



NWT OFFICE OF THE REGULATOR OF OIL AND GAS OPERATIONS

Office of the Regulator of Oil and Gas Operations

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Ryan Munro, P.Eng.
Manager, Abandonment Engineering
Canadian Natural Resources Ltd.
Suite 2100, 8800 – 2 ST SW
CALGARY AB T2P 4J8

January 27, 2023

Dear Ryan Munro:

Inspection: Arrowhead River C-55 (WID 1979) Well – ACW-2020-003-CNRL-C-55-WID1979

Inspectors Michael Martin, Chief Safety Officer/Chief Conservation Officer, and Brandon Bradbury, Safety Officer/Conservation Officer inspected the abandonment of the Arrowhead River C-55 (WID1979) well on January 15th, 2023.

The inspection was carried out to ensure Canadian Natural Resources Ltd. was adhering to the terms of the Well Approval for this operation (ACW-2020-003-CNRL-C-55-WID1979). The inspectors met with Mr. Roy Craft, Well Site Supervisor, on site.

Please see the attached Operations Summary Inspection Report for your reference. This report will be posted to the Office of the Regulator of Oil and Gas Operations' Public Registry at www.oroogo.gov.nt.ca.

If you have any questions, please contact me at (867) 767-9097 or by email at Brandon_Bradbury@gov.nt.ca.

Sincerely,

Brandon Bradbury
Safety Officer
Conservation Officer

Encl. Arrowhead River C-55 (WID 1979) Operation Summary Inspection Report – January 15th, 2023

- c. Department of Lands, Dehcho Region;
Department of Environment and Natural Resources, Dehcho Region.
Dale Duffy, Superintendent, Abandonments, CNRL

OROGO Operations Inspection Summary Report

Well Information

Well name: Arrowhead River C-55

4 digit WID: 1979

Operator: Canadian Natural Resources Ltd.

Well status: Suspended

OROGO risk level: Level 1

Shallow wellbore plug? Yes No24-hour operations? Yes NoCoordinates (*In decimal degrees; verified onsite*)Datum: NAD 27 NAD 83 Unknown

Lat: 60° 34' 04.8" N

Long: 122° 55' 27.5" W

Completed in H₂S zone? Yes Estimated % of H₂S: 1% or Measured % of H₂S: 0%

Program step on arrival: 20: Pressure test surface casing to 7 MPa for 10 minutes.

Program step on departure: 27 (Contingency): Cutting tubing above the ON/OFF tool.

Inspection Date and Contact Information

Date of inspection: January 15th, 2023

Access method: Vehicle

OROGO Inspector:

- Michael Martin – Chief Safety Officer /
Conservation Officer- Brandon Bradbury – Safety Officer/Conservation
Officer

Activity Inspected

OA#: OA-2018-005-CNRL

Nature of activity: Abandonment

ACW#: ACW-2020-003-CNRL-C-55-WID 1979

Contractor on site (if applicable):

Name: Michael Gauthier

Company: Precision Drilling

Rig Number: 129

Phone: (403) 716-4500

Email: N/A

Inspection Results

Rig Safety

Accumulator
function test Compliant Non-Compliant Corrected Non-Compliance

Comments: Function Test Compliant – did not drop below 8.4 MPa after three functions and recharged in <5 min.

Initial Pressure: 13.5 MPa

Pipe Ram Closed: 19 sec / 13 MPa

Pipe Ram Open: 17 sec / 12.5 MPa

Annular: 33 sec / 10.75 MPa

Recharge: 200 sec / 13.5 MPa

Equipment certifications	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Serial Numbers of the BOP matched the certifications submitted to OROGO on December 15, 2022: - Annular: MP2590 - Double Gate: MP2584 (Photo #1)
Authorization / Approval available	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Authorizations issued by OROGO located in the Consultants trailer and the Dog House.
Boiler inspection	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non-Compliance	Comments: Boiler certifications were readily available and matched the on-site equipment. (Photos #2 & #3)
Guards and covers on moving equipment	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: All guards and covers on moving equipment were in a condition satisfactory to the Inspectors
Pump lines and hoses secured, intact and appropriate?	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: All pump lines and hoses were secured and in a condition satisfactory to the Inspectors (Photo #4)
Adequate lighting	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Click or tap here to enter text.
Wind indicators visible and functional	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Wind indicators were present on site and in a location that was highly visible. (Photo #5)
Fire extinguishers	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: All fire extinguishers inspected have been recertified within the last 12 months.
Equipment spacing	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Spacing of equipment on site was compliant with Alberta Energy Regulator's Directive 36 adopted by OROGO. - Flare stack - Well centre = 51.2m - Rig pump - Rig tank = 7.3m - Rig Tank - Well centre = 50.3m - Pressure tank - Well center = 26.2m - Doghouse - Well center = 25.6m - Flare stack - Pressure tank = 25.2m
Engine kills	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Engine kills (2 on the service rig and 1 on the rig tank pump) operated as designed and required manual reset of the air kill mechanism.
Sufficient N ₂ back-up?	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Nitrogen Gas back ups were confirmed to be sufficient by on-site staff for the accumulator and BOP.
Flow turns	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: All flow turns inspected were compliant and installed correctly (Photo #6).

