Natural Soda LLC

2019 Project Status Report
&
Annual Plan of Development
January 2020

Please note CONFIDENTIAL data sections of this document

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1.0 Introduction and Project Summary

This 2019 Project Status Report and Annual Plan of Development is submitted to fulfill the requirements of BLM sodium leases, COC-00118326, COC-00118327, COC-0119986, and COC-37474 as stated in Federal Regulations 43 CFR, Subpart 3591 and 3592 and the Project Record of Decision dated January 20, 1987. This report is also submitted to the Colorado Division of Reclamation Mining and Safety (DRMS) to meet the requirements for an Annual Report per State permit number M-1983-194, and in part to meet the requirements contained in the EPA UIC Class III Area Permits: CO30358-00000 and CO32169-00000.

This report summarizes the Natural Soda LLC (NS) 2019 process operations, production activities, reclamation status, geotechnical and environmental monitoring results, as well as, the status of surface facilities and wells. Proposed operations for 2020 will be described in this report, including drilling the 16H-1V and 16H-IR-E production wells and the 2020 Plugging and Abandonment Program.

2.0 Description of Project Area

2.1 Location and Regional Setting

The four NS sodium leases are located in the Piceance Creek Basin in Rio Blanco County in northwestern Colorado (Figures 1 and 2). The sodium leases are located primarily between the Yellow Creek and Piceance Creek drainages, approximately 41 miles from Meeker, Colorado and 53 miles from Rifle, Colorado. The climate is semi-arid with annual precipitation averaging 12-14 inches. Precipitation generally occurs as snow from November to March and as rain during the remainder of the year. The vegetation is predominantly pinyon pine, sagebrush, Utah juniper, western wheatgrass, and needle-and-thread grass. The total area contained within the four sodium leases is 8,379 acres more or less. The principle area of operation is located in and around Section 26, T1S, R98W, 6th Principal Meridian. Figure 1 shows the NS leases and regional setting. Figure 2 shows sodium leases within the Piceance Creek Basin. Figure 3 and Figure 4 show the NS well locations, and proposed well locations.

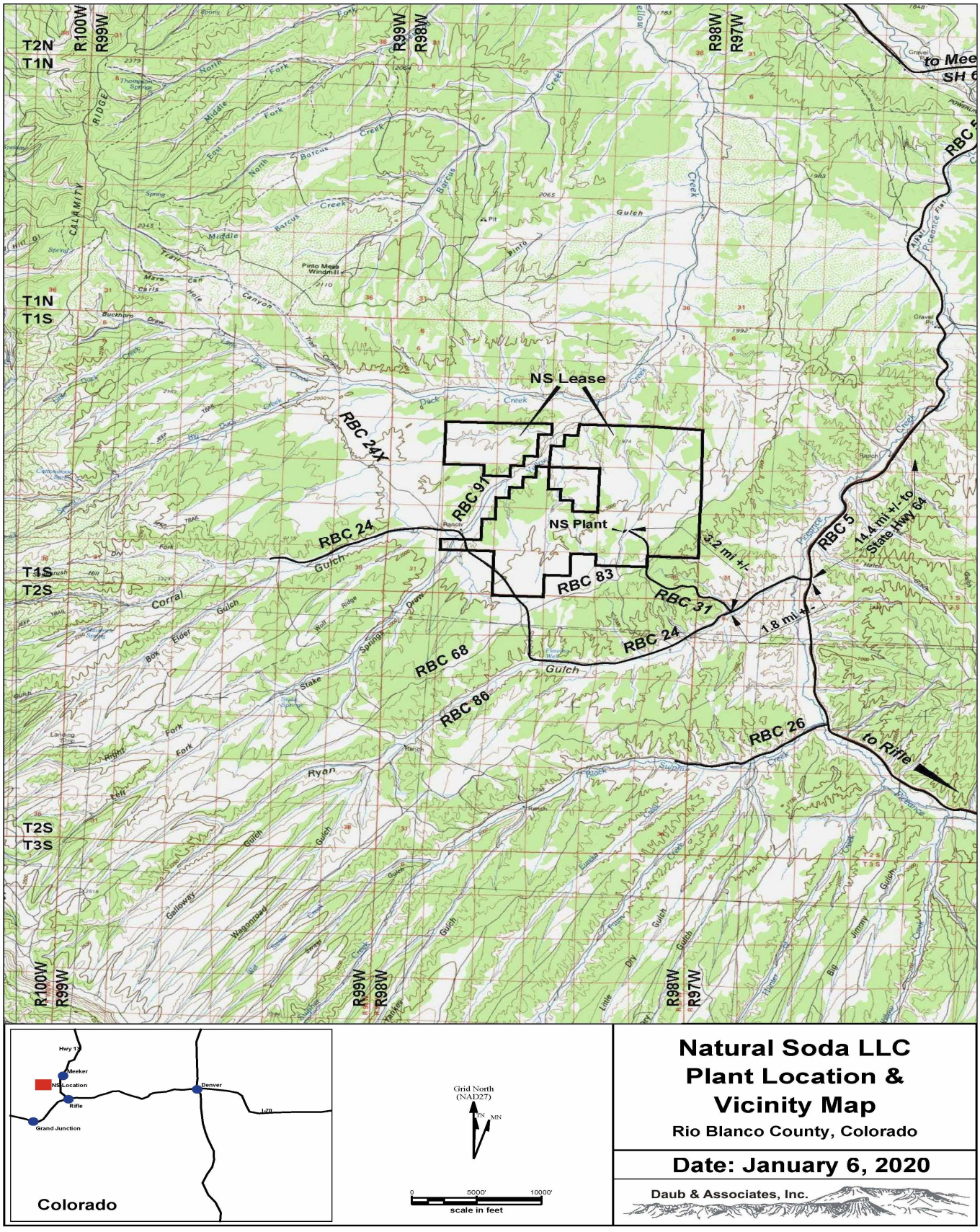

Figure 1: Natural Soda LLC Vicinity Map

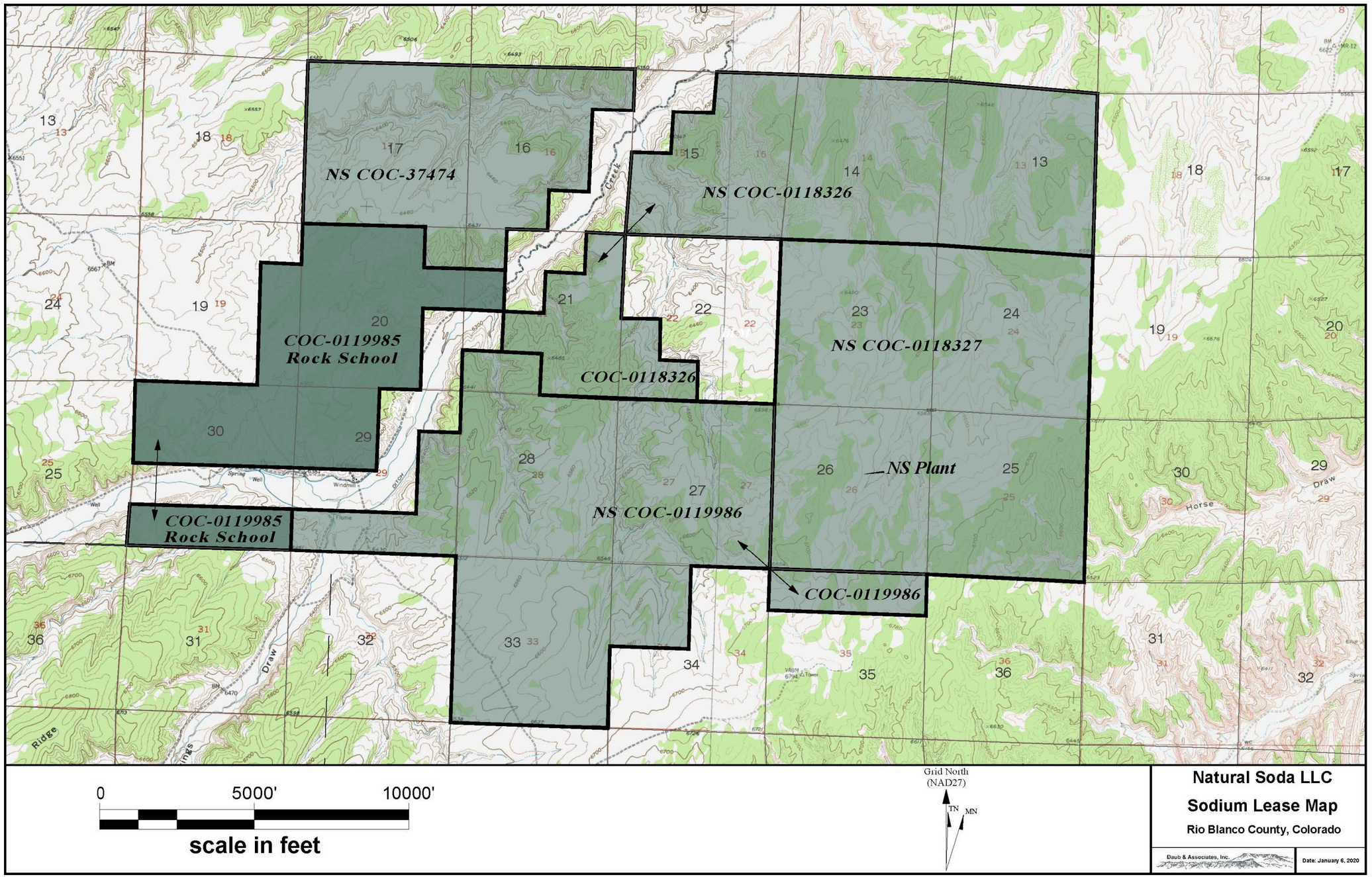

Figure 2: Sodium Leases Map

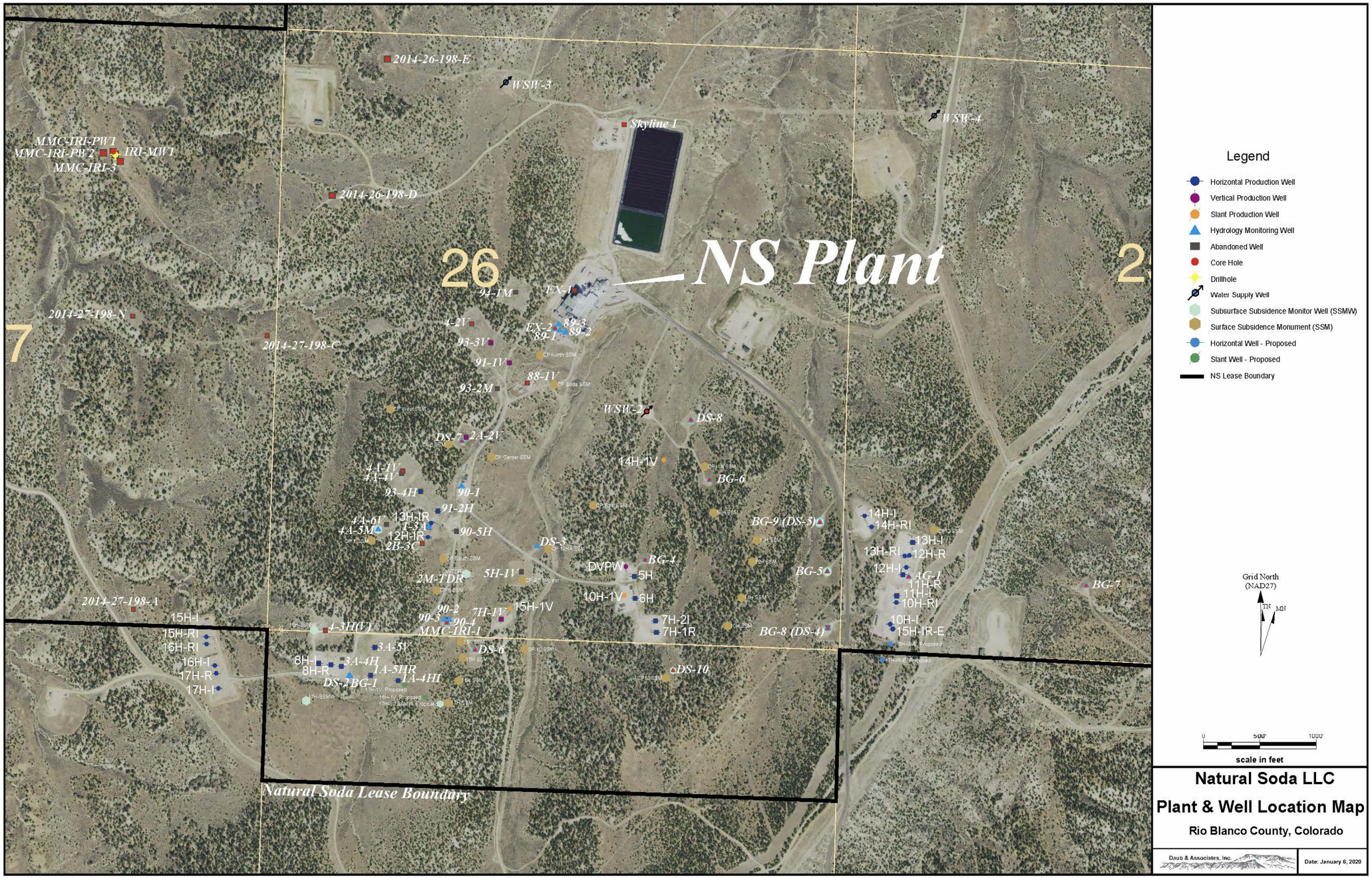

Figure 3: Plant and Well Location Map, Section 26 Detail.

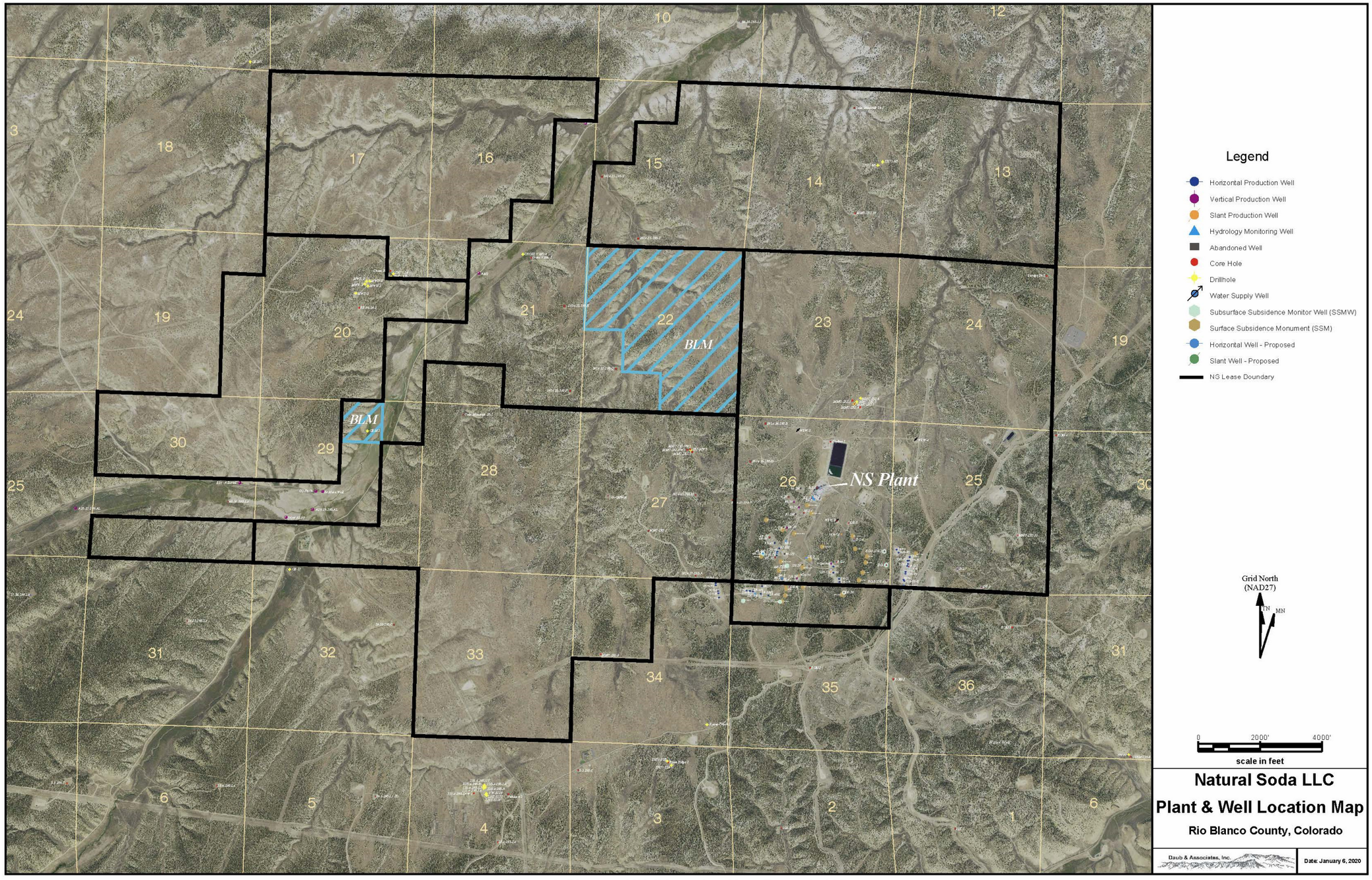

Figure 4: Plant and Well Location Map, Expanded View.

2.2 Leasehold Status

The original four sodium leases were renewed by the BLM, in 2011 for a period of ten years. Annual rental and royalty payments have been submitted to the Mineral Management Service. The NS leases comprise approximately 8,379 acres.

3.0 Project Status

3.1 2019 Project Activities (Confidential)

(See Figure 3 & Figure 4: Plant and Well Location Maps)

In 2019 NS produced 231,561 tons of sodium bicarbonate. This product was produced from the 10H, 12H, 13H, 14H, 15H, 16H, and 17H mining intervals. Routine boil outs were performed in 2019. Various short shut-downs were required for routine maintenance, equipment repair and/or replacement.

3.1.1 Items of Significance (Confidential)

- The 14H-1V (Slant Well), 15H-1V (Slant Well), and 15H-IR-E (Extended Lateral Well) production wells were variously drilled and/or completed in June and July.
- The DS-10 monitor well was drilled and completed during June and July and subsequently fitted with a sample pump.
- Sample pump equipment for the DS-2 and DS-3 monitor wells all had sampling equipment and pumps removed and were replaced in 2019.
- The 8H-I, 8H-R, and 13H-I production wells were successfully plugged and abandoned (P&A) in 2019.

3.1.2 Mining interval Production (Confidential)

Table 1: Mining Interval Production in Tons (Confidential)

Tons in 2019	Mining Interval #8H	Mining Interval #10H	Mining Interval #12H	Mining Interval #13H	Mining Interval #14H	Mining Interval #15H	Mining Interval #16H	Mining Interval #17H	Mining Interval DVPW1
	0	4,368	56,802	43,323	15,238	24,645	30,945	56,241	0
Total tons	93,878	356,348	206,642	153,589	232,559	155,149	110,380	72,762	1,264

3.1.3 2019 Monthly Production Tons Summary (Confidential)

Table 2: Monthly Production Summary in Tons (Confidential)

Month	Beginning Inventory	Production	Sales	Ending Inventory
January	3,354	22,212	20,417	5,149
February	5,149	16,914	15,826	6,237
March	6,237	16,584	17,487	5,334
April	5,334	19,610	18,886	6,058
May	6,058	19,564	18,935	6,687
June	6,687	19,906	19,001	7,592
July	7,592	17,518	20,696	4,415
August	4,415	21,364	18,961	6,817
September	6,817	17,538	19,112	5,243
October	5,243	19,435	20,090	4,588
November	4,588	20,258	18,573	6,273
December	6,273	20,658	18,932	7,998
TOTALS		**231,561**	**226,917**	

3.1.4 Regulatory Review (Confidential)

NS submitted routine Sundry Notices, monthly, quarterly, and annual reports to the appropriate agencies. The following summarizes other regulatory related activities:

Bureau of Land Management (BLM)

- NS submitted required Application for Permit to Drill (APD) and well completion documents for the DS-10 groundwater monitor well, 14H-1V production well, 15H-1V production well, and the 15H-IR-E production well.
- Sundry Notices for the P&A of the 8H-I, 8H-R, and 13H-I production wells were submitted.
- Undesirable Event reports (minor leaks of brine water to the ground surface) were submitted to the BLM in May and September 2019.
- In August 2019, NS, submitted the application for a 30 year renewal of ROW COC40613 (BLM Form 299). The right of way totals 12.05 acres.

United States Environmental Protection Agency (EPA)

- DS-10 GWM/SSMW well established a baseline gamma ray log and casing collar locator log for this dual purpose GWM/SSMW well.
- The EPA approved the addition and construction of the 14H-1V, 15H-1V, 16H-1V, and 17H-1V injection wells.
- The 13H-RI-E, 14H-RI, 15H-RI, and 16H-RI production wells were permitted for conversion to dual use injection/recovery. Required logging and MIT work was completed and submitted according to permit requirements.
- Routine Subsurface Subsidence Monitor Well (SSMW) Gamma-Ray logging was completed in the BG-5 in February.
- Routine Mechanical Integrity Testing (MIT) Part 2 temperature logging in the 13H-IR production well was completed in February.
- Routine MIT (Parts 1 and 2) was completed in the 10H-I production well in May.
- The EPA collected samples, inspected, and approved Natural Soda's facilities, records, processes, and controls in May.
- NS notified the EPA and provided completion documents for the plugging and abandonment of the 8H-I, 8H-R, and 13H-I production wells.
- Required logging and MIT work was completed and submitted for the newly constructed 15H-IR-E production well according to permit requirements.
- Mechanical Integrity Pressure Testing (MIT P1) was done in the newly constructed 14H-1V and 15H-1V slant production wells.
- NS submitted a UIC Add a Well (AAW) and request to inject (RTI) packet for the recently constructed 15H-IR-E production well.

- NS submitted an AAW packet for the 16H-IR-E production well to be drilled in 2020.
- NS updated the EPA's Financial Assurance documents in February, April, and December.

Colorado Division of Reclamation and Mine Safety (DRMS)

- NS submitted required annual payment fees and reports for DRMS Permits M-1983-194 and M-1999-051.
- The DRMS inspected the NS plant and well field in January, May, August, and October, no significant issues were noted.
- The DRMS approved Technical Revision (TR) 42 in May. TR 42 allowed for the construction of the 14H-1V and DS-10 wells and associated infrastructure.
- The DRMS approved TR 43 in June. TR 43 allowed for the construction of the 15H-1V, 16H-1V, 17H-1V, 15H-IR-E, 16H-IR-E, and 17H-IR-E wells and associated infrastructure.
- The DRMS approved TR 44 in October. TR 44 reduced the NS reclamation bond.

Colorado Division of Water Resources (DWR)

- The DWR issued a permit for the DS-10 groundwater monitor well in September 2019.

Colorado Department of Public Health & Environment (CDPHE)

- The annual CDPHE Sand and Gravel Mining and Processing Stormwater discharge Report Form was submitted in January.
- NS notified the CDPHE of the Start-up for the new "Main Boiler #2, mfr. Date: 2016" by submitting form APCD-103 in late October. CDPHE previously (March 2016) issued construction permit #15RB0259 for Main, Boiler #2.
- In May NS submitted a permit cancellation request for their back-up boiler #2 and renewed/updated six Air Pollution Emission Notices (APENs) to include: the main and #1 backup boilers, flash dryers and baghouses, air classifier, and mining and product conveyance.
- NS submitted required CDPHE form APCD-107 (Emissions Permit/APEN Cancellation) in December to cancel the old NS boiler #1 permit.
- In 2019 NS complied with all reporting requirements for storm water and environmental emissions.

Rio Blanco County (RBC)

- In May the existing Special Use Permit (SUP) 12-04 was amended to include the 14H-1V, 15H-1V, 15H-IR-E, and DS-10 wells and pads.
- On and off lease temporary living quarters were inspected and approved in June for use in support of the 2019 drilling program.

3.2 Proposed 2020 Activities and Schedule (Confidential)

3.2.1 Processing (Confidential)

NS anticipates increased production in 2020. Brief shut-downs for periodic boil-outs and routine maintenance are planned in 2020.

3.2.2 Well field (Confidential)

- NS anticipates limited production from the DVPW in 2020.
- The 16H-1V and 16H-IR-E Injection/Recovery wells are planned to be drilled, completed, and begin production in 2020.
- In 2020 NS anticipates Plugging and Abandoning (P&A) the 10H-I, 10H-R, 10H-1V, and 14H-I production wells.
- In December 2018 89-1 (B-Groove Aquifer) wells was Inspected with a video log to determine the status of the sampling equipment in the well. Post video log, an operation commenced to remove all of the old PVC tubing, nylon sample lines, and wire from the well bore. The old sampling pump was not recovered from the sandpack at the bottom of the 89-1 well. Due to the proximity of the well to overhead power lines, this work will only proceed during the NS plant annual common electrical outage. NS plans clean out the 89-1 well in May of 2020 during the electrical outage and replace the sampling pump and associated equipment in the wellbore.
- The 89-2 (A-Groove Aquifer) well underwent operations in 2018 to remove all of the old PVC tubing, nylon sample lines, sampling pump, and wire from the well bore. Due to the proximity of the 89-2 well to overhead power lines, this work will only proceed during the NS plant annual common electrical outage. NS plans clean out the 89-2 well in conjunction with the operations on the 89-1 well in May of 2020 during the planned plant annual electrical outage and replace the sampling pump and associated equipment in the wellbore.

3.2.3 EPA Notification – 2020 Schedule of Planned Mechanical Integrity Test (MIT) (Confidential)

- Per EPA UIC Permit C030358-00000 Final Area Permit requirements the following MIT Part 1 and MIT Part 2 testing is planned for 2019.
    - 15H-IR-E Well – initial, routine MIT Part 2 temperature logging will be conducted in the first or second quarter of 2020.
    - 16H-RI Well – initial, routine MIT Part 2 temperature logging will be conducted in the first or second quarter of 2020.
    - 16H-IV Well – initial, routine MIT Part 1 pressure testing, and Part 2 temperature logging will be conducted following well completion operations in 2020 per UIC permit requirements.
    - 16H-IR-E Well – initial, routine MIT Part 1 pressure testing, and Part 2 temperature logging will be conducted following well completion operations in 2020 per UIC permit requirements.

3.2.4 EPA Notification – 2020 Schedule of Planned SSM Survey (Confidential)

- NS will collect biennial surface subsidence monument surveys in 2021, in accordance with UIC Permit C030358-00000 requirements.

3.2.5 EPA Notification – 2020 Schedule of Planned SSMW Logging (GR/CCL) (Confidential)

- Per EPA UIC Permit C030358-00000 requirements; the following routine subsurface subsidence monitor well (SSMW) logging (GR/CCL) is planned for 2020:
    - No routine SSMW logging is planned for 2020.

4.0 2019 Project Activities

4.1 On-Site Facilities and Process Description

4.1.1 General Arrangement

Figure 5 provides an overview of the process flow.

4.1.2 Lab Operation / Sanitation / ISO

In 2019, activities continued in the laboratory to provide analysis for process control, quality assurance, and regulatory requirements.

- Plant operators performed process control analyses.
- Chloride levels were monitored by both operations and laboratory personnel on all USP grades to ensure USP standards were met.
- The USP test for insoluble materials was conducted on a per lot basis by laboratory personnel and a filter test for insoluble materials was conducted on the dry product once per shift by operations.
- Pests were controlled with the use of two UV bug lights and rodent traps around the interior and exterior walls of the plant.
- GMP/ISO/Sanitation training was provided for all employees as required.
- A food safety audit for FSSC 22000 was conducted for which Natural Soda maintained GFSI certification.
- CDPHE, NSF, OMRI, Kosher, Halal, non-GMO, and ISO 9001 certifications were maintained.

4.1.3 Process, Utilities, Facilities

- In 2019 NS installed and brought online a new boiler rated at 88.203 MM BTU per hour, fitted with a LoNOx burner. NS refers to this boiler as “Boiler, Main Number 2” and is permitted with CDPHE.
- In conjunction with the new boiler installation, NS added a new Barren Heat Exchanger. NS upgraded and expanded the condensate collection process and handling capacity.
- The 2 old NS boilers were retired, decommissioned and removed.
- The existing two boiler buildings were demolished and replaced with a new boiler building that encompass the upgraded boiler and all associated equipment.

Figure 5 illustrates the general process flow.

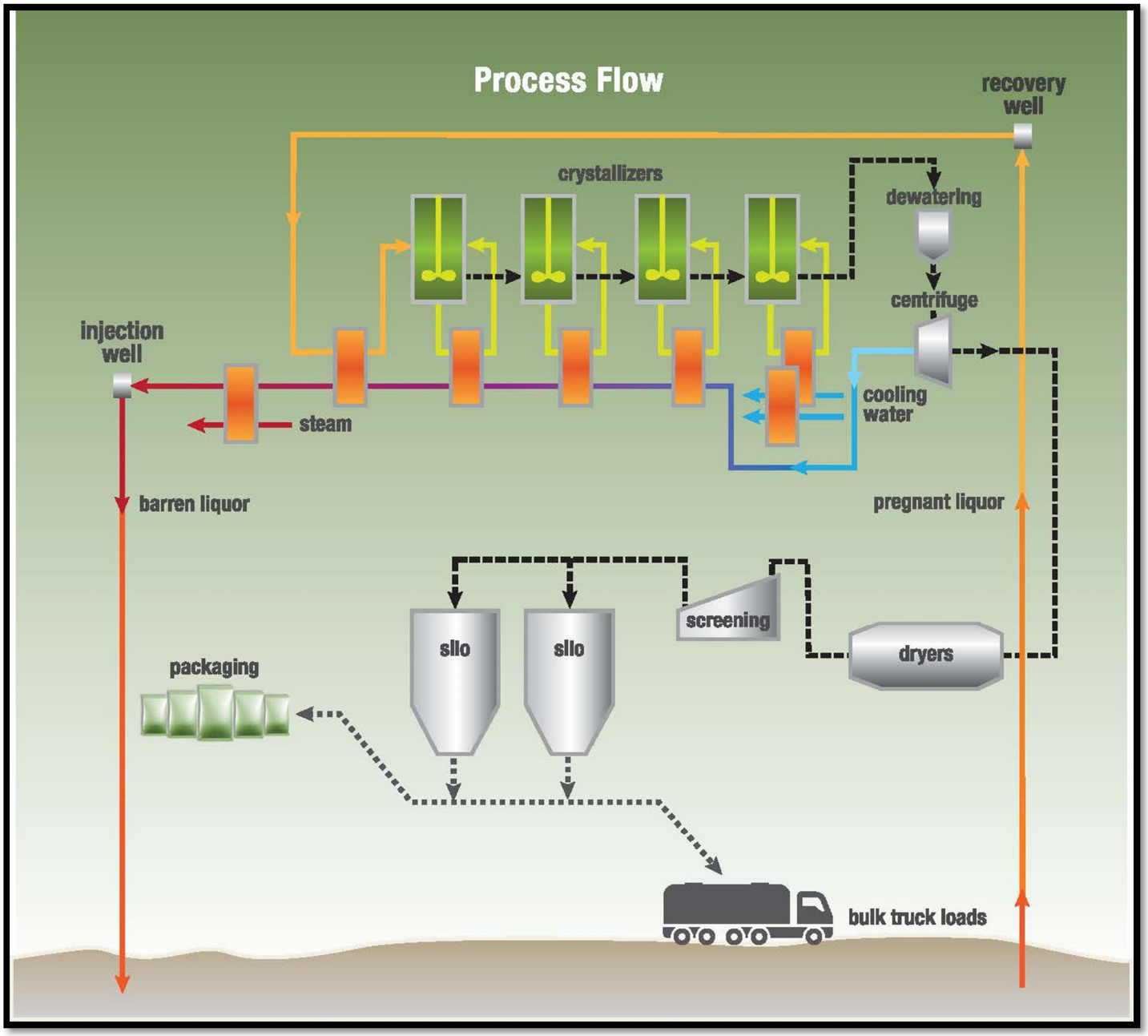

Figure 5: General Flow Process

4.1.4 Wells Associated With the NS Project (Confidential)

The following well-field related activities occurred in 2019: Refer to *Figure 3 & Figure 4 Plant and Well Location Map.*

- The DS-10 Core Hole/GMW/SSMW well was drilled and completed in 2019 to serve as a multi-purpose well for NS. The DS-10 will monitor the DS Aquifer and provide water level and chemistry data for the DS aquifer. Per EPA requirements the DS-10 will also serve as a subsurface subsidence monitor well for the 15H and 16H mining intervals.
- The 14H-1V Slant/Production well was drilled and completed in June 2019, and began producing in August 2019. Routine Mechanical Integrity Tests (MIT) Parts 1 & 2 were completed pursuant to UIC stipulations. The 14H-1V began producing in August 2019.
- The 15H-1V Slant/Production well was spudded on June 28, 2019, and completed on July 6, 2019. Routine Mechanical Integrity Tests (MIT) Parts 1 & 2 were completed pursuant to UIC stipulations. The 15H-1V began producing in September 2019.
- The 15H-IR-E Production well was spudded on July 8, 2019, and initially completed on July 29, 2019. Prior to operation the 15H-IR-E required additional remediation work that was completed in December 2019. Routine Mechanical Integrity Tests (MIT) Part 1 was completed pursuant to UIC stipulations. The 15H-IR-E began producing in January 2020.
- The DS-3 well sampling equipment and pump were removed and replaced with a new nitrogen lift pump (NLP) system in May 2019.
- The DS-2 well sampling equipment and pump were removed and replaced with a new nitrogen lift pump (NLP) system in May 2019.

The current status of all wells associated with the NS Project is indicated in *Table 3: List and Status of Wells Associated with NS*.

4.1.5 Other Activities

Continuous water level monitoring of proximal DS aquifer monitor wells provided real time data for the management of active production mining interval operations. Throughout the year, injection and recovery rates were adjusted to maintain monitoring well water levels near target zones.

Table 3: List and Status of Wells Associated with NS

Well Name	Initial Well Type	Current Well Status	Section	Town-ship	Range	Latitude (NAD 27)	Longitude (NAD 27)	Initial TD, (MD, ft)	Current TD, (MD, ft)	Comments
3M-TDR	Subsidence Monitoring	Subsidence Monitoring	26	1S	98W	39.928794934	108.362551397	1820	1820	
4A-5M	Hydrology/Subsidence Monitoring	Plugged and Abandoned	26	1S	98W	39.929813477	108.365383461	1830	0	P&A June 2012 Currently Operates as TDR Well
10H-I	Horizontal Injection	Horizontal Injection (Inactive)	25	1S	98W	39.927895622	108.349074715	4033	4033	TVD TD=~1995'
10H-R	Horizontal Recovery	Horizontal Recovery (Inactive)	25	1S	98W	39.928427876	108.348902019	2840	2840	TVD TD=~2005'
10H-1V	Slant Recovery	Slant Recovery (Inactive)	26	1S	98W	39.928386480	108.357515700	2038	2038	TVD TD =~2000
12H-I	Horizontal-Injection	Horizontal-Production	25	1S	98W	39.929304000	108.348621000	4189.0	4189	TVD TD=~1985’
12H-R	Horizontal-Recovery	Horizontal-Recovery	25	1S	98W	39.929598000	108.348538000	2623.0	2623	TVD TD=~2007'
12H-IR	Horizontal-Production (Inj/Rec)	Horizontal-Production	26	1S	98W	39.929667896	108.363801054	3464.7	3464.7	TVD TD=-1972’
13H-R(I)	Horizontal-Production (Inj/Rec)	Horizontal-Production	25	1S	98W	39.929583170	108.348684400	2549	2549	TVD TD=~2013’
13H-IR	Horizontal-Production (Inj/Rec)	Horizontal-Production	26	1S	98W	39.930014690	108.363712457	3423.7	3423.7	TVD TD=-1964’
14H-I	Horizontal Injection	Horizontal-Injection (Inactive)	25	1S	98W	39.930529000	108.349996000	3822	3822	TVD TD=~1970’
14H-R(I)	Horizontal Production (Inj/Rec)	Horizontal-Production	25	1S	98W	39.930265288	108.349763798	2819	2819	TVD TD=~1983’
14H-1V	Slant Production (Inj/Rec)	Slant Production (Rec)	26	1S	98W	39.931733549	108.35641781	2095.5	2095.5	
15H-I	Horizontal Injection	Horizontal-Injection	27	1S	98W	39.927281590	108.370834800	5477	5477	TVD TD=~1877’
15H-R(I)	Horizontal Production (Inj/Rec)	Horizontal-Production	34	1S	98W	39.927050806	108.370714984	2698	2698	TVD TD=~1850’
15H-1V	Slant Production (Inj/Rec)	Slant Production (Rec)	26	1S	98W	39.92797980	108.36112812	2079.1	2079.1	
15H-IR-E	Horizontal Production (Inj/Rec)	Slant Production (Inj)	25	1S	98W	39.92778393	108.34898748	4032.4	4032.4	
15H-SSMW	Subsurface Subsidence Monitoring	Subsurface Subsidence Monitoring	26	1S	98W	39.927297800	108.367304200	1760.5	1760.5	
16H-I	Horizontal Injection	Horizontal-Injection	34	1S	98W	39.926332533	108.371061443	5425	5425	TVD TD=~1910’
16H-R(I)	Horizontal Production (Inj/Rec)	Horizontal-Production	34	1S	98W	39.926848404	108.371348247	2451	2451	TVD TD=~1856’
17H-I	Horizontal-Injection	Horizontal-Injection	34	1S	98W	39.925807900	108.370279100	5378.9	5378.9	TVD TD=-1911’
17H-R	Horizontal-Recovery	Horizontal-Recovery	34	1S	98W	39.926171184	108.370365216	2431.7	2431.7	TVD TD=-1872’
17H-SSMW	Subsurface Subsidence Monitoring	Subsurface Subsidence Monitoring	35	1S	98W	39.925620961	108.367424479	1731.0	1720.6	
89-1	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.934818008	108.359830288	1989	1570	
89-2	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.934771572	108.359655360	1409	1389	
89-3	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.934959857	108.359876003	400	390	Periodic sampling issues.
90-1	Water Supply	Hydrology Monitoring Well	26	1S	98W	39.930942569	108.362786046	1451	1451	Converted to A-Grv MW August 2015
WSW-2 (2010-26-198-2C)	Core Hole	Water Supply	26	1S	98W	39.932913043	108.357000636	1964	1402	Cored July 2010
WSW-3	Water Supply	Water Supply	26	1S	98W	39.940837450	108.361799400	1440	1440	Drilled August 2014
WSW-4	Water Supply	Water Supply	26	1S	98W	39.940358200	108.348198508	1437	1437	Drilled August 2014
90-3	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.927659529	108.363196386	1577	1556	
90-4	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.927654857	108.363040763	1392	1371	
AG-1	Core Hole 2014-25-198-J	Hydrology Monitoring Well	25	1A	98W	39.929116963	108.348465043	2061	1487	Cemented up to groundwater monitoring well level
BG-1	Hydrology Monitoring	Hydrology Monitoring	35	1S	98W	39.92620970	108.36612260	1911	1552	
BG-4	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.929278506	108.356901248	1999.5	1603	
BG-5 (12H-C)	Core Hole	Hydrology & Subsidence Monitoring Well	26	1S	98W	39.929138572	108.351120681	3005	1645	Cemented up to groundwater monitoring well level.
BG-6 (2010-26-198-6C)	Core Hole	Hydrology Subsidence Monitoring Well	26	1S	98W	39.931301816	108.354997679	1978	1577	Bladder pump installed December 2010.
BG-7	Core Hole 2014-25-198-K	Hydrology Monitoring Well	25	1S	98W	39.928987896	108.432905289	1967	1593.1	Cemented up to groundwater monitoring well level.
BG-9 (DS-5)	Core Hole	Hydrology Subsidence Monitoring Well	26	1S	98W	39.930335423	108.351403951	1973	1902	Previously known as DS-5, Sep 2018: CIBP; 1829’, perfs: 1603-1623’ for B-Grv Monitoring.
DS-2 (97 DS2)	Hydrology Monitoring	Hydrology Monitoring Well	35	1S	98W	39.926217942	108.366158755	1854	1829	
DS-3	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.929529067	108.360329121	2100	1874.5	Sample pump replaced with NLP in 2018

Table 3: List and Status of Wells Associated with NS (continued)

Well Name	Initial Well Type	Current Well Status	Section	Town-ship	Range	Latitude (NAD 27)	Longitude (NAD 27)	Initial TD, (MD, ft)	Current TD, (MD, ft)	Comments
DVPW-1	Vertical Production	Vertical Production	26	1S	98W	39.929100000	108.357500000	2904.6	2904.6	Limited Production.
DS-6	Core Hole	Hydrology Monitoring Well	35	1S	98W	39.926942000	108.362195000	2962.6	1870	Cemented up to groundwater monitoring well level.
DS-7	Core Hole	Hydrology Subsidence Monitoring Well	26	1S	98W	39.932036903	108.362826421	1980	1875	Cemented up to groundwater monitoring well level.
DS-8	Core Hole 2014-26-198-I	Hydrology Monitoring Well	26	1S	98W	39.932738295	108.355594975	2000	1881.7	Cemented up to groundwater monitoring well level.
DS-9	Core Hole 2014-25-198-M	Hydrology Monitoring Well	25	1S	98W	39.927447860	108.340064803	1916.5	1842	Cemented up to groundwater monitoring well level
DS-10	Hydrology Subsidence Monitoring Well	Hydrology Subsidence Monitoring Well	35	1S	98W	39.92659671	108.35590409	1995	1925	
EX-2	Core Hole	Hydrology Monitoring Well	26	1S	98W	39.934857517	108.359996032	1980	1897	
MMC-IRI-1	Core Hole	Hydrology Monitoring Well	26	1S	98W	39.927580161	108.363115621	2981	397	Cemented up to groundwater monitoring well level.
MMC-IRI-4	Core Hole	Hydrology Monitoring Well	23	1S	98W	39.942950000	108.355333333	3001	1411	Cemented up to groundwater monitoring well level.
MMC-IRI-5	Core Hole	Hydrology Monitoring Well	23	1S	98W	39.943578031	108.355623039	2983	378	
MMC-IRI-6	Core Hole	Hydrology Monitoring Well	23	1S	98W	39.943733333	108.355316667	1878	1394	
MMC-IRI-7	Core Hole	Hydrology Monitoring Well	23	1S	98W	39.943516667	108.356033333	1880	1395	
MMC-IRI-8	Core Hole	Hydrology Monitoring Well	23	1S	98W	39.943450000	108.355833333	1880	489	
MMC-IRI-9	Core Hole	Hydrology Monitoring Well	34	1S	98W	39.920759982	108.383119038	2864	1710	
MMC-IRI-11	Core Hole	Hydrology Monitoring Well	25	1S	98W	39.931608050	108.336010982	2963	1550	Cemented up to groundwater monitoring well level.
MWA-2	Hydrology Monitoring	Hydrology Monitoring Well	20	1S	98W	39.952825612	108.412403600	1200	1200	
MWB-2	Hydrology Monitoring	Hydrology Monitoring Well	20	1S	98W	39.953067253	108.412206500	1398	1398	
MWD-1	Hydrology Monitoring	Hydrology Monitoring Well	20	1S	98W	39.953094778	108.411828300	1731	1731	
MWD-2	Hydrology Monitoring	Hydrology Monitoring Well	20	1S	98W	39.952635000	108.412036900	1703	1703	
MWU-2	Hydrology Monitoring	Hydrology Monitoring Well	20	1S	98W	39.933370000	108.350210000	687	687	
O-GMW-A	Core Hole 2014-27-198-O	Hydrology Monitoring Well (Inactive)	27	1S	98W	39.934483259	108.383446479	1786	1294	Cemented up to groundwater monitoring well level
TH75-6A	Hydrology Monitoring	Hydrology Monitoring Well	14	1S	98W	39.964492958	108.353578053	1260	1260	
TH75-6B	Hydrology Monitoring	Hydrology Monitoring Well	14	1S	98W	39.964807700	108.353045189	1755	1755	
TH75-7A	Hydrology Monitoring	Hydrology Monitoring Well	20	1S	98W	39.952321958	108.409207410	1080	1080	
TH75-7B	Hydrology Monitoring	Hydrology Monitoring Well	20	1S	98W	39.953286260	108.409494700	1498	1498	
RS-96-20-1	Hydrology Monitoring	Inactive	20	1S	98W	39.95037676	108.41282630	2598	1717	OH Packer at 1295’

4.2 New Findings or Developments (Confidential)

- The 10H mining interval reached the end of its useable life and was retired in 2019, the 10H-I, 10H-R, and 10H-1V wells will be P&A'd in 2020.
- The WSW-2 water supply well is currently pumping at a minimal rate. The water chemistry of the WSW-2 is currently under review.
- The DS-10 Core Hole/GMW/SSMW well was drilled and completed in 2019 to serve as a multi-purpose well for NS. The DS-10 well was drilled and cored the Boies Bed to provide addition geological data for the southern portion of the NS lease. The DS-10 well was completed as a DS Aquifer monitor well that will provide water level and chemistry data for the DS Aquifer. NS installed a transducer into the DS-10 well to allow it to be used to monitor DS Aquifer WL in conjunction with production mining of the 15H and 16H well interval. Per EPA requirements the DS-10 will also serve as a subsurface subsidence monitor well for the 15H and 16H mining intervals.
- In 2019, the 14H-1V Slant/Production well was drilled and completed as the first of three production wells drilled in 2019. The 14H-1V production well was drilled into the end of the existing horizontal well bore of the 14H-I production well, providing a new recovery well on the western end of the 14H mining interval. The 14H mining interval began production operations in August of 2019, the 14H mining interval had not been actively mined since June of 2018.
- The 15H-1V Slant/Production well was drilled and completed as the second of three production wells drilled in 2019. The 15H-1V well was drilled into the approximate mid-point of the existing horizontal well bore of the 15H-I lateral well. The 15H-1V production well will provide a new recovery/injection well to support the 15H mining interval from either the 15H-R(I)/15H-I wells on the western end of the mining interval, or the newly drilled 15H-IR-E production well drilled on the eastern end of the 15H mining interval. The 15H-1V began production operations in September of 2019, recovering fluid injected into the 15-R(I) well (western side).
- The third of three production wells drilled in 2019 was the 15H-IR-E Production well. The 15H-IR-E well was horizontally drilled and completed into the end of the existing 15H-I production well. In conjunction with the 15H-1V Slant/Production well, the 15H-IR-E will serve to enhance NS production capabilities and demonstrate a new model for the future mining of sodium bicarbonate on the NS lease.

