Rev3

noble MIDSTREAM PARTNERS

TEST SPECIFICATIONS

Black Diamond Gathering, LLC - Pressure Test

Crestone Kugel

Date:	Select Routing:
9-Oct-2019	

Test Number: 1 of 1

Project Name:	Project I.D. / AFE Number	Facility Name or Number
Crestone Kugel	5000450	Kugel Connect - BDO-04-MVD-100-L4
Contractor / Testing Company:	Technician	
Northwinds		

Installation Location (M.P. or S.S.):				State:	County/Parish:	Class Location Designation		Selected Design Pressure		Planned MAOP	
0+00	to	48+97		CO	Weld	N/A		1480		1480	
Lat:	40.1308	to Lat:	40.13931								
Long:	104.92077	Long:	104.92757								

Project Description:

Hydrostatic pressure test of 4897' of 4" Carbon Steel.

Testing at 1.25*MAOP = 1850 psig minimum test pressure. 2026 psig Target Test Pressure at Chart Location

Max Test Pressure for ANSI 600 Valves and Fittings is 2660 psig where they are located.

LEAK ONLY TEST ☐ STRENGTH TEST ☐ FABRICATION ☐ NEW CONSTRUCTION ☒ REPLACEMENT ☐ RETEST ☐ REFERENCE DRAWINGS ATTACHED ☒

POST-INSTALLATION TEST ☒ PRE-INSTALLATION TEST ☐

Test Design Criteria

Minimum Component Characteristics

Pipe Information

O.D.	4.5
Wall Thickness	0.188
SMYS	52,000
Grade	X52

Valve/Flange ANSI Class Rating

600# Valves/Fittings

Test Pressure Calculations

☐ Input minimum and maximum pressure of test

☐ Input minimum and maximum %SMYS of test

	Pressure (psig)	% PIPE SMYS
Max. Test Pressure (Pipe)	2220	51.1%
Max. Test Pressure (Valves and Fittings)	2220	51.1%
Min.	1850	42.6%

Test Section - Reference Data

Test Medium	Water	
Test Duration	8 hour	Hours (min)
Section Length	4,897	Ft.
Section Fill Volume	4,045	Gal
Max. Elevation Change	45	Ft.

Station Equations:	1	2	3
Back	0+00	0+00	0+00
Ahead	0+00	0+00	0+00

Test Pressures

Location	Station	Elevation (feet)	Max. psig.	% SMYS @ Max.	Min. psig.	% SMYS @ Min.	Variance psig.	Target psig.	% SMYS @Target
BEGIN	0+00	4972	2,202	50.7%	1,851	42.6%	351	2,026	46.6%
HIGH ELEVATION	48+97	4975	2,201	50.6%	1,850	42.6%	351	2,025	46.6%
LOW ELEVATION	37+00	4930	2,220	51.1%	1,869	43.0%	351	2,044	47.0%
END	48+97	4975	2,201	50.6%	1,850	42.6%	351	2,025	46.6%
Chart Location (Test Point)	0+00	4972	2,202	50.7%	1,851	42.6%	351	2,026	46.6%

REMARKS:

ASME B16.5 2.6 System Hydrostatic Testing 2003:
Flanged joints and flanged fittings may be subjected to system hydrostatic tests at a pressure of 1.5 times the 38°C (100°F) rating rounded off to the next higher 1 bar (25 psi) increment. Testing at any higher pressure is the responsibility of the user, taking into account the requirements of the applicable code or regulation.

PRE-TEST APPROVAL / REVIEWED BY:		TEST PERFORMED / ACCEPTED BY:		POST-TEST REVIEWED BY:	
Originator/Project Manager (Signature)	Date: 10/09/2019	Test Performed by (Signature):	Date: 10-10-19	Construction Manager (signature):	Date: 10/10/19
Designed Reviewed if applicable (Signature)	Date:	Company Name (for Contractor or for Employee):	Date: 10-10-19		
Compliance (Signature)	Date:	Witnessed & Accepted by Company Representative: (Signature)	Date: 10-10-19	Actual MAOP	

noble MIDSTREAM PARTNERS

Pipeline Pressure Test Documentation

Pressure Test Report	Form :	Revision 3	Revision Date

Project Name : Crestone Kugel
AFE No. : 5000450

Contractor / Testing Company :	Northwinds	Technician :	Phil
Test Section No. :	0	From Station No.:	0+00
Test Description:	Hydrostatic pressure test of 4897' of 4" Carbon Steel.	To Station No.:	48+97
Test Type :	Subpart E Test	Start of Test Period : Date :	10-10-19 Time : 12:30 PM
Min. Test Duration :	8 hour	End of Test Period : Date :	10-10-19 Time : 4:00 PM
Class Location :	Not Applicable (Liquids)		
Low Strength Pipe : O.D. :	4.500 W.T. : 0.188 SMYS: 52,000 Grade: X52	Station Piping :	Yes
Test Medium :	Water	Source of Medium :	N/A
Corrosion Inhibitor :	No	Inhibitor Type : N/A	Rate : N/A
Leak Detection :	No	Material Type : N/A	Rate : N/A

