 25,563,891 | | | | 25,563,891 | | 25,563,891 | |

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Attachment 4 – Itemwise Cost Estimate for Instrumentation and Control

Attachment 4: Itemwise Cost estimate for Instrumentation and Control
Option 5

| New Combined CDP & WHT-F platform | | USD | 1,100,000 |
|--|------|----------|-----------|
| | | Option 5 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| New DCS system | | | |
| Marshalling Cabinet + System Cabinet | Nos. | 1 | 200,000 |
| Network cabinet | Nos. | 1 | |
| New ESD system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| New F&G system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Operator & Engineer Work stations | Nos. | 2 | |
| New Equipment room (Common for E&I) | Nos. | 1 | - |
| Multi Well head Control Panel (only for Step 2 5-1) | Nos. | 1 | 325,000 |
| Telecom facilities including - CCTV - PA/GA - Radio | Nos. | 1 | 175,000 |

| New Combined CFP & WHT-D platform | | USD | 1,100,000 |
|--|------|----------|-----------|
| | | Option 6 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| New DCS system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Network cabinet | Nos. | 1 | |
| New ESD system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| New F&G system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Operator Work stations | Nos. | 2 | |
| New Equipment room | Nos. | 1 | - |
| Multi Well head Control Panel (only for Step 2 5-1) | Nos. | 1 | 325,000 |
| Telecom facilities including - CCTV - PA/GA - Radio | Nos. | 1 | 175,000 |

| Mubarraz Island | | USD | 925,000 |
|---|------|----------|---------|
| | | Option 5 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| New DCS Remote I/O cabinet system | | | |
| System/Marshalling cabinet | Nos. | 1 | 200,000 |
| New ESD system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| New F&G system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Operator & Engineer Work stations | Nos. | 1 | |
| New Unit Control Panel for Compressors | Nos. | 2 | - |
| Substation Building (Common for E&I) | Nos. | 1 | |
| Modification of existing DCS,ESD & F&G | | Required | 200,000 |
| Modification of existing Telecom facilities | | Required | 75,000 |

| Existing CFP platform | | USD | 200,000 |
|------------------------------------|------|----------|---------|
| | | Option 5 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| Modification of existing DCS & F&G | - | Required | 200,000 |

| Abu Dhabi office | | USD | 50,000 |
|--|------|----------|--------|
| | | Option 5 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| Exaquantum (yokogawa) system operation monitoring system | - | Required | 50,000 |

Option 6

| New WHT-F platform (only applicable for Step 2 5-1) | | USD | 1,100,000 |
|--|------|----------|-----------|
| | | Option 6 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| New DCS system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Network cabinet | Nos. | 1 | |
| New ESD system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| New F&G system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Operator Work stations | Nos. | 1 | |
| New Equipment room | Nos. | 1 | - |
| Multi Well head Control Panel (only for Step 2 5-1) | Nos. | 1 | 325,000 |
| Telecom facilities including - CCTV - PA/GA - Radio | Nos. | 1 | 175,000 |

| New WHT-D platform (only applicable for Step 2 5-1) | | USD | 1,100,000 |
|--|------|----------|-----------|
| | | Option 6 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| New DCS system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Network cabinet | Nos. | 1 | |
| New ESD system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| New F&G system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Operator Work stations | Nos. | 1 | |
| New Equipment room | Nos. | 1 | - |
| Multi Well head Control Panel (only for Step 2 5-1) | Nos. | 1 | 325,000 |
| Telecom facilities including - CCTV - PA/GA - Radio | Nos. | 1 | 175,000 |

| Mubarraz Island | | USD | 925,000 |
|---|------|----------|---------|
| | | Option 6 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| New DCS Remote I/O cabinet system | | | |
| System cabinet | Nos. | 1 | 200,000 |
| New ESD system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| New F&G system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Operator & Engineer Work stations | Nos. | | |
| New Unit Control Panel for Compressors | Nos. | 2 | - |
| Substation Building (Common for E&I) | Nos. | 1 | - |
| Modification of existing DCS,ESD & F&G | | Required | 200,000 |
| Modification of existing Telecom facilities | | Required | 75,000 |

| Existing CFP,CDP,AAP and CAP platform | | USD | 200,000 |
|---------------------------------------|------|----------|---------|
| | | Option 6 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| Modification of existing DCS | - | Required | 200,000 |

| Abu Dhabi office | | USD | 50,000 |
|--|------|----------|--------|
| | | Option 5 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| Exaquantum (yokogawa) system operation monitoring system | - | Required | 50,000 |

Option 6a



| New WHT-F platform (only applicable for Step 2 5-1) | | USD | 1,100,000 |
|--|------|-----------|-----------|
| | | Option 6a | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| New DCS system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Network cabinet | Nos. | 1 | |
| New ESD system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| New F&G system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Operator Work stations | Nos. | 1 | |
| New Equipment room | Nos. | 1 | - |
| Multi Well head Control Panel | Nos. | 1 | 325,000 |
| Telecom facilities including - CCTV - PA/GA - Radio | Nos. | 1 | 175,000 |

| New WHT-D platform (only applicable for Step 2 5-1) | | USD | 1,100,000 |
|--|------|-----------|-----------|
| | | Option 6a | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| New DCS system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Network cabinet | Nos. | 1 | |
| New ESD system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| New F&G system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Operator Work stations | Nos. | 1 | |
| New Equipment room | Nos. | 1 | - |
| Multi Well head Control Panel | Nos. | 1 | 325,000 |
| Telecom facilities including - CCTV - PA/GA - Radio | Nos. | 1 | 175,000 |

| Mubarraz Island | | USD | 925,000 |
|---|------|-----------|---------|
| | | Option 6a | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| New DCS Remote I/O cabinet system | | | |
| System cabinet | Nos. | 1 | 200,000 |
| New ESD system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| New F&G system | | | |
| Marshalling Cabinet + System cabinet | Nos. | 1 | 200,000 |
| Operator & Engineer Work stations | Nos. | | |
| New Unit Control Panel for Compressors | Nos. | 2 | - |
| Substation Building (Common for E&I) | Nos. | 1 | - |
| Modification of existing DCS,ESD & F&G | | Required | 200,000 |
| Modification of existing Telecom facilities | | Required | 75,000 |

| Existing CFP & CDP platform | | USD | 200,000 |
|------------------------------|------|-----------|---------|
| | | Option 6a | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| Modification of existing DCS | - | Required | 200,000 |

| Abu Dhabi office | | USD | 50,000 |
|--|------|----------|--------|
| | | Option 5 | Cost |
| ITEM DESCRIPTION | UNIT | | USD |
| Exaquantum (yokogawa) system operation monitoring system | - | Required | 50,000 |

| | | | |
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Attachment 5 – Cost Estimate for Produced Water Treatment Package

Hydrocyclones

| Parameter / Location | | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|--|-------|--------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | CDP | CDP | CDP | CDP | CDP | CFP | CFP | CFP | CFP | CFP |
| Design Flow rate | | BPD | 14,023 | 17,341 | 24,650 | 22,707 | 20,242 | 15,462 | 22,103 | 32,557 | 36,692 | 32,135 |
| Material of Construction (MoC) | | | CS + 3 mm CA + internal lining | CS + 3 mm CA + internal lining | CS + 3 mm CA + internal lining | CS + 3 mm CA + internal lining | CS + 3 mm CA + internal lining | CS + 3 mm CA + internal lining | CS + 3 mm CA + internal lining | CS + 3 mm CA + internal lining | CS + 3 mm CA + internal lining | CS + 3 mm CA + internal lining |
| Direct Cost | | | | | | | | | | | | |
| Material cost | | | 799,760 | 908,447 | 1,121,877 | 1,067,950 | 996,798 | 848,037 | 1,050,814 | 1,325,690 | 1,424,289 | 1,315,353 |
| Piping Bulks | 50.0% | % of material cost | 399,880 | 454,224 | 560,939 | 533,975 | 498,399 | 424,018 | 525,407 | 662,845 | 712,144 | 657,676 |
| Instrumentation Bulks | 40.0% | % of material cost | 319,904 | 363,379 | 448,751 | 427,180 | 398,719 | 339,215 | 420,326 | 530,276 | 569,716 | 526,141 |
| Electrical Bulks | 20.0% | % of material cost | 159,952 | 181,689 | 224,375 | 213,590 | 199,360 | 169,607 | 210,163 | 265,138 | 284,858 | 263,071 |
| Structural Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Others | 10.0% | % of material cost | 79,976 | 90,845 | 112,188 | 106,795 | 99,680 | 84,804 | 105,081 | 132,569 | 142,429 | 131,535 |
| 2 years operational spares | 2.0% | % of material cost | 15,995 | 18,169 | 22,438 | 21,359 | 19,936 | 16,961 | 21,016 | 26,514 | 28,486 | 26,307 |
| Installation Cost | 30.0% | % of material cost | 239,928 | 272,534 | 336,563 | 320,385 | 299,040 | 254,411 | 315,244 | 397,707 | 427,287 | 394,606 |
| Construction Cost | 20.0% | % of material cost | 159,952 | 181,689 | 224,375 | 213,590 | 199,360 | 169,607 | 210,163 | 265,138 | 284,858 | 263,071 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 15,995 | 18,169 | 22,438 | 21,359 | 19,936 | 16,961 | 21,016 | 26,514 | 28,486 | 26,307 |
| Direct Cost | | | 2,191,343 | 2,489,146 | 3,073,944 | 2,926,184 | 2,731,228 | 2,323,621 | 2,879,231 | 3,632,390 | 3,902,552 | 3,604,067 |
| Contractor Indirects | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 219,134 | 248,915 | 307,394 | 292,618 | 273,123 | 232,362 | 287,923 | 363,239 | 390,255 | 360,407 |
| Freight Cost | 7.0% | % of Material Cost | 55,983 | 63,591 | 78,531 | 74,757 | 69,776 | 59,363 | 73,557 | 92,798 | 99,700 | 92,075 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 15,995 | 18,169 | 22,438 | 21,359 | 19,936 | 16,961 | 21,016 | 26,514 | 28,486 | 26,307 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 219,134 | 248,915 | 307,394 | 292,618 | 273,123 | 232,362 | 287,923 | 363,239 | 390,255 | 360,407 |
| Total Contractor Indirect Cost | | | 510,247 | 579,589 | 715,758 | 681,352 | 635,957 | 541,047 | 670,420 | 845,790 | 908,696 | 839,195 |
| EPC Costs | | | 2,701,590 | 3,068,735 | 3,789,702 | 3,607,537 | 3,367,185 | 2,864,668 | 3,549,651 | 4,478,180 | 4,811,248 | 4,443,262 |
| Client Indirects | | | | | | | | | | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 67,540 | 76,718 | 94,743 | 90,188 | 84,180 | 71,617 | 88,741 | 111,954 | 120,281 | 111,082 |
| PMC + PMT | 7.0% | % of EPC Costs | 189,111 | 214,811 | 265,279 | 252,528 | 235,703 | 200,527 | 248,476 | 313,473 | 336,787 | 311,028 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 27,016 | 30,687 | 37,897 | 36,075 | 33,672 | 28,647 | 35,497 | 44,782 | 48,112 | 44,433 |
| Total Client Indirect Cost | | | 283,667 | 322,217 | 397,919 | 378,791 | 353,554 | 300,790 | 372,713 | 470,209 | 505,181 | 466,542 |
| Base Estimate | | | 2,985,257 | 3,390,952 | 4,187,621 | 3,986,328 | 3,720,739 | 3,165,458 | 3,922,364 | 4,948,389 | 5,316,429 | 4,909,804 |
| Contingency | 10.0% | % of Base Estimate | 298,526 | 339,095 | 418,762 | 398,633 | 372,074 | 316,546 | 392,236 | 494,839 | 531,643 | 490,980 |
| Total Installed Cost | | USD | 3,283,783 | 3,730,047 | 4,606,383 | 4,384,961 | 4,092,813 | 3,482,004 | 4,314,601 | 5,443,228 | 5,848,072 | 5,400,785 |

Source: Vendor offer from Inhouse database

| Parameter | | |
|--|------|---------|
| Capacity | BWPD | 40000 |
| Base equipment cost including bulks without indexation | USD | 1500000 |
| Cost index | 2022 | 209 |
| Cost index | 2022 | 209 |
| Equipment cost including bulks with indexation | USD | 1500000 |

