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| Form # WH-DWH-FT-0053 |  Husky Energy WEST WHITE ROSE PROJECT TECHNICAL QUERY FORM | Project TQ # |
| HDMS Closeout Number | | External Contractor REF# WH-WGP-TQ-HUS-G-40125-00 |
| | | Page 1 of 2 |

| | | | |
|---|-------------------------------------|----------------------------|------------|
| This is a Technical Query: | <input checked="" type="checkbox"/> | Response Required Date: | 11/2/2018 |
| This is a Deviation/Concession Request: | <input type="checkbox"/> | Date TQ Received by Husky: | 10/26/2018 |

Section A: TQ Initiation (Completed By TQ Originator)

TQ Title: Removal of Inlet Gas Heater

| | |
|---|---------------------------|
| System Description / Equipment Tag #: 36W-A-1000; 36W;43W. | CGS Pour Sequence: |
|---|---------------------------|

TQ Description (Use attachments and / or references as required):

Husky has advised that the new subsea gas line has been approved, resulting in the platform receiving gas at higher temperatures during normal operation. Subsequently, it has been requested by Husky that the inlet gas heater be removed from the design and indicated additional design changes will be implemented to account for low temp and low flow gas start-up conditions, addition of a crossover stream from inlet fuel gas heater for lift gas heating etc.

References:

TQ Originator's Proposed Solution:


Wood requests for Husky to provide all relevant information regarding the removal of the inlet gas heater and the associated desired changes to the topsides. This information will be utilized for Wood to develop a CR to be presented to Husky.

| | | | | | |
|---|---|--|--|--|--|
| Originator's Scope Impacts: | | | | | NOTE: If YES is checked provide supporting information (preliminary) |
| Cost: Yes <input checked="" type="checkbox"/> | Schedule: Yes <input checked="" type="checkbox"/> | Safety: Yes <input type="checkbox"/> | Quality: Yes <input type="checkbox"/> | Weight: Yes <input type="checkbox"/> | |
| No <input type="checkbox"/> | No <input type="checkbox"/> | No <input checked="" type="checkbox"/> | No <input checked="" type="checkbox"/> | No <input checked="" type="checkbox"/> | |

Originator's Name: Garrett Ewing **Position:** Lead Process

| | | |
|--|-------------------------------------|-------------------------|
| Engineering Manager: Mike Miles | Signature: <i>Mike Miles</i> | Date: 10/26/2018 |
|--|-------------------------------------|-------------------------|

| | | |
|---|--------------------------------------|-------------------------|
| Interface Manager/Coordinator: Travis Hall | Signature: <i>Travis Hall</i> | Date: 10/26/2018 |
|---|--------------------------------------|-------------------------|


| | | |
|-----------------------|---|--|
| Form # WH-DWH-FT-0053 |  <h1 style="margin: 0;">Husky Energy</h1> <p style="margin: 5px 0;">WEST WHITE ROSE PROJECT TECHNICAL QUERY FORM</p> | Project TQ # |
| HDMS Closeout Number | | External Contractor REF# WH-WGP-TQ-HUS-G-40125-00 |
| | | Page 2 of 2 |

Section B: TQ Response (Completed By TQ Responsible Engineer/Technical Manager) and associated Monorail

Husky requests for Wood to proceed with deleting the Inlet Gas Heater from Topsides scope. Wood to add a crossover line from downstream of Fuel Gas Inlet Heaters to Gas Lift System. Wood to generate change request based on the P&ID mark ups used during the HAZOP conducted on October 19th and 23rd of 2018.

References:
P&ID mark ups used during the HAZOP conducted on October 19th and 23rd of 2018


TQ Responder Name: **Nazia Khatoon**

| | | |
|--|---|-------------------------|
| Position: Topsides Process Engineer | Signature:  | Date: 5-Nov-2018 |
| 3rd Party Responder Name (if required): | | |
| Position: | Signature: | Date: |

Section C: TQ Response Approval (Completed By Affected Scope Manager)


Wood to raise a CR to address the commercial impacts of this change.