Deadweight Tester : Mfg:	Crystal Eng.	Serial #: 822296	Calibration Date : 9-27-19
Deadweight Tester Location : Station No. (ESN) :	0+00	Elevation (ft) : 4,972	
Pressure Recorder : Mfg:	Barton	Serial #: 265A-3511	Calibration Date : 6-19-19
Pipe Temp. Recorder : Mfg:	Barton	Serial #: 242-125220	Calibration Date : 9-11-19

			Target Test Pressure Range	
Pre-approved Target Test Pressure :	2,026.0 psig	Maximum Test Pressure :	2,220.0	psig
Max Elevation Change:	45	Minimum Test Pressure :	1,850.0	psig

Time	Pressure (psig)	Pipe Temp.	Amb. Temp.	Weather	Visual Inspection	Comments
10-10-19 12:30 PM	0	48	25	Mostly Sunny	OK	Above ground pipe is hooched
12:45	0	50	25	cold		Build to 1013 - 50%
12:55	1015	52	25	Wind @ 3		hold 15 minutes
1:10	1016	53	26			Build to 1620 - 80%
1:16	1622	54	26			hold 15 minutes
1:31	1623	54	26			Build to 2026 - 100%
1:36	2026	54	26		OK	
* 1:45	2026	55	26			BEGIN TEST *
2:00	2027	56	27			
2:15	2031	56	28			
2:30	2036	57	28			
2:45	2039	57	29			
3:00	2041	57	30		OK	
3:30	2047	56	31	cloudy		
4:00	2050	56	30			bleed off to 2026
4:30	2031	55	29			
5:00	2035	54	28	light snow	OK	
5:30	2038	52	28			
6:00	2040	50	28			
6:30	2043	49	28	dark		
7:00	2045	48	27		OK	Turn Heat on
7:30	2048	52	27			
8:00	2050	57	27			Bleed Down to 2026
9:30	2032	67	25			
9:00	2035	73	25		OK	

Project Name : Crestone Kugel

AFE No. : 5000450 Test Section No. : 0

Time	Pressure (psig)	Pipe Temp.	Amb. Temp.	Weather	Visual Inspection	Comments
9:30 PM	2037	75	25	dark, still	Ok	
9:45	2038	76	24			END TEST
10:00	2038	76	24			Bleed to 1620
10:02	1620	76	24			hold 15 minutes
10:17	1622	76	22			Bleed to 1013
10:18	1013	76	22			hold 15 minutes
10:33	1014	76	21			Bleed to 0
10:45	0	76	21			
11:00	6	75	20			

Comments

Recorded Maximum Test Pressure at Chart: 2060 psig

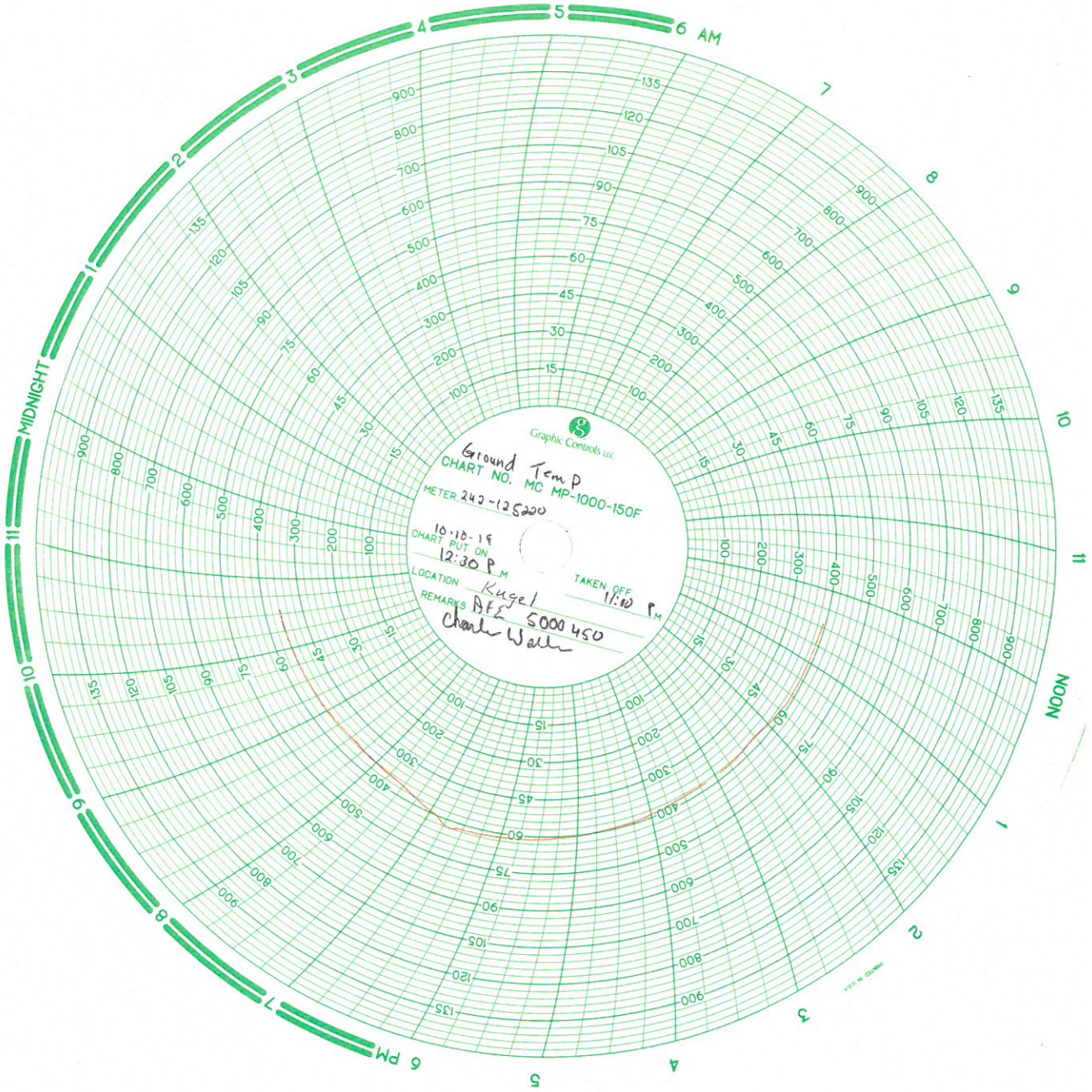
Recorded Minimum Test Pressure at Chart: 2026 psig

