



Kerr-McGee Oil & Gas Onshore LP

Stormwater Plan

**DB Farms 40-12HZ Well Pad and Facility
SE/4 NE/4 Section 12, 3N 67W**

Weld County, Colorado

August 2021

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1.0 INTRODUCTION

Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee) has prepared this site-specific Stormwater Management Plan (SWMP) for construction activities in Weld County, Colorado. The SWMP is intended to ensure construction activities adhere to good engineering, hydrologic, and pollution control practices, and to ensure erosion, sediment and stormwater control measures are selected, installed, implemented, and maintained to protect state waters, and minimize site erosion or degradation. This facility is a part of Kerr-McGee’s Area 1 operations and is covered under CDPS Permit COR402542.

2.0 SITE DESCRIPTION

Operator:	Kerr-McGee Oil & Gas Onshore LP
Project / Site Name:	DB Farms 40-12HZ
Location:	Sec 12, T3N, Range 67W, Weld County, Colorado
Total Area of Project:	14.04 acres
Description of Existing Vegetation:	Existing vegetation on the subject location is winter wheat, land use is agriculture
Soil Type(s):	1 - Altvan Loam 0-1% slopes 8 - Ascalon Loam 0-1% slopes
Primary Receiving Water:	Farmers Independent Ditch, approximately 0.06 miles south west of proposed pad
Operator ID:	47120
CDPS Permit:	COR402542
Stormwater Manager:	Lynna Scranton, HSE Manager Occidental Petroleum Corporation Office: 720-929-6317
SWMP Administrator & Inspector:	Lynna Scranton, HSE Manager Occidental Petroleum Corporation Office: 720-929-6317
Emergency Contact:	Name: Integrated Operation Center (IOC) Office: (970) 506-5980

3.0 PROPOSED SEQUENCE OF MAJOR ACTIVITIES

- | | | | | |
|---|--|--|---|---|
| <input checked="" type="checkbox"/> Delineation of Disturbance Limits | <input checked="" type="checkbox"/> Access Road Construction | <input checked="" type="checkbox"/> Perimeter /Control Measures Installation | <input checked="" type="checkbox"/> Grading, stripping, excavation, earthwork | <input checked="" type="checkbox"/> Well drilling & Completions |
| <input checked="" type="checkbox"/> Facility Construction | <input checked="" type="checkbox"/> Pipeline & Flowline Installation | <input checked="" type="checkbox"/> Disturbance Reduction | <input checked="" type="checkbox"/> Interim & Final Reclamation | <input checked="" type="checkbox"/> Return to Agriculture |

All construction and development shall be in accordance with the Colorado Department of Public Health and Environment’s CDPS General Permit for Stormwater Discharges Associated with Construction Activity, and the Colorado Oil and Gas Conservation Commission (COGCC) 304.c.15 and 1002.f rules and requirements.

4.0 POTENTIAL POLLUTANT SOURCES

Potential pollution sources shall be placed within the project construction boundary, designated staging area(s), working surface, contained by general or sized secondary containment, and stormwater perimeter controls. Anticipated pollution sources which will be managed by appropriate BMP fact sheets or operational best management standard operating procedures include, but are not limited to:

- | | | |
|---|---|--|
| <input checked="" type="checkbox"/> Disturbed and stored soils | <input checked="" type="checkbox"/> Vehicle/equipment maintenance and fueling | <input type="checkbox"/> Non-industrial waste |
| <input checked="" type="checkbox"/> Vehicle tracking of sediments | <input checked="" type="checkbox"/> Dust generating processes | <input checked="" type="checkbox"/> Potential Spills |
| <input type="checkbox"/> Management of contaminated soils | <input checked="" type="checkbox"/> Routine maintenance activities | <input type="checkbox"/> Spill prevention and response |
| <input checked="" type="checkbox"/> Loading/unloading ops | <input checked="" type="checkbox"/> On-site waste management | |
| <input checked="" type="checkbox"/> Outdoor storage activities | <input type="checkbox"/> Concrete truck washing | |

No dedicated concrete or asphalt batch plants will be at the project location. Safety Data Sheets (SDS) for materials to be used are maintained by Kerr-McGee. Pollutants shall be managed in accordance with waste regulations administered by COGCC 900 series rules.

5.0 STORMWATER CONTROL MEASURES

Measures for stormwater, erosion and sediment control will be accomplished through a combination of construction techniques, structural and non-structural controls, vegetation and re-vegetation, administrative controls, and good housekeeping practices. Control measures will be implemented and adjusted with changing site conditions, as well as phases of construction. All control measures deployed throughout construction, shall be identified on site specific stormwater management plan as-built maps. The following list of control measures will be implemented during all phases of construction on the Project:

BMP / Control Measure	Intended Use/Purpose	Installation Timing	Removal Timing
Limits of Construction (LOC)	<i>To establish a perimeter for which construction activities are managed within.</i>	Prior to construction	Interim / Final Reclamation
Vehicle Tracking Controls (VOC)	<i>Provide a stabilized construction site access to reduce off-site tracking.</i>	Prior to construction	Interim Reclamation
Diversion Ditch (DD)	<i>To divert and effectively manage run-on/run-off from the project.</i>	Prior to Construction	Interim Reclamation
Sediment Control Log (SCL)	<i>Provide a sediment barrier to intercept sheet flow run-off from disturbed areas, or as a perimeter control.</i>	During Construction	Interim Reclamation
Check Dams (CD)	<i>Slow the velocity of concentrated flow, thus reducing erosion.</i>	During Construction	Interim Reclamation
Sediment Basin (SB)	<i>Collect stormwater and provide detention and settling time of stormwater run-off.</i>	During Construction	Interim Reclamation or As Permitted
Culverts (C)	<i>Divert water under a crossing, or to direct flow to a designated point.</i>	During Construction	Interim Reclamation
Inlet Protection (IP)	<i>Reduce erosion and sediment loading into a designated culvert or inlet.</i>	During Construction	Interim Reclamation
Outlet Protection (OP)	<i>Reduce velocity and erosion from a designated culvert or outlet.</i>	During Construction	Interim Reclamation
Seed & Mulch (SM)	<i>Stabilize disturbed areas no longer in use or intended for construction and development (including stockpiles)</i>	Construction and Interim Reclamation	N/A

