



INTERNAL MEMORANDUM

To: Julie Murphy, Chief of Staff

CC: Scott Cuthbertson, Deputy Director
Project #14612

From: Margaret Ash

Subject: SandRidge Exploration and Production LLC
North Park Basin Compliance Project

Date: January 2, 2020

Introduction

This memorandum provides a brief summary of a compliance project initiated in July 2019 designed to bring SandRidge Exploration and Production LLC's (SandRidge) North Park Basin operations into compliance with COGCC rules and regulations, to improve their day-to-day operations, and to prevent significant adverse impact to public health, safety, welfare, and the environment and wildlife resources. To address the compliance problems staff from several work units formed a team, developed a project outline and engaged with the enforcement unit to identify a new process for obtaining compliance for multiple complex issues within a short time frame without formal enforcement proceedings.

Information about the project including meeting notes, email correspondence, PowerPoint presentations, photographs and field-wide documents is located in COGCC Project #14612. Additional data are located within the COGIS well and facility files.

Background

The issues and the extensive nature of the problems with SandRidge's North Park operations became apparent through field inspections conducted by the area Field Inspector Emily Waldron. Environmental Protection Specialist II Kris Neidel and Western Area Environmental Supervisor Alex Fischer also identified an excessive number of spills and lagging remediation projects. Due to the significant nature of problems that coincided with a very sensitive

operational area Field Inspector Waldron specifically requested senior staff involvement in order to effect change to bring the operator into compliance.

Joint field inspections, with reclamation and field staff, conducted on June 18 and 19, confirmed the significant nature of the issues. Additionally, not only were SandRidge's operations noncompliant they also failed to complete required corrective actions. Upon review it became apparent that SandRidge struggled with compliance on numerous fronts including reporting and permitting; forms and documents submitted with so many problems that there were described as "unprocessable".

When the nature and extent of the issues it became apparent, that it would be difficult for any one group to effect or improve operator compliance. Without compliance however, the potential for the operations cause significant impacts public health, safety, welfare, the environment and wildlife resources were significant.

Internal Issues

The lack of effective information sharing tools and COGCC's fragmented organizational structure initially frustrated staff's ability to bring meaningful results. A robust and well-organized database does not equate to information sharing; a detailed assessment of SandRidge's overall compliance required extensive SQL queries, and various data downloads. COGCC's workforce tends to prioritize separate functions assigned to their group and over broad compliance and assessment. Tools available for obtaining compliance such as issuing Notices of Alleged Violations (NOAV), negotiating Administrative Orders on Consent (AOC) or developing an Order Finding Violation (OFV) are complex, time consuming and utilize extensive amount of staff time; meanwhile SandRidge continued operating in an area with extensive wetlands, surface water, within and near sage-grouse habitat and other sensitive resources.

Process

Team development occurred through engagement by field staff with various work units to identify compliance problems or deficiencies. As work units communicated back, a team lead was identified. The project team then held a series of internal meetings to identify the most pressing and significant issues and the actions required to bring the operations into compliance.

The team organized and analyzed issues and then working with the Enforcement Supervisor developed a Compliance Plan (Plan). The Plan included action items and deadlines for SandRidge and identified the team lead responsible for monitoring compliance status. Staff understood and fully informed SandRidge that the Plan was outside of standard enforcement policy and due to lack of actionable NOAV and AOCs that the implementation of the plan would have limited authority for enforcement if they decided not accept it. Staff also informed SandRidge that working on the compliance program and maintaining compliance

might result in reduced penalties and fines (documenting completion of CA for example), however, staff made it clear that enforcement action, including fines and penalties, was still on the table. The Plan is included as Attachment 1.

The project team met with SandRidge in Denver, Colorado on July 23, 2019. The team presented a detailed analysis of the project including findings and issues and discussed the Plan. SandRidge provided feedback on actions and improvements that were already in process. After the meeting, staff conferred and submitted a revised plan to SandRidge for review on July 31, 2019. SandRidge committed to completing the Plan, and immediately began working on the action items.

On August 29, 2019, SandRidge met with COGCC staff in Denver, Colorado. SandRidge provided a status update, submitted a number of documents for review and provided a detailed description of their near term plan for delineation and development of the North Park Basin asset. Attachment 2 includes detailed information about the asset, which consists of various sections within 6N80W, 7N80W and 7N81W. It includes both federal and private minerals. The BLM has prescriptive requirements for development, which include drilling two wells per year in Peterson Ridge and Surprise Federal Units and an obligation to drill a well in the Beaver Creek Federal Unit.