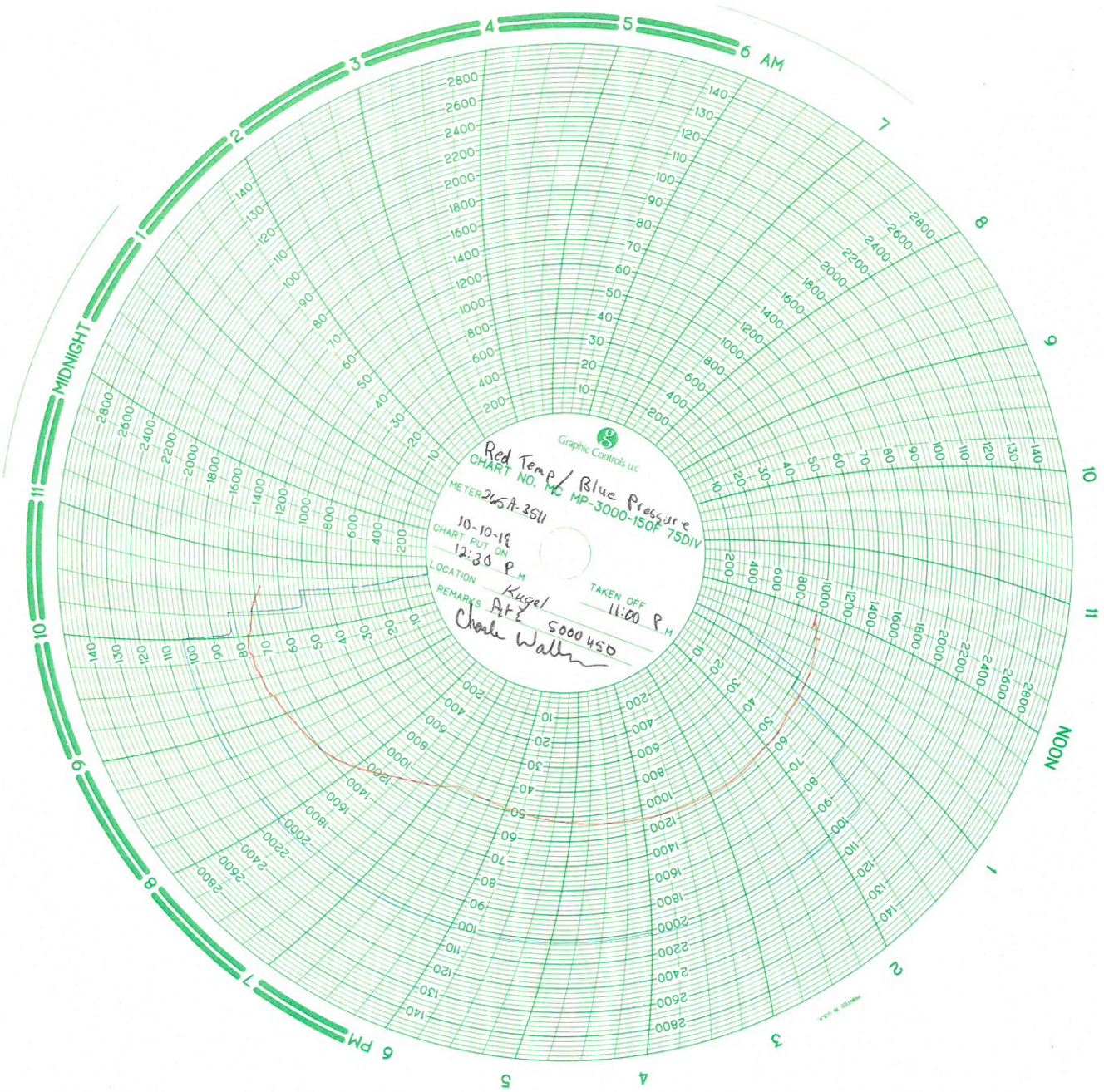
Pressure Test is : Accepted

Recorded by : [signature] (Contractor Representative) Print/Sign — 10-10-19 (Date)