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General housekeeping	<input type="checkbox"/> Compliant <input checked="" type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: The inspectors observed various equipment and hose lines restricting access into the accumulator shack. This concern was identified to precision personnel on site and must be addressed during all operations to allow safe ingress/egress from the accumulator shack.
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Other Rig Safety notes:

Although BOP function tests are required to be conducted at the beginning of operations and every week there after, the rig crew conducted and recorded these tests at the beginning of every shift.

Personnel Safety

Valid safety tickets	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: All safety tickets inspected were valid at the time of inspection and available upon request.
<input checked="" type="checkbox"/> First Aid / CPR <input checked="" type="checkbox"/> H2S <input type="checkbox"/> WHIMS <input type="checkbox"/> TDG <input checked="" type="checkbox"/> BOP <input type="checkbox"/> Other (specify in comments)		

Safety meetings and documentation	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Inspectors attended the January 15th, 2023 safety meeting at 0730h. Safety practices were re-enforced and potential hazards of that days operations were identified.
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SCBAs and/or supplied air available and visible	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: 6 SCBA's (2-Lease Entrance, 2-Dog house and 2 with the Air Hand) were on site. Additionally, there was a 6-bottle supplied air trailer with 6 SABA masks. (Photos #7 & #8)
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First Aid equipment and EMS on site and accessible	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: First aid kits located through out site. There was a paramedic at camp as well as a medic located centrally to the 3 active operations in the area.
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Gas detection equipment on site and accessible	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: All personnel were wearing personal gas detection monitors that included H ₂ S sensors.
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Communication plans available	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments:
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Hazard identification and signage	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Signage with indicator lights to identify where a H ₂ S hazard may be present was located in front of the Dog house and when the alarm is sounded, lights would illuminate and indicate where the hazard was located on the site. (Photos #9 & #10)
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ERP available upon request	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Was located in the Dog House during operations.
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Safety Plan available upon request	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Click or tap here to enter text.
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BOP drills and documentation	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Tower sheets and daily reports identified regular BOP drills. Inspectors also had the site personnel conduct a BOP drill during the inspection.
Function tests and documentation	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Tower sheets and daily reports identified function tests being conducted daily.

Other Personnel Safety notes:

Rig crew, testers and other on-site personnel showed a knowledge and understanding of the safe operation of the service rig and associated equipment.

Blowout Prevention Equipment

BOP certifications	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments:
BOP pressure rating	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: The BOP used for this operation was 11"/34.5 MPa which is an appropriate pressure rating for this well.
Kill sheet in dog house	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments:
Stabbing valves and cross-overs	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments:
Flow lines and choke lines secured	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Click or tap here to enter text.

Other Blowout Prevention Equipment notes:

All blowout prevention equipment had a valid certification and appeared to be well maintained.

Specific to Shallow Wellbore Plug (Not Applicable)

Snubbing unit in place	<input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Click or tap here to enter text.
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Other Shallow Wellbore Plug notes:

Click or tap here to enter text.

Specific to 24-Hour Operations (Not Applicable)

Cross-over notes	<input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Click or tap here to enter text.
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Other 24-hour operations notes:

Click or tap here to enter text.

Environment

Rig matting	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Rig matting was placed below the service rig.
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Drip trays	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Drip trays were located under equipment and at fuel tanks to prevent the possibility of hydrocarbon impacts to the underlying ground.
Materials handling and storage	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments:
Spill response equipment on site and accessible	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Although spill response equipment was on site near the Dog house. Inspectors recommended that a spill kit must be readily available in the vicinity of all fuel handling and storage locations.
Tubing laydown area protection	<input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Corrected Non- Compliance	Comments: Tubing racks were on site but not being utilized at the time of the inspection since drill tubing was still down hole unable to unlatch from the ON/OFF tool.