During the August 29, 2019 meeting, SandRidge also provided their development objectives including:

- Develop the field with environmental and fiscal responsibility.
- Confirm well spacing.
- Conduct multi-well pad drilling in proven areas.
- Satisfy BLM/federal unit requirements.
- To partner with midstream service provider to connect a gas pipeline out to the basin.
- Appraise and delineate less proven areas.
- SandRidge uses enclosed flares, and requires 98% destruction efficiency and retains stack testers to check the equipment destruction efficiency.
- The asset area has significant wildlife resources and they work with BLM, Colorado Parks and Wildlife, the COGCC, and surface owners on wildlife related issues.

On September 11, 2019, field and reclamation staff conducted a number of inspections at several SandRidge locations. Staff immediately identified improvements in stormwater controls, waste management, and equipment integrity. Contractors interacted with staff and required staff to review and sign Job Safety Analysis. On September 13, 2019, staff met at the SandRidge field office to discuss a few items identified during the previous field day and the status of the ongoing program. SandRidge introduced additional staff that they brought on to improve operations and provided an update on various projects. A larger meeting, scheduled by SandRidge, with their executive team, local staff and contractors followed. Staff from BLM, CPW, and CDOT also attended.

Closing

To address the problems COGCC applied a new approach, which included building a team with staff from different work units, accelerating a compliance program including issuing a compliance schedule before formal enforcement actions occurred, and actively engaging with the operator on the broad but focused plan. The results of the project brought outstanding cooperation from the operator including a true commitment from the executive team to be the best in a difficult area. Improvements in operational practices occurred immediately and continue. SandRidge retained a qualified contractor for assistance with permitting and reporting, increased area staffing and improved contractor awareness and compliance. SandRidge has stated that the program effectively changed their compliance culture and their understanding of the requirements of conducting oil and gas operations in the State of Colorado.

The processes followed during implementation of the project provides a model for handling complex issues, informs on the deficiencies in current organizational structure, the lack of information sharing tools, and the inconsistent priorities and strategies within the Colorado Oil and Gas Conservation Commission that present hurdles for field wide or asset wide problem solving.

This project brought significant changes and improvements to the SandRidge North Park Basin Asset. However, challenges remain including substandard contractor waste management practices, SandRidge continues to plan and develop surface facilities without complete field total delineation, flaring of natural gas and natural gas liquids continues to be a major part of development in the near term.

Attachment 1: Compliance Plan

Attachment 2: SandRidge, North Park Basin Development Plan and Drivers

SANDRIDGE EXPLORATION & PRODUCTION LLC (#10598)

COMPLIANCE PROGRAM

7/26/2019

revised 7-31-2019

Item	Description	Notes	Due Date Initial	Other Reporting
Compliance Report				
	Report on status of corrective actions	<i>See SandRidge CA Spread Sheet</i>	8/12/2019	Ongoing: per FIRR SOP
Regulatory				
	Audit all In Process Form			
	Submit replacement forms for those with attachment/log issues.		9/23/2019	
	Submit spreadsheet for forms that only require data field corrections.		9/23/2019	
	Conductor Setting Policy			
	Audit and bring conductors into compliance with Conductor Setting Policy.		8/26/2019	
	Provide report on conductor compliance.		10/1/2019	
	Provide Financial Assurance as required under CSP.			
Stormwater Management				
	Develop Site Specific Stormwater Plans	<i>Improve compliance with COGCC Stormwater Rules</i>	9/9/2019	start immediately
	Completed by Qualified Individual.			
	Use good engineering practices during design and installation of site specific stormwater BMPs (1002 f.(2).			
	Identify all pollutant sources and provide BMP.			
	Implementation of Plans		immediate as developed	
	Staff training		8/23/2019	Ongoing
	Contractor oversight by QI		Immediate	Ongoing
	Vehicle Tracking Control Level 2+	<i>Street sweepers are not a primary BMP</i>	Immediate	Ongoing