6.0 MATERIALS HANDLING AND SPILL PREVENTION

Discharges of hazardous substances or oil resulting from spills or construction operations are not authorized under the Construction General Permit or this plan. **In the event of a spill, notify the Stormwater Manager, after taking emergency and internal procedures for notification.** Depending on the nature of the spill and material involved, the Colorado Department of Public Health and Environment 24-hour spill reporting line (877-518-5608) will be contacted and/or downstream water users notified, as necessary.

7.0 NON-STORMWATER DISCHARGES

Sources of non-stormwater discharges include emergency fire-fighting activities or a fire hydrant, uncontaminated springs which do not originate from an area of land disturbance, and construction dewatering. In the event of construction dewatering, control measures shall be implemented and Low Risk Discharge Guidance for Uncontaminated Groundwater to Land (WQP27) shall be followed.:

8.0 FINAL STABILIZATION

The Colorado Department of Health and Environment (CDPHE) defines final stabilization as, “finally stabilized means that all ground surface disturbing activities at the site have been completed, and all disturbed areas have been either built on, paved, or a uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, and the vegetation cover is capable of providing erosion control equivalent to pre-existing conditions, or equivalent permanent, physical erosion reduction methods have been employed.” Stabilized unpaved surfaces, such as gravel access roads or working surfaces, necessary for the operation of the facility or nearby facilities, also qualifies as “final stabilized”.

9.0 POST-CONSTRUCTION STORMWATER

Following final stabilization, and pursuant of COGCC rule 1002.f and rule 1004, BMPs shall be maintained under Kerr-McGee’s Post-Construction Stormwater Program, and evaluated for Tier 1 / Non-Tier 1 status, as applicable and per COGCC 100 series definitions, until the facility is abandoned, and final reclamation is achieved.

10.0 INSPECTION AND MAINTENANCE PROCEDURES

10.1 Inspections

Inspections will be conducted to document the status of construction activities, stormwater control measure placement, maintenance needs, and effectiveness, to evaluate pollution sources, and to document reclamation / final stabilization progress. Inspections will be managed by the Stormwater Manager and SWMP Administrator and conducted by their designated representative(s). Inspection forms will document non-compliance conditions, including any release of sediment or other contaminants, additional control measures that are needed, or repair and maintenance work orders.

During construction, inspections shall be conducted every 14 days, and after a major precipitation or melt event, which has the potential to cause surface runoff.

For sites earthwork and construction is completed, but final stabilization is not achieved due to vegetative cover, inspections shall be conducted every 30 days and exclude precipitation or melt event response. Inspections will continue until all reclaimed areas have achieved a cover of 70% the pre-construction reference vegetation (i.e. final stabilization).

Findings, inspection records and site maps are documented electronically and available within 24 hours of any inspection. All inspection records are stored for a minimum of three years after the location has achieved final stabilization.

10.2 Maintenance

For maintenance items discovered at active construction locations, action and documentation towards completing repairs identified at the time of inspection, shall be made within 24 hours of discovery. Timeline for completion of maintenance items are a priority and will depend on scope; but in all cases, shall not be completed until field conditions allow for safe access, and utility clearance has been confirmed for actions requiring ground disturbance / earthwork.

APPENDIX A

CDPS STORMWATER GENERAL PERMIT CERTIFICATION



COLORADO
Department of Public
Health & Environment

**CERTIFICATION TO DISCHARGE
UNDER
CDPS GENERAL PERMIT COR400000
STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

Certification Number: **COR402542**

This Certification to Discharge specifically authorizes:

**Owner Kerr McGee Oil and Gas Onshore LP
Operator Kerr McGee Oil and Gas Onshore LP**

to discharge stormwater from the facility identified as

Kerr Area 1

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

to South Platte River

Facility Activity : Oil & Gas Field Development
Disturbed Acres: >5 acres
Facility Located at: See Map in File Uninc CO 80537
Larimer County
Latitude 40.279 Longitude -104.54

**Specific Information
(if applicable):**

Certification is issued 4/1/2019

Certification is effective 4/1/2019

Expiration date of general permit : 3/31/2024

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:
Meg Parish, Unit Manager
Permits Section
Water Quality Control Division



APPENDIX B

GRADING PLANS AND DRAINAGE REPORT

**FACILITY PAD - DB FARMS 40-12HZ
FACILITY DESIGN SUMMARY**

**TEMPORARY EQUIPMENT PAD -
DB FARMS 40-12HZ DESIGN SUMMARY**

PAD QUANTITIES AND DESIGN PARAMETERS

CUT SLOPES = 5:1
FILL SLOPES = 5:1
SHRINKAGE FACTOR = 1.10
SWELL FACTOR = 1.00
GRADED FACILITY PAD AREA = 2.07 ACRES
TOTAL FACILITY PAD AREA = 2.11 ACRES

PAD QUANTITIES AND DESIGN PARAMETERS

CUT SLOPES = 5:1
FILL SLOPES = 5:1
SHRINKAGE FACTOR = 1.10
SWELL FACTOR = 1.00
GRADED PAD AREA = 0.45 ACRES
TOTAL PAD AREA = 0.48 ACRES