4.3 2018 Operation Results (Confidential)

Mining and production activities were continuous in 2019. The following table provides a summary of mining and process results:

Table 4: Mine and Process Data (Confidential)

2019	Recovery	Recovery	Assay	Assay	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Monthly
Month	Avg GPM	Temp.	Bicarb g/l	NaCl g/l	Mining Interval #8H	Mining Interval #10H	Mining Interval #12H	Mining Interval #13H	Mining Interval #14H	Mining Interval #15H	Mining Interval #16H	Mining Interval #17H	Mining Interval DVPW1	Total Tons
Jan-19	1,916	196	211	23	0	0	5,078	3,248	0	4,656	3,285	5,945	0	22,212
Feb-19	1,640	194	212	19	0	87	4,350	2,330	0	2,863	2,588	4,696	0	16,914
Mar-19	1,497	194	208	17	0	1,047	4,330	2,504	0	426	3,248	5,028	0	16,584
Apr-19	2,016	193	198	17	0	932	4,515	4,053	0	1,233	3,983	4,895	0	19,610
May-19	1,833	195	202	18	P&A	1,023	5,081	3,946	0	554	3,420	5,540	0	19,564
Jun-19	1,846	197	206	18	P&A	619	4,979	3,953	0	1,151	4,143	5,060	0	19,906
Jul-19	1,709	196	207	18	P&A	366	4,628	3,541	0	29	4,380	4,574	0	17,518
Aug-19	1,987	194	206	20	P&A	292	5,121	4,777	1,850	0	4,599	4,725	0	21,364
Sep-19	1,737	185	205	20	P&A	0	4,469	3,172	2,653	2,078	1,299	3,867	0	17,538
Oct-19	1,720	186	204	19	P&A	0	4,266	4,385	3,506	3,408	0	3,870	0	19,435
Nov-19	1,827	184	201	18	P&A	0	5,047	3,282	3,848	4,133	0	3,946	0	20,258
Dec-19	1,862	185	203	18	P&A	0	4,938	4,131	3,381	4,112	0	4,059	0	20,658
AVERAGE	1,799	192	205	19	0	364	4,734	3,610	1,270	2,054	2,579	4,687	0	19,297
TOTAL					*0*	*4,368*	*56,802*	*43,323*	*15,238*	*24,645*	*30,945*	*56,241*	*0*	*231,561*

Key to above headings:	
	Recovery - Monthly average house flow rate and pregnant liquor temperature during process operations
	Assay - g/L sodium bicarbonate (as total bicarbonate) and sodium chloride in the pregnant liquor
	(Total bicarbonate = bicarbonate g/L + 1.58 x carbonate g/L)
	Tons - Total monthly bicarbonate production from each mining interval.
	Temp. - Temperature in degrees F recovered at the pregnant liquor tank.
	Avg GPM - Monthly average injection flow rate during process operations.

Figure 6 illustrates 2019 pregnant liquor analytical results. Figure 7 represents monthly production for 2019. NS processed and produced their sodium bicarbonate product during all twelve months of 2019. The balance between injection and recovery rates for mining intervals 10H, 12H, 13H, 14H, 15H, 16H, 17H, and the DVPW has been continuously monitored using fluid level indicators (pressure transmitters) installed in existing Dissolution Surface aquifer monitoring wells located near the active mining intervals.

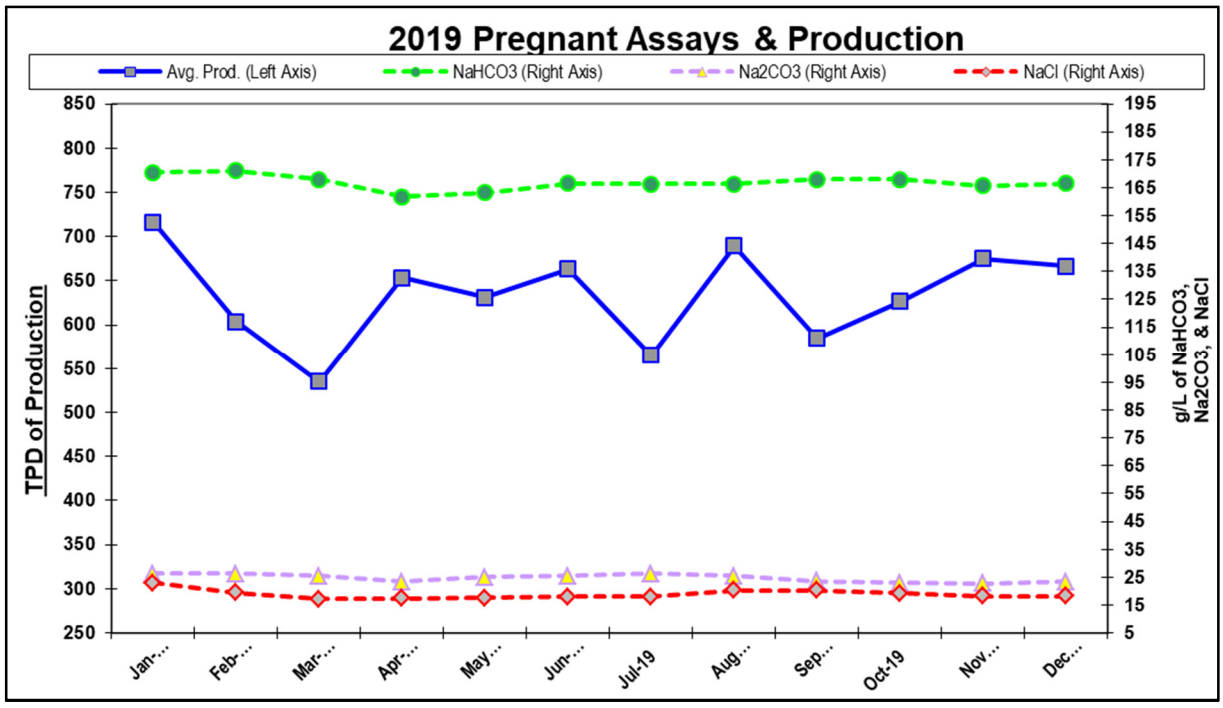

Figure 6: Pregnant Assays and Production (Confidential)

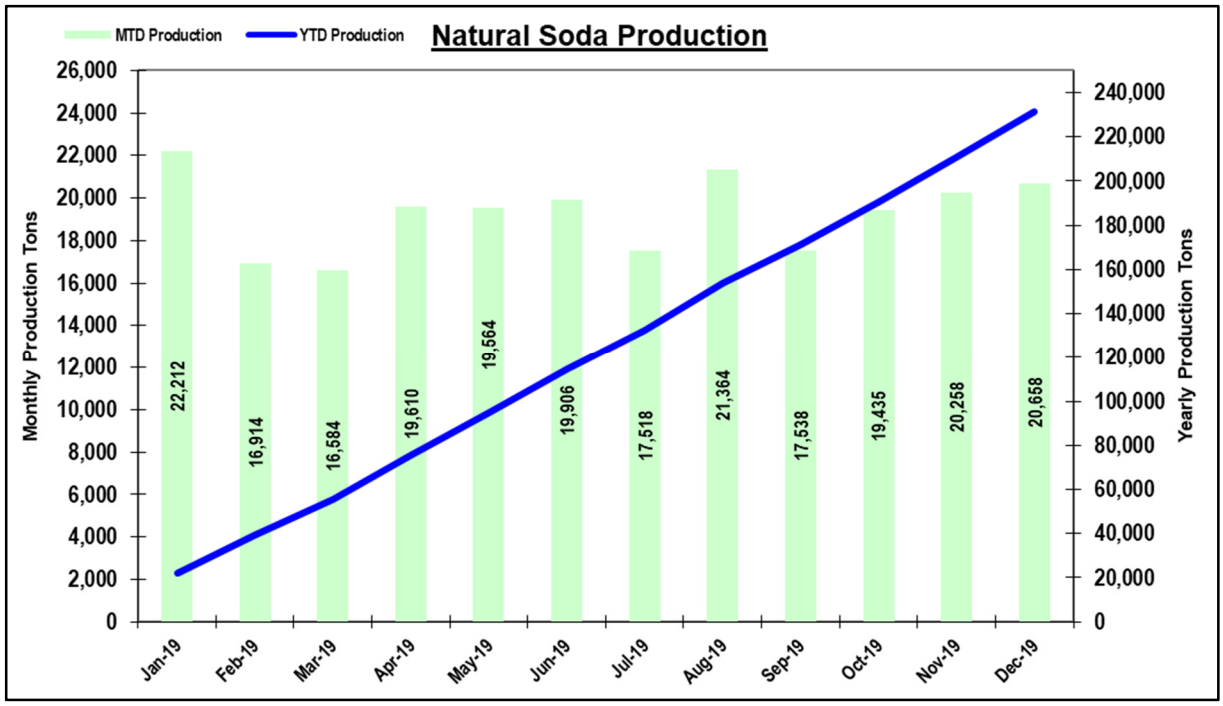

Figure 7: NS 2019 Production (Confidential)

4.4 Geotechnical Program

NS currently monitors two time-domain-reflectometry (TDR) subsurface-subsidence monitor wells, the 4A-5M and 3M-TDR. There has been no indication of surface or subsurface subsidence near the 4A-5M or 3M-TDR wells since installation. One of the TDR cables in the 4A-5M well is showing evidence of water infiltration. Two of the four TDR cables in 3M-TDR subsidence well were corrupted during installation, in 2003, and not operable. In addition to the monthly NS readings, the installation contractor also collects data quarterly.

4.4.1 Subsurface Subsidence Geophysical Logging

NS conducted the initial EPA mandated, subsurface subsidence logging, in the new DS-10 monitor well on July 1, 2019. This subsurface subsidence monitor well is associated with the 15H and 16H mining intervals.

4.4.2 Surface Subsidence Monitoring

A surface subsidence monument (SSM) survey of all SSMs above NS's area of operations was conducted in the second quarter of 2019. Results of the 2019 SSM survey are shown in Table 5 below.

4.5 Water Well Pumpage

In 2019, approximately 70.5 million gallons of water was pumped from water supply wells WSW-2, WSW-3, and WSW-4 with an average of 134.5 gpm. The total pumpage from WSW-2 was 226,000 gallons, WSW-3 was 40.5 million gallons, and the total pumpage from WSW-4 was 29.6 million gallons.

Table 5: Surface Subsidence Monument (SSM) Elevation Monitoring

SSM Monument	Initial Monument Elevation (ft. AMSL)	2019 Monument Elevation (ft. AMSL)	Elevation Change (ft.)
CP Soda BM	6,634.90	6,634.90	0.00
CP Center SSM	6,658.99	6,658.95	-0.04
CP North SSM	6,639.21	6,639.18	-0.02
CP East SSM	6,669.52	6,669.39	-0.13
CP South SSM	6,683.84	6,683.86	0.02
CP West SSM	6,669.77	6,669.59	-0.18
CP 6 SSM	6,682.88	6,683.06	0.18
CP 7 SSM	6,706.52	6,706.46	-0.06
CP 8 SSM	6,691.65	6,691.66	0.01
CP 10 SSM	6,687.41	6,687.39	-0.02
10H SSM	6,712.95	6,712.71	-0.25
11H SSM	6,705.81	6,705.48	-0.32
12H SSM	6,695.86	6,695.64	-0.22
13H SSM	6,684.47	6,684.22	-0.25
14H SSM	6,675.20	6,675.08	-0.12
15X SSM	6,694.41	6,694.37	-0.04
15H SSM	6,702.35	6,702.38	0.03
16H SSM	6,713.03	6,713.21	0.18
17H SSM	6,719.06	6,719.12	0.07
12HA SSM	6,661.41	6,661.39	-0.02
CP 11 SSM	6,653.71	6,653.69	-0.02
CP 12 SSM	6,702.11	6,702.11	0.00
CP 13 SSM	6,725.22	6,725.30	0.08

5.0 Environmental Monitoring and Protection

5.1 Hydrology Monitoring

5.1.1 Introduction

NS's hydrology monitoring program concentrates on groundwater, as there are no perennial streams or springs located on the NS's sodium leases. The USGS stream gauging station-monitoring program is conducted, with NS support, to provide regional surface stream flow data on Yellow and Piceance Creeks.

The hydrology-monitoring plan is designed to determine impacts of NS's solution mining operations on underground sources of drinking water, as designated by the US EPA.

Refer to Figure 3 and Figure 4 for the locations of existing monitor wells. Groundwater analytical results are presented in Appendix A.

5.1.2 Stream Gauging Stations

NS contracts with the USGS to monitor surface waters for water quality and quantity. Monitoring was performed upstream and downstream relative to the mining operations and with respect to Yellow Creek and Piceance Creek at four existing stations with extensive historical data. Historical stream gauging data is reported in this document and discharge data is complete through the 2018 water year (WY) (October 2017 – September 2018). Discharge data is mostly complete through the 2019 WY (October 2018 – September 2019).

The USGS surface water data are available to the public from the USGS web site at http://co.water.usgs.gov. Tables 6 and 7 summarize key 2019 WY data for surface water near the NS site.

Data reported in Table 6 and Table 7 is compiled from the USGS web site. At the time of publication of this Annual report, monitoring stations 6200 (Piceance Creek below Ryan Gulch) and 6242 (Corral Gulch near Rangely) 2019 year end water discharge reports were not available. The Specific Conductance and Temp data included in the tables were generated by using USGS lab test results for each stream reported on the USGS web site during the 2019 WY.

A review of USGS stream water quality data indicated no significant change in stream water quality during 2019. The NS 2019 precipitation data showed an increase at the NS location from 2017 (16.6"), 2018 (18.2"), through 2019 (20.8"). The WY data discharge (cfs) in this area does not indicate a similar increase in average stream discharge levels from 2017 to 2019. Possible reasons for the decrease in stream flow discharge levels 2017 through 2019 could be from irrigation diversions in the area. The USGS notes in the 2018 and 2019 year end water reports that the 6200 (Piceance Creek below Ryan Gulch) has diversions for irrigation upstream of monitor station. The 6222 (Piceance Creek at White River) has diversions for irrigation of ~5,500 acres upstream from the monitor station. The 6255 (Yellow Creek near White River) has

diversions to irrigate ~300 acres upstream from the monitor station. The 6242 (Corral Gulch near Rangely) which historically has been a low flow stream is not reported as having any diversions upstream from the monitoring station.

The 2019 Specific Conductance data from USGS for all four stations was within the range values for the period of record. Two (6220 & 6255) of the four streams had increases in Max Specific Conductance from 2018 to 2019 WY. Two (6222 & 6242) of the four streams had decreases in Max Specific Conductance from 2018 to 2019 WY.

The 2019 water temperature values were within the range of historic data. Post review of the USGS data, no effect on stream water quality was noted due to the NS mining operations.

Table 6: Historical Comparison with 2019 Water Year Data

Station	Discharge P of R*	Discharge 2019 WY**	Average Total Discharge P of R	Total Discharge 2019	Specific conductance (µS/cm @ 25° C)				Temp (°c.)	
					P of R	2019 WY	P of R	2019 WY	P of R	2019 WY
	cfs	cfs	ac ft/yr	ac ft/yr	Max	Max	Min	Min	Max	Max
6200	N/D (54 yrs)	N/D	N/D	N/D	2,800	1,740	600	1,310	26.3	18.1
6222	31.80 (50 yrs)	11.60	22,806	8,398	7,240	3,300	516	1,780	30.0	18.9
6242	N/D (44 yrs)	N/D	N/D	N/D	1,760	1,480	312	1,090	24.0	20.2
6255	2.40 (41 yrs)	1.63	1,732	1,180	5,200	4,530	460	3,580	31.0	23.2

6200 Piceance Creek below Ryan Gulch | 6242 Corral Gulch near Rangely

6222 Piceance Creek at White River | 6255 Yellow Creek near White River

* P of R = Period of Record for collection of data. | **WY = Water Year (October-September).

cfs = cubic feet per second, average annual flow. | N/D = No data available at time of publication

Table 7: Yellow and Piceance Creek Discharge Data up to 2019 Water Year

Project Data Comparison

Discharge for Water Years in cfs

Station	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
6200	14.3	15.2	27.9	16.3	13.4	36.2	17.5	11.3	10.7	15.9	17.0	11.7	7.5	N/D
6222	16.6	17.8	36.2	20.8	17.6	41.7	19.2	11.8	13.0	19.7	21.2	15.5	8.9	11.6
6242	0.2	0.5	1.3	0.4	0.3	1.1	0.3	0.2	0.5	0.5	1.9	0.6	0.1	N/D
6255	1.1	1.2	1.1	1.0	0.9	1.3	1.2	1.1	1.2	1.3	1.3	1.7	0.8	1.6

Maximum Specific Conductance (µS/cm @ 25° C)

Station	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
6200	1,800	1,700	1,460	1,620	2,020	1,460	1,610	1,930	2,040	1,770	1,840	2,120	1,700	1,740
6222	3,910	3,500	1,950	3,130	4,800	2,290	5,350	5,100	3,190	2,790	2,020	3,550	5,350	3,300
6242	1,500	1,280	1,350	1,320	1,460	1,280	1,480	1,430	1,400	1,330	1,170	1,280	1,490	1,480
6255	4,320	4,230	3,830	4,050	4,260	4,130	4,170	4,720	4,530	4,070	4,520	3,600	3,980	4,530

* P of R = Period of Record for collection of data. | **WY = Water Year (October-September). | cfs = cubic feet per second, average annual flow.

6200 Piceance Creek below Ryan Gulch | 6242 Corral Gulch near Rangely

6222 Piceance Creek at White River | 6255 Yellow Creek near White River

N/D No data available at time of publication.

5.1.3 Monitoring Wells

Per regulatory requirements, dedicated groundwater monitoring wells have been constructed to monitor four water-bearing intervals identified as the Perched, A-Groove, B-Groove, and the Dissolution Surface Aquifers. These aquifers are monitored at several locations across the solution mining area: up and down-gradient, remote down-gradient, and toward the east near the southeast portion of Section 26. Refer to Figure 3 and Figure 4 for well locations.

Baseline and current groundwater monitoring data have been obtained from 1991 through present. Within NS's lease boundaries, there are four aquifers defined by US EPA as underground sources of drinking water (USDW): the Perched, A-Groove, B-Groove, and Dissolution Surface Aquifers. The Dissolution Surface Aquifer has been exempted as an underground source of drinking water in the NS lease and permit areas. The DS Aquifer monitored by NS contains TDS values in excess of 10,000 parts per million (PPM).

The Perched Aquifer is characteristically lower in total dissolved solids (TDS), conductivity, fluoride, SAR (sodium absorption ratio) and moderate to higher in sulfate and pH. The A-Groove and B-Groove Aquifers are similar in water quality with moderate TDS, conductivity, SAR, but higher fluoride. However, the B-Groove Aquifer generally has slightly higher levels of TDS, conductivity, SAR, and fluoride. The Dissolution Surface Aquifer is characterized by very high TDS and conductivity (30,000 to >100,000 ppm), higher SAR, magnesium, potassium, moderate pH, and a generally higher fluoride.

In 2019 the results of groundwater monitoring were analyzed for potential anomalies in order to prevent or mitigate potential negative impacts to the USDW's.

Appendix A contains detailed sampling results for all groundwater monitoring wells.

5.1.4 Storage and Evaporation Ponds

The NS storage and evaporation ponds have a secondary liner and are constructed to collect and direct any condensation or leakage to tubes for removal. Weekly collection and removal of leachate continued in 2019. Pond information is reported on a monthly basis.

5.1.5 Potentiometric Surface Maps (Confidential)

Using groundwater level elevations from NS groundwater monitoring wells and other NS wells, the potentiometric surface has been plotted for the A-Groove and B-Groove Aquifers. Maps representing the potentiometric surface for the A-Groove and B-Groove Aquifers have been included with this report in Appendix C (Confidential).

6.0 Land Disturbance and Reclamation

6.1 Summary of 2019 Disturbance

NS created new disturbed acreage in 2019 by building two new pads and access to these locations for the DS-10 groundwater monitor well and the 14H-1V production well. The 15H-IR-E production well was built by extending the existing 10H pad resulting in some new disturbance and a small portion of the total area underwent interim reclamation. New disturbed acreage was used to build the 15H-1V production well pad on a location that had both previously disturbed and reclaimed land. Following drilling operations on the DS-10 GMW/SSMW well, the pad and road were regraded and pulled in and are now undergoing interim reclamation. The total disturbed acreage reported in 2018 was 98.55 acres. In 2019 the NS land disturbance is 103.49 acres as of December 2019. Table 8 lists the disturbed acreage as of December 2019.

Table 8: Disturbed Acreage

Process Area:	**Acres:**
Plant Site Disturbed	26.84
Plant Site Undergoing Interim Reclamation	4.46
Plant Site Undergoing Final Reclamation	0.00
Plant Site Successfully Reclaimed	0.00
Well Field:	
Roads Disturbed	2.39
Well Pads Disturbed	27.08
Roads/Misc. Undergoing Interim Reclamation	1.26
Well Pads Undergoing Interim Reclamation	12.66
Road/Misc. Undergoing Final Reclamation	0.91
Well Pads Undergoing Final Reclamation	7.65
Road/Misc. Successfully Reclaimed	1.55
Well Pads Successfully Reclaimed	18.69
Total Disturbance:	**103.49**

6.2 Regulatory Compliance

6.2.1 Regulatory Activity

In 2019, all required reports were submitted in a timely manner. Required forms were submitted to the appropriate agencies regarding all activities pertaining to the new wells drilled & associated plugging and abandonment operations.

6.3 Reclamation Activity

6.3.1 Regrading & Scarification

Regrading and scarification activities occurred in 2019 at the DS-10 GMW/SSMW pad location to support interim reclamation.

6.3.2 Seeding & Weed Control

The majority of seeding activity in 2019 focused on the areas disturbed following the 2019 well field drilling projects, specifically the DS-10 and 15H-IR-E well pads. These areas were reseeded with the BLM Approved final seed mix. The DS-10 was seeded following interim reclamation activities in November and the top soil pile for the 15H-IR-E was seeded in November.

Slash was placed on various well locations in 2019 for interim reclamation compliance. The pads slash was placed on include the A, C, G, DS-10 locations, and on the 15H-IR-E topsoil pile.

In 2019 NS applied weed control measures in and around the wellfield area as recommended by agency communication and the 2018 Vegetation Monitoring report. In 2019 Noxious weed control was conducted by Elder Weed Spraying. The focus of the weed control was Cheatgrass and Russian Thistle. Locations sprayed include the following; A, C, G, T, U, 5H-1V, 7H-IR, and the 90-2 well pads.

Annual vegetation monitoring continued in 2019 for the areas of study that are currently in final reclamation status. This report, *The 2019 Vegetation Monitoring Reclamation Status Report,* prepared by Mr. Rusty Roberts, can found in Appendix D.

6.3.3 Reclamation Fencing

Repair and maintenance was performed, as necessary, on existing fences in 2019 as needed. Fencing is utilized to keep livestock and wildlife out of the reclaimed areas.

All newly built, lined pits on the 14H-1V, 15H-1V, and 15H-IR-E locations were fenced for safety purposes.

6.3.5 Precipitation

Perennial vegetation is an indicator of long-term precipitation, the "normal" precipitation for the NS site is 12-14 inches for the calendar year. The distribution of precipitation is important for proper reclamation. 2019 precipitation as measured at the NS plant was 20.75 inches. Table 9 provides a composite of precipitation from the NS mine site for the last 10 years.

Table 9: Annual Precipitation in inches (10 Year)

Month/Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	AVG
Jan	0.40	0.18	0.18	0.25	0.98	0.47	1.62	1.89	1.26	0.67	0.79
Feb	0.20	0.15	1.15	0.30	0.35	0.39	1.34	1.52	1.35	1.47	0.82
Mar	1.45	1.25	0.30	0.50	0.28	0.82	1.76	1.01	1.55	0.85	0.98
Apr	0.25	1.25	0.40	1.35	0.63	1.71	5.18	1.11	1.74	2.99	1.66
May	0.05	0.95	0.14	1.05	1.66	4.36	2.06	2.17	1.52	2.93	1.69
Jun	0.95	0.00	0.06	0.35	0.01	0.51	0.53	0.47	0.99	3.86	0.77
Jul	0.45	0.23	0.43	1.40	1.34	1.78	1.07	3.36	1.27	1.87	1.32
Aug	0.40	0.00	0.86	0.26	3.17	1.44	2.78	0.85	3.24	0.83	1.38
Sep	0.70	0.13	0.36	2.89	2.14	0.32	2.19	1.55	0.10	1.75	1.21
Oct	1.08	0.87	0.58	1.35	1.09	1.38	1.89	1.62	4.10	1.19	1.52
Nov	0.35	0.05	0.28	1.30	0.80	0.70	1.56	0.64	0.60	1.62	0.79
Dec	1.67	0.32	0.83	0.17	1.00	0.10	1.04	0.44	0.45	0.71	0.67
Annual Totals	7.95	5.38	5.57	11.17	13.45	13.97	23.02	16.63	18.17	20.75	13.61

6.3.6 Vegetation Monitoring Results

See Appendix D for *2019 Vegetation Monitoring Reclamation Status Report* prepared by Rusty Roberts.

6.4 Deer Road Kill Study

Per the monitoring requirement from the BLM, NS compiled deer road kill data throughout 2019 for vehicles traveling to and from the mine site. Four deer of unknown sex were reported as struck and killed in 2019. Three deer of unknown sex were reported as struck but not killed, ran off into wilderness, in 2019. One cow was reported as struck and killed in 2019; the rancher claimed the carcass with no issues reported.

6.5 Raptor Survey

In 2019 NS conducted a raptor breeding activity survey and inventory in the pinion-juniper habitat that was proximal to the planned 2019/2020 well field development areas. The survey was performed on April 23, 2019 by Daub & Associates, Inc., and covered 144 acres of suitable raptor habitat. The intent of the raptor study was to identify raptor breeding areas and nests prior to well field development. The BLM White River Field Office assisted by identifying areas which provide the most suitable raptor nesting habitat within the 2019/2020 project areas. Surveyors walked predetermined transect paths checking all suitable trees for nests and higher accumulations of woody debris under trees. Call-playback techniques were used in conjunction with pedestrian surveys using the Kennedy Stahlecker-Rinker method. GPS track logs were collected from all transects surveyed. No new raptor nest, or known raptor nests were observed

within the area of study during the pedestrian transect surveys. One known raven nest first documented in 2014 was no longer present in 2019. Two red tailed hawks were seen outside the survey area near the plant. Hawks have been present in this location since 2017. A report was written and submitted to the BLM following completion of the survey. The area surveyed in 2019 included the areas of the planned 2020 well field development activities, therefore, per BLM guidelines, no raptor survey will be conducted in 2020.

6.6 Other Observations

Elk, deer, coyotes, rabbits, bobcat, and fox were noted in and around the well-field throughout the year.

6.7 Waste Disposal

Common domestic solid waste was collected in containers and periodically transported to the Rio Blanco County landfill. Sewage from the plant was directed to a septic system with a leach drain field. Process water, including cooling tower blowdowns, boiler ditch, plant wash down, blow down from the boilers, and precipitation runoff, was directed to the process pond. A pump in the process storage pond allows NS to recycle the water to the barren system. The wastewater evaporation pond contains water from the cooling tower overflow and laboratory drains. Table 10 indicates hazardous waste that was generated and collected at the NS facilities. Hazardous waste was collected, contained safely, stored separately from day to day waste, and then disposed of properly by Clean Harbors, Inc., a certified hazardous waste handling/disposal company.

Table 10: Hazardous Waste Disposal

Date Shipped	# of Containers	Total Quantity	Contents / Waste	EPA Waste Code
01/17/2019	4	899 lbs	UN1219, WASTE ISOPROPANOL SOLUTION, 3, PG II, -- TETRA-ALKYL AMMONIUM CHLORIDE	D001
04/30/2018	1	506 lbs	NA3082, HAZARDOUS WASTE, LIQUID, N.O.S. (SILVER, CHROMIUM) , 9, PG III -- CHLORIDE TEST WASTE	D007, D011
	1	8 lbs	UN1477, WASTE NITRATES, INORGANIC, N.O.S. (NITRATES, INORGANIC) , 5.1, PG II -- LABPACK REACTIVE OXIDIZERS FOR INCINERATION.	D001, D003
	1	14 lbs	UN1830, WASTE SULFURIC ACID (SULPHURIC ACID) , 8, PG II -- LABPACK MERCURY SALTS AND SOLUTIONS FOR RETORT.	D009
	1	72 lbs	NONE, NON DOT REGULATED MATERIAL, N/A, NONE, (UNIVERSAL WASTE-LAMPS) -- STRAIGHT FLUORESCENT TUBES FOR RECLAIM.	NONE
	1	62 lbs	UN1993, WASTE FLAMMABLE LIQUIDS, N.O.S. (ACETONE, ISOPROPANOL) , 3, PG II -- ACETONE WITH TERPENE PHENOLIC AND BLACK INK.	D001, F003
	1	5 lbs	UN2810, TOXIC LIQUIDS, ORGANIC, N.O.S (SULFITES, SODIUMBICARBONATE) , 6.1, PG III -- LABPACK ORGANICS FOR INCINERATION.	NONE
	1	11 lbs	UN3262, WASTE CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (SODIUMSULFIDE) , 8, PG II -- LABPACK BASIC AND BASIC COMPATIBLES FOR INCINERATION.	D002
	1	7 lbs	UN3260, WASTE CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (LITHIUMHYDROXIDE, SULFAMIC ACID) , 8, PG II -- LABPACK ACIT AND ACID COMPATIBLES FOR INCINERATION.	D002
	1	492 lbs	NONE, NON-REGULATED LIQUID (HYDROCARBONS) , N/A, NONE -- ULTRA FG.	NONE
09/19/2019	1	600 lbs	NA3082, HAZARDOUS WASTE, LIQUID, N.O.S. (SILVER, CHROMIUM) , 9, PG III -- CHLORIDE TEST WASTE	D007, D011
Reported from Natural Soda by Mr. Gerry Deschaine 01/03/2020				

Natural Soda LLC

Appendix A

Groundwater Analytical Results

Table 11: 89-3 Annual Perched Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	171	404.00	8/28/13	66.00	9/14/92	204.01	mg/l
Carbonate as CaCO3	171	138.00	12/5/12	3.00	6/26/90	29.66	mg/l
Total Alkalinity as	171	524.00	8/28/13	66.00	9/14/92	225.60	mg/l
Bromide	25	0.60	7/6/00	0.05	10/22/89	0.19	mg/l
Cation-Anion Balance	169	15.70	6/14/17	-13.00	12/16/15	0.19	%
Sum of Anions	148	12.60	8/28/13	5.10	6/14/17	7.55	meq/l
Sum of Cations	149	11.80	8/28/13	5.78	9/14/92	7.53	meq/l
Chemical Oxygen	19	300.00	9/23/10	10.00	10/22/89	51.82	mg/l
Chloride	171	75.30	8/28/13	4.00	9/27/90	15.77	mg/l
Conductivity, Lab	167	1,210.00	8/28/13	534.00	8/6/92	726.15	µmhos
Fluoride	171	18.00	7/31/91	0.02	4/19/01	0.48	mg/l
Hardness as CaCO3	170	113.00	4/11/06	27.00	3/30/90	79.91	mg/l
Nitrate as N, dissolved	27	0.76	7/24/02	0.02	12/5/12	0.14	mg/l
Nitrate/Nitrite as N,	27	0.85	7/24/02	0.03	7/18/95	0.15	mg/l
Nitrite as N, dissolved	27	0.10	6/26/91	0.01	6/25/07	0.04	mg/l
Nitrogen, Ammonia	24	13.10	9/23/10	0.11	7/12/96	1.52	mg/l
Nitrogen, Organic	24	13.40	6/26/91	0.10	7/18/95	1.93	mg/l
Nitrogen, Total Kjeldahl	24	25.40	9/23/10	0.20	7/21/94	3.20	mg/l
pH, lab	170	11.50	12/19/91	6.60	9/14/92	8.57	units
Phosphate, total	22	155.00	6/25/07	0.03	7/2/98	11.12	mg/l
Phosphorus, total	24	2.33	9/23/10	0.01	6/26/91	0.23	mg/l
SAR in Water	160	15.92	3/30/90	4.82	9/14/92	6.84	none
Sulfate	171	296.00	3/30/90	1.00	12/12/08	126.31	mg/l
Sulfide	21	4.50	9/23/10	0.03	7/2/98	0.49	mg/l
Total Dissolved Solids	171	659.00	8/28/13	329.00	6/14/17	441.57	mg/l
Conductivity, Field	188	16,000.00	7/1/90	500.00	2/24/93	778.70	µmhos
pH, Field	189	10.23	7/19/09	6.90	12/12/18	8.67	units
Temperature (°C), Field	99	21.10	7/19/09	6.40	12/1/90	12.05	(°C)
Water Level, Field	85	341.00	9/1/11	315.50	3/12/19	323.78	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	25	0.04	10/22/89	0.0007	12/5/12	0.0117	mg/l
Arsenic, dissolved	25	0.69	3/30/90	0.01	10/22/89	0.06	mg/l
Barium, dissolved	25	0.01	6/26/91	0.01	6/26/91	0.01	mg/l
Beryllium, dissolved	171	0.43	8/28/13	0.02	4/24/91	0.06	mg/l
Boron, dissolved	25	0.003	9/13/95	U	12/5/12	U	mg/l
Cadmium, dissolved	171	17.00	9/27/90	4.50	6/25/07	11.66	mg/l
Calcium, dissolved	26	0.01	6/26/91	0.01	6/26/91	0.01	mg/l
Chromium, dissolved	26	0.20	12/5/12	0.01	3/30/90	0.06	mg/l
Copper, dissolved	25	4.17	9/27/90	0.01	7/7/99	0.44	mg/l
Iron, dissolved	25	0.06	8/19/09	0.02	6/26/91	0.04	mg/l
Lead, dissolved	25	0.05	3/30/90	0.02	6/26/91	0.03	mg/l
Lithium, dissolved	171	18.40	7/24/02	3.00	3/30/90	12.32	mg/l
Magnesium, dissolved	25	0.14	9/27/90	0.01	7/7/99	0.03	mg/l
Manganese, dissolved	24	0.0005	10/22/89	0.0001	6/26/91	0.0003	mg/l
Mercury, dissolved	25	0.15	6/26/90	0.01	7/12/96	0.07	mg/l
Molybdenum, dissolved	25	0.02	10/22/89	0.02	10/22/89	0.02	mg/l
Nickel, dissolved	171	10.00	1/31/91	0.04	4/28/95	1.19	mg/l
Potassium, dissolved	25	0.002	3/30/90	0.001	9/27/90	0.002	mg/l
Selenium, dissolved	171	33.20	7/27/01	4.80	1/21/92	15.62	mg/l
Silica, dissolved	171	236.00	8/28/13	96.00	9/14/92	134.00	mg/l
Sodium, dissolved	171	1.09	4/11/06	0.17	3/30/90	0.81	mg/l
Strontium, dissolved	25	U	12/5/2012	U	9/23/2010	U	mg/l
Vanadium, dissolved	25	0.35	3/30/90	0.01	10/22/89	0.05	mg/l
Zinc, dissolved	25	0.04	10/22/89	0.0007	12/5/12	0.0117	mg/l

Table 12: IRI-1 Annual Perched Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	115	548.00	1/8/15	0.00	8/1/90	166.14	mg/l
Carbonate as CaCO3	115	300.00	10/25/90	0.00	8/30/08	120.90	mg/l
Total Alkalinity as	115	900.00	8/1/90	156.00	10/13/92	303.29	mg/l
Bromide	26	1.60	7/21/93	0.06	6/16/11	0.29	mg/l
Cation-Anion Balance	112	63.90	8/14/17	-16.00	3/13/03	0.74	%
Sum of Anions	105	24.97	8/13/90	5.30	6/15/14	9.05	meq/l
Sum of Cations	105	50.00	8/14/17	5.70	6/14/11	9.55	meq/l
Chemical Oxygen	19	300.00	9/21/10	10.00	8/16/94	46.25	mg/l
Chloride	115	400.00	4/24/91	14.00	12/15/92	52.42	mg/l
Conductivity, Lab	112	2,630.00	1/20/92	467.00	3/23/05	880.77	µmhos
Fluoride	115	24.00	9/2/98	1.70	4/20/92	6.53	mg/l
Hardness as CaCO3	115	553.00	8/1/90	2.00	6/23/10	37.79	mg/l
Nitrate as N, dissolved	26	2.77	6/26/02	0.02	6/28/06	0.38	mg/l
Nitrate/Nitrite as N,	26	2.79	6/26/02	0.03	6/28/06	0.35	mg/l
Nitrite as N, dissolved	26	0.13	8/16/96	0.01	8/1/90	0.05	mg/l
Nitrogen, Ammonia	25	2.57	7/31/91	0.25	6/9/99	0.76	mg/l
Nitrogen, Organic	25	3.90	7/21/92	0.10	6/16/11	1.03	mg/l
Nitrogen, Total Kjeldahl	25	5.90	7/31/91	0.50	6/16/11	1.83	mg/l
pH, lab	112	11.30	7/31/91	6.60	8/30/08	9.56	units
Phosphate, total	24	155.00	6/28/06	0.10	8/13/90	18.35	mg/l
Phosphorus, total	25	1.41	9/21/10	0.03	7/31/91	0.26	mg/l
SAR in Water	107	76.00	8/14/17	5.76	8/1/90	21.71	none
Sulfate	115	243.00	12/15/92	40.40	9/16/19	77.95	mg/l
Sulfide	24	4.00	6/13/01	0.03	6/2/98	1.08	mg/l
Total Dissolved Solids	113	1,644.00	8/1/90	335.00	6/15/14	597.48	mg/l
Conductivity, Field	172	3,500.00	8/1/90	643.00	11/27/12	1,169.82	µmhos
pH, Field	172	12.80	12/1/90	6.04	8/30/08	10.25	units
Temperature (°C), Field	112	20.10	5/16/07	6.50	12/12/08	12.29	(°C)
Water Level, Field	87	387.19	8/14/17	308.80	6/20/17	380.54	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	26	11.10	8/16/96	0.06	7/29/09	3.18	mg/l
Arsenic, dissolved	26	0.01	7/31/91	0.00	11/27/12	0.00	mg/l
Barium, dissolved	26	0.29	8/14/95	0.01	11/27/12	0.08	mg/l
Beryllium, dissolved	26	0.00	8/14/95	0.00	8/14/95	0.00	mg/l
Boron, dissolved	115	0.39	1/8/15	0.00	10/25/90	0.17	mg/l
Cadmium, dissolved	26	0.03	7/21/93	0.03	7/21/93	0.03	mg/l
Calcium, dissolved	115	223.00	8/1/90	0.90	6/23/10	11.52	mg/l
Chromium, dissolved	26	0.02	8/1/90	0.01	8/16/96	0.01	mg/l
Copper, dissolved	26	0.20	6/14/00	0.01	8/1/90	0.04	mg/l
Iron, dissolved	26	14.10	7/21/93	0.02	7/21/92	3.20	mg/l
Lead, dissolved	26	0.10	7/21/93	0.05	6/16/97	0.07	mg/l
Lithium, dissolved	26	0.19	8/13/90	0.00	8/30/08	0.05	mg/l
Magnesium, dissolved	115	31.20	3/14/00	0.30	9/26/01	2.57	mg/l
Manganese, dissolved	26	0.37	8/14/95	0.01	8/30/08	0.09	mg/l
Mercury, dissolved	26	0.0002	8/14/95	U	8/16/96	U	mg/l
Molybdenum, dissolved	26	0.10	8/1/90	0.01	6/16/97	0.04	mg/l
Nickel, dissolved	26	0.02	10/25/90	0.01	8/16/96	0.01	mg/l
Potassium, dissolved	115	146.00	8/1/90	1.00	4/24/91	7.76	mg/l
Selenium, dissolved	26	0.004	7/31/91	0.002	8/13/90	0.003	mg/l
Silica, dissolved	115	99.30	8/14/95	7.10	8/1/90	30.67	mg/l
Sodium, dissolved	115	1,110.00	8/14/17	126.00	6/14/11	200.65	mg/l
Strontium, dissolved	115	2.45	8/1/90	0.02	5/24/94	0.31	mg/l
Vanadium, dissolved	26	0.03	8/14/95	0.01	6/16/97	0.01	mg/l
Zinc, dissolved	26	0.24	7/21/93	0.02	6/9/99	0.07	mg/l

Table 13: IRI-5 Annual Perched Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	59	327.00	6/30/09	2.00	12/18/91	183.18	mg/l
Carbonate as CaCO3	59	284.00	12/18/91	0.00	6/14/08	76.98	mg/l
Total Alkalinity as	59	406.00	3/25/92	181.00	5/29/02	252.21	mg/l
Bromide	29	1.00	8/22/91	0.00	8/12/92	0.21	mg/l
Cation-Anion Balance	56	17.30	6/14/08	-10.20	5/26/04	0.89	%
Sum of Anions	51	15.77	6/16/92	8.43	12/19/95	9.92	meq/l
Sum of Cations	51	15.25	6/16/92	7.90	5/26/04	10.15	meq/l
Chemical Oxygen	26	181.00	11/2/15	0.00	5/29/02	53.69	mg/l
Chloride	59	420.00	6/16/92	9.00	12/19/95	21.24	mg/l
Conductivity, Lab	59	1,500.00	6/16/92	795.00	8/12/91	976.56	µmhos
Fluoride	59	0.90	9/16/91	0.00	6/30/95	0.29	mg/l
Hardness as CaCO3	59	182.00	6/14/08	1.00	12/20/93	33.49	mg/l
Nitrate as N, dissolved	30	12.50	5/29/02	0.00	8/12/92	1.03	mg/l
Nitrate/Nitrite as N,	30	12.50	5/29/02	0.00	8/12/92	0.91	mg/l
Nitrite as N, dissolved	30	0.06	9/14/92	0.00	8/12/92	0.02	mg/l
Nitrogen, Ammonia	30	0.87	6/23/94	0.08	5/21/07	0.29	mg/l
Nitrogen, Organic	30	80.00	5/15/98	0.00	8/12/92	5.09	mg/l
Nitrogen, Total Kjeldahl	30	80.00	5/15/98	0.40	6/25/19	4.89	mg/l
pH, lab	59	11.90	6/28/93	2.40	6/16/92	9.22	units
Phosphate, total	28	155.00	7/29/09	0.06	5/29/02	6.20	mg/l
Phosphorus, total	30	1.87	6/18/96	0.02	5/29/02	0.21	mg/l
SAR in Water	50	90.44	1/20/94	7.50	6/30/09	22.64	none
Sulfate	59	290.00	3/25/92	148.00	3/22/96	203.29	mg/l
Sulfide	29	1.20	8/24/17	0.05	6/14/08	0.32	mg/l
Total Dissolved Solids	58	1,090	6/16/92	504	4/21/94	631	mg/l
Conductivity, Field	72	9,880	5/21/07	715	12/19/95	1,178	µmhos
pH, Field	71	12.00	8/12/92	6.33	6/14/08	9.88	units
Temperature (°C), Field	32	17	6/14/08	9.70	11/1/02	12	(°C)
Water Level, Field	53	248.06	6/15/10	238.40	12/15/15	241.12	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	29	10.00	8/22/92	0.04	5/29/03	1.17	mg/l
Arsenic, dissolved	29	0.01	6/18/96	0.0003	5/26/04	0.0019	mg/l
Barium, dissolved	29	0.27	5/21/07	0.01	5/26/04	0.04	mg/l
Beryllium, dissolved	29	0.01	8/22/92	0.01	8/22/92	0.01	mg/l
Boron, dissolved	59	0.11	11/21/05	0.02	8/22/97	0.07	mg/l
Cadmium, dissolved	29	0.01	8/22/92	0.00	3/22/16	0.00	mg/l
Calcium, dissolved	59	63.60	6/14/08	1.00	6/16/92	7.05	mg/l
Chromium, dissolved	29	0.02	8/22/92	0.01	6/23/94	0.02	mg/l
Copper, dissolved	29	0.04	6/25/19	0.01	6/23/94	0.02	mg/l
Iron, dissolved	29	7.30	8/22/92	0.01	5/26/04	0.65	mg/l
Lead, dissolved	29	0.12	3/22/16	0.02	8/12/91	0.05	mg/l
Lithium, dissolved	29	0.06	10/3/12	0.02	5/26/04	0.03	mg/l
Magnesium, dissolved	59	9.10	6/30/09	0.30	6/30/95	4.52	mg/l
Manganese, dissolved	33	0.07	8/22/92	0.01	8/22/97	0.02	mg/l
Mercury, dissolved	29	0.0001	8/22/92	U	8/24/17	U	mg/l
Molybdenum, dissolved	29	0.03	6/14/08	0.01	6/18/96	0.02	mg/l
Nickel, dissolved	29	0.04	7/29/09	0.02	8/22/92	0.03	mg/l
Potassium, dissolved	58	22.00	12/18/91	0.70	6/25/19	7.57	mg/l
Selenium, dissolved	29	0.00	8/12/91	0.00	8/12/91	0.00	mg/l
Silica, dissolved	58	74.00	8/22/92	10.90	3/21/17	18.46	mg/l
Sodium, dissolved	58	336.00	6/16/92	166.00	5/26/04	209.07	mg/l
Strontium, dissolved	58	1.30	6/30/09	0.06	6/16/92	0.48	mg/l
Vanadium, dissolved	29	0.01	8/22/92	0.01	8/22/92	0.01	mg/l
Zinc, dissolved	29	0.08	8/22/92	0.02	6/23/94	0.03	mg/l