Surface Disturbance Minimization Plan				
	Prepare, submit and implement plans to reduce pad size	<i>Include areas used for storing equipment and materials that were not permitted</i>	9/9/2019	<i>Currently SandRidge is disturbing lands not permitted for oil and gas. Consider county permit for storage yard(s). Test soil/debris piles per direction from Environmental group Locations with potential future operations must have additional financial assurances identified</i>
	Soil and debris piles	Remove piles	10/1/2019	
	Interim Reclamation	Immediately begin interim reclamation at all locations (3 months 6 months after rig demob)	Immediate	
Topsoil Plan				
	Provide individual topsoil plans and analysis for each location		8/26/2019	
	Include map that identifies all topsoil and current condition of stockpiles relative to COGCC Rules Include analysis of topsoil that should have been salvaged according to COGCC Rules			
Winter Operations Plan				
	Develop and submit Winter Operations Plan		9/23/2019	
	Snow management Spill response Equipment maintenance <i>Consider winter shut down</i> Cold weather operations			
Facility Engineering				
	Facility Engineer		9/1/2019	
	Modify Site Layouts Implement designs that allow for reclamation and reduces disturbance of surface. Further site permits or modification may require or be candidate for Alternative Site Analysis			

Construction Supervisor/Manager				
	Construction Manager/Supervisor		Immediate	
	Oversight of all work	<i>Surface owner can be contractor but must meet all requirements under COGCC rule.</i>		
	Review construction practices		8/26/2019	
	<i>Build smaller locations that are designed to handle winter conditions and high intensity rain events.</i>			
	<i>Consider</i>			
	<i>soil stabilization</i>			
	<i>chipped asphalt</i>			
	<i>compaction</i>			
	<i>geotextiles</i>			
	<i>Removal of snow cannot include movement of surface materials</i>			
	<i>All stockpiles of any kind require stormwater control.</i>			
Field Development				
	Provide report that describes plans to develop field	<i>Schedule meeting to discuss.</i>	8/16/2019	Quarterly
	New wells			
	Re-permitting			
	Pipelines			
	Gas Plant			
Waste Management Plan			per environmental work unit	
Unused FRAC sand				
	Identify all locations where frac sand was dumped on location, remove, dispose of at landfill.	hazardous substance that will be handled per MSDS.	8/19/2019	
	Provide manifest			
	Good housekeeping			
	Update on spill release detection and prevention			
	Remediation and cleanup of spills			
	Chemicals storage			
	Used Oil and Oily Waste			

Containment structures and liners
 Removal fluids from containment
 Maintain records of fluid removal

Mechanical Condition

Integrity Management

Provide Integrity Management Program

Inspections, testing,
 maintenance and
 movement of
 equipment

TBD

Contractor training program

Remove gravel from cellar around TA Wells at Marr.

Contact engineering
 concerning well integrity

TBD

9/16/2019

Contractor Oversight

Company man on location under active operations

Immediate

Safety

Contractors should have safety programs.

Contractors should provide JSA.

Immediate



North Park Basin

Near Term Plan and Development Plan Drivers





Agenda

- Asset Development Phases and Terminology
- Historical Overview of the Play as it Relates to Development Planning
- Where is the North Park asset today?
- Development Objectives in North Park
- Development Planning Drivers in North Park
- Discussion on Recent or Key Questions
- New Questions / Additional Discussion



Asset Development Phases and Terminology

Oil & gas assets progress from Discovery through Mature Production lifecycle

Technology Advancement



- First well(s) in field, formation or play
 - Typically, vertical wells
- Prove that reservoir is present
- Prove that hydrocarbon is present
- Temporary to permanent individual well facilities

- Assess the quality of the reservoir
 - Cut core for rock properties
- Assess fluid properties
- Drill first horizontal well
- Demonstrate the potential for commerciality on an individual basis
- Individual well facilities
- Assess infrastructure requirements

- Assess reservoir quality and consistency over a broad area
- Prove the aerial extent of commerciality
- Begin to develop best drilling and completion practices for cost efficiencies
- Individual well facilities
- Begin scoping full development plan
- Evaluate and begin work on infrastructure requirements

- Evaluate well spacing
- Establish units / hold acreage
- Optimize drilling and completion practices, reducing cost
- Employ multi-well development
- Employ multi-well facilities
- Replace infrastructure
- Infill and full field development

- Low to no new drilling activity
- Optimize efficiencies in production, and reduce cost
- Capitalize on recompletion opportunities where present
- Evaluate new technology and new formations for potential rejuvenation
- Abandonment at end of life