CFU

| Parameter / Location | | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a |
|--|-------|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|-----------|-----------|------------|------------|------------|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | CDP | CDP | CDP | CDP | CDP | CFP | CFP | CFP | CFP | CFP | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI |
| Design Flow rate | | BPD | 14,023 | 17,341 | 24,650 | 22,707 | 20,242 | 15,462 | 22,103 | 32,557 | 36,692 | 32,135 | - | - | 12,448 | 15,395 | 10,198 | 18,849 | 36,357 | 67,770 | 74,503 | 62,096 | 8,350 | 25,859 | 57,274 | 64,000 | 51,597 |
| Direct Cost | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Material Cost | | | 1,259,851 | 1,431,064 | 1,767,277 | 1,682,327 | 1,570,242 | 1,335,900 | 1,655,332 | 2,088,339 | 2,243,661 | 2,072,056 | - | - | 1,172,936 | 1,332,424 | 1,040,695 | 1,504,484 | 2,231,348 | 3,242,179 | 3,431,774 | 3,076,470 | 923,052 | 1,818,786 | 2,930,819 | 3,132,726 | 2,752,892 |
| Piping Bults | 50.0% | % of material cost | 629,925 | 715,532 | 883,639 | 841,163 | 785,121 | 667,950 | 827,666 | 1,044,170 | 1,121,831 | 1,036,028 | - | - | 586,468 | 666,212 | 520,348 | 752,242 | 1,115,674 | 1,621,089 | 1,715,887 | 1,538,235 | 461,526 | 909,393 | 1,465,409 | 1,566,363 | 1,376,446 |
| Instrumentation Bults | 40.0% | % of material cost | 503,940 | 572,425 | 706,911 | 672,931 | 628,097 | 534,360 | 662,133 | 835,336 | 897,465 | 828,822 | - | - | 469,174 | 532,969 | 416,278 | 601,793 | 892,539 | 1,296,872 | 1,372,710 | 1,230,588 | 369,221 | 727,514 | 1,172,328 | 1,253,091 | 1,101,157 |
| Electrical Bults | 20.0% | % of material cost | 251,970 | 286,213 | 353,455 | 336,465 | 314,048 | 267,180 | 331,066 | 417,668 | 448,732 | 414,411 | - | - | 234,587 | 266,485 | 208,139 | 300,897 | 446,270 | 648,436 | 686,355 | 615,294 | 184,610 | 363,757 | 586,164 | 626,545 | 550,578 |
| Structural Bults | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Others | 10.0% | % of material cost | 125,985 | 143,106 | 176,728 | 168,233 | 157,024 | 133,590 | 165,533 | 208,834 | 224,366 | 207,206 | - | - | 117,294 | 133,242 | 104,070 | 150,448 | 223,135 | 324,218 | 343,177 | 307,647 | 92,305 | 181,879 | 293,082 | 313,273 | 275,289 |
| 2 years operational spares | 2.0% | % of material cost | 25,197 | 28,621 | 35,346 | 33,647 | 31,405 | 26,718 | 33,107 | 41,767 | 44,873 | 41,441 | - | - | 23,459 | 26,648 | 20,814 | 30,090 | 44,627 | 64,844 | 68,635 | 61,529 | 18,461 | 36,376 | 58,616 | 62,655 | 55,058 |
| Installation Cost | 30.0% | % of material cost | 377,955 | 429,319 | 530,183 | 504,698 | 471,073 | 400,770 | 496,600 | 626,502 | 673,098 | 621,617 | - | - | 351,881 | 399,727 | 312,209 | 451,345 | 669,404 | 972,654 | 1,029,532 | 922,941 | 276,916 | 545,636 | 879,246 | 939,818 | 825,868 |
| Construction Cost | 20.0% | % of material cost | 251,970 | 286,213 | 353,455 | 336,465 | 314,048 | 267,180 | 331,066 | 417,668 | 448,732 | 414,411 | - | - | 234,587 | 266,485 | 208,139 | 300,897 | 446,270 | 648,436 | 686,355 | 615,294 | 184,610 | 363,757 | 586,164 | 626,545 | 550,578 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 25,197 | 28,621 | 35,346 | 33,647 | 31,405 | 26,718 | 33,107 | 41,767 | 44,873 | 41,441 | - | - | 23,459 | 26,648 | 20,814 | 30,090 | 44,627 | 64,844 | 68,635 | 61,529 | 18,461 | 36,376 | 58,616 | 62,655 | 55,058 |
| Direct Cost | 0.0% | | 3,451,991 | 3,921,114 | 4,842,339 | 4,609,575 | 4,302,462 | 3,660,365 | 4,535,611 | 5,722,050 | 6,147,632 | 5,677,433 | - | - | 3,213,844 | 3,650,840 | 2,851,504 | 4,122,285 | 6,113,893 | 8,883,570 | 9,403,062 | 8,429,527 | 2,529,164 | 4,983,473 | 8,030,444 | 8,583,670 | 7,542,924 |
| Contractor Indirects | 0.0% | | | | | | | | | | | | - | - | | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 345,199 | 392,111 | 484,234 | 460,958 | 430,246 | 366,037 | 453,561 | 572,205 | 614,763 | 567,743 | - | - | 321,384 | 365,084 | 285,150 | 412,229 | 611,389 | 888,357 | 940,306 | 842,953 | 252,916 | 498,347 | 803,044 | 858,367 | 754,292 |
| Freight Cost | 7.0% | % of Material Cost | 88,190 | 100,174 | 123,709 | 117,763 | 109,917 | 93,513 | 115,873 | 146,184 | 157,056 | 145,044 | - | - | 82,106 | 93,270 | 72,849 | 105,314 | 156,194 | 226,953 | 240,224 | 215,353 | 64,614 | 127,315 | 205,157 | 219,291 | 192,702 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 25,197 | 28,621 | 35,346 | 33,647 | 31,405 | 26,718 | 33,107 | 41,767 | 44,873 | 41,441 | - | - | 23,459 | 26,648 | 20,814 | 30,090 | 44,627 | 64,844 | 68,635 | 61,529 | 18,461 | 36,376 | 58,616 | 62,655 | 55,058 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 345,199 | 392,111 | 484,234 | 460,958 | 430,246 | 366,037 | 453,561 | 572,205 | 614,763 | 567,743 | - | - | 321,384 | 365,084 | 285,150 | 412,229 | 611,389 | 888,357 | 940,306 | 842,953 | 252,916 | 498,347 | 803,044 | 858,367 | 754,292 |
| Total Contractor Indirect Cost | 0.0% | | 803,785 | 913,019 | 1,127,523 | 1,073,324 | 1,001,814 | 852,304 | 1,056,102 | 1,332,361 | 1,431,456 | 1,321,972 | - | - | 748,333 | 850,086 | 663,963 | 959,861 | 1,423,600 | 2,068,510 | 2,189,472 | 1,962,788 | 588,907 | 1,160,385 | 1,869,862 | 1,998,679 | 1,756,345 |
| EPC Costs | | | 4,255,775 | 4,834,133 | 5,969,862 | 5,682,899 | 5,304,277 | 4,512,669 | 5,591,713 | 7,054,411 | 7,579,088 | 6,999,405 | - | - | 3,962,177 | 4,500,927 | 3,515,468 | 5,082,146 | 7,537,493 | 10,952,080 | 11,592,534 | 10,392,315 | 3,118,071 | 6,143,858 | 9,900,306 | 10,582,350 | 9,299,269 |
| Client Indirects | | | | | | | | | | | | | - | - | | | | | | | | | | | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 106,394 | 120,853 | 149,247 | 142,072 | 132,607 | 112,817 | 139,793 | 176,360 | 189,477 | 174,985 | - | - | 99,054 | 112,523 | 87,887 | 127,054 | 188,437 | 273,802 | 289,813 | 259,808 | 77,952 | 153,596 | 247,508 | 264,559 | 232,482 |
| PMC + PMT | 7.0% | % of EPC Costs | 297,904 | 338,389 | 417,890 | 397,803 | 371,299 | 315,887 | 391,420 | 493,809 | 530,536 | 489,958 | - | - | 277,352 | 315,065 | 246,083 | 355,750 | 527,625 | 766,646 | 811,477 | 727,462 | 218,265 | 430,070 | 693,021 | 740,764 | 650,949 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 42,558 | 48,341 | 59,699 | 56,829 | 53,043 | 45,127 | 55,917 | 70,544 | 75,791 | 69,994 | - | - | 39,622 | 45,009 | 36,155 | 50,821 | 75,375 | 109,521 | 115,925 | 103,923 | 31,181 | 61,439 | 99,003 | 105,823 | 92,993 |
| Total Client Indirect Cost | | | 446,856 | 507,584 | 626,835 | 596,704 | 556,949 | 473,830 | 587,130 | 740,713 | 795,804 | 734,937 | - | - | 416,029 | 472,597 | 369,124 | 533,625 | 791,437 | 1,149,968 | 1,217,216 | 1,091,193 | 327,397 | 645,105 | 1,039,532 | 1,111,147 | 976,423 |
| Base Estimate | | | 4,702,632 | 5,341,717 | 6,596,697 | 6,279,604 | 5,861,226 | 4,986,500 | 6,178,843 | 7,795,124 | 8,374,892 | 7,734,342 | - | - | 4,378,206 | 4,973,524 | 3,884,592 | 5,615,771 | 8,328,930 | 12,102,048 | 12,809,750 | 11,483,508 | 3,445,468 | 6,788,963 | 10,939,838 | 11,693,496 | 10,275,692 |
| Contingency | 10.0% | % of Base Estimate | 470,263 | 534,172 | 659,670 | 627,960 | 586,123 | 498,650 | 617,884 | 779,512 | 837,489 | 773,434 | - | - | 437,821 | 497,352 | 388,459 | 561,577 | 832,893 | 1,210,205 | 1,280,975 | 1,148,351 | 344,547 | 678,896 | 1,093,984 | 1,169,350 | 1,027,569 |
| Total Installed Cost | | USD | 5,172,895 | 5,875,889 | 7,256,367 | 6,907,564 | 6,447,348 | 5,485,150 | 6,796,727 | 8,574,636 | 9,212,381 | 8,507,776 | - | - | 4,816,026 | 5,470,876 | 4,273,051 | 6,177,348 | 9,161,823 | 13,312,253 | 14,090,725 | 12,631,859 | 3,790,015 | 7,467,859 | 12,033,822 | 12,862,846 | 11,303,261 |

Source: Vendor offer from inhouse database



| Parameter | | |
|--|------|---------|
| Capacity | BWPD | 30000 |
| Base equipment cost including bulks without indexation | USD | 1760000 |
| Cost index | 2019 | 185 |
| Cost index | 2022 | 209 |
| Equipment cost including bulks with indexation | USD | 1988324 |

[illegible]

Produced water disposal pumps

| Parameter / Location | | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | | | |
|---|-------|--------------------|----------|----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|-------|--------|
| | | | S14a1 | S24b2 | S14a1 | S24b2 | S2-5-1 | S14a1 | S24b2 | S2-5-1 | S14a1 | S24b2 | S2-5-1 | S14a1 | S24b2 | S2-5-1 | S14a1 | S24b2 | S2-5-1 | S14a1 | S24b2 | S2-5-1 | S14a1 | S24b2 | S2-5-1 | S14a1 | S24b2 | S2-5-1 | S14a1 | S24b2 | S2-5-1 | S14a1 | S24b2 | S2-5-1 |
| | | | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P | LTDP1 | LTDP2P |
| | | | CDP | CDP | CDP | CDP | CDP | CFP | CFP | CFP | CFP | CFP | CFP | CFP | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI | |
| Design Flow rate | | BPD | 14,023 | 17,341 | 24,650 | 22,707 | 20,242 | 15,462 | 22,103 | 32,557 | 36,692 | 32,135 | 32,135 | 32,135 | - | - | 12,448 | 15,395 | 10,198 | 18,849 | 36,357 | 67,770 | 74,503 | 62,096 | 8,350 | 25,859 | 57,274 | 64,000 | 51,597 | 51,597 | 51,597 | 51,597 | | |
| Head | | ft | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | - | - | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | 2,336 | | |
| Head | | psi | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | - | - | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | 1,012.8 | | |
| MOC | | - | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | - | - | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | SDSS | | |
| | | kW | 358 | 424 | 567 | 529 | 481 | 387 | 518 | 716 | 794 | 708 | 708 | 708 | - | - | 325 | 385 | 278 | 454 | 787 | 1,366 | 1,490 | 1,262 | 239 | 590 | 1,173 | 1,297 | 1,069 | 1,069 | 1,069 | 1,069 | | |
| Direct Cost | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Material Cost | | | 338,000 | 383,934 | 474,135 | 451,344 | 421,274 | 358,403 | 444,102 | 560,272 | 601,942 | 555,903 | 555,903 | 555,903 | - | - | 314,682 | 357,470 | 279,204 | 403,632 | 598,639 | 869,830 | 920,696 | 825,373 | 247,642 | 487,954 | 786,297 | 840,466 | 738,562 | 738,562 | 738,562 | 738,562 | | |
| Piping Bults | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Instrumentation Bults | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Electrical Bults | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Structural Bults | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Others | 10.0% | % of material cost | 33,800 | 38,393 | 47,414 | 45,134 | 42,127 | 35,840 | 44,410 | 56,207 | 60,194 | 55,590 | 55,590 | 55,590 | - | - | 31,468 | 35,747 | 27,920 | 40,363 | 59,864 | 86,983 | 92,070 | 82,537 | 24,764 | 48,795 | 78,630 | 84,047 | 73,856 | 73,856 | 73,856 | 73,856 | | |
| 2 years operational spares | 2.0% | % of material cost | 6,760 | 7,679 | 9,483 | 9,027 | 8,425 | 7,168 | 8,882 | 11,205 | 12,039 | 11,118 | 11,118 | 11,118 | - | - | 6,294 | 7,149 | 5,584 | 8,073 | 11,973 | 17,397 | 18,414 | 16,507 | 4,953 | 9,759 | 15,726 | 16,809 | 14,771 | 14,771 | 14,771 | 14,771 | | |
| Installation Cost | 30.0% | % of material cost | 101,400 | 115,180 | 142,241 | 135,403 | 126,382 | 107,521 | 133,231 | 168,082 | 180,583 | 166,771 | 166,771 | 166,771 | - | - | 94,405 | 107,241 | 83,761 | 121,089 | 179,592 | 260,949 | 276,209 | 247,612 | 74,293 | 146,386 | 235,889 | 252,140 | 221,569 | 221,569 | 221,569 | | | |
| Construction Cost | 20.0% | % of material cost | 67,600 | 76,787 | 94,827 | 90,269 | 84,255 | 71,681 | 88,820 | 112,054 | 120,388 | 111,181 | 111,181 | 111,181 | - | - | 62,936 | 71,494 | 55,841 | 80,726 | 119,728 | 173,966 | 184,139 | 165,075 | 49,528 | 97,591 | 157,259 | 168,093 | 147,712 | 147,712 | 147,712 | | | |
| Commissioning Assistance Cost | 2.0% | % of material cost | 6,760 | 7,679 | 9,483 | 9,027 | 8,425 | 7,168 | 8,882 | 11,205 | 12,039 | 11,118 | 11,118 | 11,118 | - | - | 6,294 | 7,149 | 5,584 | 8,073 | 11,973 | 17,397 | 18,414 | 16,507 | 4,953 | 9,759 | 15,726 | 16,809 | 14,771 | 14,771 | 14,771 | 14,771 | | |
| Direct Cost | | | 554,320 | 629,652 | 777,582 | 740,205 | 690,889 | 587,781 | 728,328 | 918,846 | 987,186 | 911,681 | 911,681 | 911,681 | - | - | 516,078 | 586,251 | 457,894 | 661,956 | 981,768 | 1,426,522 | 1,509,942 | 1,353,612 | 406,133 | 800,245 | 1,289,527 | 1,378,364 | 1,211,241 | 1,211,241 | 1,211,241 | | | |
| Contractor Indirects | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engng. | 10.0% | % of Direct Cost | 55,432 | 62,965 | 77,758 | 74,020 | 69,089 | 58,778 | 72,833 | 91,885 | 98,719 | 91,168 | 91,168 | 91,168 | - | - | 51,608 | 58,625 | 45,789 | 66,196 | 98,177 | 142,652 | 150,994 | 135,361 | 40,613 | 80,025 | 128,953 | 137,836 | 121,124 | 121,124 | 121,124 | | | |
| Freight Cost | 7.0% | % of Material Cost | 23,660 | 26,875 | 33,189 | 31,594 | 29,489 | 25,088 | 31,087 | 39,219 | 42,136 | 38,913 | 38,913 | 38,913 | - | - | 22,028 | 25,023 | 19,544 | 28,254 | 41,905 | 60,888 | 64,449 | 57,776 | 17,335 | 34,157 | 55,041 | 58,833 | 51,699 | 51,699 | 51,699 | | | |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 6,760 | 7,679 | 9,483 | 9,027 | 8,425 | 7,168 | 8,882 | 11,205 | 12,039 | 11,118 | 11,118 | 11,118 | - | - | 6,294 | 7,149 | 5,584 | 8,073 | 11,973 | 17,397 | 18,414 | 16,507 | 4,953 | 9,759 | 15,726 | 16,809 | 14,771 | 14,771 | 14,771 | | | |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 55,432 | 62,965 | 77,758 | 74,020 | 69,089 | 58,778 | 72,833 | 91,885 | 98,719 | 91,168 | 91,168 | 91,168 | - | - | 51,608 | 58,625 | 45,789 | 66,196 | 98,177 | 142,652 | 150,994 | 135,361 | 40,613 | 80,025 | 128,953 | 137,836 | 121,124 | 121,124 | 121,124 | | | |
| Total Contractor Indirect Cost | 0.0% | | 141,284 | 160,484 | 198,189 | 188,662 | 176,092 | 149,812 | 185,635 | 234,194 | 251,612 | 232,368 | 232,368 | 232,368 | - | - | 131,537 | 149,423 | 116,707 | 168,718 | 250,231 | 363,589 | 384,851 | 345,006 | 103,514 | 203,965 | 328,672 | 351,315 | 308,719 | 308,719 | 308,719 | | | |
| EPC Costs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 695,604 | 790,136 | 975,770 | 928,867 | 866,981 | 737,593 | 913,962 | 1,153,039 | 1,238,798 | 1,144,049 | 1,144,049 | 1,144,049 | - | - | 647,616 | 735,674 | 574,601 | 830,674 | 1,231,999 | 1,790,111 | 1,894,793 | 1,698,618 | 509,647 | 1,004,210 | 1,618,199 | 1,729,679 | 1,519,960 | 1,519,960 | 1,519,960 | | | |
| Client Indirects | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 17,390 | 19,753 | 24,394 | 23,222 | 21,675 | 18,440 | 22,849 | 28,826 | 30,970 | 28,601 | 28,601 | 28,601 | - | - | 16,190 | 18,392 | 14,365 | 20,767 | 30,800 | 44,753 | 47,370 | 42,465 | 12,741 | 25,105 | 40,455 | 43,242 | 37,999 | 37,999 | 37,999 | | | |
| PMC + PMT | 7.0% | % of EPC Costs | 48,692 | 55,310 | 68,304 | 65,021 | 60,689 | 51,632 | 63,977 | 80,713 | 86,716 | 80,083 | 80,083 | 80,083 | - | - | 45,333 | 51,497 | 40,222 | 58,147 | 86,240 | 125,308 | 132,636 | 118,903 | 35,675 | 70,295 | 113,274 | 121,078 | 106,397 | 106,397 | 106,397 | | | |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 6,956 | 7,901 | 9,758 | 9,289 | 8,670 | 7,376 | 9,140 | 11,530 | 12,388 | 11,440 | 11,440 | 11,440 | - | - | 6,476 | 7,357 | 5,746 | 8,307 | 12,320 | 17,901 | 18,948 | 16,986 | 5,096 | 10,042 | 16,182 | 17,297 | 15,200 | 15,200 | 15,200 | | | |
| Total Client Indirect Cost | | | 73,038 | 82,964 | 102,456 | 97,531 | 91,033 | 77,447 | 95,966 | 121,609 | 130,074 | 120,125 | 120,125 | 120,125 | - | - | 68,000 | 77,246 | 60,333 | 87,221 | 129,360 | 187,962 | 198,953 | 178,355 | 53,513 | 105,442 | 169,911 | 181,616 | 159,596 | 159,596 | 159,596 | | | |
| Base Estimate | | | 768,642 | 873,101 | 1,078,226 | 1,026,398 | 958,014 | 815,404 | 1,009,928 | 1,274,109 | 1,368,871 | 1,264,174 | 1,264,174 | 1,264,174 | - | - | 715,615 | 812,920 | 634,934 | 917,895 | 1,361,359 | 1,978,073 | 2,093,746 | 1,876,973 | 563,160 | 1,109,652 | 1,788,110 | 1,911,295 | 1,679,556 | 1,679,556 | 1,679,556 | | | |
| Contingency | 10.0% | % of Base Estimate | 76,864 | 87,310 | 107,823 | 102,640 | 95,801 | 81,504 | 100,993 | 127,411 | 136,887 | 126,417 | 126,417 | 126,417 | - | - | 71,562 | 81,292 | 63,493 | 91,789 | 136,136 | 197,807 | 209,375 | 187,697 | 56,316 | 110,965 | 178,821 | 191,130 | 167,956 | 167,956 | 167,956 | | | |
| Total Installed Cost | | USD | 845,507 | 960,411 | 1,186,049 | 1,129,037 | 1,053,815 | 896,545 | 1,110,921 | 1,401,519 | 1,505,758 | 1,390,591 | 1,390,591 | 1,390,591 | - | - | 787,177 | 894,212 | 698,428 | 1,009,684 | 1,497,495 | 2,175,880 | 2,303,121 | 2,064,670 | 619,476 | 1,220,671 | 1,966,921 | 2,102,425 | 1,847,511 | 1,847,511 | 1,847,511 | | | |