Witnessed by: Charles Wallace / [signature] (Inspector/Integrity Representative) Print/Sign — 10-10-19 (Date)

Approved by : [signature] (Project Mgr./Construction Mgr.) Print/Sign — 10/10/19 (Date)


Graphic Controls LLC
Ground Temp
CHART NO. MC MP-1000-150F
METER 242-125220
10-10-19
CHART PUT ON
12:30 PM
TAKEN OFF
11:00 PM
LOCATION Kugel
REMARKS AFE 5000450
Charles Walker
MIDNIGHT
6 AM
NOON
6 PM


Graphic Controls LLC
Red Temp / Blue Pressure
CHART NO. MP-3000-150F-7SDIV
METER 265A-3511
CHART PUT ON 10-10-19 12:30 P M
TAKEN OFF 11:00 P M
LOCATION Kugel
REMARKS AFF 5000450
Charlie Walker
MIDNIGHT
6 AM
NOON
6 PM

C 1

P-SS-SS-COMPANIES

WASATCH SUPPLY

PSS PIPELINE SUPPLY & SERVICE

NORTH STATE SUPPLY NS

9700 E. 104TH AVE, UNIT F- HENDERSON, CO 80640 - Phone (303)857-7986 - Fax (303)389-4945

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER: CO

Details +/-: 1.0% ACCURACY

DATE CALIBRATED: 06/19/2019
DUE DATE: 06/19/2020

INDICATED TEMPERATURE RANGE: # 0 – 150°F
INDICATED PRESSURE RANGE: #0 – 3000 PSI
SERIAL NO: 265A3511
MANUFACTURER: BARTON/ 12" RECORDER

TYPE OF INSTRUMENT CALIBRATED: TEMPERATURE / PRESSURE RECORDER

INSTRUMENT FINDINGS/STATUS: UNIT IS IN TOLERANCE/ INSTRUMENT MEETS OR EXCEEDS SPECIFICATIONS.

BASED ON INTERNATIONAL STANDARDS OF GRAVITY: (980.665 cm./sq.).

TYPE OF STANDARD USED TO CALIBRATE: REFINERY DEADWEIGHT TEST UNIT SPT. (35225-3) SERIAL No. 5268: KESSLER TEST THERMOMETERS; SERIAL NO. CALIBRATION

ALL STANDARD DIRECTLY TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGIES TEST NO: (N.I.S.T.) 2.6/172490 & 6.6/139577.

CALCULATED USING MASS VALUES, AREA, AO, AND STATED GRAVITY.
ROOM TEMPERATURE/HUMIDITY (AT TIME OF TEST): 66°F / 25%.

CALIBRATED BY: NICK BEDFORD

SIGNATURE

JMC INSTRUMENTS INC.
9829 E. Easter Ave. • Centennial, CO 80112
303.794.8833 • Fax 303.730.1220
Toll Free 1.800.327.7257
www.jmcinstruments.com

CR-4

CERTIFIED CALIBRATION

CUSTOMER Cross Country ORDER NO. _____

ITEM Digital Gauge RANGE 0-5000PSIG ITEM NO. 5002-3

TRUE VALUE	INDICATED VALUE	
PSIG	INCREASING READINGS	DECREASING READINGS
0.00	0	0
500.00	499.1	499.5
1000.00	998.4	998.8
1500.00	1498.0	1497.7
2000.00	1997.2	1996.9
2500.00	2496.4	2497.0
3000.00	2996.6	2995.7
3500.00	3495.2	3494.4
4000.00	3993.9	3994.8
4500.00	4497.2	4496.7
5000.00	4993.6	4993.6

Tested On: Deadweight Tester S/N# 1GA4474

Traceable to National Institute of Standards and Technology certificate # 17-043

Tested By: BM2 Date 27 Sept 2019

Remarks:

Crystal	XP2i	SN 822296
Accuracy is +/-	.25	% of Full Scale or Better
Test Conditions	72 °F;	mmHg Atm. Pressure

P-SS-SS-COMPANIES

WASATCH SUPPLY

PSS PIPELINE SUPPLY & SERVICE

NORTH STATE SUPPLY NS

9700 E. 104TH AVE, UNIT F- HENDERSON, CO 80640 - Phone (303)857-7986 - Fax (303)389-4945

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER: CO

Details +/-: 1.0% ACCURACY

DATE CALIBRATED: 09/11/2019
DUE DATE: 09/11/2020

INDICATED TEMPERATURE RANGE: # 0 – 150°F
INDICATED PRESSURE RANGE: #0 – 1000 PSI
SERIAL NO: 242-125220 / **ID:** 010613
MANUFACTURER: BARTON/ 12" RECORDER

TYPE OF INSTRUMENT CALIBRATED: TEMPERATURE / PRESSURE RECORDER

INSTRUMENT FINDINGS/STATUS: UNIT IS IN TOLERANCE/ INSTRUMENT MEETS OR EXCEEDS SPECIFICATIONS.