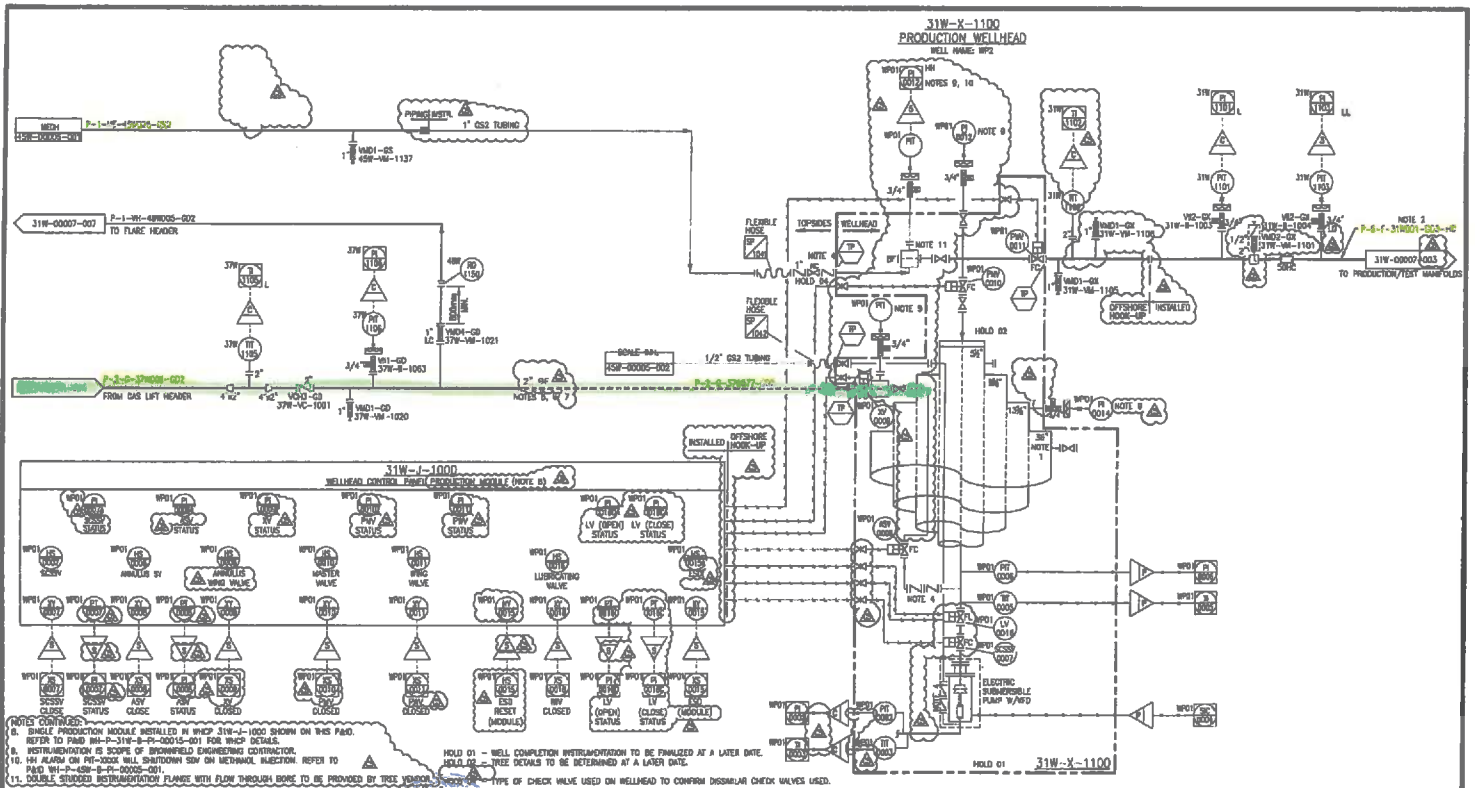
Note: The TQ process provides technical acceptance or guidance. The TQ process does not provide contractual approval to alter scope, contracts, costs or schedule. Such change must be addressed and approved through a Change Proposal and under the appropriate contract mechanism.

| | | | |
|---|--|---|---|
| Affected Scope Manager's Decision: | Accepted <input checked="" type="checkbox"/> | Rejected <input type="checkbox"/> | Print Name: Martin Arcand Sr. Project Engineer |
| Change Proposal Required? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Signature:  Date: 5-Nov-2018 |

Section D: TQ Closeout (Completed By TQ Manager / TQ Coordinator)

TQ Closed

| | | | |
|---|---|--|----------------------|
| Impact to External Interface Management: | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> | IA# : |
| Impact to Internal Interface Management: | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> | Group(s): |
| Closeout Package HDMS Doc. Number: | | | |
| Print Name: Ashley Bartlett | Signature:  | | Date: Nov 6, 2018 |