| | | | Option 5 |
|--|--------|------|----------|
| | | | LTDP1 |
| | | | CDP |
| Source: ASPEN CAPITAL COST ESTIMATOR | | | 14,023 |
| Capacity | | BPD | |
| Capacity | m3/ht | | 92.9 |
| Capacity | m3/day | | 2,229 |
| Capacity | LPS | | 25.8 |
| Head | ft | | 2,336 |
| Head | m | | 712 |
| Base equipment cost including bulks without indexation | | USD | 299,100 |
| Cost index | | 2019 | 185 |
| Cost index | | 2022 | 209 |
| Equipment cost including bulks with indexation | | USD | 338,000 |

| | | | |
|---|---|--------|--|
| <div> ABU DHABI OIL CO., LTD (JAPAN)</div> | MUBARRAZ REDEVELOPMENT STUDY – SELECT STAGE (CONTRACT NO. DP-22-101) | | <div></div> |
| | COST ESTIMATION REPORT | | |
| Document No: | 7422001 | Rev. 0 | Page 16 of 16 |

Attachment 6 – Cost Estimate for Rest of Equipment/Packages

3 phase Separators

| Parameter / Location | | | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|--|-------|--------------------|---------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | | CDP | CDP | CDP | CDP | CDP | CFP | CFP | CFP | CFP | CFP | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI |
| Diameter | | | m | 3.1 | 3.3 | 3.8 | 3.8 | 3.7 | 3.2 | 3.6 | 4.2 | 4.4 | 4.2 | 4 | 4.5 | 5.3 | 5.3 | 5.3 | 2.9 | 3.6 | 4.7 | 4.7 | 4.8 |
| Length | | | m | 6.2 | 6.6 | 7.6 | 7.6 | 7.4 | 6.4 | 7.2 | 8.4 | 8.8 | 8.4 | 8 | 9 | 10.6 | 10.6 | 10.6 | 5.8 | 7.2 | 9.4 | 9.4 | 9.6 |
| Thickness | | | mm | 38 | 38 | 41 | 41 | 41 | 38 | 41 | 48 | 48 | 48 | 44 | 48 | 54 | 54 | 54 | 35 | 41 | 51 | 51 | 51 |
| Weight | | | Tons | 24 | 28 | 40 | 40 | 38 | 26 | 36 | 56 | 61 | 56 | 47 | 64 | 101 | 101 | 101 | 20 | 36 | 75 | 75 | 78 |
| MoC | | | - | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA |
| Cost/Ton | | | USD/Ton | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 |
| Direct Cost | | | | | | | | | | | | | | | | | | | | | | | |
| Material Cost | | | | 595,800 | 675,158 | 969,855 | 969,855 | 919,481 | 634,859 | 870,451 | 1,367,055 | 1,500,351 | 1,367,055 | 1,157,295 | 1,569,323 | 2,467,157 | 2,467,157 | 2,467,157 | 477,953 | 870,451 | 1,826,046 | 1,826,046 | 1,904,577 |
| Piping Bulks | 50.0% | % of material cost | | 297,900 | 337,579 | 484,927 | 484,927 | 459,741 | 317,430 | 435,226 | 683,527 | 750,175 | 683,527 | 578,648 | 784,662 | 1,233,579 | 1,233,579 | 1,233,579 | 238,976 | 435,226 | 913,023 | 913,023 | 952,289 |
| Instrumentation Bulks | 40.0% | % of material cost | | 238,320 | 270,063 | 387,942 | 387,942 | 367,793 | 253,944 | 348,181 | 546,822 | 600,140 | 546,822 | 462,918 | 627,729 | 986,863 | 986,863 | 986,863 | 191,181 | 348,181 | 730,419 | 730,419 | 761,831 |
| Electrical Bulks | 20.0% | % of material cost | | 119,160 | 135,032 | 193,971 | 193,971 | 183,896 | 126,972 | 174,090 | 273,411 | 300,070 | 273,411 | 231,459 | 313,865 | 493,431 | 493,431 | 493,431 | 95,591 | 174,090 | 365,209 | 365,209 | 380,915 |
| Structural Bulks | 0.0% | % of material cost | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Others | 10.0% | % of material cost | | 59,580 | 67,516 | 96,985 | 96,985 | 91,948 | 63,486 | 87,045 | 136,705 | 150,035 | 136,705 | 115,730 | 156,932 | 246,716 | 246,716 | 246,716 | 47,795 | 87,045 | 182,605 | 182,605 | 190,458 |
| 2 years operational spares | 2.0% | % of material cost | | 11,916 | 13,503 | 19,397 | 19,397 | 18,390 | 12,697 | 17,409 | 27,341 | 30,007 | 27,341 | 23,146 | 31,386 | 49,343 | 49,343 | 49,343 | 9,559 | 17,409 | 36,521 | 36,521 | 38,092 |
| Installation Cost | 0.0% | % of material cost | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Construction Cost | 5.0% | % of material cost | | 29,790 | 33,758 | 48,493 | 48,493 | 45,974 | 31,743 | 43,523 | 68,353 | 75,018 | 68,353 | 57,865 | 78,466 | 123,358 | 123,358 | 123,358 | 23,898 | 43,523 | 91,302 | 91,302 | 95,229 |
| Commissioning Assistance Cost | 2.0% | % of material cost | | 11,916 | 13,503 | 19,397 | 19,397 | 18,390 | 12,697 | 17,409 | 27,341 | 30,007 | 27,341 | 23,146 | 31,386 | 49,343 | 49,343 | 49,343 | 9,559 | 17,409 | 36,521 | 36,521 | 38,092 |
| Direct Cost | | | | 1,364,383 | 1,546,111 | 2,220,967 | 2,220,967 | 2,105,612 | 1,453,827 | 1,993,334 | 3,130,556 | 3,435,803 | 3,130,556 | 2,650,206 | 3,593,750 | 5,649,790 | 5,649,790 | 5,649,790 | 1,094,511 | 1,993,334 | 4,181,646 | 4,181,646 | 4,361,482 |
| Contractor Indirects | | | | | | | | | | | | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | | 136,438 | 154,611 | 222,097 | 222,097 | 210,561 | 145,383 | 199,333 | 313,056 | 343,580 | 313,056 | 265,021 | 359,375 | 564,979 | 564,979 | 564,979 | 109,451 | 199,333 | 418,165 | 418,165 | 436,148 |
| Freight Cost | 7.0% | % of Material Cost | | 41,706 | 47,261 | 67,890 | 67,890 | 64,364 | 44,440 | 60,932 | 95,694 | 105,025 | 95,694 | 81,011 | 109,853 | 172,701 | 172,701 | 172,701 | 33,457 | 60,932 | 127,823 | 127,823 | 133,320 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | | 11,916 | 13,503 | 19,397 | 19,397 | 18,390 | 12,697 | 17,409 | 27,341 | 30,007 | 27,341 | 23,146 | 31,386 | 49,343 | 49,343 | 49,343 | 9,559 | 17,409 | 36,521 | 36,521 | 38,092 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | | 136,438 | 154,611 | 222,097 | 222,097 | 210,561 | 145,383 | 199,333 | 313,056 | 343,580 | 313,056 | 265,021 | 359,375 | 564,979 | 564,979 | 564,979 | 109,451 | 199,333 | 418,165 | 418,165 | 436,148 |
| Total Contractor Indirect Cost | 0.0% | | | 326,499 | 369,986 | 531,480 | 531,480 | 503,876 | 347,903 | 477,007 | 749,146 | 822,192 | 749,146 | 634,198 | 859,989 | 1,352,002 | 1,352,002 | 1,352,002 | 261,918 | 477,007 | 1,000,673 | 1,000,673 | 1,043,708 |
| EPC Costs | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1,690,881 | 1,916,098 | 2,752,448 | 2,752,448 | 2,609,488 | 1,801,730 | 2,470,341 | 3,879,702 | 4,257,995 | 3,879,702 | 3,284,404 | 4,453,739 | 7,001,792 | 7,001,792 | 7,001,792 | 1,356,429 | 2,470,341 | 5,182,320 | 5,182,320 | 5,405,190 |
| Client Indirects | | | | | | | | | | | | | | | | | | | | | | | |
| Studies + FEED | 2.5% | % of EPC Costs | | 42,272 | 47,902 | 68,811 | 68,811 | 65,237 | 45,043 | 61,759 | 96,993 | 106,450 | 96,993 | 82,110 | 111,343 | 175,045 | 175,045 | 175,045 | 33,911 | 61,759 | 129,558 | 129,558 | 135,130 |
| PMC + PMT | 7.0% | % of EPC Costs | | 118,362 | 134,127 | 192,671 | 192,671 | 182,664 | 126,121 | 172,924 | 271,579 | 298,060 | 271,579 | 229,908 | 311,762 | 490,125 | 490,125 | 490,125 | 94,950 | 172,924 | 362,762 | 362,762 | 378,363 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | | 16,909 | 19,161 | 27,524 | 27,524 | 26,095 | 18,017 | 24,703 | 38,797 | 42,580 | 38,797 | 32,844 | 44,537 | 70,018 | 70,018 | 70,018 | 13,564 | 24,703 | 51,823 | 51,823 | 54,052 |
| Total Client Indirect Cost | | | | 177,543 | 201,190 | 289,007 | 289,007 | 273,996 | 189,182 | 259,386 | 407,369 | 447,089 | 407,369 | 344,862 | 467,643 | 735,188 | 735,188 | 735,188 | 142,425 | 259,386 | 544,144 | 544,144 | 567,545 |
| Base Estimate | | | | 1,868,424 | 2,117,288 | 3,041,455 | 3,041,455 | 2,883,484 | 1,990,912 | 2,729,727 | 4,287,071 | 4,705,084 | 4,287,071 | 3,629,266 | 4,921,382 | 7,736,980 | 7,736,980 | 7,736,980 | 1,498,855 | 2,729,727 | 5,726,464 | 5,726,464 | 5,972,735 |
| Contingency | 10.0% | % of Base Estimate | | 186,842 | 211,729 | 304,145 | 304,145 | 288,348 | 199,091 | 272,973 | 428,707 | 470,508 | 428,707 | 362,927 | 492,138 | 773,698 | 773,698 | 773,698 | 149,885 | 272,973 | 572,646 | 572,646 | 597,274 |
| Total Installed Cost | | USD | | 2,055,266 | 2,329,017 | 3,345,600 | 3,345,600 | 3,171,833 | 2,190,003 | 3,002,699 | 4,715,778 | 5,175,593 | 4,715,778 | 3,992,193 | 5,413,520 | 8,510,678 | 8,510,678 | 8,510,678 | 1,648,740 | 3,002,699 | 6,299,110 | 6,299,110 | 6,570,009 |