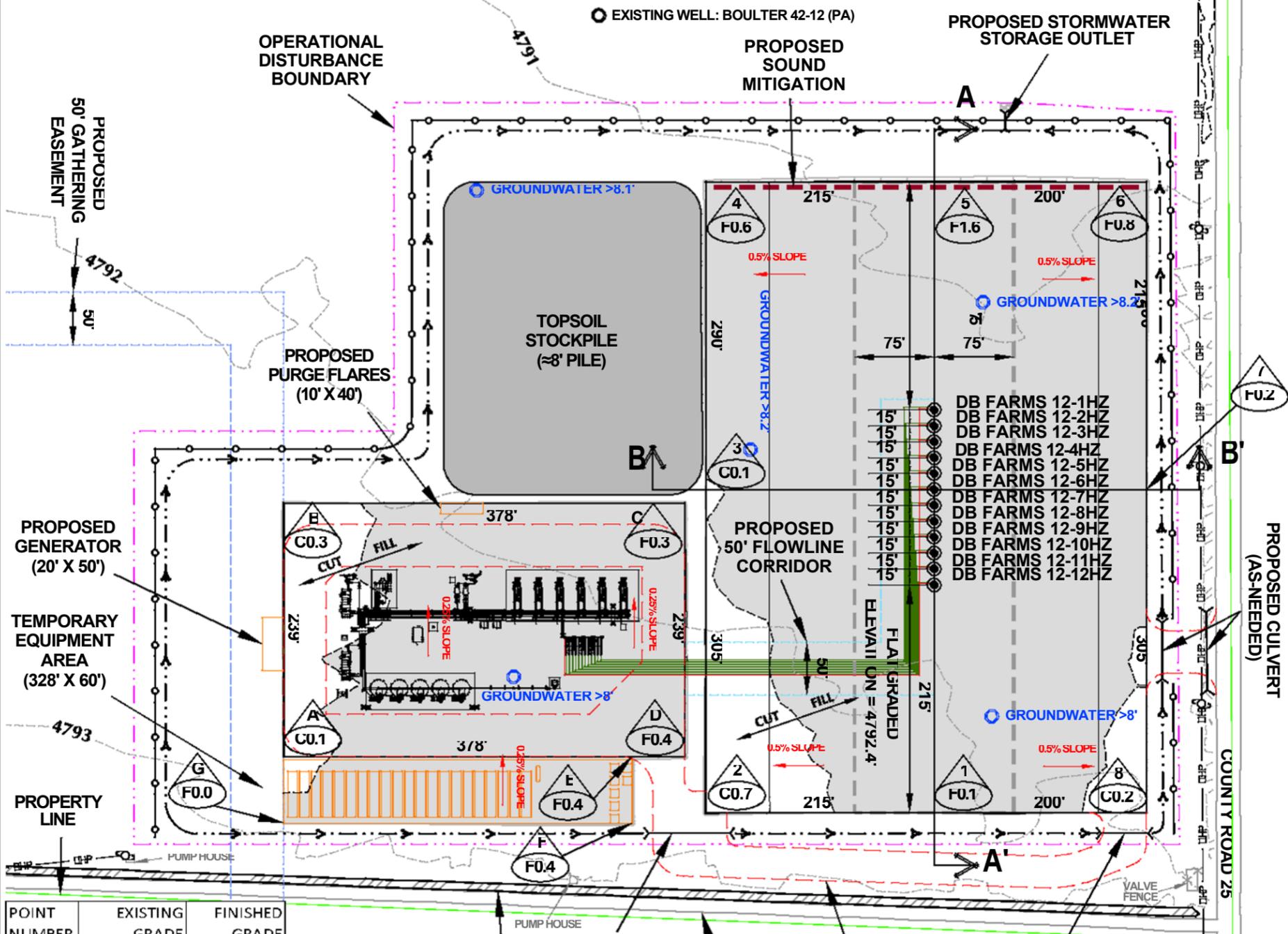
FACILITY PAD QUANTITIES

TOTAL CUT FOR FACILITY PAD = 0 C.Y.
TOTAL FILL FOR FACILITY PAD = 4,725 C.Y.
TOPSOIL @ 13" DEPTH = 3,675 C.Y.
IMPORT MATERIAL = 4,725 C.Y.

PAD QUANTITIES

TOTAL CUT FOR PAD = 0 C.Y.
TOTAL FILL FOR PAD = 1,110 C.Y.
TOPSOIL @ 13" DEPTH = 846 C.Y.
IMPORT MATERIAL = 1,110 C.Y.

NOTE:
FLARE IS TO BE LOCATED A
MINIMUM OF 100' FROM THE
NEAREST PROPOSED WELL HEAD.



POINT NUMBER	EXISTING GRADE	FINISHED GRADE
A	4792.8	4792.7
B	4792.4	4792.1
C	4791.8	4792.1
D	4792.3	4792.7
E	4792.3	4792.7
F	4792.4	4792.8
G	4792.8	4792.8

WELL NAME:	C/F
DB FARMS 12-1HZ	F1.3
DB FARMS 12-2HZ	F1.2
DB FARMS 12-3HZ	F1.1
DB FARMS 12-4HZ	F1.2
DB FARMS 12-5HZ	F1.1
DB FARMS 12-6HZ	F1.0
DB FARMS 12-7HZ	F0.9
DB FARMS 12-8HZ	F0.9
DB FARMS 12-9HZ	F1.0
DB FARMS 12-10HZ	F0.8
DB FARMS 12-11HZ	F0.8
DB FARMS 12-12HZ	F0.7