- NOTES CONTINUED:**
- SINGLE PRODUCTION MODULE INSTALLED IN WPT2 31W-X-1100 SHOWN ON THIS PAD. REFER TO PAD WH-P-31W-B-P-0004-01 FOR WPT2 DETAILS.
 - REINSTRUMENTATION IS SCOPE OF BROWNFIELD ENGINEERING CONTRACTOR.
 - AN ALARM ON PRT-0002 WILL SHUTDOWN GUY ON NETWORK. REFER TO PAD WH-P-43W-B-P-0002-01.
 - DOUBLE SHUTDOWN INSTRUMENTATION FLANGES WITH FLOW THROUGH BORE TO BE PROVIDED BY TREE VENDORS. TREE TYPE OF CHECK VALVE USED ON WELLS TO CONFORM DISMISAL CHECK VALVES USED.
- NOTES:**
- 30\"/>

PROVINCE OF NEW BRUNSWICK

PES PROFESSIONAL ENGINEER

ANDREW G. SHARPE

WOOD GROUP CANADA, INC.

To practice Professional Engineering in Newfoundland and Labrador, please file an affidavit with the province. Expiry: 2015-12-31

Husky Energy

SUITE 801, SCOTIA CENTRE, 525 WATER STREET
ST. JOHN'S, NEWBRUNSWICK & LABRADOR, A1G 1G9

WOOD GROUP

| NO. | DATE | DESCRIPTION | BY | CHKD | APP'D |
|-----|----------|-------------------------|-----|------|-------|
| 01 | 04/20/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
| 02 | 04/20/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
| 03 | 06/24/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
| 04 | 06/24/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
| 05 | 06/24/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
| 06 | 06/24/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
| 07 | 06/24/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
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| 09 | 06/24/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
| 10 | 06/24/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
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| 13 | 06/24/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |
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| 20 | 06/24/10 | DESIGN FOR CONSTRUCTION | WPT | AS | WPT |