Slug Catcher

| Parameter / Location | | Unit | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a |
|--|-------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI |
| Diameter | | m | 3.5 | 3.7 | 4.3 | 4.3 | 4.3 | 2.6 | 3.2 | 4 | 4 | 4.1 |
| Length | | m | 7 | 7.4 | 8.6 | 8.6 | 8.6 | 5.2 | 6.4 | 8 | 8 | 8.2 |
| Thickness | | mm | 41 | 41 | 48 | 48 | 48 | 32 | 38 | 44 | 44 | 44 |
| Weight | | Tons | 34 | 38 | 59 | 59 | 59 | 14 | 26 | 47 | 47 | 50 |
| MoC | | - | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA |
| Cost/Ton | | USD/Ton | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 |
| Direct Cost | | | | | | | | | | | | |
| Material Cost | | | 822,765 | 919,481 | 1,432,928 | 1,432,928 | 1,432,928 | 349,255 | 634,859 | 1,157,295 | 1,157,295 | 1,215,883 |
| Piping Bulks | 50.0% | % of material cost | 411,382 | 459,741 | 716,464 | 716,464 | 716,464 | 174,628 | 317,430 | 578,648 | 578,648 | 607,942 |
| Instrumentation Bulks | 40.0% | % of material cost | 329,106 | 367,793 | 573,171 | 573,171 | 573,171 | 139,702 | 253,944 | 462,918 | 462,918 | 486,353 |
| Electrical Bulks | 20.0% | % of material cost | 164,553 | 183,896 | 286,586 | 286,586 | 286,586 | 69,851 | 126,972 | 231,459 | 231,459 | 243,177 |
| Structural Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Others | 10.0% | % of material cost | 82,276 | 91,948 | 143,293 | 143,293 | 143,293 | 34,926 | 63,486 | 115,730 | 115,730 | 121,588 |
| 2 years operational spares | 2.0% | % of material cost | 16,455 | 18,390 | 28,659 | 28,659 | 28,659 | 6,985 | 12,697 | 23,146 | 23,146 | 24,318 |
| Installation Cost | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Construction Cost | 5.0% | % of material cost | 41,138 | 45,974 | 71,646 | 71,646 | 71,646 | 17,463 | 31,743 | 57,865 | 57,865 | 60,794 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 16,455 | 18,390 | 28,659 | 28,659 | 28,659 | 6,985 | 12,697 | 23,146 | 23,146 | 24,318 |
| Direct Cost | | | 1,884,131 | 2,105,612 | 3,281,405 | 3,281,405 | 3,281,405 | 799,794 | 1,453,827 | 2,650,206 | 2,650,206 | 2,784,373 |
| Contractor Indirects | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 188,413 | 210,561 | 328,140 | 328,140 | 328,140 | 79,979 | 145,383 | 265,021 | 265,021 | 278,437 |
| Freight Cost | 7.0% | % of Material Cost | 57,594 | 64,364 | 100,305 | 100,305 | 100,305 | 24,448 | 44,440 | 81,011 | 81,011 | 85,112 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 16,455 | 18,390 | 28,659 | 28,659 | 28,659 | 6,985 | 12,697 | 23,146 | 23,146 | 24,318 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 188,413 | 210,561 | 328,140 | 328,140 | 328,140 | 79,979 | 145,383 | 265,021 | 265,021 | 278,437 |
| Total Contractor Indirect Cost | 0.0% | | 450,875 | 503,876 | 785,244 | 785,244 | 785,244 | 191,392 | 347,903 | 634,198 | 634,198 | 666,304 |
| EPC Costs | | | 2,335,006 | 2,609,488 | 4,066,649 | 4,066,649 | 4,066,649 | 991,186 | 1,801,730 | 3,284,404 | 3,284,404 | 3,450,677 |
| Client Indirects | | | | | | | | | | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 58,375 | 65,237 | 101,666 | 101,666 | 101,666 | 24,780 | 45,043 | 82,110 | 82,110 | 86,267 |
| PMC + PMT | 7.0% | % of EPC Costs | 163,450 | 182,664 | 284,665 | 284,665 | 284,665 | 69,383 | 126,121 | 229,908 | 229,908 | 241,547 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 23,350 | 26,095 | 40,666 | 40,666 | 40,666 | 9,912 | 18,017 | 32,844 | 32,844 | 34,507 |
| Total Client Indirect Cost | | | 245,176 | 273,996 | 426,998 | 426,998 | 426,998 | 104,075 | 189,182 | 344,862 | 344,862 | 362,321 |
| Base Estimate | | | 2,580,181 | 2,883,484 | 4,493,647 | 4,493,647 | 4,493,647 | 1,095,261 | 1,990,912 | 3,629,266 | 3,629,266 | 3,812,998 |
| Contingency | 10.0% | % of Base Estimate | 258,018 | 288,348 | 449,365 | 449,365 | 449,365 | 109,526 | 199,091 | 362,927 | 362,927 | 381,300 |
| Total Installed Cost | | USD | 2,838,200 | 3,171,833 | 4,943,012 | 4,943,012 | 4,943,012 | 1,204,787 | 2,190,003 | 3,992,193 | 3,992,193 | 4,194,298 |

GTG

| Option | Value | Unit | All Options |
|--|-------|--------------------|-------------|
| Location | | | MI |
| Parameter | | | - |
| Rating | | MW | 6 |
| Direct Cost | | | |
| Material Cost | | | 8,600,000 |
| Piping Bulks | 0.0% | % of material cost | - |
| Instrumentation Bulks | 0.0% | % of material cost | - |
| Electrical Bulks | 0.0% | % of material cost | - |
| Structural Bulks | 0.0% | % of material cost | - |
| Others | 10.0% | % of material cost | 860,000 |
| 2 years operational spares | 2.0% | % of material cost | 172,000 |
| | | | |
| Installation Cost | 30.0% | % of material cost | 2,580,000 |
| Construction Cost | 20.0% | % of material cost | 1,720,000 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 172,000 |
| Direct Cost | | | 14,104,000 |
| | | | |
| Contractor Indirects | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 1,410,400 |
| Freight Cost | 7.0% | % of Material Cost | 602,000 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 172,000 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 1,410,400 |
| Total Contractor Indirect Cost | 0.0% | | 3,594,800 |
| | | | |
| EPC Costs | | | 17,698,800 |
| | | | |
| Client Indirects | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 442,470 |
| PMC + PMT | 7.0% | % of EPC Costs | 1,238,916 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 176,988 |
| Total Client Indirect Cost | | | 1,858,374 |
| Base Estimate | | | 19,557,174 |
| Contingency | 10.0% | % of Base Estimate | 1,955,717 |
| Total Installed Cost | | USD | 21,512,891 |

Source: ASPEN CAPITAL COST ESTIMATOR

| | | |
|--|--------|---------|
| Capacity | MW | 6 |
| | kVA | 7.5 |
| Base equipment cost including bulks without indexation | USD | 7552100 |
| Cost index | 2019 | 185 |
| Cost index | 2022 | 209 |
| Equipment cost including bulks with indexation | USD | 8600000 |
| | USD/kW | 1.4 |

Chemical Injection Package

| Option | Value/Remarks | Unit | as applicable to Options |
|--|--|--------------------|--|
| Location | | | New CDP/ New CFP/ WHT-D / |
| Parameter | | | WHT-F |
| Size | | ft | Tank: 4.76D x 9.52L (required cap =3.7 m3) Pump: 22 LPH |
| Tank Material Cost | | | |
| Design Pressure | | psig | 50.75 |
| Diameter | | m | 1.5 |
| Length | | m | 2.9 |
| MOC | | - | SS |
| CA | | mm | 0.0 |
| Mechanical Calculations | | | |
| P design calc : | | psig | 50.75 |
| P design used : | | psig | 50.75 |
| Heads type : | (1=Elliptical, 2= Hemi, 3= Dished) | | 1 |
| Allowable stress : | psia from Table 1 | | 17,500 |
| Joint eff. | (between 0.6-1.0) | | 0.85 |
| Material Density : | (490 lb/ft3 for CS, 494 lb/ft3 for SS) | lb/ft ³ | 490 |
| Corrosion allow.: | (between 0.0625" and 0.125") | | 0.000 |
| Min Thickness : | | in | 0.000 |
| Plate Thickness Inc : | | in | 0.125 |
| t _s : | | in | 0.098 |
| t _h : | | in | 0.097 |
| t _{calc} : | | in | 0.125 |
| t _{use} : | inches to nearest 1/8" | in | 0.25 |
| | | mm | 6 |
| Results | | | |
| Shell Area A _s : | | ft ² | 142 |
| Head Area A _h : | | ft ² | 25 |
| Total Area A _t : | | ft ² | 192 |
| Vessel Weight W : | | lb | 1958 |
| | | Tons | 0.89 |
| Material Cost | | | 42,000 |
| Pump Material Cost | | | |
| Design Flow rate | | LPH | 22 |
| Design Flow rate | | BPD | 3.3 |
| Head | | ft | 1421 |
| MOC | | - | SS |
| Material Cost | | | 8,111 |
| Total Material Cost | | USD | 58,222 |
| Piping Bulks | 50.0% | % of material cost | 29,111 |
| Instrumentation Bulks | 40.0% | % of material cost | 23,289 |
| Electrical Bulks | 20.0% | % of material cost | 11,644 |
| Structural Bulks | 0.0% | % of material cost | - |
| Others | 10.0% | % of material cost | 5,822 |
| 2 years operational spares | 2.0% | % of material cost | 1,164 |
| Installation Cost | 30.0% | % of material cost | 17,467 |
| Construction Cost | 5.0% | % of material cost | 2,911 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 1,164 |
| Direct Cost | | | 150,796 |
| Contractor Indirects | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 15,080 |
| Freight Cost | 7.0% | % of Material Cost | 4,076 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 1,164 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 15,080 |
| Total Contractor Indirect Cost | 0.0% | | 35,399 |
| EPC Costs | | | 186,195 |
| Client Indirects | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 4,655 |
| PMC + PMT | 7.0% | % of EPC Costs | 13,034 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 1,862 |
| Total Client Indirect Cost | | | 19,550 |
| Base Estimate | | | 205,745 |
| Contingency | 10.0% | % of Base Estimate | 20,575 |
| Total Installed Cost | | USD | 226,320 |

Source: ASPEN CAPITAL COST ESTIMATOR

| Parameter | | |
|--|------|--------|
| Diameter | m | 1.5 |
| Length | m | 2.9 |
| MOC | | SS |
| Base equipment cost including bulks without indexation | USD | 37,400 |
| Cost index | 2019 | 180 |
| Cost index | 2022 | 200 |
| Equipment cost including bulks with indexation | USD | 42,000 |
| Parameter | | |
| Capacity | LPH | 22 |
| Head | m | 433.1 |
| MOC | | SS |
| Base equipment cost including bulks without indexation | USD | 7,300 |
| Cost index | 2019 | 180 |
| Cost index | 2022 | 200 |
| Equipment cost including bulks with indexation | USD | 8,111 |

Oil Pumps

| Parameter / Location | | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|--|-------|--------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | CDP | CDP | CDP | CDP | CDP | CFP | CFP | CFP | CFP | CFP |
| Flow rate | | BPD | 16,942 | 20,201 | 30,501 | 25,325 | 30,770 | 16,416 | 22,443 | 31,767 | 34,056 | 33,371 |
| Head | | ft | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| Head | | psi | 121.4 | 121.4 | 121.4 | 121.4 | 121.4 | 121.4 | 121.4 | 121.4 | 121.4 | 121.4 |
| MOC | | - | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS |
| Direct Cost | | | | | | | | | | | | |
| Material Cost | | | 62,022 | 68,927 | 88,259 | 78,940 | 88,725 | 60,860 | 73,420 | 90,439 | 94,294 | 93,151 |
| Piping Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Instrumentation Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Electrical Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Structural Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Others | 10.0% | % of material cost | 6,202 | 6,893 | 8,826 | 7,894 | 8,872 | 6,086 | 7,342 | 9,044 | 9,429 | 9,315 |
| 2 years operational spares | 2.0% | % of material cost | 1,240 | 1,379 | 1,765 | 1,579 | 1,774 | 1,217 | 1,468 | 1,809 | 1,886 | 1,863 |
| Installation Cost | 30.0% | % of material cost | 18,607 | 20,678 | 26,478 | 23,682 | 26,617 | 18,258 | 22,026 | 27,132 | 28,288 | 27,945 |
| Construction Cost | 20.0% | % of material cost | 12,404 | 13,785 | 17,652 | 15,788 | 17,745 | 12,172 | 14,684 | 18,088 | 18,859 | 18,630 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 1,240 | 1,379 | 1,765 | 1,579 | 1,774 | 1,217 | 1,468 | 1,809 | 1,886 | 1,863 |
| Direct Cost | | | 101,716 | 113,041 | 144,744 | 129,462 | 145,509 | 99,810 | 120,409 | 148,319 | 154,642 | 152,768 |
| Contractor Indirects | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 10,172 | 11,304 | 14,474 | 12,946 | 14,551 | 9,981 | 12,041 | 14,832 | 15,464 | 15,277 |
| Freight Cost | 7.0% | % of Material Cost | 4,342 | 4,825 | 6,178 | 5,526 | 6,211 | 4,260 | 5,139 | 6,331 | 6,601 | 6,521 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 1,240 | 1,379 | 1,765 | 1,579 | 1,774 | 1,217 | 1,468 | 1,809 | 1,886 | 1,863 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 10,172 | 11,304 | 14,474 | 12,946 | 14,551 | 9,981 | 12,041 | 14,832 | 15,464 | 15,277 |
| Total Contractor Indirect Cost | 0.0% | | 25,925 | 28,812 | 36,892 | 32,997 | 37,087 | 25,439 | 30,690 | 37,803 | 39,415 | 38,937 |
| EPC Costs | | | 127,642 | 141,853 | 181,636 | 162,459 | 182,595 | 125,249 | 151,099 | 186,123 | 194,057 | 191,706 |
| Client Indirects | | | | | | | | | | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 3,191 | 3,546 | 4,541 | 4,061 | 4,565 | 3,131 | 3,777 | 4,653 | 4,851 | 4,793 |
| PMC + PMT | 7.0% | % of EPC Costs | 8,935 | 9,930 | 12,715 | 11,372 | 12,782 | 8,767 | 10,577 | 13,029 | 13,584 | 13,419 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 1,276 | 1,419 | 1,816 | 1,625 | 1,826 | 1,252 | 1,511 | 1,861 | 1,941 | 1,917 |
| Total Client Indirect Cost | | | 13,402 | 14,895 | 19,072 | 17,058 | 19,173 | 13,151 | 15,865 | 19,543 | 20,376 | 20,129 |
| Base Estimate | | | 141,044 | 156,747 | 200,708 | 179,517 | 201,768 | 138,400 | 166,965 | 205,666 | 214,433 | 211,835 |
| Contingency | 10.0% | % of Base Estimate | 14,104 | 15,675 | 20,071 | 17,952 | 20,177 | 13,840 | 16,696 | 20,567 | 21,443 | 21,183 |
| Total Installed Cost | | USD | 155,148 | 172,422 | 220,779 | 197,469 | 221,945 | 152,240 | 183,661 | 226,232 | 235,876 | 233,018 |

