

FIELD-WIDE STORMWATER MANAGEMENT PLAN FOR CONSTRUCTION ACTIVITIES

NORTH PARK BASIN PROJECT AREA

REVISED

MARCH 2016

Prepared for:

**SANDRIDGE EXPLORATION AND PRODUCTION LLC
Oklahoma City, Oklahoma**



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TABLE OF CONTENTS

| | |
|---|-----|
| 1.0 CERTIFICATION | 1-1 |
| 2.0 INTRODUCTION | 2-1 |
| 3.0 SWMP ADMINISTRATOR | 3-1 |
| 4.0 SITE DESCRIPTION | 4-1 |
| 4.1 NATURE OF CONSTRUCTION ACTIVITY | 4-1 |
| 4.2 SEQUENCE OF MAJOR ACTIVITIES | 4-1 |
| 4.3 AREA OF DISTURBANCE | 4-2 |
| 4.4 SOIL DESCRIPTION | 4-2 |
| 4.5 VEGETATION DESCRIPTION | 4-2 |
| 4.6 NON-STORMWATER DISCHARGES | 4-2 |
| 4.7 RECEIVING WATERS | 4-2 |
| 4.8 DESCRIPTION OF POTENTIAL POLLUTION SOURCES | 4-3 |
| 4.8.1 Disturbed and Stored Soil | 4-3 |
| 4.8.2 Vehicle Tracking Controls | 4-4 |
| 4.8.3 Management of Contaminated Soil | 4-4 |
| 4.8.4 Loading and Unloading Operations | 4-4 |
| 4.8.5 Outdoor Storage Activities | 4-4 |
| 4.8.6 Vehicle and Equipment Maintenance and Fueling | 4-4 |
| 4.8.7 Dust or Particulate Generating Processes or Activities | 4-5 |
| 4.8.8 Routine Maintenance Activities | 4-5 |
| 4.8.9 On-Site Waste Management | 4-5 |
| 4.8.10 Drill Cuttings Management | 4-5 |
| 4.8.11 Concrete Truck/Equipment Washing | 4-5 |
| 4.8.12 Dedicated Asphalt and Concrete Batch Plants | 4-5 |
| 4.8.13 Non-Industrial Waste Sources | 4-6 |
| 4.8.14 Potential Spills | 4-6 |
| 5.0 SITE MAPS | 5-1 |
| 6.0 BEST MANAGEMENT PRACTICES | 6-1 |
| 6.1 STRUCTURAL AND NON-STRUCTURAL PRACTICES FOR SEDIMENT AND EROSION CONTROL | 6-1 |
| 6.1.1 Erosion Reduction and Control Using Phased BMP Implementation | 6-1 |
| 6.1.2 Sediment Reduction and Control Using Phased BMP Implementation | 6-2 |
| 6.2 MATERIAL HANDLING AND SPILL PREVENTION | 6-4 |
| 6.3 DEDICATED CONCRETE OR ASPHALT BATCH PLANTS | 6-4 |
| 6.4 VEHICLE TRACKING CONTROL | 6-5 |
| 6.5 WASTE MANAGEMENT AND DISPOSAL, INCLUDING CONCRETE WASHOUT | 6-5 |

TABLE OF CONTENTS (CONTINUED)

| | |
|---|------|
| 6.5.1 Non-Industrial Waste..... | 6-5 |
| 6.5.2 Preventative Maintenance Waste | 6-5 |
| 6.5.3 Exploration and Production Waste..... | 6-5 |
| 6.5.4 Non-Routine Waste Generation | 6-5 |
| 6.5.5 Concrete Washout Waste | 6-5 |
| 6.6 GROUNDWATER AND STORMWATER DEWATERING | 6-6 |
| 6.7 STORMWATER PRACTICES AND LANDOWNERS..... | 6-6 |
| 7.0 FINAL STABILIZATION AND LONG-TERM STORMWATER MANAGEMENT | 7-1 |
| 7.1 RECLAMATION..... | 7-1 |
| 7.2 FINAL STABILIZATION..... | 7-1 |
| 7.3 LONG-TERM STORMWATER MANAGEMENT | 7-2 |
| 8.0 INSPECTION AND MAINTENANCE PROCEDURES | 8-1 |
| 8.1 INSPECTIONS | 8-1 |
| 8.1.1 Active Construction Stage/14-day Inspection | 8-2 |
| 8.1.2 Interim Stabilization Stage/Monthly Inspection..... | 8-2 |
| 8.1.3 Final Stabilization Stage..... | 8-2 |
| 8.1.4 Winter Conditions Exclusion | 8-2 |
| 8.1.5 Precipitation Event Inspections | 8-2 |
| 8.1.6 Inspection Documentation..... | 8-3 |
| 8.1.7 Inspection Reporting and Communication Procedures | 8-3 |
| 8.2 MAINTENANCE PROCEDURES..... | 8-3 |
| 8.3 PREVENTATIVE MAINTENANCE..... | 8-4 |
| 8.3.1 Good Housekeeping | 8-4 |
| 8.3.2 Significant Material Storage..... | 8-5 |
| 8.3.3 Waste Removal..... | 8-5 |
| 9.0 EMPLOYEE TRAINING..... | 9-1 |
| 10.0RECORDKEEPING | 10-1 |
| 11.0STORMWATER MANAGEMENT PLAN REVIEW/CHANGES | 11-1 |

TABLE OF CONTENTS (CONTINUED)

FIGURES

FIGURE 1 NORTH PARK BASIN PROJECT AREA

TABLES

| | |
|---------|--|
| TABLE 1 | AREA OF DISTURBANCE |
| TABLE 2 | CHEMICAL PRODUCT LIST |
| TABLE 3 | BMP SELECTION GUIDELINES |
| TABLE 4 | STRUCTURAL AND NON-STRUCTURAL BMP CLASSIFICATION |
| TABLE 5 | SEED MIXES AND APPLICATION RATES |

APPENDICES

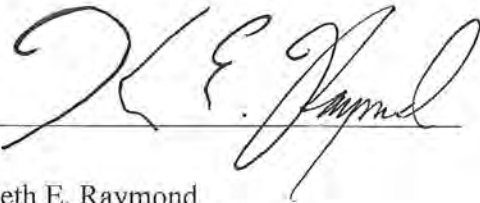
| | |
|------------|-------------------------------------|
| APPENDIX A | STORMWATER GENERAL PERMIT COR030000 |
| APPENDIX B | SITE-SPECIFIC INFORMATION |
| APPENDIX C | STORMWATER MANUAL OF BMPS |
| APPENDIX D | TRAINING LOGS |
| APPENDIX E | SWMP MODIFICATIONS |

1.0 CERTIFICATION

SandRidge Exploration and Production LLC (SandRidge) has prepared this Field-wide Stormwater Management Plan (SWMP) for Construction Activities in the North Park Basin Project Area located in Grand and Jackson counties, Colorado.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature: _____



Date: February 16, 2016

Name: Kenneth E. Raymond

Title: EHS Manager

2.0 INTRODUCTION

On June 30, 2005, the State of Colorado stormwater regulation went into effect to require Colorado Discharge Permit System (CDPS) permits from the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) for stormwater discharges associated with construction activities at oil and gas sites disturbing between one and five acres. This Field-wide SWMP for Construction Activities was prepared for SandRidge to be used for the drilling program in the North Park Basin Project Area associated with Grand and Jackson counties in accordance with good engineering, hydrologic, and pollution control practices to ensure Best Management Practices (BMPs) are selected, installed, implemented, and maintained to protect surface water.

This SWMP contains the required elements as defined in the CDPS General Permit for Stormwater Discharges Associated with Construction Activity (Permit No. COR030000, effective July 1, 2007, and administratively continued effective July 1, 2012). Copies of the permit documents for this project are included as Appendix A.



3.0 SWMP ADMINISTRATOR

The SWMP Administrator for SandRidge is responsible for developing, implementing, maintaining, and revising the SWMP. The SWMP Administrator has the authority to dedicate the financial and human resources to implement the SWMP. The SWMP Administrator will ensure the SWMP is followed and will delegate responsibility for coordination of the SWMP inspections and maintenance records. The SWMP Administrator is:

Kenneth E. Raymond, EHS Manager

Main Office: (405)-429-6630

Mobile: (405)-420-5570

Email: kraymond@sandridgeenergy.com

The SWMP Administrator will manage the SWMP team. Other foremen or designated personnel may assist in stormwater inspection and maintenance of records. Overall, the SWMP team is responsible for:

- Implementing spill/upset cleanup procedures;
- Notifying local authorities and local residents of reportable releases;
- Coordinating various stages of BMP implementation;
- Conducting inspections;
- Documenting and maintaining records; and
- Coordinating preventive maintenance programs and housekeeping measures.

This SWMP will be retained at the Oklahoma City office and continuously updated and kept current.

4.0 SITE DESCRIPTION

4.1 NATURE OF CONSTRUCTION ACTIVITIES

SandRidge currently owns or leases oil and natural gas mineral rights in northwestern Colorado in the North Park Basin Project Area, located in Grand and Jackson counties and lies within Townships 5 North to 8 North and from Ranges 79 West to 81 West, including Township 9 North and Range 80 West. Sites within the permitted area range from three-quarter acres to twelve acres in size, including site-specific access roads and flow lines. This SWMP covers the production well pad, associated access roads, and linear construction activities. A map of the North Park Basin Project Area is provided as Figure 1.

4.2 SEQUENCE OF MAJOR ACTIVITIES

The overall development of oil and natural gas pad sites is generally accomplished in three distinct work phases: construction, production, and abandonment. The work completed and the sequence of events for each phase are briefly discussed below.

The construction phase includes the following sequence of activities: well pad construction, well drilling, well completion, gas flow line installation, access road building, and well pad reclamation. Typically, three-quarter acres to twelve acres of surface terrain are disturbed during the construction of a new well pad site.

The production phase includes the operation and maintenance activities during oil and natural gas production. The typical equipment on a well pad site during the production phase consists of a wellhead, a separation unit, and one or more 300- to 500-barrel (typical capacity) aboveground tanks for storing crude oil, produced water, or condensate. Oil and gas wells are projected to produce for approximately 20 to 30 years.

When the commercial oil and natural gas reserves of a well are exhausted, it will be abandoned. Well abandonment includes plugging and abandoning the well and removal of surface equipment. The well pad area will be reclaimed by contouring disturbed soil and reseeding to conform to the surrounding terrain.

The types of oil and natural gas sites requiring ground surface disturbance include drill pad sites, pipelines, roads, and associated facilities.

For stormwater regulation purposes, construction sites have been divided into the following stormwater stages: Active Construction, Interim Stabilization, and Final Stabilization. The Active Construction stage is from the time of ground disturbance to the completion of ground-disturbing activities. The Interim Stabilization stage is from the completion of ground-disturbing activities to the time that disturbed areas have achieved 70 percent of pre-disturbance vegetation coverage, conforming to surrounding/pre-existing vegetation type. The Final Stabilization stage begins once a uniform perennial vegetative cover with a density of 70 percent of the typical or native background vegetative cover for the area has been established on disturbed unpaved areas and areas not covered by permanent structures

4.3 AREA OF DISTURBANCE

The specific area of disturbance at each individual site ranges approximately from three-quarter acres to twelve acres in size. The total area of field-wide construction disturbance is approximately 250 acres with a portion of that comprised of new and improved site access roads. Table 1 lists the area of disturbance delineated by site.

4.4 SOIL DESCRIPTION

The primary soil types for the North Park Basin Project Area are listed below. Soil varies within the North Park Basin Project Area and is classified primarily as Fluetsch-Tiagos association, Spicerton sandy loam, Tealson-Rock land association, Coalmont-Fluetsch complex, Bosler sandy loam, Cryorthents, Cabin sandy loam, Forelle loam, and various other soils according to the United States Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>).

4.5 VEGETATION DESCRIPTION

The project area includes, but is not limited to, short grass prairies, agricultural fields, or range land, and existing vegetation may include planted crops, range-type grasses such as bent switchgrass, crested wheatgrass, alpine bentgrass, sticky gilia, foxtail, madwort, Colorado blue columbine, or other various types of vegetation according to the United States Department of Agriculture (http://plants.usda.gov/adv_search.html). Pre-disturbance ground cover varies from 0 to 75 percent. Specific vegetation data for each well pad site is entered on the site-specific SWMP maps (Appendix B).

4.6 NON-STORMWATER DISCHARGES

Non-stormwater discharges which are allowed under the stormwater permit include discharges from emergency fire-fighting activities or a fire hydrant, landscape irrigation or return flow, and uncontaminated springs. SandRidge anticipates non-stormwater discharges from uncontaminated springs and landscape irrigation or return flow. Locations of these non-stormwater discharges will be detailed on site-specific descriptions and maps presented in Appendix B.

4.7 RECEIVING WATERS

Receiving water bodies within the permitted area include, but are not limited to, the North Platte River, Grizzly Creek, Little Grizzly Creek, Mutal Ditch, Arapaho Creek, Buffalo Creek, Coyote Creek, Mexican Creek, ditches, draws, and other various un-named tributaries. The above mentioned receiving bodies of water, located in the North Park Basin Project Area, lie within the Yampa and White River basin. Receiving water bodies within the permitted area will be detailed on each site-specific map presented in Appendix B.

Current SandRidge well pads or access roads do not intrude or encroach on wetland acreage. If a wetland is designated to be within a construction area, SandRidge will obtain permits from the United States Army Corps of Engineers (USACE), as appropriate.

4.8 DESCRIPTION OF POTENTIAL POLLUTION SOURCES

The permit lists several sources and activities as potential pollutant sources. An assessment of potential sources of stormwater runoff pollutants in the North Park Basin Project Area is provided in a general discussion below. Site-specific potential pollution sources will be detailed on the site-specific maps. The following activities and pollutant sources are evaluated:

- All disturbed and stored soil;
- Vehicle tracking of sediments;
- Management of contaminated soil;
- Loading and unloading operations;
- Outdoor storage activities;
- Vehicle and equipment maintenance and fueling;
- Significant dust or particulate generating processes or activities;
- Routine maintenance activities;
- On-site waste management practices;
- Concrete truck/equipment washing;
- Dedicated asphalt and concrete batch plants;
- Non-industrial waste sources; and
- Potential spills.

4.8.1 Disturbed and Stored Soil

Disturbed soil and excavated materials will be stored on, or next to, the well pad. Topsoil and other soil will be stockpiled separately. Soil stockpiles will be located along cut slopes and/or will be contained within perimeter BMPs, such as earthen berms, and within the perimeter of the surface disturbance. Areas of disturbed soil will be re-graded and contoured to blend into the adjoining landscape as soon as possible after drilling and completion activities are concluded.

Excavated materials will be utilized as backfill when practical. An exception may be excess rock generated by rock blasting excavation activities. In these areas, some select backfill materials may be required to protect the project area. Excess rock may be used in rock filter dikes, used in energy dissipation zones below culverts, constructed into rock check dams within grassed swales, or distributed over a portion of the project area. Excavation in especially sensitive areas may be conducted according to special techniques as specified by the landowner/agency representative.

4.8.2 Vehicle Tracking Controls

Properly constructed graveled roads and well pads provide the best offsite tracking control. When applicable, access roads will not be graveled in accordance with the requests of the landowner and/or state agencies. Access road entrances adjacent to paved county roads are graveled to prevent or minimize offsite soil tracking from well pad areas or access roads. In some instances, cattle guards, coarse angular rock, or tire washing procedures are used to remove mud before the vehicle exits the site area. When necessary, paved roads are swept near well pad site access areas. In addition, minimizing site access, contractor education, and other sediment control BMPs will be utilized. In the case where access roads will not be graveled, proper BMPs will be utilized to reduce offsite tracking and erosion from the road.

4.8.3 Management of Contaminated Soil

If impacted soil is excavated for treatment or disposal at a project site, additional BMPs will be employed to ensure containment of stormwater runoff. In addition, stockpiles of impacted soil may be landfarmed or removed from the site and disposed of as soon as possible at a properly licensed facility.

4.8.4 Loading and Unloading Operations

The majority of loading and unloading activities occur during well drilling and well completion activities. Well drilling and completion additives, drilling mud, condensate, and other fluids are transported or unloaded directly into the well from trucks, on-site tanks, and/or the reserve pit. A complete list of chemicals is included in Table 2.

Removal operations are supervised by SandRidge personnel to ensure proper care is taken to prevent spills or leakage from the trucks or stored materials. In the event of a spill, the SWMP material handling and spill prevention procedures will be followed according to the SandRidge standard operating procedures. Other unloading activities include drill pipe, completion pipe (casing), and natural gas line pipe, which are not potential pollution sources.

4.8.5 Outdoor Storage Activities

The most common substances stored on a well pad area are fuel and lubricants used by vehicles and construction equipment, hydraulic fracturing fluids (e.g., surfactants, friction reducers, hydrochloric acid, and potassium chloride) used during well completion procedures, and production water from the well. No fertilizers are stored on site. A list of chemicals typically used at a SandRidge well pad site is included in Table 2.

4.8.6 Vehicle and Equipment Maintenance and Fueling

Routine maintenance will be limited to fueling and lubrication of equipment. Drip pans will be used during routine fueling and maintenance to contain spills or leaks. Any waste product from maintenance will be contained and transported offsite for disposal or recycling. Major equipment maintenance or overhauls conducted on site will be limited to an “as-needed” basis. Equipment will be transported offsite for major maintenance or overhauls, when practicable.

4.8.7 Dust or Particulate Generating Processes or Activities

Dust and/or particulates generated from vehicle traffic on graveled access roads may produce fugitive emissions. Dust and particulate generation is at its highest during dry and hot times of the year. If dust from vehicle traffic on graveled access roads becomes significant, dust suppression procedures will be implemented that include road watering or the application of dust suppressants.

4.8.8 Routine Maintenance Activities

Routine maintenance activities involving fertilizers, pesticides, detergents, and solvents are not conducted at North Park Basin Project Area construction sites. Herbicides will be applied, on an as-needed basis, in some areas to control noxious weeds. Herbicide application will always be conducted by certified and trained individuals and with consideration for runoff potential to nearby surface waters.

4.8.9 On-Site Waste Management

Waste from materials generated or imported during operations will be kept in a waste disposal container on site and will be removed for disposal/recycling to an appropriate licensed disposal/recycling facility as necessary. Waste containers will be replaced as necessary so no waste is stored outside of the waste container. No waste materials will be dumped or discharged to waters of the state.

4.8.10 Drill Cuttings Management

During drilling operations, cuttings from the bore hole will be managed on-site and utilized for beneficial re-use on location or at other well sites per the SandRidge Exploration and Production (E&P) Waste Management Plan. As an alternative, drill cuttings may be hauled off location to an approved land farm or disposed of at a commercial landfill. A copy of the SandRidge E&P Waste Management Plan can be obtained upon request from SandRidge.

4.8.11 Concrete Truck/Equipment Washing

Concrete truck/equipment washing, including the concrete truck chute and associated fixtures and equipment, is conducted at a few SandRidge project sites. Pollutants arising from this operation would mainly include a water/concrete mixture and concrete debris. No waste materials will be dumped or discharged to waters of the state.

4.8.12 Dedicated Asphalt and Concrete Batch Plants

No dedicated concrete or asphalt batch plants are located within the North Park Basin Project Area.

4.8.13 Non-Industrial Waste Sources

Cleaning up of trash and discarded materials will be conducted at the end of each work day. Cleanup will consist of patrolling the roadway, access areas, and general work areas in order to pick up trash, debris, scrap, or other discarded materials.

Waste from materials imported to the construction site is removed for disposal/recycling to an appropriate licensed disposal/recycling facility. This includes sanitary sewage facilities (typically portable, self-contained units), which will be placed, anchored, and maintained with proper care.

No waste materials will be dumped or discharged to waters of the state.

4.8.14 Potential Spills

On a well pad site, spills and leaks can occur from valves, loading and unloading activities, removing excess water from production tanks, tank or reserve pit overflow, tank leaks or ruptures, separators, knockout tanks, heater treaters, flow lines, or piping. Reserve pits, when necessary, are constructed to allow additional volume to avoid overflow situations. In addition, chemicals potentially stored on site are listed in Table 2.

Depending on the nature of the material and the volumes involved, spills will be handled by SandRidge personnel or approved contractors (e.g. TSC Environmental, Sessions and Sons, etc.). A copy of the SandRidge *Spill Prevention, Control, and Countermeasure (SPCC) Plan* can be obtained by request from SandRidge.

5.0 SITE MAPS

The site-specific information (Appendix B) required to be included in the SWMP will be included on the site maps. The site-specific information is updated during the course of the stormwater inspections. These reports are provided to the SWMP team on a regular basis to document and maintain stormwater requirements. Site-specific information is located in Appendix B for sites listed in Table 1.

Maps will include pre-construction topography; location of surface waters; well pad construction site boundaries; ground surface disturbances; areas of cut and fill; locations of springs, streams, wetlands, or other surface waters; storage areas of general equipment, soil, wastes, fuel, or concrete washouts; locations of permanent and temporary structural and non-structural BMPs; locations of other BMPs; locations of dedicated asphalt or concrete batch plants; stormwater drainage patterns (including basins); areas of dedicated support activities; stormwater discharge locations; north indicator arrow; a legend; and other pertinent site-specific information are depicted on the site-specific Inspection Reports (Appendix B). Site-specific features may be hand drawn. Site maps are not necessarily drawn to scale.

6.0 BEST MANAGEMENT PRACTICES

6.1 STRUCTURAL AND NON-STRUCTURAL PRACTICES FOR SEDIMENT AND EROSION CONTROL

BMPs for sediment and erosion control will be accomplished through a combination of construction techniques, vegetation and re-vegetation, and structural features. The BMP Manual (Appendix C) and the BMP Selection Guidelines (Table 3) will be referenced for assistance with controls or BMPs when needed. Typical configurations of structural controls discussed below and technical drawings are provided in Appendix C. BMP selection is guided by the selection criteria listed in Table 3. Structural and non-structural BMPs are discussed in the following sections and are summarized in Table 4.

6.1.1 Erosion Reduction and Control Using Phased BMP Implementation

Construction of a well pad requires the removal of vegetative cover and topsoil. Erosion reduction and control will be accomplished by using approved erosion control methods.

Where conditions warrant, erosion control structures such as berms, water bars, diversion or collection channels, terraces, or culverts will be constructed to divert run-on water away from project areas as well as run-off water from the project area. The following example control structures will reduce soil erosion along adjoining areas disturbed during construction.

- Vegetation planting and maintenance;
- Application and maintenance of mulches, blankets, tackifiers, and tracking pads;
- Proper grading techniques and contouring; and
- Check dams, berms, culvert protection, diversion ditches, slope drains, rock-lined ditches, mulches with or without a tackifier, geotextiles, erosion control blanket/turf reinforcement matting, and other BMPs as needed per specific site conditions.

Existing vegetation cover and topsoil will be removed only where necessary for the operation of equipment and construction of the well pad. Trees and large shrubs not cleared from the well pad area will be protected from damage during construction by avoiding them with equipment. For example, the blade of a bulldozer will be in a raised position except for designated areas.

During different phases of ground disturbance, BMP selection and implementation is based on the current phase of construction (see Tables 3 and 4 and Appendix C). Construction sites have been divided into the following stages: Active Construction, Interim Stabilization, and Final Stabilization. Details regarding the stages and associated erosion prevention BMPs are provided below.

Pre-construction and Active Construction Sites

During pre-construction, drilling, workover rig activity, and other active construction processes, the following erosion controls may be utilized, but not limited to, at well pad areas: berms, check dams, culvert protection, ditches/ditch and berm, drainage dip, erosion control blankets, gravel surfacing, level spreaders, low-water crossings, retaining walls, riprap, seeding, slope drains, straw bale barriers, surface roughening/ripping, terracing, turnouts, silt fences, water bars, or wattles.

Interim Stabilization Sites

During interim stabilization, the following erosion controls may be utilized, but not limited to, at well pad areas: berms, check dams, culvert protection, ditches/ditch and berm, drainage dip, erosion control blankets, gravel surfacing, level spreaders, low water crossings, retaining walls, riprap, slope drains, seeding, straw bale barriers, terracing, silt fences, water bars, or wattles.

Final Stabilization Sites

Permanent stormwater erosion controls, such as berms, check dams, culvert protection, ditches/ditch and berm, drainage dip, gravel surfacing, level spreaders, low water crossings, retaining walls, riprap, seeding, slope drains, straw bale barriers, terracing, water bars, wattles and other site-specific BMPs will remain in place after final stabilization, if appropriate.

Depending upon the type of site, the site terrain, and the phase of construction, different stormwater BMPs will be utilized. Various BMP options are listed in Tables 3 and 4, and design specifications are depicted in the Stormwater Manual of BMPS (Appendix C).

6.1.2 Sediment Reduction and Control Using Phased BMP Implementation

The following site management practices are expected to reduce, minimize, and control sediment transport:

- In order to minimize disturbances associated with installation of well pads, level and gently sloping terrain outside the project area will not be graded, except where necessary.
- To prevent tracking of sediment (mud and rocks) onto public roads, portions of access roads may be graveled, as appropriate. Other means such as vehicle tracking controls (VTC) or cattle guards may be utilized if appropriate.
- Silt barriers (e.g., brush dams, rock filter dikes, silt fences, hay bales, containment berms, or water bars) will be installed as needed on down-gradient portions of project areas.

- Side hill cuts (cut slopes) will be kept to a minimum to protect local resources while providing a safe and stable plane for the efficient and safe use of equipment.
- During construction near perennial streams, lakes, or wetlands, the utilization of sediment traps, silt fences, straw bales, or fabric filters may be considered in order to prevent suspended sediments from reaching downgradient watercourses, streams, lakes, or wetlands.
- Culverts may be installed at a grade ranging from 2 to 5 percent. Inlet protection may include inlet aprons and rock armoring around the culvert perimeter while below grade inlet sumps may be installed to enhance sediment deposition. Outfall protection may include the use of a rock barrier to slow the discharge of runoff water. Culvert pipe or outfall protection will be extended to the toe of the slope on the discharge end.
- During the reclamation of a well pad, cut and fill slopes in steep terrain will be graded and contoured to blend into the adjoining landscape. Natural drainage patterns will be re-established. When possible, cut and fill slopes will be constructed so they are no steeper than a 1 to 3 ratio.
- Reclaimed well pads may have a fence constructed around areas that have been seeded. These fences can be installed in order to keep livestock and vehicles off re-seeded areas.

The control and reduction of sediment contained in stormwater runoff will be accomplished by the use of sediment containment systems if appropriate. Sediment containment systems are hydraulic controls that allow the deposition of suspended particles by gravity.

The phases of construction or development and stormwater stages are linked to the implementation BMPs. For stormwater regulation purposes, construction sites have been divided into the following stormwater stages: Active Construction, Interim Stabilization, and Final Stabilization. Details regarding the stormwater stages and associated sediment control BMPs are provided below.

Pre-construction and Active Construction Sites

During pre-construction, drilling, workover rig activity, and other active construction processes, the following sediment controls may be utilized at well pad areas: brush matting, culverts, filter berms, land grading, roadside ditches, sediment traps/ponds, silt fences, tracking pads, straw bale barriers, wattles, wind fences, and other site-specific BMPs as needed.

Interim Stabilization Sites

During interim stabilization, the following sediment controls may be utilized at well pad areas: brush matting, culverts, filter berms, roadside ditches, sediment traps/ponds, silt fences, straw bale barriers, wattles, and wind fences when practicable.

Final Stabilization Sites

Permanent stormwater sediment controls, such as culverts, filter berms, roadside ditches, and sediment traps/ponds will remain in place after final stabilization, if appropriate.

All graded surfaces, walls, dams and structures, vegetation, erosion and sediment control measures, and other protective devices identified in the well pad plan will be maintained, repaired, and restored as necessary.

SandRidge has implemented additional stormwater management into their site development, including program oversight, construction site planning and management, and materials management.

Construction site planning includes decisions regarding reserve pit placement, if necessary, planned stockpile placement, and waste storage area placement, which take into account potential stormwater runoff issues. Well pad sites may include a slope to the reserve pit or a buffer zone of natural vegetation used as a non-structural BMP to inhibit sediment travel offsite and minimize the footprint of the well pad.

6.2 MATERIAL HANDLING AND SPILL PREVENTION

Hazardous materials used in the North Park Basin Project Area include drilling fluids, completion fluids, fuels, preventative maintenance lubricants/liquids, paints, solvents, produced water, condensate, methanol, etc. Where practical, these chemicals are covered and/or placed in secondary containment. Safety Data Sheets (SDS) for materials to be used or are produced are filed at the SandRidge office in Oklahoma City, Oklahoma.

Refueling and lubrication of vehicles and equipment is conducted a minimum of 100 feet from flowing streams and wetlands. Any spills are promptly remediated and contaminated materials hauled offsite and properly disposed of/recycled or remediated on site. If contaminated soil is remediated on site, it is stored in lined containment. Quantities of fuel and other chemicals will be limited to an as-needed basis for the immediate operations underway. In general, small spills will be handled by SandRidge personnel. In most cases, an absorbent material is used to pick up the spill. SandRidge field personnel carry spill response equipment in their vehicles to respond to smaller spills/leaks. For larger spills, the SWMP team will be notified and a contractor will be called to respond to the spill. For the protection of SandRidge employees or contractors, drums, tanks, and other containers are clearly labeled to identify contents.

When practical, material handling and spill prevention BMPs will be detailed on site-specific maps.

6.3 DEDICATED CONCRETE OR ASPHALT BATCH PLANTS

SandRidge does not have or subcontract dedicated concrete or asphalt batch plants for well pad site development or construction. Stormwater at SandRidge well pad sites will not encounter concrete or asphalt batch plant activities.

6.4 VEHICLE TRACKING CONTROL

SandRidge restricts access to the site and employs BMPs such as gravel surfacing or VTCs, to minimize vehicle tracking. BMPs designed to prevent vehicle tracking will be clearly labeled on each site-specific map.

6.5 WASTE MANAGEMENT AND DISPOSAL, INCLUDING CONCRETE WASHOUT

Typical wastes generated at SandRidge construction sites include trash, portable facility liquids, maintenance lubricants/liquids, produced water, drill cuttings, flow-back wastes, pit liners, and pressed sludge. BMPs designed to prevent on-site waste from entering surface waters will be clearly labeled on each site-specific map.

6.5.1 Non-Industrial Waste

Trash is stored in dumpsters designed to prevent the wind from carrying trash offsite. Dumpsters are routinely emptied by a dedicated contractor to reduce the amount of solid waste stored on site. Trash is removed from the site and disposed of at a properly licensed facility. During stormwater inspections, dumpsters are checked for leaking substances.

Portable facilities are anchored to prevent them from tipping over. These facilities are emptied and maintained by a dedicated contractor on an as-needed basis. Wastes from portable facilities are disposed of at a properly licensed facility. During stormwater inspections, portable facilities are checked for leaks and presence of anchoring devices.

6.5.2 Preventative Maintenance Waste

Routine maintenance lubricants/liquids (used or unused) are kept in labeled containers and in secondary containment. Used lubricants/liquids are removed from the site and disposed and/or recycled at properly licensed facilities.

6.5.3 Exploration and Production Waste

Produced water and flow-back wastes will be conveyed to holding tanks and removed from the site and disposed of at licensed disposal facilities. Drill cuttings will either be disposed of off site or beneficially reused per the Sandridge E&P Waste Management Plan.

6.5.4 Non-Routine Waste Generation

Unexpected wastes will be handled properly. Decisions will be made regarding unexpected wastes by SandRidge management. No wastes will be released into surface waters.

6.5.5 Concrete Washout Waste

Concrete washout may occur at SandRidge sites, although it is not a part of regular operations.

Concrete washout areas will be installed prior to concrete placement on site. Concrete washouts primarily include small excavations located near the point of concrete masonry placement and

will be constructed using a shallow excavation with appropriate tracking and access control. Excavated material will be used for a perimeter berm, if needed. Smaller, more temporary, concrete washouts can be constructed using a mobile disposal unit, geotextile bags, or water-tight vessels such as rigid plastic pools, small dumpsters, or buckets.

Maintenance includes removal of excess materials and general structural integrity of the installation.

A designated concrete washout station will be surrounded by perimeter controls, as necessary, to prevent contaminated stormwater from leaving the area. Waste concrete will be removed or disposed of offsite as appropriate. Concrete washout areas may remain in place until concrete work for the project is completed.

When concrete washout areas are removed, excavations will be filled with suitable compacted backfill and topsoil, and disturbed areas associated with the installation, maintenance, and/or removal of the concrete washout area will be appropriately reclaimed.

6.6 GROUNDWATER AND STORMWATER DEWATERING

Construction dewatering is not anticipated to take place at SandRidge sites. For large construction projects with planned dewatering activity, SandRidge will apply for a separate dewatering permit from the state, as required. If dewatering of non-significant groundwater or stormwater runoff takes place at a site, appropriate BMPs will be installed to ensure no discharge from this activity occurs to state waters.

6.7 STORMWATER PRACTICES AND LANDOWNERS

SandRidge will always attempt to accommodate landowners and maintain compliance with the CDPS general permit. If a landowner has concerns with the installation or use of certain BMPs, SandRidge will discuss other options with the landowner for BMP implementation that are compliant with the permit. If landowners are insistent upon particular practices on their land or have previous agreements with SandRidge regarding well pad site installations, SandRidge will attempt to negotiate the best solution for all parties to maintain stormwater compliance.

7.0 FINAL STABILIZATION AND LONG-TERM STORMWATER MANAGEMENT

7.1 RECLAMATION

Unless otherwise directed by the landowner or a jurisdictional authority, rocks, cut vegetation, and other surface material temporarily stockpiled during construction are redistributed as backfill on the project area. The segregated topsoil is then spread evenly across the reclaimed areas and blended into the natural landscape. Due to the amount of soil moved around the site during reclamation, perimeter sediment controls such as wattles or surface roughening will remain until the ground disturbing activities are completed and the site has been revegetated.

Once topsoil has been distributed across the site, the location is then seeded by drill seeding methods, hydraulic seeding, or hand seeding. Reclaimed areas, except areas needed for production, will be seeded using seed mixes appropriate to the location (Table 5). Table 5 includes four separate seed mixes most commonly used throughout the North Park Basin Project Area. Landowners and government agencies may request alternate seed mixes. Seed mixes will be planted in the amount specified in pounds of pure live seed per acre. No primary or secondary noxious weeds will be incorporated in the seed mix and seed mixes will be certified weed free. Mowing or spraying may be incorporated for weed mitigation of any intrusive noxious weeds that may grow on site.

Re-vegetation is accomplished as soon as practical following the preparation of a site for final stabilization. Seeding will be done when seasonal and/or weather conditions are most favorable according to schedules identified by the jurisdictional authority or reclamation contractor. Whenever possible, seeding is timed to take advantage of moisture, such as early spring or late fall. Seed mixes are evenly and uniformly planted over the disturbed area.

On terrain where drill seeding is appropriate, seed may be planted using a drill equipped with a depth regulator to ensure proper depth of planting. Drill seeding will be used where topography and soil conditions allow operation of equipment to meet the seeding requirements of the species being planted. Steeper areas are hand seeded at double the recommended application rate. These steeper seeded areas may possibly be covered with hydraulically applied mulch.

If necessary on steeper areas or areas of concentrated surface flow, fiber reinforced matrix (FRM), erosion control blanket, or turf reinforcement matting will be employed to help facilitate vegetative growth.

7.2 FINAL STABILIZATION

According to the CDPS General Permit, “Final stabilization is reached when ground surface disturbing activities at the site have been completed, and uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed.”

A special condition exists for oil and gas sites regarding final stabilization. According to the CDPHE Stormwater Fact Sheet dated July 2007:

Areas developed as stabilized unpaved surfaces as needed for operation of the facility after interim reclamation also qualify as “finally stabilized.” The term “stabilized unpaved surfaces” includes dirt road surfaces and the portions of the well pad surfaces that cannot be revegetated due to operational necessity, but does not include slopes, ditches and other areas where revegetation is necessary. Stabilized unpaved surfaces must be prepared in such a way as to minimize erosion, such as preventing rill erosion on pad surfaces or roads.

7.3 LONG-TERM STORMWATER MANAGEMENT

Sites within the North Park Basin Project Area which have reached final stabilization are visited by various SandRidge staff for routine equipment inspections or other production and operations activities. During these routine activities, stormwater issues are observed and communicated to the SWMP team. Permanent BMPs such as culverts and associated BMPs along road sites are maintained during routine road maintenance. Stormwater issues are not expected on sites which have reached final stabilization.

8.0 INSPECTION AND MAINTENANCE PROCEDURES

8.1 INSPECTIONS

Inspections will be conducted to document the status of erosion and sediment control structures, re-vegetation efforts, and non-compliance conditions such as uncontrolled releases of sediment, muddy water, or other potential pollutants. Routine inspections are conducted during all phases of construction activity and after a precipitation-related event. A standardized Inspection Report will be utilized during inspections and include a signature line for the inspector to ensure compliance with the regulations. Required actions or modifications, as documented on the area-specific Inspection Report, will be addressed as soon as possible to minimize the discharge of pollutants.

Personnel responsible for inspections will be trained to evaluate stormwater management concerns, erosion and sediment control structures, and to evaluate construction sites.

During inspections, the following portions of the site are observed for sediment and erosion issues:

- Outfall areas and discharge points;
- Disturbed areas;
- Existing BMPs;
- Areas used for chemical and waste storage;
- Vehicle access points;
- Steep slopes; and
- Buffer areas between the site and water bodies.

Site inspections must be used to assess whether or not existing BMPs are functioning as designed. If a BMP is not functioning as designed, alternate BMPs must be recommended or the BMP needs to be maintained. If the BMP is constantly being maintained, then the inspector needs to recommend new options to mitigate sediment and erosion problems. If an emergency is encountered, i.e., large amounts of sediment laden runoff are entering a water body, on-site equipment is leaking uncontrollably, or BMPs are being overwhelmed, the SWMP team needs to be made aware as soon as possible.

For stormwater regulation purposes, construction sites are divided into stormwater inspection stages: Active Construction, Interim Stabilization, and Final Stabilization. For the purposes of this SWMP, only Active Construction and Interim Stabilization sites are inspected. Winter conditions and precipitation events trigger different inspection routines. Each of the stormwater inspection stages and weather conditions are discussed below. Once a site reaches final stabilization, it is removed from this stormwater construction permit program.

8.1.1 Active Construction Stage/14-day Inspection

According to stormwater regulations the construction phase of a site is classified as the Active Construction Stage and the inspection frequency is every 14 days. The Active Construction Stage is characterized as the time between initial groundbreaking of a site to when the site is prepared for final stabilization.

8.1.2 Interim Stabilization Stage/Monthly Inspection

For sites which have not reached final stabilization (defined in Section 7.2) but meet the following criteria, the inspection frequency can be reduced to once a month. This reduced inspection schedule is allowed only if:

- All construction activities that result in surface ground disturbance are completed;
- All activities required for final stabilization, in accordance with the SWMP, have been completed and the application of seed has occurred; and
- The SWMP has been amended to indicate those areas are to be inspected under a reduced schedule.

8.1.3 Final Stabilization Stage

When a pad site, road, or gathering line reaches final stabilization (defined in Section 7.2), further inspections are not required. An Inactivation Notice will be filed with CDPHE to deactivate the stormwater permit. All temporary site-specific BMPs no longer required will be removed.

8.1.4 Winter Conditions Exclusion

Inspections are not required where construction activities are temporarily halted because snow cover exists over the entire site for an extended period. This exclusion is valid as long as melting conditions do not exist. The following information must be documented in the Inspection Report for use of this exclusion: dates when snow cover occurred, date when construction activities ceased, and date melting conditions began.

Snow plowing and ice removal operations are critical during the winter for the safety of workers traveling through the project area. Because of this, rock bag check dams and other BMPs which could become obstacles to these operations are kept at a minimum and only used as necessary. Alternative BMPs are implemented as needed to ensure sediment containment and erosion control remains sufficient.

8.1.5 Precipitation Event Inspections

Active Construction Stage sites are inspected within 24 hours after a precipitation or snowmelt event causing surface erosion. If no construction activities will occur at the construction site following a storm event, post-storm event inspections are conducted prior to re-commencing

construction activities, but no later than 72 hours following the storm event. Precipitation event inspections are not required at Interim Stage sites.

8.1.6 Inspection Documentation

Inspection observations are recorded on the site inspection report. The report provides a standardized format for noting inspection observations and includes a signature line for the inspector. The site-specific information is updated following the specific inspection. The following items need to be documented during an inspection:

1. Inspection date;
2. Names(s) and title(s) of personnel making the inspection;
3. Location(s) of discharges of sediment or other pollutants from the site;
4. Location(s) of BMPs that need to be maintained;
5. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
6. Location(s) where additional BMPs are needed that were not in place at the time of inspection;
7. Deviations from the minimum inspection schedule;
8. Description of corrective action for items 3 through 6 above, dates corrective action(s) taken, and measures taken to prevent future violations, including requisite changes to the SWMP, as necessary; and
9. After adequate corrective action(s) has been taken, or where a report does not identify any incidents requiring corrective action, the report will contain a signed statement indicating the site is in compliance with the permit to the best of the signer's knowledge and belief.

8.1.7 Inspection Reporting and Communication Procedures

Following an inspection, inspection reports are given to members of the SandRidge SWMP team within 24 hours of the inspection. The SandRidge SWMP team will then distribute copies of the reports noting maintenance recommendations to the appropriate personnel responsible for stormwater maintenance. Reports are kept on file in the SandRidge office in Oklahoma City, Oklahoma and on a secure website.

8.2 MAINTENANCE PROCEDURES

BMP maintenance is considered proactive. Design integrity should be maintained throughout the life of BMPs. If a BMP is not functioning as designed, it is replaced with a better BMP or additional upgradient BMPs. If noncompliance issues are observed due to the failure of a BMP,

the BMP causing the noncompliance issue is maintained as soon as possible. Generally, SandRidge-appointed inspectors recommend the maintenance of BMPs following routine inspections, but BMPs can be maintained as a result of general observations made while on site.

8.3 PREVENTATIVE MAINTENANCE

SandRidge implements preventive maintenance measures in order to prevent potential pollutants from entering surface waters. These measures are used on a daily basis by SandRidge personnel working in the project area and are summarized below.

8.3.1 Good Housekeeping

In accordance with BMPs that provide procedures to eliminate impacts, and to direct, divert, and contain stormwater, SandRidge implements a number of housekeeping practices. These practices will help prevent sediment, trash, and toxic or hazardous substances from entering navigable waters.

Housekeeping practices include regular cleaning, organization and maintenance of well pad equipment, and erosion and sediment control structures throughout the project. Areas where chemicals are stored and used at a project site are within buildings or containers where there is no potential for stormwater contact or are contained within berms. These areas are located at producing well pads typically consisting of wellheads, separator units, and produced water pits.

The following items will be addressed in order to maintain a clean and orderly well pad during the development, production, and abandonment phases of work.

- Inspect well pad areas routinely;
- Correct deficiencies noted during inspections;
- Clean and maintain stormwater management structures and components;
- Conduct routine trash collection and disposal;
- Familiarize employees and contractors with spill cleanup equipment and storage locations; and
- Familiarize employees and contractors with good housekeeping procedures and well pad pollution prevention procedures.

Waste from materials imported to the construction site will be removed for disposal/recycling to an appropriate licensed disposal/recycling facility, including sanitary sewage facilities (typically portable). No wastes or imported materials will be dumped or purposely discharged to waters of the state.

8.3.2 Significant Material Storage

In order to prevent significant materials from leaving material storage areas, the following BMPs have been implemented.

- Storage containers are stored away from direct traffic;
- Limited access is granted to storage areas;
- Employees are educated on spill response measures and how to safely handle materials;
- Materials are placed in secondary containment;
- Materials are covered;
- Dumpsters and trash receptacles are enclosed;
- Storage containers are covered and checked for leaks;
- Provide internal SPCC training;
- Provide hazardous waste operations and emergency response training;
- Storage areas are kept free of refuse; and
- Chemical substance containers are clearly labeled with an SDS kept on file.

8.3.3 Waste Removal

Waste from materials imported to the construction site is removed for disposal/recycling to an appropriate licensed disposal/recycling facility, including sanitary sewage facilities (typically portable). No wastes or imported materials are dumped or purposely discharged to waters of the state.

9.0 EMPLOYEE TRAINING

SandRidge will inform and train employees who are involved in SWMP activities. Training will cover information and procedures contained in the SWMP and will be conducted on an annual basis, as new employees working in the project area are hired, or as deemed necessary by the SWMP Administrator. In addition, safety and environmental elements of the SWMP will be covered. A Training Log (Appendix D) will be kept and updated on an annual basis.

The following topics may be presented and discussed during SWMP training:

- CDPS stormwater permit;
- Stormwater regulations;
- SWMP components;
- Potential pollutant sources;
- BMPs;
- Preventative maintenance;
- Good housekeeping;
- Inspections and maintenance; and
- Recordkeeping.

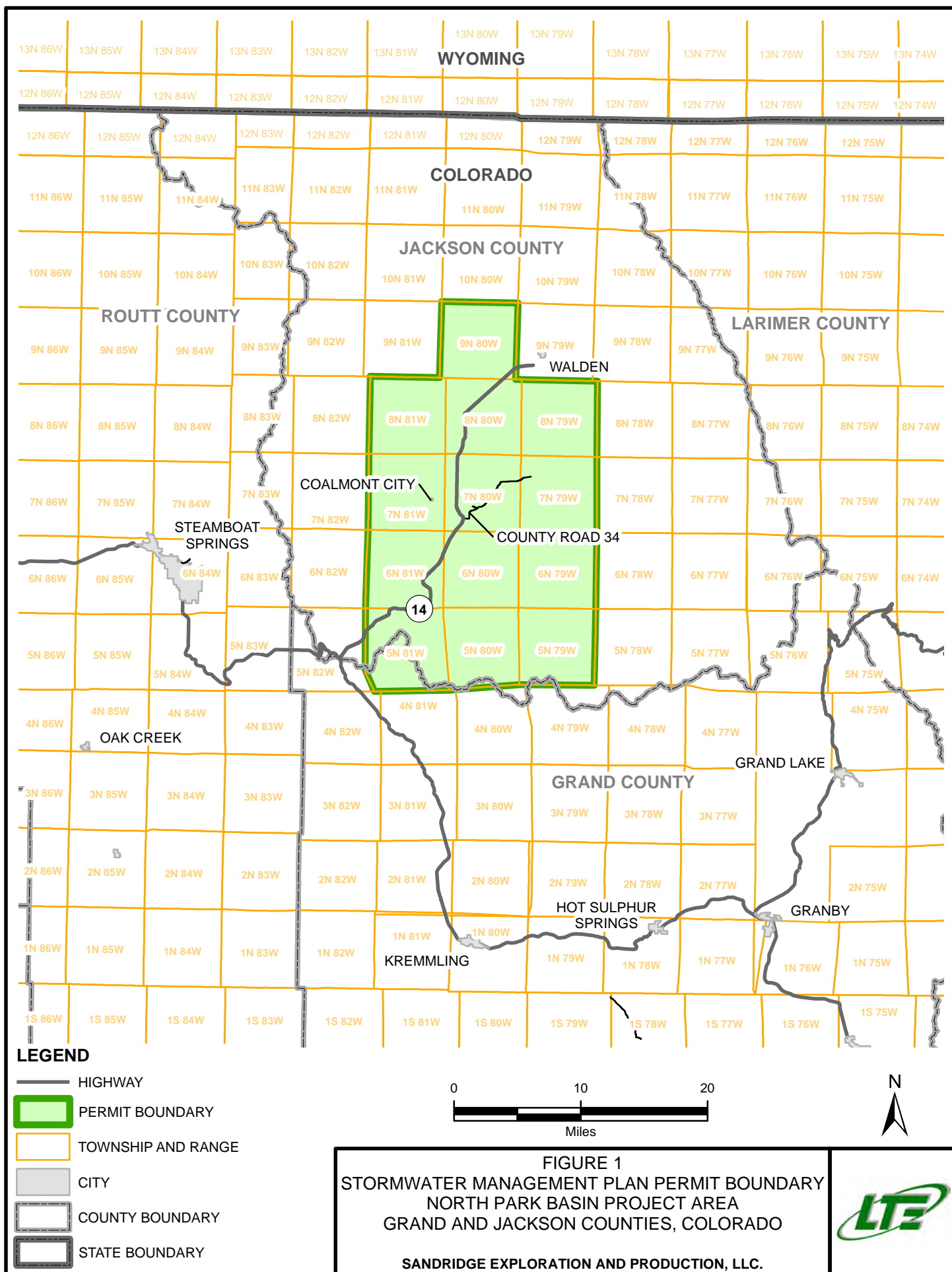
10.0 RECORDKEEPING

Stormwater related inspection records and site maps are kept on file at the SandRidge office in Oklahoma City, Oklahoma, and on a secure website. All stormwater related records will be filed and stored by SandRidge for a minimum of three years after each individual site achieves final stabilization.

11.0 STORMWATER MANAGEMENT PLAN REVIEW/CHANGES

SandRidge amends the SWMP whenever a significant change in design, construction, operation, or maintenance having a significant effect on the potential for the discharge of pollutants to water of the state occurs. Additionally, the SWMP will be amended if it proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with pads, roads, and gathering line construction activities. A record of changes made to the SWMP can be found in Appendix E. The SWMP is considered a “living document” and therefore will be amended from time to time to reflect these changes.

FIGURES



TABLES

TABLE 1
AREA OF DISTURBANCE

NORTH PARK BASIN PROJECT AREA
GRAND AND JACKSON COUNTIES, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION LLC

| Site ID | Site Name | COGCC Status | Estimated Pad (acres) | Estimated Access Road (acres) |
|--------------------------------|---|--------------|-----------------------|-------------------------------|
| 05-057-06463 | Buffalo Ditch 1-32H | PR | 2.37 | 0 |
| 05-057-06464 | Buffalo Ditch 2-32H | PR | 1.36 | 0.96 |
| 05-057-06508 | Coalmont 3-13H | PR | 3.63 | 2.1 |
| 05-057-06530 & 05-057-06531 | Evans 2-21H & Ray Ranch 7-21H | XX | 0 | 0 |
| 05-057-06535 | Gregory 5-09H | XX | 0 | 0 |
| 05-057-06529 & 05-057-06528 | Grizzly 3-11H & Grizzly 6-11H | XX | 0 | 0 |
| 05-057-06523 | Grizzly 3-32H | PR | 2 | 0.4 |
| 05-057-06499 | Hebron 02-07H | PR | 3.61 | 1.9 |
| 05-057-06501 & 05-057-06502 | Hebron 1-18H & Hebron 5-18H | PR | 2 | 0.17 |
| 05-057-06498 | Hebron 3-12H | PR | 4.22 | 1.72 |
| 05-057-06466 | Judy 1-30 | DG | 3.93 | 1.26 |
| 05-057-06465 | Mutual 2-30H | PR | 2 | 0.77 |
| 05-057-06488 | Mutual 4-30H - Same location as Mutual 2-30H | PR | 0 | 0 |
| 05-057-06515 | Peterson Ridge 1-20H | PR | 3.77 | 0.45 |
| 436642 | Ray Ranch North Central | AC | 5 | 0.2 |
| 05-057-06469 | Spicer 3-32H | PR | 3.7 | 0.75 |
| 05-057-06480 & 05-057-06482 | Surprise 4-06H & Damfino 2-06H | PR | 4 | 0.85 |
| 05-057-06526 | Surprise Unit 2-08H | PR | 3 | 2 |
| 324752 | Vaneta | AC | 3.92 | 0.2 |

Total estimated disturbed area (acres)

62.24



TABLE 2
CHEMICAL PRODUCT LIST

NORTH PARK BASIN PROJECT AREA
GRAND AND JACKSON COUNTIES, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION LLC

| Drilling Product List | |
|------------------------------|--------------------|
| Alpine Drill Beads | M-I-X II |
| Alpine Spotting Beads | MYACID |
| Asphasol Supreme | OPTISEAL |
| Black Fury | POLYPAC R |
| Calcium Nitrate | POLYPAC UL |
| Caustic Soda | POLY-PLUSRD |
| CF Desco II | POLY-PLUS |
| Citric Acid | POWERVIS |
| Clean Up | Quick Slide DS |
| Defoam X | Sack Black |
| Dilzone L | Safe Carb |
| Eco-Sponge | Safe-Scav HSW_SDS |
| Duo-Vis | Salt 96% |
| Fed Seal | Soda Ash |
| Flowzan | Sodium Bicarbonate |
| G-Seal Plus II | SP-101 |
| Hyperfloc AF 225 | Tackle |
| Hyperfloc CP 906 | Tannathin |
| HydroLoc | Unitrol |
| Lime | Walnut Plug |
| Lube 776 | WBM-MSDS |
| M-I GEL | X-CIDE 207 |
| M-I WATE | |

| Completions Product List | |
|------------------------------------|--|
| DWP-124 - Crosslinker Additive | |
| DWP-126 - Crosslinker | |
| DWP-181 - Guar Slurry | |
| DWP-213 - Oilfield Buffer | |
| DWP-621 - Friction Reducer Anionic | |
| DWP-844 - Biocide | |
| DWP-901 - Breaker | |
| DWP-913 - Clay Control | |
| DWP-938 - Flowback Surfactant | |
| DWP-954 - Surfactant | |
| DWP-975 - Breaker | |



TABLE 3
BMP SELECTION GUIDELINES

NORTH PARK BASIN PROJECT AREA
GRAND AND JACKSON COUNTIES, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION LLC

| ACTIVE | COMPLETED | INTERIM STABILIZATION | FINAL STABILIZATION |
|--|--|---|--|
| Pads, Flow lines | | | |
| Berm Brush Matting Check Dams Culverts Culvert Protection Diversion Ditch/Ditch&Berm Drainage Dip Erosion Control Blanket Filter Berm Gravel Surfacing Land Grading Level Spreader Low Water Crossing Retaining Wall Revegetation Riprap Roadside Ditches Sediment Trap Silt Fence Slope Drain Stabilized Construction Entrance Straw Bale Barrier Surface Roughening / Ripping Terracing Turnouts Vegetated Buffer Water Bar Wattles Wind Fence | Berm Brush Matting Check Dams Culverts Culvert Protection Diversion Ditch/Ditch&Berm Drainage Dip Erosion Control Blanket Filter Berm Gravel Surfacing Level Spreader Low Water Crossing Retaining Wall Riprap Roadside Ditches Sediment Trap Silt Fence Slope Drain Straw Bale Barrier Terracing Vegetated Buffer Water Bar Wattles Wind Fence | Berm Brush Matting Check Dams Culverts Culvert Protection Diversion Ditch/Ditch&Berm Drainage Dip Erosion Control Blanket Filter Berm Gravel Surfacing Level Spreader Low Water Crossing Retaining Wall Revegetation Riprap Roadside Ditches Seeding Sediment Trap Silt Fence Slope Drain Straw Bale Barrier Terracing Vegetated Buffer Water Bar Wattles Wind Fence | Berm Check Dams Culverts Culvert Protection Diversion Ditch/Ditch&Berm Drainage Dip Filter Berm Gravel Surfacing Low Water Crossing Retaining Wall Revegetation Riprap Roadside Ditches Seeding Sediment Trap Slope Drain Terracing Water Bar |
| Access Roads | | | |
| Berm Brush Matting Check Dams Culverts Culvert Protection Diversion Ditch/Ditch&Berm Drainage Dip Erosion Control Blanket Filter Berm Gravel Surfacing Land Grading Level Spreader Low Water Crossing Retaining Wall Revegetation Riprap Roadside Ditches | Berm Brush Matting Check Dams Culverts Culvert Protection Diversion Ditch/Ditch&Berm Drainage Dip Erosion Control Blanket Filter Berm Gravel Surfacing Level Spreader Low Water Crossing Retaining Wall Riprap Roadside Ditches Sediment Trap Silt Fence | Berm Brush Matting Check Dams Culverts Culvert Protection Diversion Ditch/Ditch&Berm Drainage Dip Erosion Control Blanket Filter Berm Gravel Surfacing Level Spreader Low Water Crossing Retaining Wall Revegetation Riprap Roadside Ditches Sediment Trap | Berm Check Dams Culverts Culvert Protection Diversion Ditch/Ditch&Berm Drainage Dip Filter Berm Gravel Surfacing Low Water Crossing Retaining Wall Revegetation Riprap Roadside Ditches Sediment Trap Slope Drain Water Bar |

TABLE 3
BMP SELECTION GUIDELINES

NORTH PARK BASIN PROJECT AREA
GRAND AND JACKSON COUNTIES, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION LLC

| ACTIVE | COMPLETED | INTERIM STABILIZATION | FINAL STABILIZATION |
|----------------------------------|--------------------|-----------------------|---------------------|
| Access Roads (continued) | | | |
| Sediment Trap | Slope Drain | Seeding | |
| Silt Fence | Straw Bale Barrier | Silt Fence | |
| Slope Drain | Vegetated Buffer | Slope Drain | |
| Stabilized Construction Entrance | Water Bar | Straw Bale Barrier | |
| Straw Bale Barrier | Wattles | Vegetated Buffer | |
| Surface Roughening/Ripping | Wind Fence | Water Bar | |
| Turnouts | Wind Fence | Wattles | |
| Vegetated Buffer | | Wind Fence | |
| Water Bar | | | |
| Wattles | | | |
| Wind Fence | | | |

Notes:

BMP = Best Management Practice

TABLE 4
STRUCTURAL AND NON-STRUCTURAL BMP CLASSIFICATION

NORTH PARK NIOBRARA PROJECT AREA
GRAND AND JACKSON COUNTIES, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION LLC

| NON-STRUCTURAL BMPs | | |
|---|---|--|
| Program Oversight | Construction Site Planning and Management | Good Housekeeping/Materials Management |
| Construction Phase Plan Review Contractor Training and Certification Database Development and Maintenance | Timing of projects Construction Sequencing Site Operator BMP Inspection and Maintenance Training Preserving Natural Vegetation/Buffer Minimize Initial Pad Site Acreage Slope Pad to the Reserve Pit | General Construction Site Waste Management Spill Prevention, Control Plan and Countermeasure |
| STRUCTURAL BMPs | | |
| Erosion Control | Sediment Control | Runoff Control |
| Dust Control Erosion Control Blanket Gravel Surfacing Low Water Crossing Mulching Retaining Wall Revegetation Riprap Slope Stabilization Surface Roughening/Ripping Terracing Vegetated Buffer | Brush Matting Filter Berm Land Grading Level Spreader Sediment Basin Sediment Trap Silt Fence Slope Pad Toward Reserve Pit Stabilized Construction Entrance Straw Bale Barrier Vegetated Buffer Wattle Wind Fence | Berm Check Dam Culverts Culvert Protection Diversion Ditch/Ditch & Berm Drainage Dip Roadside Ditch Slope Drain Turnout Water Bar |

Notes:

BMP = Best Management Practice

TABLE 5
SEED MIXES AND APPLICATION RATES

NORTH PARK BASIN PROJECT AREA
GRAND AND JACKSON COUNTIES, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION LLC

| AVS Rocky Mountain Native Mix | 20-25 |
|--------------------------------------|--------------|
| (25%) Slender Wheatgrass | |
| (20%) Mountain Brome | |
| (20%) Blue Grama | |
| (15%) Idaho Fescue | |
| (10%) Buffalograss | |
| (5%) Green Needlegrass | |
| (5%) Indian Ricegrass | |
| | |

lbs/acre = pounds per acre

% = percent

APPENDIX A
STORMWATER GENERAL PERMIT COR030000





COLORADO

Department of Public
Health & Environment

**CERTIFICATION TO DISCHARGE
UNDER
CDPS GENERAL PERMIT COR-0300000
STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

Certification Number: COR030855

This Certification to Discharge specifically authorizes:

**SandRidge Exploration and Production LLC
to discharge stormwater from the facility identified as**

North Park Basin

To the waters of the State of Colorado, including, but not limited to:

Grizzly Creek- Yampa River

Facility Industrial Activity :

Oil and gas production

Facility Located at:

Hwy 14 and CR 34 Coalmont CO 80430

Grand County

Latitude 40.541414 Longitude -106.37039

**Specific Information
(if applicable):**

Certification is issued and effective: 1/13/2016

Expiration Date: This authorization expires upon effective date of the General Permit COR030000 renewal unless otherwise notified by the division.