BASED ON INTERNATIONAL STANDARDS OF GRAVITY: (980.665 cm./sq.).

TYPE OF STANDARD USED TO CALIBRATE: REFINERY DEADWEIGHT TEST UNIT SPT. (35225-3) SERIAL No. 5268: KESSLER TEST THERMOMETERS; SERIAL NO, CALIBRATION

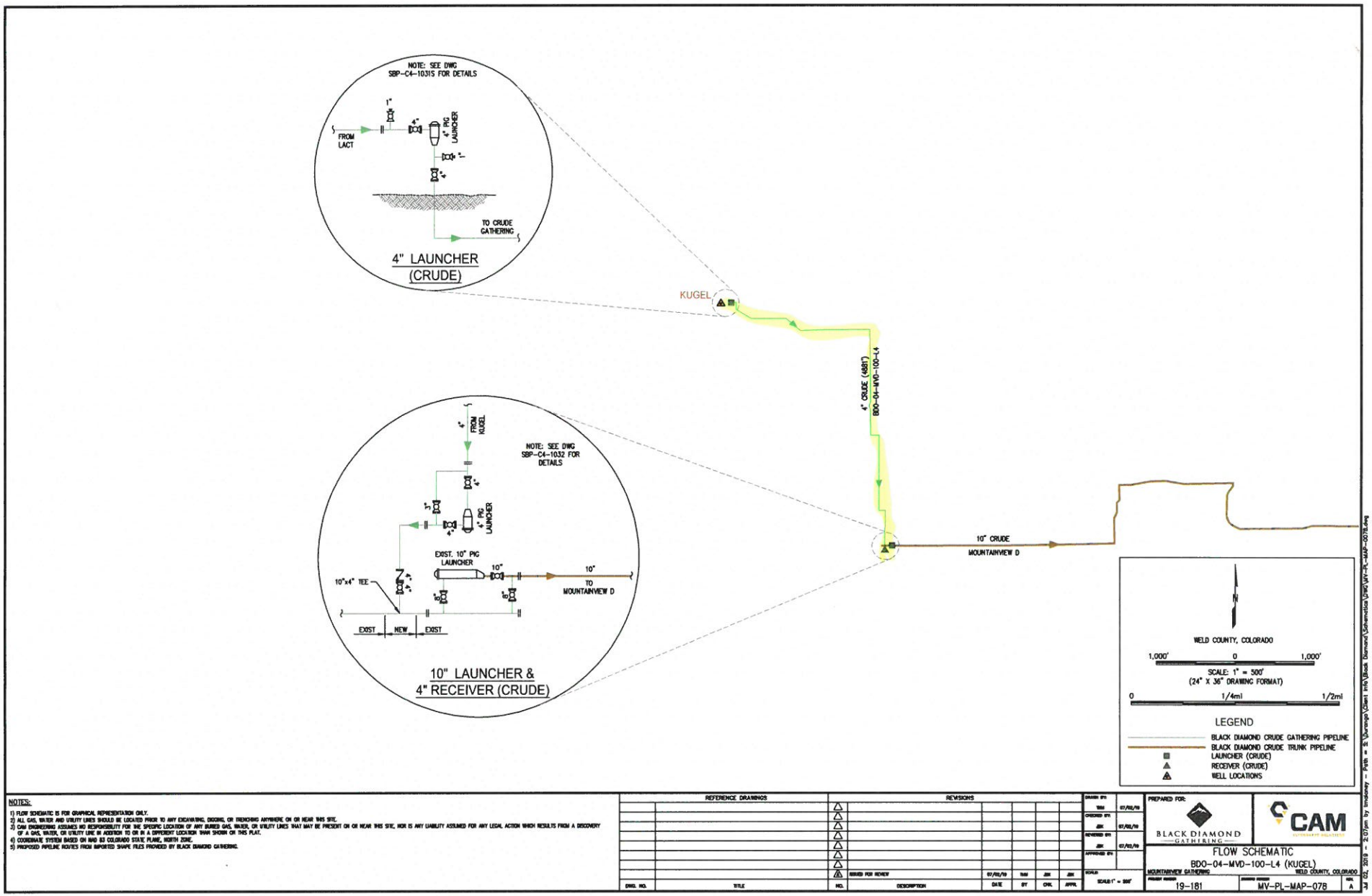
ALL STANDARD DIRECTLY TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGIES TEST NO: (N.I.S.T.) 2.6/172490 & 6.6/139577.