Source: ASPEN CAPITAL COST ESTIMATOR

| | | Option 5 |
|--|------|-----------------------------|
| | | LTDP1 |
| Parameter | | CDP |
| Capacity | BPD | 16,942 |
| Head | ft | 350 |
| | m | 107 |
| MOC | | Casing: CS Impeller: DSS |
| Base equipment cost including bulks without indexation | USD | 54,900 |
| Cost index | 2019 | 185 |
| Cost index | 2022 | 209 |
| Equipment cost including bulks with indexation | USD | 62,022 |

Closed Drain Drum

| Parameter / Location | | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 6 | Option 6 | Option 6a | Option 6a |
|--|--|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | S2-5-1 | S2-5-1 | S2-5-1 | S2-5-1 |
| | | | CDP | CDP | CDP | CDP | CDP | CFP | CFP | CFP | CFP | CFP | CDP | CFP | CDP | CFP |
| Diameter | | m | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.0 | 1.0 | 1.0 | 1.0 |
| Height | | m | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 2.5 | 2.5 | 2.5 | 2.5 |
| Gross volume selected | | m3 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 2.0 | 2.0 | 2.0 | 2.0 |
| MOC | | - | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA | CS + 3mm CRA |
| CA | | mm | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Mechanical Calculations | | | | | | | | | | | | | | | | |
| P design calc : | | psig | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 |
| P design used : | | psig | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 | 101.5 |
| Heads type : | (1=Elliptical, 2= Hemi, 3= Dished) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Allowable stress : | psia from Table 1 | | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 |
| Joint eff. | (between 0.6-1.0) | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Material Density : | (490 lb/ft3 for CS, 494 lb/ft3 for SS) | lb/ft ³ | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 |
| Corrosion allow.: | (between 0.0625" and 0.125") | | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Min Thickness : | | in | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 |
| Plate Thickness Inc : | | in | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 |
| t _s : | | in | 0.320 | 0.320 | 0.320 | 0.320 | 0.320 | 0.341 | 0.341 | 0.341 | 0.341 | 0.341 | 0.253 | 0.253 | 0.253 | 0.253 |
| t _n : | | in | 0.438 | 0.438 | 0.438 | 0.438 | 0.438 | 0.458 | 0.458 | 0.458 | 0.458 | 0.458 | 0.371 | 0.371 | 0.371 | 0.371 |
| t _{calc} : | | in | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.375 | 0.375 | 0.375 | 0.375 |
| t _{use} : | inches to nearest 1/8" | in | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.5 | 0.5 | 0.5 | 0.5 |
| | | mm | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 13 | 13 | 13 | 13 |
| Results | | | | | | | | | | | | | | | | |
| Shell Area A _s : | | ft ² | 190 | 190 | 190 | 190 | 190 | 230 | 230 | 230 | 230 | 230 | 85 | 85 | 85 | 85 |
| Head Area A _h : | | ft ² | 26 | 26 | 26 | 26 | 26 | 32 | 32 | 32 | 32 | 32 | 12 | 12 | 12 | 12 |
| Total Area A _t : | | ft ² | 243 | 243 | 243 | 243 | 243 | 294 | 294 | 294 | 294 | 294 | 108 | 108 | 108 | 108 |
| Vessel Weight W : | | lb | 6202 | 6202 | 6202 | 6202 | 6202 | 7504 | 7504 | 7504 | 7504 | 7504 | 2205 | 2205 | 2205 | 2205 |
| | | Tons | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 |
| Cost/Ton | | USD/Ton | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 | 24,445 |
| Direct Cost | | | | | | | | | | | | | | | | |
| Material Cost | | | 68,911 | 68,911 | 68,911 | 68,911 | 68,911 | 83,382 | 83,382 | 83,382 | 83,382 | 83,382 | 24,502 | 24,502 | 24,502 | 24,502 |
| Piping Bults | 50.0% | % of material cost | 34,455 | 34,455 | 34,455 | 34,455 | 34,455 | 41,691 | 41,691 | 41,691 | 41,691 | 41,691 | 12,251 | 12,251 | 12,251 | 12,251 |
| Instrumentation Bults | 40.0% | % of material cost | 27,564 | 27,564 | 27,564 | 27,564 | 27,564 | 33,353 | 33,353 | 33,353 | 33,353 | 33,353 | 9,801 | 9,801 | 9,801 | 9,801 |
| Electrical Bults | 20.0% | % of material cost | 13,782 | 13,782 | 13,782 | 13,782 | 13,782 | 16,676 | 16,676 | 16,676 | 16,676 | 16,676 | 4,900 | 4,900 | 4,900 | 4,900 |
| Structural Bults | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Others | 10.0% | % of material cost | 6,891 | 6,891 | 6,891 | 6,891 | 6,891 | 8,338 | 8,338 | 8,338 | 8,338 | 8,338 | 2,450 | 2,450 | 2,450 | 2,450 |
| 2 years operational spares | 2.0% | % of material cost | 1,378 | 1,378 | 1,378 | 1,378 | 1,378 | 1,668 | 1,668 | 1,668 | 1,668 | 1,668 | 490 | 490 | 490 | 490 |
| Installation Cost | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Construction Cost | 5.0% | % of material cost | 3,446 | 3,446 | 3,446 | 3,446 | 3,446 | 4,169 | 4,169 | 4,169 | 4,169 | 4,169 | 1,225 | 1,225 | 1,225 | 1,225 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 1,378 | 1,378 | 1,378 | 1,378 | 1,378 | 1,668 | 1,668 | 1,668 | 1,668 | 1,668 | 490 | 490 | 490 | 490 |
| Direct Cost | | | 157,806 | 157,806 | 157,806 | 157,806 | 157,806 | 190,945 | 190,945 | 190,945 | 190,945 | 190,945 | 56,109 | 56,109 | 56,109 | 56,109 |
| Contractor Indirects | | | | | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 15,781 | 15,781 | 15,781 | 15,781 | 15,781 | 19,095 | 19,095 | 19,095 | 19,095 | 19,095 | 5,611 | 5,611 | 5,611 | 5,611 |
| Freight Cost | 7.0% | % of Material Cost | 4,824 | 4,824 | 4,824 | 4,824 | 4,824 | 5,837 | 5,837 | 5,837 | 5,837 | 5,837 | 1,715 | 1,715 | 1,715 | 1,715 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 1,378 | 1,378 | 1,378 | 1,378 | 1,378 | 1,668 | 1,668 | 1,668 | 1,668 | 1,668 | 490 | 490 | 490 | 490 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 15,781 | 15,781 | 15,781 | 15,781 | 15,781 | 19,095 | 19,095 | 19,095 | 19,095 | 19,095 | 5,611 | 5,611 | 5,611 | 5,611 |
| Total Contractor Indirect Cost | 0.0% | | 37,763 | 37,763 | 37,763 | 37,763 | 37,763 | 45,693 | 45,693 | 45,693 | 45,693 | 45,693 | 13,427 | 13,427 | 13,427 | 13,427 |
| EPC Costs | | | | | | | | | | | | | | | | |
| | | | 195,569 | 195,569 | 195,569 | 195,569 | 195,569 | 236,639 | 236,639 | 236,639 | 236,639 | 236,639 | 69,536 | 69,536 | 69,536 | 69,536 |
| Client Indirects | | | | | | | | | | | | | | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 4,889 | 4,889 | 4,889 | 4,889 | 4,889 | 5,916 | 5,916 | 5,916 | 5,916 | 5,916 | 1,738 | 1,738 | 1,738 | 1,738 |
| PMC + PMT | 7.0% | % of EPC Costs | 13,690 | 13,690 | 13,690 | 13,690 | 13,690 | 16,565 | 16,565 | 16,565 | 16,565 | 16,565 | 4,868 | 4,868 | 4,868 | 4,868 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 1,956 | 1,956 | 1,956 | 1,956 | 1,956 | 2,366 | 2,366 | 2,366 | 2,366 | 2,366 | 695 | 695 | 695 | 695 |
| Total Client Indirect Cost | | | 20,535 | 20,535 | 20,535 | 20,535 | 20,535 | 24,847 | 24,847 | 24,847 | 24,847 | 24,847 | 7,301 | 7,301 | 7,301 | 7,301 |
| Base Estimate | | | 216,104 | 216,104 | 216,104 | 216,104 | 216,104 | 261,486 | 261,486 | 261,486 | 261,486 | 261,486 | 76,837 | 76,837 | 76,837 | 76,837 |
| Contingency | 10.0% | % of Base Estimate | 21,610 | 21,610 | 21,610 | 21,610 | 21,610 | 26,149 | 26,149 | 26,149 | 26,149 | 26,149 | 7,684 | 7,684 | 7,684 | 7,684 |
| Total Installed Cost | | USD | 237,714 | 237,714 | 237,714 | 237,714 | 237,714 | 287,634 | 287,634 | 287,634 | 287,634 | 287,634 | 84,521 | 84,521 | 84,521 | 84,521 |

Closed Drain pumps

| Parameter / Location | | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 6 | Option 6 | Option 6a | Option 6a |
|--|-------|--------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | S2-5-1 | S2-5-1 | S2-5-1 | S2-5-1 |
| | | | CDP | CDP | CDP | CDP | CDP | CFP | CFP | CFP | CFP | CFP | CDP | CFP | CDP | CFP |
| Design Flow rate | | BPD | 755 | 755 | 755 | 755 | 755 | 755 | 755 | 755 | 755 | 755 | 151 | 151 | 151 | 151 |
| Head | | ft | 810 | 810 | 810 | 810 | 810 | 810 | 810 | 810 | 810 | 810 | 810 | 810 | 810 | 810 |
| MOC | | - | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS | Casing: CS Impeller: DSS |
| Direct Cost | | | | | | | | | | | | | | | | |
| Material Cost | | | 13,236 | 13,236 | 13,236 | 13,236 | 13,236 | 13,236 | 13,236 | 13,236 | 13,236 | 13,236 | 5,041 | 5,041 | 5,041 | 5,041 |
| Piping Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Instrumentation Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Electrical Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Structural Bulks | 0.0% | % of material cost | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Others | 10.0% | % of material cost | 1,324 | 1,324 | 1,324 | 1,324 | 1,324 | 1,324 | 1,324 | 1,324 | 1,324 | 1,324 | 504 | 504 | 504 | 504 |
| 2 years operational spares | 2.0% | % of material cost | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 101 | 101 | 101 | 101 |
| Installation Cost | 30.0% | % of material cost | 3,971 | 3,971 | 3,971 | 3,971 | 3,971 | 3,971 | 3,971 | 3,971 | 3,971 | 3,971 | 1,512 | 1,512 | 1,512 | 1,512 |
| Construction Cost | 20.0% | % of material cost | 2,647 | 2,647 | 2,647 | 2,647 | 2,647 | 2,647 | 2,647 | 2,647 | 2,647 | 2,647 | 1,008 | 1,008 | 1,008 | 1,008 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 101 | 101 | 101 | 101 |
| Direct Cost | | | 21,708 | 21,708 | 21,708 | 21,708 | 21,708 | 21,708 | 21,708 | 21,708 | 21,708 | 21,708 | 8,267 | 8,267 | 8,267 | 8,267 |
| Contractor Indirects | | | | | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 827 | 827 | 827 | 827 |
| Freight Cost | 7.0% | % of Material Cost | 927 | 927 | 927 | 927 | 927 | 927 | 927 | 927 | 927 | 927 | 353 | 353 | 353 | 353 |
| TPiA / Vendor Representative Cost | 2.0% | % of Material Cost | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 101 | 101 | 101 | 101 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 2,171 | 827 | 827 | 827 | 827 |
| Total Contractor Indirect Cost | 0.0% | | 5,533 | 5,533 | 5,533 | 5,533 | 5,533 | 5,533 | 5,533 | 5,533 | 5,533 | 5,533 | 2,107 | 2,107 | 2,107 | 2,107 |
| EPC Costs | | | 27,241 | 27,241 | 27,241 | 27,241 | 27,241 | 27,241 | 27,241 | 27,241 | 27,241 | 27,241 | 10,374 | 10,374 | 10,374 | 10,374 |
| Client Indirects | | | | | | | | | | | | | | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 681 | 681 | 681 | 681 | 681 | 681 | 681 | 681 | 681 | 681 | 259 | 259 | 259 | 259 |
| PMC + PMT | 7.0% | % of EPC Costs | 1,907 | 1,907 | 1,907 | 1,907 | 1,907 | 1,907 | 1,907 | 1,907 | 1,907 | 1,907 | 726 | 726 | 726 | 726 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 104 | 104 | 104 | 104 |
| Total Client Indirect Cost | | | 2,860 | 2,860 | 2,860 | 2,860 | 2,860 | 2,860 | 2,860 | 2,860 | 2,860 | 2,860 | 1,089 | 1,089 | 1,089 | 1,089 |
| Base Estimate | | | 30,101 | 30,101 | 30,101 | 30,101 | 30,101 | 30,101 | 30,101 | 30,101 | 30,101 | 30,101 | 11,463 | 11,463 | 11,463 | 11,463 |
| Contingency | 10.0% | % of Base Estimate | 3,010 | 3,010 | 3,010 | 3,010 | 3,010 | 3,010 | 3,010 | 3,010 | 3,010 | 3,010 | 1,146 | 1,146 | 1,146 | 1,146 |
| Total Installed Cost | | USD | 33,111 | 33,111 | 33,111 | 33,111 | 33,111 | 33,111 | 33,111 | 33,111 | 33,111 | 33,111 | 12,609 | 12,609 | 12,609 | 12,609 |

| | | | Option 5 |
|--|------|--|----------|
| Source: ASPEN CAPITAL COST ESTIMATOR | | | LTDP1 |
| Parameter | | | CDP |
| Capacity | BPD | | 755 |
| Head | ft | | 810 |
| | m | | 247 |
| Base equipment cost including bulks without indexation | USD | | 23,100 |
| Cost index | 2019 | | 185 |
| Cost index | 2022 | | 209 |
| Equipment cost including bulks with indexation | USD | | 27,000 |