Table 14: 89-2 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	179	903.00	12/12/08	41.00	1/30/97	516.92	mg/l
Carbonate as CaCO3	179	566.00	1/30/97	8.00	11/28/90	89.40	mg/l
Total Alkalinity as	179	926.00	12/12/08	160.00	10/25/90	604.56	mg/l
Bromide	27	3.00	6/26/90	0.05	7/1/97	0.44	mg/l
Cation-Anion Balance	170	63.40	4/14/05	-28.80	8/2/06	0.76	%
Sum of Anions	153	20.10	12/12/08	11.66	11/28/90	14.13	meq/l
Sum of Cations	153	67.50	4/14/05	7.80	8/2/06	14.49	meq/l
Chemical Oxygen	24	220.00	9/22/10	10.00	8/2/06	80.23	mg/l
Chloride	178	118.00	10/22/89	2.00	4/24/91	19.66	mg/l
Conductivity, Lab	176	1,760.00	12/12/08	1,000.00	5/20/93	1,258.74	µmhos
Fluoride	179	30.00	12/19/91	1.90	6/26/91	21.40	mg/l
Hardness as CaCO3	173	375.00	5/21/18	0.40	10/25/90	11.08	mg/l
Nitrate as N, dissolved	28	5.76	8/10/08	0.02	7/18/95	0.53	mg/l
Nitrate/Nitrite as N,	28	6.26	8/10/08	0.02	7/18/95	0.56	mg/l
Nitrite as N, dissolved	28	0.50	8/10/08	0.01	3/30/90	0.13	mg/l
Nitrogen, Ammonia	26	3.77	8/10/08	0.54	6/15/92	1.30	mg/l
Nitrogen, Organic	26	14.60	9/27/90	0.10	6/15/92	4.37	mg/l
Nitrogen, Total Kjeldahl	26	15.40	9/27/90	0.60	6/15/92	5.49	mg/l
pH, lab	175	9.70	12/20/94	8.00	7/18/95	8.91	units
Phosphate, total	22	155.00	6/25/07	0.06	7/2/98	10.79	mg/l
Phosphorus, total	27	0.46	6/26/90	0.01	8/17/93	0.08	mg/l
SAR in Water	136	345.00	4/14/05	0.21	5/21/18	58.38	none
Sulfate	179	445.00	6/26/90	2.49	5/21/18	40.76	mg/l
Sulfide	23	2.40	7/24/02	0.02	7/15/04	0.45	mg/l
Total Dissolved Solids	179	2,040.00	4/14/05	494.00	10/25/90	787.56	mg/l
Conductivity, Field	225	1,980.00	12/12/08	620.00	3/16/94	1,223.05	µmhos
pH, Field	225	10.00	8/22/91	6.80	3/10/15	9.09	units
Temperature (°C), Field	105	17.40	7/1/02	9.20	1/30/06	12.20	(°C)
Water Level, Field	91	545.20	6/25/14	463.95	4/1/03	494.79	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	26	0.70	10/22/89	0.03	7/1/97	0.12	mg/l
Arsenic, dissolved	26	0.04	6/26/91	0.00	6/15/92	0.01	mg/l
Barium, dissolved	26	0.23	7/15/04	0.01	8/2/06	0.04	mg/l
Beryllium, dissolved	26	0.01	6/26/90	0.01	6/26/90	0.01	mg/l
Boron, dissolved	172	1.48	4/14/05	0.19	8/2/06	0.37	mg/l
Cadmium, dissolved	26	0.01	6/26/90	0.01	6/26/90	0.01	mg/l
Calcium, dissolved	171	141.00	5/21/18	0.30	4/27/04	2.33	mg/l
Chromium, dissolved	26	0.07	7/30/03	0.01	6/26/90	0.04	mg/l
Copper, dissolved	26	0.01	6/26/90	0.01	6/26/90	0.01	mg/l
Iron, dissolved	26	0.80	10/22/89	0.01	7/18/95	0.13	mg/l
Lead, dissolved	26	0.05	10/22/89	0.02	6/26/90	0.03	mg/l
Lithium, dissolved	26	0.13	7/15/04	0.02	6/26/90	0.05	mg/l
Magnesium, dissolved	171	9.10	12/12/08	0.20	4/27/04	1.22	mg/l
Manganese, dissolved	25	0.14	7/30/03	0.01	6/26/90	0.06	mg/l
Mercury, dissolved	26	0.00	6/15/92	0.00	6/26/90	0.00	mg/l
Molybdenum, dissolved	26	0.13	10/22/89	0.01	7/12/96	0.05	mg/l
Nickel, dissolved	26	0.52	7/30/03	0.02	10/22/89	0.19	mg/l
Potassium, dissolved	172	12.50	5/21/18	0.60	8/2/06	1.39	mg/l
Selenium, dissolved	26	0.01	9/27/90	0.001	6/26/90	0.004	mg/l
Silica, dissolved	172	27.70	1/9/01	2.00	12/10/19	12.94	mg/l
Sodium, dissolved	172	1,530.00	4/14/05	9.20	5/21/18	323.04	mg/l
Strontium, dissolved	172	1.34	12/12/08	0.03	4/27/04	0.20	mg/l
Vanadium, dissolved	26	0.01	6/26/90	0.01	6/26/90	0.01	mg/l
Zinc, dissolved	26	0.03	7/29/09	0.01	6/26/90	0.02	mg/l

Table 15: 90-1 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	99	12,800.00	9/9/19	170.00	6/12/90	2,697.76	mg/l
Carbonate as CaCO3	99	6,530.00	12/13/16	9.00	4/27/04	455.13	mg/l
Total Alkalinity as	99	14,200.00	9/9/19	477.00	4/16/02	3,172.31	mg/l
Bromide	23	0.10	1/31/91	0.08	7/31/09	0.10	mg/l
Cation-Anion Balance	96	30.70	12/13/16	-14.70	2/27/17	-0.46	%
Sum of Anions	96	466.00	9/9/19	11.49	2/24/92	100.31	meq/l
Sum of Cations	96	418.00	10/9/19	11.50	9/27/90	96.49	meq/l
Chemical Oxygen	19	191.00	6/29/16	10.00	10/22/02	61.30	mg/l
Chloride	98	6,350.00	9/9/19	10.00	1/31/91	1,216.46	mg/l
Conductivity, Lab	97	33,400.00	10/9/19	1,075.00	1/31/91	8,568.20	µmhos
Fluoride	99	46.70	9/9/19	1.40	4/27/04	16.90	mg/l
Hardness as CaCO3	99	98.00	11/6/14	4.00	9/9/15	42.38	mg/l
Nitrate as N, dissolved	23	3.99	1/31/91	0.02	9/27/90	0.70	mg/l
Nitrate/Nitrite as N,	23	4.00	1/31/91	0.02	9/27/90	0.60	mg/l
Nitrite as N, dissolved	23	0.02	9/27/90	0.01	1/31/91	0.02	mg/l
Nitrogen, Ammonia	22	5.10	8/21/15	0.08	9/27/90	1.03	mg/l
Nitrogen, Organic	22	2.50	6/29/16	0.10	1/31/91	0.53	mg/l
Nitrogen, Total Kjeldahl	22	7.10	6/29/16	0.04	9/27/90	1.43	mg/l
pH, lab	97	12.80	1/27/16	6.30	7/25/02	8.78	units
Phosphate, total	19	11.00	6/29/16	0.06	6/28/07	1.35	mg/l
Phosphorus, total	22	3.40	6/29/16	0.02	6/28/07	0.38	mg/l
SAR in Water	94	1,600.00	12/13/16	25.30	8/4/08	174.35	none
Sulfate	99	933.00	9/9/15	10.00	10/4/11	90.83	mg/l
Sulfide	23	12.00	10/19/00	0.07	10/22/02	4.14	mg/l
Total Dissolved Solids	99	24,400.00	9/9/19	700.00	7/21/94	5,341.20	mg/l
Conductivity, Field	315	33,100.00	4/8/19	1,122.70	5/4/10	3,672.64	µmhos
pH, Field	100	12.50	4/13/16	7.00	12/11/18	8.49	units
Temperature (°C), Field	72	24.40	7/28/11	7.50	3/4/13	18.26	(°C)
Water Level, Field	18	549.12	10/15/15	531.00	4/21/16	537.89	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	23	0.05	6/12/90	0.04	6/28/07	0.05	mg/l
Arsenic, dissolved	23	0.05	8/21/15	0.0008	10/26/04	0.01	mg/l
Barium, dissolved	23	1.77	11/6/14	0.02	1/31/91	0.47	mg/l
Beryllium, dissolved	23	0.01	6/12/90	0.01	6/12/90	0.01	mg/l
Boron, dissolved	99	11.20	10/9/19	0.25	6/12/90	2.23	mg/l
Cadmium, dissolved	23	0.01	6/12/90	0.01	9/27/90	0.01	mg/l
Calcium, dissolved	97	12.00	8/21/15	0.00	5/17/17	4.89	mg/l
Chromium, dissolved	23	0.02	9/28/06	0.01	6/12/90	0.01	mg/l
Copper, dissolved	23	0.01	6/12/90	0.01	6/12/90	0.01	mg/l
Iron, dissolved	23	3.00	8/21/15	0.02	9/27/90	0.23	mg/l
Lead, dissolved	23	0.02	6/12/90	0.02	6/12/90	0.02	mg/l
Lithium, dissolved	23	0.49	11/6/14	0.01	6/12/90	0.18	mg/l
Magnesium, dissolved	99	19.00	11/6/14	2.00	6/12/90	8.13	mg/l
Manganese, dissolved	23	0.08	10/4/11	0.01	9/22/10	0.02	mg/l
Mercury, dissolved	23	0.0004	10/30/03	0.00	6/12/90	0.0002	mg/l
Molybdenum, dissolved	23	0.05	6/12/90	0.02	9/15/07	0.04	mg/l
Nickel, dissolved	23	0.02	6/12/90	0.02	6/12/90	0.02	mg/l
Potassium, dissolved	99	746.00	12/13/16	0.40	7/18/00	30.26	mg/l
Selenium, dissolved	23	0.0014	8/21/15	0.00	6/12/90	0.0011	mg/l
Silica, dissolved	99	40.00	9/9/15	6.00	1/17/18	12.99	mg/l
Sodium, dissolved	99	9,480.00	10/9/19	259.00	6/12/90	2,138.87	mg/l
Strontium, dissolved	99	4.93	11/6/14	0.03	9/9/15	1.86	mg/l
Vanadium, dissolved	23	0.01	6/12/90	0.01	6/12/90	0.01	mg/l
Zinc, dissolved	23	0.02	6/28/07	0.01	6/12/90	0.01	mg/l

Table 16: 90-4 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	119	1,680.00	9/24/03	45.00	6/26/02	785.16	mg/l
Carbonate as CaCO3	119	693.00	6/26/02	10.00	12/16/03	83.76	mg/l
Total Alkalinity as	119	1,740.00	9/24/03	142.00	9/28/06	859.08	mg/l
Bromide	29	16.00	6/16/97	0.29	8/1/90	5.56	mg/l
Cation-Anion Balance	116	11.90	6/23/10	-68.80	8/15/17	-2.06	%
Sum of Anions	116	153.40	5/24/94	34.16	8/1/90	85.87	meq/l
Sum of Cations	116	143.00	2/27/97	10.00	8/15/17	83.06	meq/l
Chemical Oxygen	21	840.00	8/16/94	10.00	8/16/96	199.29	mg/l
Chloride	119	4,690.00	5/24/94	700.00	8/1/90	2,476.39	mg/l
Conductivity, Lab	116	14,100.00	2/21/94	309.00	5/27/15	8,566.03	µmhos
Fluoride	119	23.70	8/1/90	5.50	6/14/08	12.57	mg/l
Hardness as CaCO3	119	204.00	2/21/94	25.00	8/15/17	87.92	mg/l
Nitrate as N, dissolved	28	0.08	6/26/02	0.02	6/28/06	0.05	mg/l
Nitrate/Nitrite as N,	28	0.09	6/16/11	0.02	6/28/06	0.06	mg/l
Nitrite as N, dissolved	28	0.04	6/16/11	0.01	1/29/91	0.02	mg/l
Nitrogen, Ammonia	27	3.30	8/10/08	0.83	8/13/90	1.90	mg/l
Nitrogen, Organic	27	10.10	3/14/08	0.40	7/21/93	3.48	mg/l
Nitrogen, Total Kjeldahl	27	12.10	3/14/08	1.30	6/14/00	5.12	mg/l
pH, lab	116	9.00	10/9/19	7.70	9/14/04	8.54	units
Phosphate, total	25	155.00	6/28/06	0.06	8/14/95	17.76	mg/l
Phosphorus, total	27	0.11	8/13/90	0.02	7/31/91	0.06	mg/l
SAR in Water	116	4,950.00	6/24/03	19.00	8/15/17	133.54	none
Sulfate	118	2,310.00	6/15/14	4.00	12/16/04	70.78	mg/l
Sulfide	22	5.80	6/26/02	0.02	8/10/08	1.18	mg/l
Total Dissolved Solids	119	8,270.00	2/27/97	2,110.00	8/15/17	5,019.29	mg/l
Conductivity, Field	177	13,600.00	11/17/93	2,900.00	8/1/90	8,637.72	µmhos
pH, Field	172	9.53	7/29/09	7.30	10/9/19	8.53	units
Temperature (°C), Field	120	22.10	7/10/18	7.40	12/15/05	12.28	(°C)
Water Level, Field	98	544.21	3/1/10	516.40	10/1/90	538.16	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	28	0.80	6/16/05	0.03	9/21/10	0.28	mg/l
Arsenic, dissolved	28	0.05	1/29/91	0.00	6/28/06	0.01	mg/l
Barium, dissolved	28	1.56	3/14/08	0.09	8/1/90	0.87	mg/l
Beryllium, dissolved	28	U	6/16/11	U	11/27/12	U	mg/l
Boron, dissolved	119	1.29	7/21/92	0.10	11/20/96	0.32	mg/l
Cadmium, dissolved	28	0.03	7/21/93	0.03	7/21/93	0.03	mg/l
Calcium, dissolved	119	45.00	12/16/04	3.00	11/20/96	10.85	mg/l
Chromium, dissolved	28	U	6/16/11	U	11/27/12	U	mg/l
Copper, dissolved	28	0.08	6/24/04	0.08	6/24/04	0.08	mg/l
Iron, dissolved	28	1.67	10/25/90	0.07	9/21/10	0.39	mg/l
Lead, dissolved	28	U	6/16/11	U	11/27/12	U	mg/l
Lithium, dissolved	27	0.10	6/16/97	0.02	8/13/90	0.04	mg/l
Magnesium, dissolved	119	37.00	2/21/94	3.90	8/15/17	14.74	mg/l
Manganese, dissolved	27	0.15	10/25/90	0.01	9/21/10	0.05	mg/l
Mercury, dissolved	28	0.00	9/15/07	0.00	8/14/95	0.00	mg/l
Molybdenum, dissolved	28	0.37	8/13/90	0.13	10/25/90	0.24	mg/l
Nickel, dissolved	28	U	6/16/11	U	11/27/12	U	mg/l
Potassium, dissolved	119	10.00	7/31/91	1.50	1/16/18	3.07	mg/l
Selenium, dissolved	28	0.00	1/29/91	0.00	8/13/90	0.00	mg/l
Silica, dissolved	119	63.00	12/16/04	2.10	4/20/92	12.37	mg/l
Sodium, dissolved	119	3,180.00	2/27/97	220.00	8/15/17	1,902.99	mg/l
Strontium, dissolved	119	8.17	2/21/94	0.30	8/15/17	3.19	mg/l
Vanadium, dissolved	28	U	6/16/11	U	11/27/12	U	mg/l
Zinc, dissolved	28	0.10	7/31/91	0.01	10/25/90	0.05	mg/l

Table 17: AG-1 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	9	1,360	4/22/19	198	2/10/15	532	mg/l
Carbonate as CaCO3	9	273	1/29/15	53	11/4/14	184	mg/l
Total Alkalinity as	9	1,540	6/11/19	377	2/10/15	715	mg/l
Bromide	9	2.38	4/22/19	0.17	1/29/15	1.27	mg/l
Cation-Anion Balance	9	0.00	12/15/15	-6.70	2/10/15	-3.00	%
Sum of Anions	9	45.00	6/11/19	15.00	12/15/15	22.67	meq/l
Sum of Cations	9	42.00	6/11/19	14.00	2/10/15	21.22	meq/l
Chemical Oxygen	9	37.00	12/15/15	10.00	6/11/19	18.71	mg/l
Chloride	9	435	6/11/19	92	11/4/14	194	mg/l
Conductivity, Lab	9	3,800	6/11/19	1,430	11/4/14	2,083	µmhos
Fluoride	9	16.40	6/11/19	5.47	6/19/18	8.05	mg/l
Hardness as CaCO3	9	80.00	6/11/19	13.00	6/19/18	33.92	mg/l
Nitrate as N, dissolved	9	0.02	1/29/15	0.02	1/29/15	0.02	mg/l
Nitrate/Nitrite as N,	9	0.03	1/29/15	0.00	11/4/14	0.02	mg/l
Nitrite as N, dissolved	9	0.01	1/29/15	0.00	11/4/14	0.01	mg/l
Nitrogen, Ammonia	9	1.51	9/28/17	0.47	4/5/16	0.82	mg/l
Nitrogen, Organic	9	0.50	1/29/15	0.10	4/5/16	0.29	mg/l
Nitrogen, Total Kjeldahl	9	1.90	9/28/17	0.60	4/5/16	1.03	mg/l
pH, lab	9	9.70	1/29/15	8.70	11/4/14	9.36	units
Phosphate, total	9	0.53	6/11/19	0.06	6/19/18	0.26	mg/l
Phosphorus, total	9	0.17	6/11/19	0.02	6/19/18	0.08	mg/l
SAR in Water	9	48	6/19/18	20.00	11/4/14	37	none
Sulfate	9	210	2/10/15	37.30	6/11/19	117	mg/l
Sulfide	9	5.00	6/11/19	0.04	11/4/14	1.23	mg/l
Total Dissolved Solids	9	2,400	6/11/19	843	12/15/15	1,236	mg/l
Conductivity, Field	7	4,062	4/22/19	1,432	4/5/16	2,283	µmhos
pH, Field	7	9.64	6/19/18	8.44	4/22/19	9.02	units
Temperature (°C), Field	7	22.22	6/19/18	16.10	11/20/18	18.70	(°C)
Water Level, Field	7	581.90	9/28/17	572.10	1/16/15	576.37	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	9	U	11/4/14	U	6/11/19	U	mg/l
Arsenic, dissolved	9	0.00	11/4/14	0.00	2/10/15	0.00	mg/l
Barium, dissolved	9	0.41	4/22/19	0.01	12/15/15	0.10	mg/l
Beryllium, dissolved	9	U	11/4/14	U	6/11/19	U	mg/l
Boron, dissolved	9	0.93	6/11/19	0.21	2/10/15	0.40	mg/l
Cadmium, dissolved	9	U	11/4/14	U	6/11/19	U	mg/l
Calcium, dissolved	9	7.80	11/4/14	1.30	4/5/16	2.86	mg/l
Chromium, dissolved	9	U	11/4/14	U	6/11/19	U	mg/l
Copper, dissolved	9	U	11/4/14	U	6/11/19	U	mg/l
Iron, dissolved	9	0.86	9/28/17	0.03	11/4/14	0.25	mg/l
Lead, dissolved	9	U	11/4/14	U	6/11/19	U	mg/l
Lithium, dissolved	9	0.28	6/11/19	0.12	11/4/14	0.17	mg/l
Magnesium, dissolved	9	17.10	6/11/19	2.40	6/19/18	6.50	mg/l
Manganese, dissolved	9	0.08	11/4/14	0.01	4/5/16	0.03	mg/l
Mercury, dissolved	9	U	11/4/14	U	6/11/19	U	mg/l
Molybdenum, dissolved	9	0.19	6/19/18	0.06	11/4/14	0.13	mg/l
Nickel, dissolved	9	U	11/4/14	U	6/11/19	U	mg/l
Potassium, dissolved	9	11.30	6/19/18	1.50	6/11/19	7.12	mg/l
Selenium, dissolved	9	0.00	6/11/19	0.00	9/28/17	0.00	mg/l
Silica, dissolved	9	13.90	11/4/14	0.20	2/10/15	5.46	mg/l
Sodium, dissolved	9	924	6/11/19	303	2/10/15	459	mg/l
Strontium, dissolved	9	1.93	6/11/19	0.23	12/15/15	0.75	mg/l
Vanadium, dissolved	9	U	11/4/14	U	6/11/19	U	mg/l
Zinc, dissolved	9	0.06	9/28/17	0.01	11/4/14	0.04	mg/l

Table 18: IRI-4 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	58	1,250.00	3/22/93	34.00	9/8/93	266.31	mg/l
Carbonate as CaCO3	58	870.00	3/22/93	24.00	6/30/09	266.97	mg/l
Total Alkalinity as	58	2,120.00	3/22/93	176.00	6/14/08	492.38	mg/l
Bromide	29	2.70	11/29/11	0.07	5/26/00	0.62	mg/l
Cation-Anion Balance	56	13.30	11/6/14	-9.10	3/22/16	2.09	%
Sum of Anions	56	19.49	9/16/91	9.50	5/29/03	13.11	meq/l
Sum of Cations	56	18.34	9/16/91	9.50	5/26/04	13.76	meq/l
Chemical Oxygen	27	1,300.00	5/29/02	15.00	3/27/18	450.58	mg/l
Chloride	58	252.00	6/14/08	21.00	12/20/93	112.50	mg/l
Conductivity, Lab	57	3,320.00	9/15/92	1,010.00	5/29/03	1,519.30	µmhos
Fluoride	58	27.00	12/19/95	2.20	9/15/92	8.95	mg/l
Hardness as CaCO3	58	962.00	3/22/93	0.00	1/19/94	34.72	mg/l
Nitrate as N, dissolved	29	3.89	6/14/08	0.02	9/15/92	0.43	mg/l
Nitrate/Nitrite as N,	29	3.90	6/14/08	0.02	9/15/92	0.33	mg/l
Nitrite as N, dissolved	29	0.05	11/6/14	0.01	6/18/96	0.02	mg/l
Nitrogen, Ammonia	29	21.30	9/8/93	0.34	8/23/17	3.84	mg/l
Nitrogen, Organic	29	104.00	5/29/02	0.20	8/23/17	18.43	mg/l
Nitrogen, Total Kjeldahl	29	106.00	5/29/02	0.40	4/22/19	20.54	mg/l
pH, lab	57	11.90	6/16/92	8.60	6/30/09	10.23	units
Phosphate, total	29	155.00	7/29/09	0.03	5/26/99	7.01	mg/l
Phosphorus, total	29	2.95	9/27/90	0.01	5/26/99	0.25	mg/l
SAR in Water	49	190.00	11/14/97	3.83	3/25/92	63.42	none
Sulfate	58	360.00	9/16/91	0.80	2/26/97	31.18	mg/l
Sulfide	29	29.00	3/22/16	0.02	9/15/92	4.73	mg/l
Total Dissolved Solids	57	2,752.00	3/22/93	578.00	9/27/90	848.57	mg/l
Conductivity, Field	76	3,910.00	7/29/09	694.00	6/1/05	1,583.00	µmhos
pH, Field	75	12.90	9/13/95	7.78	9/16/19	10.69	units
Temperature (°C), Field	36	22.50	6/1/05	7.00	7/1/91	12.55	(°C)
Water Level, Field	59	485.59	5/17/18	409.63	11/1/90	431.15	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	29	1.35	11/6/14	0.03	8/23/17	0.22	mg/l
Arsenic, dissolved	29	0.01	8/23/17	0.00	4/22/19	0.00	mg/l
Barium, dissolved	29	0.20	7/29/09	0.00	9/8/93	0.04	mg/l
Beryllium, dissolved	29	U	5/29/03	U	10/17/13	U	mg/l
Boron, dissolved	58	0.47	12/20/93	0.10	3/17/10	0.22	mg/l
Cadmium, dissolved	29	U	5/29/03	U	10/17/13	U	mg/l
Calcium, dissolved	58	27.50	6/30/09	0.20	11/14/97	4.27	mg/l
Chromium, dissolved	29	0.02	11/6/14	0.01	6/23/94	0.02	mg/l
Copper, dissolved	29	0.04	7/29/09	0.01	7/30/91	0.03	mg/l
Iron, dissolved	29	65.10	11/6/14	0.01	6/30/95	3.22	mg/l
Lead, dissolved	29	0.63	9/15/10	0.02	6/23/94	0.14	mg/l
Lithium, dissolved	29	0.17	9/27/90	0.02	8/23/17	0.07	mg/l
Magnesium, dissolved	58	5.00	9/27/90	0.00	5/24/05	1.38	mg/l
Manganese, dissolved	29	0.59	11/6/14	0.01	7/29/09	0.06	mg/l
Mercury, dissolved	29	0.00	7/30/91	0.00	9/27/90	0.00	mg/l
Molybdenum, dissolved	29	0.13	5/24/05	0.01	5/9/01	0.05	mg/l
Nickel, dissolved	29	0.03	9/15/92	0.01	3/22/16	0.01	mg/l
Potassium, dissolved	58	39.00	3/22/93	0.70	8/23/17	5.99	mg/l
Selenium, dissolved	29	0.00	7/30/91	0.00	3/27/18	0.00	mg/l
Silica, dissolved	58	44.60	6/16/92	3.40	10/3/12	16.20	mg/l
Sodium, dissolved	58	567.00	3/22/93	153.00	3/25/92	303.07	mg/l
Strontium, dissolved	58	5.10	3/25/92	0.01	4/21/94	0.32	mg/l
Vanadium, dissolved	29	0.01	6/23/94	0.01	5/26/00	0.01	mg/l
Zinc, dissolved	29	1.35	11/6/14	0.03	8/23/17	0.22	mg/l

Table 19: O-GMW-A Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	1	528.00	10/5/14	528.00	10/5/14	528.00	mg/l
Carbonate as CaCO3	1	51.40	10/5/14	51.40	10/5/14	51.40	mg/l
Total Alkalinity as	1	579.00	10/5/14	579.00	10/5/14	579.00	mg/l
Bromide	1	U	10/5/14	U	10/5/14	U	mg/l
Cation-Anion Balance	1	-3.70	10/5/14	-3.70	10/5/14	-3.70	%
Sum of Anions	1	14.00	10/5/14	14.00	10/5/14	14.00	meq/l
Sum of Cations	1	13.00	10/5/14	13.00	10/5/14	13.00	meq/l
Chemical Oxygen	1	U	10/5/14	U	10/5/14	U	mg/l
Chloride	1	18.60	10/5/14	18.60	10/5/14	18.60	mg/l
Conductivity, Lab	1	1,270.00	10/5/14	1,270.00	10/5/14	1,270.00	µmhos
Fluoride	1	16.40	10/5/14	16.40	10/5/14	16.40	mg/l
Hardness as CaCO3	1	46.00	10/5/14	46.00	10/5/14	46.00	mg/l
Nitrate as N, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Nitrate/Nitrite as N,	1	U	10/5/14	U	10/5/14	U	mg/l
Nitrite as N, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Nitrogen, Ammonia	1	0.40	10/5/14	0.40	10/5/14	0.40	mg/l
Nitrogen, Organic	1	0.30	10/5/14	0.30	10/5/14	0.30	mg/l
Nitrogen, Total Kjeldahl	1	0.70	10/5/14	0.70	10/5/14	0.70	mg/l
pH, lab	1	8.60	10/5/14	8.60	10/5/14	8.60	units
Phosphate, total	1	0.06	10/5/14	0.06	10/5/14	0.06	mg/l
Phosphorus, total	1	0.02	10/5/14	0.02	10/5/14	0.02	mg/l
SAR in Water	1	17.00	10/5/14	17.00	10/5/14	17.00	none
Sulfate	1	60.00	10/5/14	60.00	10/5/14	60.00	mg/l
Sulfide	1	0.03	10/5/14	0.03	10/5/14	0.03	mg/l
Total Dissolved Solids	1	746.00	10/5/14	746.00	10/5/14	746.00	mg/l
Conductivity, Field	0	N/A	N/A	N/A	N/A	N/A	µmhos
pH, Field	0	N/A	N/A	N/A	N/A	N/A	units
Temperature (°C), Field	0	N/A	N/A	N/A	N/A	N/A	(°C)
Water Level, Field	0	N/A	N/A	N/A	N/A	N/A	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Arsenic, dissolved	1	0.02	10/5/14	0.02	10/5/14	0.02	mg/l
Barium, dissolved	1	0.13	10/5/14	U	10/5/14	0.13	mg/l
Beryllium, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Boron, dissolved	1	0.25	10/5/14	0.25	10/5/14	0.25	mg/l
Cadmium, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Calcium, dissolved	1	6.00	10/5/14	U	10/5/14	6.00	mg/l
Chromium, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Copper, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Iron, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Lead, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Lithium, dissolved	1	0.12	10/5/14	0.12	10/5/14	0.12	mg/l
Magnesium, dissolved	1	7.40	10/5/14	U	10/5/14	7.40	mg/l
Manganese, dissolved	1	0.01	10/5/14	U	10/5/14	0.01	mg/l
Mercury, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Molybdenum, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Nickel, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Potassium, dissolved	1	1.30	10/5/14	1.30	10/5/14	1.30	mg/l
Selenium, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Silica, dissolved	1	11.80	10/5/14	11.80	10/5/14	11.80	mg/l
Sodium, dissolved	1	267.00	10/5/14	267.00	10/5/14	267.00	mg/l
Strontium, dissolved	1	1.16	10/5/14	U	10/5/14	1.16	mg/l
Vanadium, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l
Zinc, dissolved	1	U	10/5/14	U	10/5/14	U	mg/l

Table 20: WSW-2 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	47	3,720.00	7/3/19	483.00	6/16/14	1,381.79	mg/l
Carbonate as CaCO3	46	387.00	5/14/19	42.60	11/10/14	121.34	mg/l
Total Alkalinity as	47	4,000.00	7/3/19	534.00	6/16/14	1,501.30	mg/l
Bromide	5	0.46	7/11/13	0.03	10/4/11	0.18	mg/l
Cation-Anion Balance	45	3.40	6/16/14	-3.40	6/14/11	-2.92	%
Sum of Anions	46	135.00	7/3/19	13.70	10/4/11	42.79	meq/l
Sum of Cations	46	125.00	7/3/19	12.60	6/14/11	40.08	meq/l
Chemical Oxygen	8	30.00	1/24/18	10.00	1/20/11	17.38	mg/l
Chloride	46	1,910.00	7/3/19	11.00	6/14/11	421.10	mg/l
Conductivity, Lab	47	10,400	7/3/19	1,250	10/4/11	3,792	µmhos
Fluoride	46	28.10	11/14/18	13.80	9/17/12	19.77	mg/l
Hardness as CaCO3	46	72.00	1/24/18	14.00	11/30/11	31.13	mg/l
Nitrate as N, dissolved	2	0.10	11/10/14	0.06	3/30/11	0.08	mg/l
Nitrate/Nitrite as N,	2	0.10	11/10/14	0.06	3/30/11	0.08	mg/l
Nitrite as N, dissolved	12	UH	4/3/19	U	1/24/18	U	mg/l
Nitrogen, Ammonia	12	1.62	4/3/19	0.39	10/4/11	0.80	mg/l
Nitrogen, Organic	10	0.90	4/3/19	0.10	3/23/11	0.27	mg/l
Nitrogen, Total Kjeldahl	12	2.50	4/3/19	0.60	3/30/11	1.03	mg/l
pH, lab	47	8.90	3/16/14	8.50	5/14/18	8.69	units
Phosphate, total	12	1.83	4/3/19	0.09	3/23/11	0.38	mg/l
Phosphorus, total	12	0.59	4/3/19	0.03	3/23/11	0.12	mg/l
SAR in Water	46	160.00	7/3/19	31.30	6/14/11	63.56	none
Sulfate	45	156.00	9/11/19	5.41	7/17/18	38.24	mg/l
Sulfide	12	3.90	10/4/11	1.41	1/24/18	2.42	mg/l
Total Dissolved Solids	46	7,230.00	7/3/19	740.00	11/30/11	2,285.28	mg/l
Conductivity, Field	102	10,470	7/3/19	719	3/23/11	3,500	µmhos
pH, Field	74	8.90	3/16/16	7.30	5/28/15	8.22	units
Temperature (°C), Field	74	25.00	7/13/16	16.35	5/17/16	21.77	(°C)
Water Level, Field	N/A	N/A	N/A	N/A	N/A	N/A	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	12	0.05	3/23/11	0.03	11/5/15	0.04	mg/l
Arsenic, dissolved	12	0.0004	3/23/17	0.0002	11/5/15	0.0003	mg/l
Barium, dissolved	12	1.53	4/3/19	0.03	1/24/18	0.24	mg/l
Beryllium, dissolved	12	0.002	1/20/11	U	3/23/11	U	mg/l
Boron, dissolved	46	2.80	7/3/19	0.36	10/4/11	0.97	mg/l
Cadmium, dissolved	12	U	1/24/18	U	4/3/19	U	mg/l
Calcium, dissolved	46	14.10	1/24/18	1.70	5/14/19	3.23	mg/l
Chromium, dissolved	12	0.02	4/6/16	0.02	4/6/16	0.02	mg/l
Copper, dissolved	12	U	1/24/18	U	4/3/19	U	mg/l
Iron, dissolved	12	1.30	4/3/19	0.05	3/23/11	0.28	mg/l
Lead, dissolved	12	U	1/24/18	U	4/3/19	U	mg/l
Lithium, dissolved	12	0.22	4/3/19	0.06	1/20/11	0.09	mg/l
Magnesium, dissolved	46	13.00	4/10/18	2.00	1/20/11	5.60	mg/l
Manganese, dissolved	12	0.05	4/3/19	0.01	3/23/11	0.02	mg/l
Mercury, dissolved	12	U	1/24/18	U	4/3/19	U	mg/l
Molybdenum, dissolved	12	U	1/24/18	U	4/3/19	U	mg/l
Nickel, dissolved	12	0.02	7/11/13	0.01	3/23/11	0.02	mg/l
Potassium, dissolved	46	3.10	1/27/16	0.40	11/1/12	1.21	mg/l
Selenium, dissolved	12	U	1/24/18	U	4/3/19	U	mg/l
Silica, dissolved	46	12.80	11/5/15	9.00	1/24/18	11.54	mg/l
Sodium, dissolved	46	2,800.00	7/3/19	279.00	6/14/11	895.07	mg/l
Strontium, dissolved	46	2.67	1/24/18	0.44	6/14/11	1.22	mg/l
Vanadium, dissolved	12	U	1/24/18	U	4/3/19	U	mg/l
Zinc, dissolved	12	0.07	4/3/19	0.01	11/5/15	0.03	mg/l

Table 21: WSW-3 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	25	529.00	8/22/14	459.0	7/17/18	487.4	mg/l
Carbonate as CaCO3	25	86.10	4/3/19	26.70	4/6/16	55.52	mg/l
Total Alkalinity as	25	578.00	11/5/15	520.0	10/18/16	543.0	mg/l
Bromide	4	1.54	3/23/17	0.10	8/22/14	0.98	mg/l
Cation-Anion Balance	25	13.30	1/24/18	-4.00	8/22/14	-1.38	%
Sum of Anions	25	14.00	4/3/19	12.00	10/18/16	13.00	meq/l
Sum of Cations	25	17.00	1/24/18	12.00	8/22/14	12.68	meq/l
Chemical Oxygen	2	196.00	4/6/16	22.00	8/22/14	109.0	mg/l
Chloride	25	20.90	4/6/16	11.60	8/27/15	13.96	mg/l
Conductivity, Lab	25	1,250	4/6/16	1,100	8/16/16	1,178	µmhos
Fluoride	25	19.80	8/22/14	16.50	4/6/16	18.41	mg/l
Hardness as CaCO3	25	238.00	1/24/18	12.00	6/27/17	22.14	mg/l
Nitrate as N, dissolved	1	0.09	8/22/14	0.09	8/22/14	0.09	mg/l
Nitrate/Nitrite as N,	1	0.25	8/22/14	0.25	8/22/14	0.25	mg/l
Nitrite as N, dissolved	1	0.16	8/22/14	0.16	8/22/14	0.16	mg/l
Nitrogen, Ammonia	6	0.52	11/5/15	0.43	4/6/16	0.47	mg/l
Nitrogen, Organic	3	0.40	8/22/14	0.30	4/3/19	0.37	mg/l
Nitrogen, Total Kjeldahl	6	0.80	8/22/14	0.30	1/24/18	0.60	mg/l
pH, lab	25	9.30	10/10/19	8.60	8/22/14	8.77	units
Phosphate, total	6	0.12	8/22/14	0.06	4/3/19	0.10	mg/l
Phosphorus, total	6	0.04	8/22/14	0.02	4/3/19	0.03	mg/l
SAR in Water	25	37.00	9/10/19	7.60	1/24/18	32.50	none
Sulfate	23	57.90	4/6/16	11.60	1/27/16	34.99	mg/l
Sulfide	6	2.70	4/3/19	0.16	8/22/14	1.58	mg/l
Total Dissolved Solids	25	774.00	1/24/18	661.0	8/27/15	695.1	mg/l
Conductivity, Field	52	1,498	10/10/19	632	2/21/19	1,184	µmhos
pH, Field	52	8.90	3/16/16	7.60	4/6/16	8.35	units
Temperature (°C), Field	52	23.40	7/17/17	17.80	12/3/15	21.46	(°C)
Water Level, Field	N/A	N/A	N/A	N/A	N/A	N/A	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	6	0.04	1/24/18	0.00	8/22/14	0.02	mg/l
Arsenic, dissolved	6	0.05	8/22/14	0.00	3/23/17	0.02	mg/l
Barium, dissolved	6	0.25	4/3/19	0.03	1/24/18	0.17	mg/l
Beryllium, dissolved	6	U	11/5/15	U	4/3/19	U	mg/l
Boron, dissolved	25	0.27	8/22/14	0.21	4/6/16	0.24	mg/l
Cadmium, dissolved	6	U	11/5/15	U	4/3/19	U	mg/l
Calcium, dissolved	25	81.30	1/24/18	2.20	3/23/17	5.58	mg/l
Chromium, dissolved	6	U	11/5/15	U	4/3/19	U	mg/l
Copper, dissolved	6	U	11/5/15	U	4/3/19	U	mg/l
Iron, dissolved	6	0.13	11/5/15	0.05	3/23/17	0.08	mg/l
Lead, dissolved	6	U	11/5/15	U	4/3/19	U	mg/l
Lithium, dissolved	6	0.13	4/6/16	0.06	8/22/14	0.08	mg/l
Magnesium, dissolved	25	8.50	1/24/18	1.40	9/10/19	1.97	mg/l
Manganese, dissolved	6	0.03	8/22/14	0.01	4/6/16	0.02	mg/l
Mercury, dissolved	6	U	11/5/15	U	4/3/19	U	mg/l
Molybdenum, dissolved	6	0.16	1/24/18	0.07	8/22/14	0.12	mg/l
Nickel, dissolved	6	0.01	4/6/16	0.00	8/22/14	0.01	mg/l
Potassium, dissolved	25	29.20	4/6/16	0.20	10/18/16	1.87	mg/l
Selenium, dissolved	6	U	11/5/15	U	4/3/19	U	mg/l
Silica, dissolved	25	13.40	8/5/19	11.30	4/6/16	12.39	mg/l
Sodium, dissolved	25	297.00	1/14/19	258.0	5/14/18	274.0	mg/l
Strontium, dissolved	25	0.57	1/14/19	0.45	1/24/18	0.53	mg/l
Vanadium, dissolved	6	U	11/5/15	U	4/3/19	U	mg/l
Zinc, dissolved	6	0.36	1/24/18	0.02	8/22/14	0.19	mg/l

Table 22: WSW-4 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	26	523.00	9/10/19	439.0	8/27/15	476.0	mg/l
Carbonate as CaCO3	27	537.00	9/25/14	49.00	10/18/16	80.43	mg/l
Total Alkalinity as	27	925.00	9/25/14	511.0	6/9/15	553.3	mg/l
Bromide	3	0.73	4/3/19	0.09	8/25/14	0.39	mg/l
Cation-Anion Balance	26	3.70	1/24/18	-7.30	9/25/14	-2.32	%
Sum of Anions	27	22.00	9/25/14	13.00	6/9/15	13.70	meq/l
Sum of Cations	27	19.00	9/25/14	12.00	8/27/15	13.07	meq/l
Chemical Oxygen	4	53.00	8/25/14	13.00	4/6/16	31.25	mg/l
Chloride	27	50.60	11/14/18	14.90	10/10/19	19.44	mg/l
Conductivity, Lab	27	2,810	9/25/14	1,130	4/6/16	1,279	µmhos
Fluoride	27	19.70	11/14/18	5.11	9/25/14	16.70	mg/l
Hardness as CaCO3	27	67.00	1/24/18	11.00	3/5/19	14.75	mg/l
Nitrate as N, dissolved	2	0.03	8/25/14	0.00	9/25/14	0.02	mg/l
Nitrate/Nitrite as N,	2	0.08	8/25/14	0.00	9/25/14	0.04	mg/l
Nitrite as N, dissolved	2	0.05	8/25/14	0.01	9/25/14	0.03	mg/l
Nitrogen, Ammonia	7	2.28	9/25/14	0.46	3/23/17	0.75	mg/l
Nitrogen, Organic	4	0.40	4/3/19	0.00	9/25/14	0.25	mg/l
Nitrogen, Total Kjeldahl	7	1.00	9/25/14	0.30	3/23/17	0.67	mg/l
pH, lab	27	11.70	9/25/14	8.70	10/18/16	8.91	units
Phosphate, total	7	0.28	9/25/14	0.06	4/3/19	0.12	mg/l
Phosphorus, total	7	0.09	9/25/14	0.02	4/3/19	0.04	mg/l
SAR in Water	27	44.00	9/25/14	15.00	1/24/18	34.81	none
Sulfate	27	130.00	9/25/14	20.00	4/6/16	57.38	mg/l
Sulfide	7	4.10	4/3/19	0.10	9/25/14	2.41	mg/l
Total Dissolved Solids	27	1,210.00	9/25/14	700.0	8/27/15	740.5	mg/l
Conductivity, Field	53	1,558	10/10/19	1,073	4/6/16	1,241	µmhos
pH, Field	53	8.90	3/16/16	7.70	8/27/15	8.42	units
Temperature (°C), Field	53	29.00	6/20/16	13.80	4/19/17	21.24	(°C)
Water Level, Field	N/A	N/A	N/A	N/A	N/A	N/A	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	7	0.42	9/25/14	0.42	9/25/14	0.42	mg/l
Arsenic, dissolved	7	0.01	9/25/14	0.00	4/6/16	0.00	mg/l
Barium, dissolved	7	0.23	4/6/16	0.02	9/25/14	0.09	mg/l
Beryllium, dissolved	7	U	1/24/18	U	4/3/19	U	mg/l
Boron, dissolved	27	0.44	9/25/14	0.18	8/27/15	0.22	mg/l
Cadmium, dissolved	7	U	1/24/18	U	4/3/19	U	mg/l
Calcium, dissolved	27	24.70	1/24/18	1.90	3/23/17	3.13	mg/l
Chromium, dissolved	7	U	1/24/18	U	4/3/19	U	mg/l
Copper, dissolved	7	U	1/24/18	U	4/3/19	U	mg/l
Iron, dissolved	7	1.63	4/3/19	0.02	3/23/17	0.37	mg/l
Lead, dissolved	7	U	1/24/18	U	4/3/19	U	mg/l
Lithium, dissolved	7	0.13	11/5/15	0.07	4/6/16	0.11	mg/l
Magnesium, dissolved	27	2.00	8/27/15	0.30	9/25/14	1.69	mg/l
Manganese, dissolved	7	0.01	1/24/18	0.01	1/24/18	0.01	mg/l
Mercury, dissolved	7	U	1/24/18	U	4/3/19	U	mg/l
Molybdenum, dissolved	7	0.04	1/24/18	0.02	9/25/14	0.03	mg/l
Nickel, dissolved	7	0.00	8/25/14	U	1/24/18	U	mg/l
Potassium, dissolved	27	18.30	9/25/14	0.20	5/14/18	1.30	mg/l
Selenium, dissolved	7	0.0004	3/23/17	0.0003	4/3/19	0.0004	mg/l
Silica, dissolved	27	172.00	9/25/14	8.90	1/24/18	17.59	mg/l
Sodium, dissolved	27	416.00	9/25/14	266.00	10/18/17	287.41	mg/l
Strontium, dissolved	27	7.97	1/24/18	0.39	3/5/19	0.70	mg/l
Vanadium, dissolved	7	U	1/24/18	U	4/3/19	U	mg/l
Zinc, dissolved	7	0.02	9/25/14	0.02	9/25/14	0.02	mg/l

Table 23: 89-1 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	179	762.00	3/25/94	144.00	7/30/90	609.29	mg/l
Carbonate as CaCO3	179	406.00	5/21/97	25.00	7/1/97	101.25	mg/l
Total Alkalinity as	179	830.00	7/31/91	200.00	7/30/90	710.70	mg/l
Bromide	28	10.00	6/26/91	0.06	7/1/97	1.15	mg/l
Cation-Anion Balance	174	24.10	4/16/02	-9.10	6/14/17	0.06	%
Sum of Anions	173	18.00	6/14/17	4.29	7/30/90	15.69	meq/l
Sum of Cations	173	18.20	4/11/06	4.38	7/30/90	15.51	meq/l
Chemical Oxygen	30	420.00	6/25/07	30.00	3/30/90	81.41	mg/l
Chloride	178	70.50	6/14/17	6.00	9/27/90	15.47	mg/l
Conductivity, Lab	171	1,850.00	4/24/91	1,000.00	5/20/93	1,392.39	µmhos
Fluoride	173	38.20	2/24/92	0.20	9/29/94	23.80	mg/l
Hardness as CaCO3	177	65.00	9/27/90	0.00	7/30/90	11.14	mg/l
Nitrate as N, dissolved	30	16.50	6/25/07	0.02	6/26/91	1.01	mg/l
Nitrate/Nitrite as N,	30	17.00	6/25/07	0.02	6/26/91	1.07	mg/l
Nitrite as N, dissolved	31	0.55	6/25/07	0.01	3/30/90	0.13	mg/l
Nitrogen, Ammonia	30	9.23	12/26/18	0.06	7/30/90	1.85	mg/l
Nitrogen, Organic	29	29.10	6/26/91	0.10	6/15/92	5.08	mg/l
Nitrogen, Total Kjeldahl	30	30.10	6/26/91	0.80	6/15/92	6.81	mg/l
pH, lab	174	9.80	12/20/94	8.10	10/28/02	8.89	units
Phosphate, total	26	155.00	6/25/07	0.06	7/18/95	13.46	mg/l
Phosphorus, total	31	2.90	9/27/90	0.02	7/2/98	0.17	mg/l
SAR in Water	149	158.62	6/26/90	16.50	9/27/90	48.70	none
Sulfate	177	140.00	10/25/90	0.00	8/16/17	20.10	mg/l
Sulfide	26	2.10	7/30/90	0.02	7/27/01	0.45	mg/l
Total Dissolved Solids	179	1,100.00	10/21/89	446.00	7/30/90	865.41	mg/l
Conductivity, Field	196	1,683.00	6/5/12	925.00	8/2/06	1,342.65	µmhos
pH, Field	196	10.12	7/29/09	7.60	3/10/15	9.05	units
Temperature (°C), Field	102	19.00	7/31/91	7.60	4/1/06	12.46	(°C)
Water Level, Field	86	500.70	6/25/14	432.37	6/25/14	473.35	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	30	1.54	3/30/90	0.04	7/1/97	0.24	mg/l
Arsenic, dissolved	30	0.30	10/21/89	0.0005	12/3/12	0.02	mg/l
Barium, dissolved	30	0.43	8/2/06	0.02	12/26/18	0.18	mg/l
Beryllium, dissolved	29	0.01	6/26/91	0.01	6/26/91	0.01	mg/l
Boron, dissolved	174	3.30	3/25/91	0.35	1/27/04	0.68	mg/l
Cadmium, dissolved	29	0.01	10/21/89	0.01	10/21/89	0.01	mg/l
Calcium, dissolved	171	13.00	9/27/90	0.50	3/16/10	2.30	mg/l
Chromium, dissolved	29	0.01	6/26/91	0.01	6/26/91	0.01	mg/l
Copper, dissolved	30	0.02	6/25/07	0.01	3/30/90	0.01	mg/l
Iron, dissolved	30	0.93	3/30/90	0.01	7/7/99	0.17	mg/l
Lead, dissolved	29	0.10	10/21/89	0.02	6/26/91	0.06	mg/l
Lithium, dissolved	29	0.20	12/27/90	0.06	3/30/90	0.13	mg/l
Magnesium, dissolved	173	8.00	9/27/90	0.30	3/16/10	1.37	mg/l
Manganese, dissolved	29	0.07	6/25/07	0.01	7/1/97	0.03	mg/l
Mercury, dissolved	30	0.001	6/15/92	0.0001	6/26/91	0.0005	mg/l
Molybdenum, dissolved	29	0.60	10/21/89	0.01	7/27/01	0.14	mg/l
Nickel, dissolved	30	0.03	10/21/89	0.01	12/3/12	0.02	mg/l
Potassium, dissolved	173	13.00	3/25/91	0.70	4/27/04	1.31	mg/l
Selenium, dissolved	30	0.00	10/21/89	U	12/26/18	U	mg/l
Silica, dissolved	174	35.90	10/21/89	1.80	6/11/19	17.07	mg/l
Sodium, dissolved	174	408.00	4/11/06	102.00	12/27/90	349.91	mg/l
Strontium, dissolved	174	0.83	3/14/12	0.06	10/21/89	0.48	mg/l
Vanadium, dissolved	30	0.03	6/26/91	0.01	10/21/89	0.02	mg/l
Zinc, dissolved	30	0.07	7/29/09	0.01	3/30/90	0.02	mg/l