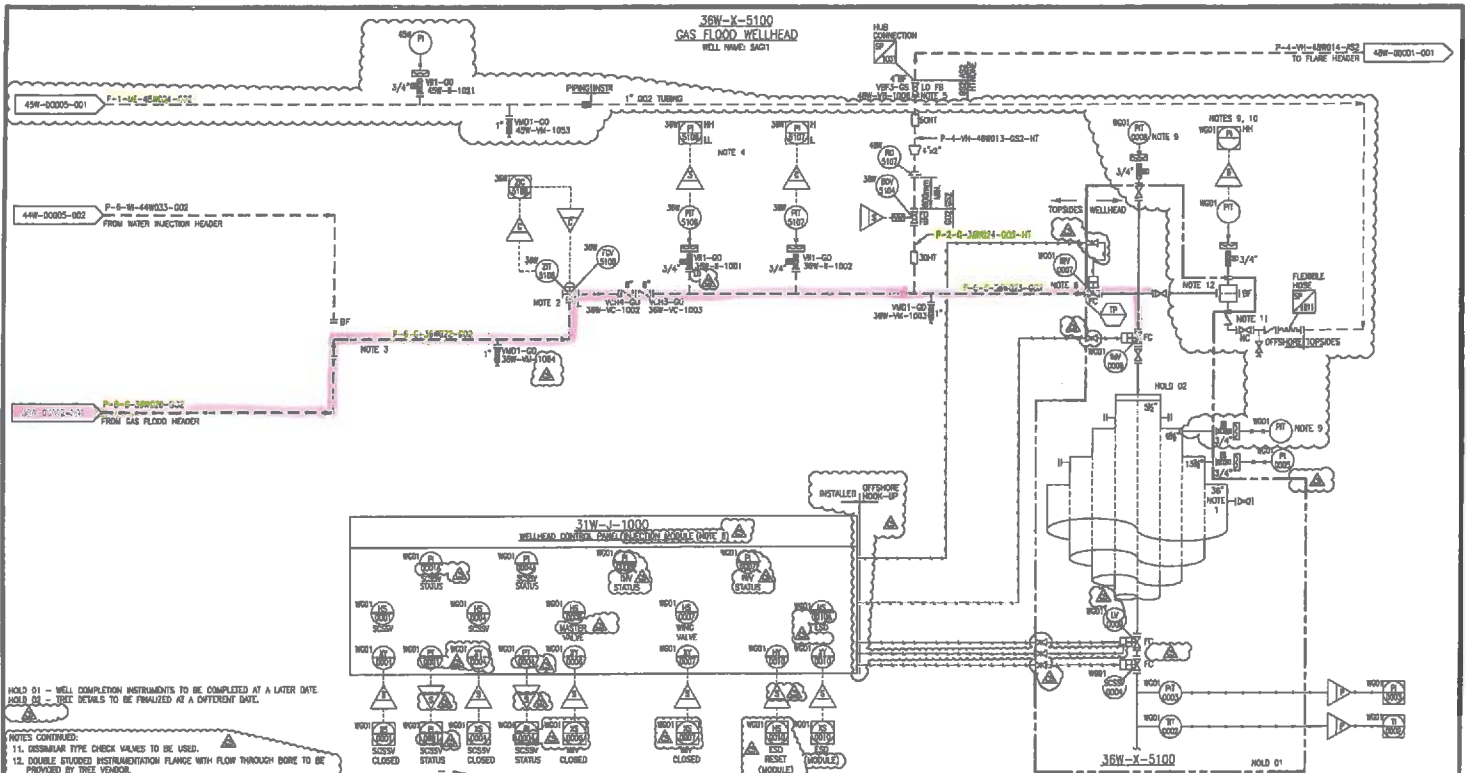
WEST WHITE ROSE PROJECT

PIPING & INSTRUMENT DIAGRAM
PRODUCTION WELLHEAD WITH ESP

PROJECT NUMBER: WH-P-31W-B-P-0004-01

PROJECT NO: 101414

DATE: 05/11/10



HOLD 01 - WELL COMPLETION INSTRUMENTS TO BE COMPLETED AT A LATER DATE.
 HOLD 02 - TEST DETAILS TO BE FINALIZED AT A DIFFERENT DATE.

NOTES CONTINUED:
 11. OSGEMAR TYPE CHECK VALVES TO BE USED.
 12. DOUBLE STUDDED INSTRUMENTATION FLANGE WITH FLOW THROUGH BORE TO BE PROVIDED BY TREE VENDOR.

- NOTES:
- 3" CONDUCTOR HOLDS TWO (2) WELLS.
 - CHANGE OUT OF CHECK VALVE MAY BE REQUIRED TO SWITCH TO WATER INJECTION.
 - SPool TO ADJUSTS BETWEEN WATER AND GAS.
 - MAY NEED DIFFERENT ALARM AND TRIP SETTINGS FOR TWO MODES OF OPERATION.
 - WAVE NOT PROVIDED.
 - WING VALVE CLOSURE WILL BE STAGGERED TO PREVENT WATER HAMMER ISSUES DURING WATER INJECTION MODE.
 - DELETED.
 - SINGLE INJECTION MODULE INSTALLED IN WHP 31W-J-1000 SHOWN ON THIS P&ID. REFER TO P&ID 31W-P-31W-0-0003-001 FOR WHP DETAILS.
 - INSTRUMENTATION IS SCOPE OF GROUNDWATER ENGINEERING CONTRACTOR.
 - NO ALARM ON P&ID-0002 WILL SHUTDOWN SWY ON WATER INJECTION. REFER TO P&ID 31W-P-31W-0-0003-001.



PROVINCE OF NEWFOUNDLAND AND LABRADOR
P.E. Andrew G. Sharpe
 PERMIT HOLDER
 THIS PERMIT ALLOWS
 ENGINEERING
WOOD GROUP CANADA, INC.
 In practice Professional Engineering
 as Authorized and Licensed
 Permit No. as Issued by PEG
 which is valid for the year
 2018
 MPEC Signature/Number 00001

| REV | DATE | DESCRIPTION | BY | CHKD | APP'D |
|-----|----------|-------------------------|----|------|-------|
| 01 | 12/15/18 | ISSUED FOR CONSTRUCTION | AW | AW | AW |
| 02 | 01/26/19 | ISSUED FOR CONSTRUCTION | AW | AW | AW |
| 03 | 02/07/19 | ISSUED FOR CONSTRUCTION | AW | AW | AW |
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| 19 | 02/07/19 | ISSUED FOR CONSTRUCTION | AW | AW | AW |
| 20 | 02/07/19 | ISSUED FOR CONSTRUCTION | AW | AW | AW |