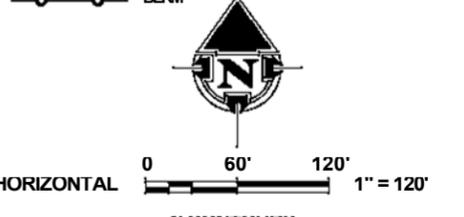
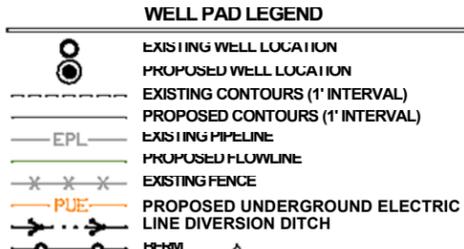
- NOTE:**
- EXISTING UTILITIES DISPLAYED ON THE GRADING PLAN ARE FOR REFERENCE PURPOSES ONLY. PRIOR TO CONSTRUCTION OR EARTHWORK, CONTRACTOR WILL BE RESPONSIBLE TO CALL FOR LOCATES: (800) 922-1987
 - DIVERSION DITCH AND/OR BERM TO BE CONSTRUCTED AROUND THE ENTIRE PAD LOCATION. BERM SECTIONS TO BE COMPACTED IN ACCORDANCE WITH STANDARD CONSTRUCTION PRACTICES.
 - CENTER OF WELL PAD REFERENCED BELOW CORRESPONDS TO THE SURFACE LOCATION OF THE DB FARMS 12-6HZ WELL.
 - FLAT GRADED AREA TO BE RECLAIMED DURING INTERIM RECLAMATION.

WELL PAD - DB FARMS 40-12HZ DESIGN SUMMARY

WELL PAD QUANTITIES AND DESIGN PARAMETERS
EXISTING GRADE @ CENTER OF WELL PAD = 4791.4'
FINISHED GRADE ELEVATION = 4792.4'
CUT SLOPES = 3:1
FILL SLOPES = 3:1
SHRINKAGE FACTOR = 1.10
SWELL FACTOR = 1.00
GRADED WELL PAD SURFACE AREA = 5.67 ACRES
TOTAL WELL PAD AREA = 5.74 ACRES
OPERATIONAL DISTURBANCE AREA = 14.04 ACRES

WELL PAD QUANTITIES
TOTAL CUT FOR WELL PAD = 0 C.Y.
TOTAL FILL FOR WELL PAD = 17,530 C.Y.
TOPSOIL @ 13" DEPTH = 10,029 C.Y.
IMPORT MATERIAL = 17,530 C.Y.

DRAFT



WELL PAD - DB FARMS 40-12HZ
WELL PAD - GRADING PLAN
DB FARMS 12-1HZ, DB FARMS 12-2HZ, DB FARMS 12-3HZ,
DB FARMS 12-4HZ, DB FARMS 12-5HZ, DB FARMS 12-6HZ,
DB FARMS 12-7HZ, DB FARMS 12-8HZ, DB FARMS 12-9HZ,
DB FARMS 12-10HZ, DB FARMS 12-11HZ & DB FARMS 12-12HZ
LOCATED IN SECTION 12, T3N, R67W, 6TH P.M.
WELD COUNTY, COLORADO

Kerr-McGee Oil & Gas Onshore LP.
1099 18th Street
Denver, Colorado 80202

609 CONSULTING, LLC
LOVELAND OFFICE
6706 North Franklin Avenue
Loveland, Colorado 80538
Phone 970-776-4331
SHERIDAN OFFICE
1095 Saberton Avenue
Sheridan, Wyoming 82801
Phone 307-674-0609