CALCULATED USING MASS VALUES, AREA, AO, AND STATED GRAVITY.
ROOM TEMPERATURE/HUMIDITY (AT TIME OF TEST): 66°F / 25%.

CALIBRATED BY: NICK BEDFORD

Nick Bed

* hydrotest included receiver (1032-58), launcher (1031-52), fab between launcher + lact, bypass between 4" receiver + 10" launcher and all piping between 4" receiver + 4" launcher



NOTES:
1) FLOW SCHEMATIC IS FOR GRAPHICAL REPRESENTATION ONLY.
2) ALL GAS, WATER AND UTILITY LINES SHOULD BE LOCATED PRIOR TO ANY EXCAVATING, DIGGING, OR TRENCHING ANYWHERE ON OR NEAR THIS SITE.
3) CAM ENGINEERING ASSUMES NO RESPONSIBILITY FOR THE SPECIFIC LOCATION OF ANY BURIED GAS, WATER, OR UTILITY LINES THAT MAY BE PRESENT ON OR NEAR THIS SITE, NOR IS ANY LIABILITY ASSUMED FOR ANY LEGAL ACTION WHICH RESULTS FROM A DISCOVERY OF A GAS, WATER, OR UTILITY LINE IN ADDITION TO OR IN A DIFFERENT LOCATION THAN SHOWN ON THIS PLAT.
4) COORDINATE SYSTEM BASED ON NAD 83 COLORADO STATE PLANE, NORTH ZONE.
5) PROPOSED PIPELINE ROUTES FROM IMPORTED SHAPE FILES PROVIDED BY BLACK DIAMOND GATHERING.

REFERENCE DRAWINGS

DWG. NO.	TITLE

REVISIONS

NO.	DESCRIPTION	DATE	BY	CHK.	APPR.
1	ISSUED FOR REVIEW	07/02/19	TMH	JBK	JBK

DRAWN BY: TMH 07/02/19
CHECKED BY: JBK 07/02/19
REVIEWED BY: JBK 07/02/19
APPROVED BY:
SCALE: SCALE:1" = 500'

PREPARED FOR: BLACK DIAMOND GATHERING

CAM

FLOW SCHEMATIC
BDO-04-MVD-100-L4 (KUGEL)
MOUNTAINVIEW GATHERING — WELD COUNTY, COLORADO
PROJECT NUMBER: 19-181
DRAWING NUMBER: MV-PL-MAP-078
REV: A

Jul 02, 2019 - 2:01pm by tmckinney - Path = S:\Surveys\Client Info\Black Diamond\Schematics\DWG\MV-PL-MAP-078.dwg