Other Environment notes:
Click or tap here to enter text.

Safety Plan

Compliant? Yes No Comments: Click or tap here to enter text.

Environmental Protection Plan

Compliant? Yes No Comments: Click or tap here to enter text.

Emergency Response (Contingency) Plan

Compliant? Yes No Comments: Click or tap here to enter text.

Authorization and Approvals

Following program as approved? Yes No Comments: The contingency in step 27 of the approved abandonment program was utilized as the rig was unable to unlatch the tubing from the ON/OFF tool. This contingency step states: 'If unable to release ON/OFF from packer then confirm free point and cut tubing directly above ON/OFF. Consult with OROGO Operations before Cutting.' Consultation took place with the OROGO Inspectors on site.

Meeting all conditions? Yes No Comments:

Other Documents Requested / Received During Inspection

Details:

Photographs

Number of photographs attached: 10

Additional Comments / Observations

Overall, there were no major concerns noted during the inspection and the Inspectors were pleased with operation and the cooperation of the onsite staff.

This inspection was conducted under the *Oil and Gas Operations Act* and associated regulations.

Name: Michael Martin

Designation: Chief Safety Officer

Date: 2023-01-27

Signature: 

Name: Brandon Bradbury

Designation: Safety Officer

Date: 2023-01-27

Signature: 



PHOTO #1: Double gate serial number.

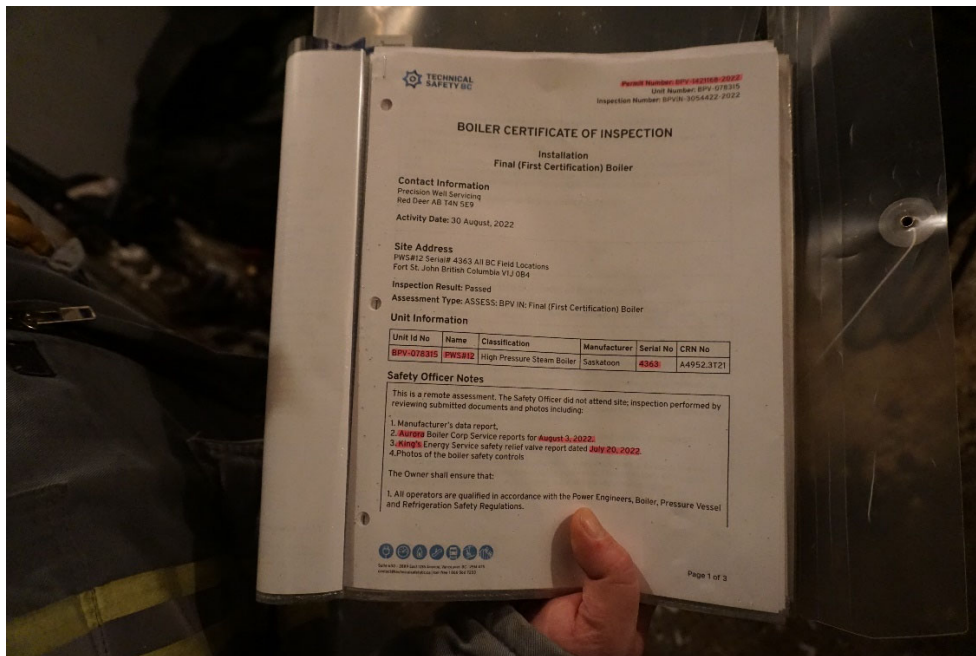


PHOTO #2: Boiler certifications matched the equipment that was on site.



PHOTO #3: View of the Boiler with Serial number 4363.



PHOTO #4: Pressurized line from the P-tank to the Flare stack was secured with continuous anchor line on either side of the segment coupling.



PHOTO #5: Wind indicators were visible on site and can be seen in the foreground before the service rig.



PHOTO #6: Flow turns on the rig pump were satisfactory to the Inspectors.



PHOTO #7: SCBA and SABA located on front of the air hands truck.