FACILITY REVISION: DB_FARMS-PP-2020 REV 2A
SCALE: 1"=120' DATE: 1/14/19 SHEET NO: 1 OF 1
REVISED: 1/22/21

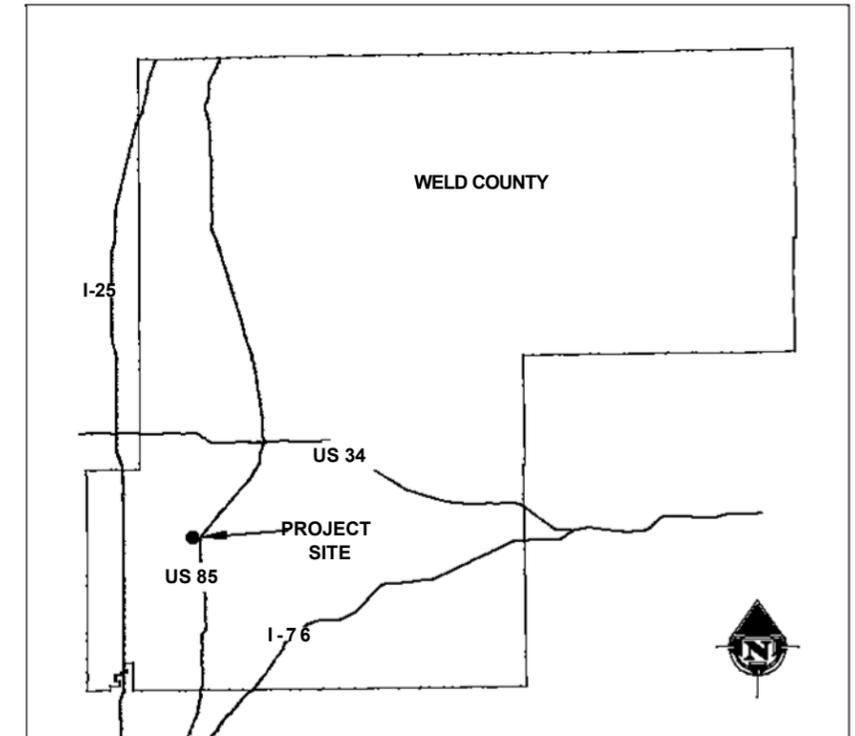
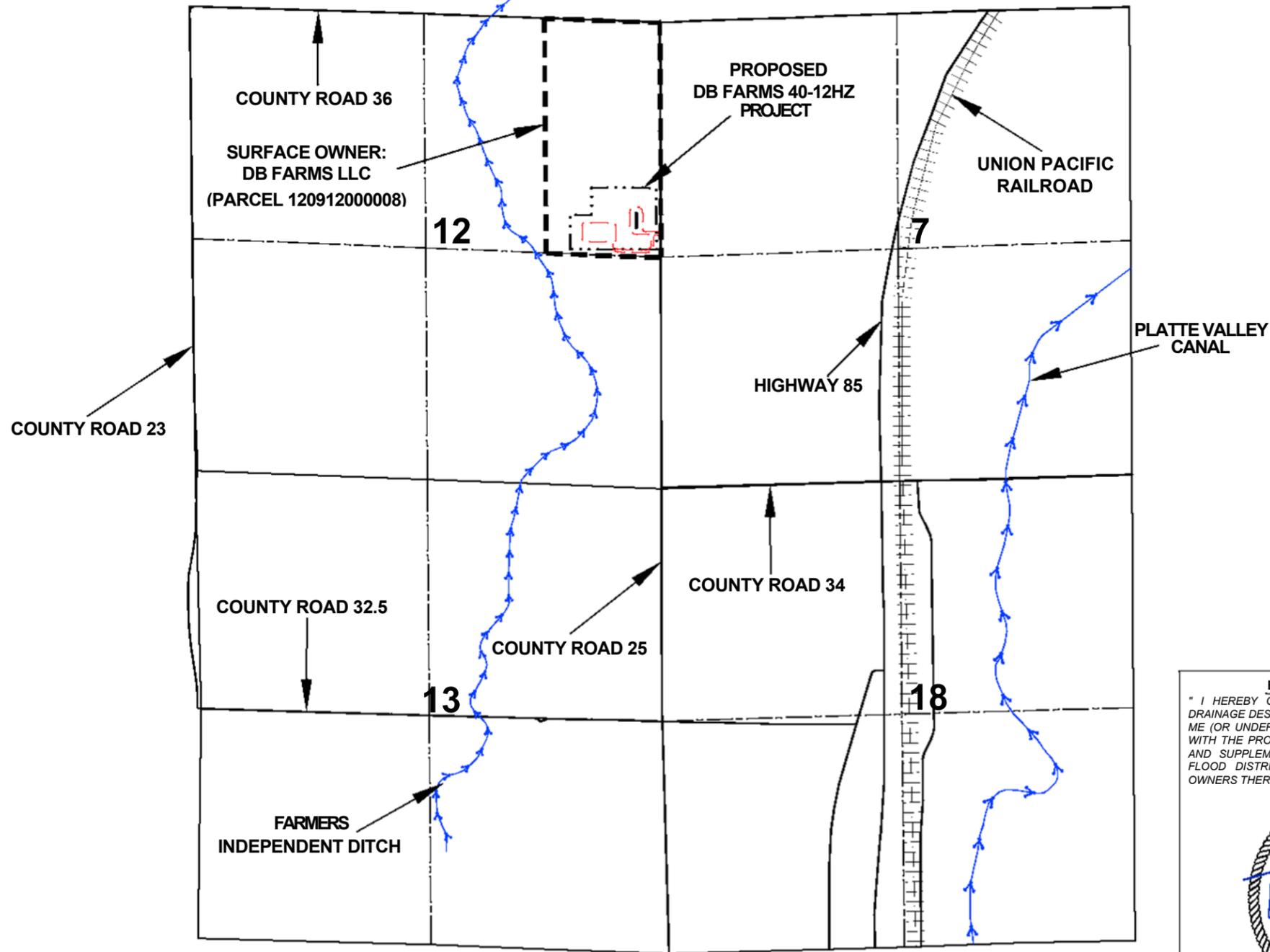
T03N R67W

T03N R66W

DB FARMS 40-12HZ DRAINAGE AND EROSION CONTROL PLAN

LOCATED IN SECTION 12, T3N, R67W, 6TH
P.M. WELD COUNTY, COLORADO

1041WOGLA20-0090



VICINITY MAP

ENGINEER'S CERTIFICATION
 " I HEREBY CERTIFY THAT THIS FINAL PLAN FOR THE DRAINAGE DESIGN OF DB FARMS 40-12HZ WAS PREPARED BY ME (OR UNDER MY DIRECT SUPERVISION) IN ACCORDANCE WITH THE PROVISIONS OF WELD COUNTY MUNICIPAL CODE AND SUPPLEMENTAL REQUIREMENTS OF THE MILE HIGH FLOOD DISTRICT STORM DRAINAGE CRITERIA FOR THE OWNERS THEREOF."