Table 24: 90-3 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	118	1,790.00	9/14/04	419.00	3/23/05	770.45	mg/l
Carbonate as CaCO3	118	419.00	3/23/05	4.00	6/16/97	88.41	mg/l
Total Alkalinity as	118	1,790.00	9/14/04	680.00	6/15/14	855.14	mg/l
Bromide	13	1.50	7/21/92	0.10	1/29/91	0.44	mg/l
Cation-Anion Balance	117	36.90	8/10/08	-33.50	9/14/04	-1.42	%
Sum of Anions	108	37.50	9/14/04	15.00	6/26/02	18.88	meq/l
Sum of Cations	108	39.50	8/10/08	11.10	11/23/10	18.24	meq/l
Chemical Oxygen	20	210.00	9/15/07	10.00	8/14/95	75.00	mg/l
Chloride	118	293.00	6/14/08	9.75	1/16/18	21.52	mg/l
Conductivity, Lab	115	2,200.00	5/16/07	1,280.00	7/21/92	1,590.12	µmhos
Fluoride	118	98.00	3/24/99	9.00	12/11/01	23.15	mg/l
Hardness as CaCO3	114	47.00	10/9/19	1.00	10/25/90	14.99	mg/l
Nitrate as N, dissolved	25	0.27	6/24/04	0.04	1/29/91	0.11	mg/l
Nitrate/Nitrite as N,	25	0.27	6/24/04	0.05	1/29/91	0.12	mg/l
Nitrite as N, dissolved	25	0.03	8/16/94	0.01	1/29/91	0.02	mg/l
Nitrogen, Ammonia	24	10.90	8/16/96	0.83	6/28/06	1.66	mg/l
Nitrogen, Organic	24	12.00	9/15/07	0.20	1/29/91	3.70	mg/l
Nitrogen, Total Kjeldahl	24	13.00	9/15/07	0.50	8/14/95	4.37	mg/l
pH, lab	115	9.00	4/24/91	7.40	6/16/97	8.69	units
Phosphate, total	20	155.00	6/28/06	0.09	8/10/08	8.70	mg/l
Phosphorus, total	23	3.63	8/1/90	0.02	6/28/06	0.29	mg/l
SAR in Water	109	198.04	10/25/90	0.08	4/24/91	48.53	none
Sulfate	74	333.00	1/20/92	0.60	9/29/97	49.26	mg/l
Sulfide	18	6.21	8/1/90	0.03	6/28/06	0.76	mg/l
Total Dissolved Solids	116	1,490.00	8/10/08	813.00	11/23/10	1,014.48	mg/l
Conductivity, Field	176	2,200.00	5/16/07	1,135.00	6/16/97	1,548.07	µmhos
pH, Field	176	10.60	12/16/02	7.00	10/9/19	8.69	units
Temperature (°C), Field	117	19.70	5/1/02	8.00	12/1/04	12.34	(°C)
Water Level, Field	98	547.40	6/14/11	507.30	1/15/16	530.43	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	25	9.47	6/16/97	0.04	6/14/00	1.73	mg/l
Arsenic, dissolved	25	0.02	8/1/90	0.0003	11/27/12	0.0035	mg/l
Barium, dissolved	25	0.96	6/16/97	0.03	8/8/90	0.36	mg/l
Beryllium, dissolved	25	U	9/21/10	U	11/27/12	U	mg/l
Boron, dissolved	119	0.93	3/18/04	0.31	2/21/94	0.73	mg/l
Cadmium, dissolved	25	0.03	7/21/93	0.03	7/21/93	0.03	mg/l
Calcium, dissolved	119	15.00	10/9/19	0.80	12/12/08	2.50	mg/l
Chromium, dissolved	25	U	9/21/10	U	11/27/12	U	mg/l
Copper, dissolved	25	0.40	7/31/91	0.01	6/24/04	0.21	mg/l
Iron, dissolved	25	12.10	6/16/97	0.01	6/16/05	1.65	mg/l
Lead, dissolved	25	0.07	6/16/97	0.04	7/21/92	0.06	mg/l
Lithium, dissolved	24	0.15	6/9/99	0.04	7/21/93	0.13	mg/l
Magnesium, dissolved	119	8.00	10/30/91	0.90	12/12/08	2.20	mg/l
Manganese, dissolved	24	0.08	6/16/97	0.01	6/28/06	0.02	mg/l
Mercury, dissolved	25	0.02	7/31/91	0.0002	8/14/95	0.01	mg/l
Molybdenum, dissolved	25	0.14	8/1/90	0.02	8/16/96	0.07	mg/l
Nickel, dissolved	25	0.02	1/29/91	0.01	9/21/10	0.02	mg/l
Potassium, dissolved	119	12.00	7/31/91	1.00	5/23/94	1.70	mg/l
Selenium, dissolved	25	0.001	8/8/90	U	11/27/12	U	mg/l
Silica, dissolved	119	122.00	10/30/91	0.30	4/24/91	19.87	mg/l
Sodium, dissolved	119	882.00	8/10/08	247.00	11/23/10	409.02	mg/l
Strontium, dissolved	119	1.30	4/20/92	0.06	6/14/00	0.68	mg/l
Vanadium, dissolved	25	U	9/21/10	U	11/27/12	U	mg/l
Zinc, dissolved	25	0.53	7/31/91	0.01	8/1/90	0.09	mg/l

Table 25: BG-1 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	136	1,010.00	8/7/97	283.00	2/16/07	638.36	mg/l
Carbonate as CaCO3	136	581.00	8/21/03	8.00	5/26/00	133.02	mg/l
Total Alkalinity as	136	1,160.00	8/21/03	364.00	2/16/07	767.32	mg/l
Bromide	18	3.00	9/2/98	0.10	5/18/06	0.49	mg/l
Cation-Anion Balance	136	42.30	3/17/09	-36.30	8/7/97	-1.45	%
Sum of Anions	136	30.80	8/7/97	9.10	2/16/07	17.34	meq/l
Sum of Cations	136	43.20	3/17/09	6.70	2/16/07	16.88	meq/l
Chemical Oxygen	15	470.00	8/25/05	10.00	9/14/00	148.00	mg/l
Chloride	136	249.00	8/7/97	U	9/25/02	24.88	mg/l
Conductivity, Lab	136	3,980.00	8/7/97	769.00	2/16/07	1,509.54	µmhos
Fluoride	136	56.00	3/25/98	12.80	6/14/08	24.12	mg/l
Hardness as CaCO3	135	48.00	4/19/01	1.00	2/16/07	11.10	mg/l
Nitrate as N, dissolved	18	0.53	9/25/02	0.03	8/30/08	0.20	mg/l
Nitrate/Nitrite as N,	18	0.53	9/25/02	0.02	5/18/06	0.17	mg/l
Nitrite as N, dissolved	18	0.02	5/18/06	0.02	5/18/06	0.02	mg/l
Nitrogen, Ammonia	16	5.00	9/29/97	0.72	9/29/06	1.87	mg/l
Nitrogen, Organic	16	28.00	9/25/02	0.30	9/22/99	8.02	mg/l
Nitrogen, Total Kjeldahl	16	28.00	9/25/02	1.40	9/15/97	9.79	mg/l
pH, lab	135	9.60	7/29/09	7.00	12/12/08	8.94	units
Phosphate, total	14	155.00	5/18/06	0.08	9/15/97	24.26	mg/l
Phosphorus, total	16	0.51	9/24/03	0.03	9/15/97	0.13	mg/l
SAR in Water	135	148.00	11/23/10	19.80	4/19/01	58.44	none
Sulfate	134	70.00	10/30/03	0.00	5/15/17	12.30	mg/l
Sulfide	14	1.50	9/24/03	0.03	9/29/06	0.33	mg/l
Total Dissolved Solids	136	1,510.00	3/17/09	453.00	2/16/07	936.71	mg/l
Conductivity, Field	149	3,980.00	8/7/97	1,310.00	2/8/00	1,528.27	µmhos
pH, Field	149	10.69	7/29/09	6.35	8/30/08	8.92	units
Temperature (°C), Field	101	16.20	6/1/07	8.60	12/1/03	12.56	(°C)
Water Level, Field	100	539.90	3/20/15	493.67	7/1/01	521.56	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	18	7.96	9/25/02	0.03	11/16/07	1.06	mg/l
Arsenic, dissolved	18	0.002	9/29/97	0.0002	11/27/12	0.0009	mg/l
Barium, dissolved	18	1.26	9/25/02	0.13	9/29/06	0.31	mg/l
Beryllium, dissolved	18	U	9/21/10	U	11/27/12	U	mg/l
Boron, dissolved	135	1.67	3/17/09	0.22	4/19/01	0.82	mg/l
Cadmium, dissolved	18	U	9/21/10	U	11/27/12	U	mg/l
Calcium, dissolved	134	8.80	12/12/08	0.20	11/23/10	2.25	mg/l
Chromium, dissolved	18	0.02	9/29/97	0.02	9/29/97	0.02	mg/l
Copper, dissolved	18	0.38	9/25/02	0.01	9/24/03	0.09	mg/l
Iron, dissolved	18	29.40	9/25/02	0.03	3/14/08	2.66	mg/l
Lead, dissolved	18	0.88	9/25/02	0.05	9/21/10	0.36	mg/l
Lithium, dissolved	18	0.20	9/2/98	0.12	8/30/08	0.16	mg/l
Magnesium, dissolved	134	9.40	4/19/01	0.20	9/29/06	1.34	mg/l
Manganese, dissolved	17	0.18	9/25/02	0.01	9/14/00	0.04	mg/l
Mercury, dissolved	18	0.0006	9/2/98	U	11/27/12	U	mg/l
Molybdenum, dissolved	18	0.06	9/29/97	0.01	9/14/04	0.03	mg/l
Nickel, dissolved	18	0.05	9/29/06	0.02	9/25/02	0.03	mg/l
Potassium, dissolved	136	12.00	8/7/97	1.20	6/14/01	3.09	mg/l
Selenium, dissolved	18	U	9/21/10	U	11/27/12	U	mg/l
Silica, dissolved	136	50.20	9/25/02	1.40	10/26/04	9.75	mg/l
Sodium, dissolved	136	973.00	3/17/09	152.00	2/16/07	375.47	mg/l
Strontium, dissolved	135	1.58	9/25/02	0.14	2/16/07	0.52	mg/l
Vanadium, dissolved	18	U	9/21/10	U	11/27/12	U	mg/l
Zinc, dissolved	18	0.80	9/25/02	0.01	9/29/97	0.11	mg/l

Table 26: BG-4 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	201	899.00	10/28/02	524.0	9/14/04	687.9	mg/l
Carbonate as CaCO3	201	210.00	7/30/03	16.00	11/21/08	93.54	mg/l
Total Alkalinity as	201	984.00	5/7/18	612.0	4/17/02	778.2	mg/l
Bromide	28	0.10	8/12/04	0.10	8/12/04	0.10	mg/l
Cation-Anion Balance	201	13.40	8/2/06	-2.80	5/7/18	-2.27	%
Sum of Anions	201	22.00	5/7/18	12.60	8/2/06	17.39	meq/l
Sum of Cations	201	19.60	8/22/02	13.60	4/29/10	16.62	meq/l
Chemical Oxygen	28	400.00	8/22/02	10.00	8/2/06	80.08	mg/l
Chloride	201	57.90	8/30/06	2.00	8/2/06	21.47	mg/l
Conductivity, Lab	200	1,920	5/7/18	1,160	8/2/06	1,533	µmhos
Fluoride	201	26.90	12/16/03	2.09	6/6/17	22.23	mg/l
Hardness as CaCO3	200	47.00	9/30/08	5.00	11/27/02	15.04	mg/l
Nitrate as N, dissolved	27	2.06	9/28/06	0.03	11/6/14	1.05	mg/l
Nitrate/Nitrite as N,	27	2.08	9/28/06	0.02	5/18/06	0.59	mg/l
Nitrite as N, dissolved	27	0.21	8/2/06	0.01	5/18/06	0.07	mg/l
Nitrogen, Ammonia	28	1.61	9/30/08	0.59	12/20/07	0.89	mg/l
Nitrogen, Organic	26	27.00	8/22/02	0.50	8/2/06	4.88	mg/l
Nitrogen, Total Kjeldahl	28	28.00	8/22/02	1.00	4/13/16	5.26	mg/l
pH, lab	201	9.20	5/21/09	7.50	8/30/08	8.78	units
Phosphate, total	24	155.00	5/18/06	0.12	8/18/10	43.98	mg/l
Phosphorus, total	28	0.24	12/20/18	0.03	8/2/06	0.07	mg/l
SAR in Water	200	73.30	12/16/02	23.40	9/30/08	42.84	none
Sulfate	199	50.00	9/28/06	0.00	9/2/15	12.06	mg/l
Sulfide	20	0.80	8/22/02	0.03	9/28/06	0.28	mg/l
Total Dissolved Solids	201	1,070	5/7/18	789	8/2/06	921	mg/l
Conductivity, Field	218	2,874	2/10/16	1,101	10/5/06	1,528	µmhos
pH, Field	218	10.01	7/29/09	6.90	11/4/19	8.52	units
Temperature (°C), Field	214	22.70	8/2/16	5.80	1/26/10	12.09	(°C)
Water Level, Field	210	547.26	11/10/10	468.3	7/1/02	506.4	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	30	0.67	8/21/03	0.03	5/18/06	0.14	mg/l
Arsenic, dissolved	30	0.0009	9/30/08	0.0003	12/20/18	0.0006	mg/l
Barium, dissolved	30	0.14	7/29/09	0.003	7/6/17	0.02	mg/l
Beryllium, dissolved	30	U	8/22/02	U	12/20/18	U	mg/l
Boron, dissolved	202	0.97	7/12/07	0.34	8/21/03	0.72	mg/l
Cadmium, dissolved	30	U	8/22/02	U	12/20/18	U	mg/l
Calcium, dissolved	203	11.70	9/30/08	1.10	12/16/02	2.89	mg/l
Chromium, dissolved	30	0.02	9/28/06	0.02	9/28/06	0.02	mg/l
Copper, dissolved	30	U	8/22/02	U	12/20/18	U	mg/l
Iron, dissolved	30	0.63	9/28/06	0.01	8/12/04	0.13	mg/l
Lead, dissolved	30	0.04	5/6/19	0.04	5/6/19	0.04	mg/l
Lithium, dissolved	30	0.16	12/20/18	0.08	8/21/03	0.14	mg/l
Magnesium, dissolved	202	4.40	9/30/08	0.60	11/27/02	1.90	mg/l
Manganese, dissolved	28	0.19	9/30/08	0.01	3/14/08	0.03	mg/l
Mercury, dissolved	30	0.0004	9/28/06	0.0004	9/28/06	0.0004	mg/l
Molybdenum, dissolved	30	0.12	8/22/02	0.01	8/18/10	0.04	mg/l
Nickel, dissolved	30	0.03	9/30/08	0.01	12/3/12	0.02	mg/l
Potassium, dissolved	203	6.20	7/24/02	0.60	11/21/08	1.62	mg/l
Selenium, dissolved	30	0.0001	5/6/19	U	12/20/18	U	mg/l
Silica, dissolved	202	29.30	4/17/02	5.50	8/21/03	14.57	mg/l
Sodium, dissolved	203	434.00	8/22/02	302.00	9/11/13	368.77	mg/l
Strontium, dissolved	202	0.82	2/7/17	0.06	4/27/04	0.48	mg/l
Vanadium, dissolved	30	U	8/22/02	U	12/20/18	U	mg/l
Zinc, dissolved	30	0.13	8/30/08	0.01	8/22/02	0.03	mg/l

Table 27: BG-5 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	126	3,530.00	9/4/18	447.0	3/22/11	1,001.	mg/l
Carbonate as CaCO3	126	735.00	9/4/18	43.10	2/10/16	154.7	mg/l
Total Alkalinity as	126	4,260.00	9/4/18	670.0	5/14/14	1,156.	mg/l
Bromide	13	0.94	7/10/13	0.00	11/10/14	0.47	mg/l
Cation-Anion Balance	126	7.90	10/28/10	-1.10	10/9/13	-2.98	%
Sum of Anions	126	127.00	9/4/18	15.00	5/14/14	31.65	meq/l
Sum of Cations	126	120.00	9/4/18	14.90	5/6/13	29.77	meq/l
Chemical Oxygen	13	320.00	9/22/10	16.00	10/12/15	70.73	mg/l
Chloride	126	1,440.00	9/4/18	14.20	11/30/15	260.6	mg/l
Conductivity, Lab	126	10,300	9/4/18	1,420	1/11/16	2,833	µmhos
Fluoride	126	33.00	8/6/18	9.80	2/23/10	22.52	mg/l
Hardness as CaCO3	126	44.00	10/28/10	11.00	5/6/13	17.65	mg/l
Nitrate as N, dissolved	14	0.07	11/10/14	0.02	10/7/09	0.04	mg/l
Nitrate/Nitrite as N,	14	0.07	11/10/14	0.02	10/7/09	0.04	mg/l
Nitrite as N, dissolved	14	U	10/7/09	0.00	11/10/14	U	mg/l
Nitrogen, Ammonia	14	2.15	5/7/19	0.56	10/7/09	0.96	mg/l
Nitrogen, Organic	14	3.90	9/22/10	0.20	12/13/12	1.13	mg/l
Nitrogen, Total Kjeldahl	14	5.10	9/22/10	0.80	10/12/15	1.99	mg/l
pH, lab	126	9.60	3/22/11	6.10	4/2/19	8.89	units
Phosphate, total	14	155.00	10/7/09	0.06	10/12/15	19.73	mg/l
Phosphorus, total	14	0.65	5/7/19	0.02	10/12/15	0.12	mg/l
SAR in Water	126	240.00	6/4/18	39.20	11/10/10	68.40	none
Sulfate	126	110.00	11/10/10	0.00	11/22/11	29.94	mg/l
Sulfide	14	1.33	8/11/11	0.00	11/10/14	0.57	mg/l
Total Dissolved Solids	126	6,810	9/4/18	829	5/14/14	1,690	mg/l
Conductivity, Field	152	10,410	9/4/18	1,232	6/5/17	2,742	µmhos
pH, Field	150	9.66	2/4/11	6.70	11/4/19	8.61	units
Temperature (°C), Field	152	21.00	8/18/10	7.10	2/5/14	12.44	(°C)
Water Level, Field	145	540.40	9/7/14	520.1	12/2/19	529.4	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	13	0.10	8/18/10	0.04	8/11/11	0.06	mg/l
Arsenic, dissolved	13	0.01	11/10/10	0.00	11/10/14	0.00	mg/l
Barium, dissolved	13	2.47	5/7/19	0.04	10/7/09	0.58	mg/l
Beryllium, dissolved	13	U	10/7/09	U	12/20/18	U	mg/l
Boron, dissolved	126	3.24	9/4/18	0.45	11/19/09	0.95	mg/l
Cadmium, dissolved	13	U	10/7/09	U	12/20/18	U	mg/l
Calcium, dissolved	126	7.70	10/28/10	1.60	6/4/18	2.93	mg/l
Chromium, dissolved	13	U	10/7/09	U	12/20/18	U	mg/l
Copper, dissolved	13	0.07	7/5/17	0.02	10/7/09	0.05	mg/l
Iron, dissolved	13	0.90	10/7/09	0.03	12/4/12	0.16	mg/l
Lead, dissolved	13	U	10/7/09	U	12/20/18	U	mg/l
Lithium, dissolved	13	0.33	5/7/19	0.17	10/7/09	0.20	mg/l
Magnesium, dissolved	126	5.90	10/28/10	1.30	3/9/14	2.49	mg/l
Manganese, dissolved	13	0.03	10/7/09	0.01	7/10/13	0.01	mg/l
Mercury, dissolved	13	U	10/7/09	U	12/20/18	U	mg/l
Molybdenum, dissolved	13	1.31	11/10/10	0.01	10/7/09	0.30	mg/l
Nickel, dissolved	13	U	5/7/19	0.02	7/10/13	U	mg/l
Potassium, dissolved	126	34.80	8/2/10	0.60	11/1/16	1.98	mg/l
Selenium, dissolved	13	0.01	11/10/10	0.00	8/11/11	0.00	mg/l
Silica, dissolved	126	15.80	12/4/12	0.50	2/17/11	12.42	mg/l
Sodium, dissolved	126	2710	9/4/18	332.0	5/6/13	666.1	mg/l
Strontium, dissolved	126	2.55	8/6/18	0.48	8/2/10	0.96	mg/l
Vanadium, dissolved	13	U	10/7/09	U	12/20/18	U	mg/l
Zinc, dissolved	13	0.17	12/20/18	U	10/7/09	0.052	mg/l

Table 28: BG-6 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	112	869.00	12/18/13	541.0	12/8/10	668.8	mg/l
Carbonate as CaCO3	112	219.00	12/8/10	56.60	9/5/18	92.04	mg/l
Total Alkalinity as	112	1,040.00	12/18/13	633.0	6/11/14	760.8	mg/l
Bromide	12	U	1/13/11	U	5/6/19	U	mg/l
Cation-Anion Balance	112	5.90	4/9/14	-9.30	4/11/11	-2.50	%
Sum of Anions	112	23.00	12/18/13	14.30	6/11/14	16.88	meq/l
Sum of Cations	112	20.00	12/18/13	13.10	4/11/11	16.06	meq/l
Chemical Oxygen	11	800.00	1/13/11	21.00	12/31/18	232.7	mg/l
Chloride	94	70.00	12/8/10	10.00	1/20/11	16.32	mg/l
Conductivity, Lab	112	8,820	6/3/19	1,320	7/5/17	1,587	µmhos
Fluoride	112	27.80	6/3/19	14.60	9/17/12	23.33	mg/l
Hardness as CaCO3	112	16.00	9/5/17	10.00	9/11/13	12.62	mg/l
Nitrate as N, dissolved	1	0.03	12/27/12	0.03	12/27/12	0.03	mg/l
Nitrate/Nitrite as N,	1	0.03	12/27/12	0.03	12/27/12	0.03	mg/l
Nitrite as N, dissolved	12	U	1/13/11	UH	5/6/19	U	mg/l
Nitrogen, Ammonia	11	0.95	10/12/15	0.71	1/20/11	0.82	mg/l
Nitrogen, Organic	11	8.30	1/13/11	0.80	10/12/15	2.49	mg/l
Nitrogen, Total Kjeldahl	11	9.00	1/13/11	1.60	5/6/19	3.30	mg/l
pH, lab	112	9.40	12/8/10	8.60	9/5/18	8.85	units
Phosphate, total	11	77.50	8/11/11	0.09	1/13/11	7.17	mg/l
Phosphorus, total	11	0.09	7/10/13	0.03	1/13/11	0.04	mg/l
SAR in Water	112	56.60	12/18/13	37.80	4/11/11	44.38	none
Sulfate	6	20.00	1/13/11	0.00	9/2/15	10.05	mg/l
Sulfide	5	0.10	1/20/11	0.03	7/10/13	0.05	mg/l
Total Dissolved Solids	112	1,130	12/18/13	799	5/14/14	883	mg/l
Conductivity, Field	110	2,413	9/17/12	1,232	6/5/17	1,503	µmhos
pH, Field	109	9.58	3/5/12	6.60	11/4/19	8.36	units
Temperature (°C), Field	110	23.00	9/5/17	4.62	11/22/11	11.67	(°C)
Water Level, Field	109	517.10	8/7/17	493.9	10/12/15	507.7	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	2	0.04	1/13/11	0.04	1/13/11	0.04	mg/l
Arsenic, dissolved	12	0.06	1/13/11	0.000	4/12/16	0.01	mg/l
Barium, dissolved	12	0.39	1/13/11	0.31	7/5/17	0.34	mg/l
Beryllium, dissolved	12	U	11/10/14	0.00	11/10/14	U	mg/l
Boron, dissolved	112	0.91	12/18/13	0.62	12/8/10	0.72	mg/l
Cadmium, dissolved	12	U	11/10/14	U	5/6/19	U	mg/l
Calcium, dissolved	112	3.40	9/5/17	2.00	9/11/13	2.42	mg/l
Chromium, dissolved	1	0.01	12/31/18	0.01	12/31/18	U	mg/l
Copper, dissolved	1	0.04	5/6/19	0.04	5/6/19	U	mg/l
Iron, dissolved	10	0.19	12/31/18	0.02	12/4/12	0.07	mg/l
Lead, dissolved	1	0.05	12/4/12	0.05	12/4/12	U	mg/l
Lithium, dissolved	12	0.13	1/13/11	0.11	7/5/17	0.12	mg/l
Magnesium, dissolved	112	1.90	3/9/11	1.30	12/8/10	1.59	mg/l
Manganese, dissolved	1	0.01	1/13/11	0.01	1/13/11	0.01	mg/l
Mercury, dissolved	12	U	1/13/11	U	12/27/12	U	mg/l
Molybdenum, dissolved	1	0.06	1/13/11	0.06	1/13/11	0.06	mg/l
Nickel, dissolved	12	U	1/13/11	U	12/27/12	U	mg/l
Potassium, dissolved	112	2.10	12/8/10	0.60	11/2/16	0.98	mg/l
Selenium, dissolved	12	U	1/13/11	U	12/27/12	U	mg/l
Silica, dissolved	112	17.60	10/1/18	1.10	12/8/10	15.30	mg/l
Sodium, dissolved	112	439.00	12/18/13	292.0	4/11/11	356.8	mg/l
Strontium, dissolved	112	0.83	9/7/14	0.38	12/8/10	0.70	mg/l
Vanadium, dissolved	12	U	1/13/11	U	12/27/12	U	mg/l
Zinc, dissolved	3	0.03	7/5/17	0.01	12/4/12	U	mg/l

Table 29: BG-7 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	6	818	6/25/19	501	12/15/15	633	mg/l
Carbonate as CaCO3	6	307	12/15/15	102	6/25/19	227	mg/l
Total Alkalinity as	6	920	6/25/19	808	12/15/15	860	mg/l
Bromide	6	0.14	10/18/14	0.13	9/28/17	0.13	mg/l
Cation-Anion Balance	6	2.40	6/25/19	-2.10	4/5/16	-0.30	%
Sum of Anions	6	24.00	10/18/14	20.00	6/25/19	22.83	meq/l
Sum of Cations	6	24.00	10/18/14	21.00	6/25/19	22.67	meq/l
Chemical Oxygen	6	30.00	6/25/19	14.00	4/5/16	22.67	mg/l
Chloride	6	201	12/15/15	24	6/25/19	155	mg/l
Conductivity, Lab	6	2,340	10/18/14	1,780	6/25/19	2,162	µmhos
Fluoride	6	21.70	6/25/19	18.20	12/15/15	19.75	mg/l
Hardness as CaCO3	6	13.00	10/18/14	11.00	4/5/16	11.82	mg/l
Nitrate as N, dissolved	6	0.02	10/18/14	0.02	10/18/14	0.02	mg/l
Nitrate/Nitrite as N,	6	0.02	10/18/14	0.02	10/18/14	0.02	mg/l
Nitrite as N, dissolved	6	0.01	12/15/15	0.00	10/18/14	0.01	mg/l
Nitrogen, Ammonia	6	1.22	10/18/14	0.81	6/20/18	1.05	mg/l
Nitrogen, Organic	6	1.20	6/20/18	0.20	10/18/14	0.63	mg/l
Nitrogen, Total Kjeldahl	6	2.00	9/28/17	1.40	10/18/14	1.67	mg/l
pH, lab	6	9.60	12/15/15	8.80	6/25/19	9.30	units
Phosphate, total	6	0.40	12/15/15	0.09	6/20/18	0.18	mg/l
Phosphorus, total	6	0.13	12/15/15	0.03	6/20/18	0.06	mg/l
SAR in Water	6	66	4/5/16	58.00	6/25/19	64	none
Sulfate	6	40	10/18/14	5.58	6/20/18	16	mg/l
Sulfide	6	0.15	6/25/19	0.12	12/15/15	0.14	mg/l
Total Dissolved Solids	6	1,350	10/18/14	1,090	6/25/19	1,233	mg/l
Conductivity, Field	7	2,575	12/15/15	1,594	10/25/18	2,112	µmhos
pH, Field	7	9.40	6/20/18	8.21	10/25/18	8.84	units
Temperature (°C), Field	7	22.50	10/18/14	11.49	10/25/18	15.31	(°C)
Water Level, Field	7	480.10	9/28/17	470.30	10/25/18	476.54	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	6	0.08	10/18/14	U	4/5/16	0.07	mg/l
Arsenic, dissolved	6	0.03	10/18/14	U	9/28/17	0.01	mg/l
Barium, dissolved	6	0.40	6/25/19	0.02	12/15/15	0.10	mg/l
Beryllium, dissolved	6	U	10/18/14	U	6/25/19	U	mg/l
Boron, dissolved	6	0.78	6/25/19	0.56	12/15/15	0.65	mg/l
Cadmium, dissolved	6	U	10/18/14	U	6/25/19	U	mg/l
Calcium, dissolved	6	3.60	10/18/14	U	6/20/18	2.08	mg/l
Chromium, dissolved	6	U	10/18/14	U	6/25/19	U	mg/l
Copper, dissolved	6	U	10/18/14	U	6/25/19	U	mg/l
Iron, dissolved	6	0.36	9/28/17	0.06	12/15/15	0.18	mg/l
Lead, dissolved	6	U	10/18/14	U	6/25/19	U	mg/l
Lithium, dissolved	6	0.17	4/5/16	0.10	6/25/19	0.15	mg/l
Magnesium, dissolved	6	1.90	9/28/17	U	10/18/14	1.63	mg/l
Manganese, dissolved	6	U	9/28/17	U	10/18/14	U	mg/l
Mercury, dissolved	6	U	10/18/14	U	6/25/19	U	mg/l
Molybdenum, dissolved	6	0.14	10/18/14	0.05	6/20/18	0.09	mg/l
Nickel, dissolved	6	U	10/18/14	U	6/25/19	U	mg/l
Potassium, dissolved	6	14.50	10/18/14	0.90	6/25/19	9.83	mg/l
Selenium, dissolved	6	U	10/18/14	U	12/15/15	U	mg/l
Silica, dissolved	6	18.90	10/18/14	0.90	12/15/15	6.07	mg/l
Sodium, dissolved	6	536	10/18/14	459	6/25/19	500	mg/l
Strontium, dissolved	6	0.66	6/25/19	U	12/15/15	0.30	mg/l
Vanadium, dissolved	6	U	10/18/14	U	10/18/14	U	mg/l
Zinc, dissolved	6	0.04	12/15/15	U	12/15/15	0.04	mg/l

Table 30: BG-9 (DS-5) Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	16	900	5/7/19	529	8/5/19	607	mg/l
Carbonate as CaCO3	16	542	11/4/19	185	10/10/18	307	mg/l
Total Alkalinity as	16	1,290	5/7/19	793	8/5/19	914	mg/l
Bromide	3	U	10/3/18	U	5/7/19	U	mg/l
Cation-Anion Balance	16	2.30	8/5/19	-24.50	5/7/19	-3.74	%
Sum of Anions	16	33.00	5/7/19	20.00	10/10/18	24.06	meq/l
Sum of Cations	16	31.00	12/2/19	19.00	10/10/18	22.25	meq/l
Chemical Oxygen	3	23.00	5/7/19	23.00	5/7/19	23.00	mg/l
Chloride	16	254	11/4/19	101	10/10/18	161	mg/l
Conductivity, Lab	16	3,230	5/7/19	1,840	10/10/18	2,205	µmhos
Fluoride	16	24.90	2/11/19	18.90	10/7/19	22.83	mg/l
Hardness as CaCO3	16	17.00	10/7/19	5.10	9/9/19	9.12	mg/l
Nitrate as N, dissolved	3	UH	10/3/18	UH	5/7/19	UH	mg/l
Nitrate/Nitrite as N,	3	UH	10/3/18	UH	5/7/19	UH	mg/l
Nitrite as N, dissolved	3	UH	10/3/18	UH	5/7/19	UH	mg/l
Nitrogen, Ammonia	3	1.44	10/3/18	1.37	10/10/18	1.40	mg/l
Nitrogen, Organic	3	0.40	5/7/19	0.30	10/3/18	0.35	mg/l
Nitrogen, Total Kjeldahl	3	1.80	5/7/19	1.70	10/3/18	1.75	mg/l
pH, lab	16	9.80	11/4/19	9.20	10/3/18	9.46	units
Phosphate, total	3	0.43	5/7/19	0.09	10/3/18	0.21	mg/l
Phosphorus, total	3	0.14	5/7/19	0.03	10/3/18	0.07	mg/l
SAR in Water	16	120	12/2/19	50.00	10/3/18	77	none
Sulfate	16	9	11/4/19	2.41	12/4/18	6	mg/l
Sulfide	3	0.09	10/10/18	0.08	10/3/18	0.09	mg/l
Total Dissolved Solids	16	1,680	12/2/19	1,060	10/10/18	1,251	mg/l
Conductivity, Field	15	3,367	5/7/19	1,560	9/9/19	2,149	µmhos
pH, Field	15	9.50	4/2/19	7.60	11/4/19	8.87	units
Temperature (°C), Field	15	14.30	7/1/19	8.07	2/11/19	11.81	(°C)
Water Level, Field	14	516.80	7/1/19	502.60	12/2/19	512.40	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Arsenic, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Barium, dissolved	3	0.26	10/3/18	0.10	5/7/19	0.18	mg/l
Beryllium, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Boron, dissolved	16	1.48	12/2/19	0.67	10/10/18	0.89	mg/l
Cadmium, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Calcium, dissolved	16	5.50	10/7/19	1.10	7/1/19	1.77	mg/l
Chromium, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Copper, dissolved	3	0.01	10/3/18	0.01	10/3/18	0.01	mg/l
Iron, dissolved	3	2.40	10/3/18	0.10	5/7/19	1.27	mg/l
Lead, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Lithium, dissolved	3	0.14	5/7/19	0.14	10/10/18	0.14	mg/l
Magnesium, dissolved	16	2.20	10/3/18	0.50	9/9/19	1.13	mg/l
Manganese, dissolved	3	0.03	10/3/18	0.02	10/10/18	0.02	mg/l
Mercury, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Molybdenum, dissolved	3	0.17	10/3/18	0.13	5/7/19	0.16	mg/l
Nickel, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Potassium, dissolved	16	5.20	12/2/19	2.40	10/10/18	3.03	mg/l
Selenium, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Silica, dissolved	16	4.70	12/2/19	1.80	6/3/19	2.87	mg/l
Sodium, dissolved	16	699	12/2/19	420	12/4/18	499	mg/l
Strontium, dissolved	16	0.60	10/3/18	0.35	8/5/19	0.44	mg/l
Vanadium, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l
Zinc, dissolved	3	U	10/3/18	U	5/7/19	U	mg/l

Table 31: IRI-6 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	62	806.00	12/16/92	356.00	2/26/91	634.92	mg/l
Carbonate as CaCO3	62	754.00	9/27/90	10.00	6/16/92	102.70	mg/l
Total Alkalinity as	62	1,064.00	9/27/90	375.00	9/7/90	714.21	mg/l
Bromide	32	2.60	9/7/90	0.06	5/26/00	0.82	mg/l
Cation-Anion Balance	60	11.10	5/29/02	-9.40	7/29/09	0.53	%
Sum of Anions	54	24.21	9/27/90	12.00	5/26/04	16.36	meq/l
Sum of Cations	54	23.84	9/27/90	13.00	5/26/04	16.47	meq/l
Chemical Oxygen	24	550.00	7/29/09	11.00	8/24/17	156.21	mg/l
Chloride	61	524.00	9/7/90	11.00	6/30/95	41.49	mg/l
Conductivity, Lab	60	1,660.00	9/8/93	1,050.00	3/22/93	1,436.58	µmhos
Fluoride	62	32.00	9/28/94	2.80	5/28/91	21.61	mg/l
Hardness as CaCO3	60	59.00	9/27/90	3.00	6/30/09	10.83	mg/l
Nitrate as N, dissolved	31	1.99	6/14/08	0.02	6/30/95	0.23	mg/l
Nitrate/Nitrite as N,	31	2.13	6/14/08	0.02	9/28/94	0.24	mg/l
Nitrite as N, dissolved	31	0.14	6/14/08	0.01	10/3/12	0.08	mg/l
Nitrogen, Ammonia	31	5.70	5/9/01	0.58	5/21/07	1.15	mg/l
Nitrogen, Organic	31	34.70	7/29/09	0.92	5/9/01	9.08	mg/l
Nitrogen, Total Kjeldahl	31	35.50	7/29/09	1.80	3/27/18	10.21	mg/l
pH, lab	60	11.60	12/20/93	8.40	12/30/96	8.87	units
Phosphate, total	31	0.90	9/7/90	0.03	5/26/00	0.15	mg/l
Phosphorus, total	31	0.30	9/7/90	0.01	6/18/96	0.05	mg/l
SAR in Water	50	92.00	11/27/02	29.17	9/27/90	53.06	none
Sulfate	62	140.00	6/14/08	2.00	5/28/91	17.55	mg/l
Sulfide	31	0.80	9/7/90	0.01	5/26/04	0.13	mg/l
Total Dissolved Solids	61	1,428.00	9/27/90	690.00	5/29/03	916.16	mg/l
Conductivity, Field	86	3,803.00	9/1/09	982.00	11/21/05	1,540.99	µmhos
pH, Field	85	12.00	9/27/90	7.60	9/16/19	9.29	units
Temperature (°C), Field	43	16.20	6/14/08	8.00	12/1/90	12.25	(°C)
Water Level, Field	59	435.60	8/24/17	398.45	11/1/90	411.22	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	30	3.79	9/27/90	U	5/26/04	0.65	mg/l
Arsenic, dissolved	30	0.03	9/27/90	U	5/26/04	0.01	mg/l
Barium, dissolved	30	0.43	3/27/18	U	9/7/90	0.22	mg/l
Beryllium, dissolved	30	U	9/7/90	U	8/24/17	U	mg/l
Boron, dissolved	62	0.72	1/31/91	0.19	12/20/93	0.57	mg/l
Cadmium, dissolved	30	U	9/7/90	U	8/24/17	U	mg/l
Calcium, dissolved	62	12.00	9/27/90	0.00	2/26/91	2.27	mg/l
Chromium, dissolved	30	0.01	9/7/90	U	9/7/90	0.01	mg/l
Copper, dissolved	30	U	10/22/13	U	10/22/13	U	mg/l
Iron, dissolved	30	0.24	11/6/14	U	5/26/99	0.05	mg/l
Lead, dissolved	30	0.32	3/22/16	U	6/23/94	0.15	mg/l
Lithium, dissolved	30	0.13	9/7/90	0.06	9/15/92	0.08	mg/l
Magnesium, dissolved	62	7.00	9/27/90	U	2/26/91	1.20	mg/l
Manganese, dissolved	30	0.02	3/27/18	U	7/31/91	0.01	mg/l
Mercury, dissolved	30	U	9/7/90	U	8/24/17	U	mg/l
Molybdenum, dissolved	30	U	3/22/16	U	3/22/16	U	mg/l
Nickel, dissolved	30	0.02	6/23/94	U	6/23/94	0.02	mg/l
Potassium, dissolved	62	13.00	9/7/90	0.90	11/16/04	1.78	mg/l
Selenium, dissolved	30	0.00	9/27/90	U	7/31/91	0.00	mg/l
Silica, dissolved	62	63.00	9/27/90	9.50	12/20/93	17.46	mg/l
Sodium, dissolved	62	508.00	9/27/90	287.0	12/20/93	368.6	mg/l
Strontium, dissolved	62	0.76	8/24/17	U	12/20/93	0.46	mg/l
Vanadium, dissolved	30	0.01	9/7/90	U	6/18/96	0.01	mg/l
Zinc, dissolved	30	0.13	10/22/13	U	5/9/01	0.03	mg/l

Table 32: DS-2 Monthly Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	153	66,300.00	8/21/03	3,970.00	11/18/06	42,334.67	mg/l
Carbonate as CaCO3	153	33,400.00	8/5/99	130.00	11/18/06	3,885.32	mg/l
Total Alkalinity as	153	68,800.00	8/21/03	4,100.00	11/18/06	45,915.79	mg/l
Bromide	19	3.00	5/18/06	2.70	11/5/19	2.85	mg/l
Cation-Anion Balance	153	80.00	11/18/06	-67.20	9/15/07	-2.03	%
Sum of Anions	153	1,420.00	8/21/03	105.00	11/18/06	962.53	meq/l
Sum of Cations	153	1,320.00	1/15/19	193.00	9/15/07	928.70	meq/l
Chemical Oxygen	18	1,100.00	7/29/09	100.00	9/14/00	295.33	mg/l
Chloride	153	15,000.00	12/9/19	105.00	4/11/06	1,493.69	mg/l
Conductivity, Lab	153	73,300.00	9/10/19	5,220.00	2/8/00	50,190.99	µmhos
Fluoride	153	123.00	3/25/98	8.60	4/11/06	51.08	mg/l
Hardness as CaCO3	153	150.00	11/16/07	1.00	3/25/98	36.99	mg/l
Nitrate as N, dissolved	19	0.96	9/25/02	0.00	9/24/03	0.10	mg/l
Nitrate/Nitrite as N,	19	1.65	9/25/02	0.00	9/24/03	0.16	mg/l
Nitrite as N, dissolved	19	0.87	9/25/02	0.00	9/24/03	0.11	mg/l
Nitrogen, Ammonia	18	16.30	9/26/01	3.75	9/14/00	11.98	mg/l
Nitrogen, Organic	18	16.40	7/29/09	1.90	9/24/03	6.80	mg/l
Nitrogen, Total Kjeldahl	18	27.00	11/5/19	1.70	9/14/00	15.29	mg/l
pH, lab	153	9.10	10/14/08	8.20	6/9/99	8.49	units
Phosphate, total	18	77.50	5/18/06	1.55	10/14/08	34.87	mg/l
Phosphorus, total	18	18.80	9/15/07	3.00	10/14/08	10.89	mg/l
SAR in Water	134	7,600.00	3/25/98	801.00	11/16/07	2,273.04	none
Sulfate	153	1,040.00	12/16/02	10.00	9/27/05	128.81	mg/l
Sulfide	18	18.60	11/5/19	0.05	8/25/05	2.87	mg/l
Total Dissolved Solids	153	69,100.00	2/12/19	20,800.00	12/8/00	50,972.37	mg/l
Conductivity, Field	156	82,870.00	12/9/19	26,900.00	12/1/08	53,153.65	µmhos
pH, Field	156	10.29	6/1/09	7.00	3/4/15	8.50	units
Temperature (°C), Field	110	23.77	6/15/11	6.30	3/4/13	13.02	(°C)
Water Level, Field	167	569.00	11/26/18	511.30	4/2/19	551.97	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	19	1.60	9/23/10	U	3/14/08	1.09	mg/l
Arsenic, dissolved	19	U	9/30/97	U	11/5/19	U	mg/l
Barium, dissolved	19	3.85	3/14/08	0.06	10/14/08	1.72	mg/l
Beryllium, dissolved	19	U	9/30/97	U	11/5/19	U	mg/l
Boron, dissolved	152	43.40	1/28/03	6.60	9/15/07	30.99	mg/l
Cadmium, dissolved	19	U	9/30/97	U	11/5/19	U	mg/l
Calcium, dissolved	152	60.00	11/16/07	U	8/12/04	13.40	mg/l
Chromium, dissolved	19	0.40	9/23/10	U	9/23/10	0.40	mg/l
Copper, dissolved	19	0.60	9/14/04	U	9/2/98	0.45	mg/l
Iron, dissolved	19	1.20	9/2/98	0.24	10/14/08	0.64	mg/l
Lead, dissolved	19	0.28	3/14/08	U	3/14/08	0.28	mg/l
Lithium, dissolved	19	12.70	3/14/08	1.00	9/15/07	4.59	mg/l
Magnesium, dissolved	152	10.00	9/8/15	U	3/14/08	5.56	mg/l
Manganese, dissolved	19	0.01	10/14/08	U	10/14/08	0.01	mg/l
Mercury, dissolved	19	U	9/30/97	U	11/5/19	U	mg/l
Molybdenum, dissolved	19	0.50	9/23/10	U	3/14/08	0.40	mg/l
Nickel, dissolved	19	0.23	3/14/08	U	3/14/08	0.23	mg/l
Potassium, dissolved	152	340.00	10/10/18	11.40	10/14/08	41.99	mg/l
Selenium, dissolved	19	0.00	9/30/97	U	9/30/97	0.00	mg/l
Silica, dissolved	152	50.00	6/2/98	3.60	4/11/06	26.82	mg/l
Sodium, dissolved	152	29,800.00	4/19/01	4,370.00	9/15/07	21,126.78	mg/l
Strontium, dissolved	152	0.60	8/4/97	U	10/14/08	0.26	mg/l
Vanadium, dissolved	19	0.20	9/23/10	U	3/14/08	0.10	mg/l
Zinc, dissolved	19	3.00	11/16/07	U	3/14/08	1.51	mg/l