***ADMINISTRATIVELY CONTINUED**

This certification under the permit requires that specific actions be performed at designated times. The certification holder is legally obligated to comply with all terms and conditions of the permit.

This certification was approved by:

Lillian Gonzalez, Unit Manager

Permits Section

Water Quality Control Division

*explanation of Admin Continued in cover letter



COLORADO

Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

John Suter, Sr Production VP
SandRidge Exploration and Production LLC
123 Robert S Kerr Ave
Oklahoma City, OK 73102

DATE: 1/13/2016

MEMO RE: Certification, Colorado Discharge Permit System
Permit No., COR030000, Certification Number: COR030855

DIVISION CONTACTS: Kendra Kelly, Environmental Protection Specialist, at 303-692-3387, or Karen Harford, Admin, at 303-691-4019

ATTACHMENTS: Certification COR030855, General Permit, Highlight Sheet, Inactivation form

The Water Quality Control Division (the Division) has reviewed the application submitted for the **North Park Basin** facility and determined that it qualifies for coverage under the CDPS General Permit for Stormwater Discharges Associated with Construction Activities (the permit). Enclosed please find a copy of the permit certification, which was issued under the Colorado Water Quality Control Act.

FEE INFORMATION:

The Annual Fee for this certification is \$245.00 [category 7, subcat 9 - Stormwater Construction per CRS 25-8-502] is invoiced every July. Do Not Pay This Now. The initial prorated invoice will be sent to the legal contact shortly.

CERTIFICATION RECORDS INFORMATION:

The following information is what the Division records show for this certification.

For any changes to Contacts - Legal, Facility, or Billing - a "Notice of Change of Contacts form" must be submitted to the Division. This form is also available on our web site and must be signed by the legal contact.

Facility: North Park Basin

GrandCounty

Construction Activities

Oil and gas production

Legal Contact (*receives all legal documentation pertaining to the permit certification*):

John Suter, Sr Production VP
SandRidge Exploration and Production LLC
123 Robert S Kerr Ave
Oklahoma City, OK 73102

Phone number: 405-429-5700
Email: jsuter@sandridgeenergy.com

Facility Contact (*contacted for general inquiries regarding the facility*):

Jason Niven, Production Svs VP
SandRidge Exploration and Production LLC
123 Robert S Kerr Ave
Oklahoma City, OK 73102

Phone number: 405-429-6419
Email: jniven@sandridgeenergy.com

Billing Contact (*receives the invoice pertaining to the permit certification*):

Kenneth Raymond, Sr Env Specialist
SandRidge Exploration and Production LLC
123 Robert S Kerr Ave
Oklahoma City, OK 73102

Phone number: 405-429-6630
Email: kraymond@sandridgeenergy.com

ADMINISTRATIVE CONTINUATION EXPLANATION:

The Division is currently developing a renewal permit and associated certification for the above permitted facility. The development and review procedures required by law have not yet been completed. The Construction Stormwater General Permit, which expired June 30, 2012, is administratively continued and will remain in effect under Section 104(7) of the Administrative Procedures Act, C.R.S. 1973, 24-4-101, et seq (1982 repl. vol. 10) until a renewal permit/certification is issued and effective. The renewal for this facility will be based on the application that was received 1/8/2016 All effluent limits, terms and conditions of the administratively continued permit are in effect until the renewal is complete.



CDPS GENERAL PERMIT
STORMWATER DISCHARGES ASSOCIATED WITH
CONSTRUCTION ACTIVITY
AUTHORIZATION TO DISCHARGE UNDER THE
COLORADO DISCHARGE PERMIT SYSTEM

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), this permit authorizes the discharge of stormwater associated with construction activities (and specific allowable non-stormwater discharges in accordance with Part I.D.3 of the permit) certified under this permit, from those locations specified throughout the State of Colorado to specified waters of the State. Such discharges shall be in accordance with the conditions of this permit.

This permit specifically authorizes the facility listed on page 1 of this permit to discharge, as of this date, in accordance with permit requirements and conditions set forth in Parts I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

This permit and the authorization to discharge shall expire at midnight, **June 30, 2012**.

Issued and Signed this 31st day of May, 2007

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT



Janet S. Kieler
Permits Section Manager
Water Quality Control Division

SIGNED AND ISSUED MAY 31, 2007

EFFECTIVE JULY 1, 2007

ADMINISTRATIVELY
CONTINUED EFFECTIVE
JULY 1, 2012

TABLE OF CONTENTS

PART I

| | | |
|-----|--|----|
| A. | COVERAGE UNDER THIS PERMIT | 3 |
| 1. | Authority to Discharge | 3 |
| a) | Applicable Sections..... | 3 |
| b) | Oil and Gas Construction | 3 |
| 2. | Definitions..... | 3 |
| 3. | Permit Coverage Without Application – Qualifying Local Programs..... | 3 |
| a) | Applicable Sections..... | 3 |
| b) | Local Agency Authority..... | 4 |
| c) | Permit Coverage Termination | 4 |
| d) | Compliance with Qualifying Local Program | 4 |
| e) | Full Permit Applicability..... | 4 |
| 4. | Application, Due Dates | 4 |
| a) | Application Due Dates | 4 |
| b) | Summary of Application | 4 |
| 5. | Permit Certification Procedures | 4 |
| a) | Request for Additional Information | 4 |
| b) | Automatic Coverage..... | 5 |
| c) | Individual Permit Required | 5 |
| d) | General vs. Individual Permit Coverage | 5 |
| e) | Local Agency Authority..... | 5 |
| 6. | Inactivation Notice | 5 |
| 7. | Transfer of Permit | 5 |
| 8. | Reassignment of Permit..... | 5 |
| 9. | Sale of Residence to Homeowners | 6 |
| 10. | Permit Expiration Date..... | 6 |
| 11. | Individual Permit Criteria..... | 6 |
| B. | STORMWATER MANAGEMENT PLAN – GENERAL REQUIREMENTS | 6 |
| C. | STORMWATER MANAGEMENT PLAN – CONTENTS..... | 7 |
| 1. | Site Description | 7 |
| 2. | Site Map | 7 |
| 3. | Stormwater Management Controls..... | 8 |
| a) | SWMP Administrator..... | 8 |
| b) | Identification of Potential Pollutant Sources..... | 8 |
| c) | Best Management Practices (BMPs) for Stormwater Pollution Prevention. | 8 |
| 4. | Final Stabilization and Long-term Stormwater Management..... | 9 |
| 5. | Inspection and Maintenance | 10 |
| D. | TERMS AND CONDITIONS | 10 |
| 1. | General Limitations..... | 10 |
| 2. | BMP Implementation and Design Standards..... | 10 |
| 3. | Prohibition of Non-Stormwater Discharges | 11 |
| 4. | Releases in Excess of Reportable Quantities..... | 11 |
| 5. | SWMP Requirements..... | 11 |
| a) | SWMP Preparation and Implementation..... | 11 |
| b) | SWMP Retention Requirements | 11 |
| c) | SWMP Review/Changes | 11 |
| d) | Responsive SWMP Changes | 12 |
| 6. | Inspections..... | 12 |
| a) | Minimum Inspection Schedule..... | 12 |
| b) | Inspection Requirements | 13 |
| c) | Required Actions Following Site Inspections | 13 |
| 7. | BMP Maintenance | 13 |
| 8. | Replacement and Failed BMPs | 14 |
| 9. | Reporting | 14 |

TABLE OF CONTENTS (cont.)

| | | |
|-----|---------------------------------------|----|
| 10. | SWMP Availability | 14 |
| 11. | Total Maximum Daily Load (TMDL) | 14 |
| E. | ADDITIONAL DEFINITIONS | 15 |
| F. | GENERAL REQUIREMENTS | 16 |
| 1. | Signatory Requirements | 16 |
| 2. | Retention of Records | 16 |
| 3. | Monitoring..... | 16 |

PART II

| | | |
|-----|---|----|
| A. | MANAGEMENT REQUIREMENTS | 17 |
| 1. | Amending a Permit Certification..... | 17 |
| 2. | Special Notifications - Definitions | 17 |
| 3. | Noncompliance Notification | 17 |
| 4. | Submission of Incorrect or Incomplete Information | 18 |
| 5. | Bypass | 18 |
| 6. | Upsets | 18 |
| 7. | Removed Substances..... | 18 |
| 8. | Minimization of Adverse Impact..... | 18 |
| 9. | Reduction, Loss, or Failure of Stormwater Controls..... | 19 |
| 10. | Proper Operation and Maintenance | 19 |
| B. | RESPONSIBILITIES | 19 |
| 1. | Inspections and Right to Entry | 19 |
| 2. | Duty to Provide Information | 19 |
| 3. | Transfer of Ownership or Control..... | 19 |
| 4. | Modification, Suspension, or Revocation of Permit By Division | 20 |
| 5. | Permit Violations..... | 21 |
| 6. | Legal Responsibilities | 21 |
| 7. | Severability | 21 |
| 8. | Renewal Application | 21 |
| 9. | Confidentiality..... | 21 |
| 10. | Fees | 21 |
| 11. | Requiring an Individual CDPS Permit | 22 |

PART I

A. COVERAGE UNDER THIS PERMIT

1. **Authority to Discharge**

Under this permit, facilities are granted authorization to discharge stormwater associated with construction activities into waters of the state of Colorado. This permit also authorizes the discharge of specific allowable non-stormwater discharges, in accordance with Part I.D.3 of the permit, which includes discharges to the ground. This includes stormwater discharges from areas that are dedicated to producing earthen materials, such as soils, sand and gravel, for use at a single construction site (i.e., borrow or fill areas). This permit also authorizes stormwater discharges from dedicated asphalt batch plants and dedicated concrete batch plants. (Coverage under the construction site permit is not required for batch plants if they have alternate CDPS permit coverage.) This permit does not authorize the discharge of mine water or process water from such areas.

- a) **Applicable Sections:** In accordance with Part I.A.3 of this permit, some parts of this permit do not apply to sites covered under a Qualifying Local Program, as defined in I.A.2.d. For sites not covered by a Qualifying Local Program, all parts of the permit apply except Part I.A.3. The permittee will be responsible for determining and then complying with the applicable sections.
- b) **Oil and Gas Construction:** Stormwater discharges associated with construction activities directly related to oil and gas exploration, production, processing, and treatment operations or transmission facilities are regulated under the Colorado Discharge Permit System Regulations (5CCR 1002-61), and require coverage under this permit in accordance with that regulation. However, references in this permit to specific authority under the Federal Clean Water Act (CWA) do not apply to stormwater discharges associated with these oil and gas related construction activities, to the extent that the references are limited by the federal Energy Policy Act of 2005.

2. **Definitions**

- a) **Stormwater:** Stormwater is precipitation-induced surface runoff.
- b) **Construction activity:** Construction activity refers to ground surface disturbing activities, which include, but are not limited to, clearing, grading, excavation, demolition, installation of new or improved haul roads and access roads, staging areas, stockpiling of fill materials, and borrow areas. Construction does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.
- c) **Small construction activity:** Stormwater discharge associated with small construction activity means the discharge of stormwater from construction activities that result in land disturbance of equal to or greater than one acre and less than five acres. Small construction activity also includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale, if the larger common plan will ultimately disturb equal to or greater than one and less than five acres.
- d) **Qualifying Local Program:** This permit includes conditions that incorporate qualifying local erosion and sediment control program (Qualifying Local Program) requirements by reference. A Qualifying Local Program is a municipal stormwater program for stormwater discharges associated with small construction activity that has been formally approved by the Division.

Other Definitions: Definitions of additional terms can be found in Part I.E. of this permit.

3. **Permit Coverage Without Application – for small construction activities under a Qualifying Local Program only**

If a small construction site is within the jurisdiction of a Qualifying Local Program, the operator of the construction activity is authorized to discharge stormwater associated with small construction activity under this general permit without the submittal of an application to the Division.

- a) **Applicable Sections:** For sites covered by a Qualifying Local Program, only Parts 1.A.1, 1.A.2, 1.A.3, I.D.1, I.D.2, I.D.3, I.D.4, I.D.7, I.D.8, I.D.11, I.E and Part II of this permit, with the exception of Parts II.A.1, II.B.3, II.B.8, and II.B10, apply.

A. COVERAGE UNDER THIS PERMIT (cont.)

- b) **Local Agency Authority:** This permit does not pre-empt or supersede the authority of local agencies to prohibit, restrict, or control discharges of stormwater to storm drain systems or other water courses within their jurisdiction.
- c) **Permit Coverage Termination:** When a site under a Qualifying Local Program has been finally stabilized, coverage under this permit is automatically terminated.
- d) **Compliance with Qualifying Local Program:** A construction site operator that has authorization to discharge under this permit under Part I.A.3 shall comply with the requirements of the Qualifying Local Program with jurisdiction over the site.
- e) **Full Permit Applicability:** The Division may require any operator within the jurisdiction of a Qualifying Local Program covered under this permit to apply for and obtain coverage under the full requirements of this permit. The operator must be notified in writing that an application for full coverage is required. When a permit certification under this permit is issued to an operator that would otherwise be covered under Part I.A.3 of this permit, the full requirements of this permit replace the requirements as per Part I.A.3 of this permit, upon the effective date of the permit certification. A site brought under the full requirements of this permit must still comply with local stormwater management requirements, policies or guidelines as required by Part I.D.1.g of this permit.

4. **Application, Due Dates**

- a) **Application Due Dates:** At least **ten calendar days** prior to the commencement of construction activities, the applicant shall submit an application form as provided by the Division, with a certification that the Stormwater Management Plan (SWMP) is complete.

One original completed discharge permit application shall be submitted, by mail or hand delivery, to:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-Permits-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

- b) **Summary of Application:** The application requires, at a minimum, the following:
 - 1) The applicant's company name; address; telephone number; and email address (if available); whether the applicant is the owner, developer, or contractor; and local contact information;
 - 2) Project name, address, county and location of the construction site, including the latitude and longitude to the nearest 15 seconds of the approximate center of the construction activity;
 - 3) Legal description or map of the construction site;
 - 4) Estimates of: the total area of the site, the area of the site that is expected to be disturbed, and the total area of the larger common plan of development or sale to undergo disturbance;
 - 5) The nature of the construction activity;
 - 6) The anticipated start date and final stabilization date for the project;
 - 7) The name of the receiving water(s), or the municipal separate storm sewer system and the ultimate (i.e., named) receiving water(s);
 - 8) Certification that the SWMP for the construction site is complete (see Part I.C. below); and
 - 9) The signature of the applicant, signed in accordance with Part I.F.1 of this permit.

5. **Permit Certification Procedures**

If this general permit is appropriate for the applicant's operation, then a certification will be developed and the applicant will be authorized to discharge stormwater under this general permit.

- a) **Request for Additional Information:** The Division shall have up to **ten calendar days** after receipt of the above information to request additional data and/or deny the authorization for any particular discharge. Upon receipt of additional information, the Division shall have an additional **ten calendar days** to issue or deny authorization for the particular discharge. (Notification of denial shall be by letter, in cases where coverage under an alternate general permit or an individual permit is required, instead of coverage under this permit.)

A. COVERAGE UNDER THIS PERMIT (cont.)

- b) **Automatic Coverage:** If the applicant does not receive a request for additional information or a notification of denial from the Division dated within ten calendar days of receipt of the application by the Division, authorization to discharge in accordance with the conditions of this permit shall be deemed granted.
- c) **Individual Permit Required:** If, after evaluation of the application (or additional information, such as the SWMP), it is found that this general permit is not appropriate for the operation, then the application will be processed as one for an individual permit. The applicant will be notified of the Division's decision to deny certification under this general permit. For an individual permit, additional information may be requested, and 180 days may be required to process the application and issue the permit. At the Division's discretion, temporary coverage under this general permit may be allowed until the individual permit goes into effect.
- d) **General vs. Individual Permit Coverage:** Any permittee authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual CDPS permit. The permittee shall submit an individual application, with reasons supporting the request, to the Division at least 180 days prior to any discharge.
- e) **Local Agency Authority:** This permit does not pre-empt or supersede the authority of local agencies to prohibit, restrict, or control discharges of stormwater to storm drain systems or other water courses within their jurisdiction.

6. **Inactivation Notice**

When a site has been finally stabilized in accordance with the SWMP, the permittee must submit an **Inactivation Notice** form that is signed in accordance with Part I.F.1. of this permit. The Inactivation Notice form is available from the Division and includes:

- a) Permit certification number;
- b) The permittee's name, address, telephone number;
- c) Name, location, and county for the construction site for which the inactivation notice is being submitted; and
- d) Certification that the site has been finally stabilized, and a description of the final stabilization method(s).

7. **Transfer of Permit**

When responsibility for stormwater discharges at a construction site changes from one entity to another, the permittee shall submit a completed **Notice of Transfer and Acceptance of Terms** form that is signed in accordance with Part I.F.1. of this permit. The Notice of Transfer form is available from the Division and includes:

- a) Permit certification number;
- b) Name, location, and county for the construction site for which the Notice of Transfer is being submitted;
- c) Identifying information for the new permittee;
- d) Identifying information for the current permittee; and
- e) Effective date of transfer.

If the new responsible party will not complete the transfer form, the permit may be inactivated upon written request to the Division and completion of the Inactivation Notice if the permittee has no legal responsibility, through ownership or contract, for the construction activities at the site. In this case, the new owner or operator would be required to obtain permit coverage separately.

8. **Reassignment of Permit**

When a permittee no longer has control of a specific portion of a permitted site, and wishes to transfer coverage of that portion of the site to a second party, the permittee shall submit a completed **Notice of Reassignment of Permit Coverage** form that is signed in accordance with Part I.F.1. of this permit. The Notice of Reassignment of Permit Coverage form is available from the Division and includes:

- a) Current permit certification number;
- b) Identifying information and certification as required by Part I.A.4.b for the new permittee;
- c) Identifying information for the current permittee, revised site information and certification for reassignment; and
- d) Effective date of reassignment.

A. COVERAGE UNDER THIS PERMIT (cont.)

If the new responsible party will not complete the reassignment form, the applicable portion of the permitted site may be removed from permit coverage upon written request to the Division if the permittee has no legal responsibility, through ownership or contract, for the construction activities at the portion of the site. In this case, the new owner or operator would be required to obtain permit coverage separately.

9. **Sale of Residence to Homeowners**

For residential construction only, when a residential lot **has been conveyed to a homeowner** and all criteria in paragraphs a through e, below, are met, coverage under this permit is no longer required and the conveyed lot may be removed from coverage under the permittee's certification. At such time, the permittee is no longer responsible for meeting the terms and conditions of this permit for the conveyed lot, including the requirement to transfer or reassign permit coverage. The permittee remains responsible for inactivation of the original certification.

- a) The lot has been sold to the homeowner(s) for private residential use;
- b) the lot is less than one acre of disturbed area;
- c) all construction activity conducted by the permittee on the lot is completed;
- d) a certificate of occupancy (or equivalent) has been awarded to the home owner; and
- e) the SWMP has been amended to indicate the lot is no longer covered by permit.

Lots not meeting all of the above criteria require continued permit coverage. However, this permit coverage may be transferred (Part I.A.7, above) or reassigned (Part I.A.8, above) to a new owner or operator.

10. **Permit Expiration Date**

Authorization to discharge under this general permit shall expire on June 30, 2012. The Division must evaluate and reissue this general permit at least once every five years and must recertify the permittee's authority to discharge under the general permit at such time. Therefore, a permittee desiring continued coverage under the general permit must reapply by March 31, 2012. The Division will initiate the renewal process; however, it is ultimately the permittee's responsibility to ensure that the renewal is submitted. The Division will determine if the permittee may continue to operate under the terms of the general permit. An individual permit may be required for any facility not reauthorized to discharge under the reissued general permit.

11. **Individual Permit Criteria**

Various criteria can be used in evaluating whether or not an individual (or alternate general) permit is required instead of this general permit. This information may come from the application, SWMP, or additional information as requested by the Division, and includes, but is not limited to, the following:

- a) the quality of the receiving waters (i.e., the presence of downstream drinking water intakes or a high quality fishery, or for preservation of high quality water);
- b) the size of the construction site;
- c) evidence of noncompliance under a previous permit for the operation;
- d) the use of chemicals within the stormwater system; or
- e) discharges of pollutants of concern to waters for which there is an established Total Maximum Daily Load (TMDL).

In addition, an individual permit may be required when the Division has shown or has reason to suspect that the stormwater discharge may contribute to a violation of a water quality standard.

B. STORMWATER MANAGEMENT PLAN (SWMP) – **GENERAL REQUIREMENTS**

- 1. A SWMP shall be developed for each facility covered by this permit. The SWMP shall be prepared in accordance with good engineering, hydrologic and pollution control practices. (The SWMP need not be prepared by a registered engineer.)

B. STORMWATER MANAGEMENT PLAN (SWMP) – **GENERAL REQUIREMENTS** (cont.)

2. The SWMP shall:
 - a) Identify all potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with construction activity from the facility;
 - b) Describe the practices to be used to reduce the pollutants in stormwater discharges associated with construction activity at the facility; and ensure the practices are selected and described in accordance with good engineering practices, including the installation, implementation and maintenance requirements; and
 - c) Be properly prepared, and updated in accordance with Part I.D.5.c, to ensure compliance with the terms and conditions of this permit.
3. Facilities must implement the provisions of the SWMP as written and updated, from commencement of construction activity until final stabilization is complete, as a condition of this permit. The Division reserves the right to review the SWMP, and to require the permittee to develop and implement additional measures to prevent and control pollution as needed.
4. The SWMP may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under section 311 of the CWA, or Best Management Practices (BMPs) Programs otherwise required by a separate CDPS permit, and may incorporate any part of such plans into the SWMP by reference, provided that the relevant sections of such plans are available as part of the SWMP consistent with Part I.D.5.b.
5. For any sites with permit coverage before June 30, 2007, the permittee's SWMP must meet the new SWMP requirements as summarized in Section II.I of the rationale. Any needed changes must be made by **October 1, 2007**.

C. STORMWATER MANAGEMENT PLAN (SWMP) – **CONTENTS**

The SWMP shall include the following items, at a minimum.

1. **Site Description.** The SWMP shall clearly describe the construction activity, to include:
 - a) The nature of the construction activity at the site.
 - b) The proposed sequence for major activities.
 - c) Estimates of the total area of the site, and the area and location expected to be disturbed by clearing, excavation, grading, or other construction activities.
 - d) A summary of any existing data used in the development of the site construction plans or SWMP that describe the soil or existing potential for soil erosion.
 - e) A description of the existing vegetation at the site and an estimate of the percent vegetative ground cover.
 - f) The location and description of all potential pollution sources, including ground surface disturbing activities (see Part I.A.2.b), vehicle fueling, storage of fertilizers or chemicals, etc.
 - g) The location and description of any anticipated allowable sources of non-stormwater discharge at the site, e.g., uncontaminated springs, landscape irrigation return flow, construction dewatering, and concrete washout.
 - h) The name of the receiving water(s) and the size, type and location of any outfall(s). If the stormwater discharge is to a municipal separate storm sewer system, the name of that system, the location of the storm sewer discharge, and the ultimate receiving water(s).
2. **Site Map.** The SWMP shall include a legible site map(s), showing the entire site, identifying:
 - a) construction site boundaries;
 - b) all areas of ground surface disturbance;
 - c) areas of cut and fill;
 - d) areas used for storage of building materials, equipment, soil, or waste;
 - e) locations of dedicated asphalt or concrete batch plants;
 - f) locations of all structural BMPs;
 - g) locations of non-structural BMPs as applicable; and
 - h) locations of springs, streams, wetlands and other surface waters.

C. STORMWATER MANAGEMENT PLAN (SWMP) – CONTENTS (cont.)

3. **Stormwater Management Controls.**

The SWMP must include a description of all stormwater management controls that will be implemented as part of the construction activity to control pollutants in stormwater discharges. The appropriateness and priorities of stormwater management controls in the SWMP shall reflect the potential pollutant sources identified at the facility.

The description of stormwater management controls shall address the following components, at a minimum:

- a) **SWMP Administrator** - The SWMP shall identify a specific individual(s), position or title who is responsible for developing, implementing, maintaining, and revising the SWMP. The activities and responsibilities of the administrator shall address all aspects of the facility's SWMP.
- b) **Identification of Potential Pollutant Sources** - All potential pollutant sources, including materials and activities, at a site must be evaluated for the potential to contribute pollutants to stormwater discharges. The SWMP shall identify and describe those sources determined to have the potential to contribute pollutants to stormwater discharges, and the sources must be controlled through BMP selection and implementation, as required in paragraph (c), below.

At a minimum, each of the following sources and activities shall be evaluated for the potential to contribute pollutants to stormwater discharges, and identified in the SWMP if found to have such potential:

- 1) all disturbed and stored soils;
 - 2) vehicle tracking of sediments;
 - 3) management of contaminated soils;
 - 4) loading and unloading operations;
 - 5) outdoor storage activities (building materials, fertilizers, chemicals, etc.);
 - 6) vehicle and equipment maintenance and fueling;
 - 7) significant dust or particulate generating processes;
 - 8) routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents, oils, etc.;
 - 9) on-site waste management practices (waste piles, liquid wastes, dumpsters, etc.);
 - 10) concrete truck/equipment washing, including the concrete truck chute and associated fixtures and equipment;
 - 11) dedicated asphalt and concrete batch plants;
 - 12) non-industrial waste sources such as worker trash and portable toilets; and
 - 13) other areas or procedures where potential spills can occur.
- c) **Best Management Practices (BMPs) for Stormwater Pollution Prevention** - The SWMP shall identify and describe appropriate BMPs, including, but not limited to, those required by paragraphs 1 through 8 below, that will be implemented at the facility to reduce the potential of the sources identified in Part I.C.3.b to contribute pollutants to stormwater discharges. The SWMP shall clearly describe the installation and implementation specifications for each BMP identified in the SWMP to ensure proper implementation, operation and maintenance of the BMP.
 - 1) **Structural Practices for Erosion and Sediment Control**. The SWMP shall clearly describe and locate all structural practices implemented at the site to minimize erosion and sediment transport. Practices may include, but are not limited to: straw bales, wattles/sediment control logs, silt fences, earth dikes, drainage swales, sediment traps, subsurface drains, pipe slope drains, inlet protection, outlet protection, gabions, and temporary or permanent sediment basins.
 - 2) **Non-Structural Practices for Erosion and Sediment Control**. The SWMP shall clearly describe and locate, as applicable, all non-structural practices implemented at the site to minimize erosion and sediment transport. Description must include interim and permanent stabilization practices, and site-specific scheduling for implementation of the practices. The SWMP should include practices to ensure that existing vegetation is preserved where possible. Non-structural practices may include, but are not limited to: temporary vegetation, permanent vegetation, mulching, geotextiles, sod stabilization, slope roughening, vegetative buffer strips, protection of trees, and preservation of mature vegetation.

C. STORMWATER MANAGEMENT PLAN (SWMP) – CONTENTS (cont.)

- 3) Phased BMP Implementation. The SWMP shall clearly describe the relationship between the phases of construction, and the implementation and maintenance of both structural and non-structural stormwater management controls. The SWMP must identify the stormwater management controls to be implemented during the project phases, which can include, but are not limited to, clearing and grubbing; road construction; utility and infrastructure installation; vertical construction; final grading; and final stabilization.
- 4) Materials Handling and Spill Prevention. The SWMP shall clearly describe and locate all practices implemented at the site to minimize impacts from procedures or significant materials (see definitions at Part I.E.) that could contribute pollutants to runoff. Such procedures or significant materials could include: exposed storage of building materials; paints and solvents; fertilizers or chemicals; waste material; and equipment maintenance or fueling procedures.

Areas or procedures where potential spills can occur must have spill prevention and response procedures identified in the SWMP.

- 5) Dedicated Concrete or Asphalt Batch Plants. The SWMP shall clearly describe and locate all practices implemented at the site to control stormwater pollution from dedicated concrete batch plants or dedicated asphalt batch plants covered by this certification.
- 6) Vehicle Tracking Control. The SWMP shall clearly describe and locate all practices implemented at the site to control potential sediment discharges from vehicle tracking. Practices must be implemented for all areas of potential vehicle tracking, and can include: minimizing site access; street sweeping or scraping; tracking pads; graveled parking areas; requiring that vehicles stay on paved areas on-site; wash racks; contractor education; and/or sediment control BMPs, etc.
- 7) Waste Management and Disposal, Including Concrete Washout.
 - i) The SWMP shall clearly describe and locate the practices implemented at the site to control stormwater pollution from all construction site wastes (liquid and solid), including concrete washout activities.
 - ii) The practices used for concrete washout must ensure that these activities do not result in the contribution of pollutants associated with the washing activity to stormwater runoff.
 - iii) Part I.D.3.c of the permit authorizes the conditional discharge of concrete washout water to the ground. The SWMP shall clearly describe and locate the practices to be used that will ensure that no washout water from concrete washout activities is discharged from the site as surface runoff or to surface waters.
- 8) Groundwater and Stormwater Dewatering.
 - i) The SWMP shall clearly describe and locate the practices implemented at the site to control stormwater pollution from the dewatering of groundwater or stormwater from excavations, wells, etc.
 - ii) Part I.D.3.d of the permit authorizes the conditional discharge of construction dewatering to the ground. For any construction dewatering of groundwater not authorized under a separate CDPS discharge permit, the SWMP shall clearly describe and locate the practices to be used that will ensure that no groundwater from construction dewatering is discharged from the site as surface runoff or to surface waters.

4. Final Stabilization and Long-term Stormwater Management

- a) The SWMP shall clearly describe the practices used to achieve final stabilization of all disturbed areas at the site, and any planned practices to control pollutants in stormwater discharges that will occur after construction operations have been completed at the site.
- b) Final stabilization practices for obtaining a vegetative cover should include, as appropriate: seed mix selection and application methods; soil preparation and amendments; soil stabilization practices (e.g., crimped straw, hydro mulch or rolled erosion control products); and appropriate sediment control BMPs as needed until final stabilization is achieved; etc.

C. STORMWATER MANAGEMENT PLAN (SWMP) – CONTENTS (cont.)

- c) Final stabilization is reached when all ground surface disturbing activities at the site have been completed, and uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed.

The Division may, after consultation with the permittee and upon good cause, amend the final stabilization criteria in this section for specific operations.

5. **Inspection and Maintenance**

Part I.D.6 of the permit includes requirements for site inspections. Part I.D.7 of the permit includes requirements for BMP maintenance. The SWMP shall clearly describe the inspection and maintenance procedures implemented at the site to maintain all erosion and sediment control practices and other protective practices identified in the SWMP, in good and effective operating condition.

D. TERMS AND CONDITIONS

1. **General Limitations**

The following limitations shall apply to all discharges covered by this permit:

- a) Stormwater discharges from construction activities shall not cause, have the reasonable potential to cause, or measurably contribute to an exceedance of any water quality standard, including narrative standards for water quality.
- b) Concrete washout water shall not be discharged to state surface waters or to storm sewer systems. On-site permanent disposal of concrete washout waste is not authorized by this permit. Discharge to the ground of concrete washout waste that will subsequently be disposed of off-site is authorized by this permit. See Part I.D.3.c of the permit.
- c) Bulk storage structures for petroleum products and any other chemicals shall have secondary containment or equivalent adequate protection so as to contain all spills and prevent any spilled material from entering State waters.
- d) No chemicals are to be added to the discharge unless permission for the use of a specific chemical is granted by the Division. In granting the use of such chemicals, special conditions and monitoring may be addressed by separate correspondence.
- e) The Division reserves the right to require sampling and testing, on a case-by-case basis, in the event that there is reason to suspect that compliance with the SWMP is a problem, or to measure the effectiveness of the BMPs in removing pollutants in the effluent. Such monitoring may include Whole Effluent Toxicity testing.
- f) All site wastes must be properly managed to prevent potential pollution of State waters. This permit does not authorize on-site waste disposal.
- g) All dischargers must comply with the lawful requirements of federal agencies, municipalities, counties, drainage districts and other local agencies regarding any discharges of stormwater to storm drain systems or other water courses under their jurisdiction, including applicable requirements in municipal stormwater management programs developed to comply with CDPS permits. Dischargers must comply with local stormwater management requirements, policies or guidelines including erosion and sediment control.

2. **BMP Implementation and Design Standards**

Facilities must select, install, implement, and maintain appropriate BMPs, following good engineering, hydrologic and pollution control practices. BMPs implemented at the site must be adequately designed to provide control for all potential pollutant sources associated with construction activity to prevent pollution or degradation of State waters.

D. TERMS AND CONDITIONS (cont.)

3. **Prohibition of Non-Stormwater Discharges**

- a) Except as provided in paragraphs b, c, and d below, **all discharges covered by this permit shall be composed entirely of stormwater associated with construction activity.** Discharges of material other than stormwater must be addressed in a separate CDPS permit issued for that discharge.
- b) Discharges from the following sources that are combined with stormwater discharges associated with construction activity may be authorized by this permit, provided that the non-stormwater component of the discharge is identified in the SWMP (see Part I.C.1.g of this permit):
 - emergency fire fighting activities
 - landscape irrigation return flow
 - uncontaminated springs
- c) Discharges to the ground of concrete washout water from washing of tools and concrete mixer chutes may be authorized by this permit, provided that:
 - 1) the source is identified in the SWMP;
 - 2) BMPs are included in the SWMP in accordance with Part I.C.3(c)(7) and to prevent pollution of groundwater in violation of Part I.D.1.a; and
 - 3) these discharges do not leave the site as surface runoff or to surface waters
- d) Discharges to the ground of water from construction dewatering activities may be authorized by this permit, provided that:
 - 1) the source is groundwater and/or groundwater combined with stormwater that does not contain pollutants in concentrations exceeding the State groundwater standards in Regulations 5 CCR 1002-41 and 42;
 - 2) the source is identified in the SWMP;
 - 3) BMPs are included in the SWMP, as required by Part I.C.3(c)(8); and
 - 4) these discharges do not leave the site as surface runoff or to surface waters.

Discharges to the ground from construction dewatering activities that do not meet the above criteria must be covered under a separate CDPS discharge permit. Contaminated groundwater requiring coverage under a separate CDPS discharge permit may include groundwater contaminated with pollutants from a landfill, mining activity, industrial pollutant plume, underground storage tank, or other source.

4. **Releases in Excess of Reportable Quantities**

This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117 or 40 CFR 302. Any discharge of hazardous material must be handled in accordance with the Division's Noncompliance Notification Requirements (see Part II.A.3 of the permit).

5. **SWMP Requirements**

- a) **SWMP Preparation and Implementation:** The SWMP shall be prepared prior to applying for coverage under the general permit, and certification of its completion submitted with the application. The SWMP shall be implemented prior to commencement of construction activities. The plan shall be updated as appropriate (see paragraph c, below), below). SWMP provisions shall be implemented until expiration or inactivation of permit coverage.
- b) **SWMP Retention Requirements:** A copy of the SWMP must be retained on site unless another location, specified by the permittee, is approved by the Division.
- c) **SWMP Review/Changes:** The permittee shall amend the SWMP:
 - 1) when there is a change in design, construction, operation, or maintenance of the site, which would require the implementation of new or revised BMPs; or
 - 2) if the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity; or

D. TERMS AND CONDITIONS (cont.)

- 3) when BMPs are no longer necessary and are removed.

SWMP changes shall be made prior to changes in the site conditions, except as allowed for in paragraph d, below. SWMP revisions may include, but are not limited to: potential pollutant source identification; selection of appropriate BMPs for site conditions; BMP maintenance procedures; and interim and final stabilization practices. The SWMP changes may include a schedule for further BMP design and implementation, provided that, if any interim BMPs are needed to comply with the permit, they are also included in the SWMP and implemented during the interim period.

- d) **Responsive SWMP Changes:** SWMP changes addressing BMP installation and/or implementation are often required to be made in response to changing conditions, or when current BMPs are determined ineffective. The majority of SWMP revisions to address these changes can be made immediately with quick in-the-field revisions to the SWMP. In the less common scenario where more complex development of materials to modify the SWMP is necessary, SWMP revisions shall be made in accordance with the following requirements:
 - 1) the SWMP shall be revised as soon as practicable, but in no case more than 72 hours after the change(s) in BMP installation and/or implementation occur at the site, and
 - 2) a notation must be included in the SWMP prior to the site change(s) that includes the time and date of the change(s) in the field, an identification of the BMP(s) removed or added, and the location(s) of those BMP(s).

6. **Inspections**

Site inspections must be conducted in accordance with the following requirements and minimum schedules. The required minimum inspection schedules do not reduce or eliminate the permittee's responsibility to implement and maintain BMPs in good and effective operational condition, and in accordance with the SWMP, which could require more frequent inspections.

- a) **Minimum Inspection Schedule:** The permittee shall, at a minimum, make a thorough inspection, in accordance with the requirements in I.D.6.b below, at least once every 14 calendar days. Also, post-storm event inspections must be conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion. Provided the timing is appropriate, the post-storm inspections may be used to fulfill the 14-day routine inspection requirement. A more frequent inspection schedule than the minimum inspections described may be necessary, to ensure that BMPs continue to operate as needed to comply with the permit. The following conditional modifications to this Minimum Inspection Schedule are allowed:
 - 1) **Post-Storm Event Inspections at Temporarily Idle Sites** – If no construction activities will occur following a storm event, post-storm event inspections shall be conducted prior to re-commencing construction activities, but no later than 72 hours following the storm event. The occurrence of any such delayed inspection must be documented in the inspection record. Routine inspections still must be conducted at least every 14 calendar days.
 - 2) **Inspections at Completed Sites/Areas** – For sites or portions of sites that meet the following criteria, but final stabilization has not been achieved due to a vegetative cover that has not become established, the permittee shall make a thorough inspection of their stormwater management system at least once every month, and post-storm event inspections are not required. This reduced inspection schedule is *only* allowed if:
 - i) all construction activities that will result in surface ground disturbance are completed;
 - ii) all activities required for final stabilization, in accordance with the SWMP, have been completed, with the exception of the application of seed that has not occurred due to seasonal conditions or the necessity for additional seed application to augment previous efforts; and
 - iii) the SWMP has been amended to indicate those areas that will be inspected in accordance with the reduced schedule allowed for in this paragraph.

D. TERMS AND CONDITIONS (cont.)

- 3) **Winter Conditions Inspections Exclusion** – Inspections are not required at sites where construction activities are temporarily halted, snow cover exists over the entire site for an extended period, and melting conditions posing a risk of surface erosion do not exist. This exception is applicable only during the period where melting conditions do not exist, and applies to the routine 14-day and monthly inspections, as well as the post-storm-event inspections. The following information must be documented in the inspection record for use of this exclusion: dates when snow cover occurred, date when construction activities ceased, and date melting conditions began. Inspections, as described above, are required at all other times.

When site conditions make the schedule required in this section impractical, the permittee may petition the Division to grant an alternate inspection schedule.

b) **Inspection Requirements**

- 1) **Inspection Scope** - The construction site perimeter, all disturbed areas, material and/or waste storage areas that are exposed to precipitation, discharge locations, and locations where vehicles access the site shall be inspected for evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters. All erosion and sediment control practices identified in the SWMP shall be evaluated to ensure that they are maintained and operating correctly.
- 2) **Inspection Report/Records** - The permittee shall keep a record of inspections. Inspection reports must identify any incidents of non-compliance with the terms and conditions of this permit. Inspection records must be retained for three years from expiration or inactivation of permit coverage. At a minimum, the inspection report must include:
- i) The inspection date;
 - ii) Name(s) and title(s) of personnel making the inspection;
 - iii) Location(s) of discharges of sediment or other pollutants from the site;
 - iv) Location(s) of BMPs that need to be maintained;
 - v) Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
 - vi) Location(s) where additional BMPs are needed that were not in place at the time of inspection;
 - vii) Deviations from the minimum inspection schedule as provided in Part I.D.6.a above;
 - viii) Description of corrective action for items iii, iv, v, and vi, above, dates corrective action(s) taken, and measures taken to prevent future violations, including requisite changes to the SWMP, as necessary; and
 - viii) After adequate corrective action(s) has been taken, or where a report does not identify any incidents requiring corrective action, the report shall contain a signed statement indicating the site is in compliance with the permit to the best of the signer's knowledge and belief.

- c) **Required Actions Following Site Inspections** – Where site inspections note the need for BMP maintenance activities, BMPs must be maintained in accordance with the SWMP and Part I.D.7 of the permit. Repair, replacement, or installation of new BMPs determined necessary during site inspections to address ineffective or inadequate BMPs must be conducted in accordance with Part I.D.8 of the permit. SWMP updates required as a result of deficiencies in the SWMP noted during site inspections shall be made in accordance with Part I.D.5.c of the permit.

7. **BMP Maintenance**

All erosion and sediment control practices and other protective measures identified in the SWMP must be maintained in effective operating condition. Proper selection and installation of BMPs and implementation of comprehensive Inspection and Maintenance procedures, in accordance with the SWMP, should be adequate to meet this condition. BMPs that are not adequately maintained in accordance with good engineering, hydrologic and pollution control practices, including removal of collected sediment outside the acceptable tolerances of the BMPs, are considered to be no longer operating effectively and must be addressed in accordance with Part I.D.8, below. A specific timeline for implementing maintenance procedures is not included in this permit because BMP maintenance is expected to be proactive, not responsive. Observations resulting in BMP maintenance activities can be made during a site inspection, or during general observations of site conditions.

D. TERMS AND CONDITIONS (cont.)

8. **Replacement and Failed BMPs**

Adequate site assessment must be performed as part of comprehensive Inspection and Maintenance procedures, to assess the adequacy of BMPs at the site, and the necessity of changes to those BMPs to ensure continued effective performance. Where site assessment results in the determination that new or replacement BMPs are necessary, the BMPs must be installed to ensure on-going implementation of BMPs as per Part I.D.2.

Where BMPs have failed, resulting in noncompliance with Part I.D.2, they must be addressed as soon as possible, immediately in most cases, to minimize the discharge of pollutants.

When new BMPs are installed or BMPs are replaced, the SWMP must be updated in accordance with Part I.D.5(c).

9. **Reporting**

No scheduled reporting requirements are included in this permit; however, the Division reserves the right to request that a copy of the inspection reports be submitted.

10. **SWMP Availability**

A copy of the SWMP shall be provided upon request to the Division, EPA, or any local agency in charge of approving sediment and erosion plans, grading plans or stormwater management plans, and within the time frame specified in the request. If the SWMP is required to be submitted to any of these entities, it must include a signed certification in accordance with Part I.F.1 of the permit, certifying that the SWMP is complete and meets all permit requirements.

All SWMPs required under this permit are considered reports that shall be available to the public under Section 308(b) of the CWA and Section 61.5(4) of the Colorado Discharge Permit System Regulations. The permittee shall make plans available to members of the public upon request. However, the permittee may claim any portion of a SWMP as confidential in accordance with 40 CFR Part 2.

11. **Total Maximum Daily Load (TMDL)**

If a TMDL has been approved for any waterbody into which the permittee discharges, and stormwater discharges associated with construction activity have been assigned a pollutant-specific Wasteload Allocation (WLA) under the TMDL, the Division will either:

- a) Ensure that the WLA is being implemented properly through alternative local requirements, such as by a municipal stormwater permit; or
- b) Notify the permittee of the WLA, and amend the permittee's certification to add specific BMPs and/or other requirements, as appropriate. The permittee may be required to do the following:
 - 1) Under the permittee's SWMP, implement specific management practices based on requirements of the WLA, and evaluate whether the requirements are being met through implementation of existing stormwater BMPs or if additional BMPs are necessary. Document the calculations or other evidence that show that the requirements are expected to be met; and
 - 2) If the evaluation shows that additional or modified BMPs are necessary, describe the type and schedule for the BMP additions/revisions.

Discharge monitoring may also be required. The permittee may maintain coverage under the general permit provided they comply with the applicable requirements outlined above. The Division reserves the right to require individual or alternate general permit coverage.

E. ADDITIONAL DEFINITIONS

For the purposes of this permit:

1. **Best Management Practices (BMPs):** schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, pollution prevention, and practices to control site runoff, spillage or leaks, waste disposal, or drainage from material storage.
2. **Dedicated asphalt plants and concrete plants:** portable asphalt plants and concrete plants that are located on or adjacent to a construction site and that provide materials only to that specific construction site.
3. **Final stabilization:** when all ground surface disturbing activities at the site have been completed, and uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed. For purposes of this permit, establishment of a vegetative cover capable of providing erosion control equivalent to pre-existing conditions at the site will be considered final stabilization.
4. **Municipal separate storm sewer system:** a conveyance or system of conveyances (including: roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), owned or operated by a State, city, town, county, district, or other public body (created by state law), having jurisdiction over disposal of sewage, industrial waste, stormwater, or other wastes; designed or used for collecting or conveying stormwater.
5. **Operator:** the entity that has day-to-day supervision and control of activities occurring at the construction site. This can be the owner, the developer, the general contractor or the agent of one of these parties, in some circumstances. It is anticipated that at different phases of a construction project, different types of parties may satisfy the definition of 'operator' and that the permit may be transferred as the roles change.
6. **Outfall:** a point source at the point where stormwater leaves the construction site and discharges to a receiving water or a stormwater collection system.
7. **Part of a larger common plan of development or sale:** a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules.
8. **Point source:** any discernible, confined and discrete conveyance from which pollutants are or may be discharged. Point source discharges of stormwater result from structures which increase the imperviousness of the ground which acts to collect runoff, with runoff being conveyed along the resulting drainage or grading pattern.
9. **Pollutant:** dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal or agricultural waste.
10. **Process water:** any water which, during manufacturing or processing, comes into contact with or results from the production of any raw material, intermediate product, finished product, by product or waste product. This definition includes mine drainage.
11. **Receiving Water:** any classified stream segment (including tributaries) in the State of Colorado into which stormwater related to construction activities discharges. This definition includes all water courses, even if they are usually dry, such as borrow ditches, arroyos, and other unnamed waterways.
12. **Significant Materials** include, but are not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharge.
13. **Stormwater:** precipitation-induced surface runoff.

F. GENERAL REQUIREMENTS

1. **Signatory Requirements**

- a) All reports required for submittal shall be signed and certified for accuracy by the permittee in accordance with the following criteria:
 - 1) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates;
 - 2) In the case of a partnership, by a general partner;
 - 3) In the case of a sole proprietorship, by the proprietor;
 - 4) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee, if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates.
- b) **Changes to authorization.** If an authorization under paragraph a) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph a) of this section must be submitted to the Division, prior to or together with any reports, information, or applications to be signed by an authorized representative.
- c) **Certification.** Any person signing a document under paragraph a) of this section shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

2. **Retention of Records**

- a) The permittee shall retain copies of the SWMP and all reports required by this permit and records of all data used to complete the application to be covered by this permit, for three years after expiration or inactivation of permit coverage.
- b) The permittee shall retain a copy of the SWMP required by this permit at the construction site from the date of project initiation to the date of expiration or inactivation of permit coverage, unless another location, specified by the permittee, is approved by the Division.

3. **Monitoring**

The Division reserves the right to require sampling and testing, on a case-by-case basis (see Part I.D.1.e), for example to implement the provisions of a TMDL (see Part I.D.11 of the permit). Reporting procedures for any monitoring data collected will be included in the notification by the Division of monitoring requirements.

If monitoring is required, the following definitions apply:

- a) The **thirty (30) day average** shall be determined by the arithmetic mean of all samples collected during a thirty (30) consecutive-day period.
- b) A **grab** sample, for monitoring requirements, is a single “dip and take” sample.

PART II

A. MANAGEMENT REQUIREMENTS

1. Amending a Permit Certification

The permittee shall inform the Division (Permits Section) in writing of changes to the information provided in the permit application, including the legal contact, the project legal description or map originally submitted with the application, or the planned total disturbed acreage. The permittee shall furnish the Division with any plans and specifications which the Division deems reasonably necessary to evaluate the effect on the discharge and receiving stream. If applicable, this notification may be accomplished through submittal of an application for a CDPS process water permit authorizing the discharge. The SWMP shall be updated and implemented prior to the changes (see Part I.D.5.c).

Any discharge to the waters of the State from a point source other than specifically authorized by this permit or a different CDPS permit is prohibited.

2. Special Notifications - Definitions

- a) **Spill:** An unintentional release of solid or liquid material which may cause pollution of state waters.
- b) **Upset:** An exceptional incident in which there is unintentional and temporary noncompliance with permit discharge limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

3. Noncompliance Notification

- a) The permittee shall report the following instances of noncompliance:
 - 1) Any noncompliance which may endanger health or the environment;
 - 2) Any spill or discharge of hazardous substances or oil which may cause pollution of the waters of the state.
 - 3) Any discharge of stormwater which may cause an exceedance of a water quality standard.
- b) For all instances of noncompliance based on environmental hazards and chemical spills and releases, all needed information must be provided orally to the Colorado Department of Public Health and Environment spill reporting line (24-hour number for environmental hazards and chemical spills and releases: 1-877-518-5608) within 24 hours from the time the permittee becomes aware of the circumstances.

For all other instances of noncompliance as defined in this section, all needed information must be provided orally to the Water Quality Control Division within 24 hours from the time the permittee becomes aware of the circumstances.

For all instances of noncompliance identified here, a written submission shall also be provided within 5 calendar days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of:

- 1) The noncompliance and its cause;
- 2) The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue;
- 3) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

A. MANAGEMENT REQUIREMENTS (cont.)

4. **Submission of Incorrect or Incomplete Information**

Where the permittee failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or report to the Division, or relevant new information becomes available, the permittee shall promptly submit the relevant application information which was not submitted or any additional information needed to correct any erroneous information previously submitted.

5. **Bypass**

- a) A bypass, which causes effluent limitations (i.e., requirements to implement BMPs in accordance with Parts I.B.3 and I.D.2 of the permit) to be exceeded is prohibited, and the Division may take enforcement action against a permittee for such a bypass, unless:
 - 1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - 2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities (e.g., alternative BMPs), retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if the permittee could have installed adequate backup equipment (e.g., implemented additional BMPs) to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
 - 3) The permittee submitted notices as required in "Non-Compliance Notification," Part II.A.3.

6. **Upsets**

- a) **Effect of an Upset:** An upset constitutes an affirmative defense to an action brought for noncompliance with permit limitations and requirements if the requirements of paragraph b of this section are met. (No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.)
- b) **Conditions Necessary for a Demonstration of Upset:** A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed contemporaneous operating logs, or other relevant evidence that:
 - 1) An upset occurred and that the permittee can identify the specific cause(s) of the upset;
 - 2) The permitted facility was at the time being properly operated;
 - 3) The permittee submitted notice of the upset as required in Part II.A.3. of this permit (24-hour notice); and
 - 4) The permittee complied with any remedial measures required under 40 CFR Section 122.41(d) of the federal regulations or Section 61.8(3)(h) of the Colorado Discharge Permit System Regulations.
- c) **Burden of Proof:** In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

7. **Removed Substances**

Solids, sludges, or other pollutants removed in the course of treatment or control of discharges shall be properly disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the State.

8. **Minimization of Adverse Impact**

The permittee shall take all reasonable steps to minimize any adverse impact to waters of the State resulting from noncompliance with any terms and conditions specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

A. MANAGEMENT REQUIREMENTS (cont.)

9. **Reduction, Loss, or Failure of Stormwater Controls**

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the permit requirements. Upon reduction, loss, or failure of any stormwater controls, the permittee shall, to the extent necessary to maintain compliance with its permit, control production, or remove all pollutant sources from exposure to stormwater, or both, until the stormwater controls are restored or an alternative method of treatment/control is provided.

It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

10. **Proper Operation and Maintenance**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

B. RESPONSIBILITIES

1. **Inspections and Right to Entry**

The permittee shall allow the Director of the State Water Quality Control Division, the EPA Regional Administrator, and/or their authorized representative(s), upon the presentation of credentials:

- a) To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;
- b) At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit and to inspect any monitoring equipment or monitoring method required in the permit; and
- c) To enter upon the permittee's premises to investigate, within reason, any actual, suspected, or potential source of water pollution, or any violation of the Colorado Water Quality Control Act. The investigation may include, but is not limited to, the following: sampling of any discharge and/or process waters, the taking of photographs, interviewing permittee staff on alleged violations and other matters related to the permit, and access to any and all facilities or areas within the permittee's premises that may have any effect on the discharge, permit, or any alleged violation.

2. **Duty to Provide Information**

The permittee shall furnish to the Division, within the time frame specified by the Division, any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or inactivating coverage under this permit, or to determine compliance with this permit. The permittee shall also furnish to the Division, upon request, copies of records required to be kept by this permit.

3. **Transfer of Ownership or Control**

Certification under this permit may be transferred to a new permittee if:

- a) The current permittee notifies the Division in writing when the transfer is desired as outlined in Part I.A.7; and
- b) The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between them; and
- c) The current permittee has met all fee requirements of the Colorado Discharge Permit System Regulations, Section 61.15.

B. RESPONSIBILITIES (cont.)

4. **Modification, Suspension, or Revocation of Permit By Division**

All permit modification, inactivation or revocation and reissuance actions shall be subject to the requirements of the Colorado Discharge Permit System Regulations, Sections 61.5(2), 61.5(3), 61.7 and 61.15, 5 C.C.R. 1002-61, except for minor modifications.

- a) This permit, and/or certification under this permit, may be modified, suspended, or revoked in whole or in part during its term for reasons determined by the Division including, but not limited to, the following:
 - 1) Violation of any terms or conditions of the permit;
 - 2) Obtaining a permit by misrepresentation or failing to disclose any fact which is material to the granting or denial of a permit or to the establishment of terms or conditions of the permit;
 - 3) Materially false or inaccurate statements or information in the application for the permit;
 - 4) Promulgation of toxic effluent standards or prohibitions (including any schedule of compliance specified in such effluent standard or prohibition) which are established under Section 307 of the Clean Water Act, where such a toxic pollutant is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit.
- b) This permit, and/or certification under this permit, may be modified in whole or in part due to a change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge, such as:
 - 1) Promulgation of Water Quality Standards applicable to waters affected by the permitted discharge; or
 - 2) Effluent limitations or other requirements applicable pursuant to the State Act or federal requirements; or
 - 3) Control regulations promulgated; or
 - 4) Other available information indicates a potential for violation of adopted Water Quality Standards or stream classifications.
- c) This permit, or certification under this permit, may be modified in whole or in part to include new effluent limitations and other appropriate permit conditions where data submitted pursuant to Part I indicate that such effluent limitations and permit conditions are necessary to ensure compliance with applicable water quality standards and protection of classified uses.
- d) At the request of the permittee, the Division may modify or inactivate certification under this permit if the following conditions are met:
 - 1) In the case of inactivation, the permittee notifies the Division of its intent to inactivate the certification, and certifies that the site has been finally stabilized;
 - 2) In the case of inactivation, the permittee has ceased any and all discharges to state waters and demonstrates to the Division there is no probability of further uncontrolled discharge(s) which may affect waters of the State.
 - 3) The Division finds that the permittee has shown reasonable grounds consistent with the Federal and State statutes and regulations for such modification, amendment or inactivation;
 - 4) Fee requirements of Section 61.15 of the Colorado Discharge Permit System Regulations have been met; and
 - 5) Applicable requirements of public notice have been met.

For small construction sites covered by a Qualifying Local Program, coverage under this permit is automatically terminated when a site has been finally stabilized.

B. RESPONSIBILITIES (cont.)

5. **Permit Violations**

Failure to comply with any terms and/or conditions of this permit shall be a violation of this permit.

Dischargers of stormwater associated with industrial activity, as defined in the EPA Stormwater Regulation (40 CFR 122.26(b)(14) and Section 61.3(2) of the Colorado Discharge Permit System Regulations, which do not obtain coverage under this or other Colorado general permits, or under an individual CDPS permit regulating industrial stormwater, will be in violation of the federal Clean Water Act and the Colorado Water Quality Control Act, 25-8-101, as amended. Failure to comply with CDPS permit requirements will also constitute a violation.

6. **Legal Responsibilities**

The issuance of this permit does not convey any property or water rights in either real or personal property, or stream flows, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority granted by Section 510 of the Clean Water Act.

7. **Severability**

The provisions of this permit are severable. If any provisions of this permit, or the application of any provision of this permit to any circumstance, are held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

8. **Renewal Application**

If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least ninety (90) days before this permit expires. If the permittee anticipates that there will be no discharge after the expiration date of this permit, the Division should be promptly notified so that it can inactivate the certification in accordance with Part II.B.4.d.

9. **Confidentiality**

Except for data determined to be confidential under Section 308 of the Federal Clean Water Act and Colorado Discharge Permit System Regulations, Section 61.5(4), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division. The permittee must state what is confidential at the time of submittal.

Any information relating to any secret process, method of manufacture or production, or sales or marketing data which has been declared confidential by the permittee, and which may be acquired, ascertained, or discovered, whether in any sampling investigation, emergency investigation, or otherwise, shall not be publicly disclosed by any member, officer, or employee of the Commission or the Division, but shall be kept confidential. Any person seeking to invoke the protection of this section shall bear the burden of proving its applicability. This section shall never be interpreted as preventing full disclosure of effluent data.

10. **Fees**

The permittee is required to submit payment of an annual fee as set forth in the Water Quality Control Act. Failure to submit the required fee when due and payable is a violation of the permit and will result in enforcement action pursuant to Section 25-8-601 et. seq., C.R.S. 1973 as amended.