Husky Energy
 SUITE 901, SCOTIA CENTRE, 630 WATER STREET
 ST. JOHN'S, NEWFOUNDLAND & LABRADOR, A1C 1B6

WOOD GROUP

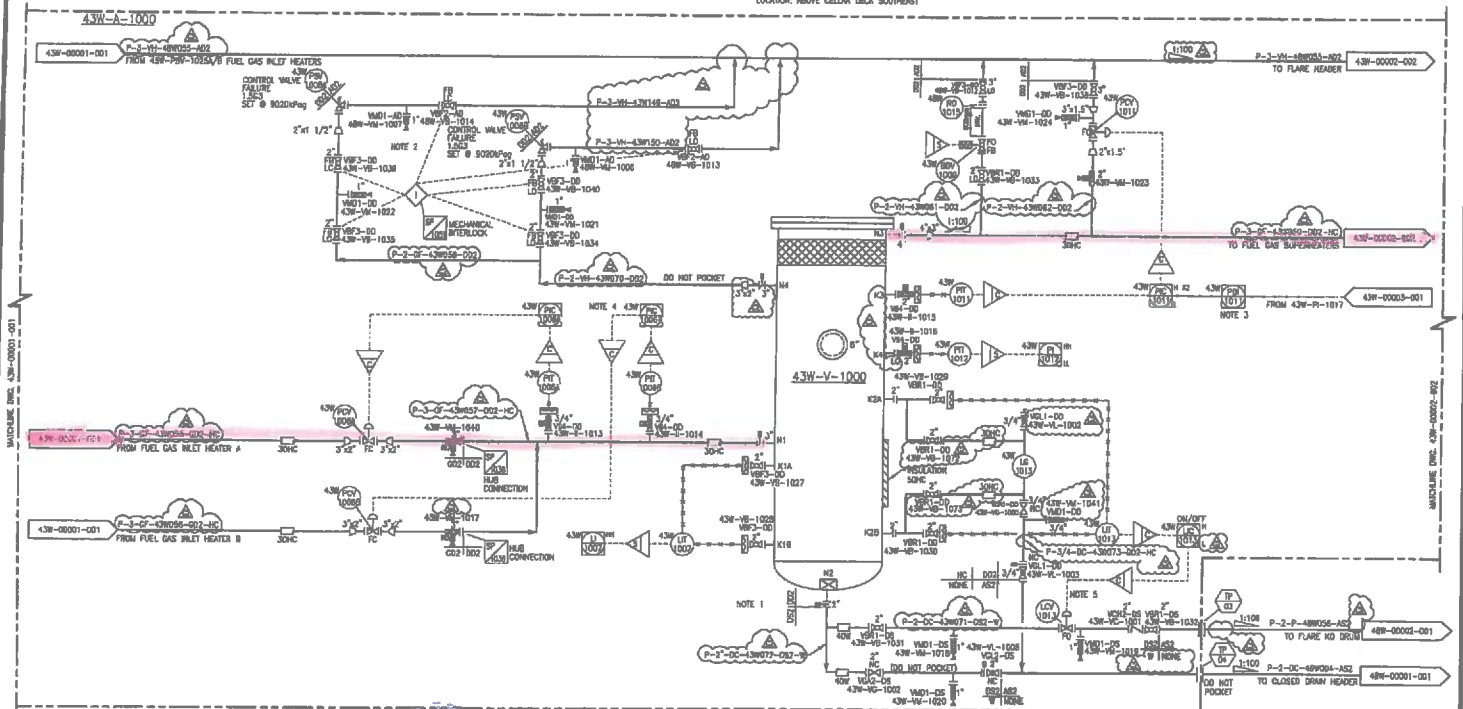
PROJECT: WEST WHITE ROSE PROJECT

ISSUED FOR: PIPING & INSTRUMENT DIAGRAM
 GAS FLOOD WELLHEAD

| | |
|-------------------------|--------------------|
| ISSUED FOR NUMBER | REVISION |
| 31W-P-31W-0-P1-0003-001 | CS |
| ISSUE NO. | PROJECT NO. 101414 |
| SCALE | SCALE NONE |

43W-A-1000
FUEL GAS PACKAGE

43W-V-1000
FUEL GAS KNOCKOUT DRUM
DESIGN 3000 IPIB @ 1000/1000
PROJECT NO. 101414
CONTRACT NO. 101414
LOCATION: ABOVE YELLOW BELL SOUTHPIKE



- NOTES:
- FUEL GAS SKID TO BE BUNDLED.
 - FUEL GAS KNOCK OUT DRUM PSY'S 1008A/B ARE TO BE MECHANICALLY INTERLOCKED.
 - PI-1011, PRESSURE DRIP ACROSS DEMISTER CALCULATED BY 43W-PC-1011 AND 43W-PC-1017.
 - 43W-PC-1008A/B WILL HAVE A 5% MINIMUM STOP TO PREVENT TRAPPED VOLUME FROM OVER PRESSURIZING SKID.
 - SNAP ACTING CONTROL VALVE TO OPEN AT 50% AND CLOSE AT 20%.
 - SEE VENDOR DRAWING P-25170-03 FOR FURTHER DETAILS.