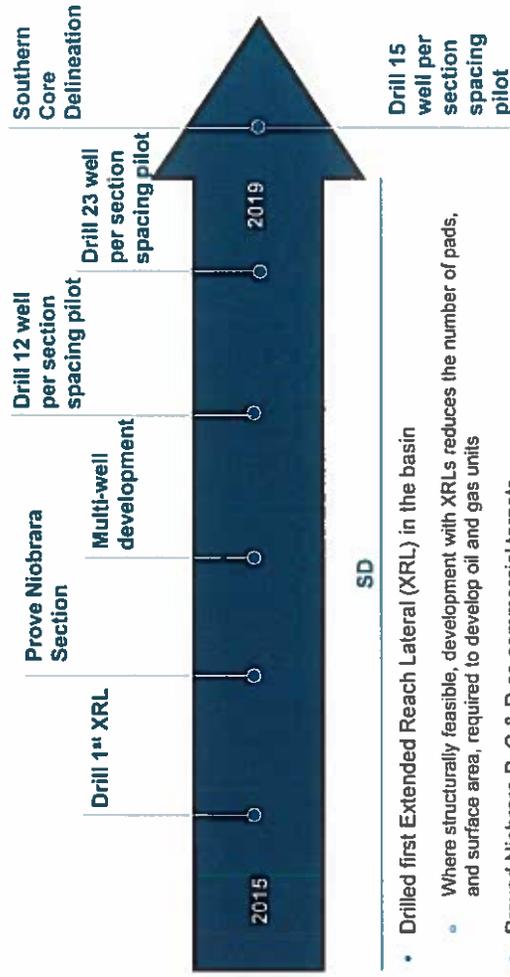
History of Niobrara Development in North Park

Asset is progressing through Delineation toward Development Phase

Timeline of Activities

Discovery Wells

- 1957 - First Niobrara well in basin (Vertical)
- 1972 – First Niobrara well in field (Vertical)



2008

2010

2010

2015

2019

EOG

- Drilled first horizontal Niobrara well
- Drilled a total of six horizontal Niobrara wells
- Cut partial Niobrara core
- Mostly in Appraisal phase
- Single well pads & facilities

EE3

- Drilled key delineation wells, proving the core of the field
- Predominantly targeted Niobrara D
- Drilled a total of ten horizontal wells
- Appraised completion design
- Single well pads
- Limited shared facilities
- Established Peterson Ridge & Surprise Federal Units

SD

- Drilled first Extended Reach Lateral (XRL) in the basin
 - Where structurally feasible, development with XRLs reduces the number of pads, and surface area, required to develop oil and gas units
- Proved Niobrara B, C & D as commercial targets
 - Key to understanding optimal spacing patterns and development
- Started multi-well drilling from consolidated pads
- Initiated multi-well pilots to evaluate well spacing patterns
- Cut full core and expanded 3D seismic to better understand reservoir properties and development viability
- Built and expanded Big Horn Central Tank Battery as centralized production facility for several multi-well pads, minimizing surface footprint compared to previous single well tank batteries
- Evaluated and tested alternative in-basin gas processing solutions



North Park Asset Today

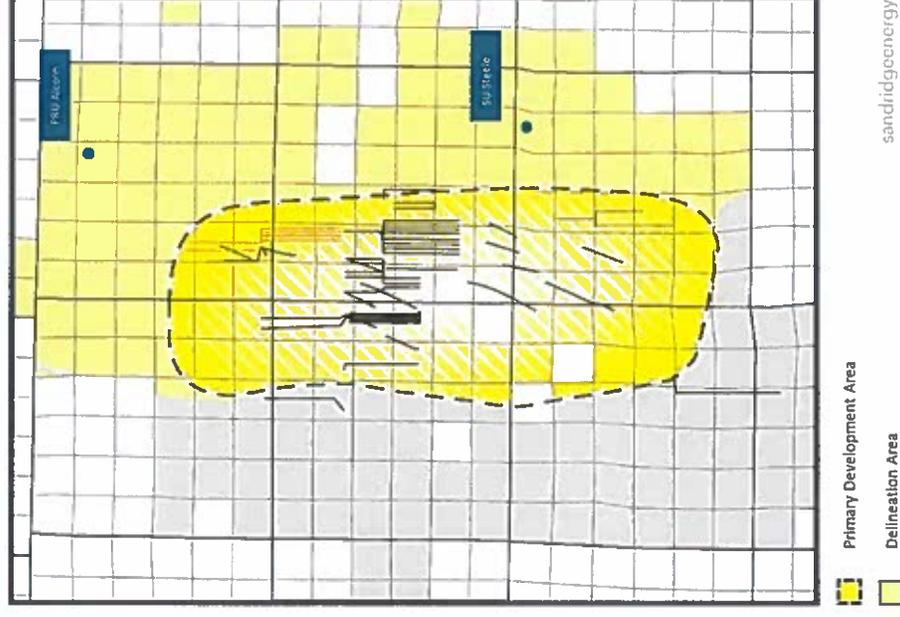
Primary Development Area primed for continued multi-well drilling, with key delineation wells to evaluate less proven areas to the north and east