TYLER P. FRENCH
 REGISTERED PROFESSIONAL ENGINEER
 STATE OF COLORADO NO. 51566

PAGE INDEX

- 1 - COVER SHEET
- 2 - SITE OVERVIEW
- 3 - CONSTRUCTION PHASE DRAINAGE PLAN
- 4 - PRODUCTION PHASE DRAINAGE PLAN
- 5 - STORAGE BERM - CONSTRUCTION PHASE
- 6 - FACILITY BERM - PRODUCTION PHASE
- 7 - WELL PAD BERM - PRODUCTION PHASE
- 8 - OUTLET DETAILS
- 9 - BMP TYPICALS

LOCATION MAP
1" = 1,500'



GENERAL NOTES:

1. THIS DRAINAGE AND EROSION CONTROL PLAN WAS PREPARED FOLLOWING TOWN OF JOHNSTOWN MUNICIPAL CODE AND DESIGN GUIDANCE PROVIDED BY URBAN DRAINAGE FLOOD CONTROL DISTRICT.
2. DISCLAIMER: THIS PLAN REPRESENTS AN APPROXIMATE LOCATION OF DRAINAGE AND EROSION CONTROL FEATURES; EXACT LOCATION MAY VARY DEPENDING UPON EXISTING EASEMENTS, PIPELINES, FLOWLINES AND SETBACK REQUIREMENTS.
3. ORIGINAL DOCUMENT SIZE: 11" X 17"



LOVELAND OFFICE
 6706 North Franklin
 Avenue Loveland, Colorado
 80538 Phone 970-776-4331

SHERIDAN OFFICE
 1095 Saberton Avenue
 Sheridan, Wyoming 82801
 Phone 307-674-0609

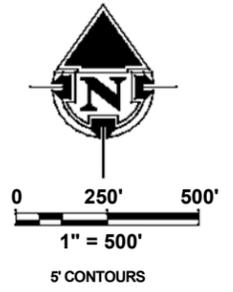
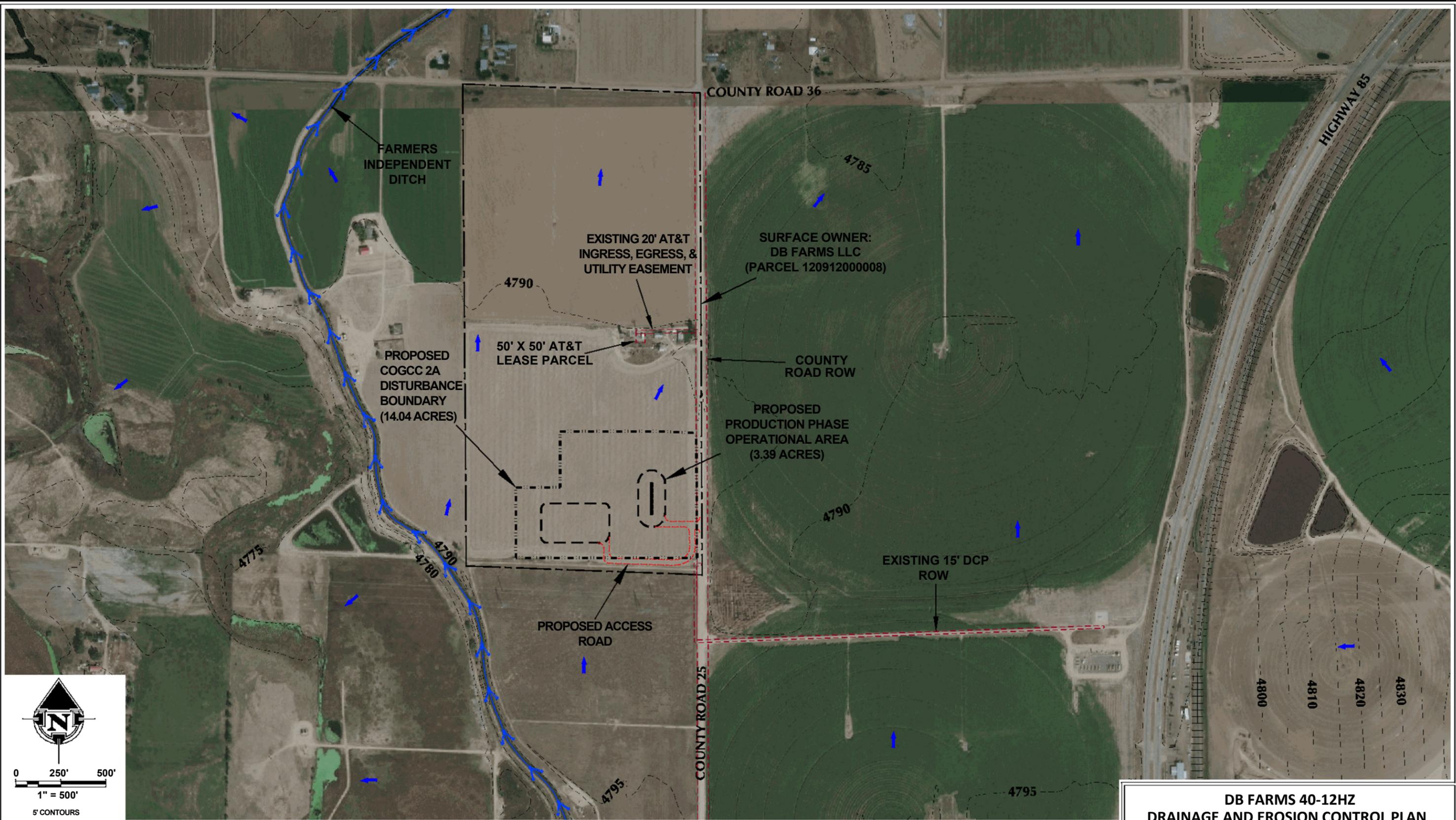
**Kerr-McGee Oil &
 Gas Onshore LP.**
 1099 18th Street
 Denver, Colorado 80202

DB FARMS 40-12HZ DRAINAGE AND EROSION CONTROL PLAN COVER SHEET

SCALE:	VARIES	PAGE:	1 OF 9
JOB NUMBER:	17-182	DATE:	4/5/21
DRAFTED BY:	HJL	REVISED:	

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LEGEND

	EXISTING CONTOUR
	EXISTING IRRIGATION DITCH
	PROPOSED COGCC 2A DISTURBANCE BOUNDARY
	PROPOSED PRODUCTION PHASE OPERATIONAL AREA
	PROPOSED ACCESS ROAD
	STORMWATER DRAINAGE

GENERAL NOTES:

1. DISCLAIMER: THIS PLAN REPRESENTS AN APPROXIMATE LOCATION OF DRAINAGE AND EROSION CONTROL FEATURES; EXACT LOCATION MAY VARY DEPENDING UPON EXISTING EASEMENTS, PIPELINES, FLOWLINES AND SETBACK REQUIREMENTS.
2. ELEVATIONS ARE BASED ON NAVD88 (GEOID12B).