BLACK DIAMOND

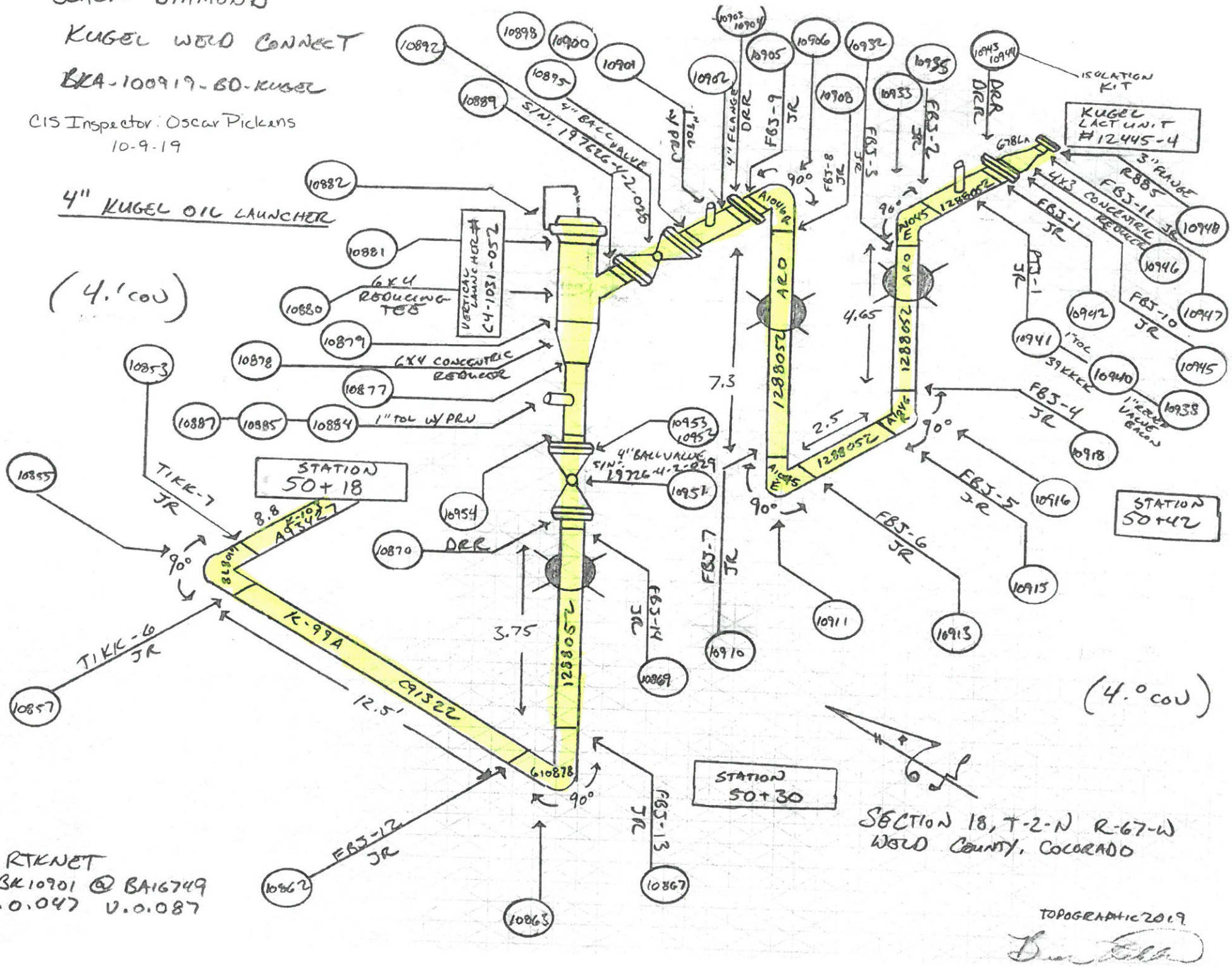
KUGEL WELD CONNECT

BKA-100919-60-KUGEL

CIS Inspector: Oscar Pickens

10-9-19

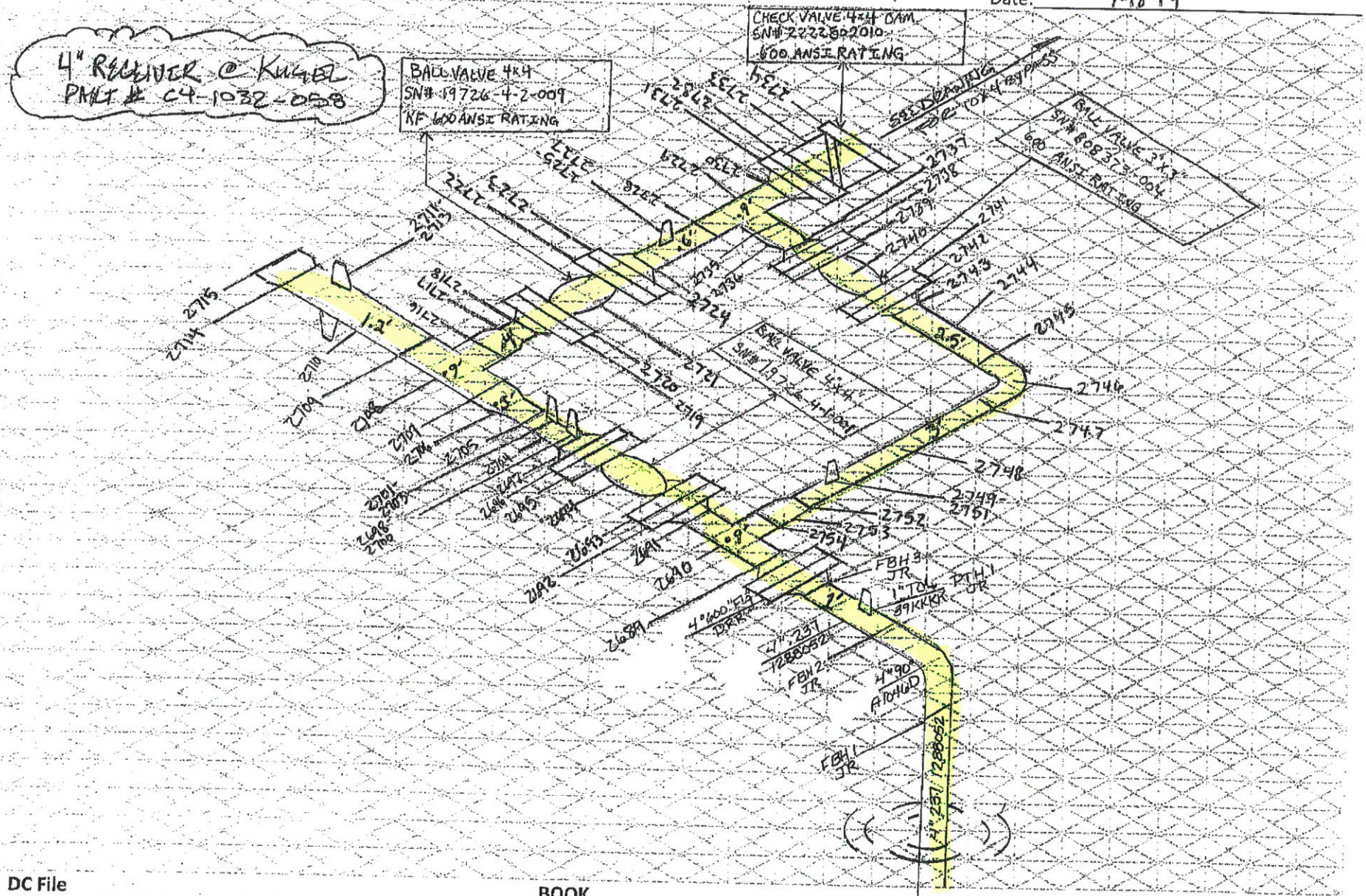
4" KUGEL OIL LAUNCHER



Client: NOBLE
Project: KUGEL
WO# 125010
Comments: AFE 5000450

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