Primary Development Area

- Successful conclusion of spacing pilots will yield appropriate well spacing for development
- Continued multi-well developed planned for 2020 and beyond

Delineation Areas

- Key vertical wells planned in 2020 & 2021 will test less proven areas to the north and east of current producing wells
 - PRU Alcorn 0880 1-10
 - SU Steele 0680 1-2





Development Objectives in North Park

Safely develop Niobrara resource in an environmentally and fiscally responsible manner

- Develop the field with environmental and fiscal responsibility
- Confirm well spacing
- Multi-well pad drilling in proven areas
 - Minimize footprint and facility requirements
 - Utilize existing pads where reasonable
- Satisfy BLM / federal unit requirements
 - Peterson Ridge and Surprise Federal Units
 - Drill minimum of two wells per year
 - Establish overlapping participating area wells
 - Drill obligation well in Beaver Creek Federal Unit
- Partner with midstream service provider to connect gas pipeline out of basin
- Appraise and delineate less proven areas

Influential Planning Factors in North Park

Development plans factor in several key variables; however, changes in these drivers, if material, can lead to changes in the development plan

- Amount of activity and pace
 - Commodity pricing
 - Business strategy, corporate / industry / market drivers
 - Asset performance
- Location selection
 - Well performance
 - Proved, delineated and appraisal areas
 - Well spacing
 - Approved & submitted APDs
 - Pad, Facilities & Infrastructure requirements
 - Maximize use of existing facilities where possible
 - Minimize new pads or additional surface disturbance where reasonable
 - CDHPE requirements
 - Well timing – Regulatory Stipulations
- Pad planning & development
 - Wildlife and environmental considerations
 - Near, mid and long term plans
 - CPW considerations and requirements
- Multi-agency coordination and alignment
 - COGCC
 - BLM
 - CPW
 - CDHPE
 - CDOT
- Approved permit availability and timing
 - COGCC
 - BLM
- Rig and service availability



Recent and Key Questions on North Park Development

Well spacing learnings, delineation wells, federal unit obligations and gas takeaway are key elements influencing increased multi-well development in the future

- Q.** Is it possible to focus on one pad, and develop an entire section / unit at one time?
- A1.** Well spacing is a key variable in development. SandRidge is in the process of evaluating several spacing pilots. The conclusions of these pilots will setup well spacing assumptions for the field, and will allow SandRidge to increase multi-well development in the primary development area
- A2.** The northern and eastern flanks of the field have not yet been evaluated. Key delineations wells will help prove reservoir quality and commerciality and are necessary step before proceeding with material development activity in these areas
- A3.** Peterson Ridge, Surprise and eventually, the Beaver Creek federal units have drilling obligations that require at least two wells per year. Additionally, overlapping Participating Area (PA) wells are required to hold acreage within the federal units
- A4.** No more than eight wells per year per pad are planned, until a gas pipeline out of basin is in place, to ensure compliance with air emission standards. SandRidge is participating in a Front End Engineering & Design (FEED) review with a midstream provider, in order to progress a pipeline solution



Recent and Key Questions on North Park Development

Building pad sites large enough to support development of a section / unit will minimize the frequency of disturbance to local vegetation and wildlife

Q. Why not build a pad fit for purpose for immediate near term drilling?

A1. Building a pad large enough to accommodate the development of a section or unit limits the number of times a pad needs to be expanded and the frequency of disturbance, which could have a positive impact in limiting the number of times the native topsoil and vegetation is disturbed, as well as potential mitigating additional impact to wildlife by reducing the number of times large construction equipment are present.

A2. In the past, CPW has advised that a one time disturbance is less disruptive to wildlife.

A3. Building a pad large enough to accommodate more the one cycle of multi-well drilling allows for more thorough preplanning, and facilitates building the site in the summer and fall seasons. Building pads in the spring and winter months is not only cost prohibitive, but is less desired from an environmental standpoint, due to snow removal and mud impacts on surface disturbance and road maintenance

A4. Consolidating and centralizing pads, where possible, to develop sections / units to the north and south will reduce the total surface area disturbed

Q. Why not reclaim pads to the size of current use?

A1. Pads or sites that do not have producing wells, are not actively being used or will not be supported in near term development should, will and are being reclaimed

A2. Pads that are being used, support existing wells are will support future development either have a direct immediate use, or will need to be expanded in the future to support development. Reclaiming pad sites to the size of their current use may cause surface disturbance multiple times, which could have negative impact to the vegetation and wildlife



Questions / Additional Discussion