609
CONSULTING, LLC

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Avenue Loveland, Colorado
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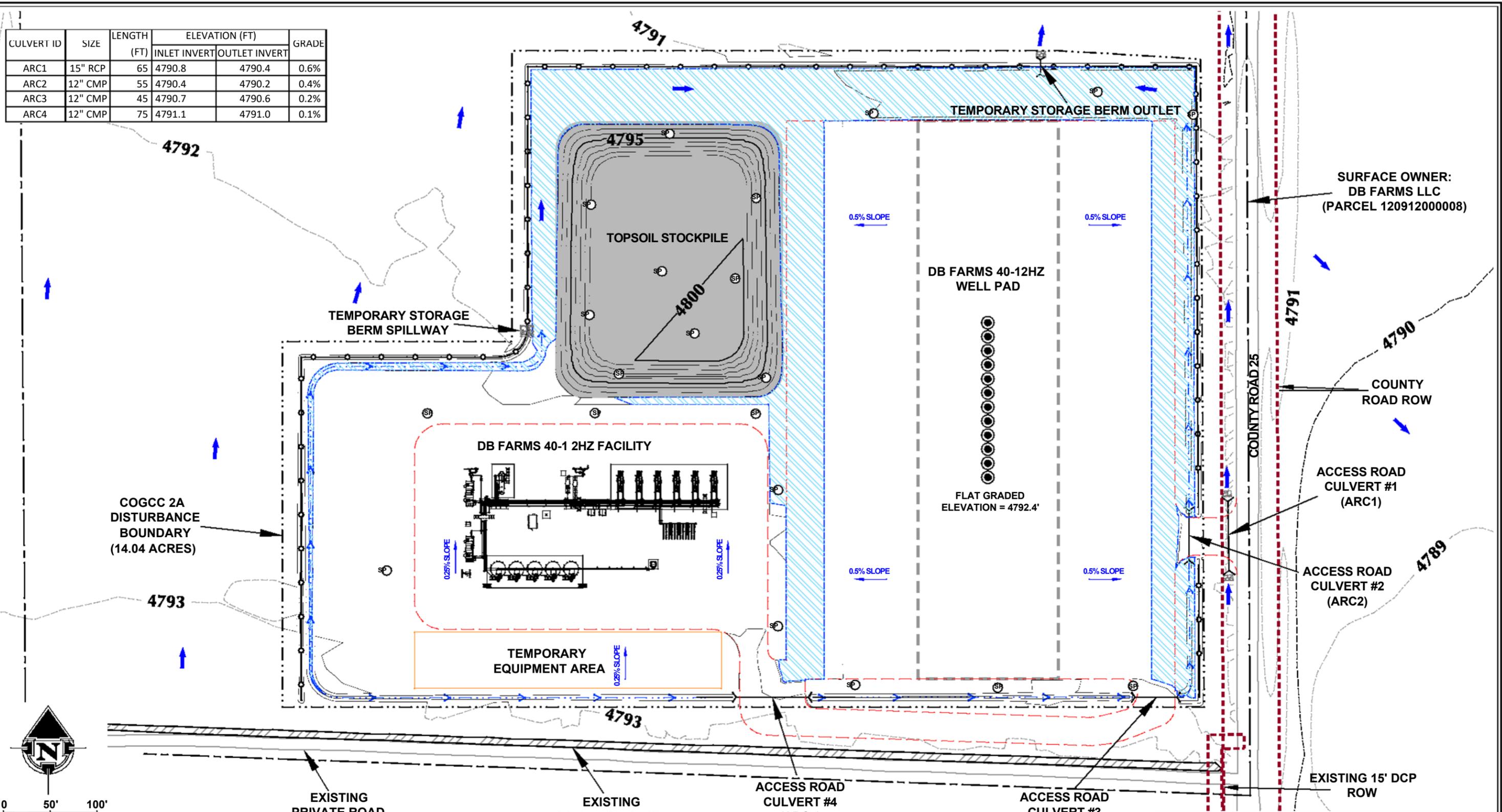
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Phone 307-674-0609

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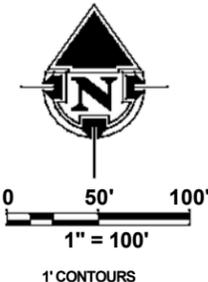
DB FARMS 40-12HZ DRAINAGE AND EROSION CONTROL PLAN SITE OVERVIEW			
SCALE:	1" = 500'	PAGE:	2 OF 9
JOB NUMBER:	17-182	DATE:	4/5/21
DRAFTED BY:	HJL	REVISED:	

CULVERT ID	SIZE	LENGTH (FT)	ELEVATION (FT)		GRADE
			INLET INVERT	OUTLET INVERT	
ARC1	15" RCP	65	4790.8	4790.4	0.6%
ARC2	12" CMP	55	4790.4	4790.2	0.4%
ARC3	12" CMP	45	4790.7	4790.6	0.2%
ARC4	12" CMP	75	4791.1	4791.0	0.1%