B. RESPONSIBILITIES (cont.)

11. **Requiring an Individual CDPS Permit**

The Director may require the permittee to apply for and obtain an individual or alternate general CDPS permit if:

- a) The discharger is not in compliance with the conditions of this general permit;
- b) Conditions or standards have changed so that the discharge no longer qualifies for a general permit; or
- c) Data/information become available which indicate water quality standards may be violated.

The permittee must be notified in writing that an application for an individual or alternate general CDPS permit is required. When an individual or alternate general CDPS permit is issued to an operator otherwise covered under this general permit, the applicability of this general permit to that operator is automatically inactivated upon the effective date of the individual or alternate general CDPS permit.

RATIONALE

STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

GENERAL PERMIT IN COLORADO THIRD RENEWAL COLORADO DISCHARGE PERMIT NUMBER COR-030000

| | CONTENTS | PAGE |
|-------|--|-------------|
| I. | <i>Introduction</i> | <i>1</i> |
| II. | <i>Changes in this General Permit</i> | <i>1</i> |
| III. | <i>Background</i> | <i>8</i> |
| IV. | <i>Stormwater Discharges Associated with Construction Activity</i> | <i>9</i> |
| V. | <i>Coverage Under this Permit</i> | <i>10</i> |
| VI. | <i>Application and Certification</i> | <i>10</i> |
| VII. | <i>Qualifying Local Programs</i> | <i>11</i> |
| VIII. | <i>Terms and Conditions of Permit</i> | <i>11</i> |
| IX. | <i>Public Notice – 12/22/06</i> | <i>15</i> |
| X. | <i>Public Notice – 3/23/07</i> | <i>15</i> |

I. INTRODUCTION

This permit is for the regulation of stormwater runoff from construction activities, and specific allowable non-stormwater discharges in accordance with Part I.D.3 of the permit. The term "construction activity" includes ground surface disturbing activities, including, but not limited to, clearing, grading, excavation, demolition, installation of new or improved haul and access roads, staging areas, stockpiling of fill materials, and borrow areas. "Stormwater" is precipitation-induced surface runoff. This rationale will explain the background of the Stormwater program, activities which are covered under this permit, how to apply for coverage under this permit, and the requirements of this permit.

The forms discussed in the rationale and permit are available on the Water Quality Control Division's website at: www.cdphe.state.co.us/wq/PermitsUnit

II. CHANGES IN THIS GENERAL PERMIT

Several notable changes from the previous General Permit for Construction Activities have been incorporated into this permit. Significant changes are listed below. Numerous other minor changes were made for clarification purposes only.

A. Authority to Discharge

This section has been restructured to list all of the types of activities covered by this permit, and to be consistent with the definition of "construction activity." The definition of construction activity has been expanded to provide clarification. See Part I.A.1 of the permit.

II. CHANGES IN THIS GENERAL PERMIT (cont.)

B. Authority to Discharge – Oil and Gas Construction

This section has been added, to take into account a regulatory change. The federal Energy Policy Act of 2005 exempts nearly all oil and gas construction activities from federal requirements under the Clean Water Act's NPDES stormwater discharge permit program. In January 2006, the Colorado Water Quality Control Commission held a hearing to determine what effects, if any, the change in federal law would have upon Colorado's stormwater regulations. The Commission determined that oil and gas construction sites in Colorado that disturb one or more acres are still required to be covered under Colorado's stormwater permitting regulations (Colorado Discharge Permit System (CDPS) regulations (5CCR 1002-61)). In practice, oil and gas construction sites have the same requirements under this permit as do other types of construction. However, this permit contains some references to the federal Clean Water Act; generally these references are not applicable to oil and gas construction sites to the extent that the references are limited by the federal Energy Policy Act of 2005. See Part I.A.1(b) of the permit.

C. Application Requirements

The permit application requirements have changed slightly, including the addition of an email address, if available. See Part I.A.4(b).

The applicant must be either the owner and/or operator of the construction site. An operator at a construction site that is not covered by a certification held by an appropriate entity may be held liable for operating without the necessary permit coverage.

D. Temporary Coverage

Part I.A.5(d) of the previous permit (effective July 1, 2002) dealt with temporarily covering a facility under the general permit even if an individual permit is more appropriate. This permit section essentially duplicated the previous section (see Part I.A.5(c)), and so it has been deleted.

E. Reassignment of Permit Coverage

Procedures have been added to clarify the requirements for the transfer of coverage of specific portions of a permitted site to a second party. See Section VIII.I.3 of the rationale and Part I.A.8 of the permit.

F. Individual Permit Criteria

This section has been modified to include situations involving a Total Maximum Daily Load (TMDL). See Part I.A.11 of the permit.

G. Stormwater Management Plan (SWMP)

The Stormwater Management Plan section has been divided into two parts: Stormwater Management Plan (SWMP) – General Requirements, which provides the basic framework and general requirements for the SWMP, and Stormwater Management Plan (SWMP) – Contents, which specifically identifies each item that must be addressed in the SWMP. See Parts I.B and I.C of the permit.

H. Stormwater Management Plan (SWMP) – General Requirements

The SWMP General Requirements section has been modified to require that the SWMP be updated in accordance with Parts I.D.5(c) and I.D.5(d) of the permit (SWMP Review/Changes). This additional requirement ensures that the SWMP provisions reflect current site conditions. See Part I.B.2(c) of the permit.

II. CHANGES IN THIS GENERAL PERMIT (cont.)

I. Stormwater Management Plan (SWMP) – Contents

The SWMP Contents section has been modified. Some of the changes are limited to organization of information, which does not require modification of an existing permittee's current SWMP. Most of the SWMP changes involve either clarifications, reformatting, or taking recommendations from the Division's SWMP guide and making them permit requirements (e.g., vehicle tracking controls, BMP installation specifications). If an **existing permittee (i.e., those with permit coverage before June 30, 2007)** followed the recommendations in the SWMP guide (Appendix A of the permit application), then their SWMP will presumably meet the new requirements. However, for any existing permittees who did not follow the applicable SWMP guide recommendations, their SWMP must be amended to include the new required items:

-SWMP Administrator

-Identification of potential pollutant sources

-Best Management Practices descriptions and installation specifications, including dedicated concrete or asphalt batch plants; vehicle tracking control; and waste management and disposal (including concrete washout activities).

For existing permittees, any SWMP changes based on the change in permit requirements must be completed by **October 1, 2007**. The plan is not to be submitted to the Division unless requested, but must be available on site as outlined in Part I.D.5(b) of the permit.

The BMP requirement clarifications included in this renewed permit in no way imply that adequate BMPs to address all pollutant sources at a permitted site were not required in previous permits. The revised requirements are intended only to better clarify SWMP content requirements and provide improved direction to permittees.

The SWMP changes are listed below. All new applicants (after June 30, 2007) for permit coverage for their sites must fully comply with the new SWMP organization, plan requirements, and implementation.

1. **Site Description:** The requirement to provide an estimate of the run-off coefficient has been removed. The run-off coefficient as currently utilized in the SWMP may not contribute sufficiently to permit compliance to justify the effort in determining accurate values. See Part I.C.1 of the permit. However, the Division still encourages use of the coefficient as needed to adequately evaluate site-specific BMP selection and design criteria (e.g., pond capacities, BMP location, etc.) See Section C.2 of the SWMP guidance (Appendix A of the permit application).
2. **Site Map:** The requirement to identify boundaries of the 100-year flood plain has been removed. The boundaries as currently utilized in the SWMP may not contribute sufficiently to permit compliance to justify the effort in determining their location. See Part I.C.2 of the permit.
3. **Stormwater Management Controls:** This section has been modified to require identification of a SWMP Administrator and all potential pollutants sources in the SWMP. See Part I.C.3 of the permit.
 - a) The SWMP Administrator is a specific individual(s), position or title who is responsible for the process of developing, implementing, maintaining, and revising the SWMP. This individual serves as the comprehensive point of contact for all aspects of the facility's SWMP. **This requirement may necessitate changes to existing permittees' SWMPs.**

II. CHANGES IN THIS GENERAL PERMIT (cont.)

- b) *The requirement to identify Potential Pollutant Sources has been expanded to include more details for the evaluation of such sources. This evaluation allows for the appropriate selection of BMPs for implementation at a facility or site. Additionally, this section was added to be consistent with the SWMP guide. **This requirement may necessitate changes to existing permittees' SWMPs.***
- c) *Best Management Practices (BMPs) for Stormwater Pollution Prevention: This section was modified to require the following items to be addressed in the SWMP. **These requirements may necessitate changes to existing permittees' SWMPs.** This section also requires that the SWMP provide installation and implementation specifications for each BMP identified in the SWMP. For structural BMPs, in most cases, this must include a technical drawing to provide adequate installation specifications. See Part I.C.3(c).*
 - i) *Dedicated concrete or asphalt batch plants. This section requires that the practices used to reduce the pollutants in stormwater discharges associated with dedicated concrete or asphalt batch plants be identified in the SWMP. (Coverage under the construction site SWMP and permit is not required for batch plants if they have alternate CDPS permit coverage.)*
 - ii) *Vehicle tracking control. This section requires that practices be implemented to control sediment from vehicle tracking, and that all such practices implemented at the site be clearly described in the SWMP.*
 - iii) *Waste management and disposal. This section requires that the practices implemented at the site to control stormwater pollution from construction site waste, including concrete washout activities, be clearly described in the SWMP. It also requires that concrete washout activities be conducted in a manner that does not contribute pollutants to surface waters or stormwater runoff.*
 - iv) *Concrete Washout Water. Part I.D.3(c) of the permit has been revised to conditionally authorize discharges to the ground of concrete wash water from washing of tools and concrete mixer chutes when appropriate BMPs are implemented. The permit prohibits the discharge of concrete washout water to surface waters and to storm sewer systems. Part I.C.3(c)(7) of the permit requires that BMPs be in place to prevent surface discharges of concrete washout water from the site.*

The use of unlined pits to contain concrete washout water is a common practice in Colorado. The Division has further evaluated the need for a permit for discharge of concrete washout water to the ground. The Division has determined that the use of appropriate BMPs for on-site washing of tools and concrete mixer chutes would prevent any significant discharge to groundwater. BMPs to protect groundwater are required by Part I.C.3(c)(7) of the permit. Because pH is a pollutant of concern for washout activities, the soil must have adequate buffering capacity to result in protection of the groundwater standard, or a liner/containment must be used. The following management practices are recommended to prevent an impact from unlined pits to groundwater:

- (1) the use of the washout site should be temporary (less than 1 year), and*
- (2) the washout site should be not be located in an area where shallow groundwater may be present, such as near natural drainages, springs, or wetlands.*

II. CHANGES IN THIS GENERAL PERMIT (cont.)

Where adequate management practices are not followed to protect groundwater quality, the Department may require discharges to unlined pits to cease, or require the entity to obtain alternate regulatory approval through notice from either the Water Quality Control Division or the Hazardous Materials and Waste Management Division.

In addition, Part I.D.1(b) of the permit has been revised to clearly state that the permit does not authorize on-site permanent disposal of concrete washout waste, only temporary containment of concrete washout water from washing of tools and concrete mixer chutes. Upon termination of use of the washout site, accumulated solid waste, including concrete waste and any contaminated soils, must be removed from the site to prevent on-site disposal of solid waste.

- v) *Construction Dewatering. Part I.D.3(d) of the permit has been revised to conditionally authorize discharges to the ground of water from construction dewatering activities when appropriate BMPs are implemented. The permit does not authorize the discharge of groundwater from construction dewatering to surface waters or to storm sewer systems. Part I.C.3(c)(8) of the permit requires that BMPs be in place to prevent surface discharges. The permittee may apply for coverage under a separate CDPS discharge permit, such as the Construction Dewatering general permit, if there is a potential for discharges to surface waters.*

The Division has determined that potential pollutant sources introduced into groundwater from construction dewatering operations do not have a reasonable potential to result in exceedance of groundwater standards when the discharge is to the ground. The primary pollutant of concern in uncontaminated groundwater is sediment. Although technology-based standards for sediment do exist in 5 CCR 1002-41, the discharge of sediment to the ground as part of construction dewatering does not have the reasonable potential to result in transport of sediment to the groundwater table so as to result in an exceedance of those standards.

For a discharge of water contaminated with other pollutants that are present in concentrations that may cause an exceedance of groundwater standards, separate CDPS discharge permit coverage is required. Contaminated groundwater may include that contaminated with pollutants from a landfill, mining activity, industrial pollutant plume, underground storage tank, or other source of human-induced groundwater pollution and exceeding the State groundwater standards in Regulations 5 CCR 1002-41 and 42.

J. Terms and Conditions, General Limitations and Design Standards

This section reiterates the requirement that facilities select, install, implement, and maintain appropriate BMPs, following good engineering, hydrologic and pollution control practices. In addition, requirements for protection of water quality standards (see Part I.D.1.(a) of the permit) and requirements to adequately design BMPs to prevent pollution or degradation of State waters (see Part I.D.2 of the permit) have been revised and are fully discussed in Part III.B of the rationale, below. Additional language was also added to Section III.B of the rationale further clarifying the expectations for compliance with this permit.

1. Management of Site Waste

This section has been modified to clarify that on-site waste must be properly managed to prevent potential pollution of State waters, and that this permit does not authorize on-site waste disposal. Solid waste disposal is regulated by the Hazardous Materials and Waste Management Division.

II. CHANGES IN THIS GENERAL PERMIT (cont.)

K. Terms and Conditions, SWMP Requirements

1. **SWMP Review/Changes:** This section now requires that when changes are made to site conditions, the SWMP must be revised immediately, except for some BMP description changes which conditionally may occur within 72 hours. This requirement is included to both ensure that the SWMP be kept accurate and up-to-date, and to clarify that stormwater management at a site typically should be proactive instead of responsive, and be integrated into site management to ensure it is calibrated with those changes. The section was also clarified to state that only changes in site conditions that do not require new or modified BMPs do not need to be addressed in the SWMP. See Part I.D.5(c) of the permit.
2. **SWMP Certification:** The previous permit was unclear on a requirement that the copy of SWMP that remains at the facility had to be signed in accordance with permit signatory requirements. This requirement has been deleted. The signatory requirement of Part I.F.1 only applies to the SWMP if it is to be submitted to the Division or to EPA. See Part I.F.1 of the permit.

L. Terms and Conditions, Post-Storm Inspections

The previous permit required post-storm inspections, but did not specify the timing of inspections. This section now requires that post-storm event inspections generally be conducted within 24 hours of the event. An alternative timeline has been allowed, only for sites where there are no construction activities occurring following a storm event. For this condition, post-storm event inspections shall instead be conducted prior to commencing construction activities, but no later than 72 hours following the storm event, and the delay noted in the inspection report.

Any exception from the minimum inspection schedule is temporary, and does not eliminate the requirement to perform routine maintenance due to the effects of a storm event, including maintaining vehicle tracking controls and removing sediment from impervious areas. In many cases, maintenance needs will require a more frequent inspection schedule than the minimum inspections required in the permit, to ensure that BMPs continue to operate as needed to comply with the permit. See Part I.D.6(a) of the permit.

M. Terms and Conditions, Inspections

1. The Winter Conditions Inspection Exclusion section has been modified to include documentation requirements for this exclusion. See Part I.D.6(a) of the permit. The Inspection Scope has been modified to include the requirement to inspect waste storage areas during inspections conducted in accordance with the permit. See Part I.D.6(b) of the permit.
2. The requirements for sites to qualify for reduced inspection frequencies for completed sites have been slightly modified (see Part I.D.6(a)(2) of the permit,). The requirement now is that only construction activities that disturb the ground surface must be completed. Construction activities that can be conducted without disturbance of the ground surface; for example, interior building construction, and some oil well activities, would not prohibit a site from otherwise qualifying for the reduced inspection frequency. In addition, the requirement for the site to be prepared for final stabilization has been slightly modified to allow for sites that have not yet been seeded to qualify, as long as the site has otherwise been prepared for final stabilization, including completion of appropriate soil preparation, amendments and stabilization practice. This will allow for sites with seasonal seeding limitations or where additional seed application may be needed in the future to still qualify.

II. *CHANGES IN THIS GENERAL PERMIT (cont.)*

3. *The Inspection Report/Records section (Part I.D.6(b)(2)) was added to clarify requirements for inspection reports generated during an inspection conducted in accordance with Part I.D.6 of the permit. Inspection reports must be signed by the inspector, or the individual verifying the corrective action indicated in the inspection report, on behalf of the permittee. Inspection reports are not typically required to be submitted to the Division, and therefore, are not required to be signed and certified for accuracy in accordance with Part I.F.1 of the permit. However, any inspection reports that are submitted to the Division must follow the signatory requirements contained in that section.*

N. *Terms and Conditions, Maintenance, Repair, and Replacement of Control Practices*

These sections have been added to clarify requirements for maintaining the BMPs identified in the SWMP and for addressing ineffective or failed BMPs. BMP maintenance and site assessment to determine the overall adequacy of stormwater quality management at the site must occur proactively, in order to ensure adequate control of pollutant sources at the site. In most cases, if BMPs are already not operating effectively, or have failed, the issue must be addressed immediately, to prevent discharge of pollutants. See Parts I.D.7 and I.D.8 of the permit.

O. *Total Maximum Daily Load (TMDL)*

A section on TMDLs has been added. This section gives a general outline of the additional requirements that may be imposed by the Division if the facility discharges to a waterbody for which a stormwater-related TMDL is in place. See Section VIII.C of the rationale and Part I.D.11 of the permit.

P. *Additional Definitions*

Part I.E of the permit has been modified to remove the definition of runoff coefficient, as it is no longer a permit requirement. The definition for state waters has also been deleted, but can be found in Regulation 61.

Q. *Changes in Discharge*

The section on the types of discharge or facility changes that necessitate Division notification has been clarified. See Part II.A.1 of the permit.

R. *Non-Compliance Notification*

The section on notification to the Division regarding instances of non-compliance has been amended to clarify which types of noncompliance require notification. See Part II.A.3 of the permit.

S. *Short Term Certifications*

The previous permit allowed small short-term construction activities to be authorized for a predetermined period from 3 to 12 months, and then automatically expire (an inactivation request did not need to be submitted). The issuance of these certifications has led to significant confusion and incidents of noncompliance resulting from permittees unintentionally letting their certifications expire prior to final stabilization, as well as issues regarding billing. Therefore, the provisions for short-term certifications have been deleted.

T. *Bypass*

The Division has revised the Bypass conditions in Part II.A.5 of the permit to be consistent with the requirements of Regulation 61.8(3)(i). The revised language addresses under what rare occurrences BMPs may be bypassed at a site.

III. BACKGROUND

As required under the Clean Water Act amendments of 1987, the Environmental Protection Agency (EPA) has established a framework for regulating municipal and industrial stormwater discharges. This framework is under the National Pollutant Discharge Elimination System (NPDES) program (Note: The Colorado program is referred to as the Colorado Discharge Permit System, or CDPS, instead of NPDES.) The Water Quality Control Division ("the Division") has stormwater regulations (5CCR 1002-61) in place. These regulations require specific types of industrial facilities that discharge stormwater associated with industrial activity (industrial stormwater), to obtain a CDPS permit for such discharge. The regulations specifically include construction activities that disturb one acre of land or more as industrial facilities. Construction activities that are part of a larger common plan of development which disturb one acre or more over a period of time are also included.

A. General Permits

The Division has determined that the use of general permits is the appropriate procedure for handling most of the thousands of industrial stormwater applications within the State.

B. Permit Requirements

This permit does not impose numeric effluent limits or require submission of effluent monitoring data in the permit application or in the permit itself. The permit instead imposes practice-based effluent limitations for stormwater discharges through the requirement to develop and implement a Stormwater Management Plan (SWMP). The narrative permit requirements include prohibitions against discharges of non-stormwater (e.g., process water). See Part I.D.3 of the permit.

The permit conditions for the SWMP include the requirement for dischargers to select, implement and maintain Best Management Practices (BMPs) at a permitted construction site that adequately minimize pollutants in the discharges to assure compliance with the terms and conditions of the permit. Part I.D.2 of the permit includes basic design standards for BMPs implemented at the site. Facilities must select, install, implement, and maintain appropriate BMPs, following good engineering, hydrologic and pollution control practices. BMPs implemented at the site must be adequately designed to control all potential pollutant sources associated with construction activity to prevent pollution or degradation of State waters. Pollution is defined in CDPS regulations (5CCR 1002-61) as man-made or man-induced, or natural alteration of the physical, chemical, biological, and radiological integrity of water. Utilizing industry-accepted standards for BMP selection that are appropriate for the conditions and pollutant sources present will typically be adequate to meet these criteria, since construction BMPs are intended to prevent the discharge of all but minimal amounts of sediment or other pollutants that would not result in actual pollution of State waters, as defined above. However, site-specific design, including ongoing assessment of BMPs and pollutant sources, is necessary to ensure that BMPs operate as intended.

The permit further requires that stormwater discharges from construction activities shall not cause, have the reasonable potential to cause, or measurably contribute to an excursion above any water quality standard, including narrative standards for water quality. This condition is the basis for all CDPS Discharge permits, and addresses the need to ensure that waters of the State maintain adequate water quality, in accordance with water quality standards, to continue to meet their designated uses. It is believed that, in most cases, BMPs can be adequate to meet applicable water quality standards. If water quality impacts are noted, or the Division otherwise determines that additional permit requirements are necessary, they are typically imposed as follows: 1) at the renewal of this general permit or through a general permit specific to an industrial sector (if the issue is sector-based); 2) through direction from the Division based on the implementation of a TMDL (if the issue is watershed-based); or 3) if the issue is site-specific, through a revision to the certification from the Division based on an inspection or SWMP review, or through an individual permit.

III. BACKGROUND (cont.)

Some construction sites may be required to comply with a Qualifying Local Program in place of meeting several of the specific requirements in this permit. Sites covered by a Qualifying Local Program may not be required to submit an application for coverage or a notice of inactivation and may not be required to pay the Division's annual fee. See Section VII of the rationale.

C. Violations/Penalties

Dischargers of stormwater associated with industrial activity, as defined in the CDPS regulations (5CCR 1002-61), that do not obtain coverage under this or other Colorado general permits, or under an individual CDPS permit regulating industrial stormwater, will be in violation of the Federal Clean Water Act and the Colorado Water Quality Control Act, 25-8-101. For facilities covered under a CDPS permit, failure to comply with any CDPS permit requirement constitutes a violation. As of the time of permit issuance, civil penalties for violations of the Act or CDPS permit requirements may be up to \$10,000 per day, and criminal pollution of state waters is punishable by fines of up to \$25,000 per day.

IV. STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

The stormwater regulations (CDPS regulations (5CCR 1002-61)), require that stormwater discharges associated with certain industrial activities be covered under the permit program. Construction activity that disturbs one acre or more during the life of the project is specifically included in the listed industrial activities. This permit is intended to cover most stormwater discharges from construction facilities required by State regulation to obtain a permit.

A. Construction Activity

Construction activity includes ground surface disturbing activities including, but not limited to, clearing, grading, excavation, demolition, installation of new or improved haul and access roads, staging areas, stockpiling of fill materials, and dedicated borrow/fill areas. Construction does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility. (The maintenance exclusion is intended for projects such as road resurfacing, and where there will be less than one acre of additional ground disturbed. Improvements or upgrades to existing facilities or roads, where at least one acre is disturbed, would not qualify as "routine maintenance.")

Definitions of additional terms can be found in Part I.E of the permit.

Stormwater discharges from all construction activity require permit coverage, except for operations that result in the disturbance of less than one acre of total land area and which are not part of a larger common plan of development or sale. A "larger common plan of development or sale" is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules.

B. Types of Discharges/Activities Covered

1. **Stormwater:** *This permit is intended to cover most new or existing discharges composed **entirely** of stormwater from construction activities that are required by State regulation to obtain a permit. This includes stormwater discharges associated with areas that are dedicated to producing earthen materials, such as soils, sand, and gravel, for use at a single construction site. These areas may be located at the construction site or at some other location. This permit does not authorize the discharge of mine water or process water from borrow areas. This permit may also cover stormwater discharges associated with dedicated asphalt plants and concrete plants located at a specific construction site.*

IV. *STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (cont.)*

2. **Process water:** *Under certain restrictions, discharges to the ground from construction dewatering, and from concrete washout activities, are also covered (see Parts I.C.3(c)(7), I.C.3(c)(8), I.D.3(c) and I.D.3(d) of the permit).*

C. *Types of Activities NOT Covered*

1. **Stormwater:** *Aside from the sources listed in subparagraph B.1, above, this permit does not cover stormwater discharged from construction sites that is mixed with stormwater from other types of industrial activities, or process water of any kind. Other types of industrial activities that require stormwater discharge permits pursuant to different sections of the regulations (Regulation 5 CCR 1002-61, Section 61.2(e)(iii)(A-I, K)], are not covered by this permit.*
2. **Process water:** *This permit also does not cover any discharge of process water to surface waters. If the construction activity encounters groundwater, in order to discharge this groundwater to surface waters, a Construction Dewatering Discharge Permit (permit number COG-070000) must also be obtained. An application for this permit can be obtained from the Division at the address listed in Part I.A.4(a) of the permit, or at the website in Section I of the rationale.*

V. *COVERAGE UNDER THIS GENERAL PERMIT*

Under this general permit, owners or operators of stormwater discharges associated with construction activity may be granted authorization to discharge stormwater into waters of the State of Colorado. This includes stormwater discharges associated with industrial activity from areas that are dedicated to producing earthen materials, such as soils, sand and gravel, for use at a single construction site, and dedicated asphalt plants and dedicated concrete plants.

This permit does not pre-empt or supersede the authority of other local, state or federal agencies to prohibit, restrict or control discharges of stormwater to storm drain systems or other water courses within their jurisdiction.

Authorization to discharge under the permit requires submittal of a completed application form and a certification that the SWMP is complete, unless the site is covered by a Qualifying Local Program. Upon receipt of all required information, the Division may allow or disallow coverage under the general permit.

VI. *APPLICATION AND CERTIFICATION*

*At least **ten days** prior to the commencement of construction activities, the owner or operator of the construction site shall submit an original completed application which includes the signed certification that the SWMP is complete. Original signatures are required for the application to be considered complete. For small construction sites only, if the site is covered by a Qualifying Local Program (see below), submittal of an application is not required.*

For the purposes of this permit, the “operator” is the person who has day-to-day control over the project. This can be the owner, the developer, the general contractor or the agent of one of these parties, in some circumstances. At different times during a construction project, different types of parties may satisfy the definition of “operator” and the certification may be transferred as roles change.

(Note - Under the Federal regulations, this application process is referred to as a Notice of Intent, or NOI. For internal consistency with its current program, the Division will continue to use the term “application.”) A summary of the permit application requirements is found in the permit at Part I.A.4(b).

If coverage under this general permit is appropriate, then a certification will be developed and the applicant will be certified under this general permit.

VII. QUALIFYING LOCAL PROGRAMS

For stormwater discharges associated with small construction activity (i.e., one to five acre disturbed area sites), the permit includes conditions that incorporate approved qualifying local erosion and sediment control program (Qualifying Local Program) requirements by reference. A Qualifying Local Program is a municipal stormwater program for stormwater discharges associated with small construction activity that has been formally approved by the Division. The requirements for Qualifying Local Programs are outlined in Part 61.8(12) of the Colorado Discharger Permit System Regulations (also see the Division's "Qualifying Local Programs for Small Construction Sites - Application Guidance"). Such programs must impose requirements to protect water quality that are at least as stringent as those required in this permit.

A. Approval Termination

A Qualifying Local Program may be terminated by either the Division or the municipality. Upon termination of Division approval of a Qualifying Local Program, any small construction activity required to obtain permit coverage under Section 61.3(2)(h) of the CDPS regulations (5CCR 1002-61), shall submit an application form as provided by the Division, with a certification that the Stormwater Management Plan (SWMP) is complete as required by Part I.A.3 of the permit, within 30 days of Division notification.

B. Approval Expiration

Division approval of a Qualifying Local Program will expire with this general permit on June 30, 2012. Any municipality desiring to continue Division approval of their program must reapply by March 31, 2012. The Division will determine if the program may continue as a approved Qualifying Local Program.

VIII. TERMS AND CONDITIONS OF PERMIT

A. Coverage under a Qualifying Local Program – **For Small Construction Sites Only**

For small construction sites (disturbing less than 5 acres) covered under a Qualifying Local Program (see Section VII, above), only certain permit requirements apply, as outlined below. The local program must have been formally designated by the Division to qualify. Most municipalities have some type of local program and may require permits and fees. However, simply having a program in place does not necessarily mean that it is a qualifying program and that a State permit is not required. The local municipality is responsible for notifying operators and/or owners that they are covered by a Qualifying Local Program. As of May 31, 2007, the only approved Qualifying Local Programs within the state are for Golden, Durango and Lakewood. An updated list of municipalities with Qualifying Local Programs, including contact information, is available on the Division's website at: <http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/construction.html>.

The Division reserves the right to require any construction owner or operator within the jurisdiction of a Qualifying Local Program covered under this permit to apply for and obtain coverage under the full requirements of this permit.

1. **Permit Coverage:** *If a construction site is within the jurisdiction of a Qualifying Local Program, the owner or operator of the construction activity is authorized to discharge stormwater associated with small construction activity under this general permit **without** the submittal of an application to the Division. The permittee also is not required to submit an inactivation notice or payment of an annual fee to the Division.*

VIII. TERMS AND CONDITIONS OF PERMIT (cont.)

2. **Permit Terms and Conditions:** *The permittee covered by a Qualifying Local Program must comply with the requirements of that Qualifying Local Program. In addition, the following permit sections are applicable:*
- a) *Parts 1.A.1, 1.A.2, and 1.A.3: Authorization to discharge and discussion of coverage under the permit.*
 - b) *Part I.D.1: General limitations that must be met in addition to local requirements.*
 - c) *Parts I.D.2, I.D.3, I.D.4: BMP implementation, prohibition of non-stormwater discharges unless addressed in a separate CDPS permit, and requirements related to releases of reportable quantities.*
 - d) *Part I.D.11: Potential coverage under a Total Maximum Daily Load (TMDL).*
 - e) *Part I.E: Additional definitions.*
 - f) *Part II (except for Parts II.A.1, II.B.3, II.B.8, and II.B.10): Specifically includes, but is not limited to, provisions applicable in the case of noncompliance with permit requirements, and requirements to provide information and access.*

B. Stormwater Management Plans (SWMPs)

Prior to commencement of construction, a stormwater management plan (SWMP) shall be developed and implemented for each facility covered by this permit. A certification that the SWMP is complete must be submitted with the permit application. The SWMP shall identify potential sources of pollution (including sediment) which may reasonably be expected to affect the quality of stormwater discharges associated with construction activity from the facility. In addition, the plan shall describe the Best Management Practices (BMPs) which will be used to reduce the pollutants in stormwater discharges from the construction site. (Note that permanent stormwater controls, such as ponds, that are used as temporary construction BMPs must be adequately covered in the SWMP.) Facilities must implement the provisions of their SWMP as a condition of this permit. The SWMP shall include the following items:

- 1. *Site Description*
- 2. *Site Map*
- 3. *Stormwater Management Controls*
- 4. *Long-term Stormwater Management*
- 5. *Inspection and Maintenance*

(See Parts I.B. and I.C of the permit for a more detailed description of SWMP requirements.) The Division has a guidance document available on preparing a SWMP. The document is included as Appendix A of the permit application, and is available on the Division's website at www.cdphe.state.co.us/wq/PermitsUnit.

Some changes have been made to the SWMP requirements. See Section II.I of the rationale for a discussion on permittee responsibilities regarding those changes.

VIII. TERMS AND CONDITIONS OF PERMIT (cont.)

Master SWMP

Often, a large construction project will involve multiple smaller construction sites that are within a common plan of development, or multiple well pads under construction within an oil and gas well field. Pollutant sources and the types of BMPs used can be relatively consistent in such cases. A permittee could significantly streamline the SWMP development process through the use of a master SWMP. SWMP information must be developed and maintained for all construction activities that exceed one acre (or are part of a common plan of development exceeding one acre) conducted within the permitted area. By developing a single master plan, the permittee can eliminate the need to develop repetitive information in separate plans. Such a plan could include two sections, one containing a reference section with information applicable to all sites (e.g., installation details and maintenance requirements for many standard BMPs, such as silt fence and erosion blankets), and the second containing all of the information specific to each site (e.g., site BMP map, drainage plans, details for BMPs requiring site specific design, such as retention ponds).

As new activities begin, information required in the SWMP is added to the plan, and as areas become finally stabilized, the related information is removed. Records of information related to areas that have been finally stabilized that are removed from the active plan must be maintained for a period of at least three years from the date that the associated site is finally stabilized.

C. Total Maximum Daily Load (TMDL)

If the designated use of a stream or water body has been impaired by the presence of a pollutant(s), development of a Total Maximum Daily Load (TMDL) may be required. A TMDL is an estimate of allowable loading in the waterbody for the pollutant in question. Types of discharges that are or have the potential to be a significant source of the pollutant are also identified. If a TMDL has been approved for any waterbody into which the permittee discharges, and stormwater discharges associated with construction activity have been assigned a pollutant-specific Wasteload Allocation (WLA) under the TMDL, the Division will either:

- 1. Notify the permittee of the TMDL, and amend the permittee's certification to add specific BMPs and/or other requirements, as appropriate; or*
- 2. Ensure that the TMDL is being implemented properly through alternative local requirements, such as by a municipal stormwater permit. (The only current example of this is the Cherry Creek Reservoir Control Regulation (72.0), which mandates that municipalities within the basin require specific BMPs for construction sites.)*

See Part I.D.11 of the permit for further information.

D. Monitoring

Sampling and testing of stormwater for specific parameters is not required on a routine basis under this permit. However, the Division reserves the right to require sampling and testing on a case-by-case basis, in the event that there is reason to suspect that compliance with the SWMP is a problem, or to measure the effectiveness of the BMPs in removing pollutants in the effluent. See Part I.D.1(e) of the permit.

E. Facility Inspections

Construction sites typically must inspect their stormwater management controls at least every 14 days and within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion. At sites or portions of sites where ground-disturbing construction has been completed but a vegetative cover has not been established, these inspections must occur at least once per month. (At sites where persistent snow cover conditions exist, inspections are not required during the period that melting conditions do not exist. These

VIII. TERMS AND CONDITIONS OF PERMIT (cont.)

conditions are only expected to occur at high elevations within the Colorado mountains.) For all of these inspections, records must be kept on file. Exceptions to the inspection requirements are detailed in Part I.D.6 of the permit.

F. SWMP Revisions

The permittee shall amend the SWMP whenever there is a change in design, construction, operation, or maintenance of the site, which would require the implementation of new or revised BMPs. The SWMP shall also be amended if it proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity. The timing for completion of SWMP changes is detailed in Parts I.D.5(c) and I.D.5(d) of the permit.

SWMP revisions shall be made prior to change in the field, or in accordance with Part I.D.5(d) of the permit.

G. Reporting

The inspection record shall be made available to the Division upon request. Regular submittal of an annual report is not required in this permit. See Part I.D.9 of the permit.

H. Annual Fee

The permittee is required to submit payment of an annual fee as set forth in the Water Quality Control Act. Permittees will be billed for the initial permit fee within a few weeks of permit issuance and then annually, based on a July 1 through June 30 billing cycle.

I. Responsibility for Permit

*The permit certification for a site may be inactivated, once coverage is no longer needed. The certification may be transferred, if another party is assuming responsibility for the entire area covered by the certification. In addition, permit responsibility for **part** of the area covered by the certification may be reassigned to another party. These actions are summarized below. The Stormwater Program construction fact sheet explains these actions in further detail under the section on Multiple Owner/Developer Sites, and is available on the Division website at*

<http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/ConstFactSheet.PDF>, Section F.

1. **Inactivation Notice:** *When a site has been finally stabilized in accordance with the SWMP, the permittee shall submit an **Inactivation Notice** that is signed in accordance with Part I.F.1 of the permit. A summary of the Inactivation Notice content is described in Part I.A.6 of the permit. A copy of the Inactivation Notice form will be mailed to the permittee along with the permit certification. Additional copies are available from the Division.*

For sites where all areas have been removed from permit coverage, the permittee may submit an inactivation notice and terminate permit coverage. In such cases the permittee would no longer have any land covered under their permit certification, and therefore there would be no areas remaining to finally stabilize. Areas may be removed from permit coverage by:

- reassignment of permit coverage (Part I.A.8 of the permit);*
- sale to homeowner(s) (Part I.A.9 of the permit); or*
- amendment by the permittee, in accordance with Division guidance for areas where permit coverage has been obtained by a new operator or returned to agricultural use.*

VIII. TERMS AND CONDITIONS OF PERMIT (cont.)

2. **Transfer of Permit:** When responsibility for stormwater discharges for an *entire* construction site changes from one individual to another, the permit shall be transferred in accordance with Part I.A.7 of the permit. The permittee shall submit a completed **Notice of Transfer form**, which is available from the Division, and at www.cdphe.state.co.us/wq/PermitsUnit. If the new responsible party will not complete the transfer form, the permit may be inactivated if the permittee has no legal responsibility, through ownership or contract, for the construction activities at the site. In this case, the new owner or operator would be required to obtain permit coverage separately.
3. **Reassignment of Permit:** When a permittee no longer has control of a specific portion of a permitted site, and wishes to transfer coverage of that portion of the site to a second party, the permittee shall submit a completed **Notice of Reassignment of Permit Coverage form**, which is available from the Division, and at www.cdphe.state.co.us/wq/PermitsUnit. The form requires that both the existing permittee and new permittee complete their respective sections. See Part I.A.8 of the permit.

J. Duration of Permit

The general permit will expire on June 30, 2012. The permittee's authority to discharge under this permit is approved until the expiration date of the general permit. Any permittee desiring continued coverage under the general permit past the expiration date must apply for recertification under the general permit at least 90 days prior to its expiration date.

Kathleen Rosow
December 18, 2006

IX. PUBLIC NOTICE – 12/22/06

The permit was sent to public notice on December 22, 2006. A public meeting was requested, and was held on February 2, 2007. Numerous comments were received on the draft permit. Responses to those comments, and a summary of changes made to the draft permit, are in a separate document entitled "Division Response To Public Comments." The permit will be sent to a second public notice on March 23, 2007. Any changes resulting from the second public notice will be summarized in the rationale.

Kathleen Rosow
March 22, 2007

X. PUBLIC NOTICE – 3/23/07

The permit was sent to public notice for a second time on March 23, 2007. Numerous comments were received on the second draft permit. Responses to those comments, and a summary of the additional changes made to the draft permit, are contained in a separate document entitled "Division Response To Public Comments Part II". This document is part of the rationale. Any changes based on the Division response are incorporated into the rationale and permit. The response document is available online at <http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/construction.html>, or by emailing cdphe.wqstorm@state.co.us, or by calling the Division at 303-692-3517.

Kathleen Rosow
May 31, 2007

APPENDIX B
SITE-SPECIFIC INFORMATION



Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|-----------------------------|------------------------|-------------------------|
| Site ID/Name: | Buffalo Ditch 1-32H | Inspection Date: | 12/21/2015 |
| Location: | SENE 32 7N 80W | Inspector: | Gentry Muniz |
| Inspection Type: | 14 day <u>Monthly</u> Final | Signature: | <i>[Signature]</i> |
| Land Use: | Rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Cloudy 23° |
| Receiving Body of Water/Distance/Direction: | Unnamed creek 885' East | | |
| Stormwater Runoff Risk: | H M <u>L</u> | Vegetation Coverage %: | 70% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | Y <u>N</u> | | |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|--|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |

| Pad area Observation | Y/N/NA | Comments |
|--|--------|----------|
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |

| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
|---|--------|----------|
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

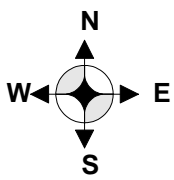
Is this site compliant with the permit at the time of the inspection? Y N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

| | | | |
|----------------------|--------------------|--------|-------------------------|
| Certified by: | Gentry Muniz | Date: | 12/21/2015 |
| Certifier signature: | <i>[Signature]</i> | Title: | Environmental Scientist |



| | | | | | | | | | |
|---|---------------|----------------------|------|------|------------------|--------------------|----|--------------|-----|
| WELL NAME: | | Buffalo Ditch 1-32H | | | | Facility/ API#: | | 05-057-06463 | |
| | | QTR/QTR: | SENE | SEC: | 32 | TWN: | 7N | RNG: | 80W |
| LAT/LONG: | | 40.53568/-106.388127 | | | | | | | |
| DIRECTIONS: | | | | | | | | | |
| HWY 14 and CR 34, E .4, S .3 into | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | |
| Jackson County | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | |
| Rangeland 70% | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | |
| 1-5% slopes | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | |
| 2.37 | | | | | | | | | |
| SOIL TYPE" | | | | | | | | | |
| Cabin sandy loam | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | |
| NAME | Unnamed creek | | | | | | | | |
| DIRECTION | East | | | | | | | | |
| DISTANCE | 885 ft | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENVIRONMENTAL | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | |
| COMMENTS | | | | | | | | | |
| | | | | | | | | | |



Lease/Name: Buffalo Ditch 1-32H

Land Use: Rangeland

Runoff Risk: low

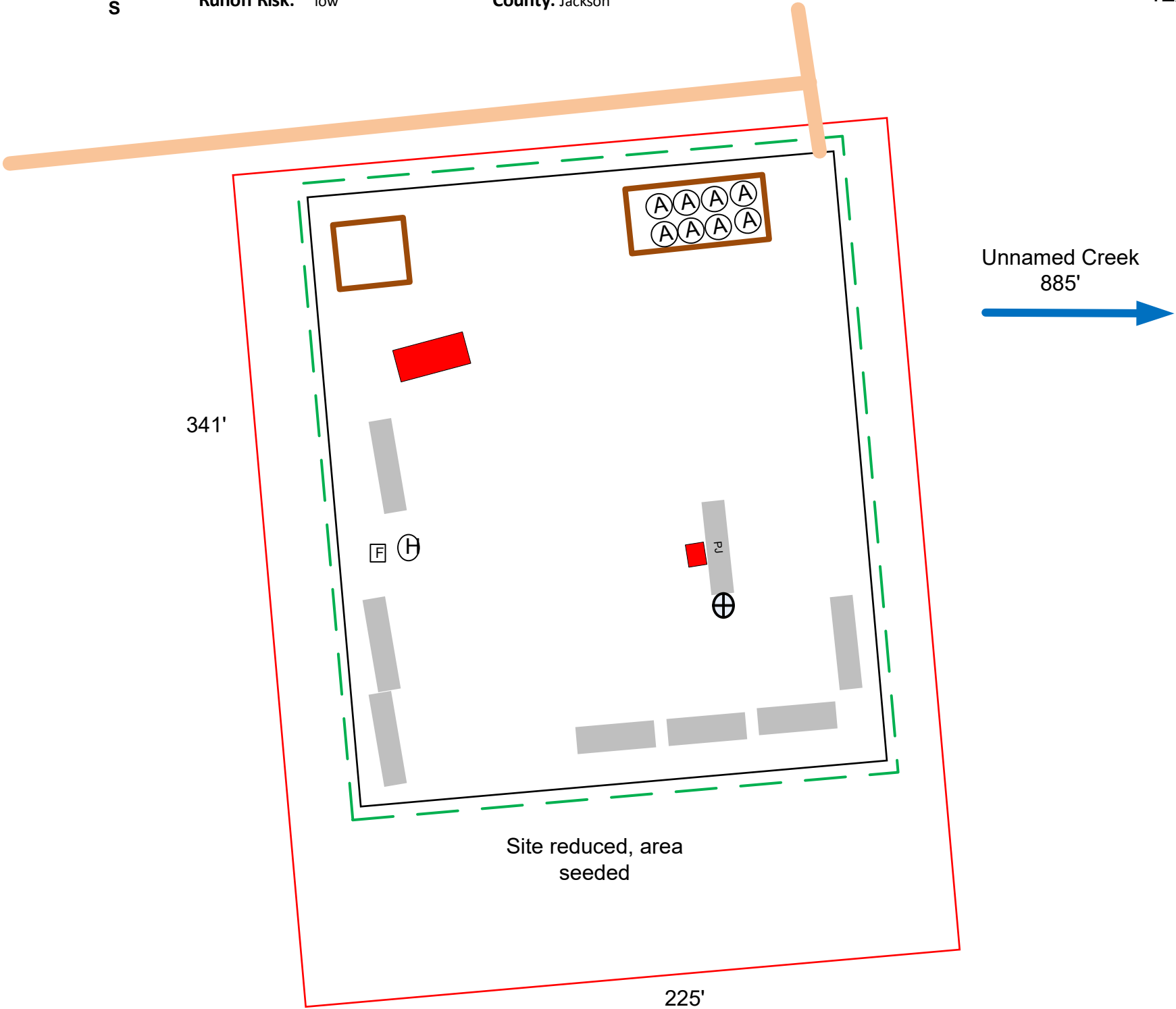
API: 05-057-06463 Qtr/Qtr: SENE SEC: 32 TWN: 7N RNG: 80W

Lat/Long: 40.53568/-106.388127

County: Jackson



Plan Date:
12/22/2015



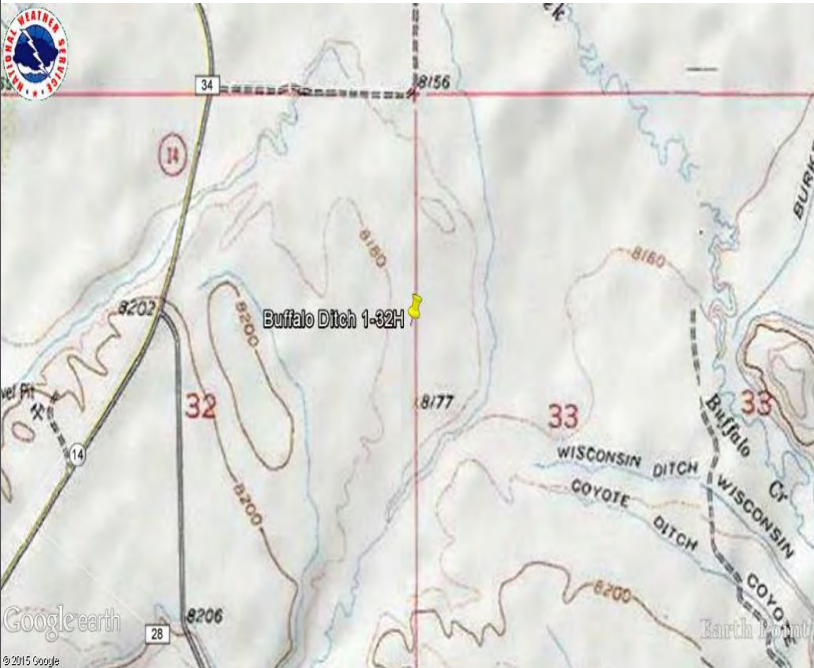
Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Heater Treater | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed Creek 885' East
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created by:



Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Buffalo Ditch 2-32H Inspection Date: 12/21/2015
 Location: SWNE 32 7N 80W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Unnamed creek 255' East
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

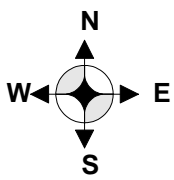
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



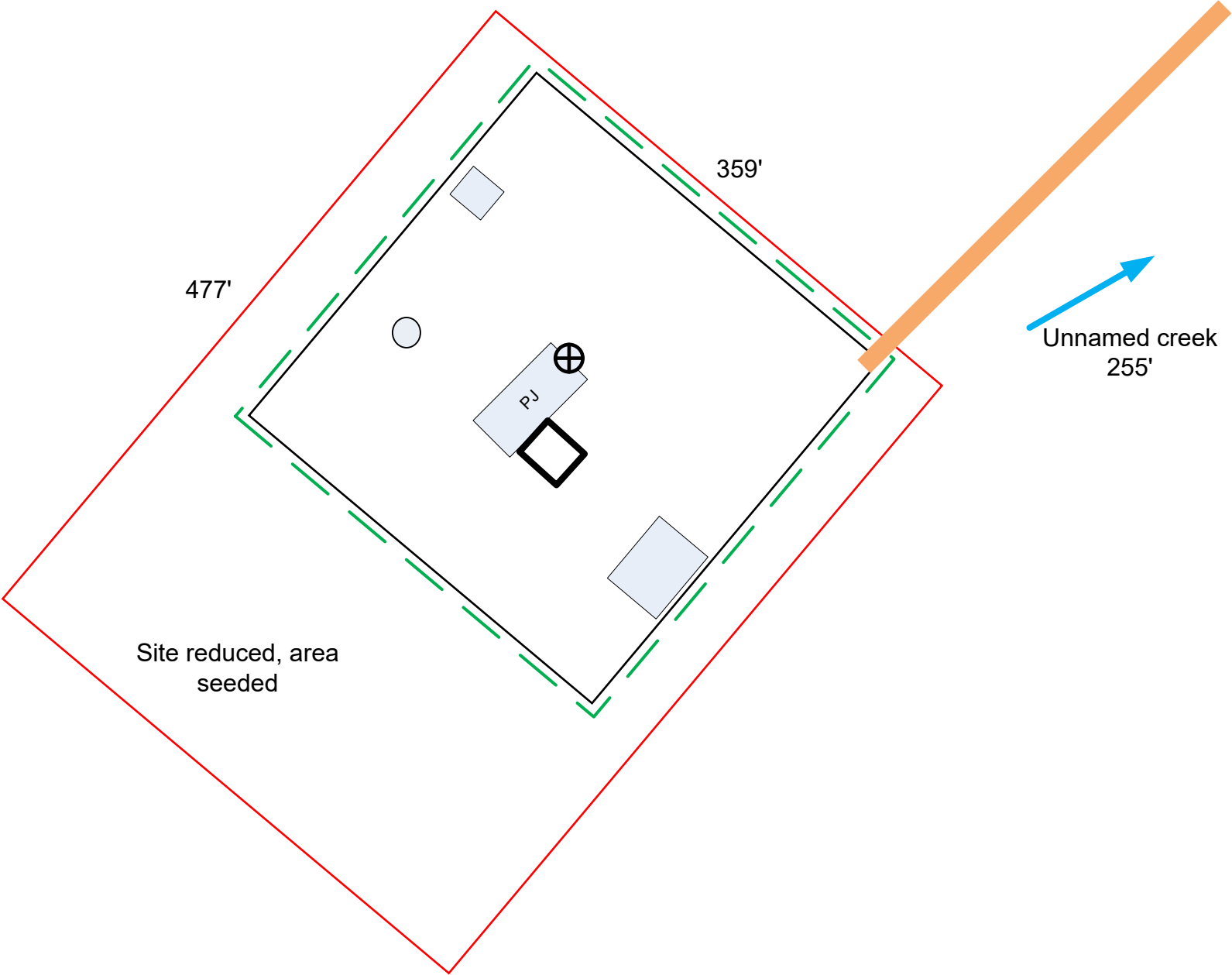
| | | | | | | | | | | | |
|---|-----------|----------------------|------|------|------------------|--------------------|----|--------------|-----|--|--|
| WELL NAME: | | Buffalo Ditch 2-32 | | | | Facility/ API#: | | 05-057-06464 | | | |
| | | QTR/QTR: | SWNE | SEC: | 32 | TWN: | 7N | RNG: | 80W | | |
| LAT/LONG: | | 40.534837/-106.39497 | | | | | | | | | |
| DIRECTIONS: | | | | | | | | | | | |
| HWY 14 and CR 34, E .4, S .3, SW .3 into | | | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | | | |
| Jackson | | | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | | | |
| Rangeland 70% | | | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | | | |
| 1-5% slopes | | | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | | | |
| 2.32 | | | | | | | | | | | |
| SOIL TYPE" | | | | | | | | | | | |
| Cabin sandy loam | | | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | | | |
| NAME | Unnamed | | | | | | | | | | |
| DIRECTION | Northeast | | | | | | | | | | |
| DISTANCE | 255 ft | | | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENVIRONMENTAL | | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | |
| | | | | | | | | | | | |



Lease/Name: Buffalo Ditch 2-32 API: 05-057-06464 Qtr/Qtr: SWNE TWN: 7N RNG: 80W SEC: 32

Land Use: Rangeland Lat/Long: 40.534837/-106.39497

Runoff Risk: low County: Jackson



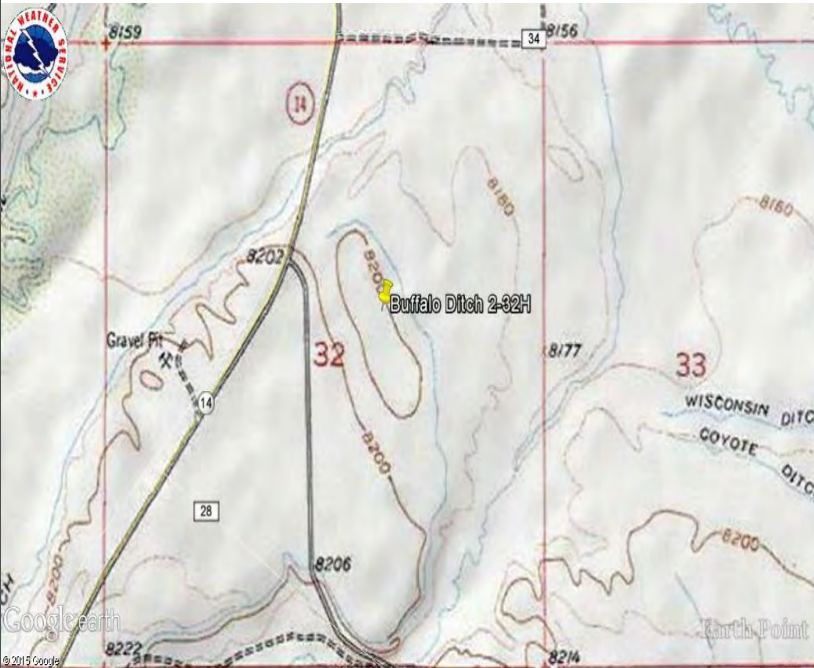
Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed Creek 255' Northeast
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|------------------------------|--|-------------------------|
| Site ID/Name: | Coalmont 3-13H | Inspection Date: | 12/21/2015 |
| Location: | SWSW 32 7N 81W | Inspector: | Gentry Muniz |
| Inspection Type: | 14 day <u>Monthly</u> Final | Signature: | <i>Gentry Muniz</i> |
| Land Use: | Rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Cloudy 23° |
| Receiving Body of Water/Distance/Direction: | | Little Grizzly Creek 2,180' West/Northwest | |
| Stormwater Runoff Risk: | <u>H</u> <u>M</u> <u>(L)</u> | Vegetation Coverage %: | 70% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | | Y <u>(N)</u> | |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------------|---|
| Berm | <u>(Y)</u> N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrex Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

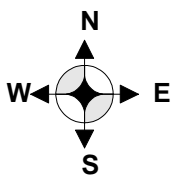
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

| | | | |
|----------------------|---------------------|--------|-------------------------|
| Certified by: | Gentry Muniz | Date: | 12/21/2015 |
| Certifier signature: | <i>Gentry Muniz</i> | Title: | Environmental Scientist |



| | | | | | | | | | |
|---|----------------------|-----------------------|------|------|------------------|--------------------|----|--------------|-----|
| WELL NAME: | | Coalmont 3-13H | | | | Facility/ API#: | | 05-057-06508 | |
| | | QTR/QTR: | SWSW | SEC: | 13 | TWN: | 7N | RNG: | 81W |
| LAT/LONG: | | 40.571358/-106.441981 | | | | | | | |
| DIRECTIONS: | | | | | | | | | |
| CR 26 & CR 24, stay right at Y .3, SE .15, S .7 into | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | |
| Jackson County | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | |
| Rangeland 70% | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | |
| 1-5% slopes | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | |
| 5.73 | | | | | | | | | |
| SOIL TYPE" | | | | | | | | | |
| Coalmont-Fluestch Complex | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | |
| NAME | Little Grizzly Creek | | | | | | | | |
| DIRECTION | West/Northwest | | | | | | | | |
| DISTANCE | 2,180 ft | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENVIRONMENTAL | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | |
| COMMENTS | | | | | | | | | |
| | | | | | | | | | |