Table 33: DS-3 Monthly Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	193	43,000	5/24/05	17,400	11/27/02	26,816	mg/l
Carbonate as CaCO3	193	23,900	5/3/08	419	6/26/02	3,584	mg/l
Total Alkalinity as	193	60,100	3/14/08	21,900	6/11/14	30,222	mg/l
Bromide	29	5.00	5/3/08	0.70	8/2/06	2.18	mg/l
Cation-Anion Balance	193	13.50	10/28/02	-3.80	4/10/13	-4.79	%
Sum of Anions	193	1,420.00	4/9/18	511.00	4/29/03	759.36	meq/l
Sum of Cations	193	1,730.00	3/14/08	20.70	4/10/13	706.85	meq/l
Chemical Oxygen	29	1,100.00	7/30/09	140.00	8/21/03	417.15	mg/l
Chloride	193	17,200	12/19/18	39.00	5/24/05	5,412.51	mg/l
Conductivity, Lab	193	81,800	2/13/19	27,200	9/28/06	46,077	µmhos
Fluoride	193	329.00	11/7/18	2.80	5/24/05	59.57	mg/l
Hardness as CaCO3	193	49.00	3/8/11	1.00	1/28/03	15.44	mg/l
Nitrate as N, dissolved	29	0.10	8/12/04	0.02	9/28/06	0.05	mg/l
Nitrate/Nitrite as N,	29	0.14	11/10/14	0.02	9/28/06	0.05	mg/l
Nitrite as N, dissolved	29	0.05	11/10/14	0.01	7/11/13	0.03	mg/l
Nitrogen, Ammonia	29	34.20	12/19/18	6.11	7/10/17	12.38	mg/l
Nitrogen, Organic	29	28.00	8/22/02	0.80	9/30/08	7.93	mg/l
Nitrogen, Total Kjeldahl	29	50.00	12/19/18	3.50	9/23/10	19.11	mg/l
pH, lab	193	9.20	4/10/08	7.90	10/28/02	8.59	units
Phosphate, total	29	155.00	7/30/09	3.10	8/16/11	30.53	mg/l
Phosphorus, total	29	183.00	9/30/08	3.20	6/26/07	13.94	mg/l
SAR in Water	149	8,450	5/18/06	0.00	12/9/14	2,466	none
Sulfate	193	1,860	9/23/10	0.00	9/2/15	206	mg/l
Sulfide	29	11.30	11/5/19	0.04	8/25/05	1.96	mg/l
Total Dissolved Solids	193	88,500	3/14/08	18,500	5/29/03	40,416	mg/l
Conductivity, Field	214	86,810	2/13/19	30,600	4/29/03	49,940	µmhos
pH, Field	214	9.91	6/30/09	7.00	3/9/16	8.42	units
Temperature (°C), Field	213	24.40	7/5/16	5.30	2/9/12	12.90	(°C)
Water Level, Field	214	543.10	9/7/14	484.10	2/4/16	521.75	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	30	79.90	8/12/04	U	3/14/08	17.00	mg/l
Arsenic, dissolved	30	U	12/4/12	U	12/4/12	U	mg/l
Barium, dissolved	30	3.32	8/25/05	0.19	8/19/07	1.83	mg/l
Beryllium, dissolved	30	U	12/19/18	U	11/5/19	U	mg/l
Boron, dissolved	194	74.70	2/13/19	3.69	5/29/03	17.31	mg/l
Cadmium, dissolved	30	U	12/19/18	U	11/5/19	U	mg/l
Calcium, dissolved	194	14.00	7/10/17	U	5/29/03	4.13	mg/l
Chromium, dissolved	30	0.01	5/18/06	U	5/18/06	0.01	mg/l
Copper, dissolved	30	1.20	8/16/11	U	8/12/04	0.85	mg/l
Iron, dissolved	30	3.70	9/15/07	U	5/18/06	1.49	mg/l
Lead, dissolved	30	1.40	8/22/02	U	3/14/08	0.81	mg/l
Lithium, dissolved	30	8.48	3/14/08	2.70	12/19/18	3.39	mg/l
Magnesium, dissolved	194	10.00	1/8/08	U	9/2/15	3.99	mg/l
Manganese, dissolved	30	U	12/19/18	U	11/5/19	U	mg/l
Mercury, dissolved	30	U	12/19/18	U	11/5/19	U	mg/l
Molybdenum, dissolved	30	0.70	8/19/07	U	8/18/10	0.45	mg/l
Nickel, dissolved	30	0.20	9/23/10	U	5/18/06	0.13	mg/l
Potassium, dissolved	194	150.00	2/13/19	0.00	11/21/08	33.73	mg/l
Selenium, dissolved	30	0.01	8/22/02	U	7/12/07	0.01	mg/l
Silica, dissolved	194	79.00	4/11/06	8.90	5/29/03	25.45	mg/l
Sodium, dissolved	194	39,200	3/14/08	450	4/10/13	16,16	mg/l
Strontium, dissolved	194	0.70	2/21/05	U	5/29/03	0.22	mg/l
Vanadium, dissolved	30	0.20	6/26/07	U	5/18/06	0.08	mg/l
Zinc, dissolved	30	1.80	7/10/17	U	3/14/08	0.68	mg/l

Table 34: DS-6 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	52	8,220	9/27/16	5,770	12/7/17	6,839	mg/l
Carbonate as CaCO3	52	5,060	3/7/18	2,730	9/27/16	3,933	mg/l
Total Alkalinity as	52	11,800	10/4/17	9,650	8/9/16	10,770	mg/l
Bromide	8	0.00	4/5/16	U	12/9/14	U	mg/l
Cation-Anion Balance	52	1.80	2/13/19	-12.70	10/4/17	-3.93	%
Sum of Anions	52	271.00	12/9/14	221.00	7/9/18	240.37	meq/l
Sum of Cations	52	240.00	12/9/14	195.00	4/4/18	222.24	meq/l
Chemical Oxygen	8	167.00	12/9/14	44.00	4/5/16	79.14	mg/l
Chloride	52	1,330	12/9/14	593	3/11/19	752	mg/l
Conductivity, Lab	52	19,800	12/9/14	15,400	9/22/16	17,010	µmhos
Fluoride	52	47.80	12/19/18	26.80	9/8/15	35.09	mg/l
Hardness as CaCO3	52	30.00	9/22/16	U	1/3/17	7.79	mg/l
Nitrate as N, dissolved	8	UH	4/5/16	U	9/27/16	U	mg/l
Nitrate/Nitrite as N,	8	0.02	12/9/14	0.02	12/9/14	0.02	mg/l
Nitrite as N, dissolved	8	0.03	12/9/14	0.03	12/9/14	0.03	mg/l
Nitrogen, Ammonia	8	4.18	12/19/18	3.30	12/9/14	3.73	mg/l
Nitrogen, Organic	8	5.60	5/7/19	0.80	7/11/17	2.86	mg/l
Nitrogen, Total Kjeldahl	8	9.30	5/7/19	4.70	7/11/17	6.58	mg/l
pH, lab	52	9.50	3/1/17	9.10	3/25/15	9.28	units
Phosphate, total	8	7.00	9/27/16	0.71	12/9/14	4.64	mg/l
Phosphorus, total	8	2.20	9/27/16	0.23	12/9/14	1.49	mg/l
SAR in Water	34	1,500	9/6/17	410.00	9/22/16	1,011	none
Sulfate	52	370	12/9/14	39.40	7/9/19	97	mg/l
Sulfide	8	3.00	7/11/17	0.30	4/5/16	1.50	mg/l
Total Dissolved Solids	52	14,100	12/9/14	11,700	1/8/19	12,531	mg/l
Conductivity, Field	48	19,680	5/7/19	15,380	4/5/16	17,047	µmhos
pH, Field	48	9.70	8/9/16	7.30	12/10/18	8.94	units
Temperature (°C), Field	48	16.70	9/6/17	9.92	2/13/19	12.34	(°C)
Water Level, Field	48	537.80	3/5/15	498.92	10/4/16	520.20	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	8	U	12/9/14	U	4/5/16	U	mg/l
Arsenic, dissolved	8	0.01	12/9/14	U	12/9/14	0.01	mg/l
Barium, dissolved	8	0.46	10/4/16	0.05	4/5/16	0.29	mg/l
Beryllium, dissolved	8	U	10/4/16	U	10/4/16	U	mg/l
Boron, dissolved	51	8.10	5/7/19	6.20	10/4/17	7.41	mg/l
Cadmium, dissolved	8	U	12/9/14	U	4/5/16	U	mg/l
Calcium, dissolved	51	7.00	9/22/16	U	3/25/15	1.96	mg/l
Chromium, dissolved	8	U	12/9/14	U	4/5/16	U	mg/l
Copper, dissolved	8	U	12/9/14	U	4/5/16	U	mg/l
Iron, dissolved	8	0.60	12/9/14	0.20	9/22/16	0.38	mg/l
Lead, dissolved	8	U	5/7/19	U	4/5/16	U	mg/l
Lithium, dissolved	8	2.22	12/19/18	1.94	9/27/16	2.08	mg/l
Magnesium, dissolved	51	4.00	3/25/15	U	9/8/15	2.71	mg/l
Manganese, dissolved	8	U	12/9/14	U	4/5/16	U	mg/l
Mercury, dissolved	8	U	12/9/14	U	4/5/16	U	mg/l
Molybdenum, dissolved	8	U	12/9/14	U	4/5/16	U	mg/l
Nickel, dissolved	8	U	12/9/14	U	4/5/16	U	mg/l
Potassium, dissolved	51	113.00	12/9/14	62.00	1/8/19	77.96	mg/l
Selenium, dissolved	8	U	9/22/16	U	9/22/16	U	mg/l
Silica, dissolved	51	34.00	7/11/17	7.00	1/27/16	26.04	mg/l
Sodium, dissolved	51	5,420	7/9/19	4,390	4/4/18	5,001	mg/l
Strontium, dissolved	51	0.27	8/7/18	U	12/29/15	0.17	mg/l
Vanadium, dissolved	8	U	12/9/14	U	4/5/16	U	mg/l
Zinc, dissolved	8	0.40	9/22/16	U	7/11/17	0.28	mg/l

Table 35: DS-7 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	59	33,500	4/8/19	17,400	12/30/14	26,853	mg/l
Carbonate as CaCO3	59	16,600	8/2/16	608	8/8/17	6,225	mg/l
Total Alkalinity as	59	41,300	7/7/16	23,300	10/10/17	33,075	mg/l
Bromide	7	0.00	12/30/14	U	12/17/14	U	mg/l
Cation-Anion Balance	59	6.50	6/17/15	-15.10	12/16/15	-3.89	%
Sum of Anions	59	3,360.00	12/17/14	728.00	10/10/17	1,522.27	meq/l
Sum of Cations	59	3,230.00	12/17/14	665.00	9/11/17	1,425.02	meq/l
Chemical Oxygen	7	3,630.00	11/5/15	344.00	5/7/19	1,693.14	mg/l
Chloride	59	96,000	12/30/14	9,250	10/10/17	30,586	mg/l
Conductivity, Lab	59	207,000	12/17/14	50,800	5/10/17	88,539	µmhos
Fluoride	59	106.00	12/10/19	40.40	10/11/16	67.67	mg/l
Hardness as CaCO3	59	82.40	12/16/15	0.00	12/30/14	45.03	mg/l
Nitrate as N, dissolved	7	UH	12/17/14	UH	12/30/14	UH	mg/l
Nitrate/Nitrite as N,	7	UH	12/17/14	UH	12/30/14	UH	mg/l
Nitrite as N, dissolved	7	UH	12/17/14	UH	12/30/14	UH	mg/l
Nitrogen, Ammonia	7	40.40	12/17/14	6.66	7/11/17	18.45	mg/l
Nitrogen, Organic	7	7.00	5/7/19	4.00	12/30/14	5.70	mg/l
Nitrogen, Total Kjeldahl	7	33.00	12/30/14	1.10	11/5/15	13.69	mg/l
pH, lab	59	9.10	5/6/15	8.40	11/6/18	8.67	units
Phosphate, total	7	71.00	11/5/15	20.00	7/11/17	45.00	mg/l
Phosphorus, total	7	23.00	11/5/15	6.50	7/11/17	14.54	mg/l
SAR in Water	20	7,600	6/8/16	1,500.00	2/12/19	3,092	none
Sulfate	59	480	12/30/14	110.00	7/11/17	350	mg/l
Sulfide	7	4.80	5/7/19	1.30	12/17/14	2.77	mg/l
Total Dissolved Solids	59	189,676	12/17/14	39,000	10/10/17	83,210	mg/l
Conductivity, Field	57	186,700	12/17/14	47,760	10/10/17	90,869	µmhos
pH, Field	57	9.20	3/10/16	7.10	12/17/14	8.34	units
Temperature (°C), Field	57	17.40	7/11/18	8.40	2/12/19	12.95	(°C)
Water Level, Field	58	643.10	12/12/14	478.76	11/9/16	498.15	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Arsenic, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Barium, dissolved	7	1.90	7/11/17	0.40	11/5/15	1.03	mg/l
Beryllium, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Boron, dissolved	59	66.00	9/9/15	7.10	1/9/18	27.94	mg/l
Cadmium, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Calcium, dissolved	59	30.00	5/6/15	U	12/30/14	12.38	mg/l
Chromium, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Copper, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Iron, dissolved	7	5.00	12/30/14	3.00	12/17/14	4.00	mg/l
Lead, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Lithium, dissolved	7	2.70	7/11/17	1.00	12/30/14	1.87	mg/l
Magnesium, dissolved	59	20.00	6/17/15	U	2/12/19	18.00	mg/l
Manganese, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Mercury, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Molybdenum, dissolved	7	2.00	4/5/16	2.00	4/5/16	2.00	mg/l
Nickel, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Potassium, dissolved	59	140.00	9/9/15	20.00	12/4/18	54.25	mg/l
Selenium, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Silica, dissolved	59	30.00	6/17/15	16.00	9/11/17	21.86	mg/l
Sodium, dissolved	59	73,200	12/17/14	15,100	9/11/17	32,344	mg/l
Strontium, dissolved	59	1.00	8/12/15	U	6/8/16	0.36	mg/l
Vanadium, dissolved	7	U	12/17/14	U	5/7/19	U	mg/l
Zinc, dissolved	7	0.50	7/11/17	U	7/11/17	0.50	mg/l

Table 36: DS-8 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	7	23,300	1/15/2015	16,700	6/25/2019	19,700	mg/l
Carbonate as CaCO3	7	9,590	6/25/2019	4,200	1/15/2015	6,851	mg/l
Total Alkalinity as	7	27,500	1/15/2015	25,300	9/28/2017	26,557	mg/l
Bromide	7	U	1/8/2015	U	6/25/2019	U	mg/l
Cation-Anion Balance	7	-1.40	6/25/2019	-9.50	1/8/2015	-4.23	%
Sum of Anions	7	582.00	1/15/2015	542.00	9/28/2017	565.57	meq/l
Sum of Cations	7	552.00	6/25/2019	477.00	1/8/2015	520.00	meq/l
Chemical Oxygen	7	731.00	1/15/2015	95.00	9/28/2017	223.14	mg/l
Chloride	7	1,080	6/25/2019	900	1/15/2015	982	mg/l
Conductivity, Lab	7	37,100	6/19/2018	33,200	12/15/2015	35,000	µmhos
Fluoride	7	70.70	6/25/2019	61.80	6/19/2018	65.70	mg/l
Hardness as CaCO3	7	U	1/8/2015	U	9/28/2017	U	mg/l
Nitrate as N, dissolved	7	0.03	1/15/2015	0.00	1/8/2015	0.02	mg/l
Nitrate/Nitrite as N,	7	0.03	1/15/2015	0.00	1/8/2015	0.02	mg/l
Nitrite as N, dissolved	7	0.01	6/25/2019	0.00	1/8/2015	0.00	mg/l
Nitrogen, Ammonia	7	10.50	1/15/2015	6.23	6/19/2018	8.11	mg/l
Nitrogen, Organic	7	6.60	4/5/2016	1.30	6/19/2018	4.63	mg/l
Nitrogen, Total Kjeldahl	7	14.80	1/15/2015	7.50	6/19/2018	12.71	mg/l
pH, lab	7	9.20	4/5/2016	8.70	1/8/2015	9.01	units
Phosphate, total	7	25.00	6/25/2019	15.00	12/15/2015	19.14	mg/l
Phosphorus, total	7	8.20	6/25/2019	4.90	12/15/2015	6.17	mg/l
SAR in Water	0	N/A	N/A	N/A	N/A	N/A	none
Sulfate	7	368	6/25/2019	100.00	1/8/2015	185	mg/l
Sulfide	7	2.00	6/25/2019	0.60	4/5/2016	1.13	mg/l
Total Dissolved Solids	7	30,100	6/25/2019	28,400	9/28/2017	29,186	mg/l
Conductivity, Field	7	39,750	12/15/201	31,210	4/5/2016	34,704	µmhos
pH, Field	7	9.23	6/19/2018	8.20	10/6/2014	8.86	units
Temperature (°C), Field	7	14.58	6/19/2018	11.20	10/6/2014	13.29	(°C)
Water Level, Field	7	497.50	6/19/2018	81.00	1/8/2015	436.61	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Arsenic, dissolved	7	0.07	1/15/2015	U	4/5/2016	0.03	mg/l
Barium, dissolved	7	1.00	1/15/2015	0.40	6/25/2019	0.65	mg/l
Beryllium, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Boron, dissolved	7	14.00	6/25/2019	12.70	4/5/2016	13.26	mg/l
Cadmium, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Calcium, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Chromium, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Copper, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Iron, dissolved	7	2.70	1/15/2015	0.40	9/28/2017	1.44	mg/l
Lead, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Lithium, dissolved	7	4.70	4/5/2016	4.20	1/8/2015	4.44	mg/l
Magnesium, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Manganese, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Mercury, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Molybdenum, dissolved	7	0.50	1/15/2015	0.50	1/15/2015	0.50	mg/l
Nickel, dissolved	7	U	1/15/2015	U	1/15/2015	U	mg/l
Potassium, dissolved	7	68.00	4/5/2016	43.00	1/8/2015	59.29	mg/l
Selenium, dissolved	7	U	1/8/2015	U	6/25/2019	U	mg/l
Silica, dissolved	7	58.00	6/25/2019	18.00	1/8/2015	28.86	mg/l
Sodium, dissolved	7	12,500	6/25/2019	10,800	1/8/2015	11,771	mg/l
Strontium, dissolved	7	0.10	1/15/2015	U	1/8/2015	0.07	mg/l
Vanadium, dissolved	7	U	6/25/2019	U	6/25/2019	U	mg/l
Zinc, dissolved	7	0.70	12/15/2015	U	12/15/2015	0.70	mg/l

Table 37: DS-9 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	8	15,800	4/22/2019	11,900	6/20/2018	12,900	mg/l
Carbonate as CaCO3	8	4,570	4/22/2019	1,880	9/28/2017	2,800	mg/l
Total Alkalinity as	8	20,300	4/22/2019	14,300	9/28/2017	15,700	mg/l
Bromide	8	U	11/4/2014	U	4/22/2019	U	mg/l
Cation-Anion Balance	8	-1.90	9/28/2017	-3.50	2/4/2015	-4.65	%
Sum of Anions	8	450.00	4/22/2019	341.00	6/20/2018	384.13	meq/l
Sum of Cations	8	424.00	4/22/2019	327.00	6/20/2018	349.38	meq/l
Chemical Oxygen	8	132.00	9/28/2017	97.00	4/5/2016	116.13	mg/l
Chloride	8	2,470	2/4/2015	1,390	4/22/2019	1,971	mg/l
Conductivity, Lab	8	27,000	4/22/2019	24,300	12/15/2015	25,913	µmhos
Fluoride	8	62.50	4/22/2019	41.40	6/20/2018	46.93	mg/l
Hardness as CaCO3	8	36.00	1/28/2015	U	12/15/2019	23.50	mg/l
Nitrate as N, dissolved	8	0.03	1/28/2015	0.03	1/28/2015	0.03	mg/l
Nitrate/Nitrite as N,	8	0.04	1/28/2015	0.04	1/28/2015	0.04	mg/l
Nitrite as N, dissolved	8	0.01	1/28/2015	0.01	1/28/2015	0.01	mg/l
Nitrogen, Ammonia	8	7.40	1/28/2015	3.43	6/20/2018	5.24	mg/l
Nitrogen, Organic	8	4.60	4/22/2019	1.80	1/28/2015	3.70	mg/l
Nitrogen, Total Kjeldahl	8	9.70	11/4/2014	7.00	2/4/2015	8.50	mg/l
pH, lab	8	9.00	4/22/2019	8.80	11/4/2014	8.86	units
Phosphate, total	8	9.90	4/22/2019	3.70	2/4/2015	6.24	mg/l
Phosphorus, total	8	3.19	4/22/2019	1.20	2/4/2015	2.01	mg/l
SAR in Water	3	660	2/4/2015	550.00	1/28/2015	617	none
Sulfate	8	2,870	2/4/2015	10.80	4/22/2019	588	mg/l
Sulfide	8	U	11/4/2014	U	4/22/2019	U	mg/l
Total Dissolved Solids	8	23,500	4/22/2019	18,100	6/20/2018	20,125	mg/l
Conductivity, Field	7	29,450	4/22/2019	23,740	4/5/2016	26,514	µmhos
pH, Field	7	8.93	6/20/2018	7.20	1/29/2015	8.29	units
Temperature (°C), Field	7	14.35	6/20/2018	11.90	4/22/2019	13.00	(°C)
Water Level, Field	8	470.10	10/29/2014	453.17	10/18/2018	457.36	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Arsenic, dissolved	8	0.01	11/4/2014	U	2/4/2015	0.01	mg/l
Barium, dissolved	8	1.87	11/4/2014	0.12	2/4/2015	0.58	mg/l
Beryllium, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Boron, dissolved	8	12.90	4/22/2019	8.70	9/28/2017	9.64	mg/l
Cadmium, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Calcium, dissolved	8	6.00	11/4/2014	U	2/4/2015	3.67	mg/l
Chromium, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Copper, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Iron, dissolved	8	1.20	11/4/2014	0.20	12/15/2015	0.58	mg/l
Lead, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Lithium, dissolved	8	3.80	4/22/2019	2.68	9/28/2017	3.03	mg/l
Magnesium, dissolved	8	7.00	1/28/2015	U	11/4/2014	5.33	mg/l
Manganese, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Mercury, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Molybdenum, dissolved	8	0.30	2/4/2015	0.20	12/15/2015	0.25	mg/l
Nickel, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Potassium, dissolved	8	30.00	4/22/2019	21.00	6/20/2018	23.50	mg/l
Selenium, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Silica, dissolved	8	29.00	4/22/2019	16.00	2/4/2015	20.63	mg/l
Sodium, dissolved	8	9,610	4/22/2019	7,420	6/20/2018	7,913	mg/l
Strontium, dissolved	8	0.30	11/4/2014	U	9/28/2017	0.17	mg/l
Vanadium, dissolved	8	U	11/4/2014	U	4/22/2019	U	mg/l
Zinc, dissolved	8	1.90	12/15/2015	U	9/28/2017	0.83	mg/l

Table 38: DS-10 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	6	22,000	12/9/19	19,100	11/5/19	20,667	mg/l
Carbonate as CaCO3	6	5,390	9/10/19	1,970	8/14/19	3,505	mg/l
Total Alkalinity as	6	25,400	9/10/19	22,100	8/14/19	24,167	mg/l
Bromide	2	U	8/14/19	U	8/20/19	U	mg/l
Cation-Anion Balance	6	1.90	12/9/19	-6.70	10/7/19	-2.63	%
Sum of Anions	6	1,060.00	9/10/19	918.00	11/5/19	993.50	meq/l
Sum of Cations	6	1,050.00	12/9/19	834.00	11/5/19	944.67	meq/l
Chemical Oxygen	2	400.00	8/14/19	400.00	8/14/19	400.00	mg/l
Chloride	6	19,800	9/10/19	15,500	11/5/19	18,217	mg/l
Conductivity, Lab	6	74,500	9/10/19	64,100	12/9/19	69,383	µmhos
Fluoride	6	53.90	12/9/19	29.00	9/10/19	42.28	mg/l
Hardness as CaCO3	6	18.00	10/7/19	18.00	10/7/19	18.00	mg/l
Nitrate as N, dissolved	2	U	8/14/19	UH	8/20/19	U	mg/l
Nitrate/Nitrite as N,	2	U	8/14/19	UH	8/20/19	U	mg/l
Nitrite as N, dissolved	2	U	8/14/19	UH	8/20/19	U	mg/l
Nitrogen, Ammonia	2	11.80	8/20/19	10.50	8/14/19	11.15	mg/l
Nitrogen, Organic	2	6.00	8/20/19	5.00	8/14/19	5.50	mg/l
Nitrogen, Total Kjeldahl	2	18.00	8/20/19	15.00	8/14/19	16.50	mg/l
pH, lab	6	8.80	9/10/19	8.60	8/14/19	8.68	units
Phosphate, total	2	23.00	8/20/19	22.00	8/14/19	22.50	mg/l
Phosphorus, total	2	7.30	8/20/19	7.10	8/14/19	7.20	mg/l
SAR in Water	1	2,100	10/7/19	2,100.00	10/7/19	2,100	none
Sulfate	6	U	8/14/19	U	12/9/19	U	mg/l
Sulfide	2	3.20	8/20/19	1.38	8/14/19	2.29	mg/l
Total Dissolved Solids	6	58,200	9/10/19	49,400	11/5/19	54,767	mg/l
Conductivity, Field	6	70,540	8/20/19	62,190	11/5/19	67,248	µmhos
pH, Field	6	8.80	11/5/19	8.33	8/14/19	8.51	units
Temperature (°C), Field	6	14.56	8/20/19	10.70	12/8/19	12.74	(°C)
Water Level, Field	6	607.78	8/14/19	599.30	12/9/19	602.49	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Arsenic, dissolved	2	0.01	8/14/19	0.01	8/14/19	0.01	mg/l
Barium, dissolved	2	1.90	8/20/19	1.80	8/14/19	1.85	mg/l
Beryllium, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Boron, dissolved	6	22.70	12/9/19	17.40	8/14/19	19.13	mg/l
Cadmium, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Calcium, dissolved	6	7.00	10/7/19	7.00	10/7/19	7.00	mg/l
Chromium, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Copper, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Iron, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Lead, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Lithium, dissolved	2	3.50	8/14/19	3.50	8/14/19	3.50	mg/l
Magnesium, dissolved	6	U	8/14/19	U	8/20/19	U	mg/l
Manganese, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Mercury, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Molybdenum, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Nickel, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Potassium, dissolved	6	800.00	8/20/19	598.00	11/5/19	720.50	mg/l
Selenium, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Silica, dissolved	6	31.00	12/9/19	20.00	8/20/19	24.83	mg/l
Sodium, dissolved	6	23,500	12/9/19	18,600	11/5/19	21,050	mg/l
Strontium, dissolved	6	0.40	12/9/19	0.30	8/14/19	0.35	mg/l
Vanadium, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l
Zinc, dissolved	2	U	8/14/19	U	8/20/19	U	mg/l

Table 39: IRI-7 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	61	30,400	6/25/19	294	9/16/91	8,170	mg/l
Carbonate as CaCO3	61	4,730	11/2/15	10.00	6/30/95	1,080	mg/l
Total Alkalinity as	61	32,000	6/25/19	294	9/16/91	9,144	mg/l
Bromide	30	33.00	8/30/90	0.10	5/21/07	7.54	mg/l
Cation-Anion Balance	61	6.10	3/28/18	-26.90	6/25/19	-1.96	%
Sum of Anions	58	663.00	6/25/19	30.69	3/25/92	217.11	meq/l
Sum of Cations	58	403.00	9/15/10	31.56	5/28/91	199.59	meq/l
Chemical Oxygen	27	960.00	6/14/08	37.00	9/27/17	158.48	mg/l
Chloride	60	735.00	6/25/19	21.00	8/30/90	337.65	mg/l
Conductivity, Lab	59	37,300	6/25/19	2,500	6/16/92	13,090	µmhos
Fluoride	61	46.20	3/22/17	1.30	5/28/91	26.53	mg/l
Hardness as CaCO3	61	135.00	6/14/08	6.00	8/30/90	25.47	mg/l
Nitrate as N, dissolved	30	3.22	10/22/13	0.02	5/24/05	0.51	mg/l
Nitrate/Nitrite as N,	30	4.14	10/22/13	0.02	9/27/17	0.61	mg/l
Nitrite as N, dissolved	30	0.92	10/22/13	0.00	5/21/07	0.15	mg/l
Nitrogen, Ammonia	30	7.90	11/6/14	1.17	9/15/92	4.04	mg/l
Nitrogen, Organic	30	46.00	6/14/08	0.50	8/22/90	7.59	mg/l
Nitrogen, Total Kjeldahl	30	51.00	6/14/08	1.90	8/22/90	11.11	mg/l
pH, lab	61	9.20	6/16/92	8.30	6/30/95	8.65	units
Phosphate, total	28	155.00	5/21/07	0.17	9/15/92	16.03	mg/l
Phosphorus, total	31	4.70	9/15/10	0.05	9/15/92	1.71	mg/l
SAR in Water	57	1,020.00	5/21/07	88.89	3/25/92	398.48	none
Sulfate	60	2,031.00	9/16/91	2.50	6/18/96	169.18	mg/l
Sulfide	30	3.31	8/30/90	0.00	7/31/91	0.57	mg/l
Total Dissolved Solids	60	29,000	6/25/19	1,708	9/15/92	10,389	mg/l
Conductivity, Field	78	29,680	3/22/17	1,800	6/1/91	12,870	µmhos
pH, Field	77	12.20	9/1/90	7.86	11/7/15	8.92	units
Temperature (°C), Field	42	19.40	8/1/90	7.50	12/1/90	12.45	(°C)
Water Level, Field	55	422.84	8/1/18	405.03	4/1/01	410.23	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	30	1.40	9/15/10	U	6/23/94	0.61	mg/l
Arsenic, dissolved	30	0.0050	8/22/90	U	9/15/92	0.0027	mg/l
Barium, dissolved	30	6.65	9/15/10	0.08	9/15/92	3.96	mg/l
Beryllium, dissolved	30	U	8/22/90	U	3/28/18	U!	mg/l
Boron, dissolved	61	8.60	6/25/19	0.03	2/26/91	2.99	mg/l
Cadmium, dissolved	30	U	8/22/90	U	3/28/18	U	mg/l
Calcium, dissolved	61	44.00	6/14/08	1.00	5/28/91	3.47	mg/l
Chromium, dissolved	30	0.20	11/2/15	U	6/23/94	0.11	mg/l
Copper, dissolved	30	0.10	7/29/09	U	7/29/09	0.10	mg/l
Iron, dissolved	30	1.82	7/31/91	0.04	6/23/94	0.30	mg/l
Lead, dissolved	30	0.04	7/31/91	U	6/23/94	0.03	mg/l
Lithium, dissolved	30	3.30	6/25/19	0.32	9/15/92	2.08	mg/l
Magnesium, dissolved	61	10.00	12/30/96	1.00	6/16/92	4.58	mg/l
Manganese, dissolved	30	0.07	5/26/99	U	6/23/94	0.04	mg/l
Mercury, dissolved	30	U	8/22/90	U	3/28/18	U	mg/l
Molybdenum, dissolved	30	0.10	6/23/94	U	6/23/94	0.10	mg/l
Nickel, dissolved	30	0.02	6/23/94	U	6/23/94	0.02	mg/l
Potassium, dissolved	61	26.00	6/30/09	3.00	8/30/90	9.05	mg/l
Selenium, dissolved	30	0.002	7/31/91	0.001	8/30/90	0.002	mg/l
Silica, dissolved	61	34.00	11/20/01	1.50	2/26/91	17.28	mg/l
Sodium, dissolved	61	9,130	9/15/10	710	5/28/91	4,079	mg/l
Strontium, dissolved	61	2.58	3/26/97	0.18	6/16/92	1.25	mg/l
Vanadium, dissolved	30	0.06	5/26/04	U	11/2/15	0.06	mg/l
Zinc, dissolved	30	0.10	11/2/15	U	6/23/94	0.06	mg/l

Table 40: Summary of 2019 Annual Remote Water Levels

For Remote Wells (all levels taken from top of casing)						
Well / Ground Level (ft)	Depth to Water Level ft.					
	2014	2015	2016	2017	2018	2019
IRI-8 / 6573.6	314.60	317.70	318.08	317.80	320.79	321.40
IRI-9 / 6666.3	470.10	469.95	469.68	469.50	470.61	471.40
IRI-10 / 6440.7	134.40	134.58	135.54	P&A	P&A	P&A
IRI-11 / 6613.6	465.00	527.44	466.95	466.90	467.60	468.00
*MWU-2 / 6441.0	191.75	194.36	195.00	195.40	195.38	197.50
*MWA-2 / 6441.0	196.20	199.05	199.80	199.60	199.60	199.40
*MWB-2 / 6441.0	251.80	253.28	253.05	254.80	256.13	255.40
*MWD-1 / 6467.0	327.55	328.59	328.83	329.30	329.60	329.50
*MWD-2 / 6641.0	251.65	252.58	247.82	253.50	254.54	254.30
TH75-6A	287.25	293.18	298.16	298.10	297.21	296.40
TH75-6B	287.19	291.46	294.82	295.50	295.28	294.30
TH75-11A	413.30	415.76	414.94	413.70	413.80	413.80
TH75-11B	496.95	500.17	497.28	494.80	495.00	494.80
EX-2 (WL collected quarterly)	486.23	481.56	471.75	472.80	476.15	479.70

Appendix B

Subsidence Monitoring

QUARTERLY 3M-TDR READING FOR DECEMBER 30, 2019

Prepared for

NATURAL SODA, INC.

January 2020

Prepared by

AGAPITO ASSOCIATES, INC.
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Grand Junction, CO 81506

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Golden, CO 80401

QUARTERLY 3M-TDR READING FOR DECEMBER 30, 2019

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LIST OF FIGURES

1.0 INTRODUCTION

Natural Soda, Inc. (Natural Soda) commissioned Agapito Associates, Inc. (AAI) to take quarterly logs of its time domain reflectometry (TDR) surveys for monitoring subsidence from monitoring well (SMW) 3M TDR. This report presents the TDR surveys logged on December 30, 2019, for Cables #2 (Kyle) and #3 (Matt) from SMW 3M TDR. The completion diagram of SMW 3M TDR is shown in Figure 1 for reference.

2.0 TDR READINGS

The surveys were taken with AAI's Campbell Scientific, Inc. TDR 100 instrument. A propagation velocity factor (v_p) of 0.87 was used in the data processing and 2,048 data points were recorded along each cable. A waveform average of 64 points was used to eliminate background noise. Cables #1 (Blank) and #4 (Kyle2) were corrupted during installation and are not used for monitoring. No readings were taken in these cables.

3.0 WAVEFORM ANALYSIS AND RESULTS

TDR waveform histories for Cables #2 and #3 are shown in Figures 2 and 3, starting with the original waveforms from December 10, 2003. Expanded waveforms are shown in Figures 4 and 5 for Cables #2 and #3, respectively. The close-up figures highlight the zone of interest between 800 and 1,960 ft deep, including the B Groove aquifer located between 1,566 and 1,589 ft.

The December 30, 2019, survey indicates that no significant ground movement has occurred around SWM 3M TDR since the cables were originally installed. This is evidenced by the constant waveform history in Cable #3 (Figure 3).

Cable #2, parallel to Cable #3, shows evidence of water infiltration into the cable starting soon after installation. This is evident in the February 17, 2004, waveform, which shows the first signs of a distorted signal beyond a depth of approximately 1,745 ft. Water causes distortion by changing the dielectric constant of the insulation material in the cable and, thus, the propagation velocity of the reflected signal. Subsequent surveys in Cable #2 show a gradual rise in the distortion elevation, symptomatic of water propagating up the cable under hydraulic pressure from a leak originating at or near the end of the cable. Similar to the most recent results, the December 30, 2019, survey indicates that water has infiltrated the cable up to a depth of about 1,438 ft.

If the cable is not mechanically deformed by ground movement, the signal distortion caused by water infiltration superimposes on the original waveform. This appears to be the process occurring in Cable #2. Cable deformation, including shearing or breakage, normally produces a sharp "spike" in the waveform, which is expected to be recognizable even through the distortion caused by water infiltration. Cable #2 shows no obvious signs of localized damage, suggesting that significant ground movement is not occurring. This is consistent with the results of Cable #3. Water infiltration is likely to continue in Cable #2 and may eventually render the cable inoperative.

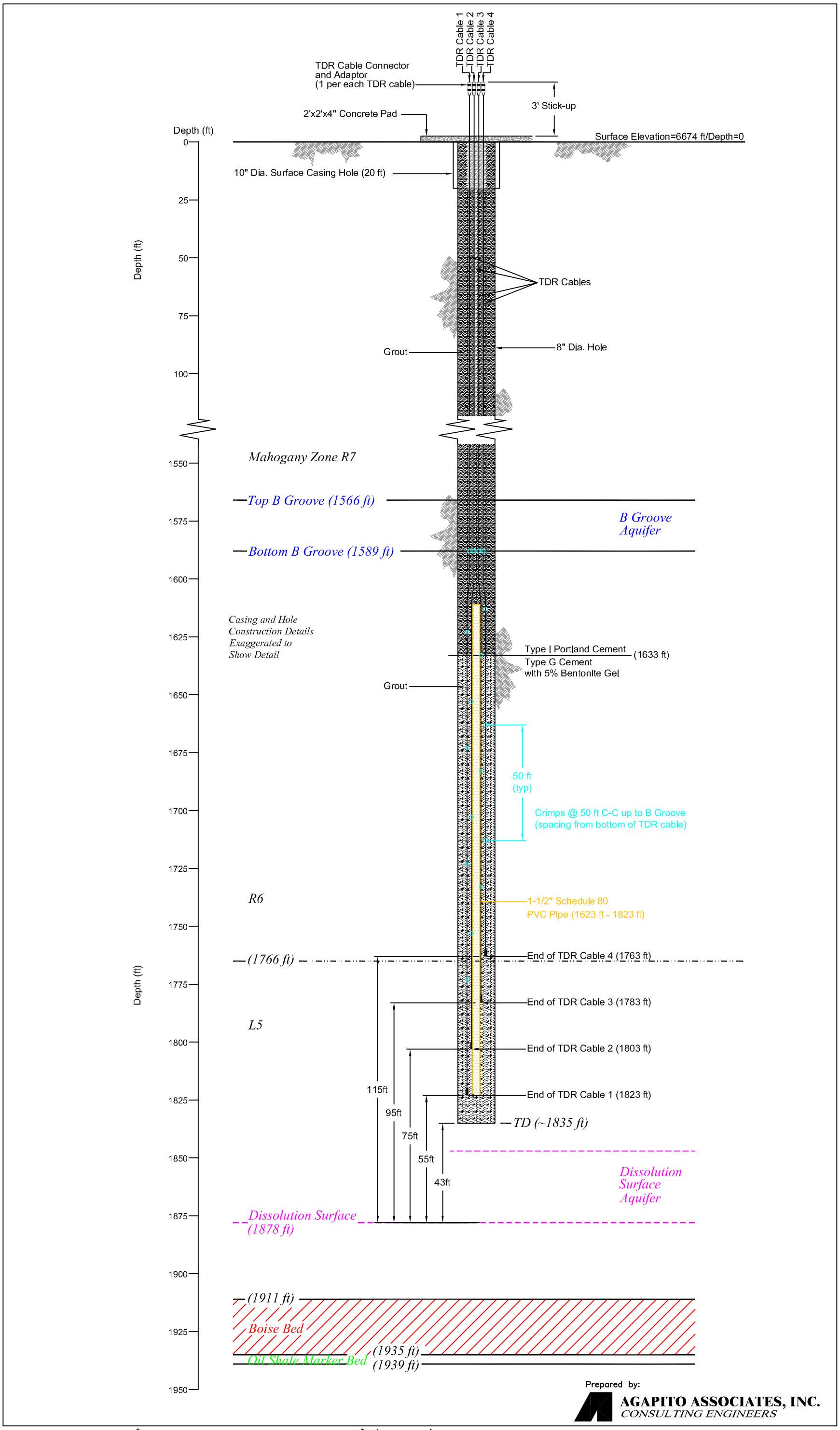


Figure 1. Draft TDR String, Crimp and End Locations Relative to Dissolution Surface and R6-L5 Interface—As Built

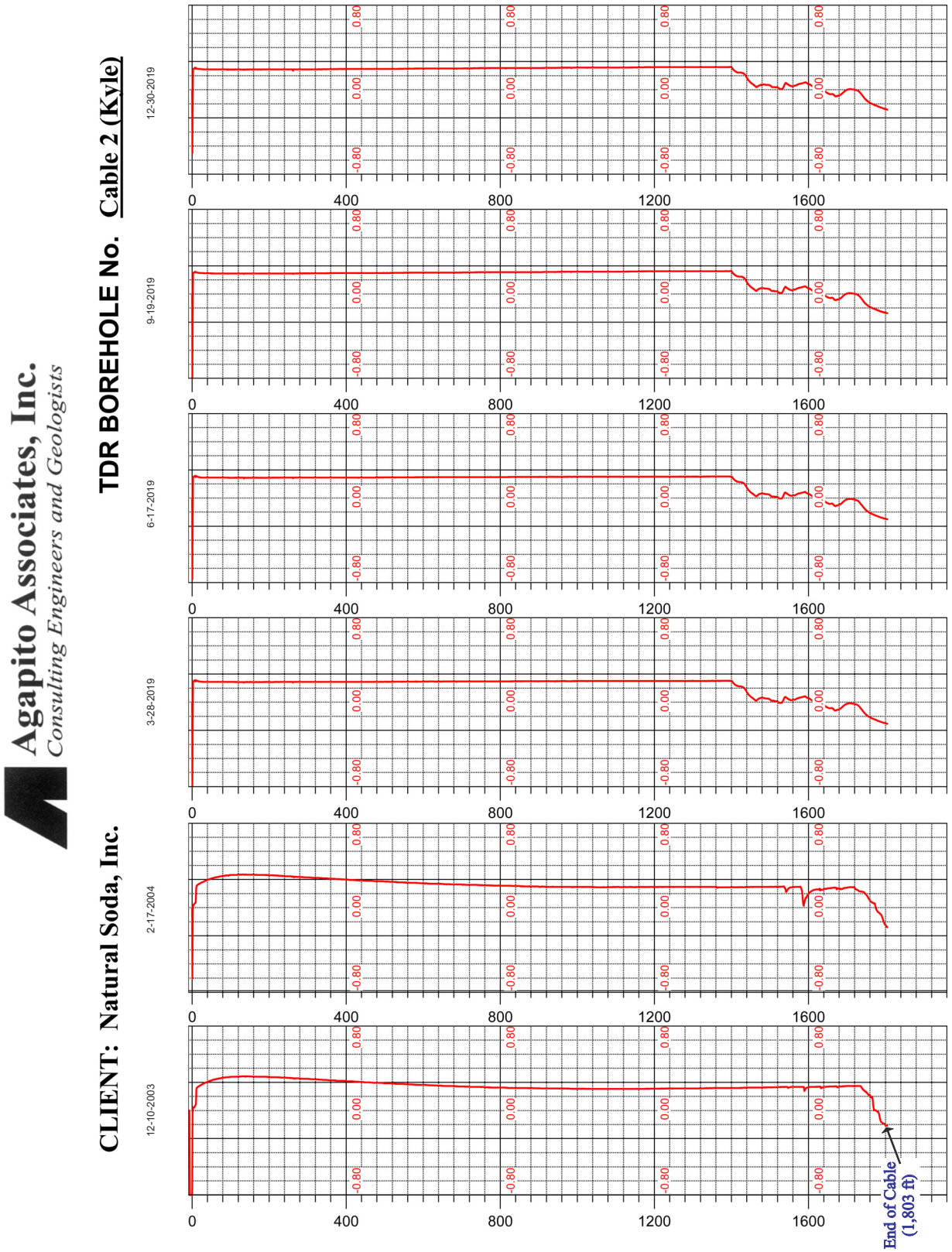


Figure 2. Comparison of Waveforms (December 10, 2003; February 17, 2004; March 28, June 17, September 9, and December 30, 2019) **for 3M-TDR Cable #2** (Kyle)

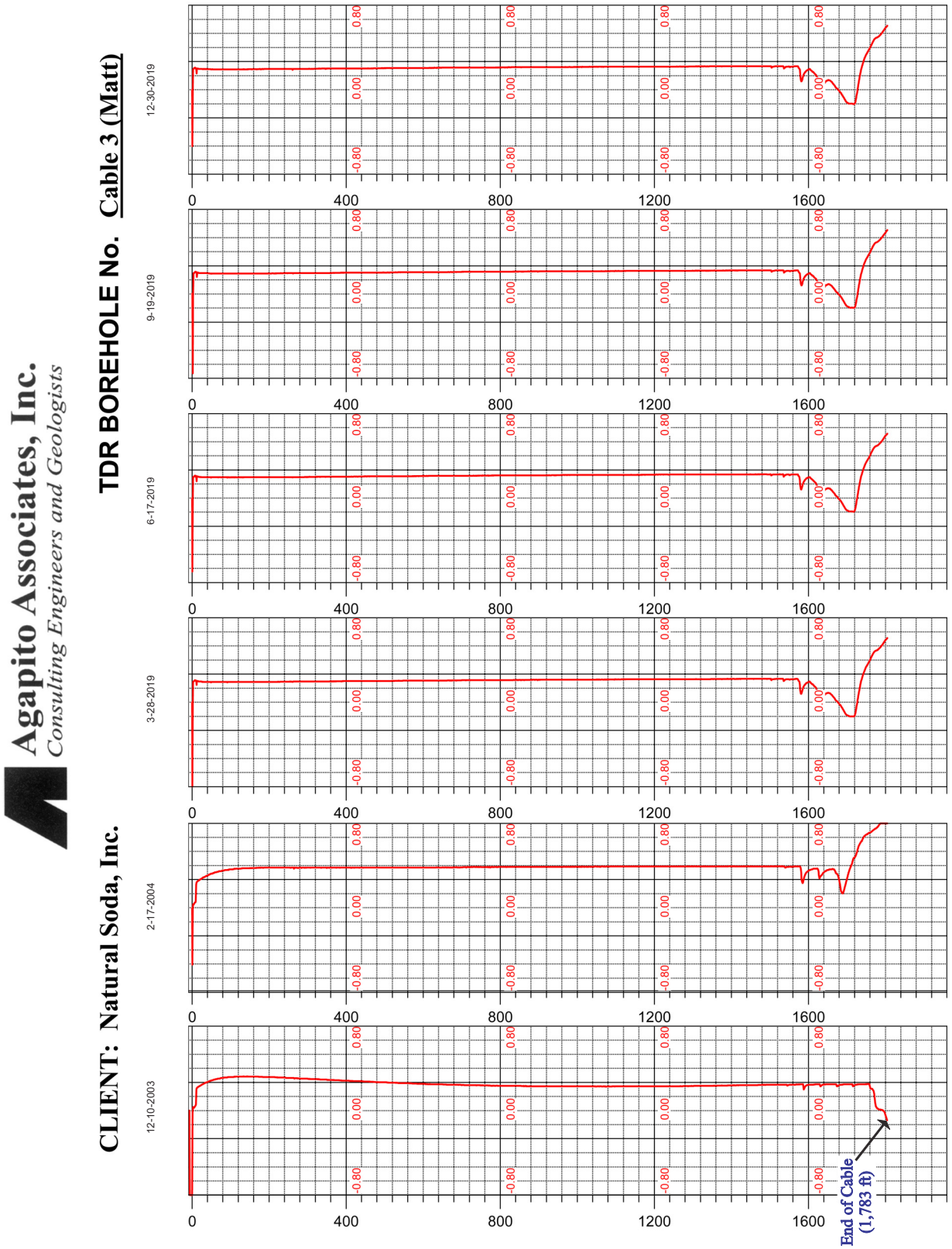


Figure 3. Comparison of Waveforms (December 10, 2003; February 17, 2004; March 28, June 17, September 9, and December 30, 2019) **for 3M-TDR Cable #3** (Matt)