Pig Traps

| Parameter / Location | | Unit | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 | Option 5 |
|--|--|--------------------|----------|----------|---|---|---|----------|----------|--|--|--|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | New CDP | New CDP | New CDP | New CDP | New CDP | New CFP | New CFP | New CFP | New CFP | New CFP |
| Design Flow rate | | BPD | - | - | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | - | - | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft |
| Design Pressure | | psig | | | 250 | 250 | 250 | | | 250 | 250 | 250 |
| Diameter | | m | | | 0.4 | 0.4 | 0.4 | | | 0.4 | 0.4 | 0.4 |
| Length | | m | | | 6.4 | 6.4 | 6.4 | | | 9.8 | 9.8 | 9.8 |
| MOC | | - | | | CS | CS | CS | | | CS | CS | CS |
| CA | | mm | | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Mechanical Calculations | | | | | | | | | | | | |
| P design calc : | | psig | 0 | 0 | 250 | 250 | 250 | 0 | 0 | 250 | 250 | 250 |
| P design used : | | psig | 0 | 0 | 250 | 250 | 250 | 0 | 0 | 250 | 250 | 250 |
| Heads type : | (1=Elliptical, 2= Hemi, 3= Dished) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Allowable stress : | psia from Table 1 | | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 |
| Joint eff. | (between 0.6-1.0) | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Material Density : | (490 lb/ft3 for CS, 494 lb/ft3 for SS) | lb/ft ³ | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 |
| Corrosion allow.: | (between 0.0625" and 0.125") | | 0.000 | 0.000 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Min Thickness : | | in | 0.000 | 0.000 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Plate Thickness Inc : | | in | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 |
| t _s : | | in | 0.000 | 0.000 | 0.254 | 0.254 | 0.254 | 0.118 | 0.118 | 0.254 | 0.254 | 0.254 |
| t _h : | | in | 0.000 | 0.000 | 0.371 | 0.371 | 0.371 | 0.236 | 0.236 | 0.371 | 0.371 | 0.371 |
| t _{calc} : | | in | 0 | 0 | 0.375 | 0.375 | 0.375 | 0.25 | 0.25 | 0.375 | 0.375 | 0.375 |
| t _{use} : | inches to nearest 1/8" | in | 0.125 | 0.125 | 0.5 | 0.5 | 0.5 | 0.375 | 0.375 | 0.5 | 0.5 | 0.5 |
| | | mm | 3 | 3 | 13 | 13 | 13 | 10 | 10 | 13 | 13 | 13 |
| Results | | | | | | | | | | | | |
| Shell Area A _s : | | ft ² | 0 | 0 | 88 | 88 | 88 | 0 | 0 | 134 | 134 | 134 |
| Head Area A _h : | | ft ² | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 2 |
| Total Area A _t : | | ft ² | 0 | 0 | 92 | 92 | 92 | 0 | 0 | 138 | 138 | 138 |
| Vessel Weight W : | | lb | 0 | 0 | 1875 | 1875 | 1875 | 0 | 0 | 2816 | 2816 | 2816 |
| | | Tons | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| Cost/Ton | | USD/Ton | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 |
| Direct Cost | | | | | | | | | | | | |
| Material Cost | | | - | - | 10,418 | 10,418 | 10,418 | - | - | 15,644 | 15,644 | 15,644 |
| Piping Bulks | 50% | % of material cost | - | - | 5,209 | 5,209 | 5,209 | - | - | 7,822 | 7,822 | 7,822 |
| Instrumentation Bulks | 40% | % of material cost | - | - | 4,167 | 4,167 | 4,167 | - | - | 6,258 | 6,258 | 6,258 |
| Electrical Bulks | 20% | % of material cost | - | - | 2,084 | 2,084 | 2,084 | - | - | 3,129 | 3,129 | 3,129 |
| Structural Bulks | 0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Others | 10% | % of material cost | - | - | 1,042 | 1,042 | 1,042 | - | - | 1,564 | 1,564 | 1,564 |
| 2 years operational spares | 2% | % of material cost | - | - | 208 | 208 | 208 | - | - | 313 | 313 | 313 |
| Installation Cost | 30% | % of material cost | - | - | 3,125 | 3,125 | 3,125 | - | - | 4,693 | 4,693 | 4,693 |
| Construction Cost | 5% | % of material cost | - | - | 521 | 521 | 521 | - | - | 782 | 782 | 782 |
| Commissioning Assistance Cost | 2% | % of material cost | - | - | 208 | 208 | 208 | - | - | 313 | 313 | 313 |
| Direct Cost | | | - | - | 26,982 | 26,982 | 26,982 | - | - | 40,519 | 40,519 | 40,519 |
| Contractor Indirects | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10% | % of Direct Cost | - | - | 2,698 | 2,698 | 2,698 | - | - | 4,052 | 4,052 | 4,052 |
| Freight Cost | 7% | % of Material Cost | - | - | 729 | 729 | 729 | - | - | 1,095 | 1,095 | 1,095 |
| TPIA / Vendor Representative Cost | 2% | % of Material Cost | - | - | 208 | 208 | 208 | - | - | 313 | 313 | 313 |
| Construction Supervision & Project Management | 10% | % of Direct Cost | - | - | 2,698 | 2,698 | 2,698 | - | - | 4,052 | 4,052 | 4,052 |
| Total Contractor Indirect Cost | 0% | | - | - | 6,334 | 6,334 | 6,334 | - | - | 9,512 | 9,512 | 9,512 |
| EPC Costs | | | | | | | | | | | | |
| | | | - | - | 33,316 | 33,316 | 33,316 | - | - | 50,031 | 50,031 | 50,031 |
| Client Indirects | | | | | | | | | | | | |
| Studies + FEED | 3% | % of EPC Costs | - | - | 833 | 833 | 833 | - | - | 1,251 | 1,251 | 1,251 |
| PMC + PMT | 7% | % of EPC Costs | - | - | 2,332 | 2,332 | 2,332 | - | - | 3,502 | 3,502 | 3,502 |
| Project Insurance & Other Overheads | 1% | % of EPC Costs | - | - | 333 | 333 | 333 | - | - | 500 | 500 | 500 |
| Total Client Indirect Cost | | | - | - | 3,498 | 3,498 | 3,498 | - | - | 5,253 | 5,253 | 5,253 |
| Base Estimate | | | - | - | 36,814 | 36,814 | 36,814 | - | - | 55,284 | 55,284 | 55,284 |
| Contingency | 10% | % of Base Estimate | - | - | 3,681 | 3,681 | 3,681 | - | - | 5,528 | 5,528 | 5,528 |
| Total Installed Cost | | USD | - | - | 40,495 | 40,495 | 40,495 | - | - | 60,812 | 60,812 | 60,812 |

Pig Traps

| Parameter / Location | | Unit | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a |
|--|--|--------------------|---|---|---|---|---|---|---|---|---|---|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | MI | MI | MI | MI | MI | MI | MI | MI | MI | MI |
| Design Flow rate | | BPD | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19.5 ft x 19.5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19.5 ft x 19.5 ft | Major Barrel Dia: 36 in Major x Minor Barrel Length: 21.5 ft x 21.5 ft | Major Barrel Dia: 36 in Major x Minor Barrel Length: 21.5 ft x 21.5 ft | Major Barrel Dia: 36 in Major x Minor Barrel Length: 17.5 ft x 21.5 ft | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 17 ft | Major Barrel Dia: 24 in Major x Minor Barrel Length: 17 ft x 17 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 19 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 19 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 19 ft |
| Design Pressure | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Diameter | | m | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 0.5 | 0.6 | 0.8 | 0.8 | 0.8 |
| Length | | m | 11.9 | 11.9 | 13.1 | 13.1 | 10.7 | 10.4 | 10.4 | 11.6 | 11.6 | 11.6 |
| MOC | | - | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| CA | | mm | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Mechanical Calculations | | | | | | | | | | | | |
| P design calc : | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| P design used : | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Heads type : | (1=Elliptical, 2= Hemi, 3= Dished) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Allowable stress : | psia from Table 1 | | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 |
| Joint eff. | (between 0.6-1.0) | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Material Density : | (490 lb/ft3 for CS, 494 lb/ft3 for SS) | lb/ft³ | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 |
| Corrosion allow.: | (between 0.0625" and 0.125") | | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Min Thickness : | | in | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Plate Thickness Inc : | | in | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 |
| t _s : | | in | 0.390 | 0.390 | 0.424 | 0.424 | 0.424 | 0.271 | 0.322 | 0.390 | 0.390 | 0.390 |
| t _h : | | in | 0.506 | 0.506 | 0.539 | 0.539 | 0.539 | 0.388 | 0.438 | 0.506 | 0.506 | 0.506 |
| t _{calc} : | | in | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.5 | 0.5 | 0.625 | 0.625 | 0.625 |
| t _{use} : | inches to nearest 1/8" | in | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.625 | 0.625 | 0.75 | 0.75 | 0.75 |
| | | mm | 19 | 19 | 19 | 19 | 19 | 16 | 16 | 19 | 19 | 19 |
| Results | | | | | | | | | | | | |
| Shell Area A _s : | | ft² | 327 | 327 | 405 | 405 | 330 | 160 | 214 | 318 | 318 | 318 |
| Head Area A _h : | | ft² | 8 | 8 | 10 | 10 | 10 | 2 | 4 | 8 | 8 | 8 |
| Total Area A _t : | | ft² | 342 | 342 | 425 | 425 | 349 | 165 | 222 | 334 | 334 | 334 |
| Vessel Weight W : | | lb | 10481 | 10481 | 13012 | 13012 | 10703 | 4214 | 5675 | 10224 | 10224 | 10224 |
| | | Tons | 5 | 5 | 6 | 6 | 5 | 2 | 3 | 5 | 5 | 5 |
| Cost/Ton | | USD/Ton | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 |
| Direct Cost | | | | | | | | | | | | |
| Material Cost | | | 58,230 | 58,230 | 72,294 | 72,294 | 59,465 | 23,413 | 31,527 | 56,805 | 56,805 | 56,805 |
| Piping Bults | 50% | % of material cost | 29,115 | 29,115 | 36,147 | 36,147 | 29,733 | 11,707 | 15,764 | 28,402 | 28,402 | 28,402 |
| Instrumentation Bults | 40% | % of material cost | 23,292 | 23,292 | 28,918 | 28,918 | 23,786 | 9,365 | 12,611 | 22,722 | 22,722 | 22,722 |
| Electrical Bults | 20% | % of material cost | 11,646 | 11,646 | 14,459 | 14,459 | 11,893 | 4,683 | 6,305 | 11,361 | 11,361 | 11,361 |
| Structural Bults | 0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Others | 10% | % of material cost | 5,823 | 5,823 | 7,229 | 7,229 | 5,947 | 2,341 | 3,153 | 5,680 | 5,680 | 5,680 |
| 2 years operational spares | 2% | % of material cost | 1,165 | 1,165 | 1,446 | 1,446 | 1,189 | 468 | 631 | 1,136 | 1,136 | 1,136 |
| Installation Cost | 30% | % of material cost | 17,469 | 17,469 | 21,688 | 21,688 | 17,840 | 7,024 | 9,458 | 17,041 | 17,041 | 17,041 |
| Construction Cost | 5% | % of material cost | 2,911 | 2,911 | 3,615 | 3,615 | 2,973 | 1,171 | 1,576 | 2,840 | 2,840 | 2,840 |
| Commissioning Assistance Cost | 2% | % of material cost | 1,165 | 1,165 | 1,446 | 1,446 | 1,189 | 468 | 631 | 1,136 | 1,136 | 1,136 |
| Direct Cost | | | 150,816 | 150,816 | 187,242 | 187,242 | 154,015 | 60,641 | 81,655 | 147,124 | 147,124 | 147,124 |
| Contractor Indirects | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10% | % of Direct Cost | 15,082 | 15,082 | 18,724 | 18,724 | 15,401 | 6,064 | 8,166 | 14,712 | 14,712 | 14,712 |
| Freight Cost | 7% | % of Material Cost | 4,076 | 4,076 | 5,061 | 5,061 | 4,163 | 1,639 | 2,207 | 3,976 | 3,976 | 3,976 |
| TPIA / Vendor Representative Cost | 2% | % of Material Cost | 1,165 | 1,165 | 1,446 | 1,446 | 1,189 | 468 | 631 | 1,136 | 1,136 | 1,136 |
| Construction Supervision & Project Management | 10% | % of Direct Cost | 15,082 | 15,082 | 18,724 | 18,724 | 15,401 | 6,064 | 8,166 | 14,712 | 14,712 | 14,712 |
| Total Contractor Indirect Cost | 0% | | 35,404 | 35,404 | 43,955 | 43,955 | 36,155 | 14,235 | 19,168 | 34,537 | 34,537 | 34,537 |
| EPC Costs | | | | | | | | | | | | |
| | | | 186,219 | 186,219 | 231,197 | 231,197 | 190,170 | 74,876 | 100,824 | 181,661 | 181,661 | 181,661 |
| Client Indirects | | | | | | | | | | | | |
| Studies + FEED | 3% | % of EPC Costs | 4,655 | 4,655 | 5,780 | 5,780 | 4,754 | 1,872 | 2,521 | 4,542 | 4,542 | 4,542 |
| PMC + PMT | 7% | % of EPC Costs | 13,035 | 13,035 | 16,184 | 16,184 | 13,312 | 5,241 | 7,058 | 12,716 | 12,716 | 12,716 |
| Project Insurance & Other Overheads | 1% | % of EPC Costs | 1,862 | 1,862 | 2,312 | 2,312 | 1,902 | 749 | 1,008 | 1,817 | 1,817 | 1,817 |
| Total Client Indirect Cost | | | 19,553 | 19,553 | 24,276 | 24,276 | 19,968 | 7,862 | 10,586 | 19,074 | 19,074 | 19,074 |
| Base Estimate | | | 205,772 | 205,772 | 255,472 | 255,472 | 210,137 | 82,738 | 111,410 | 200,735 | 200,735 | 200,735 |
| Contingency | 10% | % of Base Estimate | 20,577 | 20,577 | 25,547 | 25,547 | 21,014 | 8,274 | 11,141 | 20,074 | 20,074 | 20,074 |
| Total Installed Cost | | USD | 226,350 | 226,350 | 281,020 | 281,020 | 231,151 | 91,012 | 122,551 | 220,809 | 220,809 | 220,809 |