Lease/Name: Coalmont 3-13H

API: 05-057-06508 Qtr/Qtr: SWSW

TWN: 7N RNG: 81W SEC: 13

Land Use: Rangeland

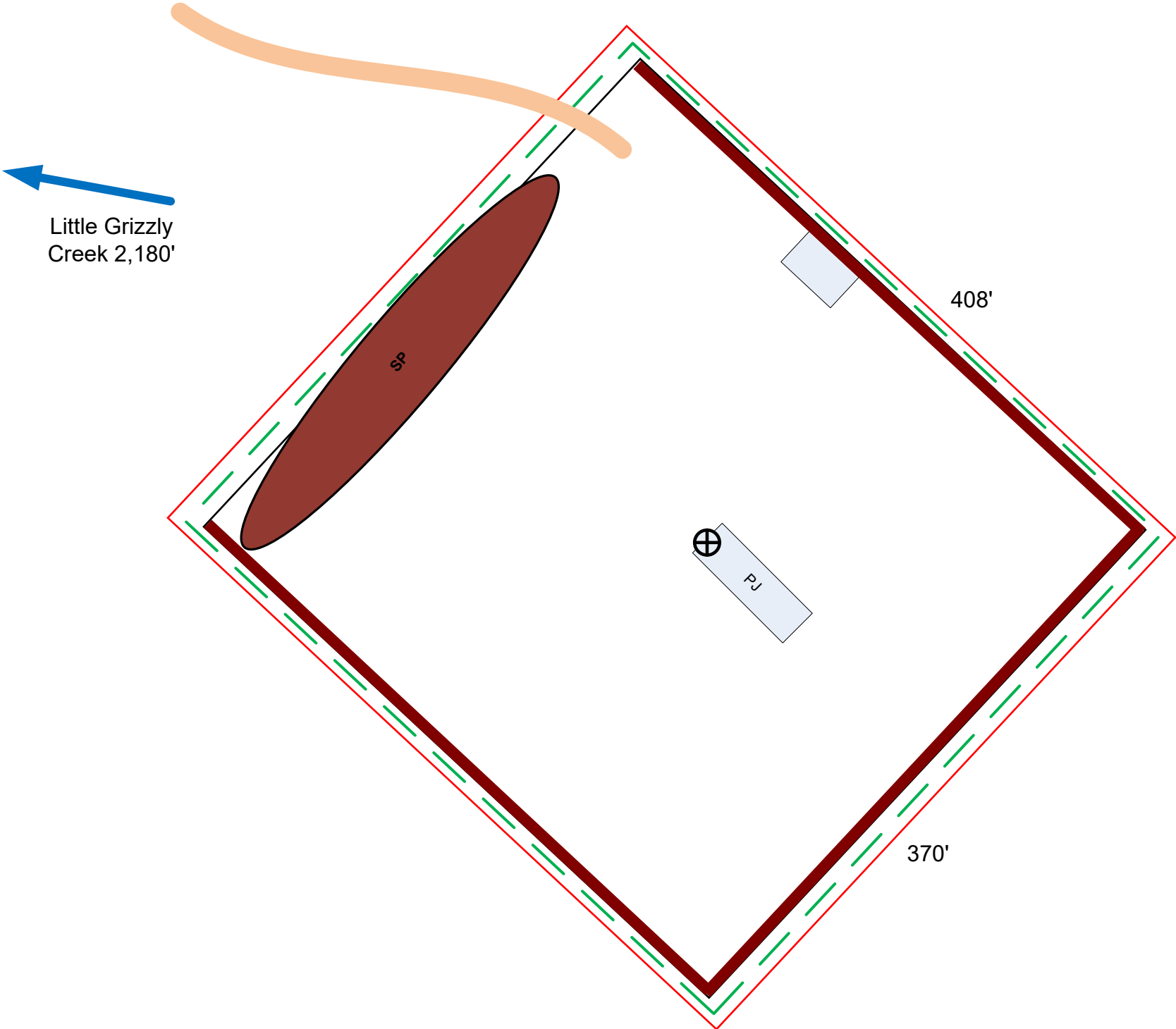
Lat/Long: 40.571358/-106.441981

Runoff Risk: low

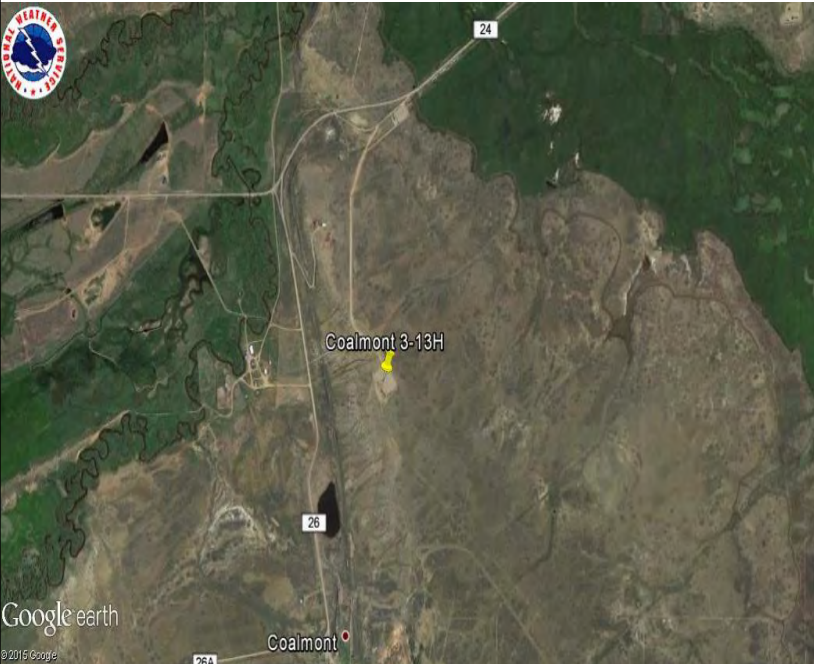
County: Jackson



Plan Date:
12/22/2015



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Little Grizzly Creek 2,180' West/Northwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created by:

Map Not to Scale

Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Evans 2-21H & Ray Ranch 7-21H Inspection Date: 12/21/2015
 Location: NWNE 21 7N 80W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Unnamed tributary 502' Northwest
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

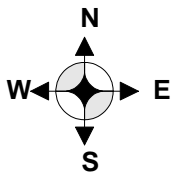
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



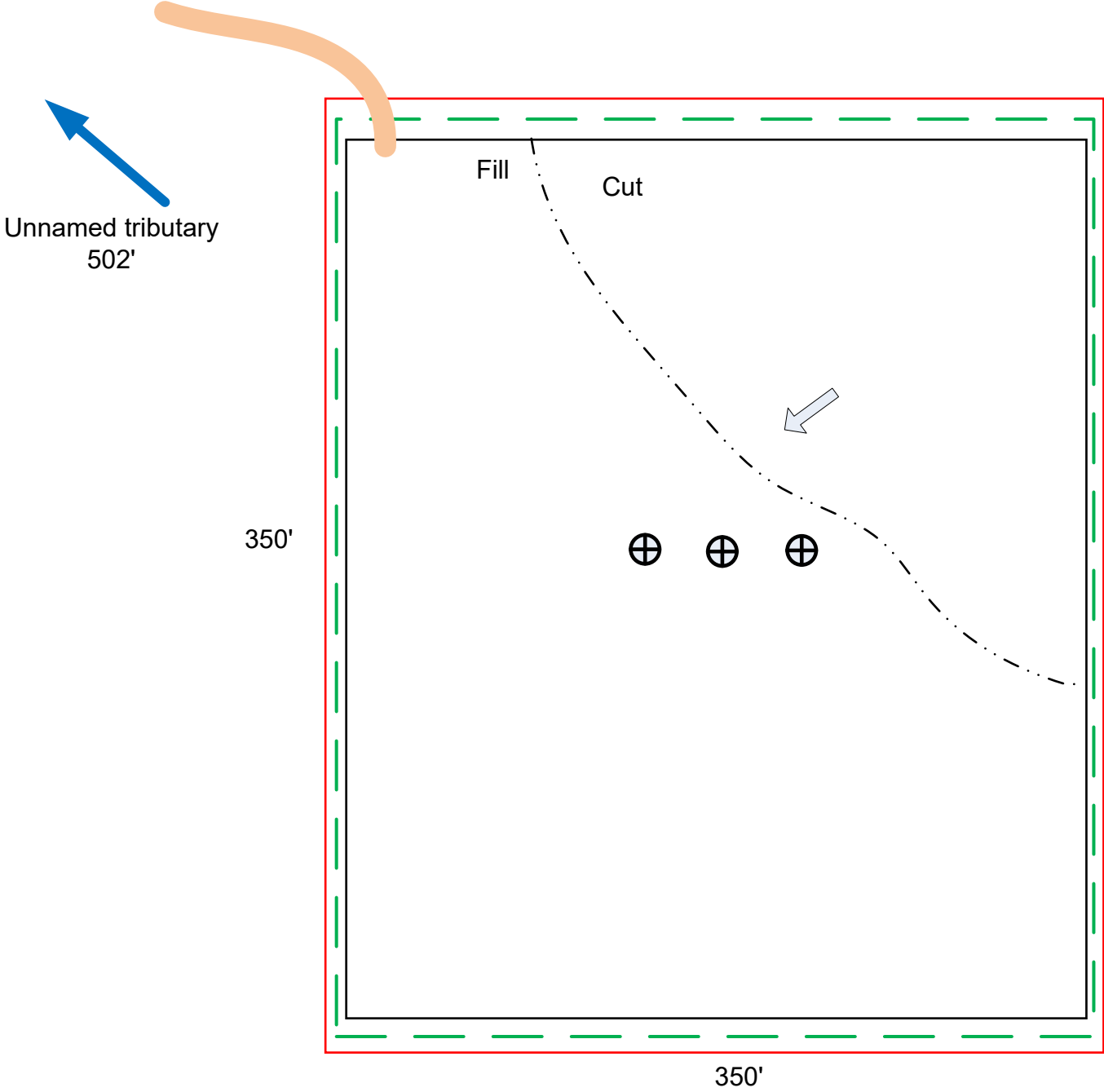
| | | | | | | | | | |
|---|--|-------------------------------|------|------|------------------|--------------------|----|--------------------------------|-----|
| WELL NAME: | | Evans 2-21H & Ray Ranch 7-21H | | | | Facility/ API#: | | 05-057-06530 & 05-057-06531 | |
| | | QTR/QTR: | NAME | SEC: | 21 | TWN: | 7N | RNG: | 80W |
| LAT/LONG: | | 40.569663/-106.375875 | | | | | | | |
| DIRECTIONS: | | | | | | | | | |
| HWY 14 & CR 24, S.9, E & S 2.21 into | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | |
| Jackson Cuntty | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | |
| Rangeland 70% | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | |
| 1-5% Slopes | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | |
| 4.00 | | | | | | | | | |
| SOIL TYPE" | | | | | | | | | |
| Fluestch-Taigos association | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | |
| NAME | | Unnamed tributary | | | | | | | |
| DIRECTION | | Northwest | | | | | | | |
| DISTANCE | | 502 ft | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENVIRONMENTAL | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | |
| COMMENTS | | | | | | | | | |
| | | | | | | | | | |



Evans 2-21H & Ray
Lease/Name: Ranch7-21H
Land Use: Rangeland
Runoff Risk: low

05-057-06530 &
API: 05-057-06531
Lat/Long: 40.569663/-106.375875
County: Jackson

Qtr/Qtr: NWNE
TWN: 7N
RNG: 80W
SEC: 21



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed tributary 502' Northwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Gregory 5-09H Inspection Date: 12/21/2015
 Location: SWSW 9 7N 80W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Grizzly Creek 816' Northwest
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|-----------------------------|------------------------------|-------------------------|
| Site ID/Name: | Gregory 5-09H | Inspection Date: | 1/18/2016 |
| Location: | SWSW 9 7N 80W | Inspector: | Gentry Muniz |
| Inspection Type: | <u>14 day</u> Monthly Final | Signature: | <i>[Signature]</i> |
| Land Use: | Rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Cloudy, windy, teens |
| Receiving Body of Water/Distance/Direction: | | Grizzly Creek 816' Northwest | |
| Stormwater Runoff Risk: | H M <u>L</u> | Vegetation Coverage %: | 70% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | | Y <u>N</u> | |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|------------|--|
| Berm | <u>Y</u> N | Clear drill cuttings from east side of the pad. Place in bermed area at NE corner. |
| Cattle Guard | <u>Y</u> N | Completed 2/10/16 |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|--|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |

| Pad area Observation | Y/N/NA | Comments |
|--|--------|--------------------------|
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | N | nothing around fuel tank |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |

| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
|---|--------|----------|
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Drill rig on location, Extreme Drilling. Soil and snow pushed to north and east side of the pad. Presence of drill cuttings (grey mud) pushed to east side when removing snow from pad. Recommend removing any drill cuttings from the east side of the pad and place back into the designated area. Unable to check or verify condition of all BMPs due to snow cover. All soil is frozen around perimeter of pad. Spoke with Scott from Total Safety about fuel tank and containment, there seems to be some confusion if the tank is double walled or not. Presently the tank is not in secondary containment. Recommend secondary containment if not double walled.

Is this site compliant with the permit at the time of the inspection? Y N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

| | | | |
|----------------------|--------------------|--------|-------------------------------|
| Certified by: | Gentry Muniz | Date: | 2/10/2016 |
| Certifier signature: | <i>[Signature]</i> | Title: | Staff Environmental Scientist |



Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|------------------------------|------------------------|-------------------------|
| Site ID/Name: | 05-057-06535/Gregory 5-09H | Inspection Date: | 1/27/2016 |
| Location: | SWSW 9 7N 80W | Inspector: | Gentry Muniz |
| Inspection Type: | <u>14 day</u> Monthly Final | Signature: | <i>[Signature]</i> |
| Land Use: | Rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Sunny teens |
| Receiving Body of Water/Distance/Direction: | Grizzly Creek 816' Northwest | | |
| Stormwater Runoff Risk: | H M <u>L</u> | Vegetation Coverage %: | 70% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | Y <u>N</u> | | |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|------------|--|
| Berm | <u>Y</u> N | clear cuttings from east side of pad and compact outer edge on N, E & SW sides of pad. |
| Cattle Guard | <u>Y</u> N | Completed 2/10/16 |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|-----------------------------|
| Have Repairs/additional BMP issues been addressed since last inspection? | N | |
| Are there Signs of sediment leaving the site? | Y | SW corner where snow pushed |
| Are there signs of offsite tracking at the access point? | N | over berm |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | NA | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Met Todd Martin on-site and walked the location with him to discuss the stormwater inspection. We discussed snow removal, secondary containment, and drill cuttings management. Drill cuttings very noticeable on the east edge of pad, recommended to Todd that it gets removed and placed in designated area. Recommended compacting the outside of the soil that is pushed to the edges during snow removal and pad clearing. Spoke with CalFrac personnel about secondary containment of their tanks when on-site.

Is this site compliant with the permit at the time of the inspection? N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

| | | | |
|----------------------|--------------------|--------|-------------------------------|
| Certified by: | Gentry Muniz | Date: | 2/10/2016 |
| Certifier signature: | <i>[Signature]</i> | Title: | Staff Environmental Scientist |



Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|------------------------------|------------------------|-------------------------|
| Site ID/Name: | 05-057-06535/Gregory 5-09H | Inspection Date: | 2/10/2016 |
| Location: | SWSW 9 7N 80W | Inspector: | Gentry Muniz |
| Inspection Type: | <u>14 day</u> Monthly Final | Signature: | <i>[Signature]</i> |
| Land Use: | Rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Sunny 20s |
| Receiving Body of Water/Distance/Direction: | Grizzly Creek 816' Northwest | | |
| Stormwater Runoff Risk: | H M <u>L</u> | Vegetation Coverage %: | 70% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | Y <u>N</u> | | |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location | Date Completed |
|-------------------------------|------------|--|----------------|
| Berm | <u>Y</u> N | eastern and northern berm compacted and stabilized with rock | 2/10/2016 |
| Cattle Guard | <u>Y</u> N | | |
| Check Dam | Y <u>N</u> | | |
| Culvert | Y <u>N</u> | | |
| Ditch | Y <u>N</u> | | |
| Ditch and Berm | Y <u>N</u> | | |
| Filtrexx Sediment Control | Y <u>N</u> | | |
| Land Grading | Y <u>N</u> | | |
| Ripping | Y <u>N</u> | | |
| Rip Rap | Y <u>N</u> | | |
| Roadside Ditches and Turnouts | Y <u>N</u> | | |
| Sediment Trap | Y <u>N</u> | | |
| Seeding | Y <u>N</u> | | |
| Silt Fence | Y <u>N</u> | | |
| Straw Bale Barrier | Y <u>N</u> | | |
| Soil Roughening | Y <u>N</u> | | |
| Tracking Pad | Y <u>N</u> | | |
| Wattles | Y <u>N</u> | | |

| General | Y/N/NA | Comments |
|--|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | N | |
| Are there Signs of sediment leaving the site? | Y | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |

| Pad area Observation | Y/N/NA | Comments |
|--|--------|----------|
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |

| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
|---|--------|----------|
| Has the site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | NA | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Drilling in progress. Spoke with the company man about a few 55 gallon drums outside of containment, I recommended to him that they be placed in secondary containment if not being used. It appears that the east and north berms were compacted. Berms are stabilized with rock. Drilling mud present on eastern berm. Unable to verify south and west berms due to snow cover. Freezing conditions exist.

Is this site compliant with the permit at the time of the inspection? Y N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: _____

Date: _____

Certifier signature: _____

Title: _____



Stormwater Management Plan Compliance Inspection Report

Site ID/Name: 05-057-06535/Gregory 5-09H
 Location: SWSW 9 7N 80W
 Inspection Type: 14 day Monthly Final
 Land Use: Rangeland
 Site Type: Well & TB
 Inspection Date: 2/24/2016
 Inspector: Gentry Muniz
 Signature: *Gentry Muniz*
 Title: Environmental Scientist
 Weather: Sunny 20s and windy
 Receiving Body of Water/Distance/Direction: Grizzly Creek 816' Northwest
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location | Date Completed |
|-------------------------------|--------------|--|----------------|
| Berm | <u>(Y)</u> N | Repair berm on east side where damaged by equipment, compact | |
| Cattle Guard | <u>(Y)</u> N | | |
| Check Dam | Y <u>(N)</u> | | |
| Culvert | Y N | | |
| Ditch | Y N | | |
| Ditch and Berm | Y N | | |
| Filtrexx Sediment Control | Y N | | |
| Land Grading | Y N | | |
| Ripping | Y N | | |
| Rip Rap | Y N | | |
| Roadside Ditches and Turnouts | Y N | | |
| Sediment Trap | Y N | | |
| Seeding | Y N | | |
| Silt Fence | Y N | | |
| Straw Bale Barrier | Y N | | |
| Soil Roughening | Y N | | |
| Tracking Pad | Y N | | |
| Wattles | Y N | | |

| General | Y/N/NA | Comments |
|---|--------|-----------------------------------|
| Have Repairs/additional BMP issues been addressed since last inspection? | N | |
| Are there Signs of sediment leaving the site? | Y | |
| Are there signs of offsite tracking at the access point? | Y | HWY 14, street sweeper on standby |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | NA | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Rig has been moved to a new location and remaining equipment was being hauled off during the inspection. The berm on the east side was damaged when equipment was being removed, repair is needed. Snow still remains on most of the perimeter of the pad. There is offsite tracking onto HWY 14 and a street sweeper on standby to keep the road cleaned up.

Is this site compliant with the permit at the time of the inspection? Y (N)

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: _____

Date: _____

Certifier signature: _____

Title: _____



Stormwater Management Plan Compliance Inspection Report

Site ID/Name: 05-057-06535/Gregory 5-09H
 Location: SWSW 9 7N 80W
 Inspection Type: 14 day Monthly Final
 Land Use: Rangeland
 Site Type: Well & TB
 Inspection Date: 3/9/2016
 Inspector: Gentry Muniz
 Signature: *Gentry Muniz*
 Title: Environmental Scientist
 Weather: cloudy 20's
 Receiving Body of Water/Distance/Direction: Grizzly Creek 816' Northwest
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location | Date Completed |
|-------------------------------|--------------|--|----------------|
| Berm | <u>(Y)</u> N | Repair berm on east side where damaged by equipment, compact | |
| Cattle Guard | <u>(Y)</u> N | | |
| Check Dam | Y <u>(N)</u> | | |
| Culvert | Y N | | |
| Ditch | Y N | | |
| Ditch and Berm | Y N | | |
| Filtrexx Sediment Control | Y N | | |
| Land Grading | Y N | | |
| Ripping | Y N | | |
| Rip Rap | Y N | | |
| Roadside Ditches and Turnouts | Y N | | |
| Sediment Trap | Y N | | |
| Seeding | Y N | | |
| Silt Fence | Y N | | |
| Straw Bale Barrier | Y N | | |
| Soil Roughening | Y N | | |
| Tracking Pad | Y N | | |
| Wattles | Y N | | |

| General | Y/N/NA | Comments |
|---|--------|-------------------------|
| Have Repairs/additional BMP issues been addressed since last inspection? | N | |
| Are there Signs of sediment leaving the site? | Y | on E and SW side of pad |
| Are there signs of offsite tracking at the access point? | Y | at HWY 14 |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | Y | 3 |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | NA | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Equipment is being staged and removed from location. Drilling mud has not been removed from the berm on the east side of the pad. There was oil staining on the ground near the flare and some misted into the field to the north, per the completions manager, and had not been cleaned up. Sediment pushed over the berm on the south side berm near entrance during snow removal. Trash observed outside the berms on the east side of the pad and on various locations on the pad.

Is this site compliant with the permit at the time of the inspection? Y (N)

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: _____

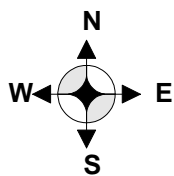
Date: _____

Certifier signature: _____

Title: _____



| | | | | | | | | | | | |
|---|--|----------------------|------|------|--|--------------------|------|--------------|------|-----|--|
| WELL NAME: | | Gregory 5-09H | | | | Facility/ API#: | | 05-057-06535 | | | |
| | | QTR/QTR: | SWSW | SEC: | | 9 | TWN: | 7N | RNG: | 80W | |
| LAT/LONG: | | 40.585258/-106.38776 | | | | | | | | | |
| DIRECTIONS: | | | | | | | | | | | |
| HWY 14 & CR 24, S .9, E .9, NE .3 into | | | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | | | |
| Jackson County | | | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | | | |
| Rangeland | | | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | | | |
| 1-5% slopes | | | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | | | |
| 2.49 | | | | | | | | | | | |
| SOIL TYPE | | | | | | | | | | | |
| Norriston gravelly sandy loam | | | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | | | |
| NAME | | Grizzly Creek | | | | | | | | | |
| DIRECTION | | Northwest | | | | | | | | | |
| DISTANCE | | 816 ft | | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| MAP GENERATED BY | | | | | | LT ENVIRONMENTAL | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | |
| | | | | | | | | | | | |



Lease/Name: Gregory 5-09H

API: 05-057-06535 Qtr/Qtr: SWSW

TWN: 7N RNG: 80W SEC: 9

Land Use: Rangeland

Lat/Long: 40.585258/-106.38776

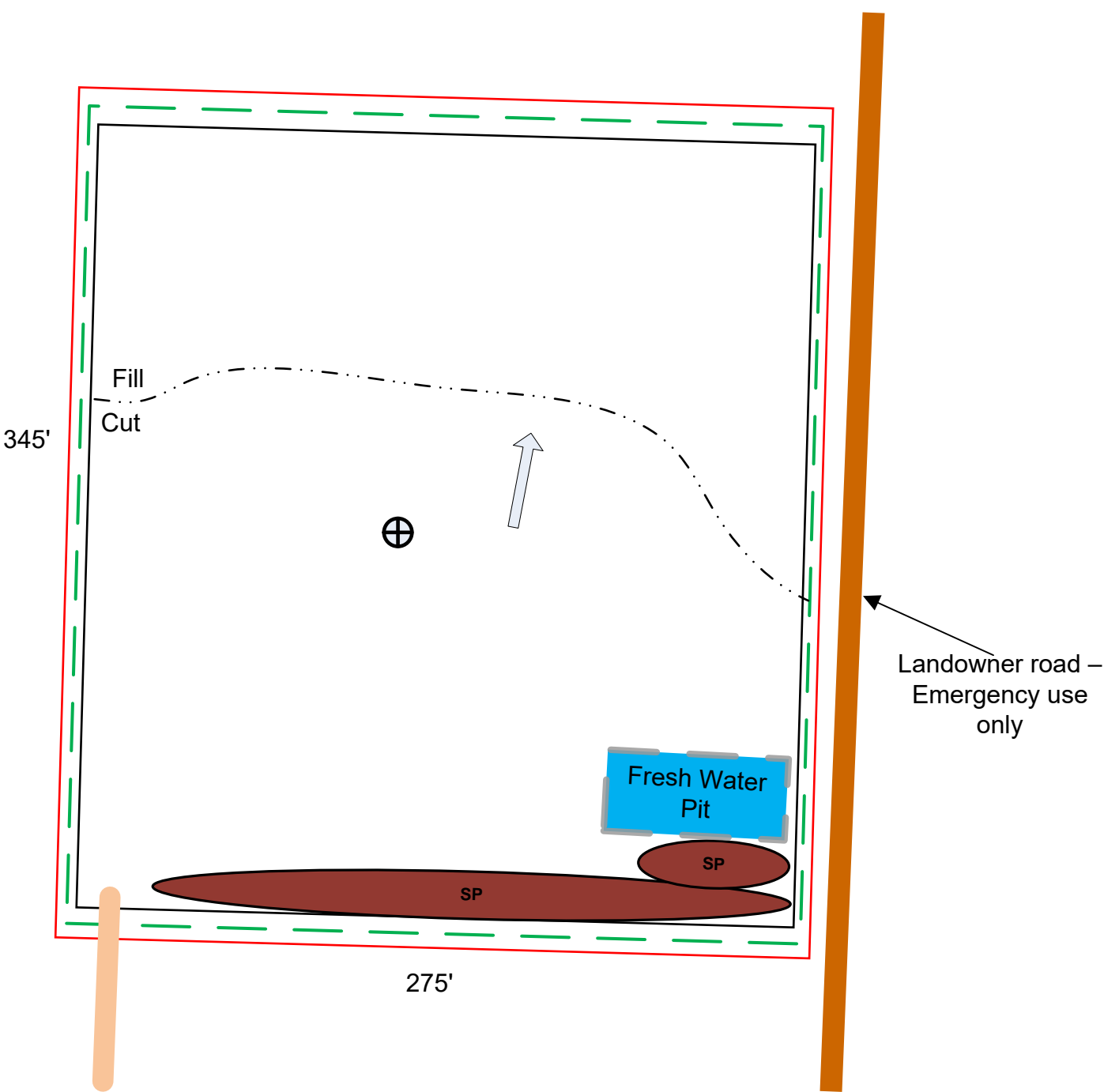
Runoff Risk: low

County: Jackson



Plan Date:
12/22/2015

Grizzly Creek 816'



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

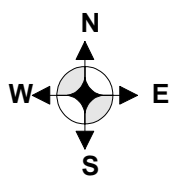
Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Grizzly Creek 816' Northwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created by:

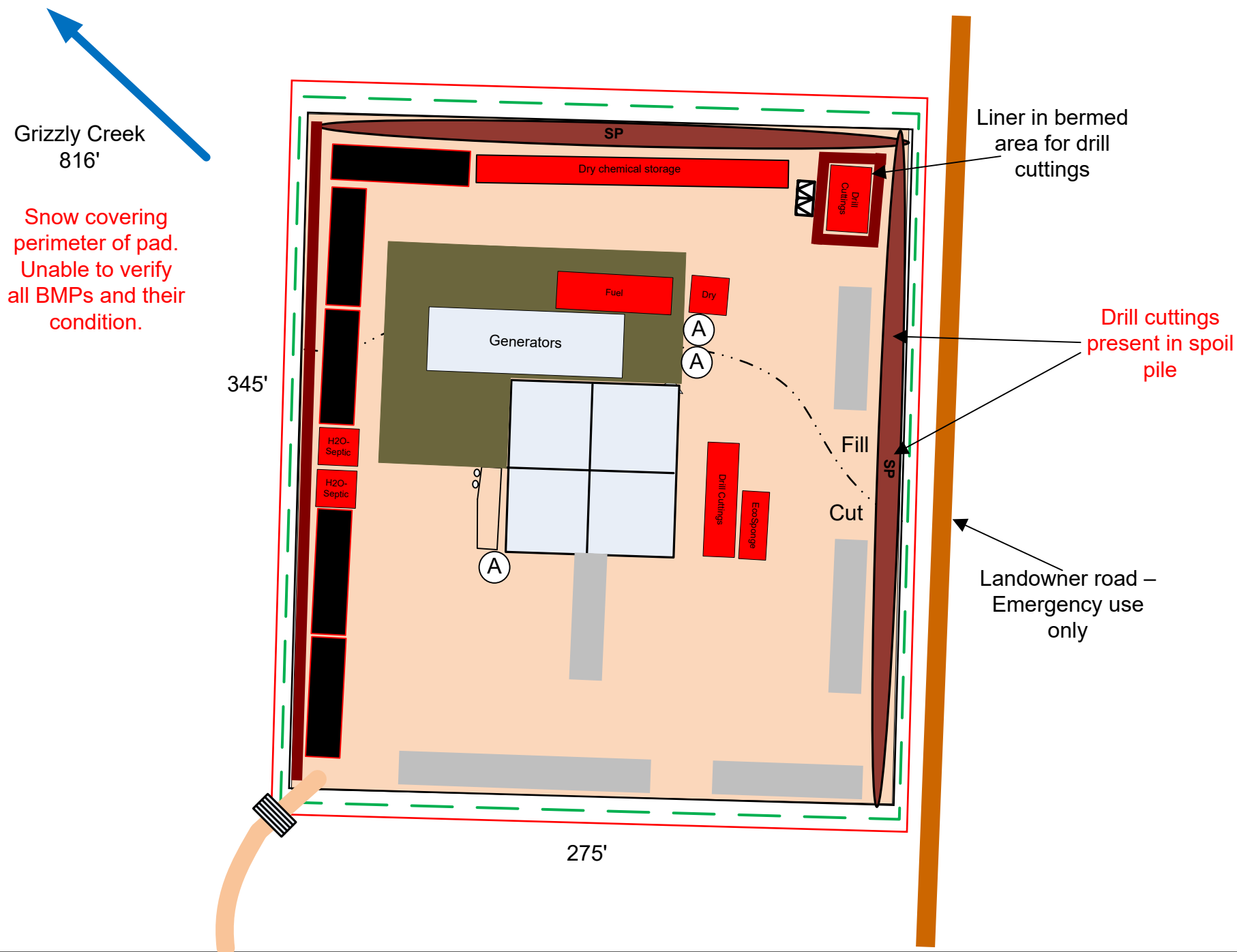
Map Not to Scale



Lease/Name: Gregory 5-09H API: 05-057-06535 Qtr/Qtr: SWSW TWN: 7N RNG: 80W SEC: 9

Land Use: Rangeland Lat/Long: 40.585258/-106.38776

Runoff Risk: low County: Jackson



Satellite Map: Courtesy of Google Earth 2015



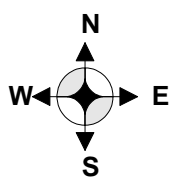
LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Deck/platform | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Grizzly Creek 816' Northwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.



Lease/Name: Gregory 5-09H

API: 05-057-06535 Qtr/Qtr: SWSW

TWN: 7N RNG: 80W SEC: 9

Land Use: Rangeland

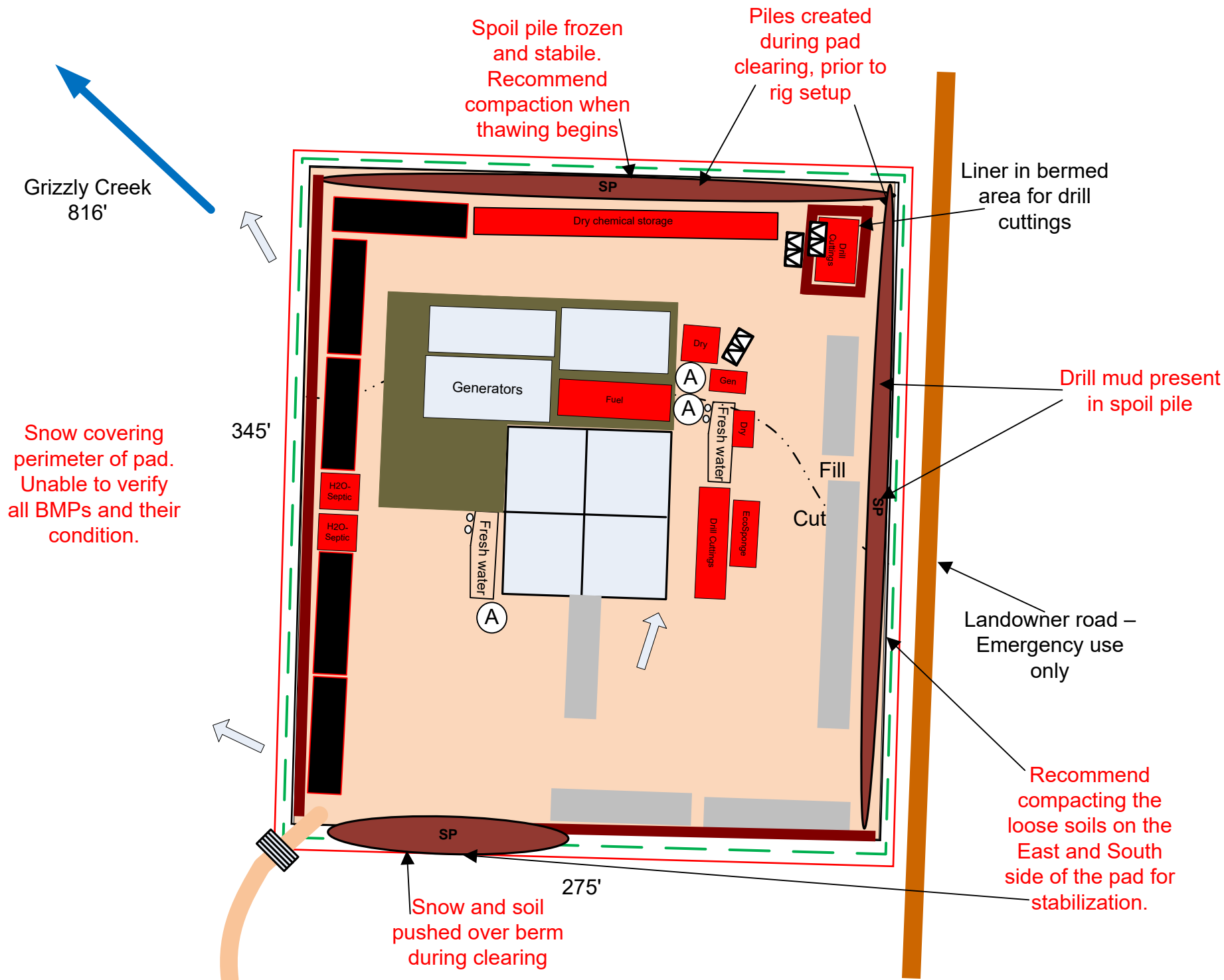
Lat/Long: 40.585258/-106.38776

Runoff Risk: low

County: Jackson



Inspection Date:
1/27/2016



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Deck/platform | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015

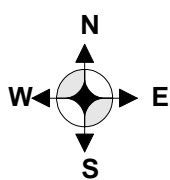


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- 3) Receiving Body of Water:
Grizzly Creek 816' Northwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created
by:



Map Not to Scale



Lease/Name: Gregory 5-09H

API: 05-057-06535 Qtr/Qtr: SWSW

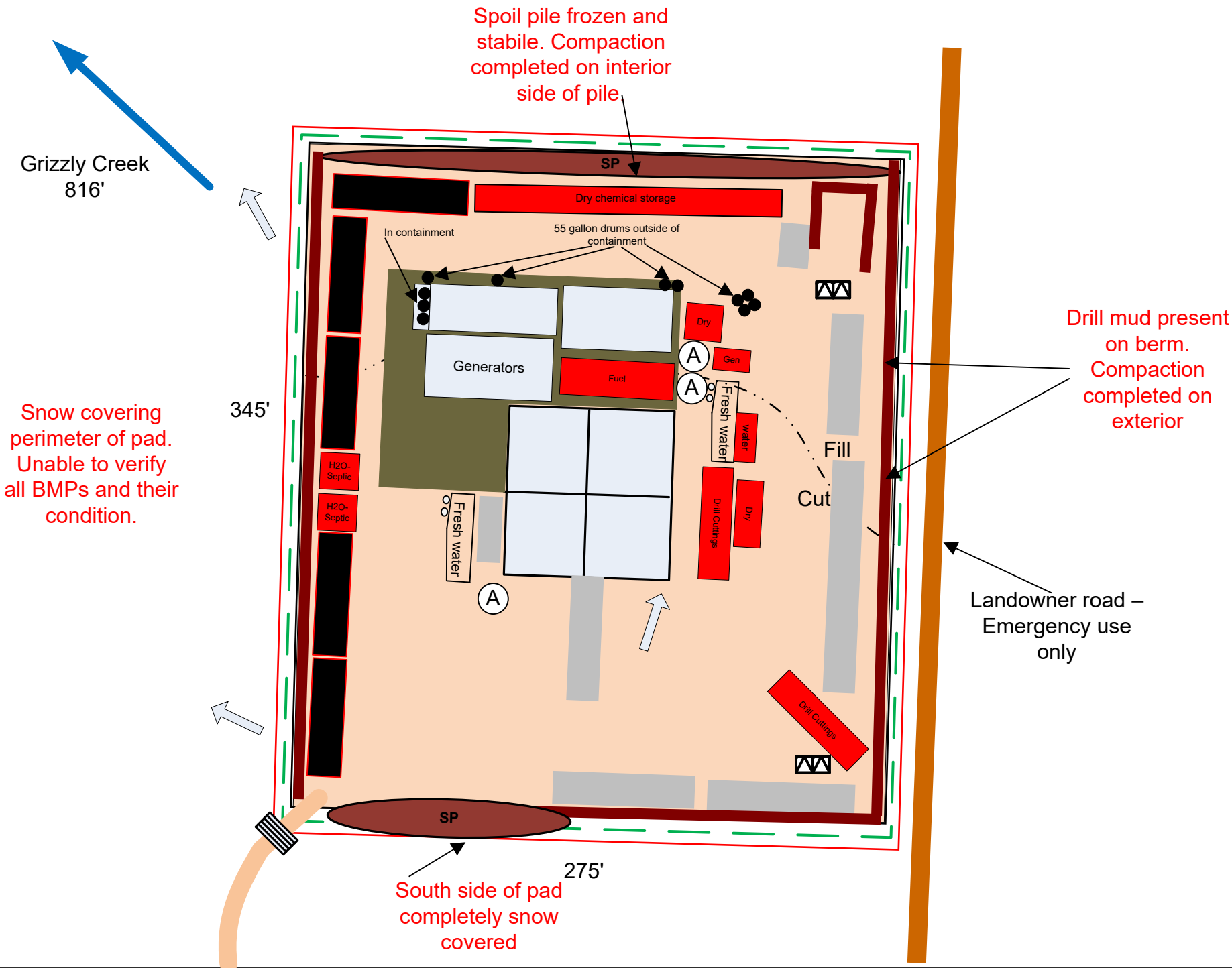
TWN: 7N RNG: 80W SEC: 9

Land Use: Rangeland

Lat/Long: 40.585258/-106.38776

Runoff Risk: low

County: Jackson



Satellite Map: Courtesy of Google Earth 2015



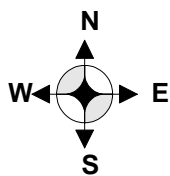
LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Deck/platform | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



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- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Grizzly Creek 816' Northwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.



Lease/Name: Gregory 5-09H

API: 05-057-06535 Qtr/Qtr: SWSW

TWN: 7N RNG: 80W SEC: 9

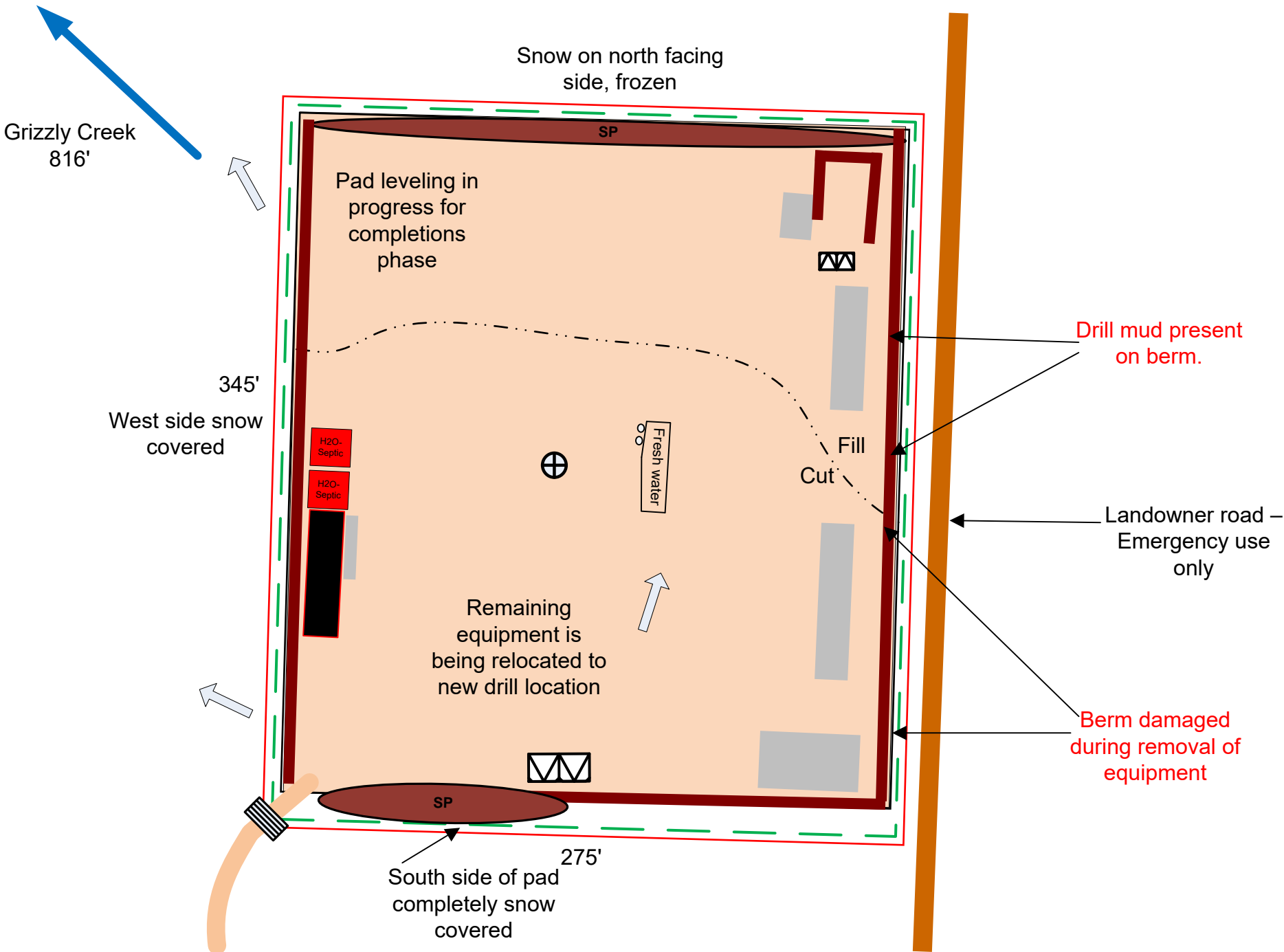
Land Use: Rangeland

Lat/Long: 40.585258/-106.38776

Runoff Risk: low

County: Jackson

SANDRIDGE
Inspection Date:
2/24/2016



Satellite Map: Courtesy of Google Earth 2015



LEGEND

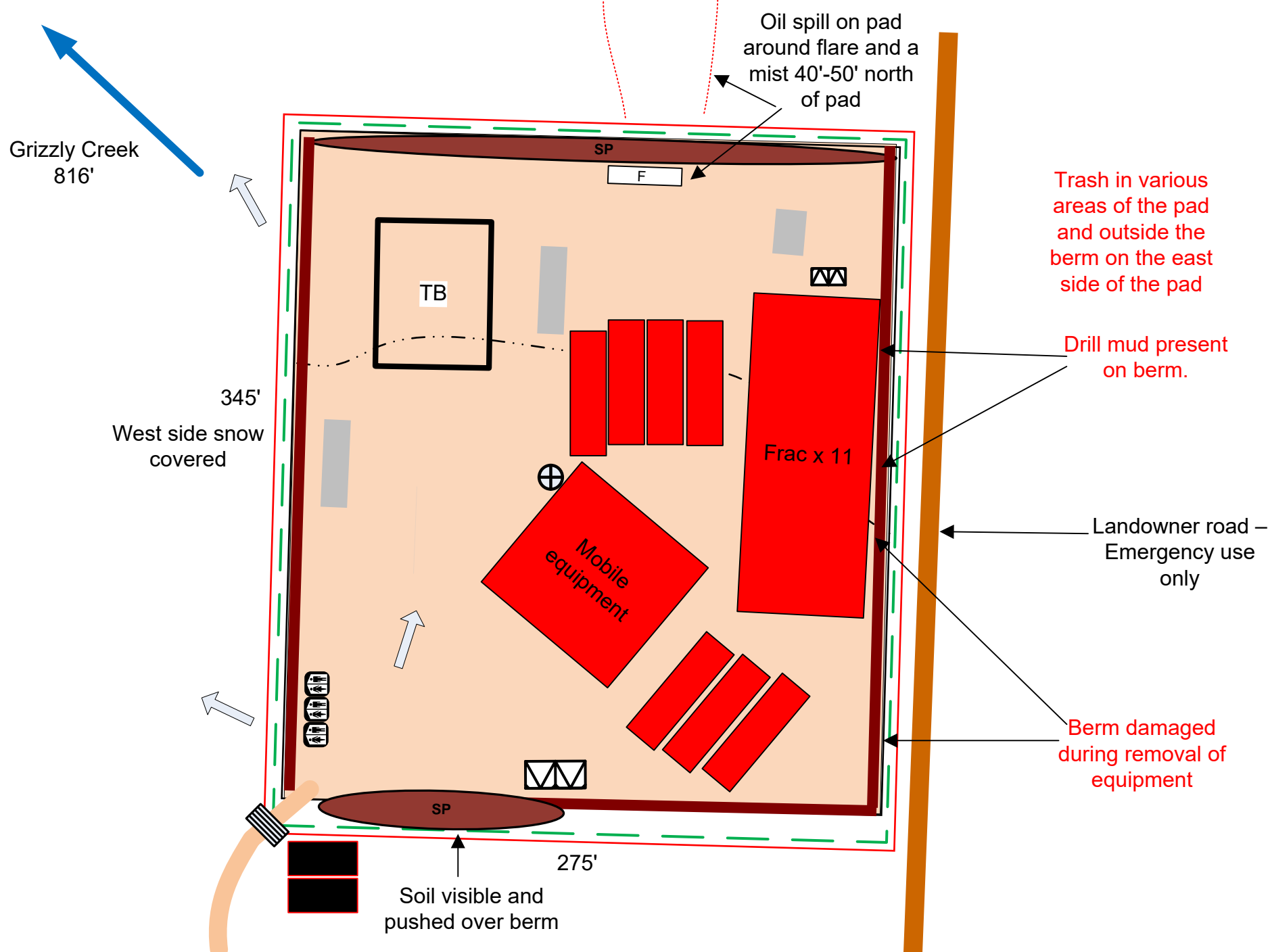
| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Wellhead | | Ditch |
| | Disturbance Boundary | | Rig | | Ditch & Berm |
| | Cut/Fill Line | | Stock Pile | | Filtrexx Sediment Control |
| | Chemical Storage | | Rolloff Frac Tank | | Ripping |
| | Port-o-let | | Frac Trailer | | Riprap |
| | Roadbased Surface | | Equipment Storage | | Roadside Ditches & Turnouts |
| | Surface Water | | Trailer | | Sediment Trap |
| | Paved Road | | Surface Flow | | Seeding |
| | Deck/platform | | Cattleguard | | Silt Fence |
| | Meter House | | Vehicle Tracking Control | | Sound Barrier |
| | Flare | | Dumpster | | Straw Bale |
| | AST | | Berm | | Soil Roughening |
| | Water Sump | | Check Dam | | Wattle |
| | Separator | | Culvert | | 55 gallon drum |

Topographic Map: Courtesy of Google Earth 2015



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Grizzly Creek 816' Northwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created
by:
LT
Map Not to Scale



A satellite map view from Google Earth showing a rural landscape in South Dakota. A winding river flows through the center of the image. To the left, a road is labeled '24' and 'Wainwright Rd'. A yellow pin is placed on the riverbank, labeled 'Gregory 5-09H'. The terrain is a mix of green fields and brown, possibly eroded or dry, areas. In the top left corner, there is a circular logo for 'SOUTH DAKOTA WEATHER SERVICE' with a star in the center. The bottom left corner shows the 'Google earth' logo and a small '14' icon, with the text '© 2015 Google' below it.

| | | | | | |
|--|------------------------------|--|---------------------------------|--|--|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filterxx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Deck/platform | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |

The map shows a topographic view of a region in California. Key features include:

- Grizzly Creek**: A prominent water feature flowing through the center of the map.
- Trownsell Ranch**: Located in the upper left quadrant.
- Ditches**: Several ditches are labeled, including "Grizzly Ditch", "Grizzly Extension Ditch", and "Grizzly Ditch" (repeated).
- Gregory 5-09H**: A yellow dot marks this location on a road near the intersection of Grizzly Creek and a road.
- Grid**: A grid system is overlaid on the map, with numbers 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797

- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Grizzly Creek 816' Northwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created
by:

Map Not to Scale

Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Grizzly 3-11H & Grizzly 6-11H Inspection Date: 12/21/2015
 Location: NWNE 11 7N 81W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Little Grizzly Creek 3,528' Southeast
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

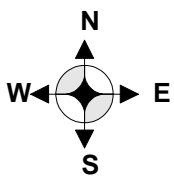
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



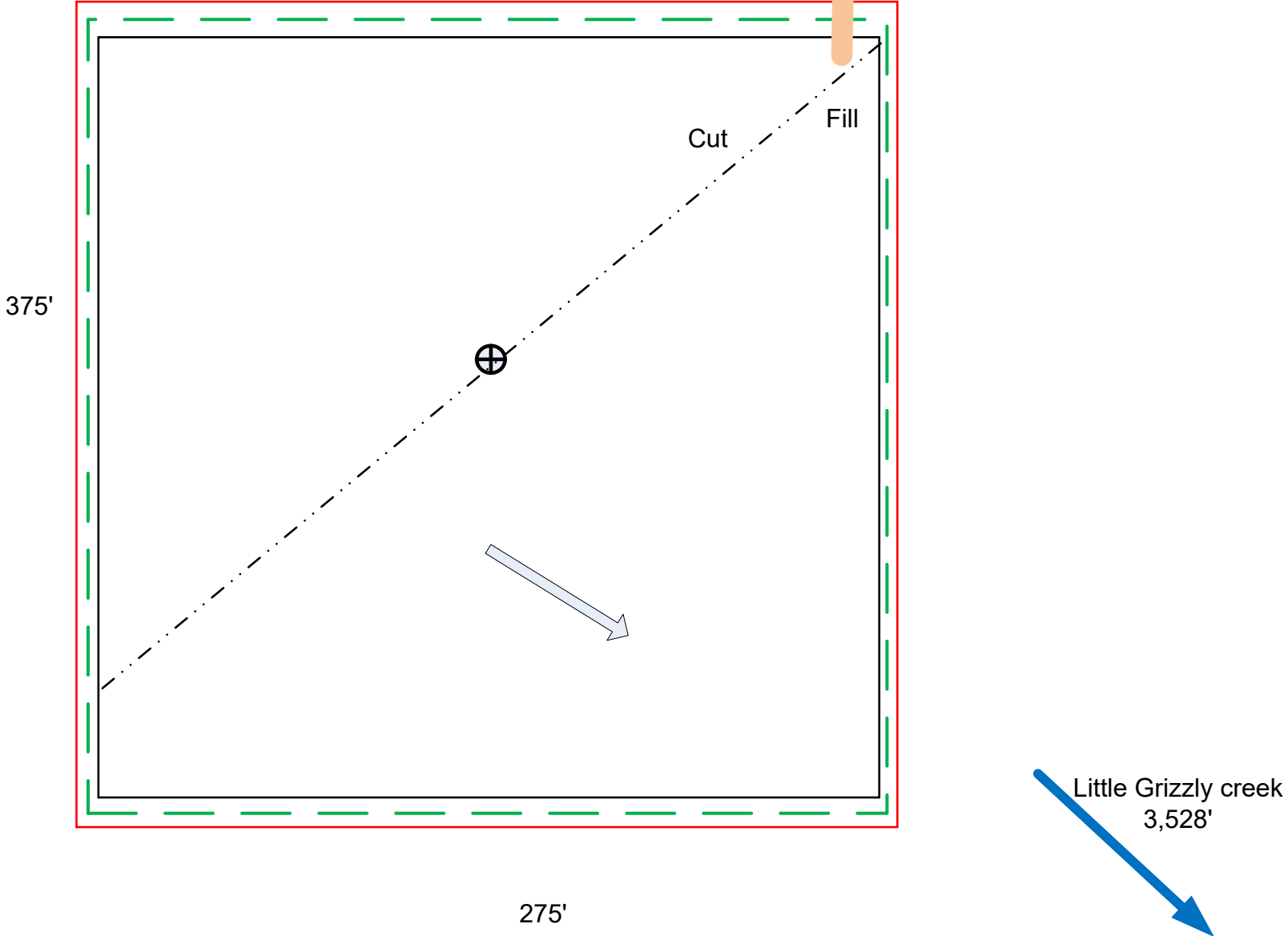
| | | | | | | | | | |
|---|----------------------|-----------------------|------|------------------|----|--------------------|----|--------------|-----|
| WELL NAME: | | Grizzly 3-11H & 6-11H | | | | Facility/ API#: | | 05-057-06529 | |
| | | QTR/QTR: | NAME | SEC: | 11 | TWN: | 7N | RNG: | 81W |
| LAT/LONG: | | 40.598397/-106.453069 | | | | | | | |
| DIRECTIONS: | | | | | | | | | |
| HWY 14 & CR 24, N.9, SW.85, W.65, SW14, S.6 into | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | |
| Jackson County | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | |
| Rangeland 70% | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | |
| 1-5% slopes | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | |
| 4.00 | | | | | | | | | |
| SOIL TYPE | | | | | | | | | |
| Spicerton sandy loam | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | |
| NAME | Little Grizzly Creek | | | | | | | | |
| DIRECTION | Southeast | | | | | | | | |
| DISTANCE | 3,528 ft | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| MAP GENERATED BY | | | | LT ENVIRONMENTAL | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | |
| COMMENTS | | | | | | | | | |
| additional API onsite: 05-057-06528 | | | | | | | | | |



Lease/Name: Grizzly 3-11H API: 05-057-06529 Qtr/Qtr: NWNE TWN: 7N RNG: 81W SEC: 11

Land Use: Rangeland Lat/Long: 40.598397/-106.453069

Runoff Risk: low County: Jackson



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | |
|-----------------------------------|--------------------------------------|---|
| <div></div> Construction Boundary | <div></div> Pad Surface Boundary | <div></div> Ditch |
| <div></div> Disturbance Boundary | <div></div> Wellhead | <div></div> Ditch & Berm |
| <div></div> Cut/Fill Line | <div></div> Rig | <div></div> Filtrexx Sediment Control |
| <div></div> Chemical Storage | <div></div> Stock Pile | <div></div> Ripping |
| <div></div> Port-o-let | <div></div> Rolloff Frac Tank | <div></div> Riprap |
| <div></div> Roadbased Surface | <div></div> Frac Trailer | <div></div> Roadside Ditches & Turnouts |
| <div></div> Surface Water | <div></div> Equipment Storage | <div></div> Sediment Trap |
| <div></div> Paved Road | <div></div> Trailer | <div></div> Seeding |
| <div></div> Unpaved Road | <div></div> Surface Flow | <div></div> Silt Fence |
| <div></div> Meter House | <div></div> Cattleguard | <div></div> Sound Barrier |
| <div></div> Flare | <div></div> Vehicle Tracking Control | <div></div> Straw Bale |
| <div></div> AST | <div></div> Dumpster | <div></div> Soil Roughening |
| <div></div> Water Sump | <div></div> Berm | <div></div> Wattle |
| <div></div> Separator | <div></div> Check Dam | <div></div> 55 gallon drum |
| | <div></div> Culvert | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Little Grizzly Creek 3,528' Southeast
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Grizzly 3-32H Inspection Date: 12/21/2015
 Location: NENW 32 8N 80W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Irrigation ditch 26' east
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------------|---|
| Berm | <u>(Y)</u> N | |
| Cattle Guard | <u>(Y)</u> N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|--|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |

| Pad area Observation | Y/N/NA | Comments |
|--|--------|----------|
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |

| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
|---|--------|----------|
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

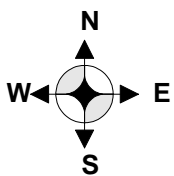
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



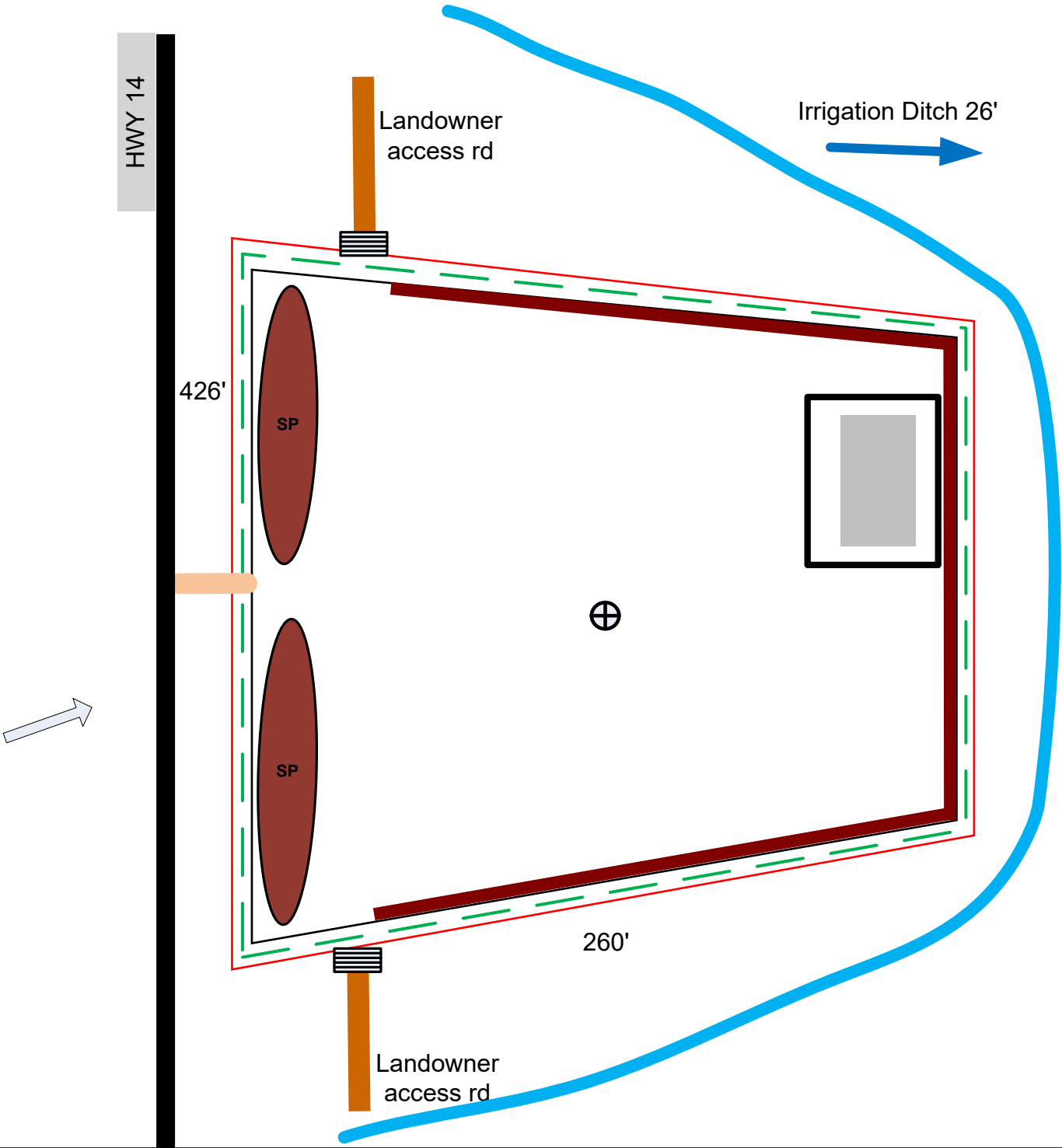
[illegible]



Lease/Name: Grizzly 3-32H API: 05-057-06523 Qtr/Qtr: NENW TWN: 8N RNG: 80W SEC: 32

Land Use: Rangeland Lat/Long: 40.627795/-106.397892

Runoff Risk: low County: Jackson



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Empire Intake Canal approximately 233 feet East/Northeast from well head
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|------------------------------|------------------------------------|-------------------------|
| Site ID/Name: | Hebron 1-18H & Hebron 5-18H | Inspection Date: | 12/21/2015 |
| Location: | NWNE 18 7N 80W | Inspector: | Gentry Muniz |
| Inspection Type: | 14 day <u>Monthly</u> Final | Signature: | <i>Gentry Muniz</i> |
| Land Use: | Rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Cloudy 23° |
| Receiving Body of Water/Distance/Direction: | | Unnamed tributary 1,459' Southwest | |
| Stormwater Runoff Risk: | <u>H</u> <u>M</u> <u>(L)</u> | Vegetation Coverage %: | 70% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | | Y <u>(N)</u> | |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

| | | | |
|----------------------|---------------------|--------|-------------------------|
| Certified by: | Gentry Muniz | Date: | 12/21/2015 |
| Certifier signature: | <i>Gentry Muniz</i> | Title: | Environmental Scientist |



Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|--|------------------------------------|-------------------------|
| Site ID/Name: | 05-057-06501/Hebron 1-18H & Hebron 5-18H | Inspection Date: | 2/10/2016 |
| Location: | NWNE 18 7N 80W | Inspector: | Gentry Muniz |
| Inspection Type: | <u>14 day</u> Monthly Final | Signature: | <i>[Signature]</i> |
| Land Use: | Rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Sunny 20s |
| Receiving Body of Water/Distance/Direction: | | Unnamed tributary 1,459' Southwest | |
| Stormwater Runoff Risk: | H M <u>L</u> | Vegetation Coverage %: | 70% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | | Y | <u>N</u> |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|------------|---|
| Berm | Y <u>N</u> | |
| Cattle Guard | Y <u>N</u> | |
| Check Dam | Y <u>N</u> | |
| Culvert | Y <u>N</u> | |
| Ditch | Y <u>N</u> | |
| Ditch and Berm | Y <u>N</u> | |
| Filtrexx Sediment Control | Y <u>N</u> | |
| Land Grading | Y <u>N</u> | |
| Ripping | Y <u>N</u> | |
| Rip Rap | Y <u>N</u> | |
| Roadside Ditches and Turnouts | Y <u>N</u> | |
| Sediment Trap | Y <u>N</u> | |
| Seeding | Y <u>N</u> | |
| Silt Fence | Y <u>N</u> | |
| Straw Bale Barrier | Y <u>N</u> | |
| Soil Roughening | Y <u>N</u> | |
| Tracking Pad | Y <u>N</u> | |
| Wattles | Y <u>N</u> | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | N | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site has been cleared of snow and is being prepared for drilling operations to begin soon. All snow has been pushed to the perimeter of the pad and I was unable to verify any BMPs that may be on site due to snow cover. No melting conditions exist.