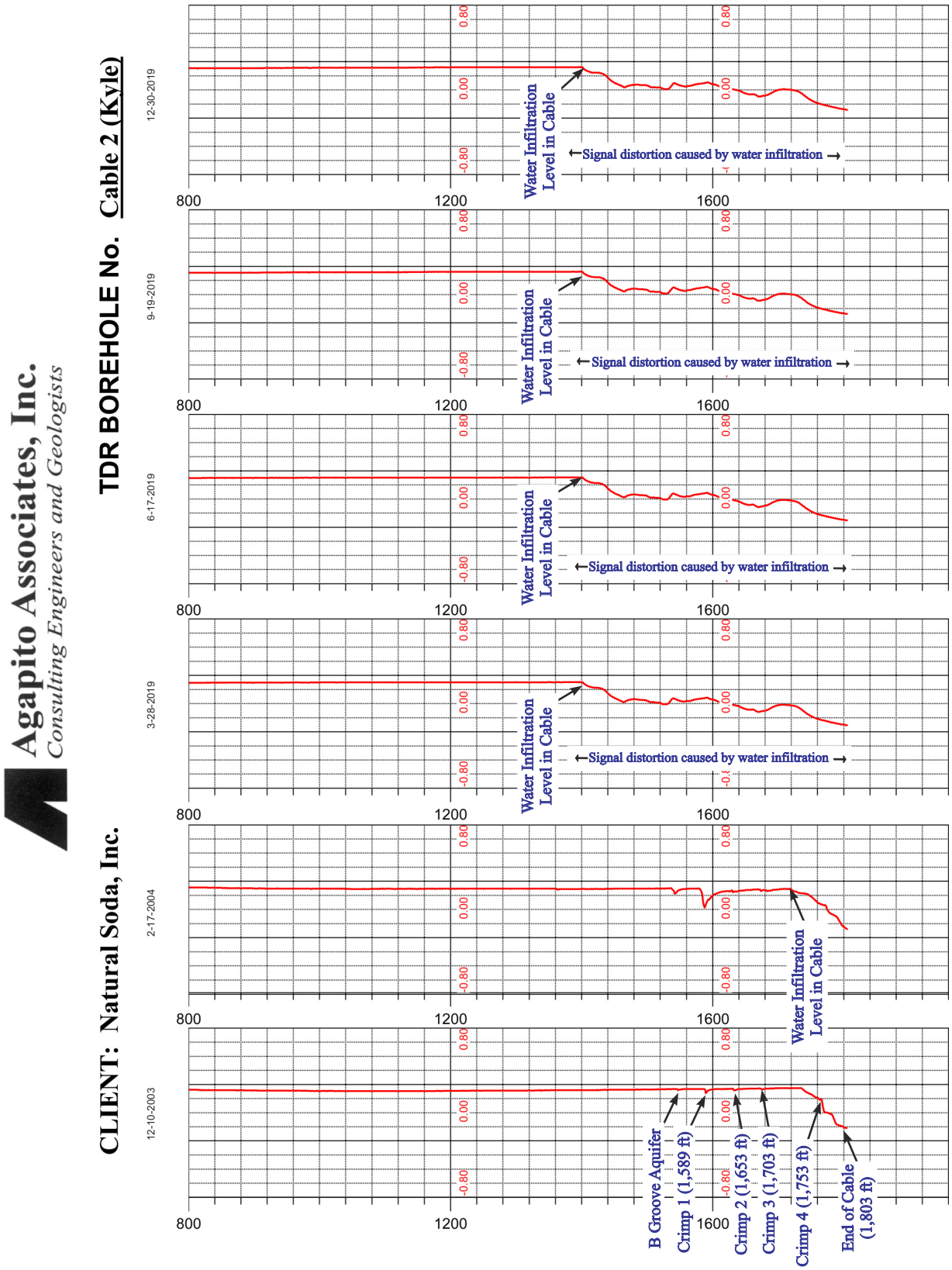


Figure 4. Comparison of Close-Up Waveforms (December 10, 2003; February 17, 2004; March 28, June 17, September 9, and December 30, 2019) **for 3M-TDR Cable #2** (Kyle)

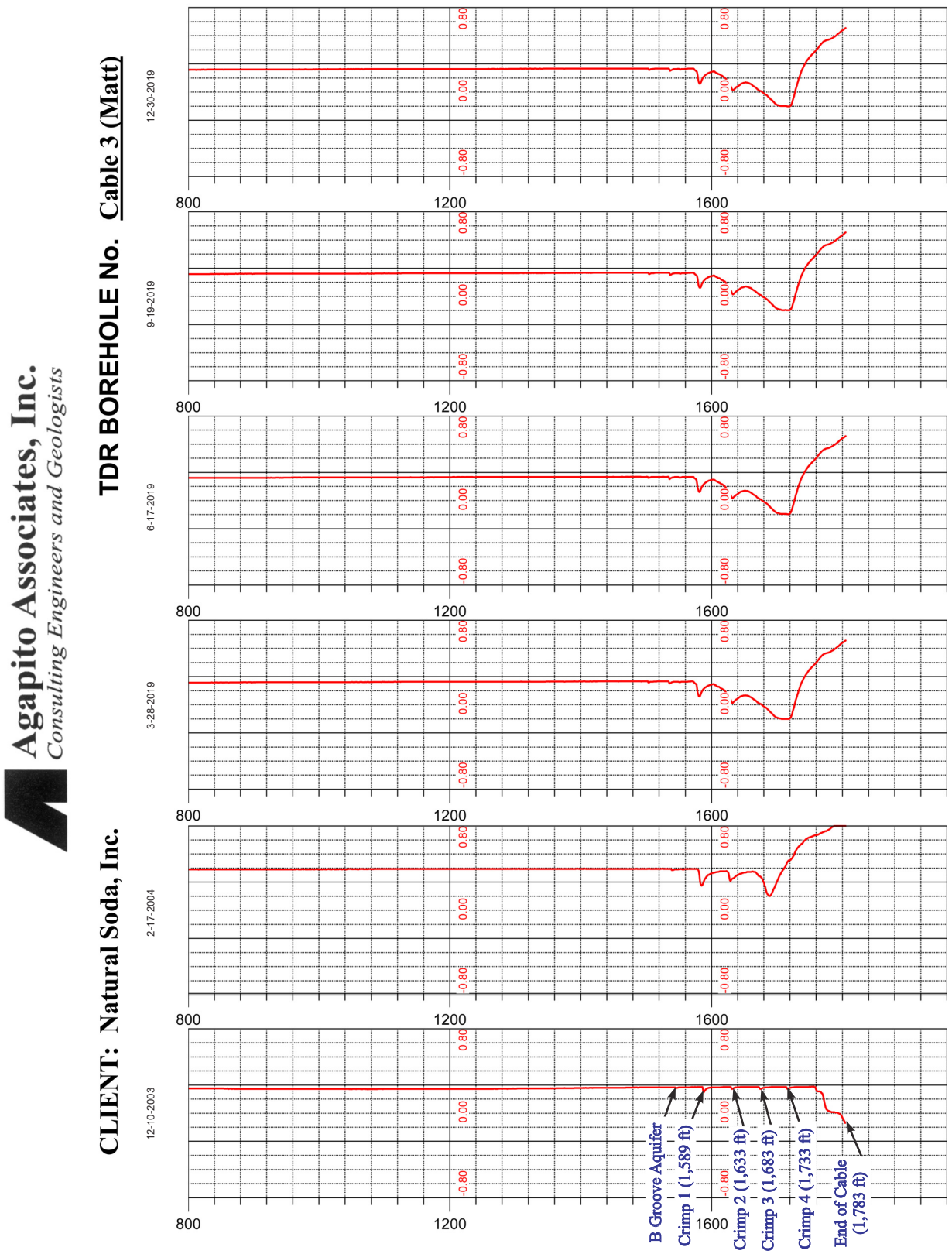
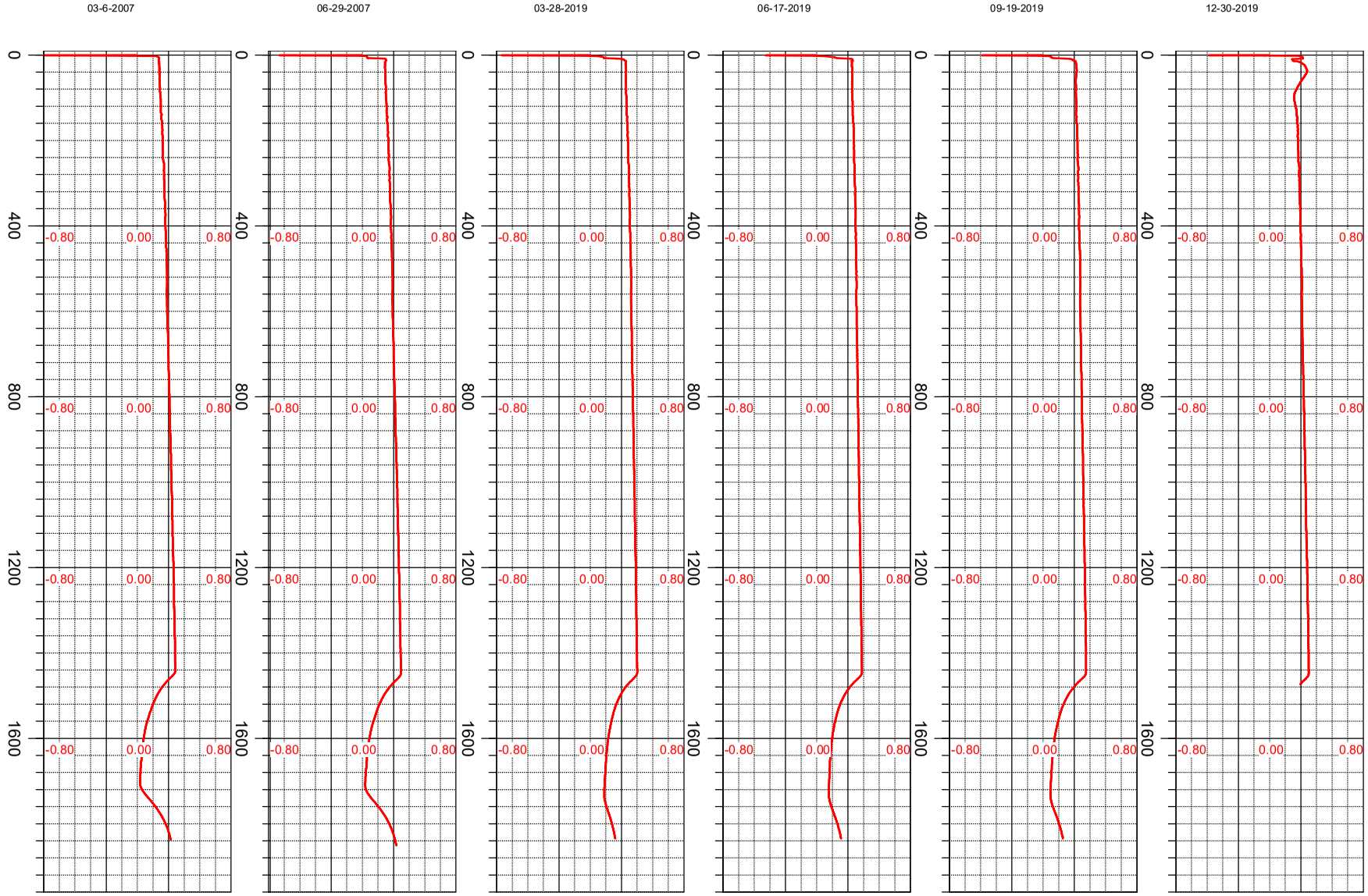


Figure 5. Comparison of Close-Up Waveforms (December 10, 2003; February 17, 2004; March 28, June 17, September 9, and December 30, 2019) **for 3M-TDR Cable #3** (Matt)

Agapito Associates, Inc.
Consulting Engineers and Geologists

CLIENT: Natural Soda, Inc.

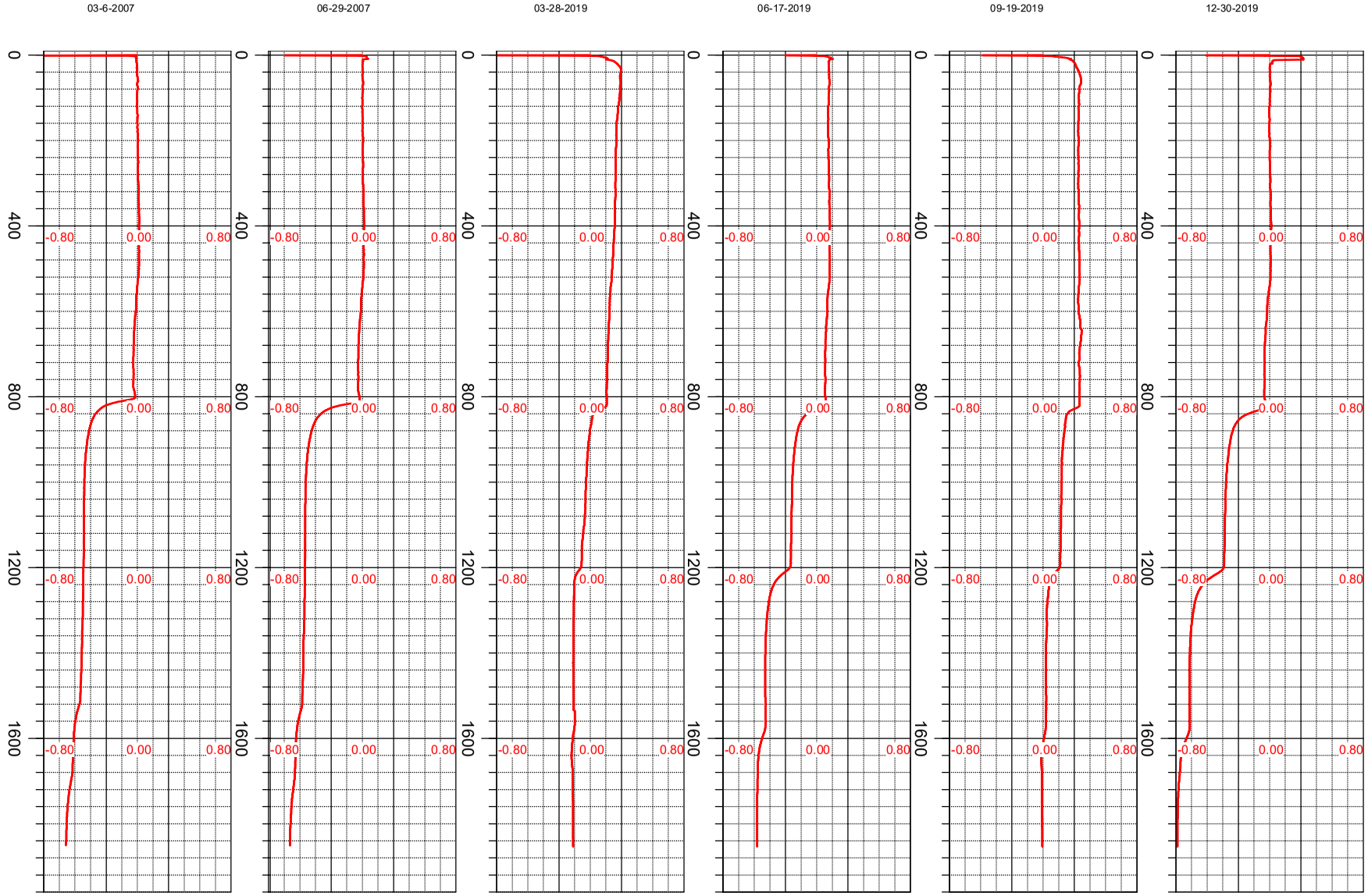
TDR BOREHOLE No. 4A 5M (Cable A)



Agapito Associates, Inc.
Consulting Engineers and Geologists

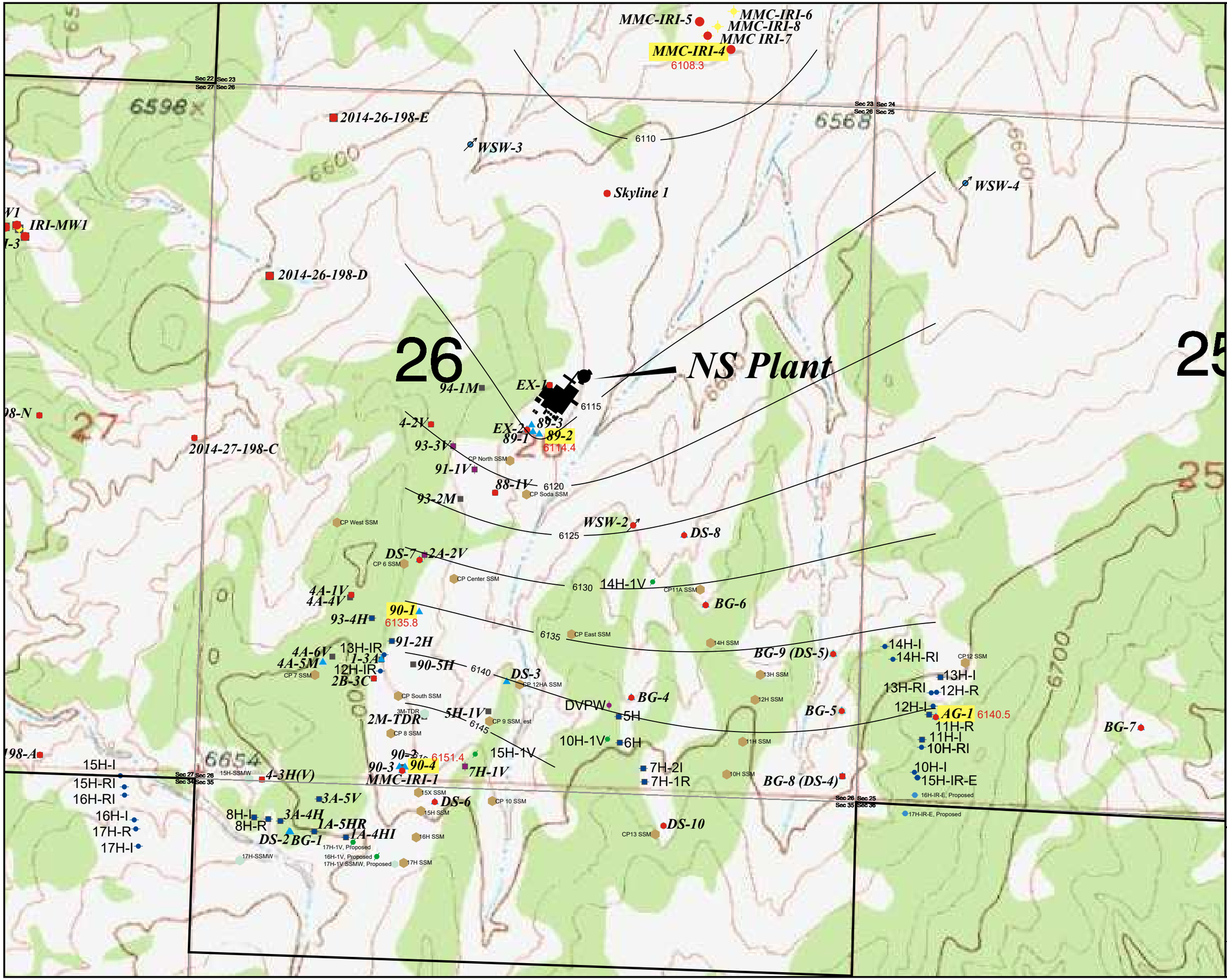
CLIENT: Natural Soda, Inc.

TDR BOREHOLE No. 4A 5M (Cable B)



Appendix C

Potentiometric Surface Maps
(Confidential)



Legend

- Horizontal Production Well
- Vertical Production Well
- Slant Production Well
- Hydrology Monitoring Well
- Abandoned Well
- Core Hole
- Drillhole
- Water Supply Well
- Subsurface Subsidence Monitor Well (SSMW)
- Surface Subsidence Monument (SSM)
- Horizontal Well - Proposed
- Slant Well - Proposed
- AG-1 A-Groove Aquifer Water Level

CONFIDENTIAL

Contour Interval: 5 feet

Grid North
(NAD27)

TN MN

0 1000' 2000'

scale in feet

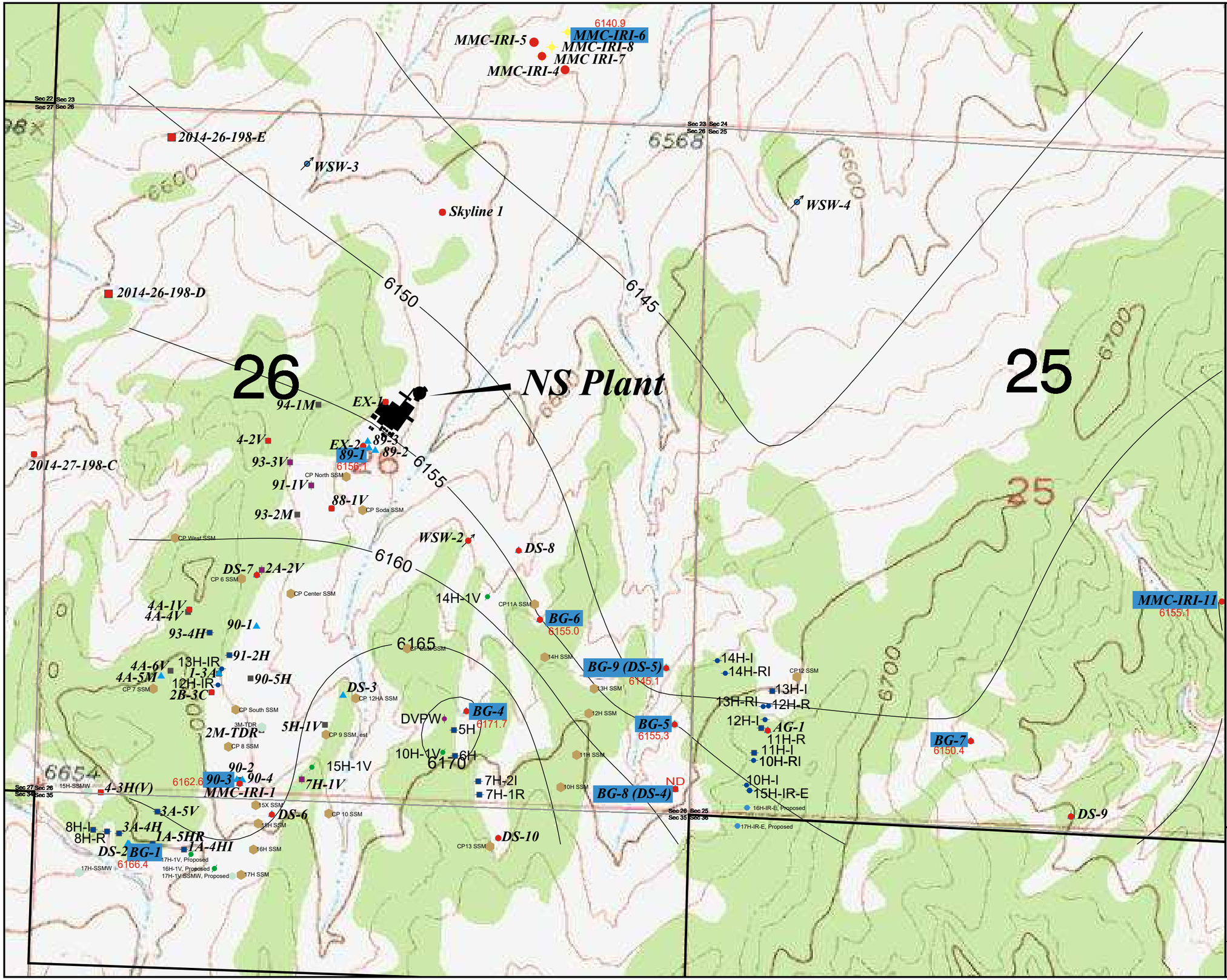
Natural Soda LLC

Average 2019 Potentiometric Surface
A-Groove Aquifer

Rio Blanco County, Colorado

Daub & Associates, Inc.

Date: January 17, 2020



Legend

- Horizontal Production Well
- Vertical Production Well
- Slant Production Well
- Hydrology Monitoring Well
- Abandoned Well
- Core Hole
- Drillhole
- Water Supply Well
- Subsurface Subsidence Monitor Well (SSMW)
- Surface Subsidence Monument (SSM)
- Horizontal Well - Proposed
- Slant Well - Proposed
- BG-7 — B-Groove Aquifer Water Level

CONFIDENTIAL

Contour Interval: 5 feet

Grid North
(NAD27)

TN MN

0 500' 1000'

scale in feet

Natural Soda LLC

Average 2019 Potentiometric Surface
B-Groove Aquifer
Rio Blanco County, Colorado

Daub & Associates, Inc.

Date: January 17, 2020

Appendix D

2019 Vegetation Monitoring Reclamation Status Report

Prepared

By

Rusty Roberts

Reclamation Status Report
2019 Vegetation Monitoring Results for Reclaimed Sites

Evaluating Status of Current Plant Communities on Three Reclaimed P&A Production Well Pads and on Six Reclaimed Exploration Corehole Pad Sites in meeting Criteria for Successful Reclamation

Prepared for:
Natural Soda
Rifle, Colorado

Prepared by:
Rusty Roberts
Meeker, Colorado

December 2019

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Introduction

The Bureau of Land Management (BLM) and the State of Colorado require reclaimed lands to be revegetated in a manner that establishes a diverse, effective, and long-lasting vegetation cover that is equal or nearly so to the natural vegetation of the surrounding areas. Natural Soda's approved mine plan requires periodic monitoring to evaluate the success of revegetation efforts.

Vegetation cover, species composition, species density and ground cover data were collected from undisturbed reference area sites on Natural Soda's lease area near their current mining operations. The data collected from undisturbed areas is used in comparison to the vegetation cover, species composition, species density and ground cover data collected from reclaimed well pad sites to determine if the site have met the criteria for successful reclamation.

Data was collected from three production well pad sites that have been plugged and abandoned and in final reclamation status, from six exploration corehole sites in final reclamation status and from four native rangeland reference area sites on Natural Soda's lease area and near the sites evaluated. Table 1 lists the nine sites in final reclamation status for which data was collected in 2019.

Criteria for Successful Reclamation of Disturbed Areas

BLM approved Natural Soda's plant expansion in August 2015. The approval for the expansion modified the criterion for successful reclamation of disturbances from what had been utilized in prior years. The new criteria for successful reclamation must reflect a plant community of at least five desirable plant species where no one species may exceed 70 percent relative cover and desired foliar cover, bare ground, and shrub and/or forb density must have 80 percent similarity in relation to the identified desired plant community.

The desired plant community referenced in the criteria refers to an ecological site present at or near the area of disturbance. Two ecological sites occur on the parts of the lease area being actively mined, a pinyon and juniper woodland site and a rolling loam rangeland site. Several of the sites were along the fringe of the pinyon and juniper community and have soils of both a woodland site and a rangeland site. The vegetative values in the criteria are based on the capability of a site in an early seral plant community, which is basically an herbaceous species dominated site with varying amounts of shrub species. The rolling loam rangeland site reflects more of the capability of a site in an early seral plant community, thus, data collected from the four rolling loam native rangeland reference areas were used to evaluate the success of the plant community on each reclaimed pad in achieving the reclamation criteria.

The scientific and common names of the plant species encountered within the sampling from reference sites and from each well pad site are presented in tables in the appendix.

Vegetation Sampling Methods Utilized to Measure Criteria for Successful Reclamation

Data was collected based upon recommendations in White River Field Office's Surface Reclamation Plan which require that vegetation cover, composition, and diversity data be

gathered using quantitative methods to measure the six Core Terrestrial Indicators and Methods in BLM Technical Note 440. BLM approved sampling methods are found in Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume I and II: Quick Start.

The six core terrestrial indicators include:

(1) Bare Ground: The amount of bare ground is accepted as one of the most sensitive indicators of resource condition in rangelands. A large percentage of bare ground can be an indicator of high erosion potential, low forage production, poor wildlife habitat, and increased risk of invasion by nonnative plant species.

(2) Vegetation Composition: Vegetation composition data, including the cover of groups of species are indicators generated from the same data, and when used together, are sensitive to most changes and are useful when determining the status of key species in a plant community.

(3) Nonnative Invasive Plant Species: The presence and cover of nonnative species is acquired as a component of vegetation composition. Nonnative invasive species have the ability to significantly alter sustainability and site resilience.

(4) Plant Species of Management Concern: The presence and cover of plant species of management concern is also acquired as a component of vegetation composition. Plant species of management concern can be sensitive to site disturbance, provide important ecosystem functions, or contribute to biological diversity.

(5) Vegetation Height: The vertical structure of vegetation which can be used to characterize wildlife habitat and estimate wind erosion potential.

(6) Proportion of Soil Surface in Large Intercanopy Gaps: Canopy gap intercept measures the proportion of a line covered by large gaps between plant canopies and is an important indicator of the potential for erosion.

Line-point intercept with plot-level species inventory was the vegetation monitoring technique used to measure the core indicators of bare ground, vegetation composition, non-native invasive plant species and plant species of management concern.

Line-point intercept is a rapid, accurate method for quantifying soil cover, including vegetation, litter, rocks and biological crusts. The theory behind this method is that if an infinite number of points are placed in a two-dimensional area, the cover of a plant species can be determined by counting the number of points that hit that species. These measurements are related to wind and water erosion, water infiltration, and the ability of the site to resist and recover from disturbance.

Gap intercept measurements were made along the line-point intercept transect line to provide information about the proportion of the line covered by large gaps between plants. Large gaps between plant canopies are important indicators of increased susceptibility to water erosion and runoff, wind erosion, weed invasion, and wildlife habitat.

A plot-level plant species inventory provides a rapid estimate of species richness. A 50 square meter area search area at each site was utilized to record all plant species occurring within the plot. A thorough search of the plot can detect less-frequently occurring species that may not have been recorded in line-point intercept cover measurements.

Shrub and forb density also a criterion for successful reclamation are not measured by the sampling methods used for the other criteria. Forb and shrub density measurements were taken from one-meter square density quadrants along the same line-point intercept transect line used for the other sampling techniques.

Summary of Results for Reclaimed Well Pads in Achieving Reclamation Goals

Vegetation cover, plant species composition, ground cover and shrub and forb density data were collected from three production well pad sites that have been plugged and abandoned and in final reclamation status, from six exploration corehole sites in final reclamation status and from four native rangeland reference area sites on Natural Soda's lease area and near the sites evaluated. Data was collected from August 15 thru August 26, 2019. Table 1 lists the sites in final reclamation status for which data was collected in 2019. The location of sites monitored are illustrated on the attached location map.

Table 1 is a summary of the progress of each site monitored in achieving successful reclamation. The site-specific monitoring results for each site are discussed in detail later.

Table 1 - Summary of Results for Reclaimed Well Pads in Achieving Successful Reclamation Criteria

Well Pad #	Criteria for Successful Reclamation of Disturbed Areas						Criteria Met
	at least five desirable plant species where no one species may exceed 70 percent relative cover		desired foliar cover, bare ground, and shrub and/or forb density must have 80 percent similarity in relation to the values measured on nearby undisturbed native rangelands				
	the number of desired plant species present	the relative cover of the desired species with the greatest cover	% similarity of desired foliar cover	% similarity of bare ground	% similarity of shrub density	% similarity of forb density	
	2019 Data Collected for P&A Production Well Pads in Final Reclamation Status						
5H-1V	25 species	25 %	122 %	152 %	35 %	86 %	Yes
93-2M	17 species	25 %	121 %	165 %	38 %	17 %	No
93-4H	22 species	17 %	97 %	142 %	21 %	97 %	Yes
Site	**2019 Data Collected for Exploration Corehole Pads in Final Reclamation Status**						
Pad E	21 species	22 %	101 %	112 %	43 %	156 %	Yes
Pad H	26 species	20 %	112 %	147 %	41 %	82 %	Yes
Pad N	25 species	15 %	106 %	145 %	60 %	195 %	Yes
Pad P	26 species	19 %	108 %	129 %	84 %	70 %	Yes
Pad Q	26 species	17 %	83 %	109 %	40 %	37 %	No
Pad R	22 species	17 %	92 %	148 %	61 %	136 %	Yes
	2019 Baseline Data Collected from Native Rangeland Reference Areas						
	23 species	**31.5 %**	**62.5 %**	**26.5 %**	**1.75**	**6.13**	

Note: values in red are below the criteria required for successful reclamation

All the sites have productive plant communities with good distribution of perennial species across the site which has adequately stabilized each site. The vegetation that has established on the nine reclaimed sites are mostly the perennial species planted during reclamation. Many of the perennial species especially the grasses, are well established providing a resilient plant community that is difficult for desirable forbs and shrubs to compete and increase in cover and density. The favorable climatic conditions that occurred in 2019 has diminished some of the drought related impacts from recent years and has allowed several of the site evaluated to achieve successful reclamation status.

Vegetation Sampling Methods and Procedures for Reclaimed Pads and Reference Areas

The line-point intercept with plot-level species inventory was the vegetation sampling protocol used on both the reclaimed pads and associated reference areas. The procedure involves random placement of a transect line (measuring tape) as the base for data collection. Values for foliar cover, basal cover, species composition and bare ground were measured at specific points along the line. Gaps in vegetation canopy were measured along the same tape line. Density quadrants were placed adjacent the line at specific points.

Either a 25- or 50-meter tape was used for the baseline transect for each of the four rolling loam reference areas. A 25-meter tape was used for the baseline for transects placed on the reclaimed pads sites. At least three transects were placed on each reclaimed pad site.

The following techniques were used to collect the sample data:

- The beginning and ending points of each transect were recorded using a GPS receiver. Azimuths from the 0-meter to the 25-meter or 50-meter point were recorded.
- Photographs were taken at each transect that show vegetation features at the time of sampling.
- Point count data were collected at 1-meter intervals along a 50-meter tape or at 0.5-meter intervals along a 25-meter tape using a thin, straight metal rod (pin flag) for a total of fifty samples taken along each transect.
    - The first plant species in the canopy hit by the drop of a pin flag at each sample point was recorded by species in the “Top Layer”. The total of top layer hits was used to determine total foliar cover for the study site and the total foliar cover for each species hit in the top layer.
    - Subsequent plant species and vegetative litter hits were recorded in the “Lower Canopy Layers”. Vegetative litter was recorded as either unattached herbaceous or woody litter.
    - Species composition based upon total of all plant species encountered in the top layer and the lower layers at reach sample point and recorded by species and summarized by plant group.
    - Soil surface hits were recorded as plant species basal intercepts, lichen crust, moss, embedded litter, duff or bare soil. Bare ground percent was determined by a bare soil hit with no canopy intercepts in the top and lower canopy layers.
- Canopy gaps were recorded directly below the transect tape line. Only perennial plant species were used in the vegetative canopy. Annual species if present were not included

as part of the canopy. Gaps larger than 20 centimeters were recorded for the length of each transect. Gaps were totaled into gap sizes (21 to 50; 51 to 100; 101 to 200; >200). Though the gap data is not used in evaluating reclamation criteria, it was collected as a visualization of perennial species cover.

- Forb and shrub density data were taken from one-meter square density quadrants alongside the same line-point intercept transect line used for the other sampling techniques. Quadrants were placed at every 5th sample point along the transect tape for a total of 10 one-meter density quads for each transect. Only desirable forb and shrub densities are required in the criteria for successful reclamation. The total number of desirable forb and shrub species rooted in each quad were counted and recorded by species and summarized by plant group. Densities for grasses or trees were not collected.
- A plot-level plant species inventory was conducted within approximately 50 square meter search area at each site. In addition to those plant species recorded during sampling, other species not encountered during sampling but were observed in the sample area were recorded for species richness.

Vegetation Sampling Results for Nearby Native Rangeland Reference Areas

Vegetation cover, species composition, species density and ground cover data were collected from four rolling loam rangeland sites on August 19 thru August 26, 2019. Transects were established in the four rolling loam sites which represent the site characteristic's common in the project area. The pre-disturbance vegetation of the reclaimed well pads examined had pinyon and juniper tree cover over all or portion of the site. Several of the sites were along the fringe of the pinyon and juniper community and had soils of both a woodland site and a rangeland site. The vegetative values in the criteria are based on the capability of a site in an early seral plant community, which is basically an herbaceous species dominated site with varying amounts of shrub species. The rolling loam rangeland site reflects more of the capability of a site in an early seral plant community, thus, data collected from the four rolling loam rangeland reference areas were used to evaluate the success of the plant community on each reclaimed pad in achieving the reclamation criteria.

Values for foliar cover, basal cover, species composition and bare ground were collected from two 50 meter transects and two 25 meter transects for a total of 200 sample points. Values for forb and shrub densities were collected from 40 one-meter square quadrants. Table 2 summarizes the data collected in 2019 from the four reference areas. A comparison to the data collected in 2018 is included in the table.

Foliar cover of native species measured on the reference sites in 2019 increased 16 percent in comparison to comparable data collected in 2018. Foliar cover of perennial grasses increased 21 percent, foliar cover perennial of forbs more than doubled and shrub cover declined 11 percent. The foliar cover of invasive nonnative grasses remained unchanged. A 67 percent decline in foliar cover of nonnative forbs occurred in 2019. A 9 percent decline in herbaceous litter cover occurred in 2019.

Table 2 - Rolling Loam Native Rangeland Reference Area Vegetation Cover, Species Composition, Species Density & Ground Cover										
	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m^2)	
Plant Group	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**
Perennial Grasses	5	5	35.0	42.5	4.5	6.5	61.65	61.08	n/a	n/a
Invasive Non-Native Grasses	1	1	1.0	1.0	0.0	0.0	1.50	1.34	n/a	n/a
Perennial Forbs	16	12	3.5	8.0	1.0	2.0	8.27	19.46	6.23	6.13
Invasive and Non-Native Forbs	3	2	1.5	0.5	0.0	0.0	3.76	1.34	n/a	n/a
Shrubs	5	5	13.5	12.0	1.5	1.0	21.80	16.78	3.20	1.70
Trees	1	1	2.0	0.0	0.0	0.0	3.01	0.0	0.05	0.050
Vegetation Totals	**31**	**26**	**56.5**	**64.0**	**7.0**	**9.5**	**100.0**	**100.0**	**12.93**	**7.88**

Line-Point Intercept Soil Surface Cover Data [3]												
Percent Cover by Type	**Bare Ground**		**Biotic Crust**		**Herbaceous Litter**		**Woody Litter**		**Duff**		**Rock**	
	2018	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**
	33.5	**26.5**	**0.0**	**0.5**	**37.0**	**40.5**	**0.0**	**1.5**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Sum of data from 4 randomly placed transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The increases in foliar cover and herbaceous litter cover that occurred in 2019 resulted in a 21 percent decrease in bare ground from that measured in 2018. The canopy gaps between perennial species is also an indicator of ground cover. The total canopy gaps between perennial species declined 3.4 percent from the values measured in 2018. The gaps in the canopies between perennial species became smaller in 2019. A 49 percent decline in the larger canopy gaps, those greater than 50 centimeters, occurred in 2019. The decline in larger canopy gaps between perennial species that occurred in 2019 is an indicator of improved ground cover.

The specific vegetation sampling data collected from the four rolling loam rangeland sites are presented in Appendix A. Data in the appendix include (1) vegetation cover, ground cover, species composition, and forb and shrub densities; (2) listing of plant species encountered; (3) GPS coordinate data for the transect start and end points; (4) inter-canopy gaps and (5) photographs of each transect.

Monitoring Results and Evaluation of Criteria for Sites in Final Reclamation Status

Vegetation cover, species composition, species density and ground cover data were collected from the disturbed areas of nine sites all in final reclamation status. The disturbed sites included 3 plugged and abandoned production well pad sites (5H-1V, 93-2M, and 93-4H) and 6 exploration corehole pad sites (pads E, H, N, P, Q and R). Well pad locations are noted on the attached location map.

Vegetation sampling data collected for the nine reclaimed sites are presented in the Appendix B through Appendix J.

- Appendix B – reclaimed production well pad 5H-1V.
- Appendix C – reclaimed production well pad 93-2M.
- Appendix D – reclaimed production well pad 93-4H.
- Appendix E – reclaimed exploration corehole pad E.
- Appendix F – reclaimed exploration corehole pad H.
- Appendix G – reclaimed exploration corehole pad N.
- Appendix H – reclaimed exploration corehole pad P.
- Appendix I – reclaimed exploration corehole pad Q.
- Appendix J – reclaimed exploration corehole pad R.

Vegetation sampling data in the appendixes include (1) vegetation cover, ground cover, species composition, and forb and shrub densities; (2) listing of plant species encountered; (3) GPS coordinate data for the transect start and end points; (4) inter-canopy gaps; (5) photographs of each transect and access route photo-points and (6) plot diagram of transect layouts and photo-point locations.

Well Pad 5H-1V

This well pad was within the 8th growing season since being reclaimed when data was collected on August 21, 2019. Three 25 meter transects were placed in a spoke pattern on the pad with 50 sample points on each transect for a total of 150 points for cover data. Ten one-meter square density quadrants were placed along each transect for a total of 30 quadrants. Data collected from this site include vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground and surface rock. Table 3 compares the data collected in 2018 and in 2019 for this site.

The 2019 data in the Table 3 is summarized from data presented in Appendix Table B1. Each plant species encountered at this site is listed in Table B1. As shown in Table B1 there is a good establishment of the perennial grasses with uniform distribution across much of the site.

The foliar cover of desirable species increased 35 percent from 2018 values. Perennial grass cover increased 28 percent and cover of desirable forbs increased 71 percent. Shrub cover more than doubled but only contributed 4.5 percent of the total cover of desirable species.

Table 3 - Reclaimed Pad 5H-1V Vegetation Cover, Species Composition, Species Density & Ground Cover										
	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m^2)	
Plant Group	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**
Perennial Grasses	8	10	52.0	66.8	7.5	13.9	85.6	80.0	n/a	n/a
Invasive Non-Native Grasses	1	1	2.5	0.0	0.0	0.0	5.6	0.8	n/a	n./a
Perennial Forbs	10	10	3.5	6.0	0.5	0.7	6.4	13.8	2.93	5.28
Invasive and Non-Native Forbs	3	2	0.5	0.0	0.0	0.0	0.8	0.7	n/a	n/a
Shrubs	5	5	1.0	3.4	0.0	0.7	1.6	4.7	0.93	0.60
Vegetation Totals	**27**	**28**	**59.5**	**76.2**	**8.0**	**15.3**	**100.0**	**100.0**	**3.86**	**6.30**

Line-Point Intercept Soil Surface Cover Data [3]												
Percent Cover by Type	**Bare Ground**		**Biotic Crust**		**Herbaceous Litter**		**Woody Litter**		**Duff**		**Rock**	
	2018	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**
	25.0	**12.7**	**0.0**	**0.0**	**41.0**	**56.0**	**4.5**	**2.7**	**0.0**	**0.0**	**12.0**	**2.0**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The increases in foliar cover and herbaceous litter cover that occurred in 2019 resulted in a 49 percent decrease in bare ground from that measured in 2018. The total canopy gaps between perennial species declined 55 percent from the values measured in 2018. The gaps in the canopies between perennial species became smaller in 2019. An 82 percent decline in the larger canopy gaps, those greater than 50 centimeters, occurred in 2019. The decline in larger canopy gaps between perennial species that occurred in 2019 is an indicator of improved ground cover.

In 2019, the densities of desirable forbs increased 80 percent and shrub densities declined 35 percent. Only the forb density measured in 2019 meet the criteria value for successful reclamation.

Table 4 is a comparison of the data collected for reclaimed well pad 5H-1V with that of the rolling loam rangeland reference areas. Only the data required to access the success of achieving successful reclamation is used in Table 4.

Table 4 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas					
Site	**# desired plant species**	**% desired foliar cover**	**%bare ground**	**shrub density (#/m^2)**	**forb density (#/m^2)**
Reclaimed Pad 5H-1V	25 species	76.2	12.7	0.60	5.28
Reference Area [1]	23 species	62.5	26.5	1.75	6.13

[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*

Evaluation of successful reclamation of the disturbance on Well Pad 5H-1V:

- There are 25 desirable plant species established on the site (10 perennial grasses, 10 desirable forbs, and 5 shrubs) meeting the requirement of at least five plant species.
- Slender wheatgrass *(Elymus trachycaulus*) was the desired species with the greatest relative cover at 25.3 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 22 percent greater than that on the native rangeland reference area meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 52 percent less than on the native rangeland reference area which equates to 152 percent similarity, exceeding the required 80 percent similarity.
- The density of forbs and shrubs on the site in comparison with the native rangeland reference area was 86 percent and 35 percent, respectively. Desirable forb densities have met the requirement of 80 percent similarity.

The plant community established on this site has a good representation of the perennial species used in the seed mix. The perennial grasses are well established providing a resilient plant community that has been difficult for desirable forbs and shrubs to compete and increase in cover and density. The favorable climatic conditions which occurred in 2019 has improved the densities of perennial forbs enough to meet the required criteria. This site has a very productive plant community with good distribution of perennial species across the site which has adequately stabilized the site. The plant community does meet the criteria for species diversity, desired foliar cover, desirable forb density and bare ground for successful reclamation of the disturbance at this site.

Well Pad 93-2M

This site was within the 9th growing season since being reclaimed when data was collected on August 19, 2019. Three 25 meter transects were placed in a spoke pattern on the pad with 50 sample points on each transect for a total of 150 points for cover data. Ten one-meter square density quadrants were placed along each transect for a total of 30 quadrants. Data collected from this site include vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground and surface rock. Table 5 compares the data collected in 2018 and in 2019 for this site.

The 2019 data in the Table 5 is summarized from data presented in Appendix Table C1. Each plant species encountered at this site is listed in Table C1. As shown in Table C1 there is a good representation of the seeded species established on the site.

Table 5 - Reclaimed Pad 93-2M Vegetation Cover, Species Composition, Species Density & Ground Cover										
	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m^2)	
Plant Group	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**
Perennial Grasses	6	7	44.7	54.1	5.3	8.1	66.4	55.7	n/a	n/a
Invasive Non-Native Grasses	1	1	10.7	5.3	0.0	0.0	18.1	10.1	n/a	n/a
Desirable Forbs	8	5	0.0	16.0	0.0	0.0	0.0	22.1	1.03	0.93
Invasive and Non-Native Forbs	4	3	4.0	3.4	0.0	0.0	6.0	7.0	n/a	n/a
Shrubs	5	5	7.3	5.3	0.0	0.7	9.5	5.1	1.60	0.67
Vegetation Totals	**24**	**21**	**66.7**	**84.1**	**5.3**	**8.8**	**100.0**	**100.0**	**2.63**	**1.60**

Line-Point Intercept Soil Surface Cover Data [3]												
Percent Cover by Type	**Bare Ground**		**Biotic Crust**		**Herbaceous Litter**		**Woody Litter**		**Duff**		**Rock**	
	2018	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**
	20.0	**9.3**	**0.0**	**0.0**	**64.7**	**67.3**	**2.7**	**1.3**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

There were several positive improvements on this site in 2019. The foliar cover of desirable species increased 45 percent from 2018 values. Perennial grass cover increased 47 percent. The cover of desirable forbs was non-existent in 2018 and increased to 16 percent of the desired foliar cover in 2019. Shrub cover declined 38 percent contributing only 9 percent of the total cover of desirable species. The cover of invasive and non-native species declined 41 percent from values measured in 2018. The amount of bare ground decreased 54 percent and the vegetative litter on the site increased 4 percent.

Table 6 is a comparison of the data collected for reclaimed well pads 93-2M with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used.