PROVINCE OF ONTARIO
PERMIT HOLDER
ANDREW G. SHARPE
WOOD GROUP CANADA, INC.
To provide Professional Engineering to Newfoundland and Labrador
Permit No. as issued by PES 20095
which is valid for the year 2011
PES Signature/Number 251411

| REV | ISSUED | DESCRIPTION | DATE |
|-----|------------|-------------------------|------------|
| 1 | 2011-01-11 | ISSUED FOR CONSTRUCTION | 2011-01-11 |
| 2 | 2011-01-11 | ISSUED FOR CONSTRUCTION | 2011-01-11 |
| 3 | 2011-01-11 | ISSUED FOR CONSTRUCTION | 2011-01-11 |
| 4 | 2011-01-11 | ISSUED FOR CONSTRUCTION | 2011-01-11 |
| 5 | 2011-01-11 | ISSUED FOR CONSTRUCTION | 2011-01-11 |
| 6 | 2011-01-11 | ISSUED FOR CONSTRUCTION | 2011-01-11 |
| 7 | 2011-01-11 | ISSUED FOR CONSTRUCTION | 2011-01-11 |
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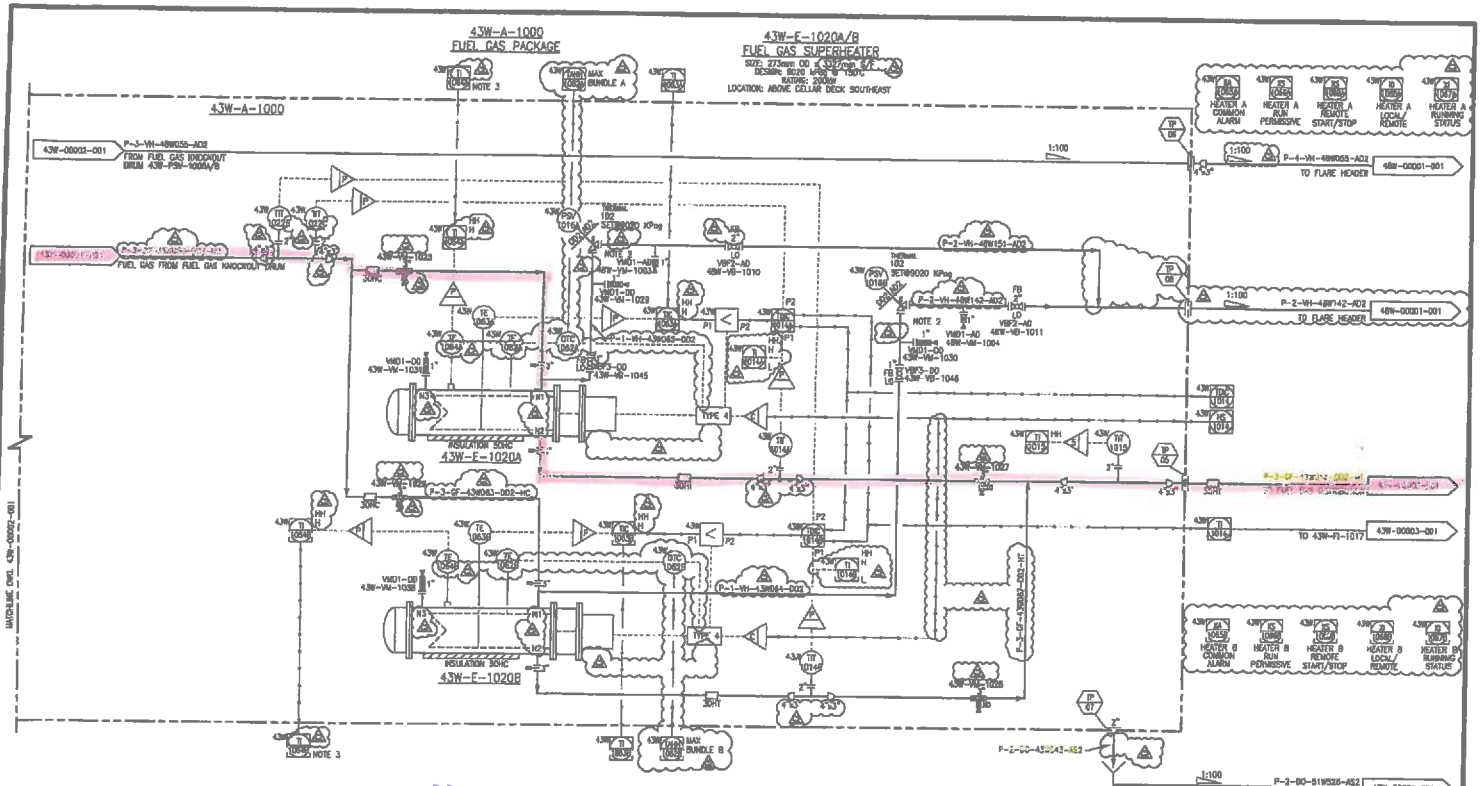
Husky Energy
SUITE 601, 8000A CENTRE, 235 WATER STREET
ST. JOHN'S, NEWFOUNDLAND & LABRADOR, A1C 1W8