Is this site compliant with the permit at the time of the inspection? Y N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

| | | | |
|----------------------|--------------------|--------|-------------------------|
| Certified by: | Gentry Muniz | Date: | 2/10/2016 |
| Certifier signature: | <i>[Signature]</i> | Title: | Environmental Scientist |



Stormwater Management Plan Compliance Inspection Report

Site ID/Name: 05-057-06501/Hebron 1-18H & Hebron 5-18H
 Location: NWNE 18 7N 80W
 Inspection Type: 14 day Monthly Final
 Land Use: Rangeland
 Site Type: Well & TB
 Inspection Date: 2/24/2016
 Inspector: Gentry Muniz
 Signature: *Gentry Muniz*
 Title: Environmental Scientist
 Weather: Sunny 20s, windy
 Receiving Body of Water/Distance/Direction: Unnamed tributary 1,459' Southwest
 Stormwater Runoff Risk: H M L Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y N

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location | Date Completed |
|-------------------------------|------------|--|----------------|
| Berm | <u>Y</u> N | Recommend berm compaction and uniform height E, W, & N | |
| Cattle Guard | Y <u>N</u> | | |
| Check Dam | Y N | | |
| Culvert | Y N | | |
| Ditch | Y N | | |
| Ditch and Berm | Y N | | |
| Filtrex Sediment Control | Y N | | |
| Land Grading | Y N | | |
| Ripping | Y N | | |
| Rip Rap | Y N | | |
| Roadside Ditches and Turnouts | Y N | | |
| Sediment Trap | Y N | | |
| Seeding | Y N | | |
| Silt Fence | Y N | | |
| Straw Bale Barrier | Y N | | |
| Soil Roughening | Y N | | |
| Tracking Pad | Y N | | |
| Wattles | Y <u>N</u> | | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have BMP repairs been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | N | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Rig setup in progress. Heavy flow of traffic in and out of site. Spoke with Todd Martin about berms, compaction, and making them uniform in height and he is having a crew perform that starting 2/25/16.

Is this site compliant with the permit at the time of the inspection? Y N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: _____

Date: _____

Certifier signature: _____

Title: _____



Stormwater Management Plan Compliance Inspection Report

Site ID/Name: 05-057-06501/Hebron 1-18H & Hebron 5-18H
 Location: NWN 18 7N 80W
 Inspection Type: 14 day Monthly Final
 Land Use: Rangeland
 Site Type: Well & TB
 Inspection Date: 3/9/2016
 Inspector: Gentry Muniz
 Signature: *[Signature]*
 Title: Environmental Scientist
 Weather: sunny 20's
 Receiving Body of Water/Distance/Direction: Unnamed tributary 1,459' Southwest
 Stormwater Runoff Risk: H M L Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y N

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location | Date Completed |
|-------------------------------|------------|---|----------------|
| Berm | <u>Y</u> N | Recommend berm compaction and uniform height E, W, S, & N | |
| Cattle Guard | Y <u>N</u> | | |
| Check Dam | Y N | | |
| Culvert | Y N | | |
| Ditch | Y N | | |
| Ditch and Berm | Y N | | |
| Filtrex Sediment Control | Y N | | |
| Land Grading | Y N | | |
| Ripping | Y N | | |
| Rip Rap | Y N | | |
| Roadside Ditches and Turnouts | Y N | | |
| Sediment Trap | Y N | | |
| Seeding | Y N | | |
| Silt Fence | Y N | | |
| Straw Bale Barrier | Y N | | |
| Soil Roughening | Y N | | |
| Tracking Pad | Y N | | |
| Wattles | Y <u>N</u> | | |

| General | Y/N/NA | Comments |
|--|--------|-------------|
| Have BMP repairs been addressed since last inspection? | N | |
| Are there Signs of sediment leaving the site? | Y | |
| Are there signs of offsite tracking at the access point? | Y | onto HWY 14 |
| Are surface waters being impacted by site runoff? | N | |
| Is there portable toilet on-site? | N | |

| Pad area Observation | Y/N/NA | Comments |
|--|--------|----------|
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |

| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
|---|--------|----------|
| Has site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | N | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Drill rig on-site. It does not appear that berms have been attended to. Observed a bag of material spilled onto the ground at the SW corner where materials are being stored. Also observed drilling material on ground where being used for drilling.

Is this site compliant with the permit at the time of the inspection? Y N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: _____

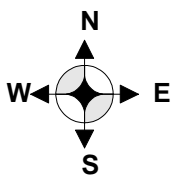
Date: _____

Certifier signature: _____

Title: _____



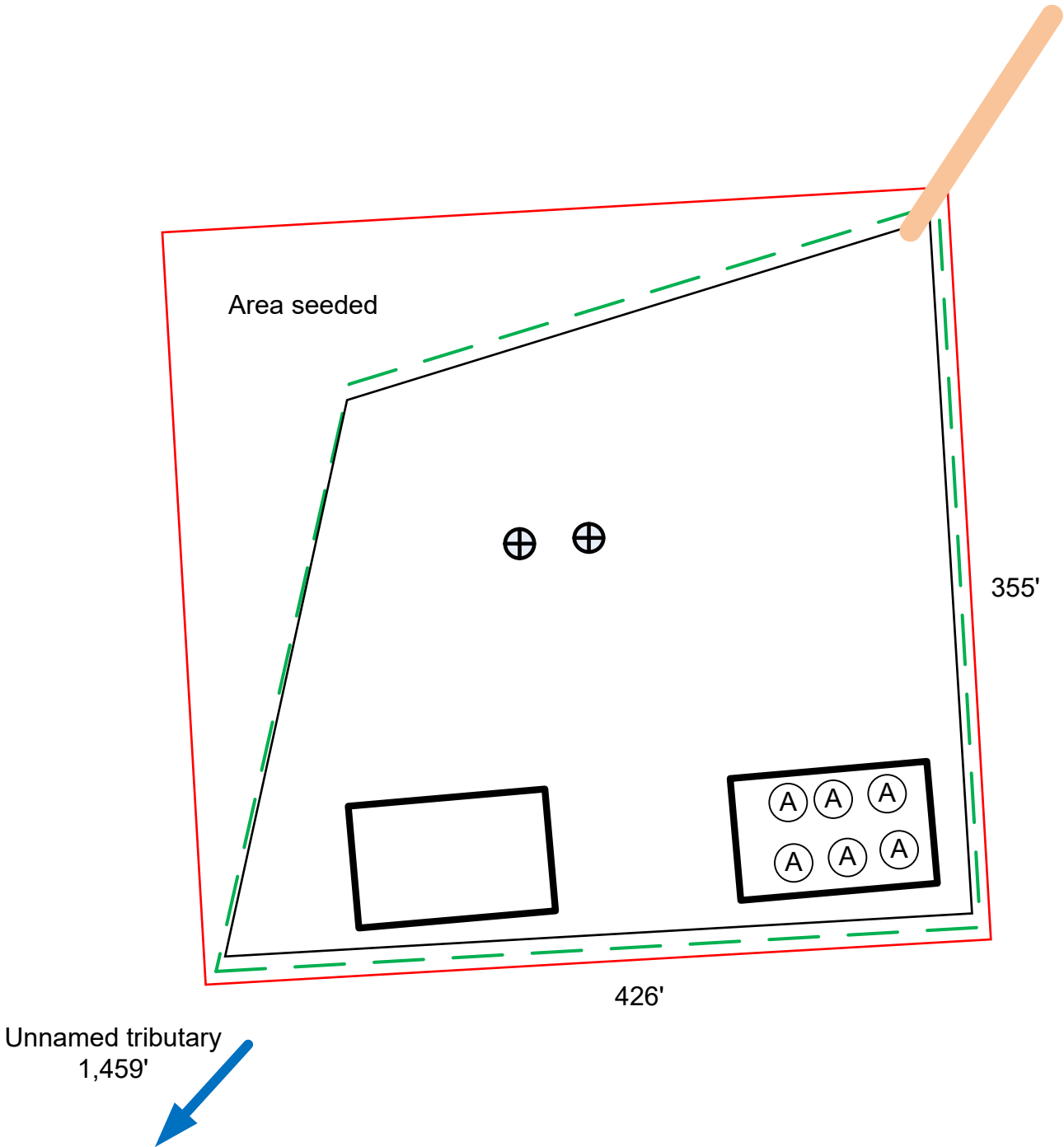
| | | | | | | | | | |
|---|-------------------|-----------------------|------|------------------|----|--------------------|----|--------------|-----|
| WELL NAME: | | Hebron 1-18H & 5-18H | | | | Facility/ API#: | | 05-057-06501 | |
| | | QTR/QTR: | NAME | SEC: | 18 | TWN: | 7N | RNG: | 80W |
| LAT/LONG: | | 40.584158/-106.415492 | | | | | | | |
| DIRECTIONS: | | | | | | | | | |
| HWY 14 & CR 24, S.8, W.3, SW into | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | |
| Jackson County | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | |
| Rangeland 70% | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | |
| 1-5% slopes | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | |
| 2.17 | | | | | | | | | |
| SOIL TYPE | | | | | | | | | |
| Forelle loam | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | |
| NAME | Unnamed tributary | | | | | | | | |
| DIRECTION | Southwest | | | | | | | | |
| DISTANCE | 1,459 ft | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| MAP GENERATED BY | | | | LT ENVIRONMENTAL | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | |
| COMMENTS | | | | | | | | | |
| Additional API onsite: 05-057-06502 | | | | | | | | | |



Lease/Name: Hebron 1-18H & 5-18H API: 05-057-06501 Qtr/Qtr: NWNE TWN: 7N RNG: 80W SEC: 18

Land Use: Rangeland Lat/Long: 40.584158/-106.415492

Runoff Risk: low County: Jackson



Satellite Map: Courtesy of Google Earth 2015



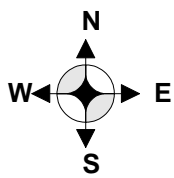
LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed tributary 1,459' Southwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.



Lease/Name: Hebron 1-18H & 5-18H API: 05-057-06501 Qtr/Qtr: NWNE TWN: 7N RNG: 80W SEC: 18

Land Use: Rangeland

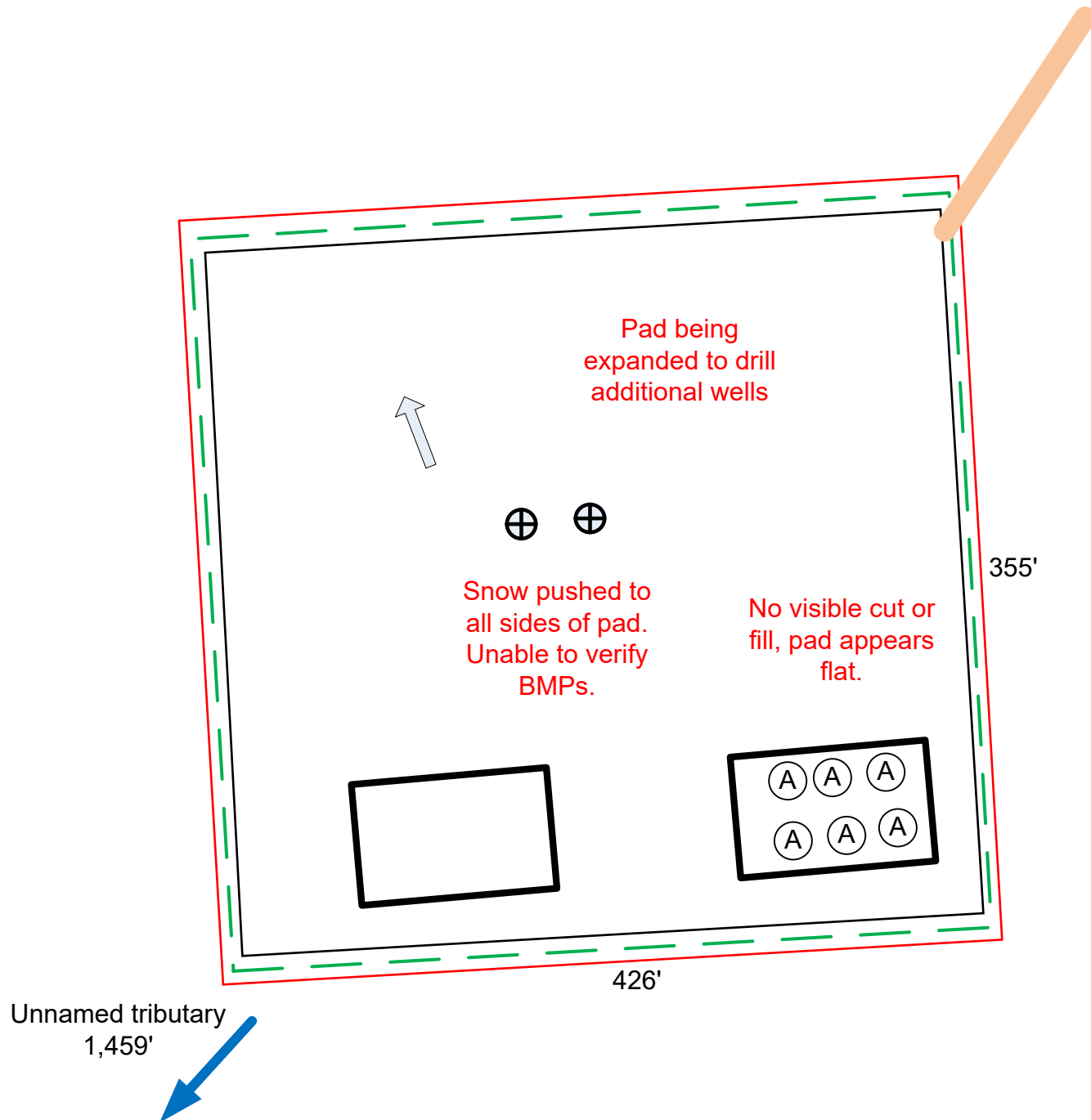
Lat/Long: 40.584158/-106.415492

Runoff Risk: low

County: Jackson



Inspection Date:
2/10/2016



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Wellhead | | Pad Surface Boundary |
| | Disturbance Boundary | | Rig | | Ditch & Berm |
| | Cut/Fill Line | | Stock Pile | | Filtrexx Sediment Control |
| | Chemical Storage | | Rolloff Frac Tank | | Ripping |
| | Port-o-let | | Frac Trailer | | Riprap |
| | Roadbased Surface | | Equipment Storage | | Roadside Ditches & Turnouts |
| | Surface Water | | Trailer | | Sediment Trap |
| | Paved Road | | Surface Flow | | Seeding |
| | Unpaved Road | | Cattleguard | | Silt Fence |
| | Meter House | | Vehicle Tracking Control | | Sound Barrier |
| | Flare | | Dumpster | | Straw Bale |
| | AST | | Berm | | Soil Roughening |
| | Water Sump | | Check Dam | | Wattle |
| | Separator | | Culvert | | 55 gallon drum |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed tributary 1,459' Southwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created by:

Map Not to Scale

Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|------------------------------|------------------------|-------------------------|
| Site ID/Name: | Hebron 02-07H | Inspection Date: | 12/21/2015 |
| Location: | NWNE 7 7N 80W | Inspector: | Gentry Muniz |
| Inspection Type: | 14 day <u>Monthly</u> Final | Signature: | <i>Gentry Muniz</i> |
| Land Use: | Rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Cloudy 23° |
| Receiving Body of Water/Distance/Direction: | | Ditch 109' Southeast | |
| Stormwater Runoff Risk: | <u>H</u> <u>M</u> <u>(L)</u> | Vegetation Coverage %: | 70% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | | Y <u>(N)</u> | |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------------|---|
| Berm | <u>(Y)</u> N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

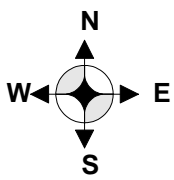
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

| | | | |
|----------------------|---------------------|--------|-------------------------|
| Certified by: | Gentry Muniz | Date: | 12/21/2015 |
| Certifier signature: | <i>Gentry Muniz</i> | Title: | Environmental Scientist |



| | | | | | | | | | |
|---|-----------|-----------------------|------|------------------|---|--------------------|----|--------------|-----|
| WELL NAME: | | Hebron 02-07H | | | | Facility/ API#: | | 05-057-06499 | |
| | | QTR/QTR: | NAME | SEC: | 7 | TWN: | 7N | RNG: | 80W |
| LAT/LONG: | | 40.598306/-106.415469 | | | | | | | |
| DIRECTIONS: | | | | | | | | | |
| HWY 14 & CR 24, SW.4, NWthru TB.3 into | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | |
| Jackson County | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | |
| Rangeland 70% | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | |
| 1-5% slopes | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | |
| 5.51 | | | | | | | | | |
| SOIL TYPE | | | | | | | | | |
| Bosler sandy loam | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | |
| NAME | Ditch | | | | | | | | |
| DIRECTION | Southeast | | | | | | | | |
| DISTANCE | 109 ft | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| MAP GENERATED BY | | | | LT ENVIRONMENTAL | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | |
| COMMENTS | | | | | | | | | |
| | | | | | | | | | |



Lease/Name: Hebron 02-07H

API: 05-057-06499 Qtr/Qtr: NWNE

TWN: 7N RNG: 80W SEC: 7

Land Use: Rangeland

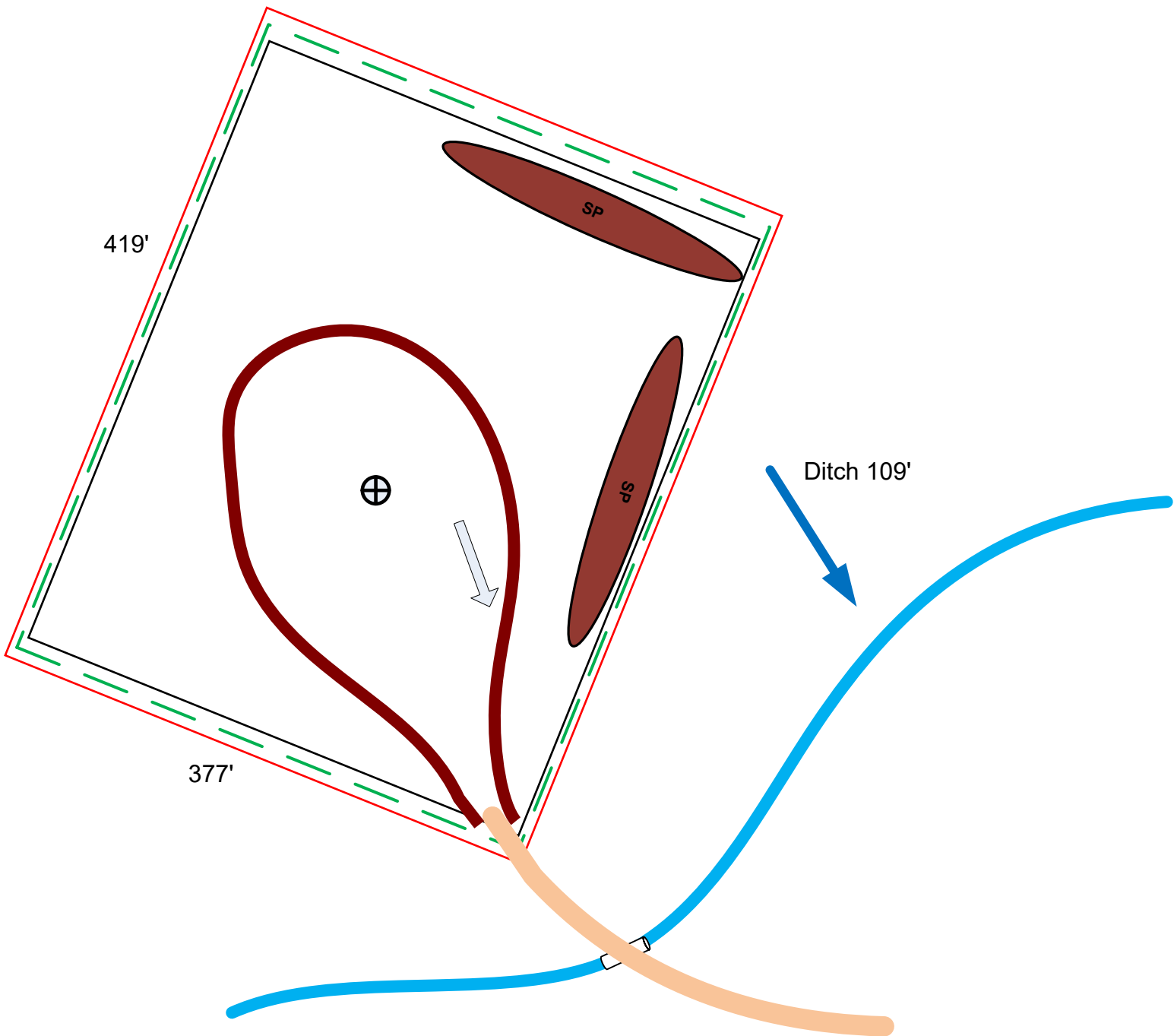
Lat/Long: 40.598306/-106.415469

Runoff Risk: low

County: Jackson



Plan Date:
12/22/2015



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Ditch 109' southeast
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created by:



Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Hebron 3-12H Inspection Date: 12/21/2015
 Location: NENE 12 7N 81W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Unnamed tributary 265' Southeast
 Stormwater Runoff Risk: H M **L** Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y **N**

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|------------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

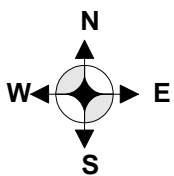
Is this site compliant with the permit at the time of the inspection? **Y** N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



| | | | | | | | | | | | |
|---|-------------------|-----------------------|------|------|------------------|--------------------|----|--------------|-----|--|--|
| WELL NAME: | | Hebron 3-12H | | | | Facility/ API#: | | 05-057-06498 | | | |
| | | QTR/QTR: | NENE | SEC: | 12 | TWN: | 7N | RNG: | 81W | | |
| LAT/LONG: | | 40.596919/-106.426358 | | | | | | | | | |
| DIRECTIONS: | | | | | | | | | | | |
| HWY 14 & CR 24, SW1, N.5 into | | | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | | | |
| Jackson County | | | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | | | |
| Rangeland 70 | | | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | | | |
| 1-5% slopes | | | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | | | |
| 5.94 | | | | | | | | | | | |
| SOIL TYPE | | | | | | | | | | | |
| Walden sandy loam | | | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | | | |
| NAME | Unnamed tributary | | | | | | | | | | |
| DIRECTION | Southeast | | | | | | | | | | |
| DISTANCE | 265' | | | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENVIRONMENTAL | | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | |
| | | | | | | | | | | | |



Lease/Name: Hebron 3-12H

API: 05-057-06498 Qtr/Qtr: NENE

TWN: 7N RNG: 81W SEC: 12

Land Use: Rangeland

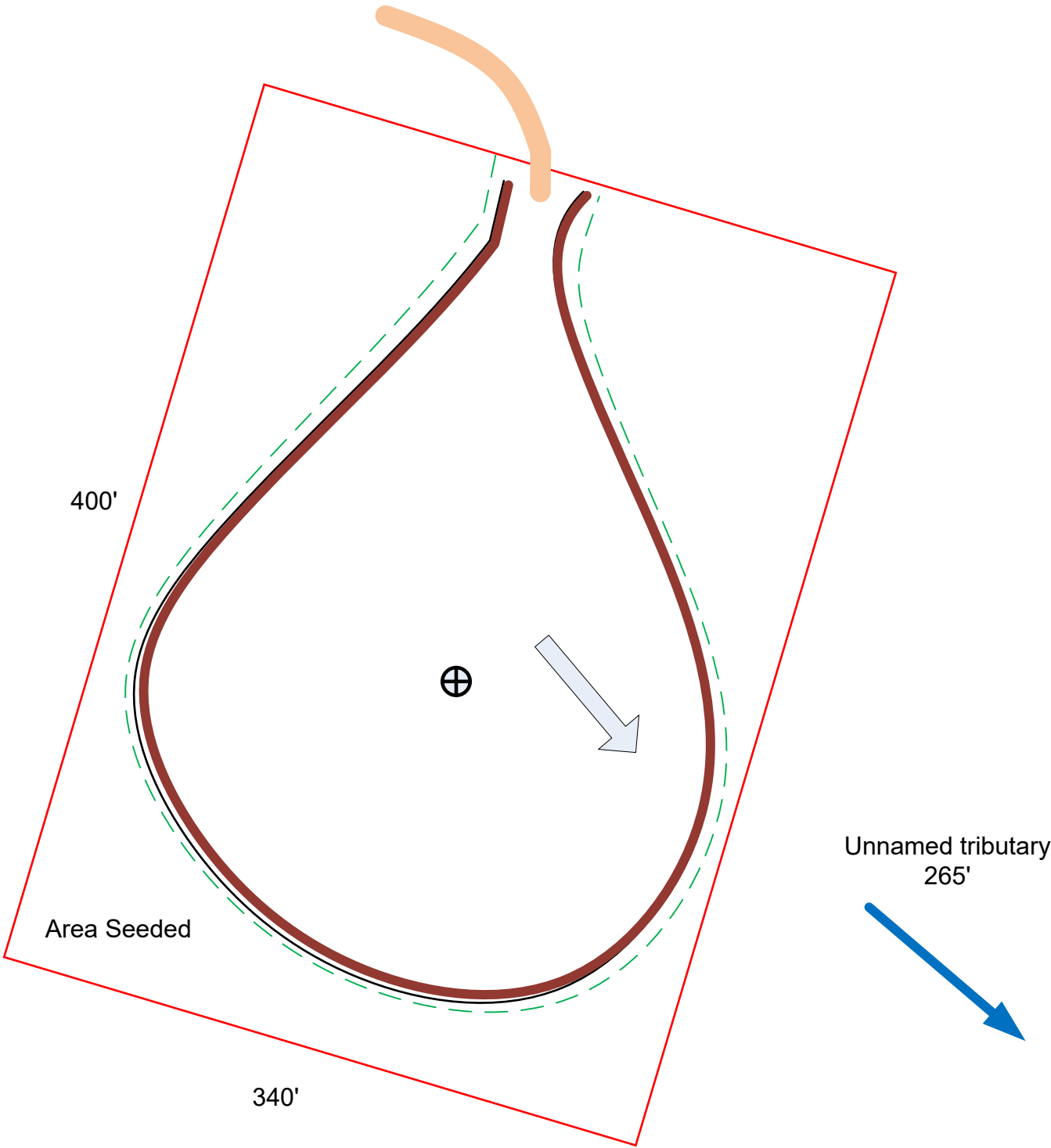
Lat/Long: 40.596919/-106.426358

Runoff Risk: low

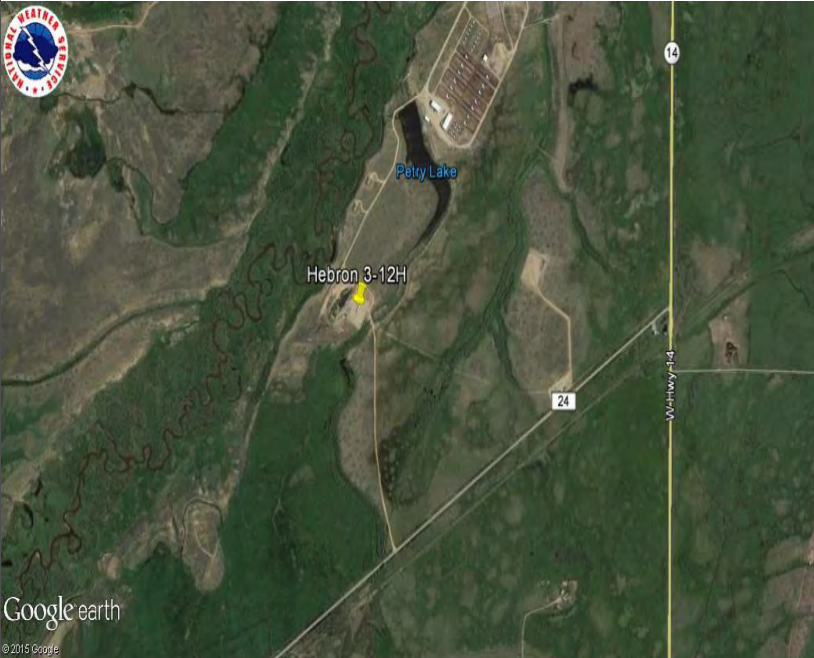
County: Jackson



Plan Date:
12/22/2015



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed tributary 265' southeast
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created by:



Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Judy 1-30 Inspection Date: 12/21/2015
 Location: NESE 30 7N 80W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Unnamed tributary 884' Northeast
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrex Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

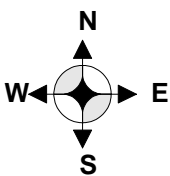
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



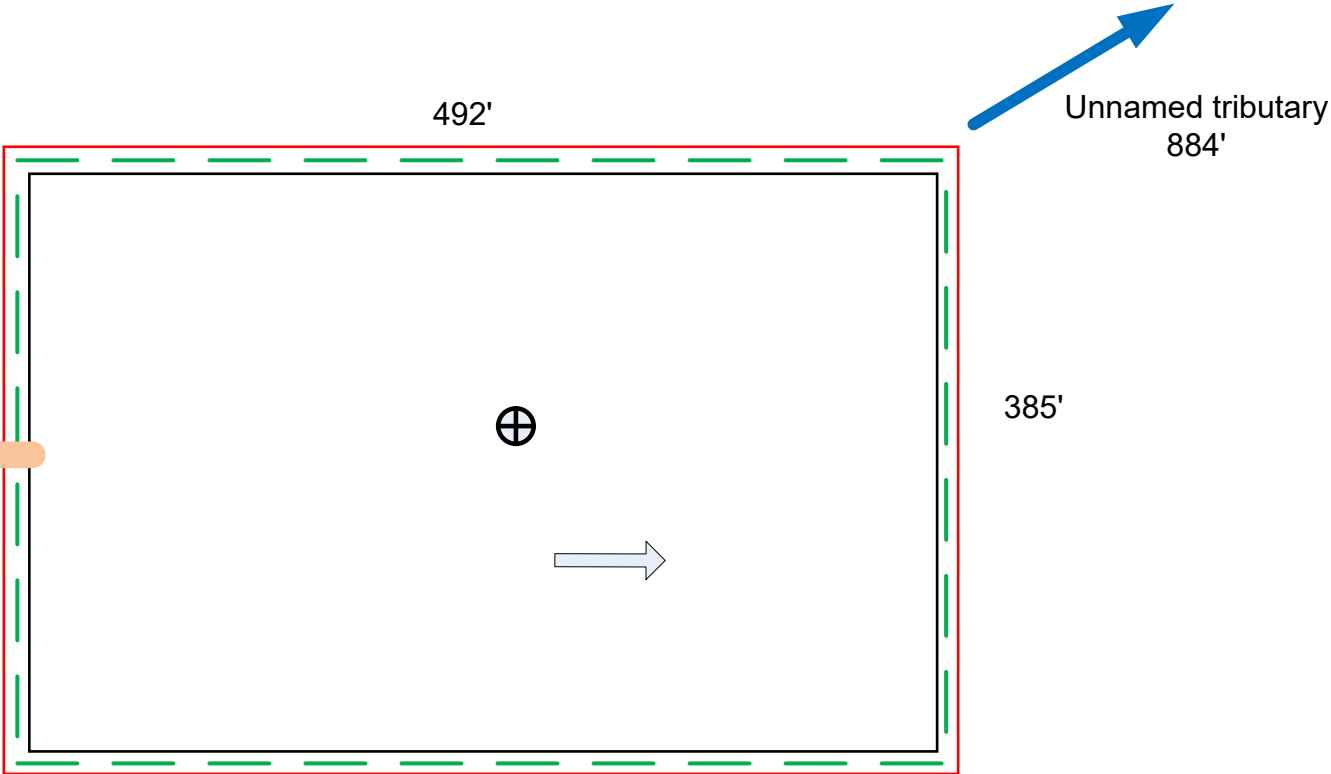
| | | | | | | | | | | | |
|---|-------------------|----------------------|------|------|------------------|--------------------|----|--------------|-----|--|--|
| WELL NAME: | | Judy 1-30 | | | | Facility/ API#: | | 05-057-06466 | | | |
| | | QTR/QTR: | NESE | SEC: | 30 | TWN: | 7N | RNG: | 80W | | |
| LAT/LONG: | | 40.547043/-106.41017 | | | | | | | | | |
| DIRECTIONS: | | | | | | | | | | | |
| HWY 14 & CR 26, W.4, S.6, E.3 into | | | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | | | |
| Jackson County | | | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | | | |
| Rangeland 70% | | | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | | | |
| 1-5% slopes | | | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | | | |
| 5.19 | | | | | | | | | | | |
| SOIL TYPE | | | | | | | | | | | |
| Forelle loam | | | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | | | |
| NAME | Unnamed tributary | | | | | | | | | | |
| DIRECTION | Northeast | | | | | | | | | | |
| DISTANCE | 884 ft | | | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENVIRONMENTAL | | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | |
| | | | | | | | | | | | |



Lease/Name: Judy 1-30 API: 05-057-06466 Qtr/Qtr: NESE TWN: 7N RING: 80W SEC: 30

Land Use: Rangeland Lat/Long: 40.547043/-106.41017

Runoff Risk: low County: Jackson



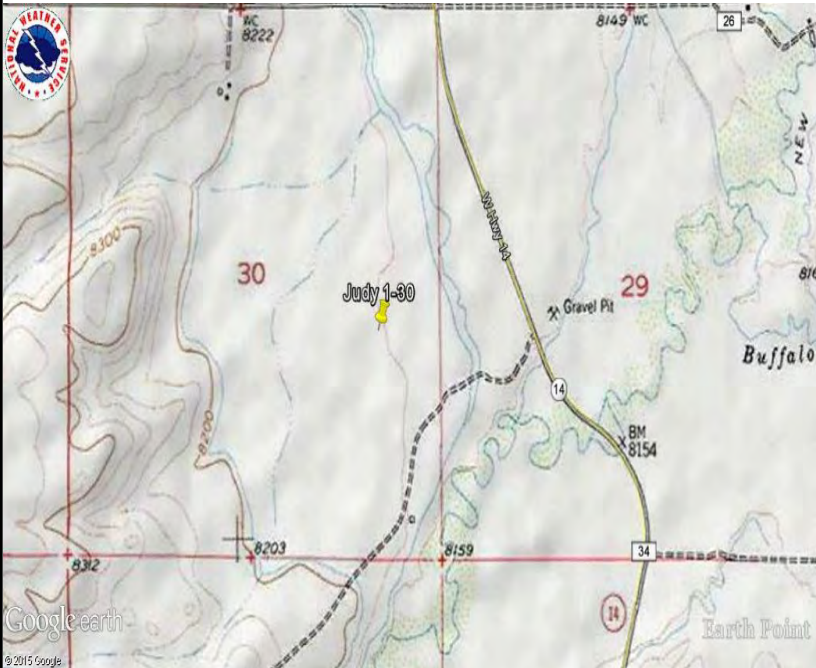
Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed tributary 884' Northeast
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Mutual 2-30H & Mutual 4-30H
 Location: SWSE 30 7N 80W
 Inspection Type: 14 day Monthly Final
 Land Use: Rangeland
 Site Type: Well & TB
 Inspection Date: 12/21/2015
 Inspector: Gentry Muniz
 Signature: *Gentry Muniz*
 Title: Environmental Scientist
 Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Unnamed tributary 265' West
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | NA | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

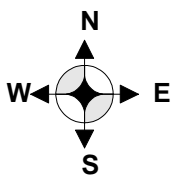
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



| | | | | | | | | | | | |
|---|-------------------|-----------------------|------|------|-----------------|--------------------|----|---------------|-----|--|--|
| WELL NAME: | | Mutual 2-30H | | | | Facility/ API#: | | 05-0570-06465 | | | |
| | | QTR/QTR: | SWSE | SEC: | 30 | TWN: | 7N | RNG: | 80W | | |
| LAT/LONG: | | 40.541977/-106.414359 | | | | | | | | | |
| DIRECTIONS: | | | | | | | | | | | |
| HWY 14 & CR 26, W.4, S 1 into | | | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | | | |
| Jackson County | | | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | | | |
| Rangeland 70% | | | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | | | |
| 1-5% slopes | | | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | | | |
| 2.77 | | | | | | | | | | | |
| SOIL TYPE | | | | | | | | | | | |
| Forelle loam | | | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | | | |
| NAME | Unnamed tributary | | | | | | | | | | |
| DIRECTION | west | | | | | | | | | | |
| DISTANCE | 265 ft | | | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENMRONVENTAL | | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | |
| | | | | | | | | | | | |



Lease/Name: Mutual 2-30H

API: 05-057-06465 Qtr/Qtr: SWSE

TWN: 7N RNG: 80W SEC: 30

Land Use: Rangeland

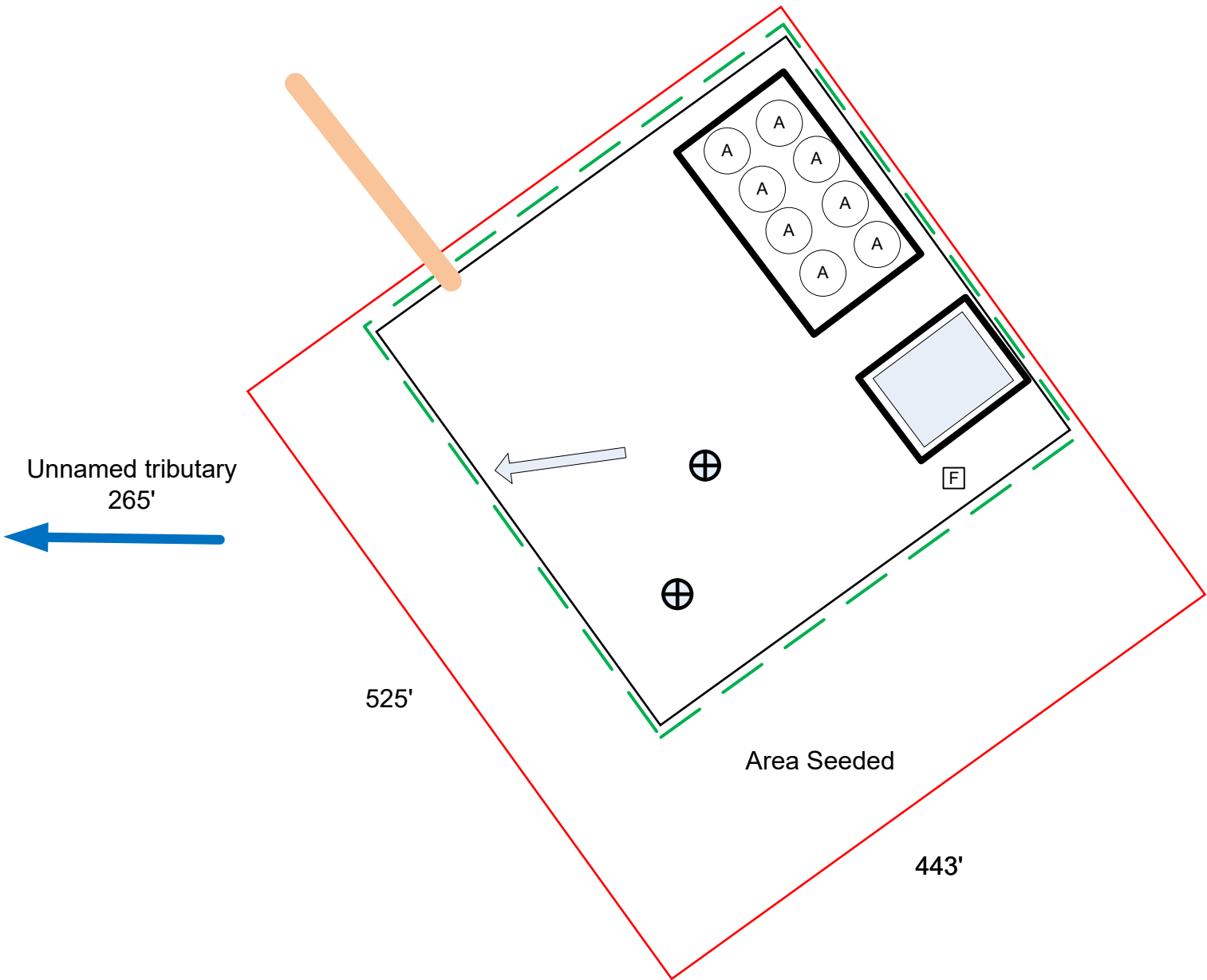
Lat/Long: 40.541977/-106.414359

Runoff Risk: low

County: Jackson



Plan Date:
12/22/2015



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Wellhead | | Ditch |
| | Disturbance Boundary | | Rig | | Ditch & Berm |
| | Cut/Fill Line | | Stock Pile | | Filtrexx Sediment Control |
| | Chemical Storage | | Rolloff Frac Tank | | Ripping |
| | Port-o-let | | Frac Trailer | | Riprap |
| | Roadbased Surface | | Equipment Storage | | Roadside Ditches & Turnouts |
| | Surface Water | | Trailer | | Sediment Trap |
| | Paved Road | | Surface Flow | | Seeding |
| | Unpaved Road | | Cattleguard | | Silt Fence |
| | Meter House | | Vehicle Tracking Control | | Sound Barrier |
| | Flare | | Dumpster | | Straw Bale |
| | AST | | Berm | | Soil Roughening |
| | Water Sump | | Check Dam | | Wattle |
| | Separator | | Culvert | | 55 gallon drum |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed tributary 265' west
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|---|---|-------------------------|
| Site ID/Name: | 05-057-06544/Mutual 7 Multi-well Pad | Inspection Date: | 3/9/2016 |
| Location: | NWNW 17 7N 80W | Inspector: | Gentry Muniz |
| Inspection Type: | 14 day | Signature: | <i>[Signature]</i> |
| Land Use: | rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Cloudy 20's |
| Receiving Body of Water/Distance/Direction: | | Ditch 20' Northeast | |
| Stormwater Runoff Risk: | H M <input checked="" type="checkbox"/> L | Vegetation Coverage %: | 75% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | | Y <input checked="" type="checkbox"/> N | |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location | Date completed |
|-------------------------------|--|---|----------------|
| Berm | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | install around pad perimeter | |
| Cattle Guard | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Check Dam | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Culvert | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Ditch | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Ditch and Berm | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Filtrexx Sediment Control | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Land Grading | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Ripping | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Rip Rap | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Roadside Ditches and Turnouts | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Sediment Trap | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Seeding | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Silt Fence | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | Install so there are no gaps or sagging in fabric | |
| Straw Bale Barrier | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Soil Roughening | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Tracking Pad | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | Install to control tracking from site onto HWY 14 | |
| Wattles | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |

| General | Y/N/NA | Comments |
|---|--------|----------------|
| Have BMP repairs been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | Y | onto HWY 14 |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | Y | 2 |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | at existing TB |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | N | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | N | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site under construction. A geotextile has been placed under the pad and fill dirt brought in to level pad. No perimeter BMPs have been installed. Silt fence around snow removal pile is not install properly. Snow melt on existing pad is be pumped off-site through a filter bag.

Is this site compliant with the permit at the time of the inspection? Y ☒ N

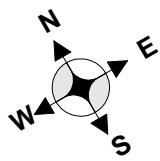
Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certifier Signature: _____ Date: _____

Certified by: _____ Title: _____



| | | | | | | | | | |
|---|--------------|-------------------------|------|------------------|--------------------|------|--------------|------|-----|
| WELL NAME: | | Mutual 7 Multi-well Pad | | | Facility/ API#: | | 05-057-06544 | | |
| | | QTR/QTR: | NWNW | SEC: | 17 | TMN: | 7N | RNG: | 80W |
| LAT/LONG: | | 40.5843556/-106.4051444 | | | | | | | |
| DIRECTIONS: | | | | | | | | | |
| HWY 14 & CR 24, S 0.9, E 150' NE into | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | |
| Jackson County | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | |
| Rangeland Grass 75% | | | | | | | | | |
| | | | | | | | | | |
| 1-5% | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | |
| 10 acres | | | | | | | | | |
| SOIL TYPE | | | | | | | | | |
| Cabin Sandy Loam | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | |
| NAME | Mutual Ditch | | | | | | | | |
| DIRECTION | West | | | | | | | | |
| DISTANCE | 62 feet | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| MAP GENERATED BY | | | | LT ENVIRONMENTAL | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | |
| COMMENTS | | | | | | | | | |
| | | | | | | | | | |



Lease/Name: Mutual 7 Multi-well Pad

Land Use: Rangeland

Runoff Risk: Moderate

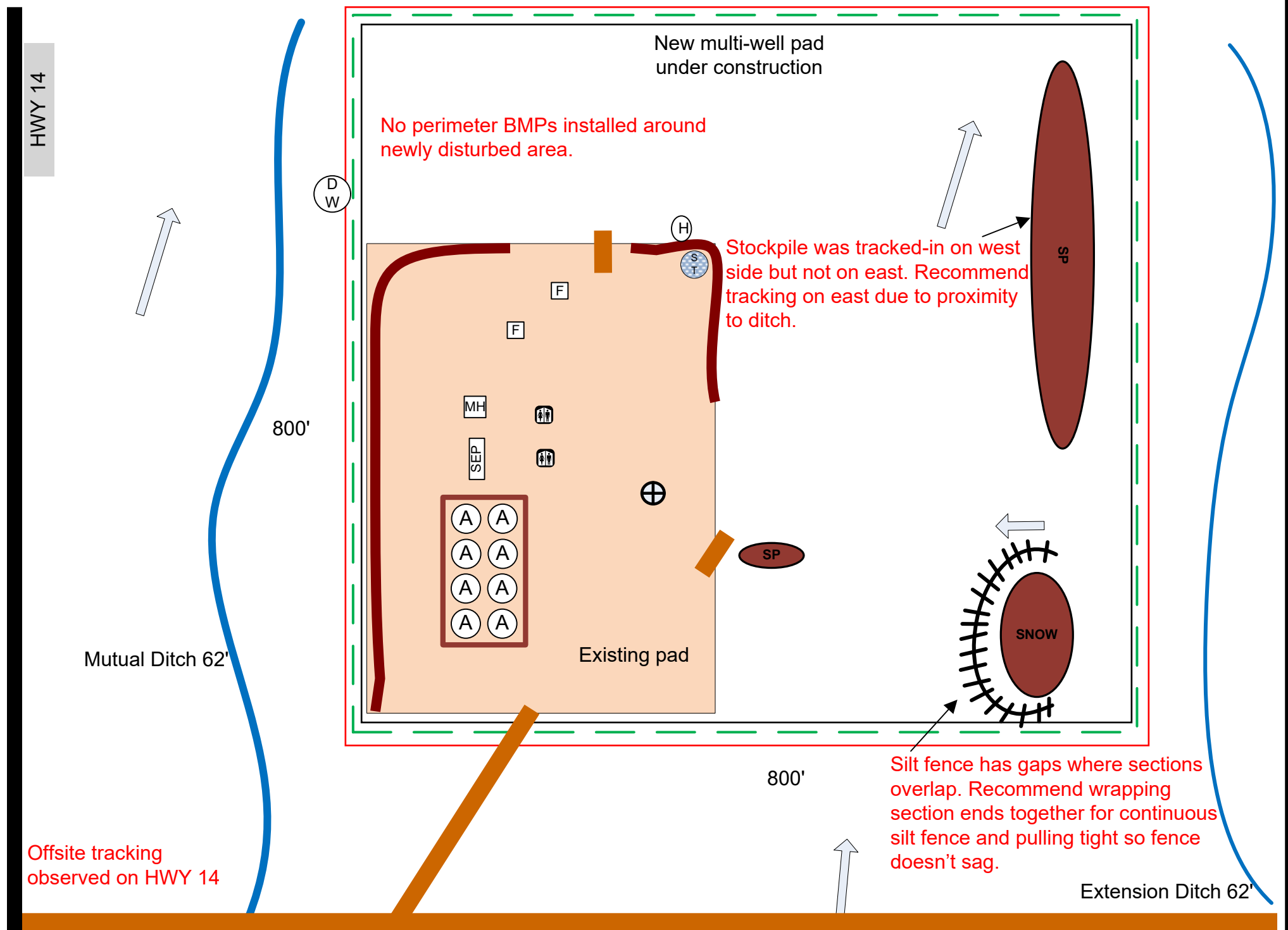
API: 05-057-06544 Qtr/Qtr: NWNW TWN: 7N R1G: 80W SEC: 17

Lat/Long: 40.5843556/-106.4051444

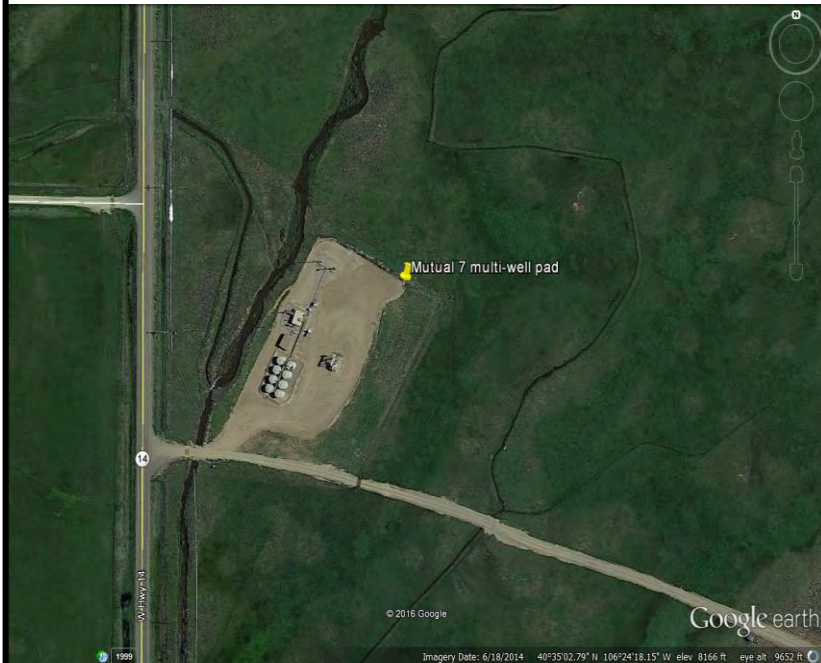
County: Jackson



Inspection Date:
3/9/2016



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | | | |
|--|-----------------------|--|--------------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Wellhead | | Stock Pile | | Ditch |
| | Disturbance Boundary | | Rig | | Rolloff Frac Tank | | Ditch & Berm |
| | Cut/Fill Line | | Frac Trailer | | Equipment Storage | | Filtrexx Sediment Control |
| | Chemical Storage | | Trailer | | Trailer | | Ripping |
| | Port-o-let | | Surface Flow | | Surface Flow | | Riprap |
| | Roadbased Surface | | Cattleguard | | Cattleguard | | Roadside Ditches & Turnouts |
| | Surface Water | | Vehicle Tracking Control | | Vehicle Tracking Control | | Sediment Trap |
| | Paved Road | | Dumpster | | Dumpster | | Seeding |
| | Unpaved Road | | Berm | | Berm | | Silt Fence |
| | Meter House | | Check Dam | | Check Dam | | Sound Barrier |
| | Flare | | Culvert | | Culvert | | Straw Bale |
| | Dewatering bag | | | | | | Soil Roughening |
| | Water Sump | | | | | | Wattle |
| | Separator | | | | | | 55 gallon drum |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Mutual Ditch approximately 62 feet West from well head
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created by:



Map Not to Scale

Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Peterson Ridge 1-20H Inspection Date: 12/21/2015
 Location: SWSE 20 8N 80W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Grizzly Creek 1,957' Southwest
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------------|---|
| Berm | <u>(Y)</u> N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrex Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|--|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | NA | |

| Pad area Observation | Y/N/NA | Comments |
|--|--------|----------|
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |

| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
|---|--------|----------|
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

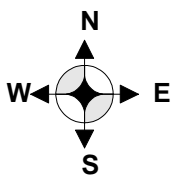
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



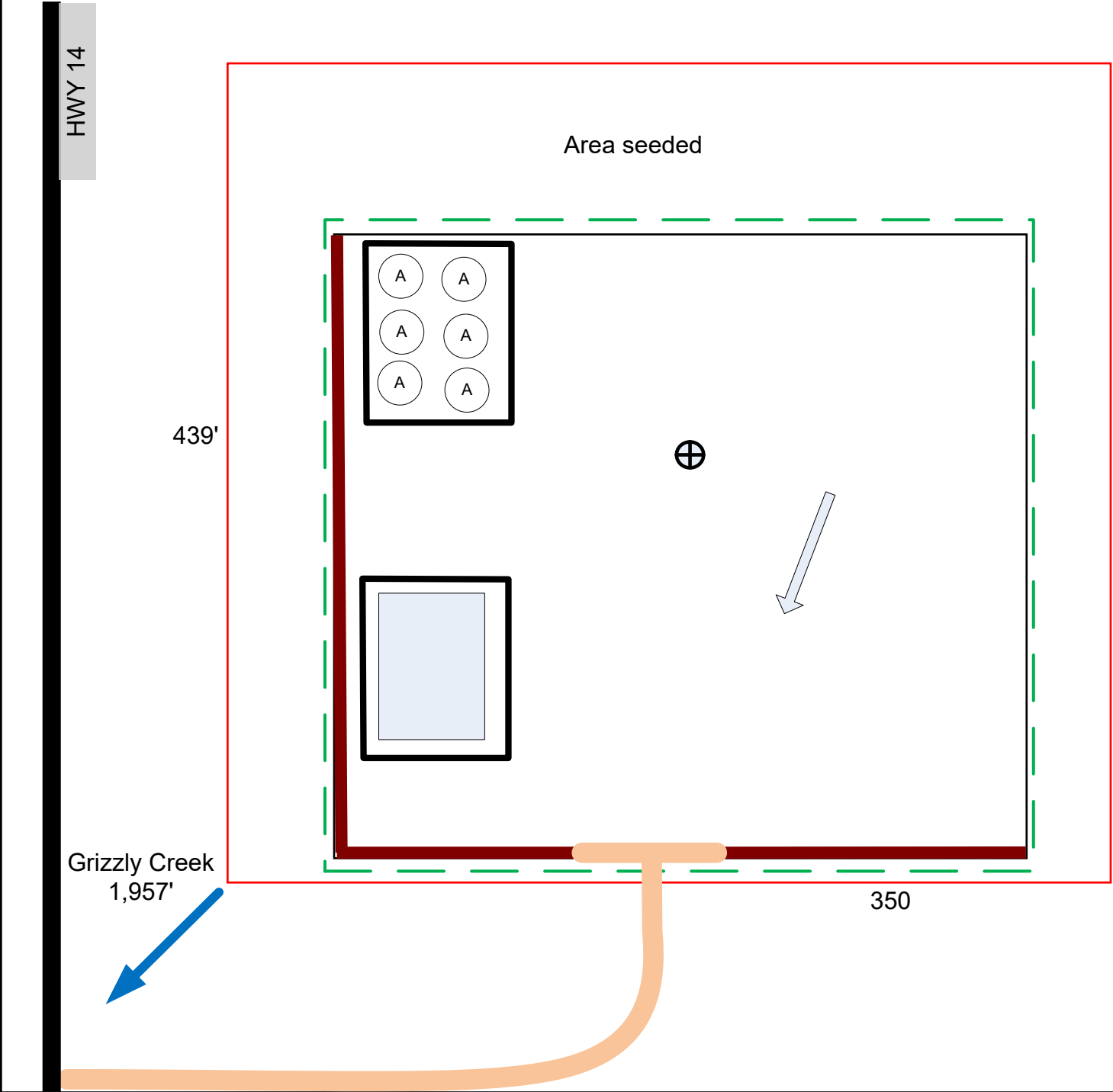
| | | | | | | | | | | | |
|---|---------------|-----------------------|------|------|------------------|--------------------|----|--------------|-----|--|--|
| WELL NAME: | | Peterson Ridge 1-20H | | | | Facility/ API#: | | 05-057-06515 | | | |
| | | QTR/QTR: | SWSE | SEC: | 20 | TWN: | 8N | RNG: | 80W | | |
| LAT/LONG: | | 40.644586/-106.394469 | | | | | | | | | |
| DIRECTIONS: | | | | | | | | | | | |
| HWY 14 & CR 68, S.6, E 100', Ninto | | | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | | | |
| Jackson County | | | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | | | |
| Rangeland 70% | | | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | | | |
| 1-5% Slopes | | | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | | | |
| 4.22 | | | | | | | | | | | |
| SOIL TYPE | | | | | | | | | | | |
| Tealson-Rock land association | | | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | | | |
| NAME | Grizzly Creek | | | | | | | | | | |
| DIRECTION | Southwest | | | | | | | | | | |
| DISTANCE | 1,957 ft | | | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENVIRONMENTAL | | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | |
| | | | | | | | | | | | |