P.C.- B. GLAZENER
I-MAN-
R-MAN-
Weather: 80°
Date: 9-18-19



DC File _____ BOOK _____ Page _____

BLACK DIAMOND
KUGER WELL CONNECT 5000450

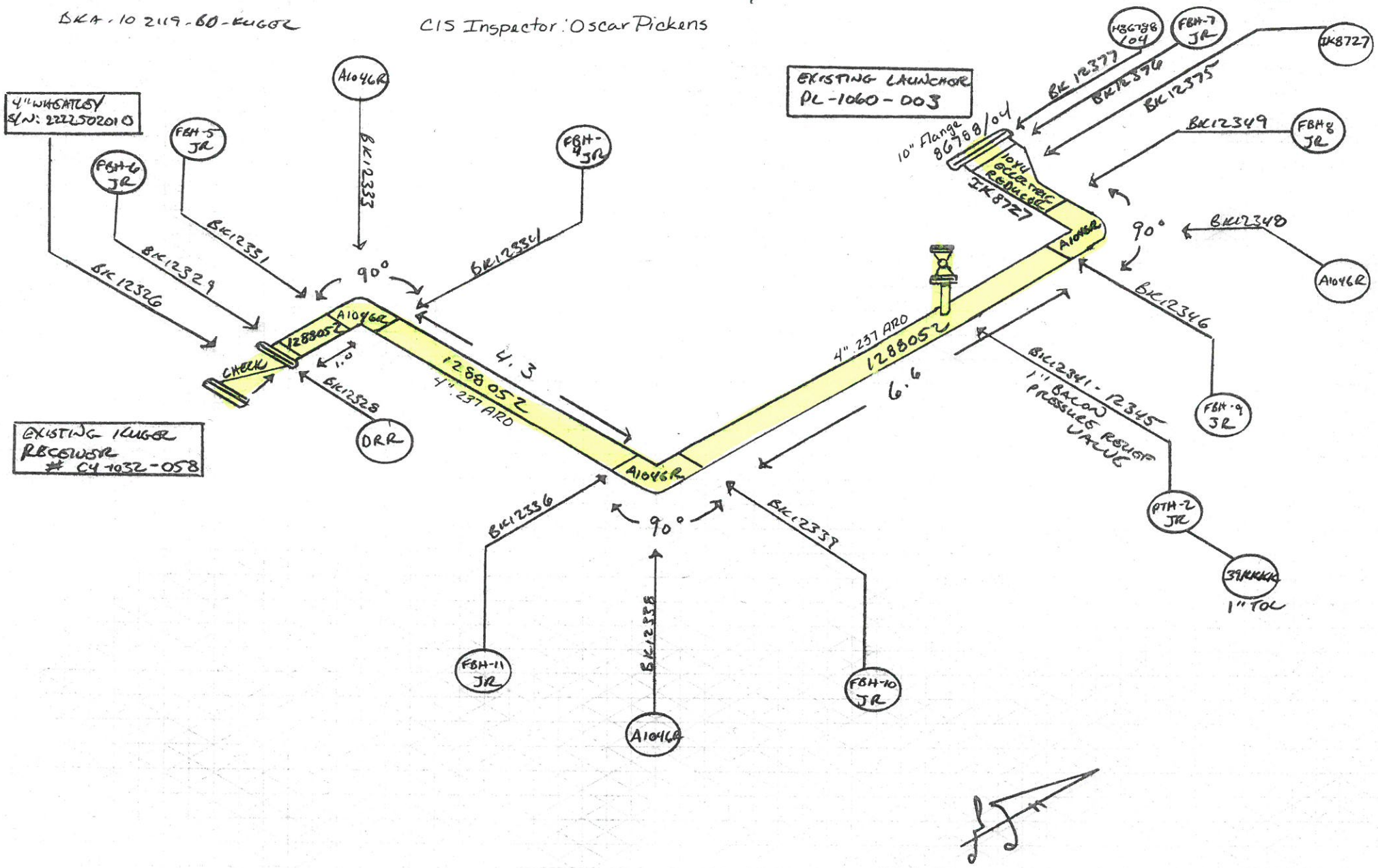
10/21/19

70°

BRIAN KOTCHOR
MATT BINGHAM

BKA-10 2119-60-KUGER

CIS Inspector: Oscar Pickens



RTKNOT!
BK12300 @ BA16749
H.0.016 V.0.007

TOPOGRAPHIC 2019