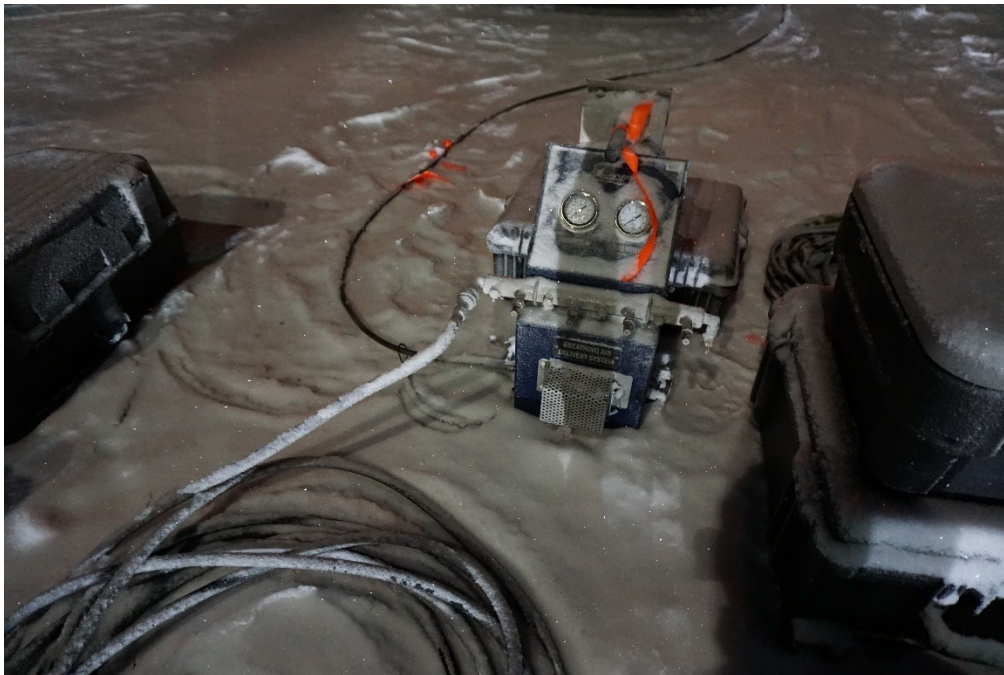


PHOTO #8: Another view of the supplied air manifold which can assist up to 4 personnel.



PHOTO #9: H₂S sensors sound an alarm and lights illuminate indicating where the hazard is present.

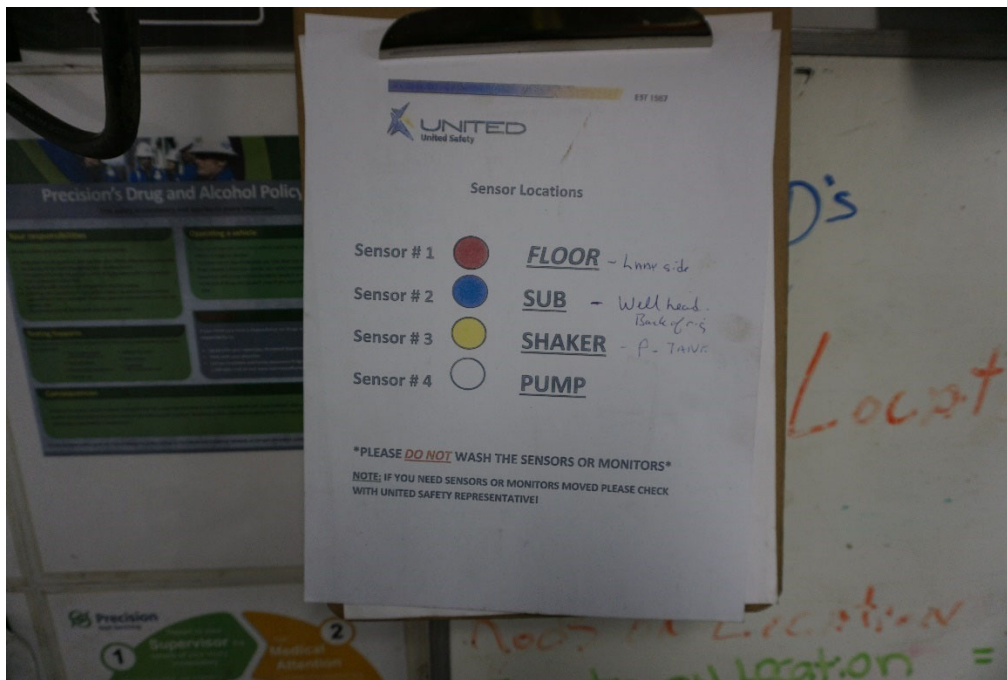


PHOTO #10: H₂S sensors were located at the Rig floor, Well head, Pressure tank, and the Rig pump.