Table 6 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas					
Site	**# desired plant species**	**% desired foliar cover**	**% bare ground**	**shrub density (#/m^2)**	**forb density (#/m^2)**
Reclaimed Pad 93-2M	17 species	75.4	9.3	0.67	1.60
Reference Area [1]	23 species	62.5	26.5	1.75	6.13

[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*

Evaluation of successful reclamation of the disturbance on Well Pads sites 93-2M:

- There are 17 desirable plant species established on the site (7 perennial grasses, 5 desirable forbs, and 5 shrubs) meeting the requirement of at least five plant species.
- Slender Wheatgrass (*Elymus trachycaulus*) was the desired species with the greatest relative cover at 24.7 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 21 percent greater than that on the native rangeland reference areas meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 65 percent less than on the native rangeland reference areas which equates to 165 percent similarity, meeting the required 80 percent similarity.
- The density of forbs and shrubs on the site in comparison with the native rangeland reference areas was 17 percent and 38 percent, respectively. The criteria only require either forb density or shrub density meet the requirement of 80 percent similarity which neither have met the required criteria.

The plant community established on this site has a good representation of the perennial species used in the seed mix. The perennial grasses are well established providing a resilient plant community that is difficult for desirable forbs and shrubs to compete and increase in cover and density. The densities of perennial forbs and shrubs continue to show improvement but remain well below the values necessary for attainment of the required criteria. It is going to take several more years with favorable climatic conditions for forb and shrub densities to reach the current criteria standards. The plant community only meets the species diversity, desired foliar cover and bare ground criteria established for successful reclamation of the disturbance at this site.

Well Pad 93-4H

This site was within the 12th growing season since being reclaimed when data was collected on August 20, 2019. Three 25 meter transects were placed in a spoke pattern on the pad with 50 sample points on each transect for a total of 150 points for cover data. Ten one-meter square density quadrants were placed along each transect for a total of 30 quadrants. Data collected from this site include vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground and surface rock. Table 7 compares the data collected in 2018 and in 2019 for this site.

The 2019 data in the Table 7 is summarized from data presented in Appendix Table D1. Each plant species encountered at this site is listed in Table D1. As shown in Table D1 there is a good representation of the seeded species established on the site.

Table 7 - Reclaimed Pad 93-4H Vegetation Cover, Species Composition, Species Density & Ground Cover										
	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m^2)	
Plant Group	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
Perennial Grasses	7	9	14.0	38.6	1.4	8.1	29.7	44.5	n/a	n/a
Invasive Non-Native Grasses	1	1	13.3	10.7	0.0	0.0	25.3	18.2	n/a	n/a
Desirable Forbs	7	7	7.3	18.8	2.0	2.0	13.2	27.1	3.60	5.93
Invasive and Non-Native Forbs	7	4	8.1	2.6	0.0	0.0	18.6	6.6	n/a	n/a
Shrubs	4	6	7.3	3.4	0.0	0.0	13.2	3.6	0.50	0.37
Vegetation Totals	**22**	**27**	**50.0**	**74.1**	**3.4**	**10.1**	**100.0**	**100.0**	**4.10**	**6.30**

Line-Point Intercept Soil Surface Cover Data [3]												
Percent Cover by Type	Bare Ground		Biotic Crust		Herbaceous Litter		Woody Litter		Duff		Rock	
	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
	26.7	**15.3**	**0.0**	**0.0**	**46.0**	**47.3**	**8.7**	**7.3**	**0.0**	**0.0**	**4.0**	**1.3**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The foliar cover of desirable species more than doubled (113%) from 2018 values and was 97 percent of that on the native rangeland reference areas, above the required 80 percent. Significant increases in perennial grass cover (175%) and in desirable forbs cover (158%) occurred in 2019. Shrub cover declined 53 percent. The amount of bare ground decreased 43 percent and the vegetative litter on the site increased 3 percent. The densities of desirable forbs increased 65 percent. Shrub densities declined 26 percent. Desirable forb densities are enough to meet the criteria value for successful reclamation.

The densities of invasive and non-native species declined 38 percent, most of which was a 68 percent decline in non-native forb species.

Table 8 is a comparison of the data collected for reclaimed well pads 93-4H with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used in Table 8.

Table 8 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas					
Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Reclaimed Pad 93-4H	22 species	60.8	15.3	0.37	5.93
Reference Area [1]	23 species	62.5	26.5	1.75	6.13

[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*

Evaluation of successful reclamation of the disturbance on Well Pad site 93-4H

- There are 22 desirable plant species established on the site (9 perennial grasses, 7 desirable forbs, and 6 shrubs) meeting the requirement of at least five plant species.
- Alfalfa (*Medicago sativa*) was the desired species with the greatest relative cover at 16.7 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 97 percent of that on the native rangeland reference areas meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 42 percent less than on the native rangeland reference areas which equates to 142 percent similarity, meeting the required 80 percent similarity.
- The density of forbs and shrubs on the site in comparison with the native rangeland reference areas was 97 percent and 21 percent, respectively. The criteria only require either forb density or shrub density meet the requirement of 80 percent similarity. The density of desirable forbs exceeds the required criteria.

The plant community established on this site has a good representation of the perennial species used in the seed mix. The favorable climatic conditions which occurred in 2019 has improved the densities of perennial forbs enough to meet the required criteria. This site has a very productive plant community with good distribution of perennial species across the site which has adequately stabilized the site. The plant community does meet the criteria of species diversity, desired foliar cover, desirable forb density and bare ground for successful reclamation of the disturbance at this site.

Exploration Corehole Pad E

This site was one of several 2014 exploration corehole sites reclaimed in the fall of 2014. The final reclamation of this site includes approximately 0.73 acres at the pad site and approximately 960 feet of access road.

Vegetation sampling data was collected on August 15, 2019. Three 25 meter transects were randomly placed on the pad with 50 sample points on each transect for a total of 150 points for cover data. Ten one-meter square density quadrants were placed along each transect for a total of 30 quadrants. Data collected from this site include vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground and surface rock.

The 2019 data in the Table 9 is summarized from data presented in Appendix Table E1. Each plant species encountered at this site is listed in Table E1. As shown in Table E1 there is a good representation of the seeded species established on the site.

A visual inspection of the reclaimed access route to the pad site was also conducted with photographs taken at points which represent the plant community established on the route. The

same seed mix used on the pad was also used on the access route. All the plant species encountered on the pad site were also present on the access route.

Table 9 - Reclaimed Exploration Corehole Pad E
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]				Density Data [2]
Plant Group	**Number of Species**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	**Desirable Forb/Shrub Density (#/m²)**
Perennial Grasses	9	45.0	3.3	58.4	n/a
Invasive Non-Native Grasses	1	3.0	0.0	4.9	n/a
Desirable Forbs	8	11.7	2.0	20.8	15.71
Invasive and Non-Native Forbs	4	7.0	0.0	10.0	n/a
Shrubs	4	6.0	0.0	5.9	0.97
Vegetation Totals	**26**	**72.7**	**5.3**	**100.0**	**16.68**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	**Bare Ground**	**Biotic Crust**	**Herbaceous Litter**	**Woody Litter**	**Duff**	**Rock**
	23.3	**0.0**	**54.0**	**1.3**	**0.0**	**1.3**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The foliar cover of desirable species on the site was slightly greater than that measured on the reference areas. The cover of perennial grasses was 6 percent greater; the cover of desirable forbs was 46 percent greater and shrub cover was 50 percent less than that on the reference areas. The species composition of desirable species was 4 percent greater than that on the reference areas. The composition of perennial grasses was 4 percent lower, desirable forbs was 7 percent greater and shrubs was 65 percent lower.

The density of desirable forbs on the site was 156 percent greater than that on reference areas. Two seeded forbs, Lewis flax (*Linum lewisii*) and alfalfa (*Medicago sativa*) in equal densities, accounted for 94 percent of the desirable forb density (Appendix Table E1).

The amount of bare ground on the reference areas was 12 percent greater than that measured on this site. The amount of herbaceous litter was 33 percent greater than that on the reference areas. The canopy gaps between perennial species measured on the site were 3 percent greater than that measured on the reference areas.

Both the pad site and the access route to the pad have productive established plant communities which have good representation of the perennial species used in the seed mix with good distribution of those species across both. The cover and composition of the of the species on the route appeared comparable to that on the pad site. The plant communities have adequately stabilized both.

Table 10 is a comparison of the data collected for exploration corehole pad E with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used in Table 10.

Table 10 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas					
Site	**# desired plant species**	**% desired foliar cover**	**% bare ground**	**shrub density (#/m^2)**	**forb density (#/m^2)**
Corehole Pad E	21 species	62.7	23.3	0.97	15.71
Reference Area [1]	23 species	62.5	26.5	1.75	6.13
[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*					

Evaluation of successful reclamation of the disturbance on Exploration Corehole Pad E

- There are 21 desirable plant species established on the site (9 perennial grasses, 8 desirable forbs, and 4 shrubs) meeting the requirement of at least five plant species.
- Western Wheatgrass (*Pascopyrum smithii*) was the desired species with the greatest relative cover at 22.0 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was slightly above that on the native rangeland reference areas meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 12 percent less than on the native rangeland reference areas which equates to 112 percent similarity, meeting the required 80 percent similarity.
- The density of forbs and shrubs on the site in comparison with the native rangeland reference areas was 156 percent and 43 percent, respectively. The criteria only require either forb density or shrub density meet the requirement of 80 percent similarity. The density of desirable forbs exceeds the required criteria.

The plant community does meet the criteria of species diversity, desired foliar cover, desirable forb density and bare ground for successful reclamation of the disturbance at the site.

Exploration Corehole Pad H

This site was one of several 2014 exploration corehole sites reclaimed in the fall of 2014. The final reclamation of this site includes approximately 0.66 acres at the pad site and approximately 585 feet of access road.

Vegetation sampling data was collected on August 20, 2019. Three 25 meter transects were randomly placed on the pad with 50 sample points on each transect for a total of 150 points for cover data. Ten one-meter square density quadrants were placed along each transect for a total of 30 quadrants. Data collected from this site include vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground and surface rock.

The 2019 data in the Table 11 is summarized from data presented in Appendix Table F1. Each plant species encountered at this site is listed in Table F1. As shown in Table F1 there is a good representation of the seeded species established on the site.

A visual inspection of the reclaimed access route to the pad site was also conducted with photographs taken at points which represent the plant community established on the route. The same seed mix used on the pad was also used on the access route. All the plant species encountered on the pad site were also present on the access route.

Table 11 - Reclaimed Exploration Corehole Pad H
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]				Density Data [2]
Plant Group	**Number of Species**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	**Desirable Forb/Shrub Density (#/m²)**
Perennial Grasses	10	50.7	9.4	68.9	n/a
Invasive Non-Native Grasses	1	0.0	0.0	0.0	n/a
Desirable Forbs	12	10.7	1.3	19.7	5.0
Invasive and Non-Native Forbs	1	0.0	0.0	0.0	n/a
Shrubs	4	8.6	0.0	11.4	0.7
Vegetation Totals	**28**	**70.0**	**10.7**	**100.0**	**5.7**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground	Biotic Crust	Herbaceous Litter	Woody Litter	Duff	Rock
	14.0	**0.0**	**40.7**	**18.0**	**0.0**	**7.3**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The foliar cover of desirable species on the site was 12 percent greater than that measured on the reference areas. The cover of perennial grasses was 19 percent greater; the cover of desirable forbs was 34 percent greater and shrub cover was 28 percent less than that on the reference areas. The species composition of desirable species was 3 percent greater than that on the reference areas. The composition of perennial grasses was 13 percent greater, desirable forbs was 1 percent greater and shrubs was 32 percent lower.

The amount of bare ground on the reference areas was 47 percent greater than that measured on this site. The amount of herbaceous litter was slightly greater than that on the reference areas. The canopy gaps between perennial species measured on the reference areas were 20 percent greater than that measured on this site.

Both the pad site and the access route to the pad have productive established plant communities which have good representation of the perennial species used in the seed mix with good distribution of those species across both. The cover and composition of the of the species on the

route appeared comparable to that on the pad site. The plant communities have adequately stabilized both.

Table 12 is a comparison of the data collected for exploration corehole pad H with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used in Table 12.

Table 12 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas					
Site	**# desired plant species**	**% desired foliar cover**	**% bare ground**	**shrub density (#/m^2)**	**forb density (#/m^2)**
Corehole Pad H	26 species	70.0	14.0	0.69	5.00
Reference Area [1]	23 species	62.5	26.5	1.75	6.13
[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*					

Evaluation of successful reclamation of the disturbance on Exploration Corehole Pad H

- There are 26 desirable plant species established on the site (10 perennial grasses, 12 desirable forbs, and 4 shrubs) meeting the requirement of at least five plant species.
- Green Needlegrass (*Nassella viridula*) was the desired species with the greatest relative cover at 20.0 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 12 greater that on the native rangeland reference areas which equates to 112 percent similarity, meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 47 percent less than on the native rangeland reference areas which equates to 147 percent similarity, meeting the required 80 percent similarity.
- The density of forbs and shrubs on the site in comparison with the native rangeland reference areas was 82 percent and 41 percent, respectively. The criteria only require either forb density or shrub density meet the requirement of 80 percent similarity. The density of desirable forbs exceeds the required criteria.

The plant community does meet the criteria of species diversity, desired foliar cover, desirable forb density and bare ground for successful reclamation of the disturbance at the site.

Exploration Corehole Pad N

This site was one of several 2014 exploration corehole sites reclaimed in the fall of 2014. The final reclamation of this site includes approximately 0.73 acres at the pad site and approximately 960 feet of access road.

Vegetation sampling data was collected on August 19, 2019. Three 25 meter transects were randomly placed on the pad with 50 sample points on each transect for a total of 150 points for cover data. Ten one-meter square density quadrants were placed along each transect for a total of

30 quadrants. Data collected from this site include vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground and surface rock.

The 2019 data in the Table 13 is summarized from data presented in Appendix Table G1. Each plant species encountered at this site is listed in Table G1. As shown in Table G1 there is a good representation of the seeded species established on the site.

A visual inspection of the reclaimed access route to the pad site was also conducted with photographs taken at points which represent the plant community established on the route. The same seed mix used on the pad was also used on the access route. All the plant species encountered on the pad site were also present on the access route.

Table 13 - Reclaimed Exploration Corehole Pad N
Vegetation Cover, Species Composition, Species Density & Ground Cover

Plant Group	Line-Point Canopy Intercept Data [1]				Density Data [2]
	Number of Species	% Foliar Cover	% Basal Cover	Species Composition	Desirable Forb/Shrub Density (#/m^2)
Perennial Grasses	12	46.7	6.7	57.0	n/a
Invasive Non-Native Grasses	1	1.3	0.0	2.9	n/a
Desirable Forbs	7	15.3	2.7	29.9	11.93
Invasive and Non-Native Forbs	2	2.0	0.0	4.4	n/a
Shrubs	6	4.1	0.7	5.8	0.70
Vegetation Totals	**28**	**69.4**	**10.1**	**100.0**	**12.63**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground	Biotic Crust	Herbaceous Litter	Woody Litter	Duff	Rock
	14.4	**0.0**	**42.7**	**15.3**	**0.0**	**7.3**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The foliar cover of desirable species on the site was 6 percent greater than that measured on the reference areas. The cover of perennial grasses was 10 percent less; the cover of desirable forbs was 91 percent greater and shrub cover was 66 percent less than that on the reference areas. The species composition of desirable species was 5 percent less than that on the reference areas. The composition of perennial grasses was 7 percent less, desirable forbs was 54 percent greater and shrubs was 65 percent lower.

The amount of bare ground on the reference areas was 45 percent greater than that measured on this site. The amount of herbaceous litter was 5 percent greater than that on the reference areas. The canopy gaps between perennial species measured on the reference areas were 19 percent greater than that measured on this site.

Both the pad site and the access route to the pad have productive established plant communities which have good representation of the perennial species used in the seed mix with good distribution of those species across both. The cover and composition of the of the species on the route appeared comparable to that on the pad site. The plant communities have adequately stabilized both.

Table 14 is a comparison of the data collected for exploration corehole pad N with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used in Table 14.

Table 14 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Corehole Pad N	25 species	66.1	14.4	0.7	11.93
Reference Area [1]	23 species	62.5	26.5	1.75	6.13

[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*

Evaluation of successful reclamation of the disturbance on Exploration Corehole Pad N

- There are 25 desirable plant species established on the site (12 perennial grasses, 7 desirable forbs, and 6 shrubs) meeting the requirement of at least five plant species.
- Indian ricegrass (*Achnatherum hymenoides*) was the desired species with the greatest relative cover at 14.7 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 6 greater than that on the native rangeland reference areas which equates to 106 percent similarity, meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 45 percent less than on the native rangeland reference areas which equates to 145 percent similarity, meeting the required 80 percent similarity.
- The density of forbs on the site was 95 percent greater than that on native rangeland reference areas which equates to 195 percent similarity, meeting the requirement of 80 percent similarity. The shrub density was only 60 percent of that on native rangeland reference areas not meeting the required 80 percent. The criteria only require either forb density or shrub density meet the requirement of 80 percent similarity with the native rangeland reference areas in which the density of desirable forbs exceeds the required criteria.

The plant community does meet the criteria of species diversity, desired foliar cover, desirable forb density and bare ground for successful reclamation of the disturbance at the site.

Exploration Corehole Pad P

This site was one of several 2014 exploration corehole sites reclaimed in the fall of 2014. The final reclamation of this site includes approximately 0.59 acres at the pad site and approximately 450 feet of access road to the pad site and about 3050 feet of access route from Pad P to Pad Q.

Vegetation sampling data was collected on August 22, 2019. Three 25 meter transects were randomly placed on the pad with 50 sample points on each transect for a total of 150 points for cover data. Ten one-meter square density quadrants were placed along each transect for a total of 30 quadrants. Data collected from this site include vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground and surface rock.

The 2019 data in the Table 15 is summarized from data presented in Appendix Table H1. Each plant species encountered at this site is listed in Table H1. As shown in Table H1 there is a good representation of the seeded species established on the site.

A visual inspection of the reclaimed access route to the pad site was also conducted with photographs taken at points which represent the plant community established on the route. The same seed mix used on the pad was also used on the access route. All the plant species encountered on the pad site were also present on the access route.

Table 15 - Reclaimed Exploration Corehole Pad P
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]				Density Data [2]
Plant Group	**Number of Species**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	**Desirable Forb/Shrub Density (#/m²)**
Perennial Grasses	11	60.1	9.4	83.5	n/a
Invasive Non-Native Grasses	1	0.0	0.0	0.0	n/a
Desirable Forbs	8	2.7	0.0	6.6	4.30
Invasive and Non-Native Forbs	1	0.7	0.0	0.8	n/a
Shrubs	7	4.7	0.0	9.1	1.47
Vegetation Totals	**28**	**68.2**	**9.4**	**100.0**	**5.77**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground	Biotic Crust	Herbaceous Litter	Woody Litter	Duff	Rock
	18.7	**0.0**	**50.0**	**2.7**	**0.0**	**4.0**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The foliar cover of desirable species on the site was 8 percent greater than that measured on the reference areas. The cover of perennial grasses was 41 percent greater; the cover of desirable forbs was 66 percent less and shrub cover was 61 percent less than that on the reference areas. The species

composition of desirable species was 2 percent greater than that on the reference areas. The composition of perennial grasses was 37 percent greater, desirable forbs was 66 percent lower and shrubs was 46 percent lower.

The amount of bare ground on the reference areas was 29 percent greater than that measured on this site. The amount of herbaceous litter was 23 percent greater than that on the reference areas. The canopy gaps between perennial species measured on this site were 18 greater than that measured on the reference areas.

Both the pad site and the access route to the pad as well as the access route from pad P to pad Q have productive established plant communities which have good representation of the perennial species used in the seed mix with good distribution of those species across both. The cover and composition of the of the species on the route appeared comparable to that on the pad site. The plant communities have adequately stabilized both.

Table 16 is a comparison of the data collected for exploration corehole pad P with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used in Table 16.

Table 16 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Corehole Pad P	26 species	67.5	18.7	1.47	4.30
Reference Area [1]	23 species	62.5	26.5	1.75	6.13

[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*

Evaluation of successful reclamation of the disturbance on Exploration Corehole Pad P

- There are 26 desirable plant species established on the site (11 perennial grasses, 8 desirable forbs, and 6 shrubs) meeting the requirement of at least five plant species.
- Slender wheatgrass (*Elymus trachycaulus*) was the desired species with the greatest relative cover at 18.7 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 8 greater than that on the native rangeland reference areas which equates to 108 percent similarity, meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 29 percent less than on the native rangeland reference areas which equates to 129 percent similarity, meeting the required 80 percent similarity.
- The density of forbs on the site was 30 percent of that on native rangeland reference areas not meeting the requirement of 80 percent similarity. The shrub density was 84 percent of that on native rangeland reference areas meeting the required 80 percent similarity. The criteria only require either forb density or shrub density meet the requirement of 80

percent similarity with the native rangeland reference areas in which the density of shrubs meet the required criteria.

The plant community does meet the criteria of species diversity, desired foliar cover, shrub density and bare ground for successful reclamation of the disturbance at the site.

Exploration Corehole Pad Q

This site was one of several 2014 exploration corehole sites reclaimed in the fall of 2014. The final reclamation of this site includes approximately 0.68 acres at the pad site.

Vegetation sampling data was collected on August 26, 2019. Three 25 meter transects were randomly placed on the pad with 50 sample points on each transect for a total of 150 points for cover data. Ten one-meter square density quadrants were placed along each transect for a total of 30 quadrants. Data collected from this site include vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground and surface rock.

The 2019 data in the Table 17 is summarized from data presented in Appendix Table I1. Each plant species encountered at this site is listed in Table I1. As shown in Table I1 there is a good representation of the seeded species established on the site.

Table 17 - Reclaimed Exploration Corehole Pad Q
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]				Density Data [2]
Plant Group	**Number of Species**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	**Desirable Forb/Shrub Density (#/m²)**
Perennial Grasses	11	39.4	4.9	48.0	n/a
Invasive Non-Native Grasses	1	13.9	0.0	20.0	n/a
Desirable Forbs	10	7.5	0.0	11.2	2.28
Invasive and Non-Native Forbs	5	6.1	0.0	14.4	n/a
Shrubs	5	4.7	0.0	6.4	0.70
Vegetation Totals	**32**	**71.6**	**4.9**	**100.0**	**2.98**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground	Biotic Crust	Herbaceous Litter	Woody Litter	Duff	Rock
	24.0	**0.0**	**30.0**	**0.0**	**0.0**	**1.3**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The foliar cover of desirable species on the site was 17 percent less than that measured on the reference areas. The cover of perennial grasses was 7 percent lower; the cover of desirable forbs was 6 percent lower and shrub cover was 61 percent less than that on the reference areas. The species composition of desirable species was 33 percent less than that on the reference areas. The composition of perennial grasses was 21 percent lower, desirable forbs was 42 percent lower and shrubs was 62 percent lower.

The amount of bare ground on this site was 9 percent greater than that measured on the reference areas. The amount of herbaceous litter was 26 percent less than that on the reference areas. The canopy gaps between perennial species measured on this site were 92 greater than that measured on the reference areas.

The pad site has a plant community which has good representation of the perennial species used in the seed mix with fair distribution of those species across the site. However, the invasive non-native species make up 34 percent of the total species composition on the site. It appeared invasive species were not invading the site but rather declining in cover. The distribution of desirable species across the site has stabilized the site.

Table 18 is a comparison of the data collected for exploration corehole pad Q with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used in Table 18.

Table 18 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Corehole Pad Q	26 species	51.6	24.0	0.7	2.28
Reference Area [1]	23 species	62.5	26.5	1.75	6.13

[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*

Evaluation of successful reclamation of the disturbance on Exploration Corehole Pad Q

- There are 26 desirable plant species established on the site (11 perennial grasses, 10 desirable forbs, and 5 shrubs) meeting the requirement of at least five plant species.
- Needle & thread needlegrass (*Hesperostipa comata*) was the desired species with the greatest relative cover at 16.7 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 83 percent of than that on the native rangeland reference areas meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 9 percent less than on the native rangeland reference areas which equates to 109 percent similarity, not meeting the required 80 percent similarity.
- The density of forbs on the site was 37 percent of that on native rangeland reference areas not meeting the requirement of 80 percent similarity. The shrub density was 40 percent of that on native rangeland reference areas not meeting the required 80 percent similarity. The criteria only require either forb density or shrub density meet the requirement of 80

percent similarity with the native rangeland reference areas in which neither meet the required criteria.

The plant community meets only the species diversity and desired foliar cover criteria. It does not meet the shrub or desirable forb densities nor bare ground criteria. The site does not meet successful reclamation standards required for the site.

Exploration Corehole Pad R

This site was one of several 2014 exploration corehole sites reclaimed in the fall of 2014. The final reclamation of this site includes approximately 0.51 acres at the pad site and approximately 1550 feet of access road leading to and from the pad site.

Vegetation sampling data was collected on August 26, 2019. Three 25 meter transects were randomly placed on the pad with 50 sample points on each transect for a total of 150 points for cover data. Ten one-meter square density quadrants were placed along each transect for a total of 30 quadrants. Data collected from this site include vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground and surface rock.

The 2019 data in the Table 19 is summarized from data presented in Appendix Table J1. Each plant species encountered at this site is listed in Table J1. As shown in Table J1 there is a good representation of the seeded species established on the site.

A visual inspection of the reclaimed access route to the pad site was also conducted with photographs taken at points which represent the plant community established on the route. The same seed mix used on the pad was also used on the access route. All the plant species encountered on the pad site were also present on the access route.

Table 19 - Reclaimed Exploration Corehole Pad R
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]				Density Data [2]
Plant Group	**Number of Species**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	**Desirable Forb/Shrub Density (#/m²)**
Perennial Grasses	9	38.7	4.1	49.3	n/a
Invasive Non-Native Grasses	1	12.4	0.0	22.7	n/a
Desirable Forbs	7	7.6	1.4	12.5	8.32
Invasive and Non-Native Forbs	3	1.4	0.0	2.4	n/a
Shrubs	6	11.1	0.7	13.1	1.07
Vegetation Totals	**26**	**71.2**	**6.2**	**100.0**	**9.39**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground	Biotic Crust	Herbaceous Litter	Woody Litter	Duff	Rock
	13.8	**0.0**	**30.0**	**0.0**	**0.0**	**1.3**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.

[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The foliar cover of desirable species on the site was 8 percent less than that measured on the reference areas. The cover of perennial grasses was 9 percent lower; the cover of desirable forbs was 5 percent lower and shrub cover was 8 percent less than that on the reference areas. The species composition of desirable species was 23 percent less than that on the reference areas. The composition of perennial grasses was 19 percent lower, desirable forbs was 36 percent lower and shrubs was 22 percent lower.

The amount of bare ground measured on the reference areas was 48 percent greater than that on this site. The amount of herbaceous litter was 9 percent greater than that on the reference areas. The canopy gaps between perennial species measured on this site were 47 greater than that measured on the reference areas.

Both the pad site and the access route to the pad have productive established plant communities which have good representation of the perennial species used in the seed mix with good distribution of those species across both. However, invasive non-native species, primarily cheatgrass (*Bromus tectorum*), make up 23 percent of the total species composition on the pad site. It appeared cheatgrass was not invading the site but rather declining in cover. Very little cheatgrass was observed on the access routes.

The distribution of desirable species across the pad site and access route has stabilized both sites. The cover and composition of the of the desirable species on the route appeared comparable to that on the pad site. The plant communities have adequately stabilized both.

Table 20 is a comparison of the data collected for exploration corehole pad R with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used in Table 20.

Table 20 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Corehole Pad R	22 species	57.4	13.8	1.07	8.32
Reference Area [1]	23 species	62.5	26.5	1.75	6.13

[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*

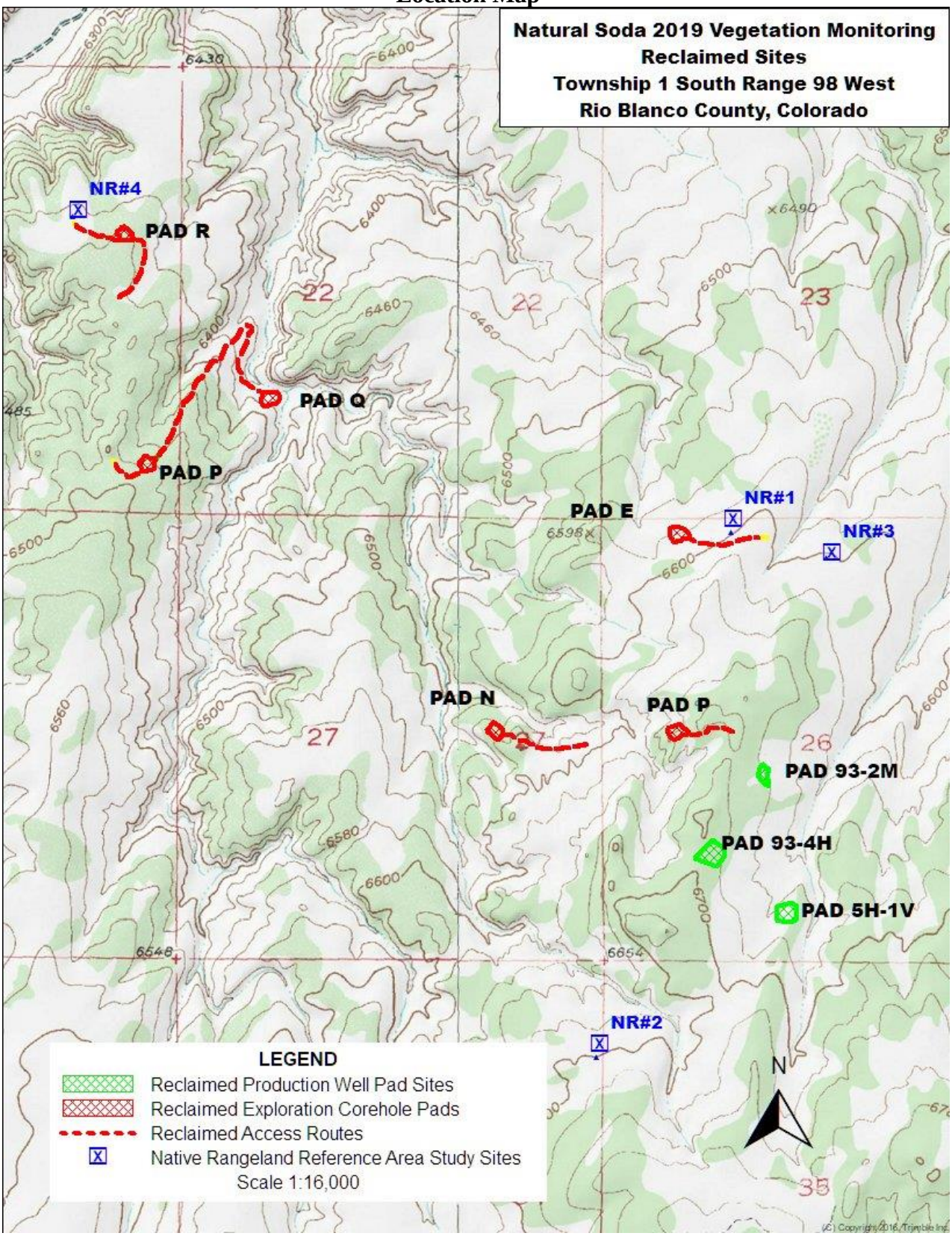
Evaluation of successful reclamation of the disturbance on Exploration Corehole Pad R

- There are 22 desirable plant species established on the site (9 perennial grasses, 7 desirable forbs, and 6 shrubs) meeting the requirement of at least five plant species.
- Indian ricegrass (*Achnatherum hymenoides*) was the desired species with the greatest relative cover at 16.6 percent meeting the requirement that no one species can exceed 70 percent relative cover.

- The foliar cover of desirable species on the site was 92 percent of than that on the native rangeland reference areas meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 48 percent less than on the native rangeland reference areas which equates to 148 percent similarity, meeting the required 80 percent similarity.
- The density of desirable forbs on the site was 36 percent greater than that on native rangeland reference areas which equates to 136 percent similarity, meeting the required 80 percent similarity. The shrub density was 61 percent of that on native rangeland reference areas not meeting the required 80 percent similarity. The criteria only require either forb density or shrub density meet the requirement of 80 percent similarity with the native rangeland reference areas in which the density of desirable forbs exceed the required criteria.

The plant community does meet the criteria of species diversity, desired foliar cover, desirable forb density and bare ground for successful reclamation of the disturbance at the site.

Location Map



Appendix A – Vegetation Sampling Data Native Rangeland Reference Areas

Table A1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Rolling Loam Native Rangeland Reference Area						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	1.0	0.5	1.34	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	31.5	4.0	44.97	
KOMA	*Koeleria macrantha*	prairie junegrass	6.0	1.0	8.72	
PASM	*Pascopyrum smithii*	western wheatgrass	3.5	1.0	4.70	**Desirable Forb/Shrub Density (#/m^2)**
POSE	*Poa secunda*	Sandberg bluegrass	0.5	0.0	1.34	
		Perennial Grass Totals	**42.5**	**6.5**	**61.08**	
ASCO12	*Astragalus convallarius*	lesser-rushy mlkvetch	0.5	0.0	4.03	0.400
CAFI	*Carex filifolia*	threadleaf sedge	0.0	0.0	0.67	0.025
CRFL6	*Cryptantha flavoculata*	roughseed cryptanth	0.5	0.5	0.67	0.100
EREA	*Erigeron eatonii*	Eaton's fleabane	2.0	1.0	2.68	0.900
HEBO	*Hedysarum boreale*	Utah sweetvetch	1.5	0.0	2.68	0.325
LUAR3	*Lupinus argenteus*	silvery lupine	0.0	0.0	0.00	0.025
LEER	*Leucelene ericoides*	heath aster	0.0	0.0	0.00	0.425
MAGR2	*Machaeranthera grindelioides*	rayless tansyaster	0.5	0.0	0.67	0.225
OPPO	*Opuntia polyacantha*	plains pricklypear cactus	0.5	0.0	0.67	0.000
PAMU11	*Pakera multilobata*	lobeleaf groundsel	0.0	0.0	0.67	0.075
PHHO	*Phlox hoodii*	Hood's phlox	1.0	0.5	3.36	1.050
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	1.5	0.0	3.36	2.575
		Perennial Forb Totals	**8.0**	**2.0**	**19.46**	**6.125**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	10.0	0.5	13.42	0.850
CHDE2	*Chrysothamnus depressus*	longflower rabbitbrush	2.0	0.5	3.36	0.750
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	0.0	0.0	0.00	0.025
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	0.0	0.0	0.00	0.050
JUOS	*Juniperus osteosperma*	Utah juniper	0.0	0.0	0.00	0.050
SAVE4	*Sarcobatus vermiculatus*	greasewood	0.0	0.0	0.00	0.025
		Shrub Totals	**12.0**	**1.0**	**16.78**	**1.751**
ALDE	*Alyssum desertorum*	desert madwort	0.5	0.0	0.67	
BRTE	*Bromus tectorum*	cheatgrass	1.0	0.0	1.34	
LECA5	*Lepidium campestre*	field pepperweed	0.0	0.0	0.67	
		Totals for Invasive and Non-Native Species	**1.5**	**0.0**	**2.68**	
		Vegetation Totals	**64.0**	**9.5**	**100.00**	**7.876**

[1] Sum of data from 4 randomly placed transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.

[2] Sum of density data collected from 10 one square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.

[3] Plant species not encountered in sampling data but were present within the study area.

[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**26.5**
Biotic Crust	**0.5**
Herbaceous Litter	**40.5**
Woody Litter	**1.5**
Duff	**0.0**
Rock	**0.0**

Table A2 - Canopy Gap Intercept Data Rolling Loam Native Rangeland Reference Area										
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**		**Gaps 21-50 cm**		**Gaps 51-100 cm**		**Gaps 101-200 cm**		**Gaps >200 cm**	
	2018	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**
Transect 1	854	987	467	641	387	346	0	0	0	0
Transect 2	1735	1227	735	1008	1000	219	0	0	0	0
Transect 3	1513	684	443	629	850	55	220	0	0	0
Transect 4	1367	1066	586	453	493	309	288	304	0	0
Total Gaps (cm)	**5469**	**3964**	**2231**	**2731**	**2730**	**929**	**508**	**304**	**0**	**0**
% Line in Gaps	**27.35**	**26.43**	**11.16**	**18.21**	**13.65**	**6.19**	**2.54**	**2.03**	**0.00**	**0.00**
Line length for each transect was 50 meters for site total length of 200 meters in 2018										

Table A3 - Transect Coordinate Locations Native Rangeland Reference Areas (Datum: UTM Zone 12, WGS 84)						
Site	**Azimuth from starting point (true N)**	**Transect Starting Point**		**Transect Ending Point**		**Length**
		Northing (mN)	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	
Transect 1	005º	4424575.074	725222.01	4424620.039	725228.378	50 meters
Transect 2	018º	4422649.855	724786.5965	4422698.949	724797.3818	50 meters
Transect 3	051º	4424490.83	725574.2099	4424505.933	725588.9861	25 meters
Transect 4	045º	4425652.377	722789.301	4425674.196	722802.1731	25 meters

Transect Photos Native Rangeland Reference Areas

Figure A1 Rolling Loam Rangeland Reference Area Transect #1

Figure A2 Rolling Loam Rangeland Reference Area Transect #2

Figure A3 Rolling Loam Rangeland Reference Area Transect #3

Figure A4 Rolling Loam Rangeland Reference Area Transect #4

Appendix B – Vegetation Sampling Data Reclaimed Well Pad 5H-1V

Table B1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Pad 5H-1V						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
ACHY[3]	*Achnatherum hymenoides*	Indian ricegrass	0.0	0.0	0.0	
ELLAL	*Elymus lanceolatus*	thickspike wheatgrass	4.0	1.3	4.6	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	25.3	6.7	30.8	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	0.7	0.0	0.7	
LECI4	*Leymus cinereus*	basin wildrye	0.7	0.0	0.8	
NAVI4	*Nassella viridula*	green needlegrass	4.0	1.3	5.4	
PASM	*Pascopyrum smithii*	western wheatgrass	0.7	0.0	0.8	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	16.0	3.3	19.2	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	2.7	0.0	3.1	**Desirable Forb/Shrub Density (#/m^2)**
THIN6	*Thinopyrum intermedium*	pubescent wheatgrass	12.7	1.3	14.6	
		Totals for Perennial Grasses	**66.8**	**13.9**	**80.0**	
ASCH	*Astragalus chamaeleuce*	cicada milkvetch	0.0	0.0	0.0	0.07
ASCI4	*Astragalus cicer*	cicer milkvetch	0.0	0.0	0.0	0.87
CROC	*Crepis occidentalis*	largeflower hawksbeard	0.0	0.0	0.0	0.03
EREA	*Erigeron eatonii*	Eaton fleabane	0.0	0.0	0.0	0.10
LILE3	*Linum lewisii*	Lewis flax	2.7	0.0	4.6	0.87
MACA2	*Machaeranthera canescens*	hoary tansyaster	0.0	0.0	0.7	0.33
MAGR2	*Machaeranthera grindelioides*	rayless tansyaster	0.0	0.0	0.8	0.10
MESA	*Medicago sativa*	alfalfa	3.3	0.7	7.7	2.27
PEPA8	*Penstemon palmeri*	Palmer's penstemon	0.0	0.0	0.0	0.27
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	0.0	0.0	0.0	0.37
		Totals for Desirable Forb Species	**6.0**	**0.7**	**13.8**	**5.28**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	0.0	0.0	0.0	0.03
ATCA2	*Atriplex canescens*	four-wing saltbush	0.7	0.0	0.8	0.00
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	0.0	0.0	0.0	0.13
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	2.0	0.7	3.1	0.37
KRLA2	*Krascheninnikovia lanata*	winterfat	0.7	0.0	0.8	0.07
		Totals for Shrubs	**3.4**	**0.7**	**4.7**	**0.60**
ALDE	*Alyssum desertorum*	desert madwort	0.0	0.0	0.7	
BRTE	*Bromus tectorum*	cheatgrass	0.0	0.0	0.8	
MEOF	*Melilotus officinalis*	yellow sweetclover	0.0	0.0	0.0	
		Totals for Invasive and Non-Native Species	**0.0**	**0.0**	**1.5**	
		Vegetation Totals	**76.2**	**15.3**	**100.0**	**5.88**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.

[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.

[3] Plant species not encountered in sampling data but were present within the study area.

[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**12.7**
Biotic Crust	**0.0**
Herbaceous Litter	**56.0**
Woody Litter	**2.7**
Duff	**0.0**
Rock	**2.0**

Table B2 - Canopy Gap Intercept Data Reclaimed Pad 5H-1V										
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**		**Gaps 21-50 cm**		**Gaps 51-100 cm**		**Gaps 101-200 cm**		**Gaps >200 cm**	
	2018[1]	**2019[2]**	**2018[1]**	**2019[2]**	**2018[1]**	**2019[2]**	**2018[1]**	**2019[2]**	**2018[1]**	**2019[2]**
Transect 1	696	294	410	215	286	79	0	0	0	0
Transect 2	636	459	342	381	294	78	0	0	0	0
Transect 3	608	389	339	389	269	0	0	0	0	0
Transect 4	577	---	251	---	326	---	0	---	0	---
Total Gaps (cm)	**2517**	**1142**	**1342**	**985**	**1175**	**157**	**0**	**0**	**0**	**0**
% Line in Gaps	**25.17**	**15.23**	**13.42**	**13.13**	**11.75**	**2.09**	**0.00**	**0.00**	**0.00**	**0.00**

[1]In 2018 four transects were sampled. Each transect was 25 meters long for site total length of 100 meters
[2]In 2019 three transects were sampled. Each transect was 25 meters long for site total length of 75 meters

Table B3 - Transect Coordinate Locations Reclaimed Pad 5H-1V (Datum: UTM Zone 12, WGS 84)						
Site	**Azimuth from starting point (true N)**	**Transect Starting Point**		**Transect Ending Point**		**Length**
		Northing (mN)	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	
Transect 1	133°	4423196.945	725478.897	4423180.277	725497.6099	25 meters
Transect 2	230°	4423195.042	725467.1489	4423181.893	725447.0939	25 meters
Transect 3	316°	4423202.974	725472.3888	4423216.758	725453.8468	25 meters

Transect Photos and Transect Layout Plot

Figure B1 Transect 1 Reclaimed Pad 5H-1V

Figure B2 Transect 2 Reclaimed Pad 5H-1V

Figure B3 Transect 3 Reclaimed Pad 5H-1V

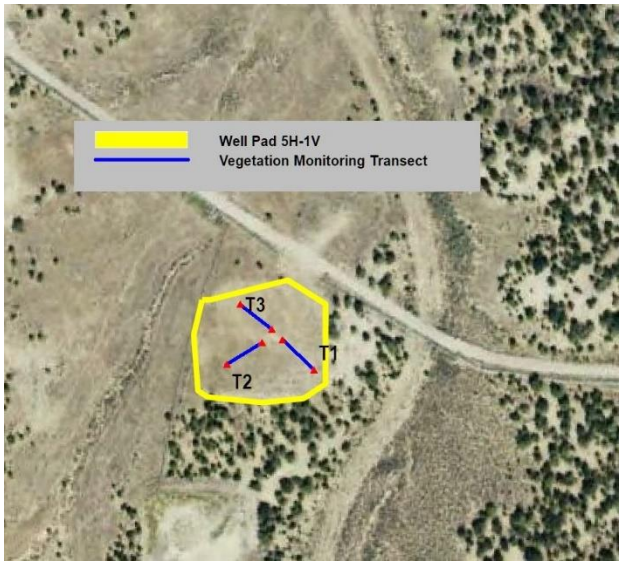


Figure B4 Transect Layout

Appendix C – Vegetation Sampling Data Reclaimed Well Pad 93-2M

Table C1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Pad 93-2M						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
ELLAL	*Elymus lanceolatus*	thickspike wheatgrass	8.0	2.0	8.9	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	24.7	4.7	25.9	
LECI4	*Leymus cinereus*	basin wildrye	3.3	0.0	3.2	
NAVI4	*Nassella viridula*	green needlegrass	0.7	0.0	0.6	
PASM	*Pascopyrum smithii*	western wheatgrass	2.0	0.0	1.9	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	8.7	0.7	8.2	**Desirable Forb/Shrub Density (#/m^2)**
THIN6	*Thinopyrum intermedium*	pubescent wheatgrass	6.7	0.7	7.0	
		Perennial Grass Totals	**54.1**	**8.1**	**55.7**	
CROC	*Crepis occidentalis*	largeflower hawksbeard	0.0	0.0	0.0	0.03
DEPI	*Descurainia pinnata*	western tansymustard	14.7	0.0	19.0	0.00
LILE3	*Linum lewisii*	Lewis flax	0.0	0.0	0.0	0.07
MESA	*Medicago sativa*	alfalfa	1.3	0.0	2.5	0.40
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	0.0	0.0	0.6	0.43
		Perennial Forb Totals	**16.0**	**0.0**	**22.1**	**0.93**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	2.0	0.0	1.9	0.17
ATCA2	*Atriplex canescens*	four-wing saltbush	0.7	0.0	0.6	0.00
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	1.3	0.0	1.3	0.17
ERNA10	*Ericameria nauseosa*	rubber rabbitbrush	0.0	0.0	0.0	0.03
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	1.3	0.7	1.3	0.30
		Shrub Totals	**5.3**	**0.7**	**5.1**	**0.67**
ALDE	*Alyssum desertorum*	desert madwort	0.7	0.0	1.3	
BRTE	*Bromus tectorum*	cheatgrass	5.3	0.0	10.1	
LECA5	*Lepidium campestre*	field pepperweed	2.0	0.0	3.2	
LEPE2	*Lepidium perfoliatum*	clasping pepperweed	0.7	0.0	2.5	
		Totals for Invasive and Non-Native Species	**8.7**	**0.0**	**17.1**	
		Vegetation Totals	**84.1**	**8.8**	**100.0**	**1.60**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**9.3**
Biotic Crust	**0.0**
Herbaceous Litter	**67.3**
Woody Litter	**1.3**
Duff	**0.0**
Rock	**0.0**

Table C2 - Canopy Gap Intercept Data Reclaimed Pad 93-2M										
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**		**Gaps 21-50 cm**		**Gaps 51-100 cm**		**Gaps 101-200 cm**		**Gaps >200 cm**	
	2018	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**
Transect 1	1011	354	179	130	731	224	101	0	0	0
Transect 2	1120	860	101	60	507	503	512	297	0	0
Transect 3	779	944	238	54	541	302	0	588	0	0
Total Gaps (cm)	**2910**	**2158**	**518**	**244**	**1779**	**1029**	**613**	**885**	**0**	**0**
% Line in Gaps	**38.80**	**28.77**	**6.91**	**3.25**	**23.72**	**13.72**	**8.17**	**11.80**	**0.00**	**0.00**
Line length for each transect was 25 meters for site total length of 75 meters										

Table C3 - Transect Coordinate Locations Reclaimed Pad 93-2M (Datum: UTM Zone 12, WGS 84)						
Site	Azimuth from starting point (true N)	Transect Starting Point		Transect Ending Point		Length
		Northing (mN)	Easting (mE)	Northing (mN)	Easting (mE)	
Transect 1	337º	4423692.586	725373.4847	4423718.07	725367.3425	25 meters
Transect 2	263º	4423688.504	725378.2242	4423683.439	725353.4837	25 meters
Transect 3	137º	4423688.915	725377.1001	4423665.028	725380.8857	25 meters