Pig Traps

| Parameter / Location | | Unit | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a |
|--|--|--------------------|--|--|--|--|--|--|--|--|--|--|
| | | | LTOP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | CDP | CDP | CDP | CDP | CDP | CDP | CDP | CDP | CDP | CDP |
| Design Flow rate | | BPD | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 5 ft | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 5 ft | Major Barrel Dia: 24 in Major x Minor Barrel Length: 17 ft x 5 ft | Major Barrel Dia: 20 in Major x Minor Barrel Length: 17 ft x 5 ft | Major Barrel Dia: 24 in Major x Minor Barrel Length: 18.5 ft x 5 ft | Major Barrel Dia: 16 in Major x Minor Barrel Length: 14 ft x 5 ft | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 5 ft | Major Barrel Dia: 20 in Major x Minor Barrel Length: 17 ft x 5 ft | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 5 ft | Major Barrel Dia: 20 in Major x Minor Barrel Length: 17 ft x 5 ft |
| Design Pressure | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Diameter | | m | 0.5 | 0.5 | 0.6 | 0.5 | 0.6 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 |
| Length | | m | 6.7 | 6.7 | 6.7 | 6.7 | 7.2 | 5.8 | 6.4 | 6.7 | 6.7 | 6.7 |
| MOC | | - | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| CA | | mm | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Mechanical Calculations | | | | | | | | | | | | |
| P design calc : | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| P design used : | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Heads type : | (1=Elliptical, 2= Hemi, 3= Dished) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Allowable stress : | psia from Table 1 | | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 |
| Joint eff. | (between 0.6-1.0) | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Material Density : | (490 lb/ft3 for CS, 494 lb/ft3 for SS) | lb/ft ³ | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 |
| Corrosion allow.: | (between 0.0625" and 0.125") | | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Min Thickness : | | in | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Plate Thickness Inc : | | in | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 |
| t _s : | | in | 0.271 | 0.271 | 0.322 | 0.288 | 0.322 | 0.254 | 0.254 | 0.288 | 0.271 | 0.288 |
| t _h : | | in | 0.388 | 0.388 | 0.438 | 0.405 | 0.438 | 0.371 | 0.371 | 0.405 | 0.388 | 0.405 |
| t _{calc} : | | in | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.375 | 0.375 | 0.5 | 0.5 | 0.5 |
| t _{use} : | inches to nearest 1/8" | in | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.5 | 0.5 | 0.625 | 0.625 | 0.625 |
| | | mm | 16 | 16 | 16 | 16 | 16 | 13 | 13 | 16 | 16 | 16 |
| Results | | | | | | | | | | | | |
| Shell Area A _s : | | ft ² | 104 | 104 | 138 | 115 | 148 | 80 | 88 | 115 | 104 | 115 |
| Head Area A _h : | | ft ² | 2 | 2 | 4 | 3 | 4 | 2 | 2 | 3 | 2 | 3 |
| Total Area A _t : | | ft ² | 109 | 109 | 147 | 121 | 156 | 83 | 92 | 121 | 109 | 121 |
| Vessel Weight W : | | lb | 2771 | 2771 | 3750 | 3094 | 3991 | 1704 | 1875 | 3094 | 2771 | 3094 |
| | | Tons | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| Cost/Ton | | USD/Ton | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 |
| Direct Cost | | | | | | | | | | | | |
| Material Cost | | | 15,395 | 15,395 | 20,836 | 17,192 | 22,173 | 9,467 | 10,418 | 17,192 | 15,395 | 17,192 |
| Piping Bults | 50% | % of material cost | 7,698 | 7,698 | 10,418 | 8,596 | 11,086 | 4,734 | 5,209 | 8,596 | 7,698 | 8,596 |
| Instrumentation Bults | 40% | % of material cost | 6,158 | 6,158 | 8,335 | 6,877 | 8,869 | 3,787 | 4,167 | 6,877 | 6,158 | 6,877 |
| Electrical Bults | 20% | % of material cost | 3,079 | 3,079 | 4,167 | 3,438 | 4,435 | 1,893 | 2,084 | 3,438 | 3,079 | 3,438 |
| Structural Bults | 0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Others | 10% | % of material cost | 1,540 | 1,540 | 2,084 | 1,719 | 2,217 | 947 | 1,042 | 1,719 | 1,540 | 1,719 |
| 2 years operational spares | 2% | % of material cost | 308 | 308 | 417 | 344 | 443 | 189 | 208 | 344 | 308 | 344 |
| Installation Cost | 30% | % of material cost | 4,619 | 4,619 | 6,251 | 5,158 | 6,652 | 2,840 | 3,125 | 5,158 | 4,619 | 5,158 |
| Construction Cost | 5% | % of material cost | 770 | 770 | 1,042 | 860 | 1,109 | 473 | 521 | 860 | 770 | 860 |
| Commissioning Assistance Cost | 2% | % of material cost | 308 | 308 | 417 | 344 | 443 | 189 | 208 | 344 | 308 | 344 |
| Direct Cost | | | 39,874 | 39,874 | 53,966 | 44,527 | 57,427 | 24,521 | 26,982 | 44,527 | 39,874 | 44,527 |
| Contractor Indirects | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10% | % of Direct Cost | 3,987 | 3,987 | 5,397 | 4,453 | 5,743 | 2,452 | 2,698 | 4,453 | 3,987 | 4,453 |
| Freight Cost | 7% | % of Material Cost | 1,078 | 1,078 | 1,459 | 1,203 | 1,552 | 663 | 729 | 1,203 | 1,078 | 1,203 |
| TPIA / Vendor Representative Cost | 2% | % of Material Cost | 308 | 308 | 417 | 344 | 443 | 189 | 208 | 344 | 308 | 344 |
| Construction Supervision & Project Management | 10% | % of Direct Cost | 3,987 | 3,987 | 5,397 | 4,453 | 5,743 | 2,452 | 2,698 | 4,453 | 3,987 | 4,453 |
| Total Contractor Indirect Cost | 0% | | 9,360 | 9,360 | 12,668 | 10,453 | 13,481 | 5,756 | 6,334 | 10,453 | 9,360 | 10,453 |
| EPC Costs | | | | | | | | | | | | |
| | | | 49,234 | 49,234 | 66,634 | 54,979 | 70,908 | 30,277 | 33,316 | 54,979 | 49,234 | 54,979 |
| Client Indirects | | | | | | | | | | | | |
| Studies + FEED | 3% | % of EPC Costs | 1,231 | 1,231 | 1,666 | 1,374 | 1,773 | 757 | 833 | 1,374 | 1,231 | 1,374 |
| PMC + PMT | 7% | % of EPC Costs | 3,446 | 3,446 | 4,664 | 3,849 | 4,964 | 2,119 | 2,332 | 3,849 | 3,446 | 3,849 |
| Project Insurance & Other Overheads | 1% | % of EPC Costs | 492 | 492 | 666 | 550 | 709 | 303 | 333 | 550 | 492 | 550 |
| Total Client Indirect Cost | | | 5,170 | 5,170 | 6,997 | 5,773 | 7,445 | 3,179 | 3,498 | 5,773 | 5,170 | 5,773 |
| Base Estimate | | | 54,404 | 54,404 | 73,631 | 60,752 | 78,353 | 33,456 | 36,814 | 60,752 | 54,404 | 60,752 |
| Contingency | 10% | % of Base Estimate | 5,440 | 5,440 | 7,363 | 6,075 | 7,835 | 3,346 | 3,681 | 6,075 | 5,440 | 6,075 |
| Total Installed Cost | | USD | 59,844 | 59,844 | 80,994 | 66,828 | 86,189 | 36,801 | 40,495 | 66,828 | 59,844 | 66,828 |

Pig Traps

| Parameter / Location | | Unit | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a |
|--|--|--------------------|---|---|---|---|---|---|---|---|---|---|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | CFP | CFP | CFP | CFP | CFP | CFP | CFP | CFP | CFP | CFP |
| Design Flow rate | | BPD | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 17 ft | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 17 ft | Major Barrel Dia: 24 in Major x Minor Barrel Length: 17 ft x 17 ft | Major Barrel Dia: 20 in Major x Minor Barrel Length: 17 ft x 17 ft | Major Barrel Dia: 24 in Major x Minor Barrel Length: 17 ft x 17 ft | Major Barrel Dia: 16 in Major x Minor Barrel Length: 14 ft x 14 ft | Major Barrel Dia: 16 in Major x Minor Barrel Length: 16 ft x 16 ft | Major Barrel Dia: 20 in Major x Minor Barrel Length: 17 ft x 17 ft | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 17 ft | Major Barrel Dia: 20 in Major x Minor Barrel Length: 17 ft x 17 ft |
| Design Pressure | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Diameter | | m | 0.5 | 0.5 | 0.6 | 0.5 | 0.6 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 |
| Length | | m | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 8.5 | 9.8 | 10.4 | 10.4 | 10.4 |
| MOC | | - | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| CA | | mm | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Mechanical Calculations | | | | | | | | | | | | |
| P design calc : | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| P design used : | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Heads type : | (1=Elliptical, 2= Hemi, 3= Dished) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Allowable stress : | psia from Table 1 | | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 |
| Joint eff. | (between 0.6-1.0) | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Material Density : | (490 lb/ft3 for CS, 494 lb/ft3 for SS) | lb/ft ³ | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 |
| Corrosion allow.: | (between 0.0625" and 0.125") | | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Min Thickness : | | in | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Plate Thickness Inc : | | in | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 |
| t _s : | | in | 0.271 | 0.271 | 0.322 | 0.288 | 0.322 | 0.254 | 0.254 | 0.288 | 0.271 | 0.288 |
| t _h : | | in | 0.388 | 0.388 | 0.438 | 0.405 | 0.438 | 0.371 | 0.371 | 0.405 | 0.388 | 0.405 |
| t _{calc} : | | in | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.375 | 0.375 | 0.5 | 0.5 | 0.5 |
| t _{use} : | inches to nearest 1/8" | in | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.5 | 0.5 | 0.625 | 0.625 | 0.625 |
| | | mm | 16 | 16 | 16 | 16 | 16 | 13 | 13 | 16 | 16 | 16 |
| Results | | | | | | | | | | | | |
| Shell Area A _s : | | ft ² | 160 | 160 | 214 | 178 | 214 | 117 | 134 | 178 | 160 | 178 |
| Head Area A _h : | | ft ² | 2 | 2 | 4 | 3 | 4 | 2 | 2 | 3 | 2 | 3 |
| Total Area A _t : | | ft ² | 165 | 165 | 222 | 184 | 222 | 121 | 138 | 184 | 165 | 184 |
| Vessel Weight W : | | lb | 4214 | 4214 | 5675 | 4698 | 5675 | 2474 | 2816 | 4698 | 4214 | 4698 |
| | | Tons | 2 | 2 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 2 |
| Cost/Ton | | USD/Ton | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 |
| Direct Cost | | | | | | | | | | | | |
| Material Cost | | | 23,413 | 23,413 | 31,527 | 26,101 | 31,527 | 13,744 | 15,644 | 26,101 | 23,413 | 26,101 |
| Piping Bults | 50% | % of material cost | 11,707 | 11,707 | 15,764 | 13,050 | 15,764 | 6,872 | 7,822 | 13,050 | 11,707 | 13,050 |
| Instrumentation Bults | 40% | % of material cost | 9,365 | 9,365 | 12,611 | 10,440 | 12,611 | 5,498 | 6,258 | 10,440 | 9,365 | 10,440 |
| Electrical Bults | 20% | % of material cost | 4,683 | 4,683 | 6,305 | 5,220 | 6,305 | 2,749 | 3,129 | 5,220 | 4,683 | 5,220 |
| Structural Bults | 0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Others | 10% | % of material cost | 2,341 | 2,341 | 3,153 | 2,610 | 3,153 | 1,374 | 1,564 | 2,610 | 2,341 | 2,610 |
| 2 years operational spares | 2% | % of material cost | 468 | 468 | 631 | 522 | 631 | 275 | 313 | 522 | 468 | 522 |
| Installation Cost | 30% | % of material cost | 7,024 | 7,024 | 9,458 | 7,830 | 9,458 | 4,123 | 4,693 | 7,830 | 7,024 | 7,830 |
| Construction Cost | 5% | % of material cost | 1,171 | 1,171 | 1,576 | 1,305 | 1,576 | 687 | 782 | 1,305 | 1,171 | 1,305 |
| Commissioning Assistance Cost | 2% | % of material cost | 468 | 468 | 631 | 522 | 631 | 275 | 313 | 522 | 468 | 522 |
| Direct Cost | | | 60,641 | 60,641 | 81,655 | 67,601 | 81,655 | 35,596 | 40,519 | 67,601 | 60,641 | 67,601 |
| Contractor Indirects | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10% | % of Direct Cost | 6,064 | 6,064 | 8,166 | 6,760 | 8,166 | 3,560 | 4,052 | 6,760 | 6,064 | 6,760 |
| Freight Cost | 7% | % of Material Cost | 1,639 | 1,639 | 2,207 | 1,827 | 2,207 | 962 | 1,095 | 1,827 | 1,639 | 1,827 |
| TPIA / Vendor Representative Cost | 2% | % of Material Cost | 468 | 468 | 631 | 522 | 631 | 275 | 313 | 522 | 468 | 522 |
| Construction Supervision & Project Management | 10% | % of Direct Cost | 6,064 | 6,064 | 8,166 | 6,760 | 8,166 | 3,560 | 4,052 | 6,760 | 6,064 | 6,760 |
| Total Contractor Indirect Cost | 0% | | 14,235 | 14,235 | 19,168 | 15,869 | 19,168 | 8,356 | 9,512 | 15,869 | 14,235 | 15,869 |
| EPC Costs | | | | | | | | | | | | |
| | | | 74,876 | 74,876 | 100,824 | 83,471 | 100,824 | 43,953 | 50,031 | 83,471 | 74,876 | 83,471 |
| Client Indirects | | | | | | | | | | | | |
| Studies + FEED | 3% | % of EPC Costs | 1,872 | 1,872 | 2,521 | 2,087 | 2,521 | 1,099 | 1,251 | 2,087 | 1,872 | 2,087 |
| PMC + PMT | 7% | % of EPC Costs | 5,241 | 5,241 | 7,058 | 5,843 | 7,058 | 3,077 | 3,502 | 5,843 | 5,241 | 5,843 |
| Project Insurance & Other Overheads | 1% | % of EPC Costs | 749 | 749 | 1,008 | 835 | 1,008 | 440 | 500 | 835 | 749 | 835 |
| Total Client Indirect Cost | | | 7,862 | 7,862 | 10,586 | 8,764 | 10,586 | 4,615 | 5,253 | 8,764 | 7,862 | 8,764 |
| Base Estimate | | | 82,738 | 82,738 | 111,410 | 92,235 | 111,410 | 48,568 | 55,284 | 92,235 | 82,738 | 92,235 |
| Contingency | 10% | % of Base Estimate | 8,274 | 8,274 | 11,141 | 9,223 | 11,141 | 4,857 | 5,528 | 9,223 | 8,274 | 9,223 |
| Total Installed Cost | | USD | 91,012 | 91,012 | 122,551 | 101,458 | 122,551 | 53,424 | 60,812 | 101,458 | 91,012 | 101,458 |