Lease/Name: Peterson Ridge 1-20H API: 05-057-06515 Qtr/Qtr: SWSE TWN: 8N RNG: 80W SEC: 20

Land Use: Rangeland Lat/Long: 40.644586/-106.394469

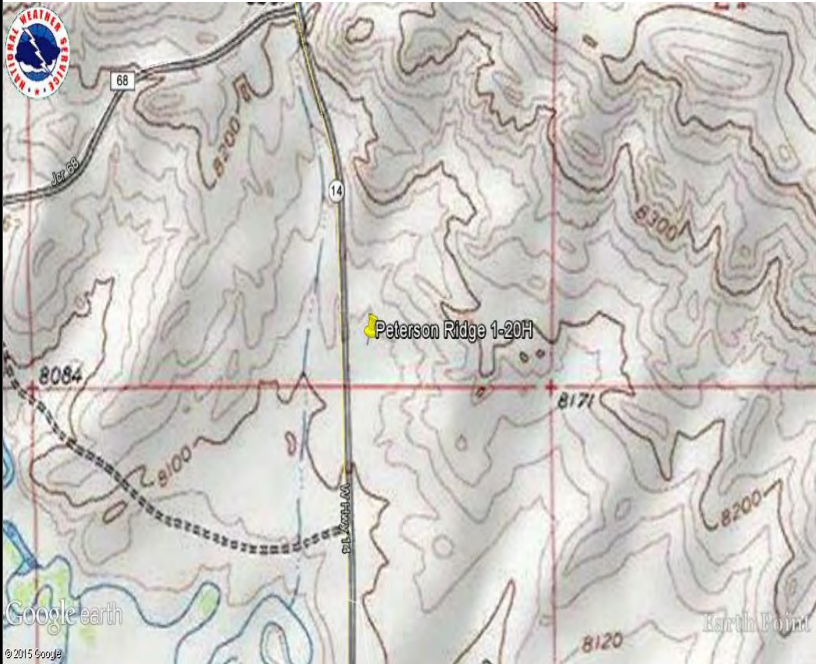
Runoff Risk: low County: Jackson



Satellite Map: Courtesy of Google Earth 2015



Topographic Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Grizzly Creek 1,957' Southwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Stormwater Management Plan Compliance Inspection Report

| | | | |
|--|----------------------------------|------------------------|-------------------------|
| Site ID/Name: | Ray Ranch North Central Facility | Inspection Date: | 12/21/2015 |
| Location: | SESW 32 8N 80W | Inspector: | Gentry Muniz |
| Inspection Type: | 14 day <u>Monthly</u> Final | Signature: | <i>Gentry Muniz</i> |
| Land Use: | Rangeland | Title: | Environmental Scientist |
| Site Type: | Well & TB | Weather: | Cloudy 23° |
| Receiving Body of Water/Distance/Direction: | Unnamed Creek 310' West | | |
| Stormwater Runoff Risk: | H M <u>L</u> | Vegetation Coverage %: | 70% |
| In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? | Y <u>N</u> | | |

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | NA | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

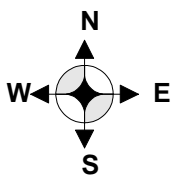
Is this site compliant with the permit at the time of the inspection? Y N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

| | | | |
|----------------------|---------------------|--------|-------------------------|
| Certified by: | Gentry Muniz | Date: | 12/21/2015 |
| Certifier signature: | <i>Gentry Muniz</i> | Title: | Environmental Scientist |



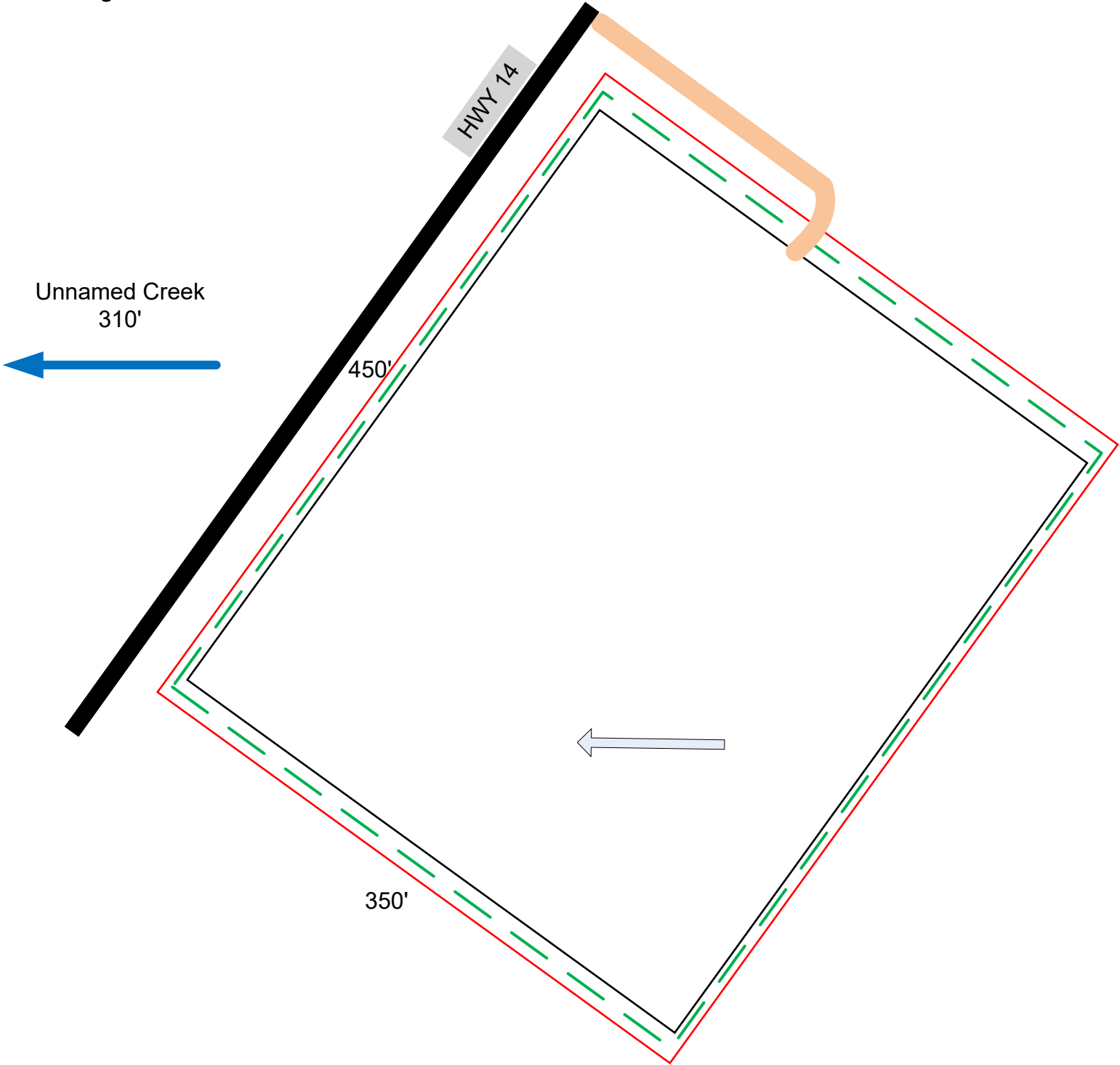
| | | | | | | | | | | | |
|---|-------------------|----------------------------------|------|------|------------------|--------------------|----|--------|-----|--|--|
| FACILITY NAME: | | Ray Ranch North Central Facility | | | | Facility/ API#: | | 436642 | | | |
| | | QTR/QTR: | SESW | SEC: | 32 | TWN: | 8N | RNG: | 80W | | |
| LAT/LONG: | | 40.617249/-106.401037 | | | | | | | | | |
| DIRECTIONS: | | | | | | | | | | | |
| HWY 14 & CR 24, N 1.5, E into | | | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | | | |
| Jackson County | | | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | | | |
| Rangeland 70% | | | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | | | |
| 1-5% slopes | | | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | | | |
| 5.20 | | | | | | | | | | | |
| SOIL TYPE | | | | | | | | | | | |
| Randman sandy loam | | | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | | | |
| NAME | Unnamed tributary | | | | | | | | | | |
| DIRECTION | west | | | | | | | | | | |
| DISTANCE | 310 ft | | | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENVIRONMENTAL | | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | |
| | | | | | | | | | | | |



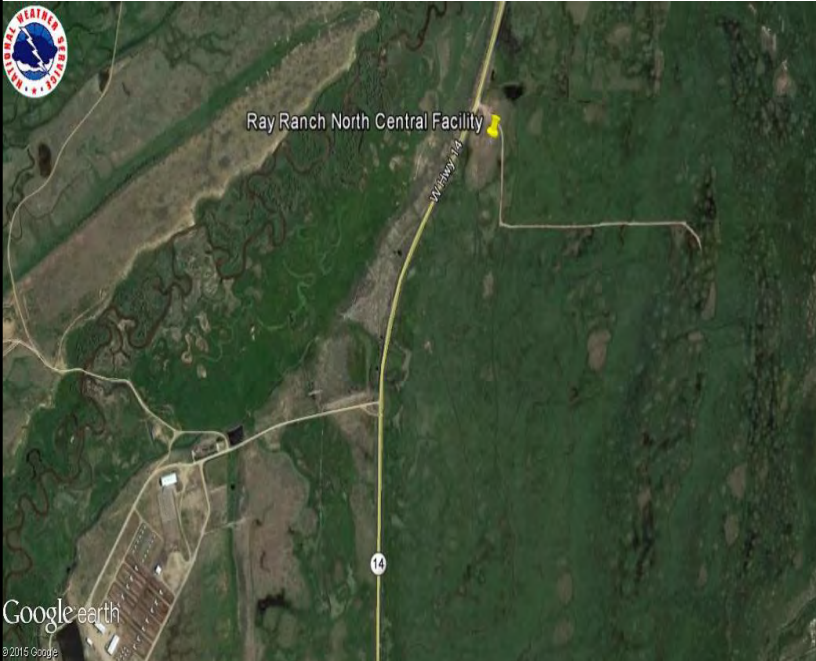
Lease/Name: Ray Ranch N Central ID: 436642 Qtr/Qtr: SESW TWN: 8N RNG: 80W SEC: 32

Land Use: Rangeland Lat/Long: 40.617249/-106.401037

Runoff Risk: low County: Jackson



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed Tributary 310' west
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Spicer 3-32H Inspection Date: 12/21/2015
 Location: SWSW 32 7N 80W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Unnamed Creek 459' South
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrex Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | NA | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



[illegible]

LTE
Map Not to Scale

Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Surprise 4-06H & Damfino 2-06H Inspection Date: 12/21/2015
 Location: SWSE 6 6N 80W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Unnamed Creek 219' East
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------|---|
| Berm | Y N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | Y N | |
| Ditch and Berm | Y N | |
| Filtrexx Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|--|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |

| Pad area Observation | Y/N/NA | Comments |
|--|--------|----------|
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |

| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
|---|--------|----------|
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

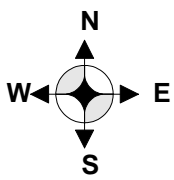
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



| | | | | | | | | | | | |
|---|--|-----------------------|------|------|-----------------|--------------------|------|--------------|------|-----|--|
| WELL NAME: | | Surprise 4-06H | | | | Facility/ API#: | | 05-057-06480 | | | |
| | | QTR/QTR: | SASE | SEC: | | 6 | TWN: | 6N | RNG: | 80W | |
| LAT/LONG: | | 40.512561/-106.416789 | | | | | | | | | |
| DIRECTIONS: | | | | | | | | | | | |
| HWY 14 & CR 28, S 1.5, E into | | | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | | | |
| Jackson County | | | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | | | |
| Rangeland 70% | | | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | | | |
| 1-5% slopes | | | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | | | |
| 4.85 | | | | | | | | | | | |
| SOIL TYPE | | | | | | | | | | | |
| Fluestch-Tiagos association | | | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | | | |
| NAME | | Unnamed creek | | | | | | | | | |
| DIRECTION | | east | | | | | | | | | |
| DISTANCE | | 219 ft | | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENMRONMENTAL | | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | |
| additional API: 05-057-06482 | | | | | | | | | | | |



Lease/Name: Surprise 4-06H

API: 05-057-06480 Qtr/Qtr: SWSE

TWN: 6N RNG: 80W SEC: 6

Land Use: Rangeland

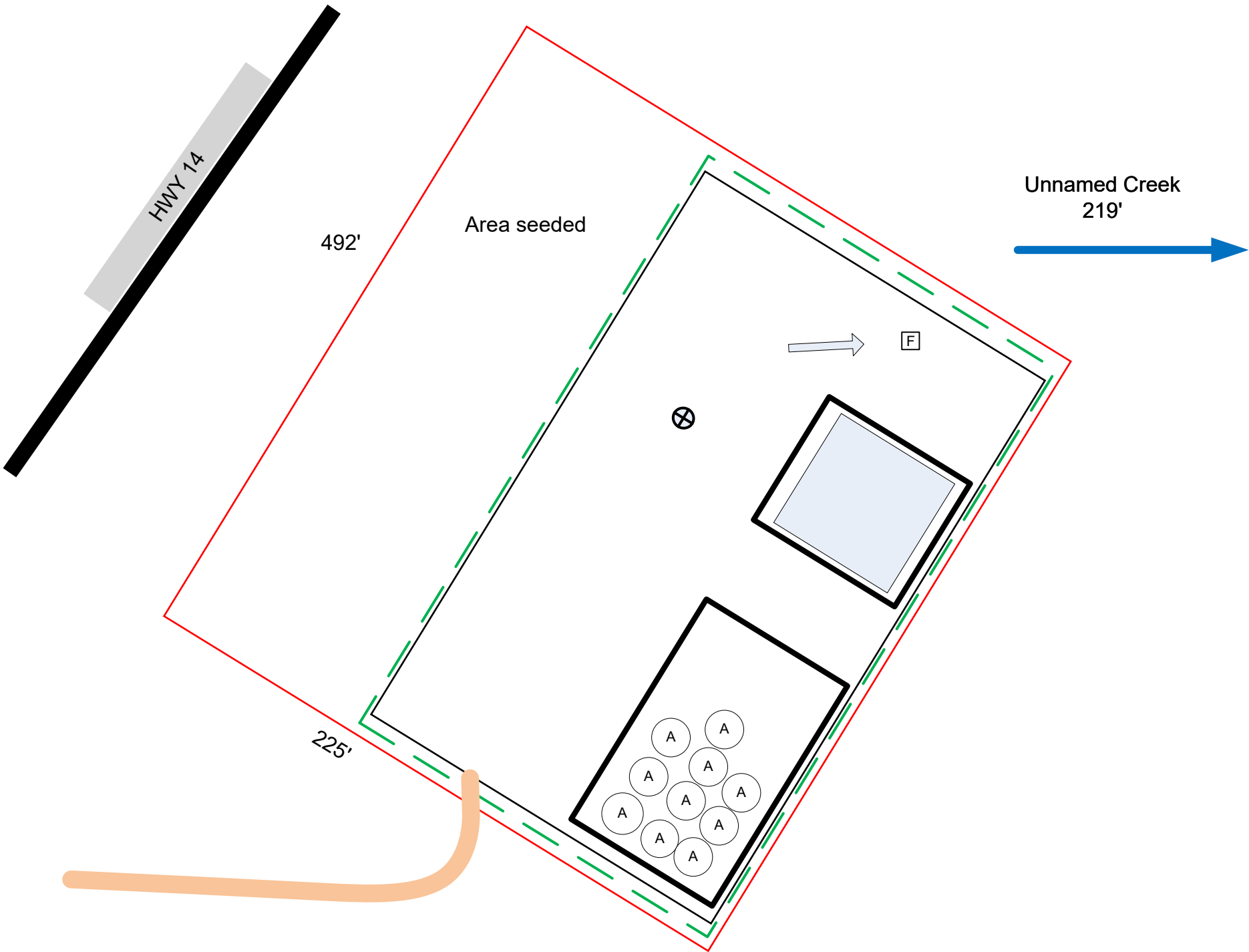
Lat/Long: 40.512561/-106.416789

Runoff Risk: low

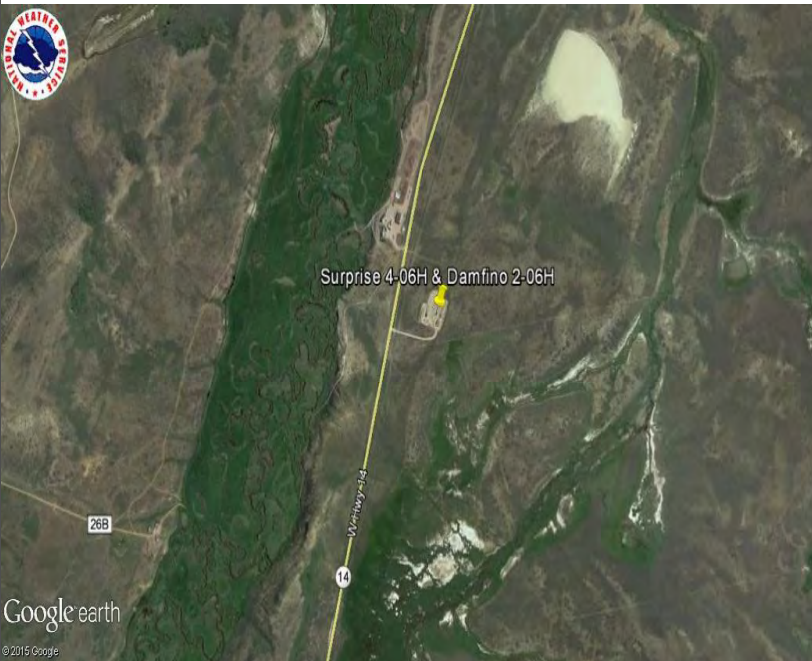
County: Jackson



Plan Date:
12/22/2015



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Pad Surface Boundary | | Ditch |
| | Disturbance Boundary | | Wellhead | | Ditch & Berm |
| | Cut/Fill Line | | Rig | | Filtrexx Sediment Control |
| | Chemical Storage | | Stock Pile | | Ripping |
| | Port-o-let | | Rolloff Frac Tank | | Riprap |
| | Roadbased Surface | | Frac Trailer | | Roadside Ditches & Turnouts |
| | Surface Water | | Equipment Storage | | Sediment Trap |
| | Paved Road | | Trailer | | Seeding |
| | Unpaved Road | | Surface Flow | | Silt Fence |
| | Meter House | | Cattleguard | | Sound Barrier |
| | Flare | | Vehicle Tracking Control | | Straw Bale |
| | AST | | Dumpster | | Soil Roughening |
| | Water Sump | | Berm | | Wattle |
| | Separator | | Check Dam | | 55 gallon drum |
| | | | Culvert | | |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed creek 219' East
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created by:



Stormwater Management Plan Compliance Inspection Report

Site ID/Name: Surprise Unit 2-08H Inspection Date: 12/21/2015
 Location: NWNW 8 6N 80W Inspector: Gentry Muniz
 Inspection Type: 14 day Monthly Final Signature: *Gentry Muniz*
 Land Use: Rangeland Title: Environmental Scientist
 Site Type: Well & TB Weather: Cloudy 23°
 Receiving Body of Water/Distance/Direction: Unnamed tributary 488' Southwest
 Stormwater Runoff Risk: H M (L) Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? Y (N)

Best Management Practice (BMP) Checklist

| | In Use | Corrective action required and location |
|-------------------------------|--------------|---|
| Berm | <u>(Y)</u> N | |
| Cattle Guard | Y N | |
| Check Dam | Y N | |
| Culvert | Y N | |
| Ditch | <u>(Y)</u> N | |
| Ditch and Berm | Y N | |
| Filtrex Sediment Control | Y N | |
| Land Grading | Y N | |
| Ripping | Y N | |
| Rip Rap | Y N | |
| Roadside Ditches and Turnouts | Y N | |
| Sediment Trap | Y N | |
| Seeding | Y N | |
| Silt Fence | Y N | |
| Straw Bale Barrier | Y N | |
| Soil Roughening | Y N | |
| Tracking Pad | Y N | |
| Wattles | Y N | |

| General | Y/N/NA | Comments |
|---|--------|----------|
| Have Repairs/additional BMP issues been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | N | |
| Are there signs of offsite tracking at the access point? | N | |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | NA | |
| Pad area Observation | Y/N/NA | Comments |
| Are tanks and/or drums present? | Y | |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | |
| Is the access road graveled (offsite soil tracking control)? | Y | |
| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
| Has the site achieved 70% or prior vegetation coverage for stabilization? | N | |
| Is the pad area reseeded? | Y | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | NA | |

Comments: Site is snow covered and will be placed in winter exclusion until melting conditions exist. BMPs cannot be observed at this time due to snow cover. Snow Start date 12/1/15. Construction ceased 12/1/15.

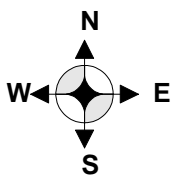
Is this site compliant with the permit at the time of the inspection? (Y) N

Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certified by: Gentry Muniz Date: 12/21/2015
 Certifier signature: *Gentry Muniz* Title: Environmental Scientist



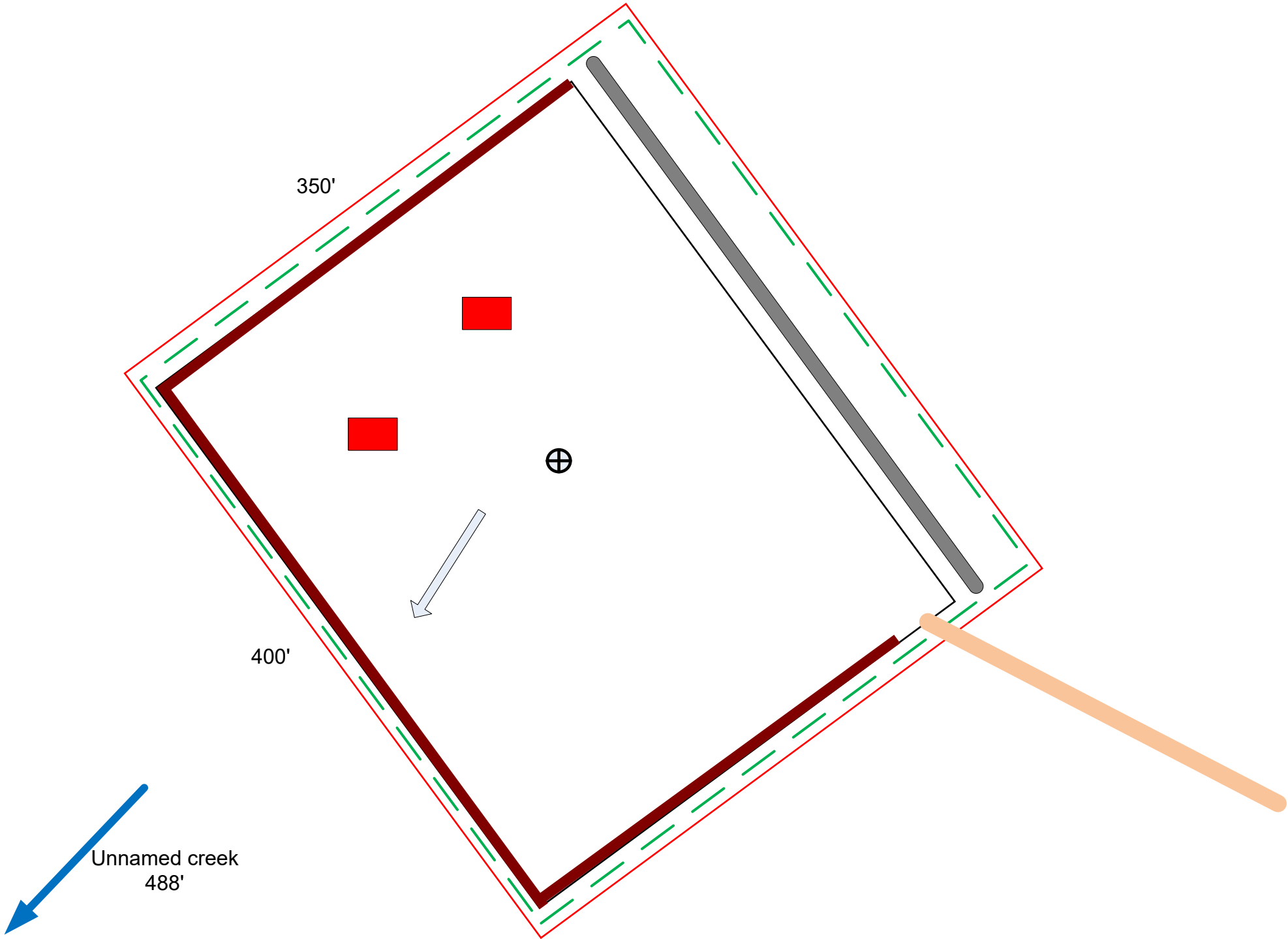
| | | | | | | | | | | | |
|---|--|---------------------|------|------|--|--------------------|------|--------------|------|-----|--|
| WELL NAME: | | Surprise Unit 2-08H | | | | Facility/ API#: | | 05-057-06526 | | | |
| | | QTR/QTR: | NNNW | SEC: | | 8 | TWN: | 6N | RNG: | 80W | |
| LAT/LONG: | | 40.511158/-106.3916 | | | | | | | | | |
| DIRECTIONS: | | | | | | | | | | | |
| HWY 14 & CR 28, SE 1.8, W.4 into | | | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | | | |
| Jackson County | | | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | | | |
| Rangeland 70% | | | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | | | |
| 1-5% slopes | | | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | | | |
| 5.00 | | | | | | | | | | | |
| SOIL TYPE | | | | | | | | | | | |
| Fluestch-Tiagos association | | | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | | | |
| NAME | | Unnamed Creek | | | | | | | | | |
| DIRECTION | | Southwest | | | | | | | | | |
| DISTANCE | | 488 ft | | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | | | |
| NAME | | | | | | | | | | | |
| DIRECTION | | | | | | | | | | | |
| DISTANCE | | | | | | | | | | | |
| MAP GENERATED BY | | | | | | LT ENVIRONMENTAL | | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | |
| | | | | | | | | | | | |



Lease/Name: Surprise Unit 2-08H API: 05-057-06526 Qtr/Qtr: NWNW TWN: 6N RNG: 80W SEC: 8

Land Use: Rangeland Lat/Long: 40.511158/-106.3916

Runoff Risk: low County: Jackson



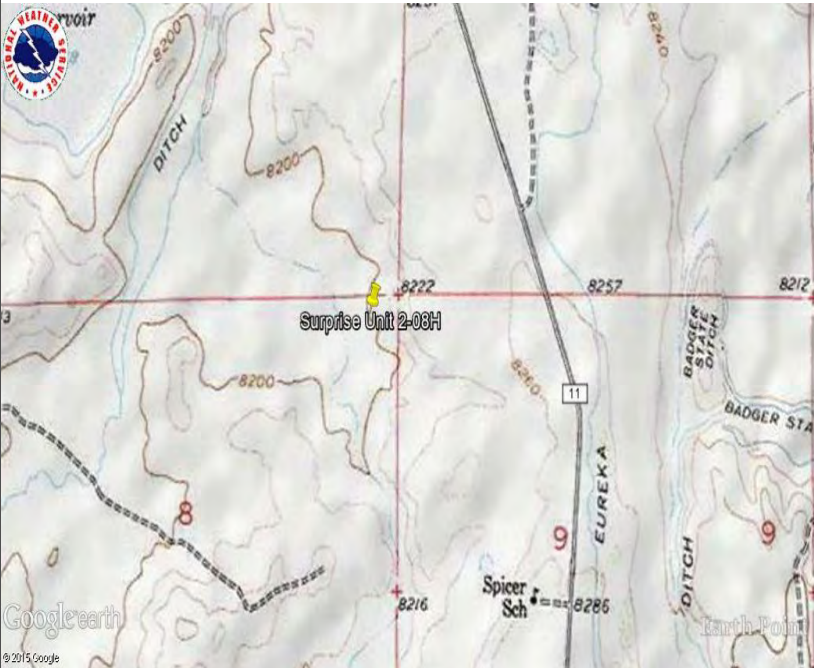
Satellite Map: Courtesy of Google Earth 2015



LEGEND


| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Wellhead | | Ditch |
| | Disturbance Boundary | | Rig | | Ditch & Berm |
| | Cut/Fill Line | | Stock Pile | | Filtrexx Sediment Control |
| | Chemical Storage | | Rolloff Frac Tank | | Ripping |
| | Port-o-let | | Frac Trailer | | Riprap |
| | Roadbased Surface | | Equipment Storage | | Roadside Ditches & Turnouts |
| | Surface Water | | Trailer | | Sediment Trap |
| | Paved Road | | Surface Flow | | Seeding |
| | Unpaved Road | | Cattleguard | | Silt Fence |
| | Meter House | | Vehicle Tracking Control | | Sound Barrier |
| | Flare | | Dumpster | | Straw Bale |
| | AST | | Berm | | Soil Roughening |
| | Water Sump | | Check Dam | | Wattle |
| | Separator | | Culvert | | 55 gallon drum |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Unnamed Creek 488' southwest
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Stormwater Management Plan Compliance Inspection Report

Site ID/Name: 324752/Vaneta Field Office
 Location: NENE 32 7N 80W
 Inspection Type: 14 day
 Land Use: Rangeland
 Site Type: Field office
 Inspection Date: 2/24/2016
 Inspector: Gentry Muniz
 Signature: 
 Title: Environmental Scientist
 Weather: Sunny 20s, windy

Receiving Body of Water/Distance/Direction: Ditch 323' North
 Stormwater Runoff Risk: ☒ H ☐ M ☐ L Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? ☒ Y ☐ N

| Best Management Practice (BMP) Checklist | | | Date completed |
|--|--|--|----------------|
| | In Use | Corrective action required and location | |
| Berm | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | recommend replacing wattle with berm, install around perimeter | |
| Cattle Guard | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Check Dam | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Culvert | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Ditch | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Ditch and Berm | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Filtrexx Sediment Control | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Land Grading | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Ripping | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Rip Rap | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Roadside Ditches and Turnouts | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Sediment Trap | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Seeding | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Silt Fence | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Straw Bale Barrier | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Soil Roughening | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Tracking Pad | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | | |
| Wattles | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | recommend removing wattle | |

| General | Y/N/NA | Comments |
|--|--------|------------------------------------|
| Have BMP repairs been addressed since last inspection? | NA | |
| Are there Signs of sediment leaving the site? | Y | Soil pushed outside of fenced area |
| Are there signs of offsite tracking at the access point? | N | during snow removal |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | N | |

| Pad area Observation | Y/N/NA | Comments |
|--|--------|-----------------|
| Are tanks and/or drums present? | Y | at tank battery |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | N | |
| Is the access road graveled (offsite soil tracking control)? | Y | |

| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
|---|--------|----------------------------|
| Has site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | N | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | Y | when construction complete |

Comments: Wattles are tied to the fence along NE side of pad, recommend removing and replacing with a berm since ground is too frozen to install stakes to secure wattle. Continue with berm around entire pad as there are no stormwater controls around entire perimeter. Large stockpiles of soil on pad without containment, recommend removing or incorporating into pad. Snow pushed off of pad laden with soil and is outside the fenced area.

Is this site compliant with the permit at the time of the inspection? ☒ Y ☐ N


Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certifier Signature: _____ Date: _____

Certified by: _____ Title: _____



Stormwater Management Plan Compliance Inspection Report

Site ID/Name: 324752/Vaneta Field Office
 Location: NENE 32 7N 80W
 Inspection Type: 14 day
 Land Use: Rangeland
 Site Type: Field office
 Inspection Date: 3/9/2016
 Inspector: Gentry Muniz
 Signature: 
 Title: Environmental Scientist
 Weather: Sunny 20s, windy

Receiving Body of Water/Distance/Direction: Ditch 323' North
 Stormwater Runoff Risk: ☒ H ☐ M ☐ L Vegetation Coverage %: 70%
 In the past 24 hrs, has there been overland runoff due to a storm event that caused erosion? ☐ Y ☒ N

| Best Management Practice (BMP) Checklist | | | Date |
|--|--|---|-----------|
| | In Use | Corrective action required and location | completed |
| Berm | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Cattle Guard | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Check Dam | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Culvert | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Ditch | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Ditch and Berm | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Filtrexx Sediment Control | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Land Grading | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Ripping | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Rip Rap | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | add to fill slopes for permanent stabilization | |
| Roadside Ditches and Turnouts | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Sediment Trap | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Seeding | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Silt Fence | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Straw Bale Barrier | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Soil Roughening | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Tracking Pad | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | | |
| Wattles | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | Install rebar stakes to secure wattle. Add wattle around pile to east | |

| General | Y/N/NA | Comments |
|--|--------|------------------------------------|
| Have BMP repairs been addressed since last inspection? | N | |
| Are there Signs of sediment leaving the site? | Y | Soil pushed outside of fenced area |
| Are there signs of offsite tracking at the access point? | N | during snow removal |
| Are surface waters being impacted by site runoff? | N | |
| Is there a portable toilet on-site? | Y | |

| Pad area Observation | Y/N/NA | Comments |
|--|--------|-----------------|
| Are tanks and/or drums present? | Y | at tank battery |
| Are tanks and/or drums placed in secondary containment? | Y | |
| Is the pad area stabilized road base material? | Y | at field office |
| Is the access road graveled (offsite soil tracking control)? | Y | |

| Vegetation Checklist (Erosion Reduction Control) | Y/N/NA | Comments |
|---|--------|----------|
| Has site achieved 70% or prior vegetation coverage for stabilization? | NA | |
| Is the pad area reseeded? | N | |
| Are there signs of vegetation regrowth? | N | |
| Is reseeding needed? | N | |

Comments: Spoke to Jason Niven about permanent stabilization for the field office site. He said the site will be stabilized with compacted road base over the entire area and will install rock to stabilize the fill slopes on the northwest and southeast sides of the pad. Wattle will be staked with rebar due to ground conditions and wattle will be installed around the pile of snow on the southeast side of the site. The well pad area will be reduced and seeded when conditions allow.

Is this site compliant with the permit at the time of the inspection? ☐ Y ☒ N

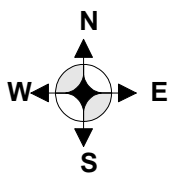
Certification: Corrective actions have been completed and the site in compliance with the permit to the best of the signer's knowledge and belief.

Certifier Signature: _____ Date: _____

Certified by: _____ Title: _____



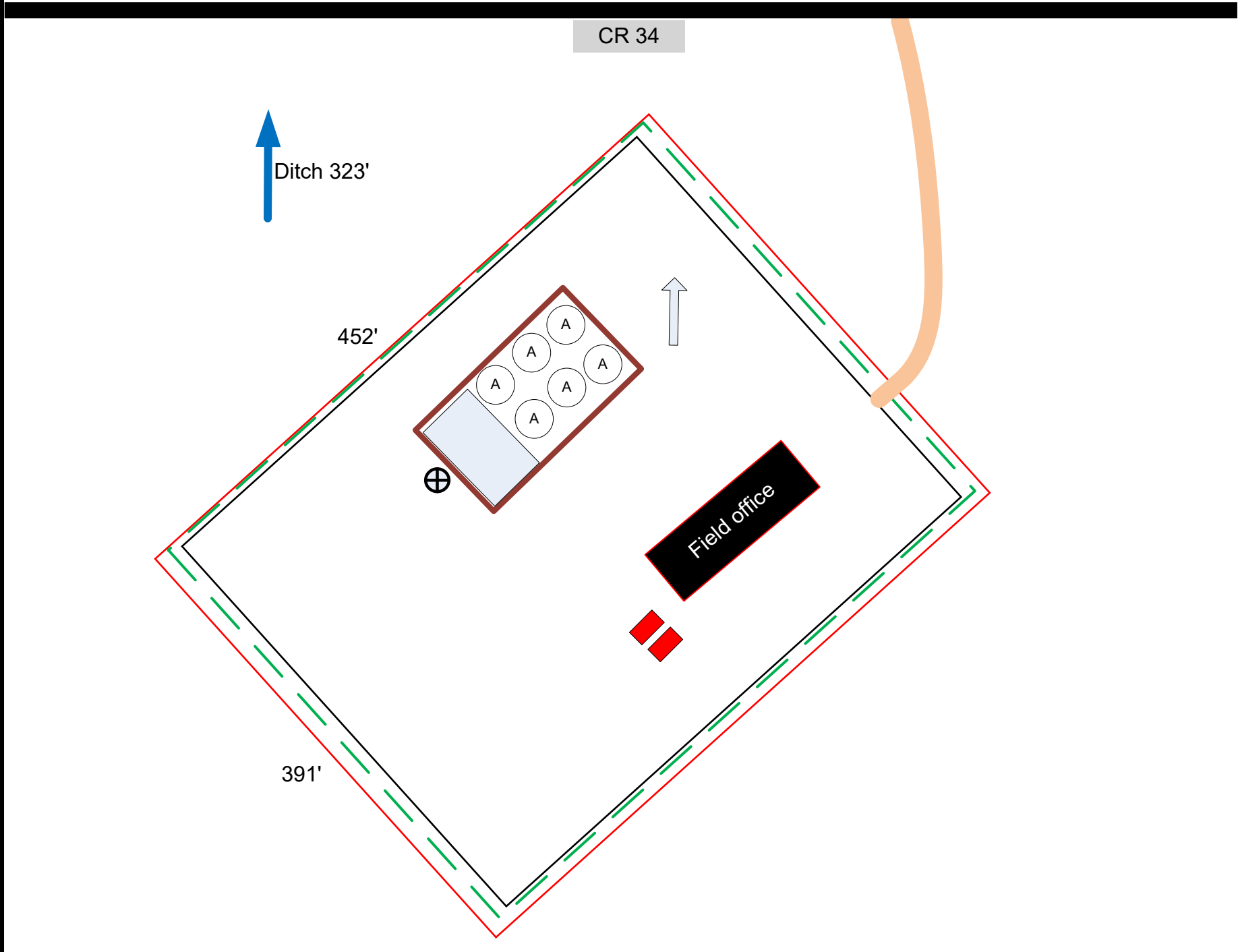
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|---|--------|----------------------|------|------|------------------|--------------------|----|--------|-----|
| WELL NAME: | | Vaneta field office | | | | Facility/ API#: | | 324752 | |
| | | QTR/QTR: | NENE | SEC: | 32 | TWN: | 7N | RNG: | 80W |
| LAT/LONG: | | 40.54016/-106.391286 | | | | | | | |
| DIRECTIONS: | | | | | | | | | |
| HWY 14 and CR 34, E .35, S into | | | | | | | | | |
| MUNICIPALITY: | | | | | | | | | |
| Jackson County | | | | | | | | | |
| PRE-CONSTRUCTION VEGETATION DESCRIPTION AND COVERAGE PERCENT: | | | | | | | | | |
| Rangeland 70% | | | | | | | | | |
| TOPOGRAPHY: | | | | | | | | | |
| 1-5% Slopes | | | | | | | | | |
| TOTAL DISTURBED AREA (acres): | | | | | | | | | |
| 3.94 | | | | | | | | | |
| SOIL TYPE | | | | | | | | | |
| Cabin sandy loam | | | | | | | | | |
| NEAREST RECEIVING WATERS | | | | | | | | | |
| NAME | Ditch | | | | | | | | |
| DIRECTION | North | | | | | | | | |
| DISTANCE | 323 ft | | | | | | | | |
| NON-STORMWATER DISCHARGE | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| POTENTIAL DRAINAGE AREA | | | | | | | | | |
| NAME | | | | | | | | | |
| DIRECTION | | | | | | | | | |
| DISTANCE | | | | | | | | | |
| MAP GENERATED BY | | | | | LT ENVIRONMENTAL | | | | |
| SITE CONSTRUCTION COMPANY | | | | | | | | | |
| LANDMAN REPRESENTATIVE | | | | | | | | | |
| COMMENTS | | | | | | | | | |
| | | | | | | | | | |



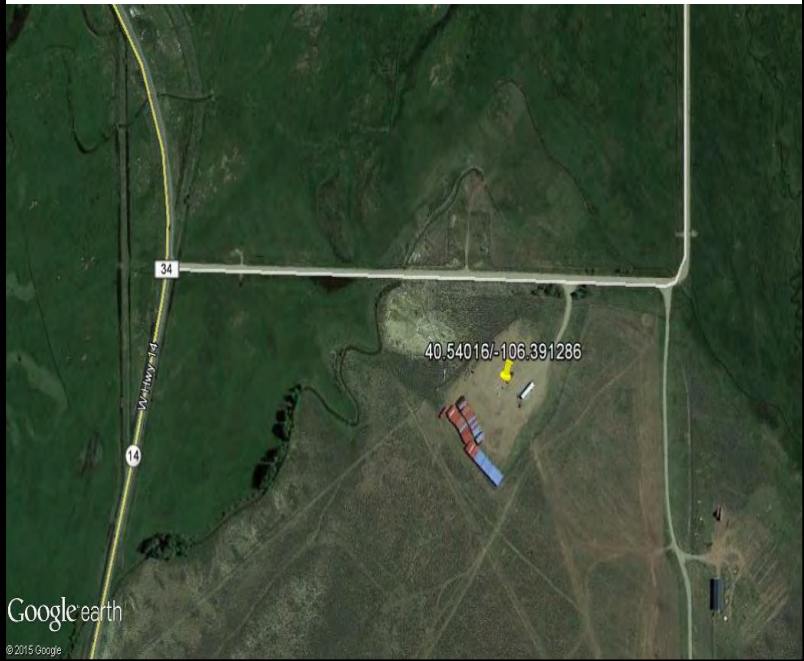
Lease/Name: Vaneta Field Office ID: 324752 Qtr/Qtr: NENE TWN: 7N RNG: 80W SEC: 32

Land Use: Rangeland Lat/Long: 40.54016/-106.391286

Runoff Risk: low County: Jackson



Satellite Map: Courtesy of Google Earth 2015



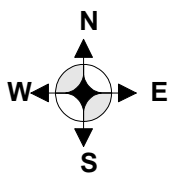
LEGEND

| | | |
|-----------------------------|-----------------------------|--|
| Construction | Pad Surface Boundary | Ditch |
| Boundary | Wellhead | Ditch & Berm |
| Disturbance Boundary | Rig | Filtrexx Sediment Control |
| Cut/Fill Line | Stock Pile | Ripping |
| Chemical Storage | Rolloff Frac Tank | Riprap |
| Port-o-let | Frac Trailer | Roadside Ditches & Turnouts |
| Roadbased Surface | Equipment Storage | Sediment Trap |
| Surface Water | Trailer | Seeding |
| Paved Road | Surface Flow | Silt Fence |
| Unpaved Road | Cattleguard | Sound Barrier |
| Meter | Vehicle Tracking | Straw Bale |
| House | Control | Soil |
| Flare | Dumpster | Roughening |
| AST | Berm | Wattle |
| Water Sump | Check Dam | 55 gallon drum |
| Separator | Culvert | |

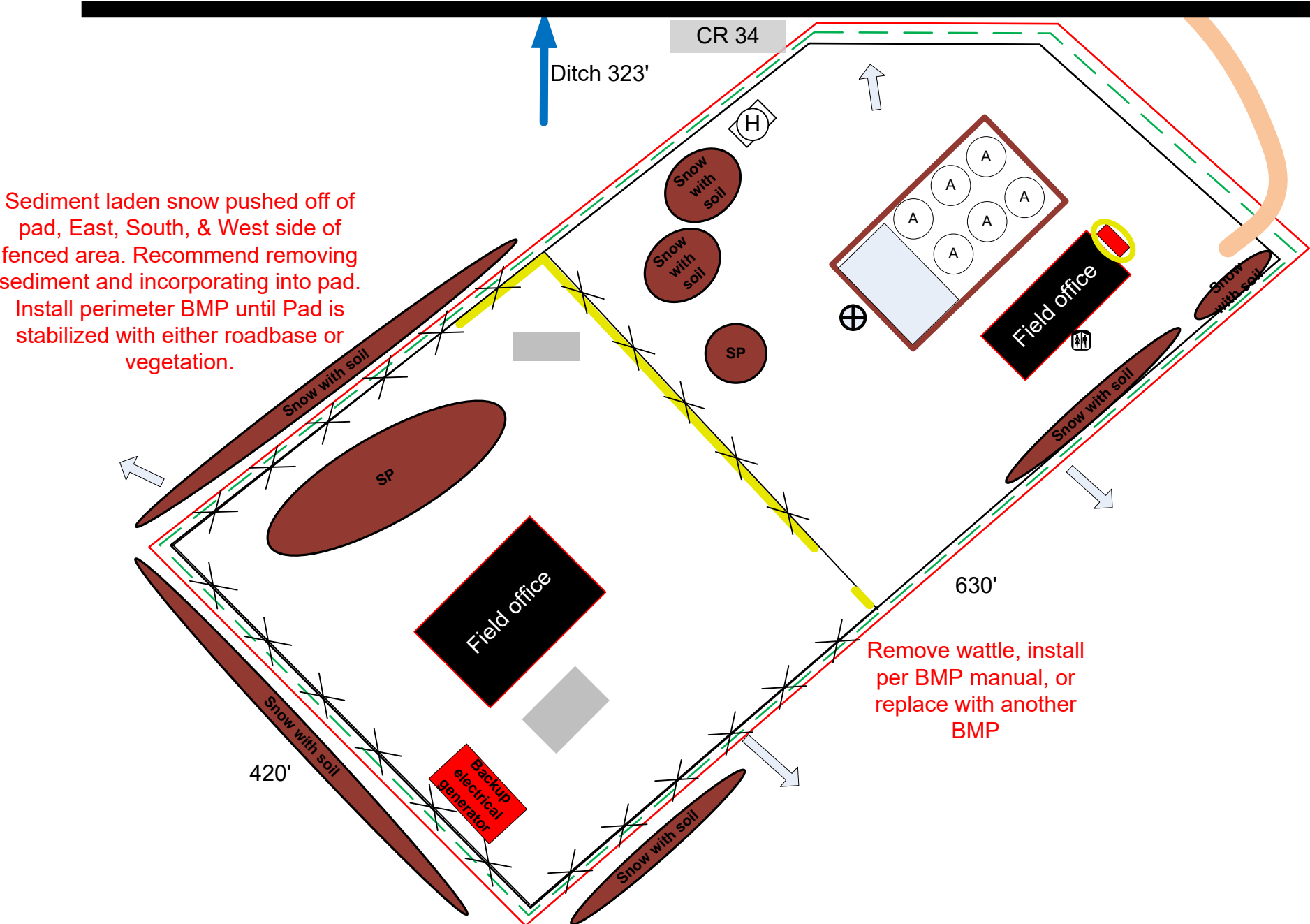
Topographic Map: Courtesy of Google Earth 2015



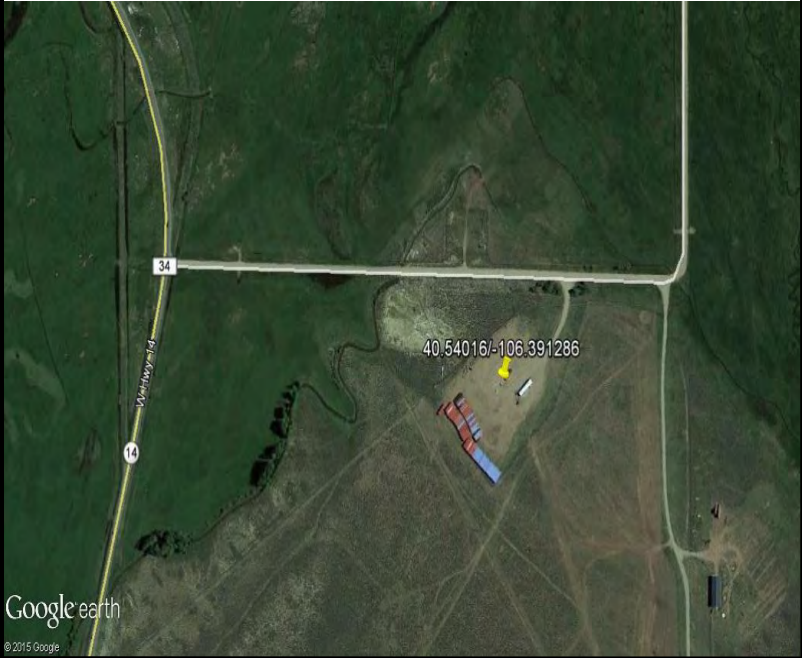
- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Ditch 323' North
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.



Lease/Name: Vaneta Field Office ID: 324752 Qtr/Qtr: NENE TWN: 7N RNG: 80W SEC: 32
Land Use: Rangeland Lat/Long: 40.54016/-106.391286
Runoff Risk: low County: Jackson



Satellite Map: Courtesy of Google Earth 2015



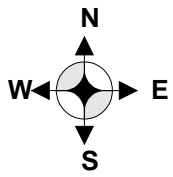
LEGEND

| | | |
|-----------------------|--------------------------|-----------------------------|
| Construction Boundary | Pad Surface Boundary | Ditch |
| Disturbance Boundary | Wellhead | Ditch & Berm |
| Cut/Fill Line | Rig | Filtrexx Sediment Control |
| Chemical Storage | Stock Pile | Ripping |
| Port-o-let | Rolloff Frac Tank | Riprap |
| Roadbased Surface | Frac Trailer | Roadside Ditches & Turnouts |
| Surface Water | Equipment Storage | Sediment Trap |
| Paved Road | Trailer | Seeding |
| Unpaved Road | Surface Flow | Silt Fence |
| Meter House | Cattle Guard | Sound Barrier |
| Flare | Vehicle Tracking Control | Straw Bale |
| AST | Dumpster | Fence |
| Heater Treater | Berm | Wattle |
| Separator | Check Dam | 55 gallon drum |
| | Culvert | |

Topographic Map: Courtesy of Google Earth 2015

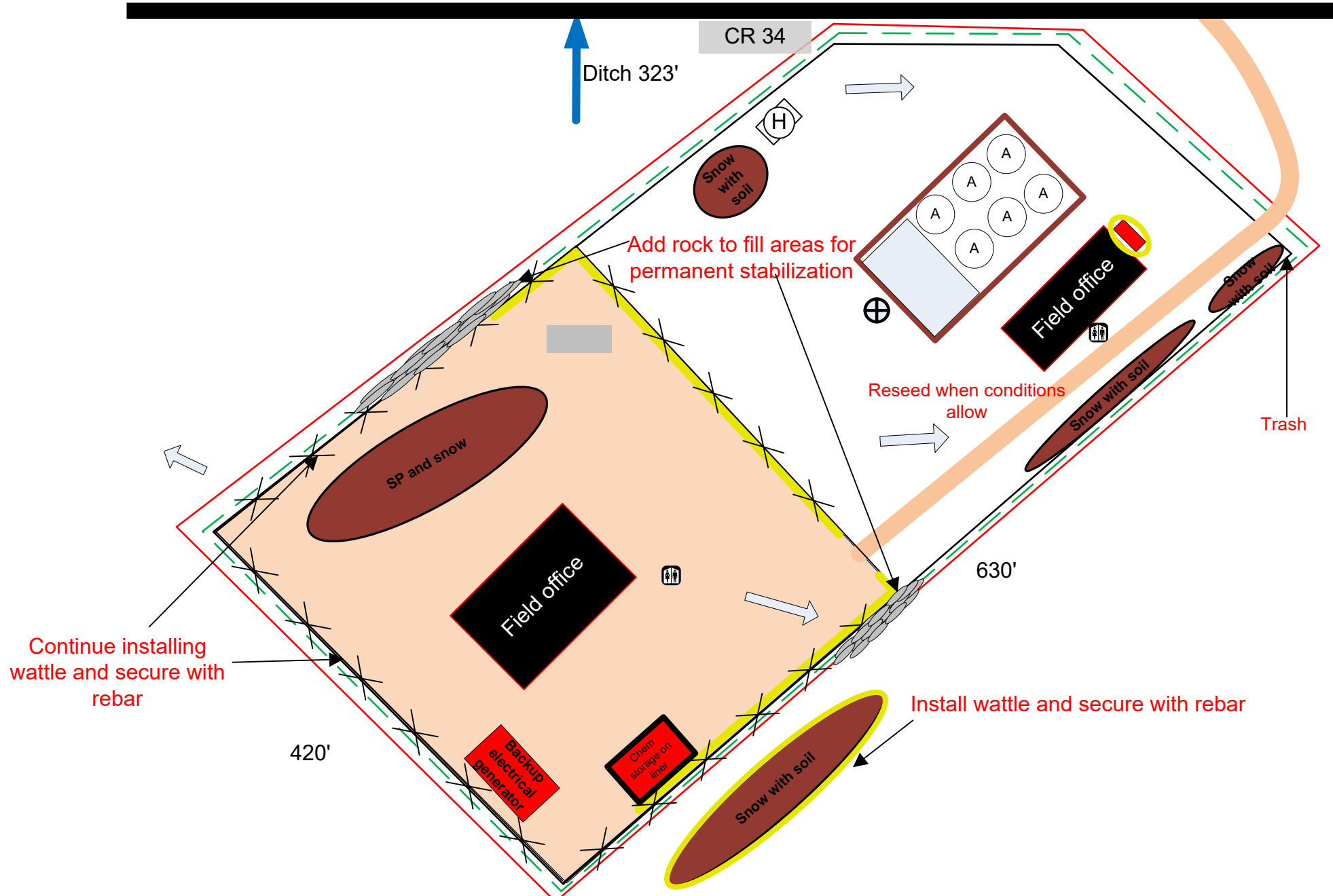


- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Ditch 323' North
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

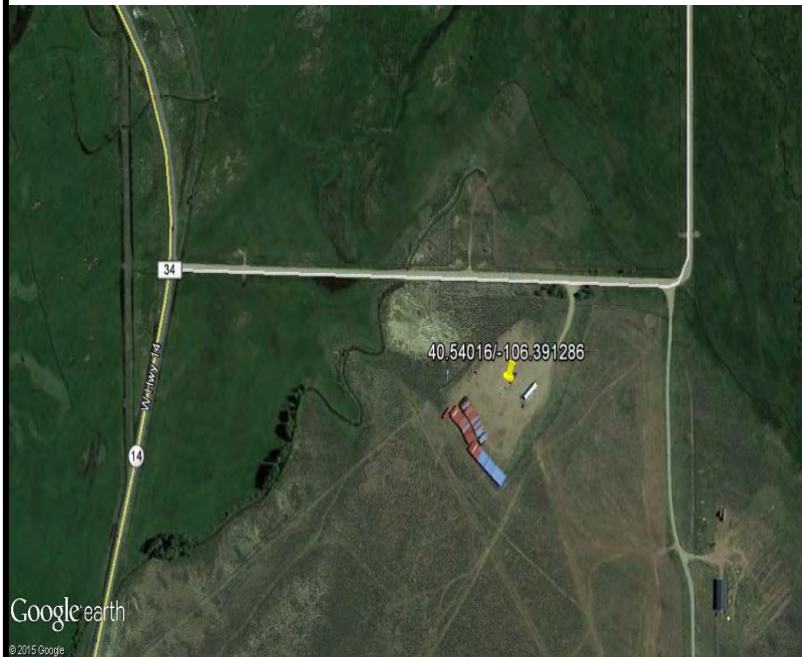


Lease/Name: Vaneta Field Office ID: 324752 Qtr/Qtr: NENE TWN: 7N RNG: 80W SEC: 32
Land Use: Rangeland Lat/Long: 40.54016/-106.391286
Runoff Risk: low County: Jackson

SANDRIDGE
Inspection Date:
2/24/2016



Satellite Map: Courtesy of Google Earth 2015



LEGEND

| | | | | | |
|--|-----------------------|--|--------------------------|--|-----------------------------|
| | Construction Boundary | | Wellhead | | Ditch |
| | Disturbance Boundary | | Rig | | Ditch & Berm |
| | Cut/Fill Line | | Stock Pile | | Filtrexx Sediment Control |
| | Chemical Storage | | Rolloff Frac Tank | | Ripping |
| | Port-o-let | | Frac Trailer | | Riprap |
| | Roadbased Surface | | Equipment Storage | | Roadside Ditches & Turnouts |
| | Surface Water | | Trailer | | Sediment Trap |
| | Paved Road | | Surface Flow | | Seeding |
| | Unpaved Road | | Cattleguard | | Silt Fence |
| | Meter House | | Vehicle Tracking Control | | Sound Barrier |
| | Flare | | Dumpster | | Straw Bale |
| | AST | | Berm | | Fence |
| | Heater Treater | | Check Dam | | Wattle |
| | Separator | | Culvert | | 55 gallon drum |

Topographic Map: Courtesy of Google Earth 2015



- 1) Construction site boundaries include all ground surface disturbances and approximately 10-15 feet beyond perimeter BMPs. Boundaries are subject to change at any time for pad expansion, maintenance and addition of BMP structures, or new access roads.
- 2) Site is located in a rangeland field. Site will be stabilized after drilling operations and will remain until wells are plugged and abandoned.
- 3) Receiving Body of Water:
Ditch 323' North
- 4) Pad will be graded as close to pre-existing conditions as practicable and seeded to match the pre-disturbance vegetation type.
- 5) Pad dimensions are approximate.

Created
by:
LTE
Map Not to Scale

APPENDIX C
STORMWATER MANUAL OF BMPS



Table of Contents

| <u>Section</u> | <u>Page</u> |
|--|--------------------|
| Berm (B) | 2 |
| Cattle Guard..... | 5 |
| Check Dam (CD)..... | 8 |
| Culvert (C) | 15 |
| Ditch (D) | 22 |
| Ditch and Berm (DB)..... | 25 |
| Filtrexx Sediment Control (FSC) | 30 |
| Land Grading (LG) | 34 |
| Ripping (RP) | 38 |
| Riprap (R) | 41 |
| Roadside Ditches (RSD) and Turnouts (TO) | 47 |
| Sediment Trap (ST)..... | 52 |
| Seeding (S)..... | 56 |
| Silt Fence (SF) | 61 |
| Straw Bale Barrier (SBB)..... | 65 |
| Soil Roughening (SR) | 69 |
| Tracking Pad | 72 |
| Wattles (W)..... | 75 |

Berm (B)



Description

A berm is a ridge of compacted soil located at the top or base of a sloping disturbed area to contain or divert surface water runoff. Berms may be constructed from either excavated topsoil or subsoil.