WOOD GROUP

PROJECT: WEST WHITE ROSE PROJECT

ISSUED FOR: PIPING & INSTRUMENT DIAGRAM FUEL GAS SKID

| | |
|-------------|---------------|
| JOB NUMBER | 43W-00002-001 |
| PROJECT NO. | 101414 |
| SCALE | NONE |



- NOTES:
- FUEL GAS SKID TO BE ISOLATED.
 - WHEN ISOLATED, FUEL GAS HEATERS WILL BE DEPRESSURED BY TEMPORARY PIPING BETWEEN VESSELS.
 - ALARMS IN THE VENDOR P&ID WILL BE COMMENSURATE TO THE TOPPED RSS.
 - SEE VENDOR DRAWING P-10170-33 FOR FURTHER DETAILS.
 - DC = DRY TEMPERATURE CONTROL.



PROVIDER OF PROFESSIONAL AND LABORATOR SERVICES
 FORESTRY & SHARPE
 123456789
 2013
 FORESTRY & SHARPE
 123456789
 2013

| NO. | DATE | DESCRIPTION | BY | CHKD | APP'D |
|-----|----------|-------------------------|-----|------|-------|
| 1 | 10/10/13 | ISSUED FOR CONSTRUCTION | ... | ... | ... |
| 2 | 10/10/13 | ISSUED FOR CONSTRUCTION | ... | ... | ... |
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| 4 | 10/10/13 | ISSUED FOR CONSTRUCTION | ... | ... | ... |
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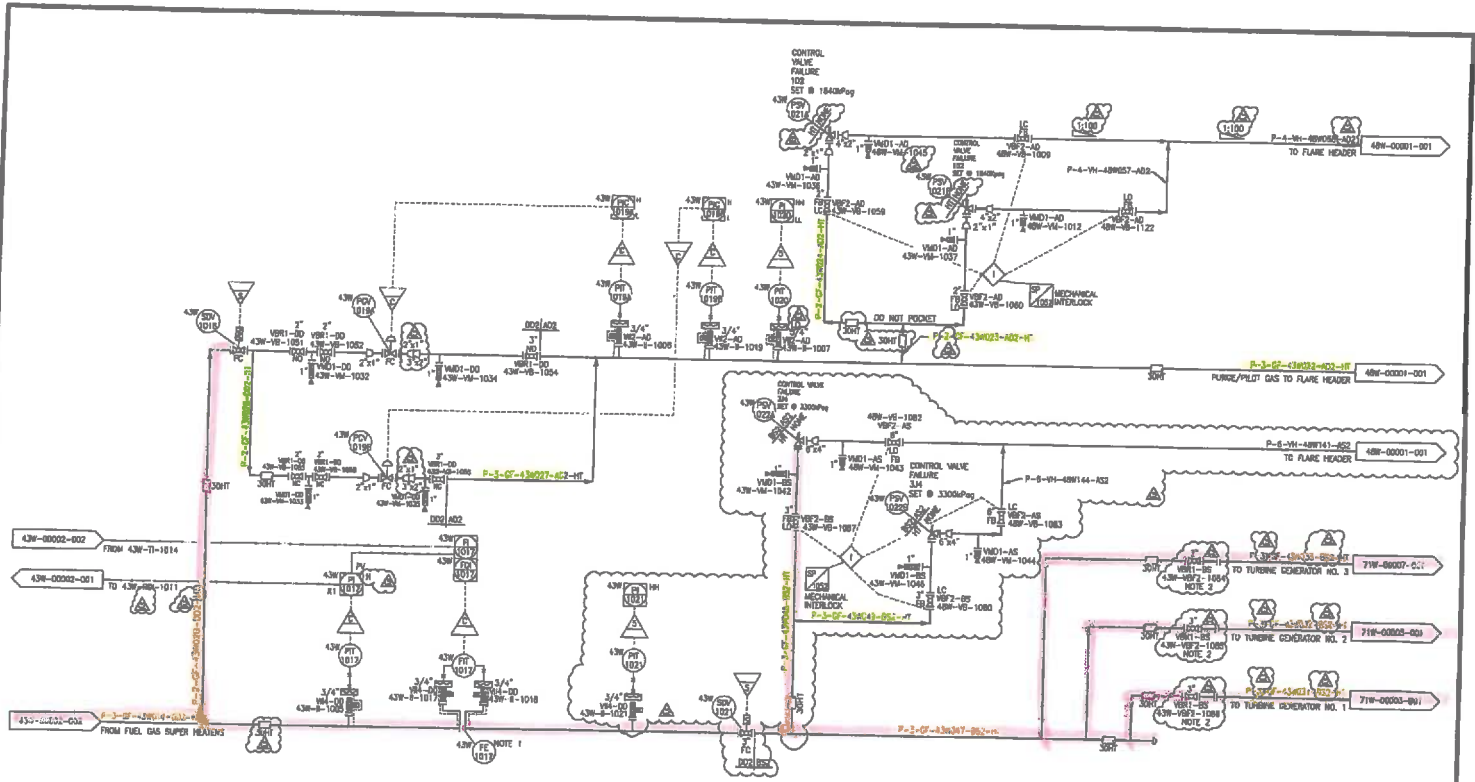
Husky Energy
 10000 100th Street, Suite 100
 Edmonton, Alberta T5A 0A6
 CANADA

WOOD GROUP

WEST WHITE ROSE PROJECT

PIPING & INSTRUMENT DIAGRAM
 FUEL GAS SKID

PROJECT NO: 101414
 SHEET NO: C2
 DATE: NONE



- NOTES:
- STRAIGHT PIPE RUN IS MINIMUM 10 DIAMETERS UPSTREAM AND 5 DIAMETERS DOWNSTREAM.
 - VALVE INSTALLED FOR PIPE BEARING (MECHANICAL HANDLING).



PROVINCE OF NEWFOUNDLAND AND LABRADOR
 PROPERTY HOLDER
 THIS PRINTS ALIQUOT
WOOD GROUP CANADA, INC.
 To certify Professional Engineers in Newfoundland and Labrador, Part III has, on behalf of P.E.C. 00000, which is valid for the year 2010. L.M.S.C. Signature Number: 211141

| REV | DATE | DESCRIPTION | GROUP | BY | CHK |
|-----|----------|------------------------|-------|----|-----|
| 01 | 04/24/10 | ISSUE FOR CONSTRUCTION | 01 | AS | AS |
| 02 | 04/28/10 | ISSUE FOR CONSTRUCTION | 01 | AS | AS |
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| 04 | 05/04/10 | ISSUE FOR CONSTRUCTION | 01 | AS | AS |
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| 09 | 05/04/10 | ISSUE FOR CONSTRUCTION | 01 | AS | AS |
| 10 | 05/04/10 | ISSUE FOR CONSTRUCTION | 01 | AS | AS |

Husky Energy
 SUITE 801, SCOTIA CENTRE, 238 WATER STREET
 ST. JOHN'S, NEWFOUNDLAND & LABRADOR, A1C 1S6

PROJECT CONTRACTOR:
WOOD GROUP

| PROJECT | |
|---|-------------------------|
| WEST WHITE ROSE PROJECT | |
| PIPING & INSTRUMENT DIAGRAM FUEL GAS DISTRIBUTION | |
| PROJECT NUMBER | WH-P-43W-B-PH-00003-001 |
| PROJECT CODE | C2 |
| PROJECT DATE | 10/14/10 |
| SCALE | NONE |

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