Pig Traps

| Parameter / Location | | Unit | Option 6 | Option 6 | Option 6 | Option 6 | Option 6 | Option 6a | Option 6a | Option 6a | Option 6a | Option 6a |
|--|--|--------------------|--|--|--|--|--|--|--|--|--|--|
| | | | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 | LTDP1 | LTDP2P | S14a1 | S24b2 | S2-5-1 |
| | | | CFP | CFP | CFP | CFP | CFP | CFP | CFP | CFP | CFP | CFP |
| Design Flow rate | | BPD | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19.5 ft x 5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19.5 ft x 5 ft | Major Barrel Dia: 36 in Major x Minor Barrel Length: 21.5 ft x 5 ft | Major Barrel Dia: 36 in Major x Minor Barrel Length: 21.5 ft x 5 ft | Major Barrel Dia: 36 in Major x Minor Barrel Length: 21.5 ft x 5 ft | Major Barrel Dia: 18 in Major x Minor Barrel Length: 17 ft x 5 ft | Major Barrel Dia: 24 in Major x Minor Barrel Length: 17 ft x 5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 5 ft | Major Barrel Dia: 32 in Major x Minor Barrel Length: 19 ft x 5 ft |
| Design Pressure | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Diameter | | m | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 0.5 | 0.6 | 0.8 | 0.8 | 0.8 |
| Length | | m | 7.5 | 7.5 | 8.1 | 8.1 | 8.1 | 6.7 | 6.7 | 7.3 | 7.3 | 7.3 |
| MOC | | - | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| CA | | mm | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Mechanical Calculations | | | | | | | | | | | | |
| P design calc : | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| P design used : | | psig | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Heads type : | (1=Elliptical, 2= Hemi, 3= Dished) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Allowable stress : | psia from Table 1 | | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 |
| Joint eff. | (between 0.6-1.0) | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Material Density : | (490 lb/ft3 for CS, 494 lb/ft3 for SS) | lb/ft ³ | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 |
| Corrosion allow.: | (between 0.0625" and 0.125") | | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Min Thickness : | | in | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 | 0.118 |
| Plate Thickness Inc : | | in | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 |
| t _s : | | in | 0.390 | 0.390 | 0.424 | 0.424 | 0.424 | 0.271 | 0.322 | 0.390 | 0.390 | 0.390 |
| t _h : | | in | 0.506 | 0.506 | 0.539 | 0.539 | 0.539 | 0.388 | 0.438 | 0.506 | 0.506 | 0.506 |
| t _{calc} : | | in | 0.625 | 0.625 | 0.625 | 0.625 | 0.625 | 0.5 | 0.5 | 0.625 | 0.625 | 0.625 |
| t _{use} : | inches to nearest 1/8" | in | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.625 | 0.625 | 0.75 | 0.75 | 0.75 |
| | | mm | 19 | 19 | 19 | 19 | 19 | 16 | 16 | 19 | 19 | 19 |
| Results | | | | | | | | | | | | |
| Shell Area A _s : | | ft ² | 205 | 205 | 250 | 250 | 250 | 104 | 138 | 201 | 201 | 201 |
| Head Area A _h : | | ft ² | 8 | 8 | 10 | 10 | 10 | 2 | 4 | 8 | 8 | 8 |
| Total Area A _t : | | ft ² | 221 | 221 | 269 | 269 | 269 | 109 | 147 | 217 | 217 | 217 |
| Vessel Weight W : | | lb | 6761 | 6761 | 8250 | 8250 | 8250 | 2771 | 3750 | 6632 | 6632 | 6632 |
| | | Tons | 3 | 3 | 4 | 4 | 4 | 1 | 2 | 3 | 3 | 3 |
| Cost/Ton | | USD/Ton | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 | 12,223 |
| Direct Cost | | | | | | | | | | | | |
| Material Cost | | | 37,561 | 37,561 | 45,834 | 45,834 | 45,834 | 15,395 | 20,836 | 36,848 | 36,848 | 36,848 |
| Piping Bults | 50% | % of material cost | 18,781 | 18,781 | 22,917 | 22,917 | 22,917 | 7,698 | 10,418 | 18,424 | 18,424 | 18,424 |
| Instrumentation Bults | 40% | % of material cost | 15,024 | 15,024 | 18,334 | 18,334 | 18,334 | 6,158 | 8,335 | 14,739 | 14,739 | 14,739 |
| Electrical Bults | 20% | % of material cost | 7,512 | 7,512 | 9,167 | 9,167 | 9,167 | 3,079 | 4,167 | 7,370 | 7,370 | 7,370 |
| Structural Bults | 0% | % of material cost | - | - | - | - | - | - | - | - | - | - |
| Others | 10% | % of material cost | 3,756 | 3,756 | 4,583 | 4,583 | 4,583 | 1,540 | 2,084 | 3,685 | 3,685 | 3,685 |
| 2 years operational spares | 2% | % of material cost | 751 | 751 | 917 | 917 | 917 | 308 | 417 | 737 | 737 | 737 |
| Installation Cost | 30% | % of material cost | 11,268 | 11,268 | 13,750 | 13,750 | 13,750 | 4,619 | 6,251 | 11,054 | 11,054 | 11,054 |
| Construction Cost | 5% | % of material cost | 1,878 | 1,878 | 2,292 | 2,292 | 2,292 | 770 | 1,042 | 1,842 | 1,842 | 1,842 |
| Commissioning Assistance Cost | 2% | % of material cost | 751 | 751 | 917 | 917 | 917 | 308 | 417 | 737 | 737 | 737 |
| Direct Cost | | | 97,283 | 97,283 | 118,711 | 118,711 | 118,711 | 39,874 | 53,966 | 95,437 | 95,437 | 95,437 |
| Contractor Indirects | | | | | | | | | | | | |
| Detailed Engineering, including Construction Engg. | 10% | % of Direct Cost | 9,728 | 9,728 | 11,871 | 11,871 | 11,871 | 3,987 | 5,397 | 9,544 | 9,544 | 9,544 |
| Freight Cost | 7% | % of Material Cost | 2,629 | 2,629 | 3,208 | 3,208 | 3,208 | 1,078 | 1,459 | 2,579 | 2,579 | 2,579 |
| TPIA / Vendor Representative Cost | 2% | % of Material Cost | 751 | 751 | 917 | 917 | 917 | 308 | 417 | 737 | 737 | 737 |
| Construction Supervision & Project Management | 10% | % of Direct Cost | 9,728 | 9,728 | 11,871 | 11,871 | 11,871 | 3,987 | 5,397 | 9,544 | 9,544 | 9,544 |
| Total Contractor Indirect Cost | 0% | | 22,837 | 22,837 | 27,867 | 27,867 | 27,867 | 9,360 | 12,668 | 22,404 | 22,404 | 22,404 |
| EPC Costs | | | 120,120 | 120,120 | 146,578 | 146,578 | 146,578 | 49,234 | 66,634 | 117,841 | 117,841 | 117,841 |
| Client Indirects | | | | | | | | | | | | |
| Studies + FEED | 3% | % of EPC Costs | 3,003 | 3,003 | 3,664 | 3,664 | 3,664 | 1,231 | 1,666 | 2,946 | 2,946 | 2,946 |
| PMC + PMT | 7% | % of EPC Costs | 8,408 | 8,408 | 10,260 | 10,260 | 10,260 | 3,446 | 4,664 | 8,249 | 8,249 | 8,249 |
| Project Insurance & Other Overheads | 1% | % of EPC Costs | 1,201 | 1,201 | 1,466 | 1,466 | 1,466 | 492 | 666 | 1,178 | 1,178 | 1,178 |
| Total Client Indirect Cost | | | 12,613 | 12,613 | 15,391 | 15,391 | 15,391 | 5,170 | 6,997 | 12,373 | 12,373 | 12,373 |
| Base Estimate | | | 132,733 | 132,733 | 161,969 | 161,969 | 161,969 | 54,404 | 73,631 | 130,214 | 130,214 | 130,214 |
| Contingency | 10% | % of Base Estimate | 13,273 | 13,273 | 16,197 | 16,197 | 16,197 | 5,440 | 7,363 | 13,021 | 13,021 | 13,021 |
| Total Installed Cost | | USD | 146,006 | 146,006 | 178,166 | 178,166 | 178,166 | 59,844 | 80,994 | 143,236 | 143,236 | 143,236 |

Compressors

| Equipment | Value | Unit/Remarks | Sweet Gas Compressor | Sour Gas Compressor | IA package |
|--|-------|--------------------|----------------------|---------------------|------------------|
| Option | | | | | |
| Location | | | MI | MI | New CDP/ New CFP |
| Parameter | | | - | - | - |
| Design Flow rate | | MSCFD | 5,100 | 3,200 | 36 |
| Direct Cost | | | | | |
| Material cost | | | 2,164,532 | 1,162,444 | 31,900 |
| Piping Bulks | 50.0% | % of material cost | 1,082,266 | 581,222 | 15,950 |
| Instrumentation Bulks | 40.0% | % of material cost | 865,813 | 464,978 | 12,760 |
| Electrical Bulks | 20.0% | % of material cost | 432,906 | 232,489 | 6,380 |
| Structural Bulks | 0.0% | % of material cost | - | - | - |
| Others | 10.0% | % of material cost | 216,453 | 116,244 | 3,190 |
| 2 years operational spares | 2.0% | % of material cost | 43,291 | 23,249 | 638 |
| | | | | | |
| Installation Cost | 30.0% | % of material cost | 649,359 | 348,733 | 9,570 |
| Construction Cost | 5.0% | % of material cost | 108,227 | 58,122 | 1,595 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 43,291 | 23,249 | 638 |
| Direct Cost | | | 5,606,137 | 3,010,731 | 82,621 |
| | | | | | |
| Contractor Indirects | | | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 560,614 | 301,073 | 8,262 |
| Freight Cost | 7.0% | % of Material Cost | 151,517 | 81,371 | 2,233 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 43,291 | 23,249 | 638 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 560,614 | 301,073 | 8,262 |
| Total Contractor Indirect Cost | | | 1,316,035 | 706,766 | 19,395 |
| | | | | | |
| EPC Costs | | | 6,922,172 | 3,717,497 | 102,016 |
| | | | | | |
| Client Indirects | | | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 173,054 | 92,937 | 2,550 |
| PMC + PMT | 7.0% | % of EPC Costs | 484,552 | 260,225 | 7,141 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 69,222 | 37,175 | 1,020 |
| Total Client Indirect Cost | | | 726,828 | 390,337 | 10,712 |
| Base Estimate | | | 7,649,000 | 4,107,835 | 112,728 |
| Contingency | 10.0% | % of Base Estimate | 764,900 | 410,783 | 11,273 |
| Total Installed Cost | | USD | 8,413,900 | 4,518,618 | 124,001 |

ASPEN CAPITAL COST ESTIMATOR

| Parameter | Unit | Sweet Gas Compressor | Sour Gas Compressor | IA package |
|--|--------|----------------------|---------------------|------------|
| Molecular weight | - | 28 | 28 | 28 |
| Flow | MSCFD | 5,100.0 | 3,200.0 | 140.000 |
| Flow | MMSCFD | 5.1 | 3.2 | 0.140 |
| SCFD | SCFD | 5,100,000 | 3,200,000 | 140,000 |
| SM3D | SM3D | 144,435 | 90,626 | 3,965 |
| T | deg K | 333 | 333 | 333 |
| P | Pa | 318,748 | 121,990 | 318,748 |
| Z | - | 1 | 1 | 1 |
| R | - | 8,314 | 8,314 | 8,314 |
| Std density | kg/m3 | 3 | 1 | 3 |
| Mass flow | kg/hr | 19,991 | 4,801 | 549 |
| Std density | m3/hr | 6,018 | 3,776 | 165 |
| Base equipment cost including bulks without indexation | USD | 1,897,900 | 1,046,200 | 72,300 |
| Cost index | 2019 | 180 | 180 | 180 |
| Cost index | 2022 | 200 | 200 | 200 |
| Equipment cost including bulks with indexation | USD | 2,108,778 | 1,162,444 | 80,333 |
| | kW | 810 | 340 | 6 |
| | USD/kW | 2,603 | 3,419 | 14,606 |

Notes

Very close to Vendor Budgetary offer, budgetary offer is available for 5643 MSCFD, required flow is 5100 MSCFD, hence Vendor offered cost is adjusted and used.

ASPEN CAPITAL COST ESTIMATOR lowest flow rate is 140 - MSCFD So, cost considered is adjusted to required flow rate

Vendor offer for Sweet Gas Compressor

| Previous Project database | | Sweet Gas Compressor |
|--|--------|----------------------|
| Capacity | MSCFD | 5,643 |
| Inlet pressure | KPAG | 217 |
| Outlet pressure | KPAG | 2,931 |
| Differential | KPA | 2,714 |
| MOC | | |
| Base equipment cost including bulks without indexation | USD | 2,300,000 |
| Cost index | 2022 | 200 |
| Cost index | 2022 | 200 |
| Equipment cost including bulks with indexation | USD | 2,300,000 |
| | kW | 810 |
| | USD/kW | 2,840 |

Fire Water Pumps

| Option | Value | Unit | Option5 |
|--|-------|--------------------|-------------------------------|
| Location | | | all profiles |
| Parameter | | | New CDP/CFP |
| Flow rate | | BPD | 42,857 |
| Head | | ft | 377 |
| MOC | | - | Casing:SDSS Impeller: SDSS |
| Direct Cost | | | |
| Material Cost | | | 68,000 |
| Piping Bulks | 0.0% | % of material cost | - |
| Instrumentation Bulks | 0.0% | % of material cost | - |
| Electrical Bulks | 0.0% | % of material cost | - |
| Structural Bulks | 0.0% | % of material cost | - |
| Others | 10.0% | % of material cost | 6,800 |
| 2 years operational spares | 2.0% | % of material cost | 1,360 |
| | | | |
| Installation Cost | 30.0% | % of material cost | 20,400 |
| Construction Cost | 20.0% | % of material cost | 13,600 |
| Commissioning Assistance Cost | 2.0% | % of material cost | 1,360 |
| Direct Cost | | | 111,520 |
| | | | |
| Contractor Indirects | | | |
| Detailed Engineering, including Construction Engg. | 10.0% | % of Direct Cost | 11,152 |
| Freight Cost | 7.0% | % of Material Cost | 4,760 |
| TPIA / Vendor Representative Cost | 2.0% | % of Material Cost | 1,360 |
| Construction Supervision & Project Management | 10.0% | % of Direct Cost | 11,152 |
| Total Contractor Indirect Cost | 0.0% | | 28,424 |
| | | | |
| EPC Costs | | | 139,944 |
| | | | |
| Client Indirects | | | |
| Studies + FEED | 2.5% | % of EPC Costs | 3,499 |
| PMC + PMT | 7.0% | % of EPC Costs | 9,796 |
| Project Insurance & Other Overheads | 1.0% | % of EPC Costs | 1,399 |
| Total Client Indirect Cost | | | 14,694 |
| Base Estimate | | | 154,638 |
| Contingency | 10.0% | % of Base Estimate | 15,464 |
| Total Installed Cost | | USD | 170,102 |

Inhouse Database

| Parameter | | SW Pumps Booster |
|--|------|------------------|
| Capacity | BPD | 42,857 |
| Head | m | 115 |
| MOC | | SDSS |
| Base equipment cost including bulks without indexation | USD | 60,000 |
| Cost index | 2019 | 185 |
| Cost index | 2022 | 209 |
| Equipment cost including bulks with indexation | USD | 68,000 |