Transect Photos and Transect Layout Plot

Figure C1 Transect 1 Reclaimed Pad 93-2M

Figure C2 Transect 2 Reclaimed Pad 93-2M

Figure C3 Transect 3 Reclaimed Pad 93-2M

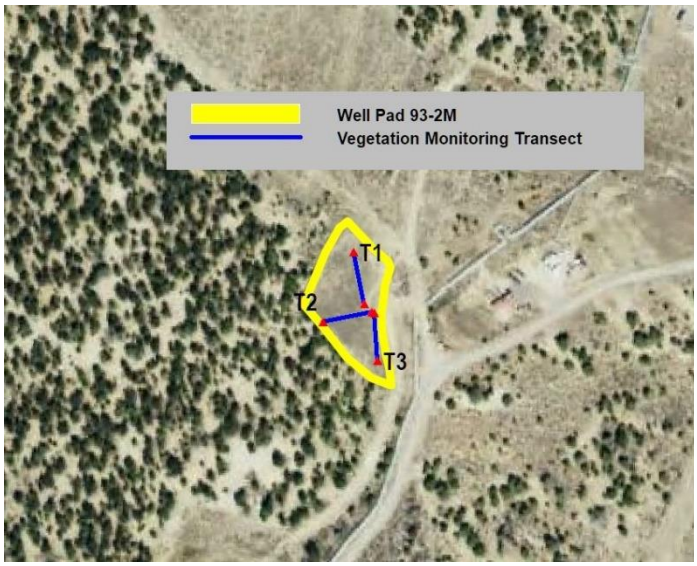


Figure C4 Pad 93-2M Transect Layout

Appendix D – Vegetation Sampling Data Reclaimed Well Pad 93-4H

Table D1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Pad 93-4H						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	6.7	2.0	8.0	
AGCR	*Agropyron cristatum*	crested wheatgrass	3.3	0.7	3.6	
ELLAL	*Elymus lanceolatus*	thickspike wheatgrass	1.3	0.7	1.6	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	10.0	2.7	10.9	
LECI4	*Leymus cinereus*	basin wildrye	1.3	0.0	1.5	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	3.3	0.0	3.6	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	0.7	0.0	0.7	
PSSPS	*Pseudoroegneria spicata ssp. spicata*	bearded bluebunch wheatgrass	0.7	0.0	0.7	**Desirable Forb/Shrub Density (#/m^2)**
THIN6	*Thinopyrum intermedium*	pubescent wheatgrass	11.3	2.0	13.9	
		Perennial Grass Totals	**38.6**	**8.1**	**44.5**	
ASCI4	*Astragalus cicer*	cicer milkvetch	0.0	0.0	0.0	0.10
CRFL6	*Cryptantha flavoculata*	roughseed cryptanth	0.0	0.0	0.0	0.00
DEPI	*Descurainia pinnata*	western tansymustard	0.7	0.0	0.7	0.00
GRSQ	*Grindelia squarrosa*	curlycup gumweed	0.7	0.0	0.7	0.23
MACA2	*Machaeranthera canescens*	hoary tansyaster	0.7	0.0	1.5	0.23
MESA	*Medicago sativa*	alfalfa	16.7	2.0	24.2	5.27
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	0.0	0.0	0.0	0.10
		Perennial Forb Totals	**18.8**	**2.0**	**27.1**	**5.93**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	0.7	0.0	0.7	0.00
ATCA2	*Atriplex canescens*	four-wing saltbush	0.7	0.0	0.7	0.10
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	2.0	0.0	2.2	0.17
ERNA10	*Ericameria nauseosa*	rubber rabbitbrush	0.0	0.0	0.0	0.00
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	0.0	0.0	0.0	0.07
JUOS	*Juniperus osteosperma*	Utah juniper	0.0	0.0	0.0	0.03
		Shrub Totals	**3.4**	**0.0**	**3.6**	**0.37**
BRTE	*Bromus tectorum*	cheatgrass	10.7	0.0	18.2	
ALDE	*Alyssum desertorum*	desert madwort	1.3	0.0	4.4	
LEPE2	*Lepidium perfoliatum*	clasping pepperweed	0.0	0.0	0.7	
MEOF	*Melilotus officinalis*	yellow sweetclover	0.0	0.0	0.0	
SATR12	*Salsola tragus*	Russian thistle	1.3	0.0	1.5	
		Totals for Invasive and Non-Native Species	**13.3**	**0.0**	**24.8**	
		Vegetation Totals	**74.1**	**10.1**	**100.0**	**6.30**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**15.3**
Biotic Crust	**0.0**
Herbaceous Litter	**47.3**
Woody Litter	**7.3**
Duff	**0.0**
Rock	**1.3**

Table D2 - Canopy Gap Intercept Data Reclaimed Pad 93-4H										
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**		**Gaps 21-50 cm**		**Gaps 51-100 cm**		**Gaps 101-200 cm**		**Gaps >200 cm**	
	2018	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**
Transect 1	1664	883	318	125	683	423	441	119	222	216
Transect 2	1596	923	263	389	472	427	322	107	539	0
Transect 3	1468	1286	334	145	235	306	353	835	546	0
Total Gaps (cm)	**4728**	**3092**	**915**	**659**	**1390**	**1156**	**1116**	**1061**	**1307**	**216**
% Line in Gaps	**63.04**	**41.23**	**12.20**	**8.79**	**18.53**	**15.41**	**14.88**	**14.15**	**17.43**	**2.88**
Line length for each transect was 25 meters for site total length of 75 meters										

Table D3 - Transect Coordinate Locations Reclaimed Pad 93-4H (Datum: UTM Zone 12, WGS 84)						
Site	**Azimuth from starting point (true N)**	**Transect Starting Point**		**Transect Ending Point**		**Length**
		Northing (mN)	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	
Transect 1	335º	4423398.615	725186.1273	4423424.276	725182.2043	25 meters
Transect 2	135º	4423392.593	725189.1279	4423377.347	725207.1133	25 meters
Transect 3	218º	4423394.462	725184.7103	4423378.398	725167.4788	25 meters

Transect Photos and Transect Layout Plot

Figure D1 Transect 1 Reclaimed Pad 93-4H

Figure D2 Transect 2 Reclaimed Pad 93-4H

Figure D3 Transect 3 Reclaimed Pad 93-4H

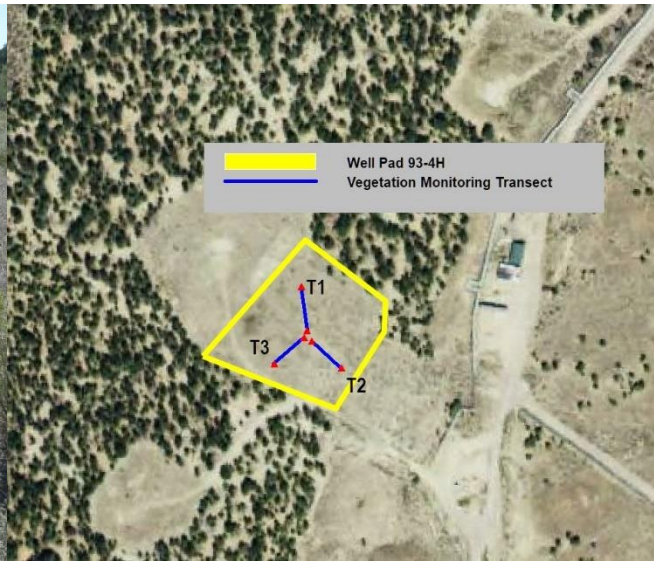


Figure D4 Transect Layout

Appendix E – Vegetation Sampling Data Reclaimed Corehole Pad E

Table E1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Exploration Corehole Pad E						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**percent Foliar Cover**	**percent Basal Cover**	**Species Composition**	
ELLAL	*Elymus lanceolatus*	thickspike wheatgrass	0.0	0.0	1.0	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	3.0	0.0	3.0	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	16.7	3.3	24.7	
LECI4	*Leymus cinereus*	basin wildrye	0.0	0.0	0.0	
NAVI4	*Nassella viridula*	green needlegrass	2.0	0.0	2.0	
PASM	*Pascopyrum smithii*	western wheatgrass	22.0	0.0	25.7	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	0.0	0.0	0.0	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	1.3	0.0	2.0	
PSSPS[3]	*Pseudoroegneria spicata ssp. Spicata*	bearded bluebunch wheatgrass	0.0	0.0	0.0	**Desirable Forb/Shrub Density (#/m^2)**
		Perennial Grass Totals	**45.0**	**3.3**	**58.4**	
ACLA	*Achillea lanulosa*	western yarrow	0.0	0.0	0.0	0.07
ASCI4	*Astragalus cicer*	cicer milkvetch	0.0	0.0	0.0	0.40
CHAL	*Chenopodium album*	lambsquarter	0.0	0.0	0.0	0.47
CLSE[3]	*Cleome serrulata*	Rocky Mtn. beeplant	0.0	0.0	0.0	0.00
LILE3	*Linum lewisii*	Lewis flax	3.0	0.7	4.0	7.37
MAGR2[3]	*Machaeranthera grindelioides*	rayless tansyaster	0.0	0.0	0.0	0.00
MESA	*Medicago sativa*	alfalfa	8.7	1.3	16.8	7.37
PEPA8	*Penstemon palmeri*	Palmer's penstemon	0.0	0.0	0.0	0.03
		Perennial Forb Totals	**11.7**	**2.0**	**20.8**	**15.71**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	0.0	0.0	0.0	0.07
ATCA2	*Atriplex canescens*	four-wing saltbush	6.0	0.0	5.9	0.67
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	0.0	0.0	0.0	0.03
KRLA2	*Krascheninnikovia lanata*	winterfat	0.0	0.0	0.0	0.20
		Shrub Totals	**6.0**	**0.0**	**5.9**	**0.97**
ALDE	*Alyssum desertorum*	desert madwort	2.0	0.0	4.0	
BRTE	*Bromus tectorum*	cheatgrass (annual grass)	3.0	0.0	4.9	
LASQ	*Lappula squarrosa*	European stickseed	2.0	0.0	2.0	
LECA5	*Lepidium campestre*	field pepperweed	2.0	0.0	3.0	
SATR12	*Salsola tragus*	Russian thistle	1.0	0.0	1.0	
		Totals for Invasive and Non-Native Species	**10.0**	**0.0**	**14.9**	
		Vegetation Totals	**72.7**	**5.3**	**100.0**	**16.68**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**23.3**
Biotic Crust	**0.0**
Herbaceous Litter	**54.0**
Woody Litter	**1.3**
Duff	**0.0**
Rock	**1.3**

Table E2 - Canopy Gap Intercept Data Reclaimed Exploration Corehole Pad E					
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**	**Gaps 21-50 cm**	**Gaps 51-100 cm**	**Gaps 101-200 cm**	**Gaps >200 cm**
Transect 1	636	522	114	0	0
Transect 2	443	392	51	0	0
Transect 3	963	264	590	109	0
Total Gaps (cm)	**2042**	**1178**	**755**	**109**	**0**
% Line in Gaps	**27.23**	**15.71**	**10.07**	**1.45**	**0.00**
Line length for each transect was 25 meters for site total length of 75 meters					

Table E3 - Transect Coordinates and Access Route Photo-point Locations Reclaimed Exploration Corehole Pad E (Datum: UTM Zone 12, WGS 84)						
Site	**Azimuth from starting point (true N)**	**Transect Starting Point**		**Transect Ending Point**		**Length**
		Northing (mN)	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	
Transect 1	332º	4424566.154	725032.9249	4424588.202	725019.5308	25 meters
Transect 2	203º	4424564.03	725032.4745	4424541.717	725018.0813	25 meters
Transect 3	126º	4424564.386	725036.9967	4424550.578	725054.7658	25 meters
Access Route/Photo-point Location						
Pad E / Photo-point # 1		4424531.064	725105.0315			

Transect Photos, Access Route Photos and Transect Layout Plot

Figure E1 Transect 1 Reclaimed Exploration Corehole Pad E

Figure E2 Transect 2 Reclaimed Exploration Corehole Pad E

Figure E3 Transect 3 Reclaimed Exploration Corehole Pad E

Figure E4 Reclaimed Access Road to Corehole Pad E

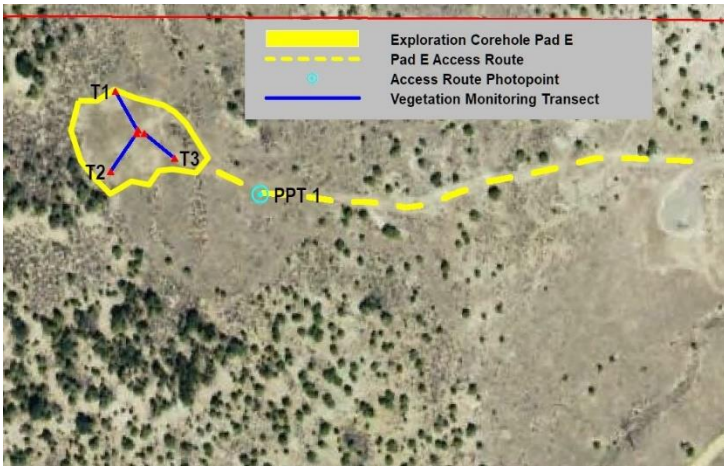


Figure E5 Transect Layout & Access Route Photopoint Location

Appendix F – Vegetation Sampling Data Reclaimed Corehole Pad H

Table F1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Exploration Corehole Pad H						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**percent Foliar Cover**	**percent Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	5.3	1.3	6.6	
ELELE	*Elymus elymoides ssp. elymoides*	bottlebrush squirreltail	0.7	0.0	0.8	
ELLAL	*Elymus lanceolatus*	thickspike wheatgrass	5.3	1.3	8.3	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	8.0	2.0	9.8	
LECI4	*Leymus cinereus*	basin wildrye	4.7	0.0	5.7	
NAVI4	*Nassella viridula*	green needlegrass	20.0	2.7	29.5	
PASM	*Pascopyrum smithii*	western wheatgrass	1.3	0.0	1.6	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	2.0	0.7	2.5	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	2.7	0.7	3.3	
PSSPS	*Pseudoroegneria spicata ssp. Spicata*	bearded bluebunch wheatgrass	0.7	0.7	0.8	
PSSPS[3]	*Pseudoroegneria spicata ssp. Spicata*	bearded bluebunch wheatgrass	0.0	0.0	0.0	**Desirable Forb/Shrub Density (#/m^2)**
		Perennial Grass Totals	**50.7**	**9.4**	**68.9**	
ACLA	*Achillea lanulosa*	western yarrow	0.0	0.0	0.0	0.07
ASCH	*Astragalus chamaeleuce*	cicada milkvetch	0.0	0.0	0.0	0.03
ASCI4	*Astragalus cicer*	cicer milkvetch	0.0	0.0	1.7	0.60
CHAL	*Chenopodium album*	lambsquarter	0.7	0.0	0.8	0.00
CIUNT	*Cirsium undulatum var. tracyi*	wavyleaf thistle	0.0	0.0	0.0	0.03
CRFL6	*Cryptantha flavoculata*	roughseed cryptanth	0.0	0.0	0.0	0.07
LILE3	*Linum lewisii*	Lewis flax	0.7	0.0	0.8	0.30
MACA2[3]	*Machaeranthera canescens*	hoary tansyaster	0.0	0.0	0.0	0.00
MAGR2	*Machaeranthera grindelioides*	rayless tansyaster	0.0	0.0	0.0	0.20
MESA	*Medicago sativa*	alfalfa	7.3	1.3	13.1	3.17
PEPA8	*Penstemon palmeri*	Palmer's penstemon	2.0	0.0	3.3	0.50
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	0.0	0.0	0.0	0.03
		Perennial Forb Totals	**10.7**	**1.3**	**19.7**	**5.00**
ATCA2	*Atriplex canescens*	four-wing saltbush	7.3	0.0	9.8	0.53
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	0.0	0.0	0.0	0.03
KRLA2	*Krascheninnikovia lanata*	winterfat	0.0	0.0	0.0	0.10
PUTR2	*Purshia tridentata*	antelope bittrebrush	1.3	0.0	1.6	0.03
		Shrub Totals	**8.6**	**0.0**	**11.4**	**0.69**
BRTE[3]	*Bromus tectorum*	cheatgrass	0.0	0.0	0.0	
LECA5[3]	*Lepidium campestre*	field pepperweed	0.0	0.0	0.0	
		Totals for Invasive and Non-Native Species	**0.0**	**0.0**	**0.0**	
		Vegetation Totals	**70.0**	**10.7**	**100.0**	**5.69**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**14.0**
Biotic Crust	**0.0**
Herbaceous Litter	**40.7**
Woody Litter	**18.0**
Duff	**0.0**
Rock	**7.3**

Table F2 - Canopy Gap Intercept Data Reclaimed Exploration Corehole Pad H					
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**	**Gaps 21-50 cm**	**Gaps 51-100 cm**	**Gaps 101-200 cm**	**Gaps >200 cm**
Transect 1	414	275	139	0	0
Transect 2	725	249	290	186	0
Transect 3	444	316	128	0	0
Total Gaps (cm)	**1583**	**840**	**557**	**186**	**0**
% Line in Gaps	**21.11**	**11.20**	**7.43**	**2.48**	**0.00**
Line length for each transect was 25 meters for site total length of 75 meters					

Table F3 - Transect Coordinates and Access Route Photo-point Locations Reclaimed Exploration Corehole Pad H (Datum: UTM Zone 12, WGS 84)						
	Azimuth from starting point (true N)	**Transect Starting Point**		**Transect Ending Point**		
Site		**Northing (mN)**	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	**Length**
Transect 1	270º	4423840.995	725052.8859	4423845.004	725026.8516	25 meters
Transect 2	196º	4423838.323	725052.7082	4423820.014	725038.4519	25 meters
Transect 3	089º	4423838.008	725053.3163	4423839.726	725081.4054	25 meters
Access Route/Photo-point Location						
Pad H / Photo-point # 1		4423835.311	725097.4446			
Pad H / Photo-point # 2		4423860.973	725161.2628			

Transect Photos, Access Route Photos and Transect Layout Plot

Figure F1 Transect 1 Reclaimed Exploration Corehole Pad H

Figure F2 Transect 2 Reclaimed Exploration Corehole Pad H

Figure F3 Transect 3 Reclaimed Exploration Corehole Pad H

Figure F4 Photo Point 1 Reclaimed Access Road Corehole Pad H

Figure F5 Photo Point 2 Reclaimed Access Road to Corehole Pad H

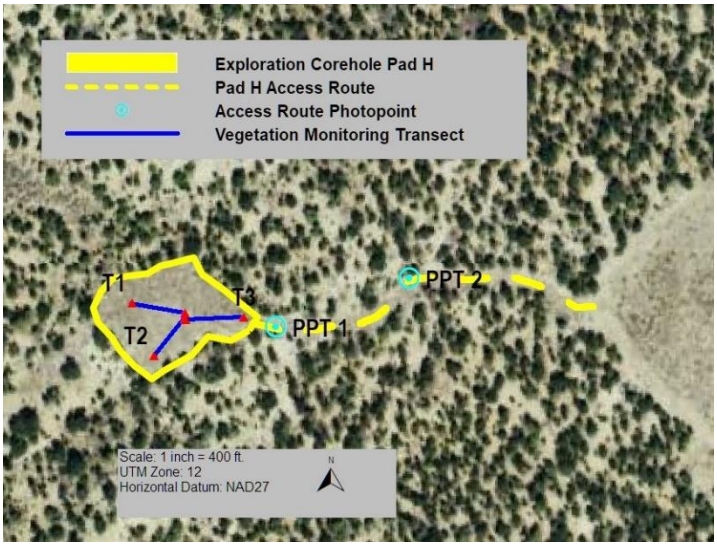


Figure F6 Transect Layout & Access Route Photopoint Locations

Appendix G – Vegetation Sampling Data Reclaimed Corehole Pad N

Table G1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Exploration Corehole Pad N						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**percent Foliar Cover**	**percent Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	14.7	1.3	19.0	
ELELE[3]	*Elymus elymoides ssp. elymoides*	bottlebrush squirreltail	0.0	0.0	0.0	
ELLAL	*Elymus lanceolatus*	thickspike wheatgrass	3.4	0.7	3.6	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	4.7	0.0	5.1	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	1.3	0.0	1.5	
KOMA	*Koeleria macrantha*	prairie junegrass	0.7	0.0	0.7	
LECI4	*Leymus cinereus*	basin wildrye	1.3	0.7	1.5	
NAVI4	*Nassella viridula*	green needlegrass	13.3	2.7	16.8	
PASM	*Pascopyrum smithii*	western wheatgrass	2.7	0.0	2.9	
PSJU3[3]	*Psathyrostachys juncea*	Russian wildrye	0.0	0.0	0.0	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	3.3	1.3	4.4	
PSSPS	*Pseudoroegneria spicata ssp. Spicata*	bearded bluebunch wheatgrass	1.3	0.0	1.5	**Desirable Forb/Shrub Density (#/m^2)**
		Perennial Grass Totals	**46.7**	**6.7**	**57.0**	
ACLA	*Achillea lanulosa*	western yarrow	0.0	0.0	0.0	0.10
ASCI4	*Astragalus cicer*	cicer milkvetch	0.0	0.0	0.0	1.07
CRFL6	*Cryptantha flavoculata*	roughseed cryptanth	0.7	0.0	0.7	0.07
LILE3	*Linum lewisii*	Lewis flax	1.3	0.0	2.2	0.10
MAGR2	*Machaeranthera grindelioides*	rayless tansyaster	0.7	0.0	0.7	0.23
MESA	*Medicago sativa*	alfalfa	12.6	2.7	26.3	10.23
PEPA8	*Penstemon palmeri*	Palmer's penstemon	0.0	0.0	0.0	0.13
		Perennial Forb Totals	**15.3**	**2.7**	**29.9**	**11.93**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	0.0	0.0	0.0	0.10
ATCA2	*Atriplex canescens*	four-wing saltbush	2.7	0.0	3.6	0.37
CHDE2	*Chrysothamnus depressus*	longflower rabbitbrush	0.7	0.7	0.7	0.00
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	0.7	0.0	1.5	0.10
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	0.0	0.0	0.0	0.03
KRLA2	*Krascheninnikovia lanata*	winterfat	0.0	0.0	0.0	0.10
		Shrub Totals	**4.1**	**0.7**	**5.8**	**0.70**
ALDE	*Alyssum desertorum*	desert madwort	1.3	0.0	1.5	
BRTE	*Bromus tectorum*	cheatgrass	1.3	0.0	2.9	
LECA5	*Lepidium campestre*	field pepperweed	0.7	0.0	2.9	
		Totals for Invasive and Non-Native Species	**3.3**	**0.0**	**7.3**	
		Vegetation Totals	**69.4**	**10.1**	**100.0**	**12.63**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.

[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.

[3] Plant species not encountered in sampling data but were present within the study area.

[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**14.4**
Biotic Crust	**0.0**
Herbaceous Litter	**42.7**
Woody Litter	**15.3**
Duff	**0.0**
Rock	**7.3**

Table G2 - Canopy Gap Intercept Data Reclaimed Exploration Corehole Pad N					
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**	**Gaps 21-50 cm**	**Gaps 51-100 cm**	**Gaps 101-200 cm**	**Gaps >200 cm**
Transect 1	529	345	184	0	0
Transect 2	610	372	136	102	0
Transect 3	459	331	128	0	0
Total Gaps (cm)	**1598**	**1048**	**448**	**102**	**0**
% Line in Gaps	**21.31**	**13.97**	**5.97**	**1.36**	**0.00**
Line length for each transect was 25 meters for site total length of 75 meters					

Table G3 - Transect Coordinates and Access Route Photo-point Locations Reclaimed Exploration Corehole Pad N (Datum: UTM Zone 12, WGS 84)						
	Azimuth from starting point (true N)	**Transect Starting Point**		**Transect Ending Point**		
Site		**Northing (mN)**	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	**Length**
Transect 1	281º	4423820.652	724385.5732	4423826.303	724362.399	25 meters
Transect 2	165º	4423816.252	724387.0712	4423795.377	724395.0415	25 meters
Transect 3	346º	4423823.801	724386.849	4423846.801	724379.3294	25 meters
Access Route/Photo-point Location						
Pad N / Photo-point # 1		4423814.762	724411.9191			
Pad N / Photo-point # 2		4423787.732	724501.4109			
Pad N / Photo-point # 3		4423583.726	724767.625			

Transect Photos, Access Route Photos and Transect Layout Plot

Figure G1 Transect 1 Reclaimed Corehole Pad N

Figure G2 Transect 2 Reclaimed Corehole Pad N

Figure G3 Transect 3 Reclaimed Corehole Pad N

Figure G4 Photo Point 1 - Access Road to Corehole Pad N

Figure G5 Photo Point 2 - Access Road to Corehole Pad N

Figure G6 Photo Point 3 - Access Road to Corehole Pad N

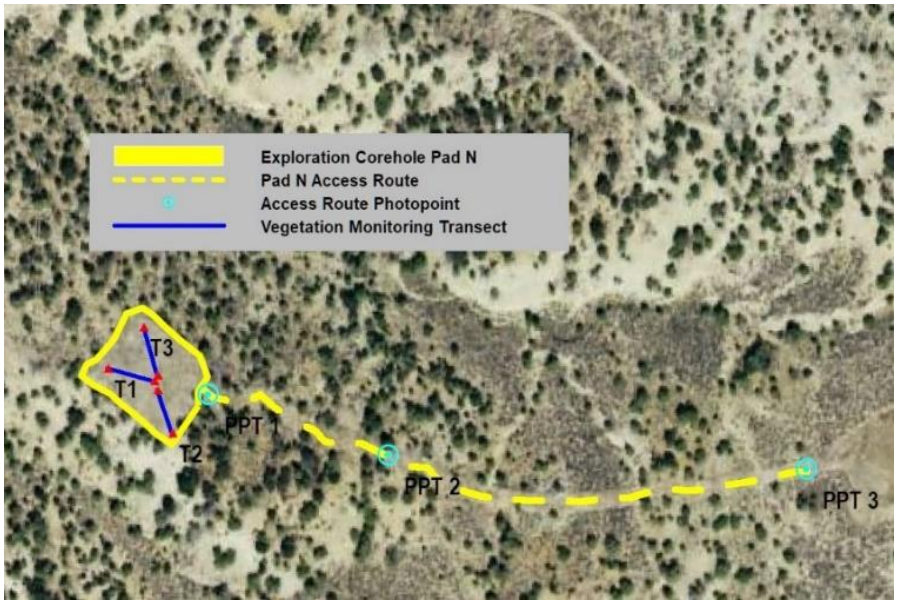


Figure G7 Transect Layout and Access Route photopoint locations

Appendix H – Vegetation Sampling Data Reclaimed Corehole Pad P

Table H1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Exploration Corehole Pad P						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**percent Foliar Cover**	**percent Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	8.7	1.3	12.4	
ELELE	*Elymus elymoides ssp. elymoides*	bottlebrush squirreltail	0.7	0.0	0.8	
ELLAL	*Elymus lanceolatus*	thickspike wheatgrass	4.0	0.7	5.0	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	18.7	4.0	28.9	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	4.0	0.0	5.8	
LECI4	*Leymus cinereus*	basin wildrye	4.0	0.7	5.0	
NAVI4	*Nassella viridula*	green needlegrass	8.0	1.3	9.9	
PASM	*Pascopyrum smithii*	western wheatgrass	0.7	0.0	0.8	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	1.3	0.0	1.7	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	3.3	0.7	4.1	
PSSPS	*Pseudoroegneria spicata ssp. Spicata*	bearded bluebunch wheatgrass	6.7	0.7	9.1	**Desirable Forb/Shrub Density (#/m²)**
		Perennial Grass Totals	**60.1**	**9.4**	**83.5**	
ASCH	*Astragalus chamaeleuce*	cicada milkvetch	0.0	0.0	0.0	0.03
ASCI4	*Astragalus cicer*	cicer milkvetch	0.0	0.0	0.0	0.17
CRFL6	*Cryptantha flavoculata*	roughseed cryptanth	0.0	0.0	0.0	0.07
EREA	*Erigeron eatonii*	Eaton's fleabane	0.7	0.0	0.8	0.03
LILE3[3]	*Linum lewisii*	Lewis flax	0.0	0.0	0.0	0.00
MAGR2	*Machaeranthera grindelioides*	rayless tansyaster	0.7	0.0	0.8	0.13
MESA	*Medicago sativa*	alfalfa	1.3	0.0	5.0	3.87
PEPA8[3]	*Penstemon palmeri*	Palmer's penstemon	0.0	0.0	0.0	0.00
		Perennial Forb Totals	**2.7**	**0.0**	**6.6**	**4.30**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	0.0	0.0	0.0	0.10
ATCA2	*Atriplex canescens*	four-wing saltbush	4.0	0.0	7.5	0.87
ATCO	*Atriplex confertifolia*	shadscale saltbush	0.0	0.0	0.8	0.13
CHVI8[3]	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	0.0	0.0	0.0	0.00
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	0.7	0.0	0.8	0.17
KRLA2	*Krascheninnikovia lanata*	winterfat	0.0	0.0	0.0	0.20
SAVE4[3]	*Sarcobatus vermiculatus*	greasewood	0.0	0.0	0.0	0.00
		Shrub Totals	**4.7**	**0.0**	**9.1**	**1.47**
ALDE	*Alyssum desertorum*	desert madwort	0.7	0.0	0.8	
BRTE[3]	*Bromus tectorum*	cheatgrass	0.0	0.0	0.0	
		Totals for Invasive and Non-Native Species	**0.7**	**0.0**	**0.8**	
		Vegetation Totals	**68.2**	**9.4**	**100.0**	**5.77**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**18.7**
Biotic Crust	**0.0**
Herbaceous Litter	**50.0**
Woody Litter	**2.7**
Duff	**0.0**
Rock	**4.0**

Table H2 - Canopy Gap Intercept Data Reclaimed Exploration Corehole Pad P					
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**	**Gaps 21-50 cm**	**Gaps 51-100 cm**	**Gaps 101-200 cm**	**Gaps >200 cm**
Transect 1	665	431	234	0	0
Transect 2	720	416	304	0	0
Transect 3	950	535	51	364	0
Total Gaps (cm)	**2335**	**1382**	**589**	**364**	**0**
% Line in Gaps	**31.13**	**18.43**	**7.85**	**4.85**	**0.00**
Line length for each transect was 25 meters for site total length of 75 meters					

Table H3 - Transect Coordinates and Access Route Photo-point Locations Reclaimed Exploration Corehole Pad P (Datum: UTM Zone 12, WGS 84)						
	Azimuth from starting point (true N)	**Transect Starting Point**		**Transect Ending Point**		
Site		**Northing (mN)**	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	**Length**
Reclaimed Well Pad 93-4H						
Transect 1	283º	4424752.11	723078.3449	4424756.347	723056.0714	25 meters
Transect 2	359º	4424757.943	723080.2266	4424780.292	723077.0066	25 meters
Transect 3	077º	4424754.559	723082.2926	4424766.628	723103.661	25 meters
Access Route/Photo-point Location						
Pad P / Photo-point # 1		4424711.226	723017.7114			
Pad P to Q / Photo-point # 1		4424779.076	723115.1836			
Pad P to Q / Photo-point # 2		4424933.260	723365.430			
Pad P to Q / Photo-point # 3		4425261.908	723443.9527			

Transect Photos, Access Route Photos and Transect Layout Plot

Figure H1 Transect 1 Reclaimed Corehole Pad P

Figure H2 Transect 2 Reclaimed Corehole Pad P

Figure H3 Transect 3 Reclaimed Corehole Pad P

Figure H4 Photo Point 1 - Access Road to Corehole Pad P

Figure H5 Photo Point 1 - Access Route Pad P to Pad Q

Figure H6 Photo Point 2 - Access Route Pad P to Pad Q

Figure H7 Photo Point 3 - Access Route Pad P to Pad Q

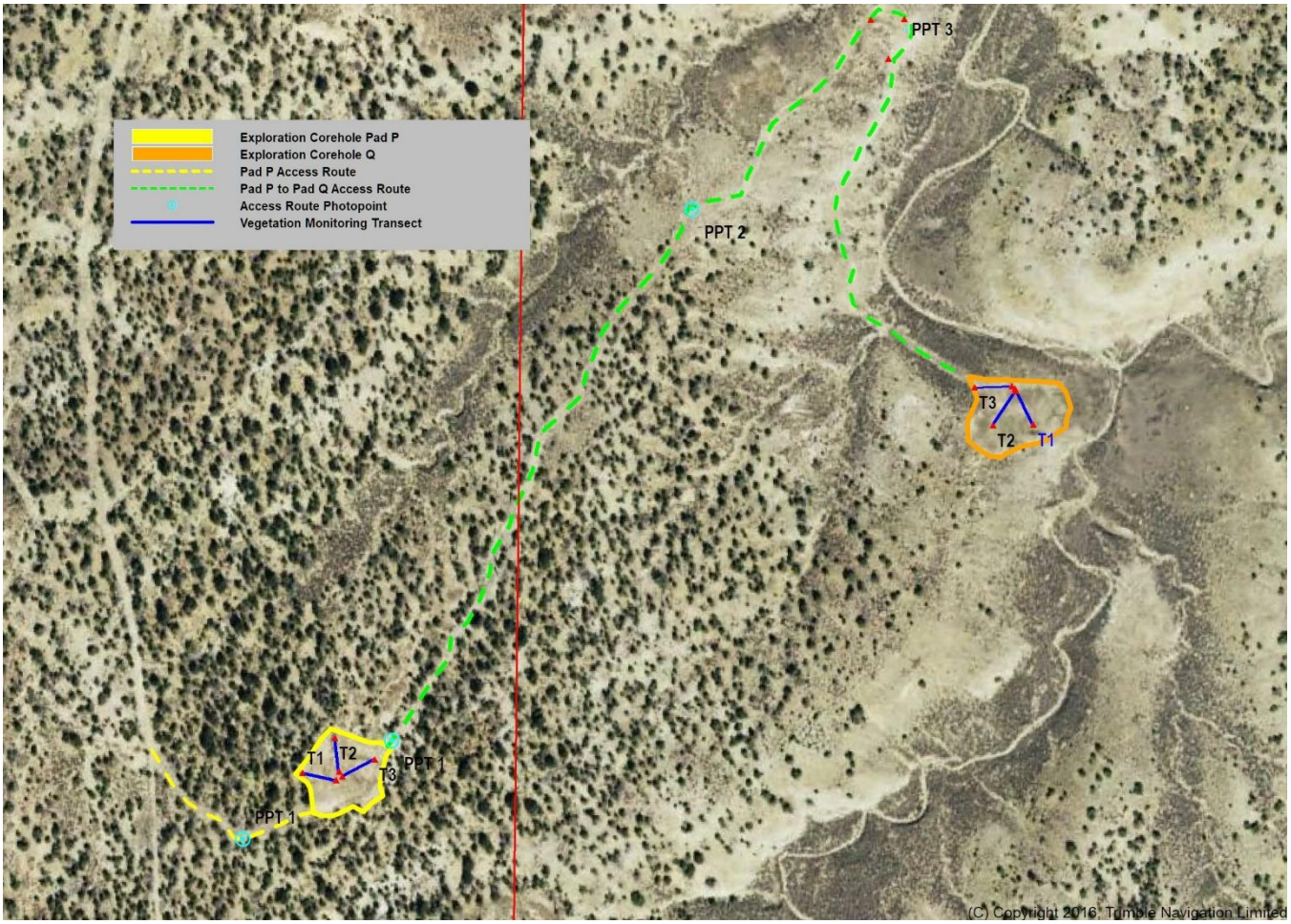


Figure H8 Coreholes P & Q - Transect Layout, Access Routes and Access Route Photopoints

Appendix I – Vegetation Sampling Data Reclaimed Corehole Pad Q

Table I 1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Exploration Corehole Pad Q						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**percent Foliar Cover**	**percent Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	3.3	0.0	4.0	
ELELE	*Elymus elymoides ssp. elymoides*	bottlebrush squirreltail	0.7	0.7	0.8	
ELLAL	*Elymus lanceolatus*	thickspike wheatgrass	2.0	0.7	2.4	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	5.3	0.7	6.4	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	16.7	2.1	20.0	
LECI4	*Leymus cinereus*	basin wildrye	0.7	0.0	0.8	
NAVI4	*Nassella viridula*	green needlegrass	6.0	0.0	7.2	
PASM	*Pascopyrum smithii*	western wheatgrass	2.7	0.7	3.2	
PSJU3[3]	*Psathyrostachys juncea*	Russian wildrye	0.0	0.0	0.0	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	1.3	0.0	2.4	
PSSPS	*Pseudoroegneria spicata ssp. spicata*	bearded bluebunch wheatgrass	0.7	0.0	0.8	**Desirable Forb/Shrub Density (#/m²)**
		Perennial Grass Totals	**39.4**	**4.9**	**48.0**	
ARFR4	*Artemisia frigida*	fringed sage	0.7	0.0	0.8	0.20
ASCH	*Astragalus chamaeleuce*	cicada milkvetch	0.0	0.0	0.0	0.07
ASCI4	*Astragalus cicer*	cicer milkvetch	0.7	0.0	0.8	0.00
CHAL	*Chenopodium album*	lambsquarter	4.0	0.0	5.6	0.00
LILE3	*Linum lewisii*	Lewis flax	0.7	0.0	0.8	0.27
LUAR3	*Lupinus argenteus*	silvery lupine	0.7	0.0	0.8	0.00
MACA2	*Machaeranthera canescens*	hoary tansyaster	0.7	0.0	0.8	0.20
MESA	*Medicago sativa*	alfalfa	0.0	0.0	0.8	0.97
PEPA8	*Penstemon palmeri*	Palmer's penstemon	0.0	0.0	0.0	0.07
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	0.0	0.0	0.8	0.50
		Perennial Forb Totals	**7.5**	**0.0**	**11.2**	**2.28**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	0.0	0.0	0.0	0.07
ATCA2	*Atriplex canescens*	four-wing saltbush	0.0	0.0	0.0	0.03
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	3.3	0.0	4.8	0.53
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	0.7	0.0	0.8	0.00
KRLA2	*Krascheninnikovia lanata*	winterfat	0.7	0.0	0.8	0.07
		Shrub Totals	**4.7**	**0.0**	**6.4**	**0.70**
ALDE	*Alyssum desertorum*	desert madwort	0.7	0.0	4.0	
BRTE	*Bromus tectorum*	cheatgrass	13.9	0.0	20.0	
DESO2	*Descurainia sophia*	yellow mustard	0.7	0.0	0.8	
LASQ	*Lappula squarrosa*	European stickseed	0.7	0.0	0.8	
LECA5	*Lepidium campestre*	field pepperweed	0.0	0.0	1.6	
SATR12	*Salsola tragus*	Russian thistle	4.0	0.0	7.2	
		Totals for Invasive and Non-Native Species	**20.0**	**0.0**	**34.4**	
		Vegetation Totals	**71.6**	**4.9**	**100.0**	**2.98**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.

[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.

[3] Plant species not encountered in sampling data but were present within the study area.

[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**24.0**
Biotic Crust	**0.0**
Herbaceous Litter	**30.0**
Woody Litter	**0.0**
Duff	**0.0**
Rock	**1.3**

Table I 2 - Canopy Gap Intercept Data Reclaimed Exploration Corehole Pad Q					
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**	**Gaps 21-50 cm**	**Gaps 51-100 cm**	**Gaps 101-200 cm**	**Gaps >200 cm**
Transect 1	1546	318	448	0	780
Transect 2	1192	490	213	489	0
Transect 3	1060	191	584	0	285
Total Gaps (cm)	**3798**	**999**	**1245**	**489**	**1065**
% Line in Gaps	**50.64**	**13.32**	**16.60**	**6.52**	**14.20**
Line length for each transect was 25 meters for site total length of 75 meters					

Table I 3 - Transect Coordinate Locations Reclaimed Exploration Corehole Pad Q (Datum: UTM Zone 12, WGS 84)						
Site	**Azimuth from starting point (true N)**	**Transect Starting Point**		**Transect Ending Point**		**Length**
		Northing (mN)	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	
Reclaimed Well Pad 93-4H						
Transect 1	150º	4425025.34	723522.6398	4425001.715	723535.3908	25 meters
Transect 2	204º	4425023.685	723523.0304	4425000.595	723508.5714	25 meters
Transect 3	258º	4425026.607	723520.3792	4425025.211	723495.5348	25 meters

Transect Photos and Transect Layout Plot

Figure I 1 Transect 1 Reclaimed Corehole Pad Q

Figure I 2 Transect 2 Reclaimed Corehole Pad Q

Figure I 3 Transect 3 Reclaimed Corehole Pad Q

Appendix J – Vegetation Sampling Data Reclaimed Corehole Pad R

Table J1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Exploration Corehole Pad R						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**percent Foliar Cover**	**percent Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	16.6	3.4	23.4	
ELLAL	*Elymus lanceolatus*	thickspike wheatgrass	0.7	0.0	0.8	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	1.4	0.0	1.6	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	6.9	0.0	7.8	
LECI4	*Leymus cinereus*	basin wildrye	4.1	0.0	4.7	
NAVI4	*Nassella viridula*	green needlegrass	0.7	0.0	0.8	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	1.4	0.0	1.6	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	5.5	0.7	7.0	**Desirable Forb/Shrub Density (#/m^2)**
THIN6	*Thinopyrum intermedium*	pubescent wheatgrass	1.4	0.0	1.6	
		Perennial Grass Totals	**38.7**	**4.1**	**49.3**	
ASCI4	*Astragalus cicer*	cicer milkvetch	0.0	0.0	0.0	0.03
ASCO12	*Astragalus convallarius*	lesser-rushy mlkvetch	0.7	0.0	0.8	0.03
CAFI	*Carex filifolia*	threadleaf sedge	0.7	0.7	0.8	0.03
LILE3	*Linum lewisii*	Lewis flax	0.0	0.0	0.0	0.17
MESA	*Medicago sativa*	alfalfa	6.2	0.7	10.9	8.00
PEFRF5	*Penstemon fremontii var. fremontii*	Fremont beardtongue	0.0	0.0	0.0	0.03
PEPA8	*Penstemon palmeri*	Palmer's penstemon	0.0	0.0	0.0	0.03
		Perennial Forb Totals	**7.6**	**1.4**	**12.5**	**8.32**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	2.1	0.0	2.1	0.27
ATCA2	*Atriplex canescens*	four-wing saltbush	7.6	0.7	9.4	0.67
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	1.4	0.0	1.6	0.07
KRLA2[3]	*Krascheninnikovia lanata*	winterfat	0.0	0.0	0.0	0.00
PUTR2	*Purshia tridentata*	antelope bittrebrush	0.0	0.0	0.0	0.03
SAVE4	*Sarcobatus vermiculatus*	greasewood	0.0	0.0	0.0	0.03
		Shrub Totals	**11.1**	**0.7**	**13.1**	**1.07**
ALDE[3]	*Alyssum desertorum*	desert madwort	0.0	0.0	0.0	
BASC	*Bassia scoparia*	burningbush (kochia)	1.4	0.0	1.6	
BRTE	*Bromus tectorum*	cheatgrass	12.4	0.0	22.7	
LECA5	*Lepidium campestre*	field pepperweed	0.0	0.0	0.8	
		Totals for Invasive and Non-Native Species	**13.8**	**0.0**	**25.1**	
		Vegetation Totals	**71.2**	**6.2**	**100.0**	**9.39**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.

[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.

[3] Plant species not encountered in sampling data but were present within the study area.

[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**13.8**
Biotic Crust	**0.0**
Herbaceous Litter	**44.1**
Woody Litter	**10.3**
Duff	**0.0**
Rock	**0.7**

Table J2 - Canopy Gap Intercept Data Reclaimed Exploration Corehole Pad R					
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**	**Gaps 21-50 cm**	**Gaps 51-100 cm**	**Gaps 101-200 cm**	**Gaps >200 cm**
Transect 1	808	352	456	0	0
Transect 2	862	416	329	117	0
Transect 3	1241	431	638	172	0
Total Gaps (cm)	**2911**	**1199**	**1423**	**289**	**0**
% Line in Gaps	**38.81**	**15.99**	**18.97**	**3.85**	**0.00**
Line length for each transect was 25 meters for site total length of 75 meters					

Table J3 - Transect Coordinates and Access Route Photo-point Locations Reclaimed Exploration Corehole Pad R (Datum: UTM Zone 12, WGS 84)						
Site	**Azimuth from starting point (true N)**	**Transect Starting Point**		**Transect Ending Point**		**Length**
		Northing (mN)	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	
Reclaimed Well Pad 93-4H						
Transect 1	318º	4425572.836	722979.492	4425595.748	722965.1398	25 meters
Transect 2	348º	4425574.962	722980.0283	4425600.314	722984.5023	25 meters
Transect 3	105º	4425573.597	722982.7191	4425571.285	723006.2164	25 meters
Access Route/Photo-point Location						
Pad R / Photo-point # 1		4425609.529	722809.6227			

Transect Photos, Access Route Photos and Transect Layout Plot

Figure J1 Transect 1 Reclaimed Corehole Pad R

Figure J2 Transect 2 Reclaimed Corehole Pad R

Figure J3 Transect 3 Reclaimed Corehole Pad R

Figure J4 Photo Point 1 - Access Road to Corehole Pad R

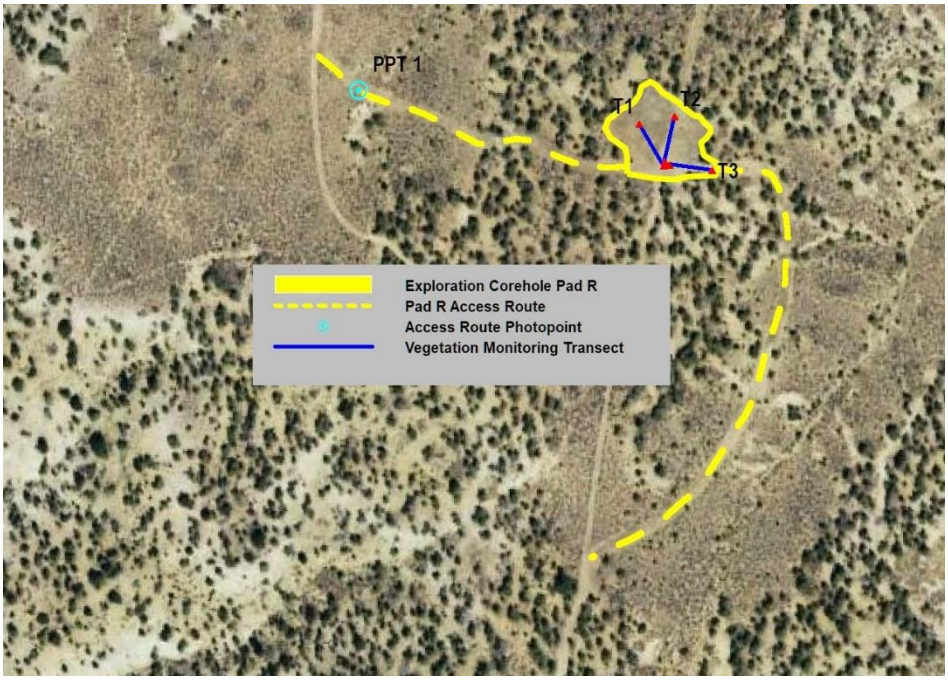


Figure J5 Corehole Pad R Transect Layout & Access Route