The purpose of a berm is to control runoff velocity, divert on-site surface runoff to a sediment trapping device, divert clean water away from disturbed areas, and to provide a safe slope barrier for vehicle traffic.

Applicability

Berms are usually appropriate for drainage basins smaller than five acres, but with modifications they can be capable of servicing areas as large as ten acres. With regular maintenance, earthen berms have a useful life span of approximately 18 months. Berms are applicable for the following applications:

- Along the outside shoulder of an in-sloped road to ensure runoff from the roadway drains inward and to protect the fill slope from continual disturbance during road blading and maintaining; Upslope of cut or fill slopes to divert flows away from disturbed areas;
- Downslope of cut or fill slopes to divert on-site runoff into a stabilized outlet or sediment trapping device; and
- Along the outside shoulder of a road to provide vehicle safety.

Limitations

Berms may erode if not properly maintained, compacted, and/or stabilized with vegetation. Berms which are adjacent to concentrated flows may require erosion blanketing or additional means for stabilization.

If a berm crosses a vehicle roadway or entrance, its effectiveness may be reduced. Wherever possible, berms should be designed to avoid crossing vehicle pathways.

Design Criteria

See Figure B-1

Construction Specifications

Prior to berm construction, remove all trees, brush, stumps, and other objects in the path of the berm and till the base of the berm before laying the fill. Fill may consist of topsoil or subsoil excavated during the construction of nearby roads or well pads.

To remain effective, berms should be compacted to reduce erosion of loose soils.

For roadside berms, construct according to Figure B-1.

Berms may have positive drainage to a stabilized outlet so runoff does not collect in ponds on the upslope side of the berm, but instead flows along the berm until it reaches a stabilized outlet. Field location should be adjusted as needed. The stabilized outlet may be a well-vegetated area, a well pad detention pond, or a sediment control such as a silt fence or sediment trap where sediment can settle out of the runoff before being discharged to surface water.

Effective berms are to be constructed with a minimum height of 12 inches and a base width of 18 inches.

If the expected life span of the berm is greater than 15 days, it is strongly recommended that the berm be stabilized with vegetation, an erosion control blanket, or another method immediately after construction. Stabilization is required where concentrated flows are expected.

Berms should be constructed and fully stabilized prior to commencement of major upslope land disturbance. This will maximize the effectiveness of the structure as a stormwater control device.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Berms should be inspected for evidence of erosion or deterioration to ensure continued effectiveness. Berms should also be maintained at the original height. Any decrease in height due to settling or erosion, which impacts the effectiveness of the BMP, should be repaired.

Removal

Berms should remain in place and in good condition until all upslope disturbed areas are permanently stabilized. There is no need to formally remove the berm on completion of stabilization until interim or final reclamation.

References

United States Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Storm Water Runoff Control*. Washington, D.C., February, 2003. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

New York State Department of Environmental Conservation, *New York Guidelines for Erosion and Sediment Control*. New York. August 2005. <http://www.dec.ny.gov/chemical/29066.html>

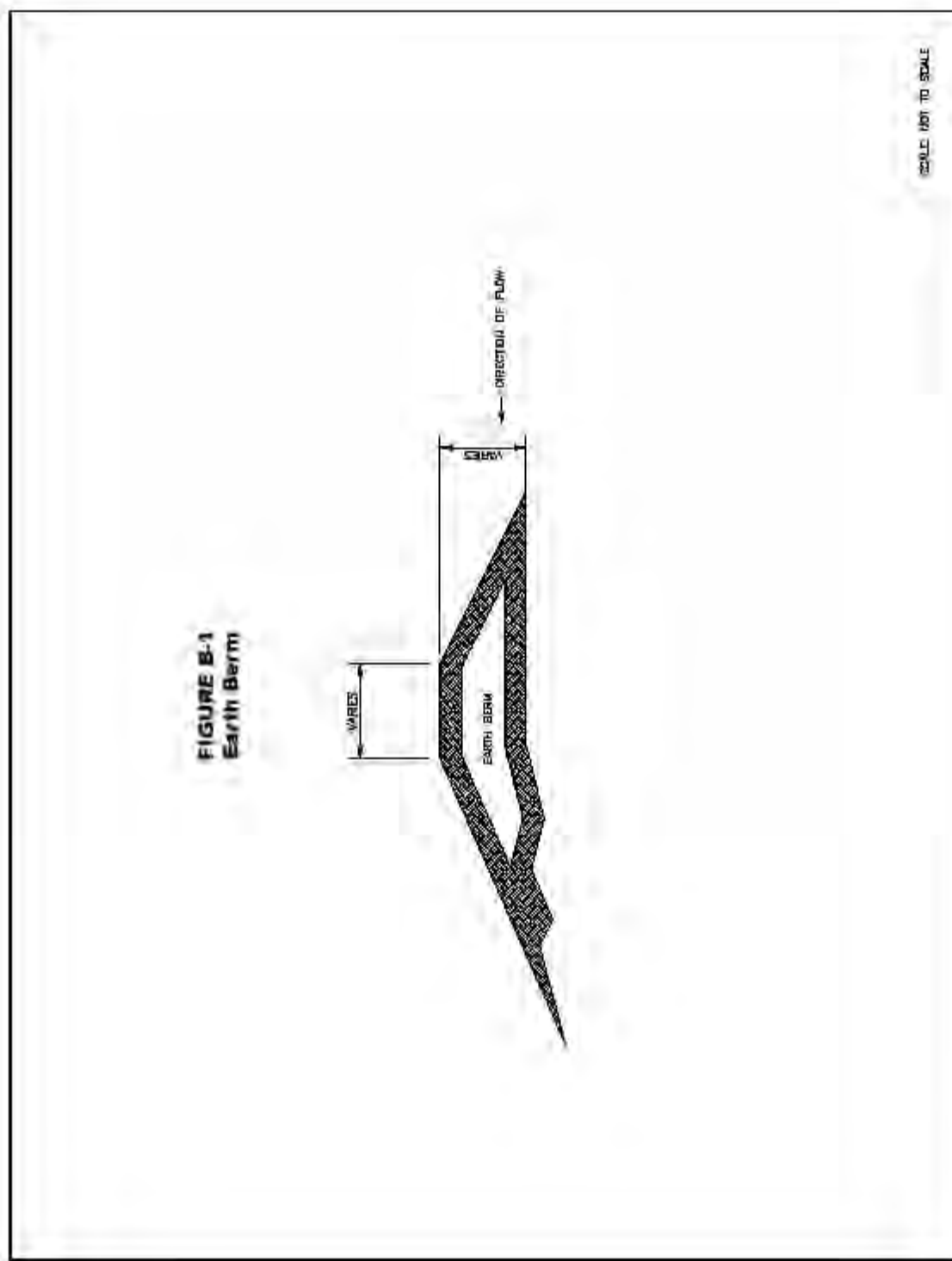


Figure B-1

Cattle Guard (CG)



Description

A cattle guard is traditionally used to keep cattle on a specific side of an access point without installing a gate. For stormwater purposes, the cattle guard is utilized as a vehicle tracking device for aiding in sediment removal and retention from vehicle tires.

As the vehicle crosses the cattle guard, the tires move across the horizontal bars (or ridges), jarring the tires. The effect from this action causes excess loose dirt and sediment to drop off the tires before the vehicle exits the construction site. The containment area beneath the cattle guard catches and holds the sediment.

Applicability

Cattle guards are usually appropriate at access points for oil and gas sites where vehicles can pick up dirt and mud on the vehicle tire tread. With regular maintenance, cattle guards can have a useful life span of many years. Cattle guards are applicable for the following applications:

- At the access point for an unpaved access road where vehicular traffic enters and exits the location; and
- Areas populated by livestock where keeping the animals separated from oil and gas activity is necessary.

Limitations

- Cattle guards may become full of sediment dropping off of the tires. In these instances, the cattle guard will need to be maintained to remove the accumulated soil.
- Unless installed successively, a single cattle guard does not provide a long enough span to knock a majority of the mud/sediment from vehicle tires. Drivers should move the vehicle forward, reverse, and repeat as many times as necessary to knock loose mud from the tires.

Design Criteria

Figure CG-1

Construction Specifications

- Cattle guards can be made of welded pipe or angle iron.
- To remain effective, cattle guards should be set above the ground level or contain a void beneath to allow the dirt to drop through the support pieces.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Cattle guards should be inspected for evidence of sediment deposition and cleaned to ensure continued effectiveness.

Removal

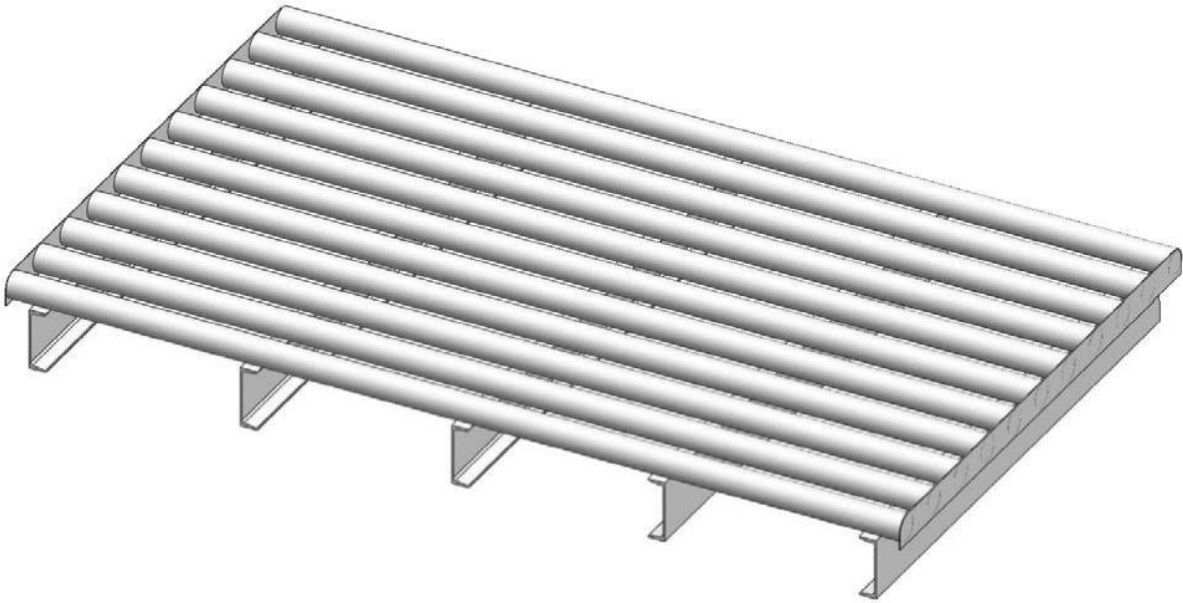
Cattle guards should remain in place and in good condition until the life-cycle of the well has been reached and the requirements for plugging and abandonment have been successful. There is no need to remove the cattle guard prior to these conditions unless requested by the landowner.

References

Quizlet, LLC., 2015. <http://quizlet.com/9130064/midterms-flash-cards/>

Cattle Guards [Online image]. Sioux Steel Company, 2015.
<http://www.siouxsteel.com/index.php/products/category/cattle-guards/>

Figure CG-1



Check Dam (CD)



Description

Check dams are small, temporary dams constructed across a diversion or roadside ditch. Check dams can be constructed using gravel, rock, sandbags, gravel bags, earth with erosion control blanketing, straw bales, or synthetic materials to slow the velocity of concentrated flow in a channel and thus reduce erosion. As a secondary function, check dams can also be used to catch sediment from the channel itself or from the contributing drainage area as stormwater runoff flows through or over the structure.

Applicability

Check dams are most often used in small, open channels with contributing drainage area of less than 10 acres and side slopes of 2:1 or less. Check dams may be used in the following applications.

- In diversion or roadside ditches where it is not practical to line the channel or implement other flow control and sediment control practices;
- In diversions or roadside ditches where temporary seeding has been recently implemented but has not had time to take root and fully develop;
- As a series of check dams, spaced at appropriate intervals, used in one of the above two applications.

Check dams should be **perpendicular** to the flowline of the ditch and must be designed so that water can flow over them, not around them. The check dam should extend far enough so that the ground level at the ends of the check is higher than the low point on the crest of the check.

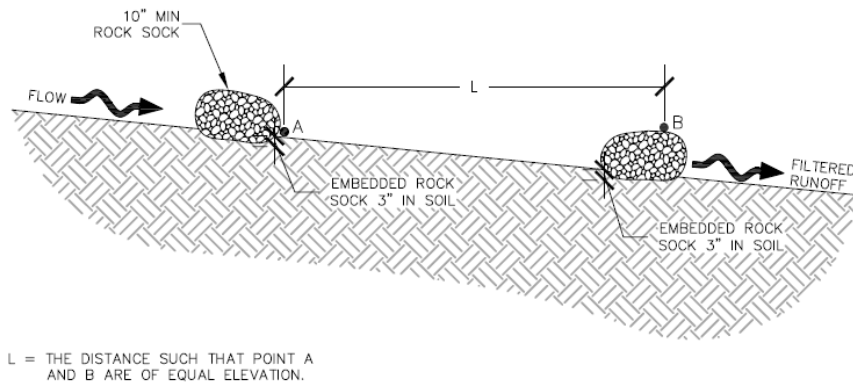
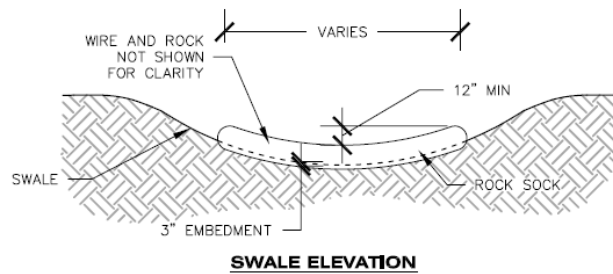
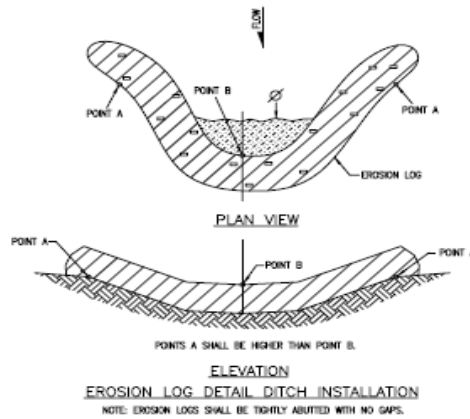
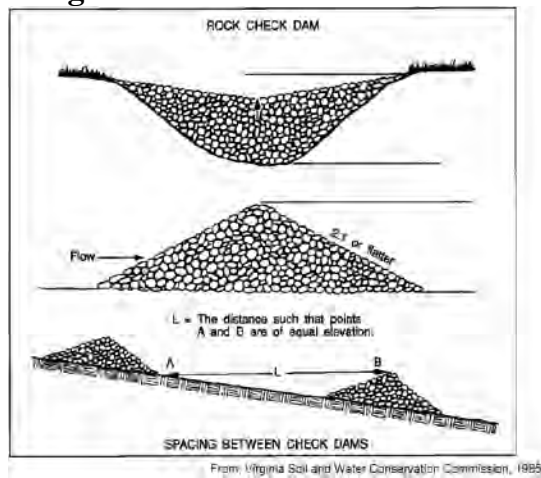
The following table provides check spacing for a given ditch grade:

| Ditch Grade (Percent) | Check Spacing (feet) | Check Spacing (meters) |
|--------------------------|-------------------------|---------------------------|
| 5 | 59 | 18 |
| 6 | 49 | 15 |
| 7 | 43 | 13 |
| 8 | 36 | 11 |
| 9 | 33 | 10 |
| 10 | 30 | 9 |

Limitations

- Check dams should not be used in live, continuously flowing streams unless approved by an appropriate regulatory agency.
- Check dams may require frequent removal of accumulated sediments. Dams should therefore be located in areas accessible to maintenance vehicles.
- Leaves have been shown to be a significant problem by clogging check dams in the fall. Therefore, they might necessitate increased inspection and maintenance.
- Straw bale check dams decompose over time, and may be consumed by livestock.

Design Criteria



Construction Specifications

- Install straw bale check dams, rock check dams, and other check dams according to Figure CD-1, respectively. Other types of check dams shall have similar designs.
- Check dams should be located in areas accessible to maintenance vehicles for the periodic removal of accumulated sediments.
- Check dams should be installed with careful placement of the construction material. Mere dumping of the check dam material into a channel is not appropriate and will reduce overall effectiveness.
- Check dams can be constructed from a number of different materials. Most commonly, they are made of straw bales, rock, or 8-18 inch straw wattle. When using rock, the material diameter should be four to eight inches depending on the expected velocity and quantity of runoff within the channel. Earth collected during excavation of diversions or roadside ditches may also be placed as check dams if covered with erosion control blanketing.
- All check dams should have a maximum height of three feet with sufficient space upslope from the barrier to allow ponding and to provide room for sediment storage. The center of the dam should be lower than the edges. This design creates a weir effect that helps to channel flows away from the banks and prevent further erosion.
- Additional stability can be achieved by implanting the dam material approximately six inches into the sides and bottom of the channel.
- In order to be most effective, dams used in a series should be spaced such that the base of the upstream dam is at the same elevation as the top of the next downstream dam.
- When installing more than one check dam in a channel, outlet erosion stabilization measures should be installed below the final dam in the series. Because this area is likely to be vulnerable to further erosion, riprap, erosion control blanket lining, or some other stabilization measure is highly recommended.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). During inspection, large debris, trash, and leaves should be removed. The center of a check dam should always be lower than its edges. If erosion or heavy flows cause the edges of a dam to fall to a height equal to or below the height of the center, and the effectiveness of the check dam is compromised, repairs should be made immediately. Accumulated sediment should be removed from the upstream side of a check dam when the sediment has reached a height of the dam (measured at the center). Close attention should be made to the repair of damaged or rotting straw bales, end runs, and undercutting beneath bales. Replacement of bales should be accomplished promptly.

Removal

Removal of check dams is optional. Check dams within roadside ditches are usually used as temporary controls, where other check dams may be left in place to silt-out. If removing a check dam, all accumulated sediment should be removed. Removal of a check dam should be completed only after the contributing drainage area has been completely stabilized. Permanent vegetation should replace areas from which rock or other material has been removed.

References

Colorado Department of Transportation (CDOT), *Erosion Control and Stormwater Quality Guide*. 2002. <http://www.coloradodot.info/programs/environmental/water-quality/documents/erosion-storm-quality>

Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Stormwater Runoff Control*. Washington, D.C., February 2003. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

Horizon Environmental Services, Inc, *Guidance Document Reasonable and Prudent Practices for Stabilization (RAPPS) of Oil and Gas Construction Sites*. April 2004.

North Dakota Department of Health Division of Water Quality, *A Guide to Temporary Erosion-Control Measures for Contractors, Designers and Inspectors*, June 2001

*Other materials may be used instead of straw.

Figure CD-1

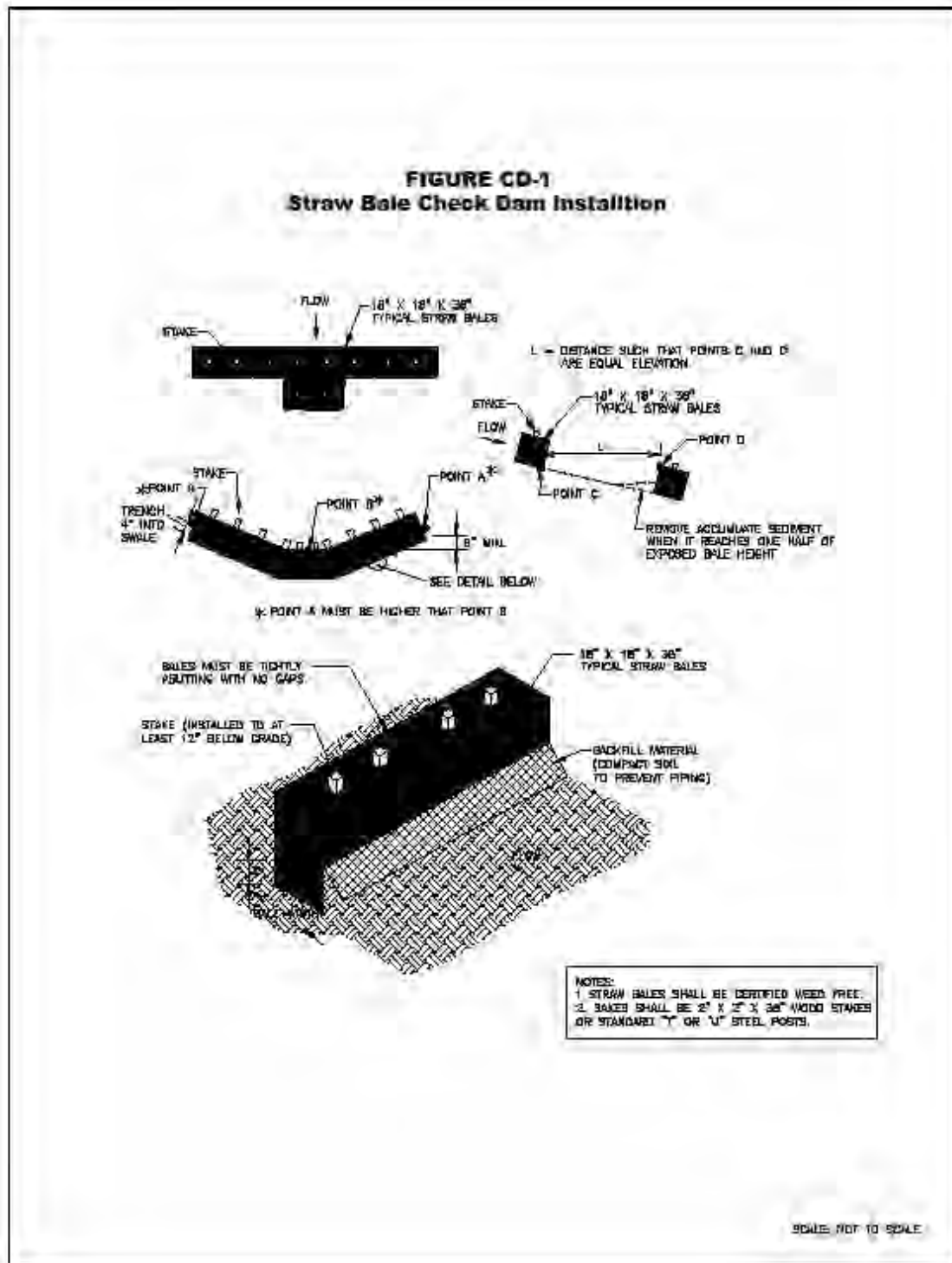


Figure CD-2

FIGURE CD-2
Rock Check Dam Installation (Aerial View)

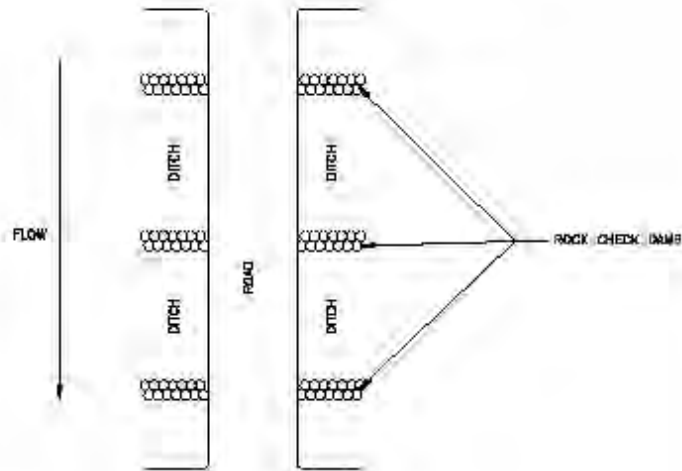
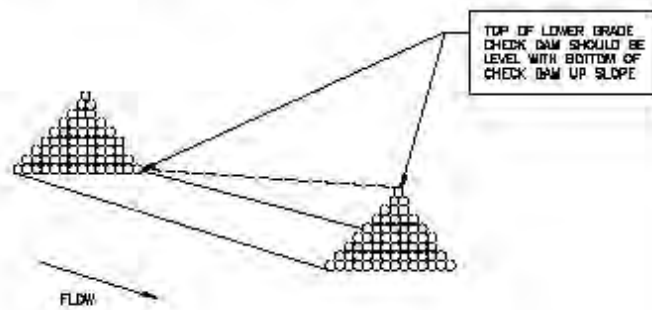


FIGURE CD-3
Rock Check Dam Installation (Ground View)



SCALE: NOT TO SCALE

Culvert (C)



Description

Culverts are typically concrete, steel, aluminum, or plastic pipe used to move ditch water under a road or to direct stream flow under the road or construction area.

Applicability

Culverts are ideal on roads with grades of less than 15%. For grades over 15%, it is difficult to slow down the water or remove it from road surface rapidly. On such steep grades, it is best to use frequently spaced relief culverts and drainage crossing culverts, with armored ditches (see RIPRAP [R]). Culverts may be used in the following applications:

- As drainage crossing culverts in streams and gullies to allow normal drainage to flow under the traveled way;
- As ditch relief culverts to periodically relieve the inside ditch line flow by piping water to the opposite side of the road where the flow can be dispersed away from the roadway. Culverts placed in natural drainages may be utilized for ditch relief.

Limitations

- Undersized culverts are susceptible to plugging and will require cleaning. Culverts will not filter sediment.
- Culverts are easily crushed if not properly designed.

Design Criteria

Pipe size can be determined using general design criteria, such as in Table C-1, but is ideally based upon site-specific hydrologic analysis.

Depth

The depth of culvert burial must be sufficient to ensure protection of the culvert barrel for the design life of the culvert. This requires anticipating the amount of material that may be lost to road use and erosion.

Headwalls

Use headwalls on culvert pipes as often as possible. The advantages of headwalls include: preventing large pipes from floating out of the ground when they plug; reducing the length of the pipe capacity; helping to funnel debris through the pipe; retaining the backfill material; and reducing the chances of culvert failure if it is overtopped.

Construction Specifications

Drainage crossing culverts

Make road crossings of natural drainages perpendicular to the drainage to minimize pipe length and area of disturbance (Figure C-1).

Use single large pipes versus multiple smaller diameter pipes to minimize plugging potential in most channels (unless roadway elevation is critical). In very broad channels, multiple pipes are desirable to maintain the natural flow spread across the channel. All culverts should be concrete corrugated metal pipe made of steel or aluminum, or properly bedded and backfilled corrugated plastic pipe.

Align culverts in the bottom and middle of the natural channel flowline so that installation causes no change in the stream alignment or stream bottom elevation. Culverts should not cause damming or pooling or increase stream velocities significantly.

Extend the outlet of the culvert at least one foot beyond the toe of the slope to prevent erosion of the fill material. Alternatively, use retaining walls (headwalls) to hold back the fill slope.

It may be necessary to install rip rap, erosion control blanketing, or a combination of both or other energy-dissipater device at the outlet end of the culvert to reduce soil erosion or to trap sediment.

It may be desirable to construct pull offs/turnouts for vehicles on one or both sides of narrow culvert crossings. This will help avoid culvert crushing as well as disturbance to roadside ditches and berms.

Ditch relief culverts See Figure C-2 for installation details.

Ditch relief culverts can provide better flow when skewed 0 to 30 degrees perpendicular to the road.

The culvert gradient should be at least 2% greater than the approach ditch gradient. This improves the flow hydraulics and reduces siltation and debris from plugging the culvert inlet. Discharge the culvert at natural ground level where possible (see Figure C-3, type A), on firm, non-erosive soil or in rocky or bushy areas. If discharging on fill slopes, armor outlets with riprap or logging slash (see Figure C-3, type B), or use down-drain structures (see Figure C-3, type C).

Extend the inlet of the culvert at least one foot beyond the flowline of the roadside ditch. Extend the outlet of the culvert at least one foot beyond the toe slopes to prevent erosion of the fill material.

It may be necessary to install riprap or other energy-dissipater devices at the outlet end of the culvert to prevent soil erosion or to trap sediment.

Spacing of culverts is dependent on the road gradient, soil types, and runoff characteristics according to the table below.

| Soil Type | Road Grade | | |
|---|------------|------|-------|
| | 3-4% | 5-8% | 9-12% |
| Highly Corrosive Granitic or Sandy | 240' | 180' | 140' |
| Intermediate Erosive Clay or Load | 310' | 260' | 200' |
| Low Erosive Shale or Gravel | 400' | 325' | 250' |

It may be desirable to construct pull offs/turnouts for vehicles on one or both sides of narrow culvert crossings. This will help avoid culvert crushing as well as disturbance to roadside ditches and berms.

Backfill and compaction

Firmly compact well-graded fill material (soil or road base) around culverts, particularly around the bottom half, using placement in layers to achieve a uniform density. Use slightly plastic sandy gravel with fines. Avoid the use of fine sand and silt rich soils for bedding material because of their susceptibility to piping. Pay particular attention to culvert bedding and compaction around the haunches of the pipe. Do not allow the compaction to move or raise the pipe. In large fills, allow for settlement.

Cover the top of the metal and plastic culvert pipes with fill to a depth of at least one foot to prevent crushing by heavy trucks. Use a minimum cover of two feet of fill over concrete pipe. For maximum allowable fill height, follow the manufacturer's recommendations.

Mound fill over the top of culvert pipes so the road is slightly raised at the culvert locations to help prevent erosion and water from ponding over culvert crossings. This practice, as well as placing large boulders around the culvert outlets, will also help to prevent culverts from being crushed.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). If any damage to culvert or inlet/outlet protection is noted or if there is any evidence of scour, repairs should be made immediately. Any debris that may be blocking the culvert inlet or outlet should be removed.

References

Horizon Environmental Services, Inc, *Guidance Document Reasonable and Prudent practices for Stabilization (RAPPS) of Oil and Gas Construction Sites*. April 2004.

Keller, Gordon and James Sherar, *Low-Volume Roads Engineering, Best Management Practices Field Guide*. United States Department of Agriculture (USDA), Forest Service, US Agency of International Development (USAID), 2003. <http://www.blm.gov/bmp/field%20guide.htm>

United States Department of the Interior and United States Department of Agriculture. *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development “Gold Book”*. BLM/WO/ST-06/021+3071. Bureau of Land Management (BLM). Denver, Colorado. Fourth Edition, 2006.

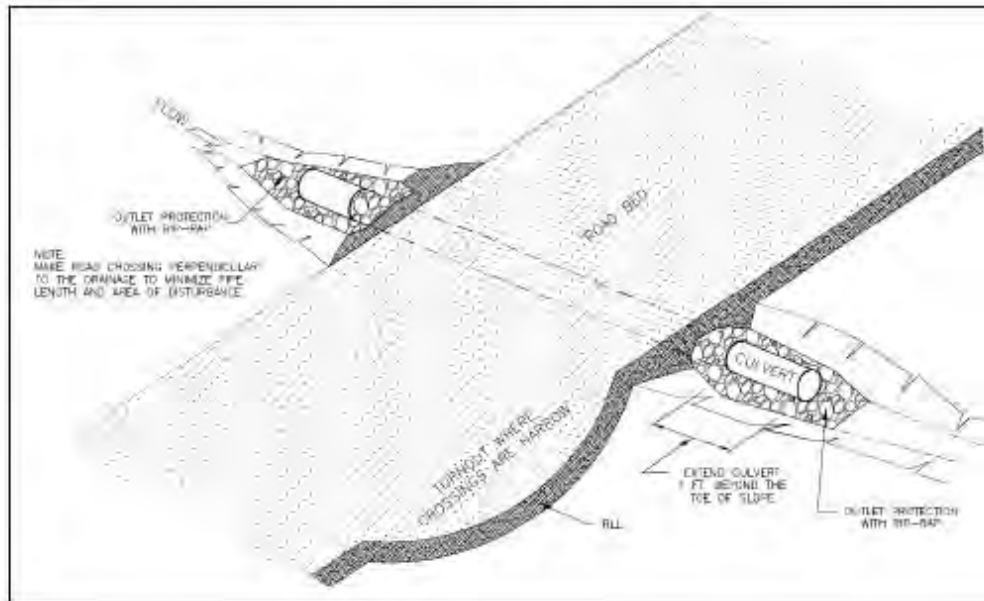
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Table C-1

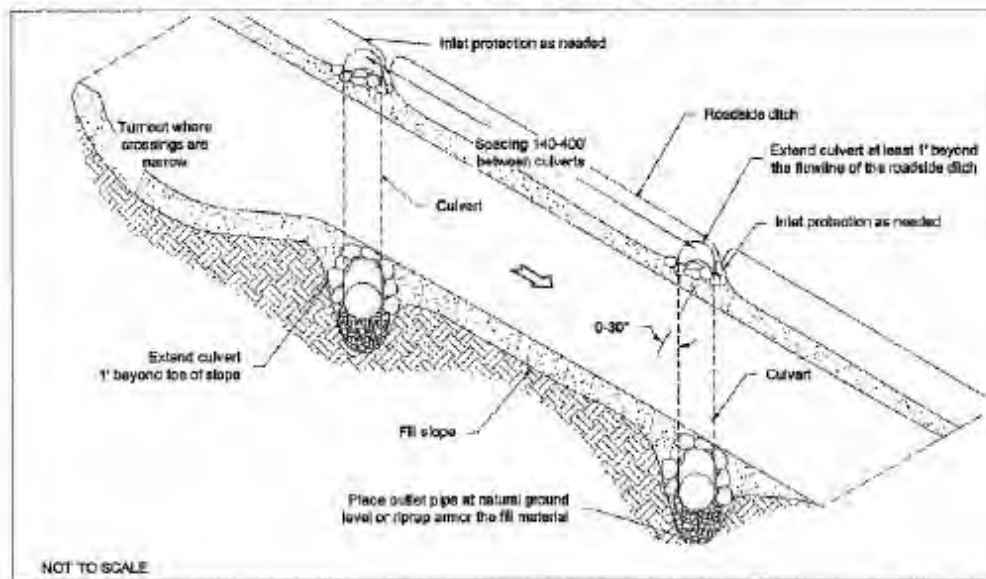
| Drainage Area (acres) | Size of Drainage Structure (diameter and area) | | | |
|--------------------------|--|--------------|---|--------------|
| | Steep Slopes (Light Vegetation) C=0.7 | | Gentle Slopes (Heavy Vegetation) C=0.2 | |
| | Round Pipe (In) | Area (sq.ft) | Round Pipe (In) | Area (sq.ft) |
| 0-10 | 30" | 4.9 | 18" | 1.8 |
| 10-20 | 42" | 9.6 | 24" | 3.1 |
| 20-35 | 48" | 12.6 | 30" | 4.9 |
| 35-75 | 72" | 28.3 | 42" | 9.6 |
| 75-125 | 84" | 38.5 | 48" | 12.6 |
| 125-200 | 96" | 50.3 | 60" | 19.6 |

* Due to site specific conditions this table may not be used.

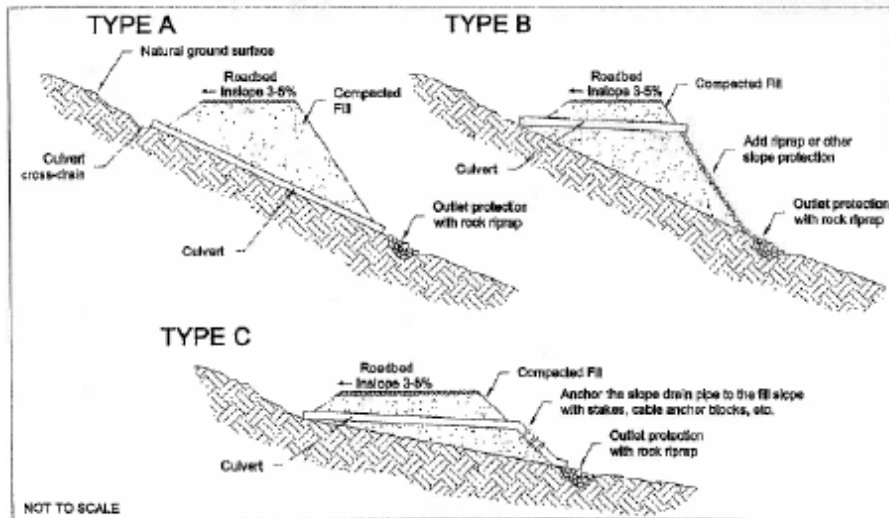
Drainage Crossing Culvert Alignment & Overflow Dip



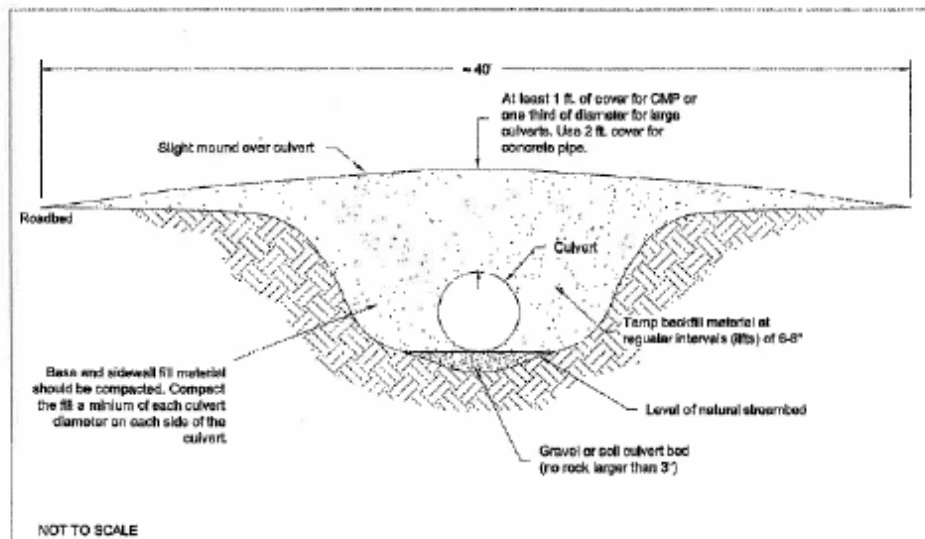
Ditch Relief Culvert Installation



Culvert Installation Options



Culvert Backfill and Compaction



Ditch (D)



Description

A ditch consists of a channel constructed across a slope to collect and divert runoff. The earthen channel may remain bare, or when necessary to protect it from erosion, it may be vegetated. The purpose of this practice is to divert surface water from one area to other areas for use or safe disposal.

Applicability

Ditches are usually appropriate where runoff can be diverted and disposed of safely to prevent flood damage, erosion, or sedimentation damage.

Specific locations and conditions include:

- Above steep slopes to limit surface runoff onto the slope;
- Across long slopes to reduce slope length to prevent erosion;
- Below steep grades where flooding, seepage, or sediment depositions may occur; and
- Around buildings or areas that are subject to damage from runoff.

Limitations

A ditch is an effective means of diverting sediment laden runoff around a disturbed area. A ditch can sometimes, if not properly constructed, concentrate runoff in the ditch and increase the erosion potential. The effectiveness of a ditch can be greatly reduced if the ditch crosses a vehicle roadway or entrance. It is recommended that a ditch be coupled with a sediment trapping device at the outfall of the ditch.

Design Criteria

A ditch shall have enough capacity to carry peak runoff. The ditch may be parabolic, V-shaped, or trapezoidal in shape. A ditch may be designed to deliver runoff to a stable outlet at a point where the outflow will not cause damage.

Construction Specifications

- All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the ditch.
- All ditches shall have uninterrupted positive grade to an outlet.
- Diverted runoff from a disturbed or undisturbed area shall outlet to a sediment trapping device or into an undisturbed stabilized area at non-erosive velocities. Vegetative outlets shall be installed before ditch construction, if needed, to ensure establishment of vegetative cover in the outlet channel.
- Ditches will be constructed with widths of up to 15 feet, depths of up to 3 feet deep. 1:3 slopes are typical, though other slopes may be used depending on site conditions. Additional controls may need to be installed.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Ditches should be cleared of any sediment and repairs completed when necessary. Maintenance efforts should be adequate to preserve ditch capacity.

Removal

The ditch shall remain in place only until the disturbed areas are re-graded and prepared for permanent stabilization.

References

United States Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Stormwater Runoff Control*. Washington, D.C., February, 2003. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

New York State Department of Environmental Conservation, *New York Guidelines for Erosion and Sediment Control*. New York. August 2005. <http://www.dec.ny.gov/chemical/29066.html>

FIGURE D-1
Parabolic Ditch



FIGURE D-2
Trapezoidal Ditch



SCALE: NOT TO SCALE

Ditch and Berm (DB)



Definition

A ditch and berm is a drainage with a parabolic or trapezoidal cross-section and a supporting ridge on the lower side that is constructed across the slope. The purpose of a ditch and berm is to prevent off-site stormwater runoff from entering a disturbed area, to prevent sediment laden storm runoff from leaving the construction site or disturbed area, to prevent flows from eroding slopes, and to direct sediment laden flows to a trapping device.

Applicability

Ditch and berms may be designed for temporary or permanent use. The maximum drainage area for a temporary, un-compacted ditch and berm is two acres. For drainage areas larger than two acres but less than ten acres, the ditch and berm should be compacted. For undisturbed drainage areas larger than ten acres, a permanent ditch and berm may be designed to handle larger flows. Ditch and berms may be used for:

- The up slope of cut or fill slopes to convey or divert flows away from disturbed areas;
- The down slope of cut or fill slopes to divert on-site runoff to a stabilized outlet or sediment trapping device;
- At the outer edge of a well pad to ensure that runoff remains on the pad and is diverted to a well pad detention pond, if available;
- Where runoff from higher areas has potential for causing erosions, or interfering with, or preventing the establishment of vegetation on lower areas;
- Where the length of slopes need to be reduced so soil loss will be kept to a minimum; and
- At the perimeter of a site or disturbed area.

Limitations

- The area around the ditch and berm that is disturbed by its construction must be stabilized (with vegetation or other erosion control) so it is not subject to similar erosion as the steep slope the channel is built to protect.
- To alleviate erosion capability, ditch and berms must be directed into a stabilized outlet or well-vegetated area or to sediment trapping devices, where erosion sediment can be settled out of the runoff before being discharged into surface waters.
- Temporary ditch and berms should be designed to avoid crossing vehicle pathways.
- Ditch and berms should be used with caution on soils subject to slippage.

Design Criteria

For a temporary ditch and berm (drainage less than 10 acres), no formal design is necessary. For permanent ditch and berms (drainage area larger than 10 acres), the following guidelines apply.

Location

Ditch and berms are usually located above or below cut or fill slopes. Exact ditch and berm location shall be determined by considering outlet conditions, topography, land use, soil type, length of slope, and the development layout. Where possible on shallow slopes, a vegetative buffer strip should be left between the edge of the cut or fill slope and the ditch and berm..

Capacity

The constructed ditch and berm shall have the capacity to carry, as a minimum, the peak discharge from a 10-year frequency rainfall event with the freeboard of not less than 0.3 feet.

Cross section See Figure DB-2 for details.

The ditch and berm shall be parabolic or trapezoidal in shape, if possible. The ditch and berm shall be designed to have stable side slopes. The side slopes shall not be steeper than 2:1 and shall be flat enough to ensure ease of maintenance of the ditch and berm. The ridge shall have a minimum width of 4 feet at the design water elevation, a minimum of 0.3 feet freeboard, and a reasonable settlement factor (10%) shall be provided.

Velocity and grade

The permissible velocity for the specific soil type will determine the maximum grade. The maximum permissible velocity for sand and silt channels is 3 feet per second, and 5 feet per second for clay vegetated channels. Ditch and berms are usually not applicable below high sediment producing areas unless structural measures, designed to prevent damaging accumulations of sediment in the channels, are installed with or before the ditch and berm.

Construction Specifications

General

- All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the ditch and berm.
- All ditch and berms shall have uninterrupted positive grade to an outlet.
- Diverted runoff from a disturbed area shall be conveyed to a sediment trapping device. Diverted runoff from an undisturbed area shall outlet to a sediment trapping device or into an undisturbed stabilized area at non-erosive velocities. Vegetative outlets shall be installed before ditch and berm construction, if needed, to ensure establishment of vegetative cover in the outlet channel.

Temporary ditch and berm (drainage area < 10 acres)

- The ditch and berm shall be excavated or shaped to line, grade, and cross section as required to meet the specific criteria. The ditch and berm does not need to be compacted if the contributing drainage area is less than 2 acres.
- Stabilization with vegetation is not required as long as sediment traps (see SEDIMENT TRAPS [ST]) or other sediment control devices are provided.

Permanent ditch and berm (drainage area > 10 acres) See Figure D-2 for details.

- The ditch and berm shall be excavated or shaped to line, grade, and cross section as required to meet the specific criteria specified herein, and be free of bank projection or other irregularities that will impede normal flow.
- Parabolic and triangular-shaped, grass lined channels should not have a top width of more than 30 feet. Trapezoidal, grass lined channels may not have a bottom width of more than 15 feet unless there are multiple or divided waterways and have a riprap center or provides other methods of controlling the meandering of low flows.
- If grass-lined channels have a base flow, a stone center or subsurface drain or another method for managing the base flow must be provided.
- Fills shall be compacted as needed to prevent unequal settlement that would cause damage in the completed ditch and berm.
- All earth that is removed and not needed in the construction shall be spread or disposed of on the well pad side so it will not interfere with the functioning of the ditch and berm.
- Immediately after the ridge and channel are constructed, they must be seeded or hydro-seeded and mulched or covered with erosion control blanketing according to SEEDING (S) or EROSION CONTROL BLANKET (ECB) along with any disturbed areas that drain into the ditch and berm.
- For design velocities less than 3.5 feet per second, seeding and mulching may be used for establishing vegetation. It is recommended that, when conditions permit, temporary ditch and berms or other means should be used to prevent water from entering during the establishment of vegetation.
- For design velocities more than 3.5 feet per second, the ditch and berm shall be stabilized with seeding protected by jute or matting or with seeding and mulching, including temporary ditch and berms, until the vegetation is established.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Channels should be cleared of sediment and repairs made when necessary. Maintain ditch and berm capacity, ridge height, especially if high-sediment yielding areas are in the drainage area above the ditch and berm. Redistribute the sediment as necessary to maintain the capacity of the ditch and berm.

Removal

Temporary and un-compacted ditch and berms shall remain in place only until the disturbed areas are re-graded and prepared for permanent stabilization. Permanent ditch and berms shall remain in place until final reclamation.

References

United States Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Stormwater Runoff Control*. Washington, D.C., February, 2003. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

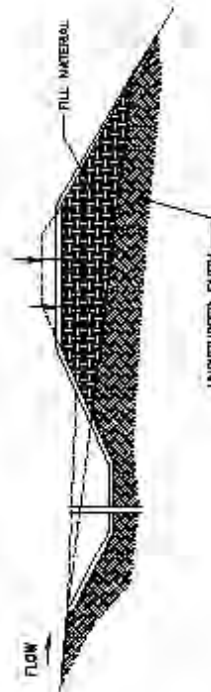
New York State Department of Environmental Conservation, *New York Guidelines for Erosion and Sediment Control*. New York. August 2005. <http://www.dec.ny.gov/chemical/29066.html>

United States Department of Agriculture (USDA), Natural Resources Conservation Services (NRCS), *Field Office Technical Guide*. 2002. <http://www.nrcs.usda.gov/technical/efotg/>

FIGURE DB-1
Temporary Ditch and Berm Installation



FIGURE DB-2
Permanent Ditch and Berm Installation



SCALE: NOT TO SCALE

Erosion Control Blanket

Filtrexx® Sediment Control (FSC)



Description

Filtrexx® Sediment control is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for perimeter control of sediment and other soluble pollutants (such as phosphorus and petroleum hydrocarbons), on and around construction activities.

Applicability

Filtrexx® Sediment control is to be installed down slope of any disturbed area requiring erosion and sediment control and filtration of soluble pollutants from runoff. Sediment control is effective when installed perpendicular to sheet or low concentrated flow. Acceptable applications include:

- Site perimeters;
-
- Above and below disturbed areas subject to sheet runoff, inter-rill and rill erosion;
-

- Above and below exposed and erodible slopes;
-
- Around area drains or inlets located in a ‘sump’;
-
- On compacted soils where trenching of silt fence is difficult or impossible;
-
- Around sensitive trees where trenching of silt fence is not beneficial for tree survival or may unnecessarily disturb established vegetation;
- On frozen ground where trenching of silt fence is impossible; and
-
- On paved surfaces where trenching of silt fence is impossible.

Limitations

Filtrexx® Sediment control should not be placed on slopes steeper than 50 percent. Runoff from the top of cut/fills or on slopes steeper than 50 percent should be routed via other means through BMPs designed to manage surface flow. Appropriate diameter Filtrexx® Sediment control should be chosen based on the application.

Design Criteria

| Maximum Slope Length Above Sediment Control in Feet* | | | | | |
|--|-----------------------|------------------------|------------------------|------------------------|------------------------|
| Slope Percent | 8 in Sediment control | 12 in Sediment control | 18 in Sediment control | 24 in Sediment control | 32 in Sediment control |
| | 6.5 in** | 9.5 in** | 14.5 in** | 19 in** | 26 in** |
| 2 (or less) | 600 | 750 | 1000 | 1300 | 1650 |
| 5 | 400 | 500 | 550 | 650 | 750 |
| 10 | 200 | 250 | 300 | 400 | 500 |
| 15 | 140 | 170 | 200 | 325 | 450 |
| 20 | 100 | 125 | 140 | 260 | 400 |
| 25 | 80 | 100 | 110 | 200 | 275 |
| 30 | 60 | 75 | 90 | 130 | 200 |
| 35 | 60 | 75 | 80 | 115 | 150 |
| 40 | 60 | 75 | 80 | 100 | 125 |
| 45 | 40 | 50 | 60 | 80 | 100 |
| 50 | 40 | 50 | 55 | 65 | 75 |

* Based on a failure point of 36 in super silt fence (wire reinforced) at 1000 ft of slope, watershed width equivalent to receiving length of sediment control device, 1 in/ 24 hr rain event.

**Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.

Construction Specifications

- Sediment control used for perimeter control of sediment and soluble pollutants in storm runoff shall meet Filtrexx® Soxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
- Contractor is required to be Filtrexx® Certified™, or use pre-filled Filtrexx® Sediment control products manufactured by a Filtrexx® Certified Manufacturer™ as determined by Filtrexx® International, LLC (440-926-2607 or visit www.filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application. Look for the Filtrexx® Certified™ Seal.
- Sediment control will be placed at locations indicated on plans as directed by the

Engineer.

- Sediment control should be installed parallel to the base of the slope or other disturbed area. In extreme conditions (i.e., 2:1 slopes), a second Sediment control shall be constructed at the top of the slope.
- Effective Soxx™ height in the field should be as follows: 8" Diameter Sediment control = 6.5" high, 12" Diameter Sediment control = 9.5" high, 18" Diameter SiltSoxx™ = 14.5" high, 24" Diameter Sediment control = 19" high.
- Stakes shall be installed through the middle of the Sediment control on 10 ft centers, using 2 in by 2 in by 3 ft hard wood stakes. In the event staking is not possible, i.e., when Sediment control is used on pavement, heavy concrete blocks shall be used behind the Sediment control to help stabilize during rainfall/runoff events.
 - Staking depth for sand and silt loam soils shall be 12 in, and 8 in for clay soils.
- Loose compost may be backfilled along the upslope side of the Sediment control, filling the seam between the soil surface and the device, improving filtration and sediment retention.
- If the Sediment control is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for establishment of permanent vegetation. The
- Engineer will specify seed requirements.
- Filtrexx® Sediment control is not to be used in perennial, ephemeral, or intermittent streams.

Maintenance Considerations

The frequency of inspection should be in accordance with the Storm Water Management Plan (SWMP) to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Sediment control may be required to reduce effective slope length or sediment removal may be necessary.

Sediment shall be removed at the base of the upslope side of the Sediment control when accumulation has reached 1/2 of the effective height of the Sediment control, or as directed by the Engineer. Alternatively, a new Sediment control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.

References

Filtrexx Land Improvement Systems, Specification Cut Sheets., Filtrexx International, LLC, 2010. <http://www.filtrexx.com/Resources/Section4.1.1-SWPPPCutSheet-FiltrexxSedimentControl.pdf>

Land Grading (LG)



Description

Grading involves reshaping the ground surface to planned grades. Grading provides more suitable topography for well pads and pipelines and helps to control runoff, soil erosion, and sediment during and after construction in these areas. Land grading includes the following.

- Proper cut and fill techniques to ensure roads and well pads remain stable over time.
- Road crowning or sloping to properly route stormwater off of the roadway.
- Surfacing of roads or well pads with gravel to avoid mud, rutting, and large quantities of sediment that will wash away during storms.

Applicability

- The construction and maintenance of any road or well pad, but particularly those located on steep topography or easily erodible soils.
- Surface gravel areas with “soft” soils sections, steep grades, highly erosive soils, or where all-weather access is needed. Gravel may be used as “fill” material in ruts or as a full structural section over the entire road or well pad.

Limitations

- Improper cut and fill slopes that disrupt natural stormwater patterns might lead to poor drainage, high runoff velocities, and increased peak flows during storm events.
- Rutting and wash boarding may develop if surface gravel is not designed properly or if road or well pad is not sloped properly.
- Flat-blading to maintain the roadway must be done properly to avoid changes in gravel thickness, road slope, and road grade.

Design Criteria

Land grading should be based upon well pad and pipeline layouts that fit and utilize existing topography and desirable natural surroundings to avoid extreme grade modifications. Clearing and grading should only occur at those areas necessary for well pad activity and equipment traffic. Maintaining undisturbed temporary or permanent buffer zones in the grading operation provides a low cost sediment control measure that will help reduce runoff and off-site sedimentation.

Slope failures

Landslides and failed cuts and fills can be a major source of sediment. Slope failures can close the roads or require major repairs and can greatly increase maintenance costs. Slope failures or landslides typically occur where a slope is over-steep, where fill material is not compacted, or where cuts in natural soils encounter groundwater or zones of weak material. Good road location can often avoid landslide areas and reduce slope failures. When failure does occur, the slide area should be stabilized by removing the slide material, flattening the slope, adding drainage, or using structures as discussed below. Designs are typically site specific and may require input from geotechnical engineers and engineering geologist. Failures that occur typically impact operations and can be costly to repair. Failures near streams and channel crossings have an added risk of impact to water quality.

Road slope See Figure LG-1 for details.

All roads should be designed with one of the following three slope types.

- Out-sloped roads minimize the concentration of water and minimize road width by avoiding the need for an inside ditch, but may require roadway surface and fill slope stabilization. Out-sloped roads with clay rich, slippery road surface materials often require surface stabilization with gravel or limited use during rainy periods to assure traffic safety. Roads with over 10% to 12% grades and on steep hill slope areas, out-sloped roads are difficult to drain and can feel unsafe.
- In-sloped roads are the best method to control surface water. However, in-sloped roads also concentrate water and require a system of ditches and turnouts or cross draining culverts.
- Crowned roads are appropriate for higher standard, two lane roads on gentle grades. They may or may not require roadside ditches, turnouts, and/or cross drains. It is difficult to create and maintain a crown on a narrow road, so generally in-sloped or out-sloped road drainage is more effective.

Construction Specifications

Cut and fill slopes

- All areas to be disturbed (both cut and fill) shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots, or other objectionable material.
- Fill material shall be free of brush, logs, stumps, roots, or other objectionable material that would interfere with, or prevent construction or satisfactory fills. This material can be set aside and later used at the toe of fill slopes as filter berms.
- Table LG-1 presents a range of commonly used cut and fill slope ratios appropriate for the soil and rock types described. Vertical cut slopes should not be used unless the cut is in rock or very well-cemented soil. Ideally, both cut and fill slopes should be constructed with a 2:1 or flatter slope to promote growth of vegetation, but cut slopes in dense, sterile soils or rocky material are often difficult to vegetate.
- All fills shall be compacted as required to reduce erosion, slippage, settlement, subsidence, or other related problems.
- Topsoil required for the establishment of vegetation shall be stockpiled in the amount necessary to complete finished grading of all exposed areas. Areas that are to be topsoiled shall be scarified to a minimum depth of 4 inches prior to placement of topsoil.

Road slope See Figure LG-1.

- Compact soil or road base material to direct runoff.
- If crowning a road, runoff is directed to both sides of the road requiring two roadside ditches, unless runoff will drain directly to well-stabilized areas.
- If using an in-slope design, runoff will be directed toward the hillside and requires a roadside ditch with periodic turnouts or cross drain culvert installation.
- If using an out-slope design, ensure a moderate road slope with dense vegetative cover.

Surface gravel

- Ideally, aggregate surfacing material is (1) hard, durable, and crushed or screened to a minus 2-inch size; (2) well graded to achieve maximum density; (3) contains 5-15% clayey binder to prevent raveling; and (4) has a plasticity index of 2 to 10.
- Gravel thickness should be at least twice the diameter of the largest stone with a minimum thickness of 4 inches. Gravel thickness can be reduced with the use of geotextile or geo-grid sub-grade reinforcement when gravel is placed over very weak soils. Also, geotextile layers are useful over soft soils to separate the gravel from the soil, keep it uncontaminated, and extend the useful life of the gravel.
- Compact the aggregate during construction and maintenance to achieve a dense, smooth surface and thus reduce the amount of water that can soak into the road or well pad.
- “Spot” stabilize local wet areas and soft areas with 4 to 6 inches of coarse rocky material, add more as needed.
- Blend coarse aggregate and fine clay-rich soil (when available) with 5% to 15% fines for binder to produce a desirable composite roadway material that is coarse yet well graded.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Inspect cut and fill slopes for rills or other indications of erosion. Maintain all crowns, out slopes, in slopes, and surface gravel.

References

United States Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Stormwater Runoff Control*. Washington, D.C., February 2003. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

Horizon Environmental Services, Inc, *Guidance Document Reasonable and Prudent Practices for Stabilization (RAPPS) of Oil and Gas Construction Sites*. April 2004.

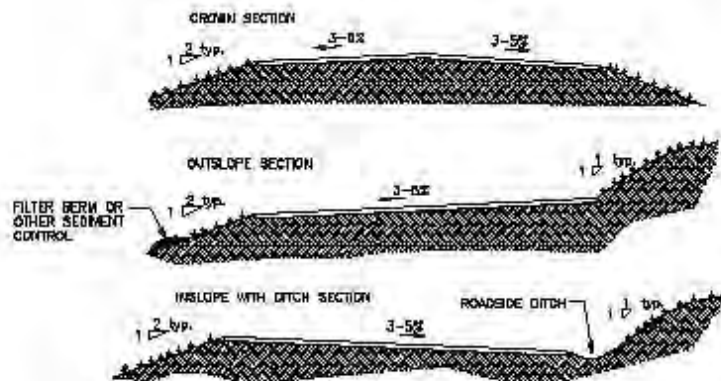
Keller, Gordon and James Sherar, *Low-Volume Roads Engineering, Best Management Practices Field Guide*. United States Department of Agriculture (USDA), Forest Service, US Agency of International Development (USAID), 2003. <http://www.blm.gov/bmp/field%20guide.htm>

New York State Department of Environmental Conservation, *New York Guidelines for Erosion and Sediment Control*. New York. August 2005. <http://www.dec.ny.gov/chemical/29066.html>

TABLE LG-1
Stable Slope Ratios for Various Conditions

| Soil/Rock Condition | Slope Ratio (Hor:Vert) |
|---|------------------------------------|
| Most rock | 1/4: 1 to 1/2: * |
| Very well cemented soils | 1/4: 1 to 1/2: * |
| Most in-place soils | 3/4: 1 to 1: 1 |
| Very fractured rock | 1: 1 to 1 1/2: * |
| Loose coarse granular soils | 1 1/2: * |
| Heavy clay soils | 2: 1 to 3: * |
| Soft clay-rich zones or wet seepage areas | 3: 1 to 3: * |
| Fills of most soils | 1 1/2: 1 to 2: * |
| Fills of hard, angular rock | * 1/3: * |
| Low cuts and fills (<10 ft high) | 2: 1 or flatter (for revegetation) |

FIGURE LG-1
Typical Road Surface Drainage Options



SCALE: NOT TO SCALE

Ripping (RP)



Description

Ripping is a series of infiltration trenches, with no outlet, that receives stormwater runoff. Runoff is stored in the void space within these trenches and infiltrates through the bottom and into the soil matrix. The primary pollutant removal mechanism of this practice is filtering through the soil. Ripping increases soil drainage by opening up the soil which allows stormwater to infiltrate at a faster rate and reducing erosion by promoting infiltration.

Applicability

Ripping can be applied in most regions of the country and is most effective in areas that do not have steep slopes or in soils with a high concentration of clay that may prevent infiltration of stormwater. Ripping is best used in areas where sheet flow of stormwater occurs.

Limitations

Depending on the surface and/or soil makeup, some areas might not be suitable for all ripping techniques, for example rock formations.

Design Criteria

Ripping should be completed by going against the natural contours to slow down stormwater velocity.

Construction Specifications

Ripping should be done with a tool bar attached to a back hoe or land grader equipment. The tool bar should have a minimum of three mounted rippers. Ripped depths should be at least 10 inches in depth and not to exceed 18 inches. The distance between contours is modified as the slope becomes steeper.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP).

References

United States Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Stormwater Runoff Control*. Washington, D.C., February 2003. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

U.S Fish and Wildlife Service, *Contour Tilling/Ripping*, January 2009.
<http://www.fws.gov/fire/ifcc/esr/Treatments/contour-tillingi.htm>

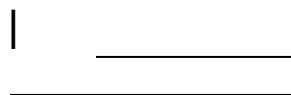
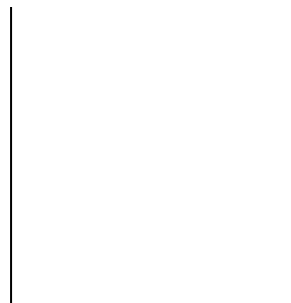
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Riprap (R)



Description

Riprap is a permanent, erosion resistant layer made of stones or boulders. It is intended to stabilize areas subject to erosion and protect against scour of the soil caused by concentrated, high velocity flows.

Applicability

Riprap can be used for areas subject to erosion or weathering, particularly where conditions prohibit the establishment of re-vegetation or where flow velocities exceed 5 feet per second. Riprap can be used in:

- Cut and fill slopes;
- Channel side slopes and/or bottoms;
- Inlets and outlets to culverts, slope drains, and sediment traps; and
- Roadside ditches.

Limitations

Riprap is limited by steepness of slope, because slopes that are greater than 1.5:1 have potential riprap loss due to erosion and sliding. When working within flowing streams, measures should be taken to prevent excessive turbidity and erosion during construction. Bypassing base flows or temporary blocking base flows are two possible methods.

Design Criteria

Gradation

A well-graded mixture of rock sizes should be used instead of one uniform size (with the exception of dry stacking boulders). Fifty percent by weight should be larger than the specified design size. The diameter of the largest stone size in such a mixture should be 1.5 times the D50 size with smaller sizes graded down to one inch. When dry stacking up a slope, boulders may be uniform in size or may get gradually smaller as the boulders are placed up the slope.

Quality

Riprap must be durable so freeze/thaw cycles do not decompose it in a short time. They should be angular and not subject to breaking down when exposed to water or weathering.

Size

The sizes of stones used for riprap protection are determined by the purpose and specific site conditions:

- **Slope Stabilization.** Riprap stone for slope stabilization not subject to flowing water should be sized for the proposed grade. The gradient of the slope to be stabilized should be less than the natural angle of the repose of the stone selected. Angles of the repose of riprap stones may be estimated using Figure R-1. Riprap used for surface stabilization of slopes does not add significant resistance to sliding or slope failure and should not be considered a retaining wall. Slopes approaching 1.5:1 may require special stability analysis. The inherent stability of the soil must be satisfactory before riprap is used for surface stabilization.
- **Stream bank Protection.** If the shear stress is estimated, riprap stone for stream bank protection can be selected from the gradations in Table R-1, below. The shear stress can be estimated from the depth of flow and the channel slope (see note for Table R-1). The riprap should extend 2 feet below the channel bottom and be keyed into the bank both at the upstream end and downstream end of the proposed work or reach.

Filter material

Filter material is sometimes used between riprap and the underlying soil surface to prevent soil from moving through the riprap. Filter cloth material or a layer of sand and/or gravel is usually used for the filter.

The design of a sand/gravel filter blanket is based on the ratio of particle size in the overlying filter material to that of the base material in accordance with the criteria below. Multiple layers (each a minimum of 6-inches thick) may be designed to affect a proper filter if necessary. A sand/gravel filter blanket should have the following relationship for a stable design.

The design of a synthetic filter fabric, which may be used with or in place of gravel filters, is:

- Filter fabric covering a base containing 50 percent or less by weight of fine particles (#200 sieve size);
- Total open area of filter fabric should not exceed 36%;
- Filter fabric covering other soils;
- Equivalent opening size (EOS) is no larger than 0.21 mm (#70 sieve size);
- Total open area of filter fabric should not exceed 10%; and
- *EOS- Equivalent opening size compared to a U.S. standard sieve size.

No filter fabric should have less than 4% open area or an EOS less than U.S. Standard Sieve #100 (0.15 mm). The permeability of the fabric must be greater than that of the soil. The fabric may be made of woven or non-woven monofilament yarns and should meet the following minimum requirements.

- Thickness 20-60 mils
- Grab strength 90-120 lbs
- Conform to ASTM D-1682 or ASTM D=177

Construction Specifications

See Figure R-2 for riprap slope stabilization and stream bank protection. See Figure R-3 for dry stacking boulders. See SEDIMENT TRAP (ST) for a detail of a riprap lined channel leading into a sediment trap.

Sub-grade Preparation

Prepare the sub-grade for riprap to the required lines and grades. Compact any fill required in the sub-grade to a density approximating that of the undisturbed material or overfill depressions with riprap. Remove brush, trees, stumps, and other objectionable material. Cut the sub-grade sufficiently deep so the finished grade of the riprap will be at the elevation of the surrounding area. Channels should be excavated sufficiently to allow placement of the riprap in a manner such that the finished inside dimensions and grade of the riprap meet design specifications.

Sand/Gravel filter basket

If using a granular filter, spread filter stone in a uniform layer to the specified depth. Where more than one layer of filter material is used, spread the layers with minimal mixing.

Synthetic filter fabric

If using a filter fabric, place the cloth directly on the prepared foundation. Where large stones are to be placed, a 4-inch layer of fine sand or gravel is recommended to protect the filter cloth. Filter fabric is not recommended as a filter on slopes steeper than 2:1.

Stone placement

Place riprap so it forms a dense, well-graded mass of stone with a minimum of voids. The desired distribution of stones throughout the mass may be obtained by selective loading at the quarry and controlled dumping during the final placement. Place riprap through chutes or other methods that cause segregation of stone sizes. If a filter is used, be careful not to lodge the underlying base filter or damage the filter cloth when placing the stones. If damage occurs, remove the riprap and repair the filter.

The toe of the riprap should be keyed into a stable foundation at its base as shown in Figure R-2 if required for slope stabilization and stream bank protection. The finished slope should be free of pockets of small stones or clusters of large stones. Hand placing may be necessary to achieve proper distribution of stone sizes to produce a relatively smooth, uniform surface. The finished grade of the riprap should blend with the surrounding area.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). If riprap has been damaged or dislodged, repairs should be made to prevent a progressive failure. If repairs are needed repeatedly at one location, the site should be evaluated to determine if the original design conditions have changed. Channel obstructions such as trees and sediment bars can change flow patterns and cause erosive forces that may damage riprap. Control of weed and brush growth may be needed in some locations.

Removal

Riprap is generally not removed.

References

United States Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Stormwater Runoff Control*. Washington, D.C., February 2003. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

New York State Department of Environmental Conservation, *New York Guidelines for Erosion and Sediment Control*. New York. August 2005. <http://www.dec.ny.gov/chemical/29066.html>

TABLE R-1
Riprap Gradations

| Unit shear stress (lb/ft ²) | D ₅₀ | d _{max} | Minimum blanket thickness (inches) |
|--|-----------------|------------------|---------------------------------------|
| 0.67 | 2 | 4 | 6 |
| 2 | 8 | 9 | 14 |
| 3 | 9 | 14 | 20 |
| 4 | 12 | 18 | 27 |
| 5 | 15 | 22 | 32 |
| 8 | 18 | 27 | 32 |
| 7.8 | 21 | 32 | 38 |
| 8 | 24 | 36 | 43 |

Unit shear stress calculated as $T = \gamma d s$ where:

T = shear stress in lb/ft²

γ = unit weight of water, 62.4 lb/ft³

d = flow depth in ft

s = channel gradient in ft/ft

FIGURE R-1
Angle of Repose of Riprap Stones

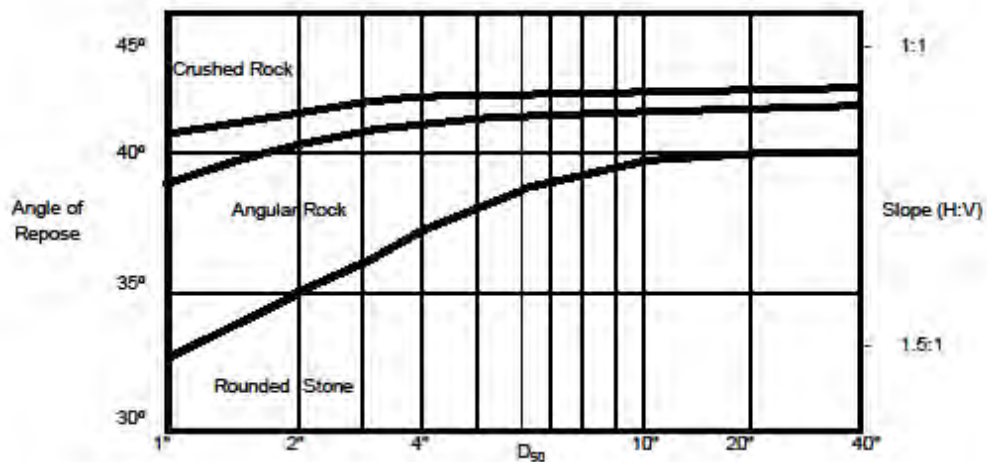
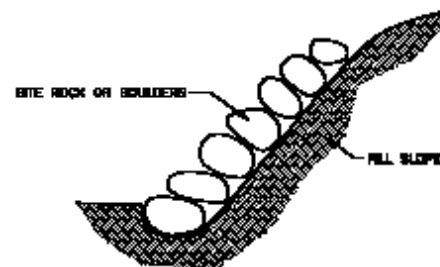


FIGURE R-2
Typical Riprap Slope Protection Detail



FIGURE R-3
Typical Boulder Drystack Detail



SCALED NOT TO SCALE

Roadside Ditches (RSD) and Turnouts (TO)



Description

Roadside ditches are channels constructed parallel to roads. The ditches convey concentrated runoff of surface water from roads and surrounding areas to a stabilized outlet. Turnouts (also called wing ditches) are extensions of roadside ditches. Turnouts effectively remove run-off water from the roadside ditch into well-stabilized areas before it reaches a waterway.

Applicability

- Roadside ditches should be used for all roads built on sloping topography and with either an in-slope or a crowned design.
- Ditch turnouts should be used as much as possible but their best use may be on slopes longer than 150 feet or greater than 5%, as conditions allow.
- Turnouts are applicable where fairly flat naturally vegetative areas exist at intervals by the roadside.

Limitations

- If these structures are not installed correctly, they may become a source of erosion.
- Roadside ditches do not necessarily filter sediment from runoff.
- Turnouts should be on gradual slopes only.
- Turnouts require vegetative cover or other filter at the discharge point.
- Turnouts only work well if small volumes of runoff drain into the turnout.
- Turnouts should only receive runoff from the road and ditch surface, not from large, uphill watersheds.

Design Criteria

No formal design required.

Construction Specifications

Roadside ditches

- Roadside ditches should be constructed with no projections of roots, stumps, rocks, or similar debris.
- Excavate ditches along roadside to a width and depth that can handle expected flow according to Figure RSD-1.
- All ditches shall have uninterrupted positive grade to an outlet. Slope ditch so water velocities do not cause excessive erosion, but no less than 0.5%. If steep slopes and high velocities exist, use a CHECK DAM (CD) to slow runoff and catch sediment.
- To control erosion and collect sediment, construct aggregate check dams according to Figure CD-1 of CHECK DAM (CD).
- All ditches shall convey runoff to a sediment trapping device such as a SEDIMENT TRAP (ST) or an undisturbed, well-vegetated, and stabilized area at non-erosive velocity.
- If necessary, stabilize ditches with RIPRAP (R) or EROSION CONTROL BLANKET (ECB).

Turnouts

- Use turnouts wherever possible and on undisturbed soil.
- Turnouts should be on gradual slopes only and should slope gradually down from the bottom of the roadside ditch.
- Angle turnouts at approximately 30 degrees to the roadside ditch
- Discharge the turnout into a well-vegetated area or install a secondary control such as a wattle, sediment trap, or silt fence. As a good rule of thumb, the vegetated outlet area should be a minimum of one-half the size of the total drainage area draining into it. If well-vegetated outlets areas are not available, use culverts or other controls to direct runoff to a stabilized area.
- Space turnouts according to the slope as indicated on Figure TO-1.
- Turnouts only work well if small volumes of runoff drain into the turnouts. Turnouts should only receive runoff from the road and ditch surface, not from large, uphill watersheds.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Road ditches and turnouts should be inspected for any signs of channelization and repaired as necessary. Structures will fail if water exists in channelized flow. Also inspect for sediment buildup at the outlet and at aggregate check dams and remove if necessary.

References

Horizon Environmental Services, Inc, *Guidance Document Reasonable and Prudent Practices for Stabilization (RAPPS) of Oil and Gas Construction Sites*. April 2004.

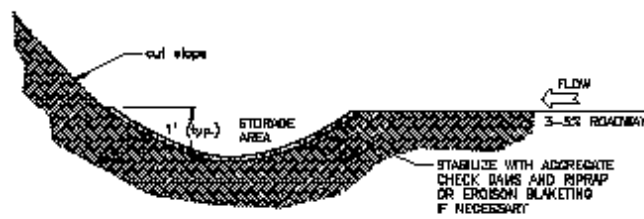
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United States Department of the Interior, Bureau of Land Management (BLM), *Surface Operating Standards for Oil and Gas Exploration and Development "Gold Book"*. Fourth Edition, 2007.

http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/gold_book.html

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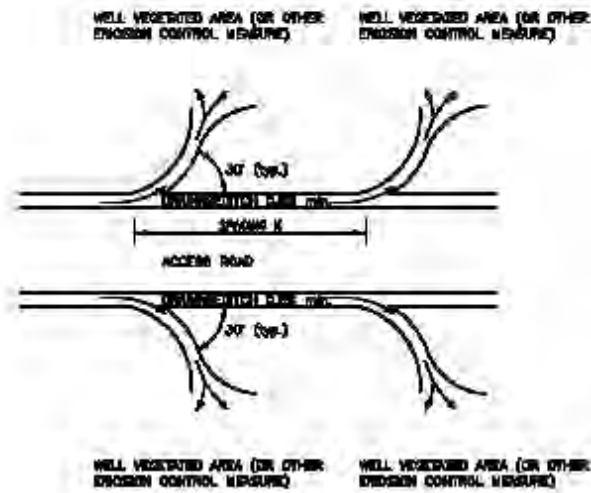
FIGURE RSD-1
Roadside Ditch Installation



NOTE:
SLOPE DITCH 0.5% TO 20% TO STABILIZED OUTLET

SCALE: NOT TO SCALE

**FIGURE TO-1
Turnout Layout**



| Road Slopes | Turnout Spacing X |
|-------------|-------------------|
| <2% | <5000 ft |
| 2-5% | 200ft |
| 6-10% | 100ft |
| >10% | 75ft |

SCALE: NOT TO SCALE

Sediment Trap (ST)



Description

Sediment traps are small collection areas that allow sediment to settle out of stormwater runoff. They are usually installed in a drainage way or other point of discharge from a disturbed area. Sediment traps are formed by excavating below grade and/or by constructing an earthen embankment.

Applicability

Sediment traps are generally temporary control measures used at the outlets of stormwater diversion structures, channels, slope drains, construction site entrance wash racks, or any other runoff conveyance that discharges waters containing erosion sediment and debris. Sediment traps should be used for drainage areas less than five acres. The effective life span of these temporary structures is usually limited to 24 months. Traps may be located in a series to allow for backup control in case one trap fails.

Limitations

- Regular maintenance is needed to remove sediment. Traps should be located near roads or where accessible to remove sediment.
- Although sediment traps allow eroded soils to settle, due to the short detention periods for stormwater, traps typically do not remove fine particles such as silts and clays.
- Water may remain in sediment traps for extended periods causing mosquitoes and other insects to gather. Locate the trap in a sunny spot if possible.
- Never construct a sediment trap on a live flow stream or in wetlands.

Design Criteria

Location

Traps should be located at points of discharge from disturbed areas. The location will be determined by the natural terrain, drainage pattern of the runoff, and the accessibility for maintenance. Sediment traps should not be located in areas where their failure due to stormwater runoff excess can lead to further erosive damage of the landscape. Alternative diversion pathways should be designed to accommodate these potential overflows. Sediment trap locations should also allow for easy maintenance access for the periodic removal of accumulated sediment.

Storage capacity

A sediment trap should be designed to maximize surface area for infiltration and sediment settling. This will increase the effectiveness of the trap and decrease the likelihood of backup during and after periods of high runoff intensity. The approximate storage capacity of each trap should be 3,600 ft³ per acre of contributing drainage area. Half of this volume may be in the form of wet storage (a permanent pool) and the other half may be in the form of dry storage. When possible, the wet storage volume should be contained within the excavated portion of the trap. The following formula may be used, as a reference, to estimate the volume of a sedimentation trap.

$$\text{Volume (ft}^3\text{)} = 0.4 \times \text{surface area (ft}^2\text{)} \times \text{maximum pool depth (ft)}$$

Construction Specifications

See Figure ST-1 for installation details.

- If possible, sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.
- Traps should be located above the floodplain, where possible. If there are space constraints, several small sediment traps may be constructed in series.
- Area under embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. The pool area shall be cleared.
- The fill material for the embankment shall be free of roots and other woody vegetation as well as over-sized stones, rocks, organic material, or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed. Seeding of the embankment should be performed as soon as possible after construction of the sediment trap. Erosion control blanketing may also be used to cover the embankment in combination with seeding or during time periods when seeding is ineffective.
- The spillway may consist of a stone section in the embankment formed by a combination coarse aggregate/riprap to provide for filtering/detention capability. Riprap shall be 4-inch to 8-inch rock, while the coarse aggregate shall be ½ to ¾ inches. A Geotextile may be placed at the stone-soil interface to act as a separator.
- Another option for the spillway is to use straw bales or wattles at the overflow point in the trap and line the rest of the spillway with an erosion control blanket (see EROSION CONTROL BLANKET [ECB]).

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). The primary maintenance consideration for temporary sediment traps is the removal of accumulated sediment from the basin to ensure the continued effectiveness of the sediment trap. Sediments should be removed when the basin reaches approximately 50% sediment capacity. Inspectors should also ensure that the trap is draining properly and check the structure for damage from erosion. The depth of the spillway should be checked and maintained at a minimum of 1.5 feet below the low point of the trap embankment.

Removal

The structure shall be removed and the area stabilized when the drainage area has been properly stabilized.

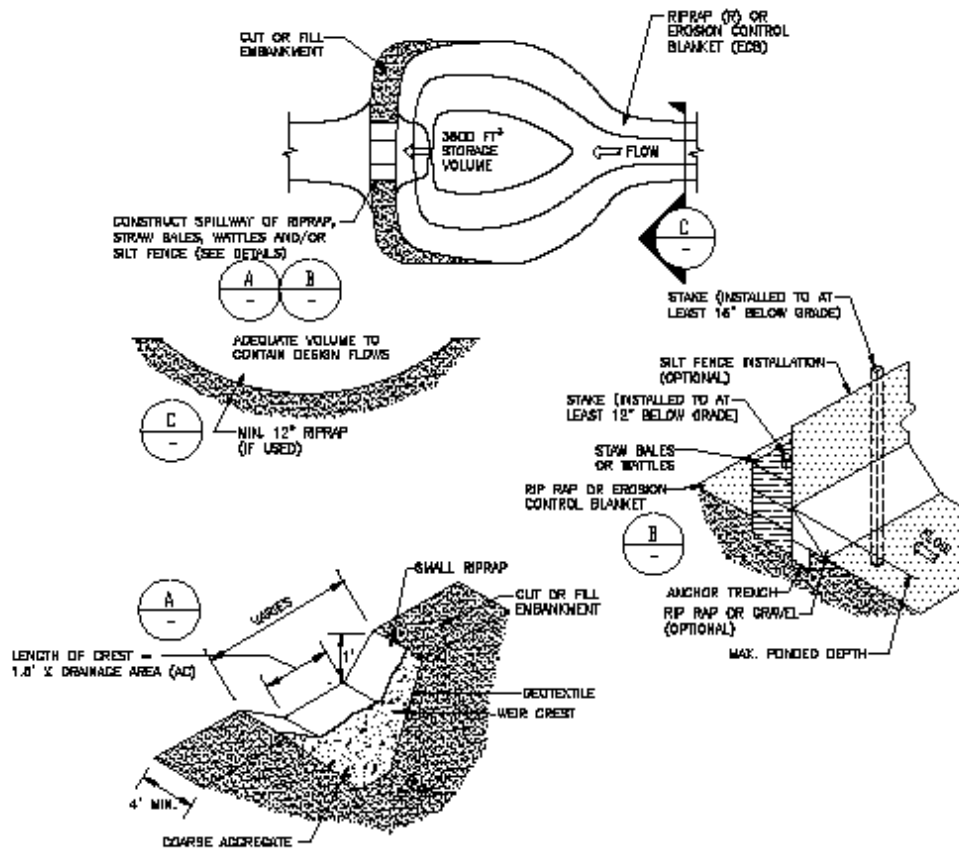
References

Colorado Department of Transportation (CDOT), *Erosion Control and Stormwater Quality Guide*. 2002. <http://www.coloradodot.info/programs/environmental/water-quality/documents/erosion-storm-quality>

United States Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Stormwater Runoff Control*. Washington, D.C., February 2003. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

Horizon Environmental Services, Inc, *Guidance Document Reasonable and Prudent Practices for Stabilization (RAPPS) of Oil and Gas Construction Sites*. April 2004

FIGURE ST-1
Sediment Trap Installation



SCALE: NOT TO SCALE

Seeding (S)



Description

Temporary seeding can be used to stabilize disturbed areas that will be inactive for an extended period. Permanent seeding should be used to stabilize areas at final grade that will not be otherwise stabilized. Effective seeding includes preparation of a seedbed, selection of an appropriate seed mixture, proper planting techniques, and protection of the seeded area with mulch, geotextiles, or other appropriate measures.

Seeding establishes vegetation that reduces erosion and sediment displacement by stabilizing disturbed areas in a manner that is economical, adaptable to site conditions, and allows selection of the most appropriate plant material. Seeding also:

- Absorbs the impact of raindrops;
- Reduces the velocity of runoff;
- Reduces runoff volumes by increasing water percolation into the soil;
- Binds soil with roots;
- Protects soil from wind;
- Improves wildlife habitat; and
- Enhances natural beauty.

Applicability

Seeding is most effective on slopes no steeper than 2:1. Seeding may be used as a permanent control or a temporary control in areas where exposed soil surfaces are not to be re-graded for periods longer than 30 days. Such areas include denuded areas, soil stockpiles, berms, temporary road banks, etc.

Prior to seeding, ensure that areas to be revegetated have soil conditions capable of supporting vegetation. Overlot grading can result in loss of topsoil, resulting in poor quality sub-soils at the ground surface that have low nutrient value, little organic matter content, few soil microorganisms, rooting restrictions, and conditions less conducive to infiltration of precipitation. As a result, it is typically necessary to provide stockpiled topsoil, compost, or other soil amendments and rototill them into the soil to a depth of 6 inches or more.

Topsoil should be salvaged during grading operations for use and spread on areas to be revegetated later. Topsoil should be viewed as an important resource to be utilized for vegetation establishment, due to its water-holding capacity, structure, texture, organic matter content, biological activity, and nutrient content. The rooting depth of most native grasses in the semi-arid Denver metropolitan area is 6 to 18 inches. At a minimum, the upper 6 inches of topsoil should be stripped, stockpiled, and ultimately reapplied across areas that will be revegetated.

Where topsoil is not available, sub-soils should be amended to provide an appropriate plant-growth medium. Organic matter, such as well digested compost, can be added to improve soil characteristics conducive to plant growth. Other treatments can be used to adjust soil pH conditions when needed. Soil testing, which is typically inexpensive, should be completed to determine and optimize the types and amounts of amendments that are required.

If the disturbed ground surface is compacted, ripped, or rototilled, the surface prior to placing topsoil. If adding compost to the existing soil surface, rototilling is necessary. Surface roughening will assist in placement of a stable topsoil layer on steeper slopes, and allow infiltration and root penetration to greater depth.

Prior to seeding, the soil surface should be rough and the seedbed should be firm, but neither too loose nor compacted. The upper layer of soil should be in a condition suitable for seeding at the proper depth and conducive to plant growth. Seed-to-soil contact is the key to good germination.

Limitations

The effectiveness of seeding can be limited by:

- High erosion potential during establishment;
- The need for stable soil temperature and soil moisture content during germination and early growth;
- The need to re-seed areas that fail to establish; and
- Limited seeding times depending on the season.

Proper seedbed preparation and the use of quality seed are important in this practice. Failure to carefully follow sound agronomic recommendations will often result in an inadequate stand of vegetation that provides little or no erosion control.

Seeding does not immediately stabilize soils. Prior to seeding, install necessary erosion and sediment control practices such as diversions, straw bales, and basins until vegetation is established.

Design Criteria

Successful plant establishment can be maximized with proper planning; consideration of soil characteristics; selection of plant materials that are suitable for the site; adequate seedbed preparation, liming, and fertilization; timely planting; and regular maintenance.

When to seed

Areas to be stabilized with vegetation must be seeded or planted one to four months after grading is completed unless temporary stabilization measures are in place. Temporary stabilization measures should be installed through “no growth” periods during winter months until the weather can support seed growth.

Seed mix

Climate, soils, and topography are major factors that dictate the suitability of plants for a particular site. Vegetation that has adapted to the site, has strong roots, and provides good ground cover should be used. Although a native seed mix is best, some grasses such as Vetiver have been used extensively worldwide because of their strong deep roots, adaptability, and non-invasive properties.

Construction Specifications

- Seeding does not immediately stabilize soils. Temporary erosion and sediment control measures should be in place to prevent off-site transport of sediments from disturbed areas until vegetation is established.
- Vegetation should not be established on slopes that are unsuitable due to inappropriate soil texture, poor internal structure or internal drainage, volume of overland flow, or excessive steepness, until measures have been taken to correct these problems.
- If the area has been recently loosened or disturbed, no further roughening is required. When the area is compacted, crusted, or hardened, the soil surface shall be loosened by disking, raking, harrowing, or other acceptable means to ensure good water infiltration and root penetration (see SOIL ROUGHENING [SR]).
- The soil on a disturbed site may need to be modified to provide an optimum environment for seed germination and seedling growth. To maintain a good stand of vegetation, the soil must meet certain minimum requirements as a growth medium. If any of the below criteria cannot be met then topsoil shall be applied. The existing soil must have these characteristics:
 1. Enough fine-grained material to maintain adequate moisture and nutrient supply.
 2. Sufficient depth of soil to provide an adequate root zone. The depth to rock or impermeable layers such as hardpans shall be 12 inches or more, except on slopes steeper than 2:1 where the addition of soil is not feasible.
 3. A favorable pH range for plant growth. If the soil is so acidic that a pH range of 6.0 to 7.0 cannot be attained by addition of pH-modifying materials, then the soil is considered an unsuitable environment for plant roots and further soil modification would be required.
 4. Freedom from toxic amounts of materials harmful to plant growth.
 5. Freedom from excessive quantities of roots, branches, large stones and clods of earth, or trash of any kind. Clods and stones may be left on slopes steeper than 3:1 if they do not significantly impede good seed soil contact.
- Add fertilizer and/or lime, if necessary. Lime and fertilizer may be incorporated into the top 2 to 4 inches of the soil if possible. The addition of lime is equally as important as applying fertilizer. Lime will modify the pH and supply calcium and magnesium. Its effect on pH makes other nutrients more available to the plant.
- The appropriate seed shall be evenly applied with a broadcast seeder, drill, cultipacker or hydro-seeder. Seeding depth should be ¼ to ½ inch.
- If necessary, apply mulch. The mulch will hold moisture and modify temperature extremes and prevent erosion while seedlings are growing.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Vegetation is considered established when a density of at least 70% of pre-disturbance

levels has been reached. Seeded areas should be inspected for failure and any necessary repairs and re-seeding should be made within the same season if possible.

References

United States Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Stormwater Runoff Control*. Washington, D.C., February 2003. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

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Keller, Gordon and James Sherar, *Low-Volume Roads Engineering, Best Management Practices Field Guide*. United States Department of Agriculture (USDA), Forest Service, US Agency of International Development (USAID), 2003. <http://www.blm.gov/bmp/field%20guide.htm>

Table S-1.

Minimum Drill Seeding Rates for Various Temporary Annual Grasses

| Species^a (Common name) | Growth Season^b | Pounds of Pure Live Seed (PLS)/acre^c | Planting Depth (inches) |
|--|----------------------------------|--|------------------------------------|
| Oats | Cool | 35 - 50 | 1 - 2 |
| Spring Wheat | Cool | 25 - 35 | 1 - 2 |
| Spring Barley | Cool | 25 - 35 | 1 - 2 |
| Annual Ryegrass | Cool | 10 - 15 | ½ |
| Millet | Warm | 3 - 15 | ½ - ¾ |
| Sudangrass | Warm | 5-10 | ½ - ¾ |
| Sorghum | Warm | 5-10 | ½ - ¾ |
| Winter Wheat | Cool | 20-35 | 1 - 2 |
| Winter Barley | Cool | 20-35 | 1 - 2 |
| Winter Rye | Cool | 20-35 | 1 - 2 |
| Triticale | Cool | 25-40 | 1 - 2 |

a. Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

b. See Table TS/PS-3 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

c. Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

Description

A silt fence is a woven geotextile fabric attached to wooden posts and trenched into the ground. It is designed as a sediment barrier to intercept sheet flow runoff from disturbed areas.

Appropriate Uses

A silt fence can be used where runoff is conveyed from a disturbed area as sheet flow. Silt fence is not designed to receive concentrated flow or to be used as a filter fabric. Typical uses include:

- Down slope of a disturbed area to accept sheet flow.
- Along the perimeter of a receiving water such as a stream, pond or wetland.
- At the perimeter of a construction site.



Photograph SF-1. Silt fence creates a sediment barrier, forcing sheet flow runoff to evaporate or infiltrate.

Design and Installation

Silt fence should be installed along the contour of slopes so that it intercepts sheet flow. The maximum recommended tributary drainage area per 100 lineal feet of silt fence, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to silt fence installed along the contour. Silt fence installed for other uses, such as perimeter control, should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the silt fence.

See Detail SF-1 for proper silt fence installation, which involves proper trenching, staking, securing the fabric to the stakes, and backfilling the silt fence. Properly installed silt fence should not be easily pulled out by hand and there should be no gaps between the ground and the fabric.

Silt fence must meet the minimum allowable strength requirements, depth of installation requirement, and other specifications in the design details. Improper installation of silt fence is a common reason for silt fence failure; however, when properly installed and used for the appropriate purposes, it can be highly effective.

| Silt Fence | |
|--------------------------|-----|
| Functions | |
| Erosion Control | No |
| Sediment Control | Yes |
| Site/Material Management | No |

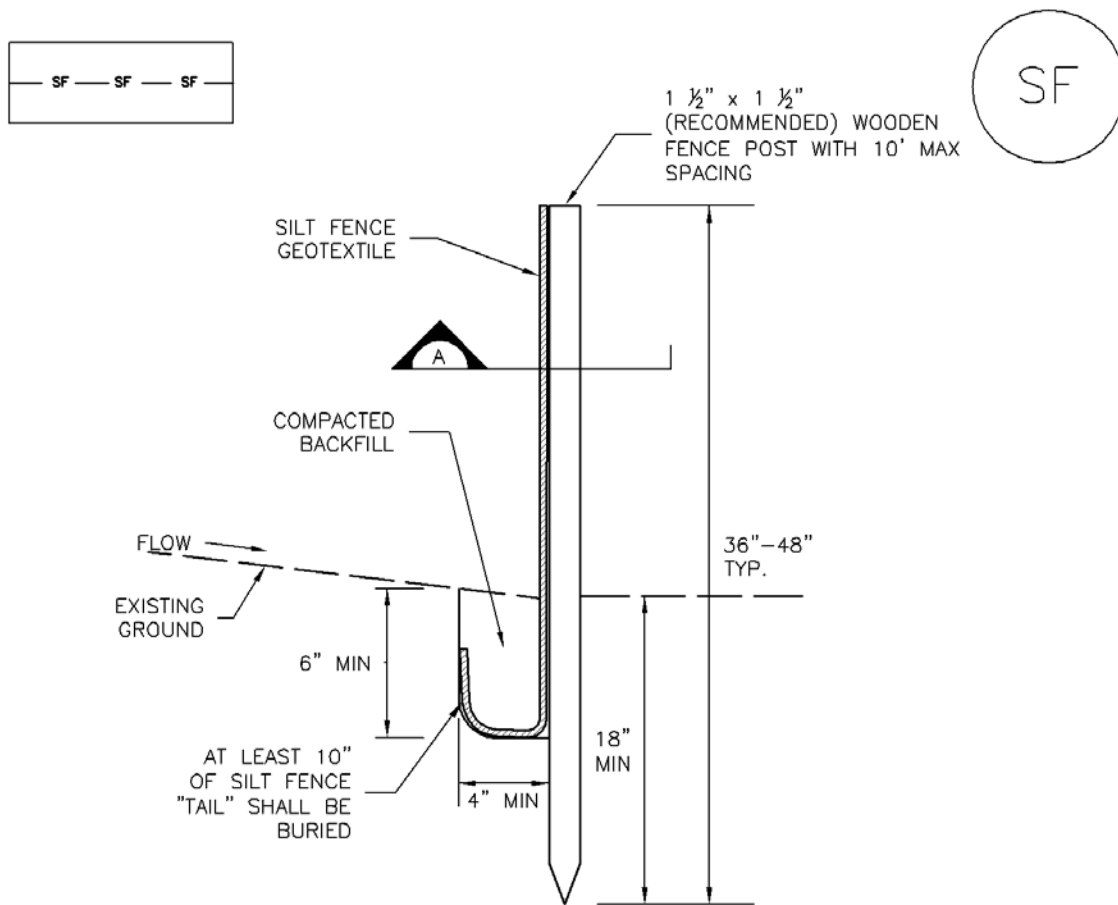
Maintenance and Removal

Inspection of silt fence includes observing the material for tears or holes and checking for slumping fence and undercut areas bypassing flows. Repair of silt fence typically involves replacing the damaged section with a new section. Sediment accumulated behind silt fence should be removed, as needed to maintain BMP effectiveness, typically before it reaches a depth of 6 inches.

Silt fence may be removed when the upstream area has reached final stabilization.



Photograph SF-2. When silt fence is not installed along the contour, a "J-hook" installation may be appropriate to ensure that the BMP does not create concentrated flow parallel to the silt fence. Photo courtesy of Tom Gore.



SILT FENCE



POSTS SHALL OVERLAP AT JOINTS SO THAT NO GAPS EXIST IN SILT FENCE



SECTION A

SF-1. SILT FENCE

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2–5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.
2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.
3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.
5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.
6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' – 20').
7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".
5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.
6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.
7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Straw Bale Barrier (SBB)



Description

A straw bale barrier is a series of entrenched and staked straw bales placed on a level contour to intercept sheet flows. The barrier reduces runoff velocity and filters sediment laden runoff from small drainage areas of disturbed soil. The barrier may also be used to protect against erosion. Straw bale barriers have an estimated design life of three months.

Applicability

Straw bale barriers may be used below disturbed areas subject to sheet and rill erosion where the length of slope above the straw bale barrier does not exceed the following limits.

| Constructed Slope | Percent Slope | Slope Length (ft) |
|-------------------|---------------|-------------------|
| 2:1 | 50% | 25' |
| 3:1 | 33% | 50' |
| 4:1 | 25% | 75' |

Straw bales may be used in the following applications.

- Below the toe of erodible slopes or other small cleared areas.
- At the top of slopes to divert runoff away from disturbed slopes.
- As sediment traps at outlets to culverts, ditches, turnouts, etc.
- Along the perimeter of a site.
- Around temporary stockpiles and soil areas.
- Along streams and channels for both erosion and sediment control.
- As check dams across mildly sloped swales or construction roads (See CHECK DAM [CD]).

Limitations

- For short-term use only.
- For use below small drainage areas less than 2 acres.
- Decomposes over time.
- May be consumed by livestock.
- Straw bales must be certified weed free to avoid invasive weeds that may develop and should not be used in areas where weeds are a concern.
- Removal of anchor stakes will be necessary after stabilization is complete.
- Not recommended for concentrated flow, live streams, or swales where there is the possibility of a washout.

Design Criteria

No formal design is required.

Construction Specifications

See Figure SBB-1 for installation details.

- Bales shall be placed in a single row on a level contour with ends of adjacent bales tightly abutting one another.
- Bales shall be certified weed free.
- Allow sufficient space up slope from the barrier to allow ponding and to provide room for sediment storage.
- All bales shall be either wire bound or string tied. Straw bales shall be installed so bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings.
- A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. Stake the bales with minimum 2 inch x 2 inch x 36 inch wood stakes or standard “T” or “U” steel posts (minimum weight of 1.33 pounds per linear foot).
- After the bales are staked and chinked (gaps filled by wedging), the excavated soil shall be back filled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the barrier.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Close attention should be paid to the repair of damaged or rotting bales, end runs, and undercutting beneath bales. Necessary repairs to barriers or replacement of bales should be accomplished promptly. Sediment deposits should be removed when the level of deposition reaches approximately one-half the height of the barrier.

Removal

Straw bale barriers may be removed when they have served their usefulness or may remain in place to decompose over time. Straw bales should not be removed, however, until the up-slope areas have been permanently stabilized. Any sediment deposits remaining in place after the straw bale barrier is no longer required, should be dressed to conform to the existing grade, prepared, and seeded.

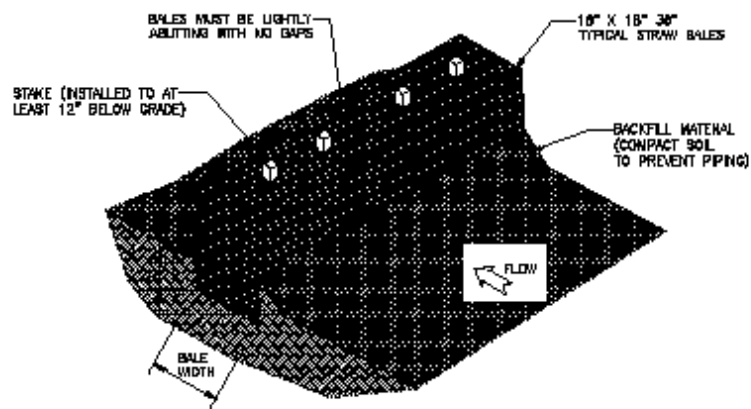
References

Colorado Department of Transportation (CDOT), *Erosion Control and Stormwater Quality Guide*. 2002. <http://www.coloradodot.info/programs/environmental/water-quality/documents/erosion-storm-quality>

Horizon Environmental Services, Inc, *Guidance Document Reasonable and Prudent Practices for Stabilization (RAPPS) of Oil and Gas Construction Sites*. April 2004.

New York State Department of Environmental Conservation, *New York Guidelines for Erosion and Sediment Control*. New York. August 2005. <http://www.dec.ny.gov/chemical/29066.html>

FIGURE SBB-1
Straw Bale Installation



SCALE: NOT TO SCALE

Soil Roughening (SR)



Description

Soil (surface) roughening is an erosion control practice that involves tracking, scarifying, imprinting, or tilling a disturbed area to provide temporary stabilization of disturbed areas. Surface roughening creates variations in the soil surface that help to minimize wind and water erosion. Depending on the technique used, surface roughening may also help establish conditions favorable to establishment of vegetation.

Applicability

Soil roughening is most effective for areas of one acre or less and works well for the following applications.

- Any slope, but particularly fill slopes greater than 3:1.
- Areas with highly erodible soils.
- Soils that are frequently disturbed.

Limitations

- Soil roughening is not appropriate for rocky slopes.
- Soil compaction might occur when roughening with tracked machinery.
- Soil roughening is of limited effectiveness in anything more than a gentle or shallow depth rain.
- If roughening is washed away in a heavy storm, the surface will have to be re-roughened.

Design Criteria

No formal design is required. However, the selection of the appropriate method depends on the type of slope. Steepness, mowing requirements, and/or a cut or fill slope operation are all factors considered in choosing a roughening method.

Construction Specifications

- To slow erosion, roughening should be done as soon as possible after grading activities have ceased (temporary or permanently) in an area.
- All cut and fill slopes should be roughened whenever possible.
- Do not blade or scrap the final fill slope face.
- Excessive compacting of the soil surface should be avoided during roughening, and areas should be seeded as soon as possible after roughening is completed.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Roughening might need to be repeated after storm events.

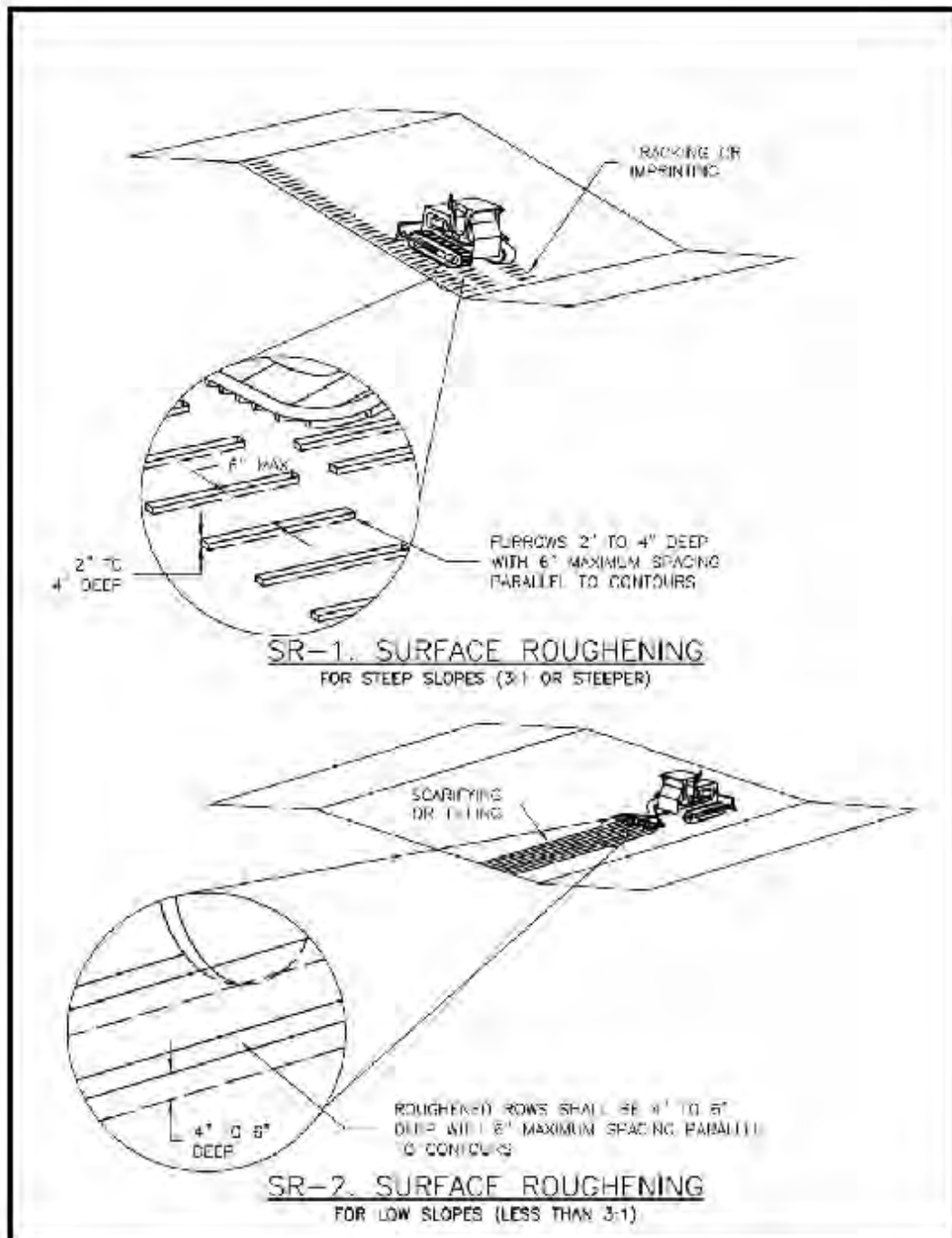
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New York State Department of Environmental Conservation, *New York Guidelines for Erosion and Sediment Control*. New York. August 2005. <http://www.dec.ny.gov/chemical/29066.html>

Figure SR-1



Tracking Pad (TP)



Description

A stabilized construction entrance (i.e., tracking pad) is a pad of gravel where construction traffic leaves a site. The purpose of a stabilized access to a site is to minimize the amount of tracked mud that leaves a site. As a vehicle drives over the gravel tracking pad, mud and sediment are removed from the vehicle's wheels and off-site transport of soil is reduced. The gravel tracking pad also reduces erosion and rutting in the soil beneath the stabilized structure. The filter fabric separates the gravel from the soil below, preventing the gravel from being ground into the soil. The fabric also reduces the amount of rutting caused by vehicle tires by spreading the vehicle's weight over a larger soil area than just the width of the tire.

Applicability

Typically, stabilized construction accesses are installed at locations where construction traffic leaves or enters an existing paved road. However, the applicability of the site access stabilization should be extended to any roadway or entrance where vehicles will enter or leave the site.

Limitations

- Although stabilizing construction access is a good way to help reduce the amount of sediment leaving a site, some soil may still be deposited from vehicle tires onto paved surfaces. To further reduce the chance of these sediments polluting stormwater runoff, sweeping of the paved area adjacent to the stabilized site access is recommended.
- Site traps or other secondary sediment controls are needed to capture that sediment that accumulates at the pad and may run off during storm events.

Design Criteria

No formal design is required.

Construction Specifications

See Figure TP-1 for installation details.

- If the pad is constructed on a crowned road, a roadside ditch with check dams or sediment traps may be located on both sides of the road to collect runoff from the pad. If the road slopes to only one side of the road then only one roadside ditch with sediment controls will be needed.
- Place a matrix of 2-inch to 4-inch washed stone, reclaimed or recycled concrete equivalent to a minimum of 12 feet wide and 20 feet in length.
- All surface water flowing or diverted toward the construction access shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slope will be permitted.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Stabilization of site accesses should be maintained until the remainder of the construction site has been fully stabilized. Stone and gravel might need to be periodically added to each stabilized construction site access to keep the access effective. Soil that is tracked off site should be swept up immediately for proper disposal.

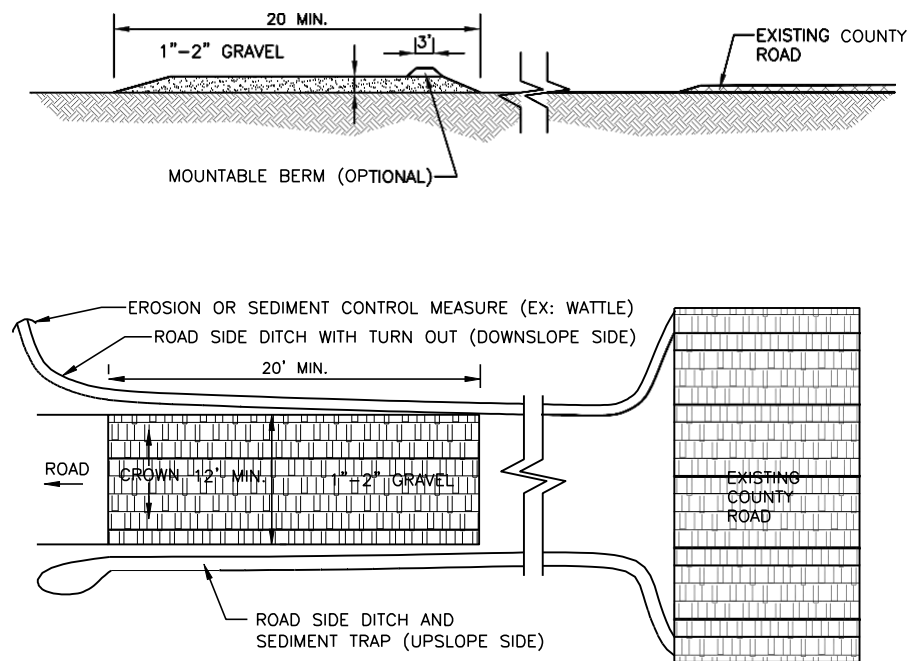
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Horizon Environmental Services, Inc, *Guidance Document Reasonable and Prudent Practices for Stabilization (RAPPS) of Oil and Gas Construction Sites*. April 2004.

FIGURETP-1
TrackingPad



Wattles (W)



Description

A wattle consists of straw, flax, or other similar synthetic materials bound into a tight tubular roll. When wattles are placed at the toe and on the face of slopes, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff. By interrupting the length of a slope, wattles can also reduce erosion.

Applicability

Wattles may be suitable:

- Along the top, face, and at the grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow;
- At the end of a downward slope where it transitions to a steeper slope;
- Along the perimeter of a project;
- At the overflow location of sediment traps;
- As check dams in unlined ditches; and
- Around temporary stockpiles.

Limitations

- Wattles on a slope of 5% or greater are not effective unless trenched.
- Wattles at the toe of the slope greater than 5:1 should be a minimum of 20-inch diameter or installations achieving the same protection (i.e., stacked smaller diameter wattles, etc.).
- Difficult to move once saturated.
- If not properly staked, wattles could be transported in high flows.
- Wattles have a very limited sediment capture zone.
- Wattles should not be used on slopes subject to creep, slumping, or landslide.
- Wattles should not be used where periodic road or surface maintenance activities are expected.

Design Criteria

No formal design is required.

Construction Specifications

Wattles should be either prefabricated rolls or rolled tubes of erosion control blankets. If using erosion control blankets, roll the length of erosion control blanket into a tube with a minimum of 8 inches in diameter and bind the roll at each end and every 4 feet along the length of the roll with jute-type twine.

See Figure W-1 for wattles used to control erosion along slopes.

Locate wattles on level contours spaced as follows.

- Slope inclination of 4:1 or flatter: Fiber rolls should be placed at a maximum interval of 20 feet.
- Slope inclination between 4:1 and 2:1: Fiber rolls should be placed at a maximum of 15 feet.
- Slope inclination 2:1 or greater: Fiber rolls should be placed at a maximum interval of 10 feet.
- Turn the ends of the wattles upslope to prevent runoff from going around the roll.
- Stake wattles with a width equal to the diameter of the wattle. Drive stakes at the end of each wattle and space 4 feet maximum on center. 2"x2" wood stakes or 1/2" rebar are acceptable for securing the wattle in place.
- If wattle is placed on a slope 5% or greater, place wattle in a 2 inch – 4 inch trench and stake as described above.
- If more than one wattle is placed in a row, the rolls should be overlapped or tightly abutted.

Maintenance Considerations

The frequency of inspections should be in accordance with the Stormwater Management Plan (SWMP). Repair or replace split, torn, unraveling, or slumping rolls. If the wattle is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates must be periodically removed in order to maintain wattle effectiveness. Sediment should be removed when sediment accumulation reaches half the distance between the top of the wattle and the adjacent ground surface.

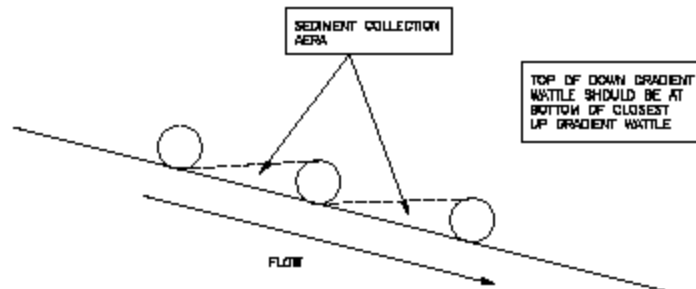
Removal

Wattles are typically left in place. If wattles are removed, collect and dispose of sediment accumulation, and fill and compact holes, trenches, depressions, or any other ground disturbance to blend with adjacent ground.

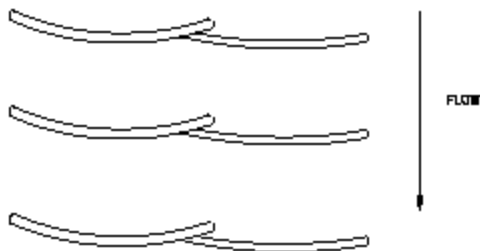
References

California Stormwater Quality Association (CASQA). 2003. Stormwater Best Management Practice Handbook: Construction. <https://www.casqa.org/store/products/tabid/154/p-167-construction-handbookportal-initial-subscription.aspx>

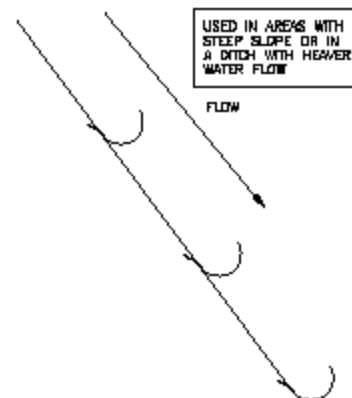
**FIGURE W-1
Wattles Ground Level**



**FIGURE W-2
Wattles (Tied In)**



**FIGURE W-3
Wattles With Check
Dam Application**



SCALE: NOT TO SCALE

APPENDIX D
TRAINING LOGS



**SANDRIDGE ENERGY, INC.
PERSONNEL TRAINING LOG
SIGN IN SHEET**

TOPICS DISCUSSED: SPILLWATER AWARENESS

(Note: Required topics must include the SWMP.)

| NAME (PLEASE PRINT) | COMPANY/POSITION | TELEPHONE / EXT. |
|-------------------------|------------------------------|------------------|
| 1. Dale Birdwell | SANDRIDGE | 405-203-6971 |
| 2. Michael James | Sandridge | 405-519-6634 |
| 3. Todd Martin | Sandridge/Logistics | 405-403-8778 |
| 4. Braylin Wertheberger | Select / Supervisor | 470-326-7281 |
| 5. Jason Niven | SANDRIDGE | 405-441-0155 |
| 6. Nathaniel Schomaker | BLACK DOG/SANDRIDGE | 970 219 3351 |
| 7. John Szymanski | TEMAHAWK/SANDRIDGE | 970 819 5218 |
| 8. Jeffrey Florman | Coudrey Autonomous/Sandridge | 307-761-0629 |
| 9. Clay Howell | SD | 405-550-7488 |
| 10. Brett Foxner | LTE / ENV. Consultant | 303-962-5538 |
| 11. | | |
| 12. | | |
| 13. | | |
| 14. | | |
| 15. | | |
| 16. | | |
| 17. | | |
| 18. | | |

Instructor: LEN RAYMOND Date: 2/2/16

| Subject/Issue Identified | Required Action |
|--------------------------|----------------------------|
| | |
| | |
| | |
| | Implementation Date: _____ |



APPENDIX E
SWMP MODIFICATIONS



**FIELD-WIDE STORMWATER MANAGEMENT PLAN FOR CONSTRUCTION ACTIVITIES
LOG OF PLAN REVIEW AND CHANGES**

**NORTH PARK BASIN PROJECT AREA
GRAND AND JACKSON COUNTIES, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION LLC**

| PREVIOUS PLAN DATE | SWMP REVISIONS | | REVISED PLAN DATE |
|-----------------------|----------------|---|----------------------|
| | SECTION NUMBER | DESCRIPTION | |
| December 2015 | title page | Update company name | February 2016 |
| | 4.1 | Update boundary | |
| | 4.8.9 | Clarify use of drill cuttings | |
| | 4.8.14 | Updated language | |
| | 5.0 | Map description | |
| | 6.1.1 | Included wattles to description of possible BMPs utilized | |
| | 6.5.1 | Updated language | |
| | 6.5.2 | Updated language | |
| | 6.5.3 | updated to include beneficial re-use of E&P waste | |
| | 8.3 | Updated language | |
| | Appendicies | Company Name | |
| | Tables | Company Name | |
| February 2016 | Table 2 | Completions Chemical list | March 2016 |
| | Appendix C | Updated Silt Fence and Wattle installation guidelines | |
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