SURFACE OWNER:
DB FARMS LLC
(PARCEL 12091200008)

COGCC 2A DISTURBANCE BOUNDARY
(14.04 ACRES)



LEGEND	
	EXISTING CONTOUR
	EXISTING ROAD
	STORMWATER DRAINAGE
	PROPOSED COGCC 2A DISTURBANCE BOUNDARY
	PROPOSED CONTOUR
	PROPOSED ACCESS ROAD
	PROPOSED WELL
	PROPOSED DIVERSION DITCH
	PROPOSED BERM / OFF-SITE FLOW DEFLECTION
	PROPOSED CULVERT PROTECTION / RIPRAP
	PROPOSED SLOPE PROTECTION
	100-YEAR STORMWATER STORAGE FOOTPRINT

GENERAL NOTES:

- DISCLAIMER: THIS PLAN REPRESENTS AN APPROXIMATE LOCATION OF DRAINAGE AND EROSION CONTROL FEATURES; EXACT LOCATION MAY VARY DEPENDING UPON EXISTING EASEMENTS, PIPELINES, FLOWLINES AND SETBACK REQUIREMENTS.
- ELEVATIONS ARE BASED ON NAVD88 (GEOID12B).
- SLOPE PROTECTION USED FOR TEMPORARY EROSION CONTROL ON CUT/FILL SLOPES AND SOIL STOCKPILES.

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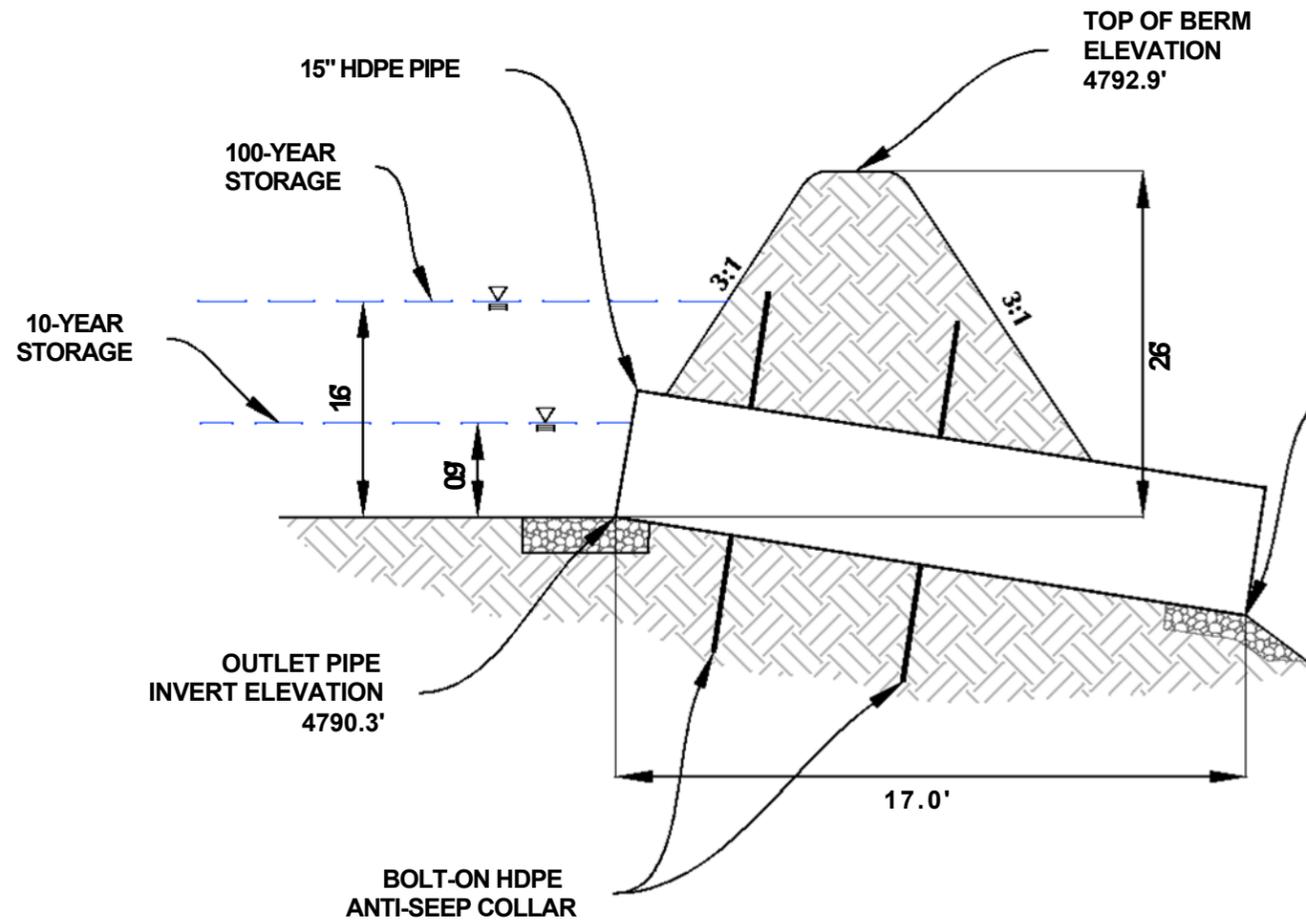
DB FARMS 40-12HZ DRAINAGE AND EROSION CONTROL PLAN CONSTRUCTION PHASE DRAINAGE PLAN			
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STORAGE BERM - CONSTRUCTION PHASE

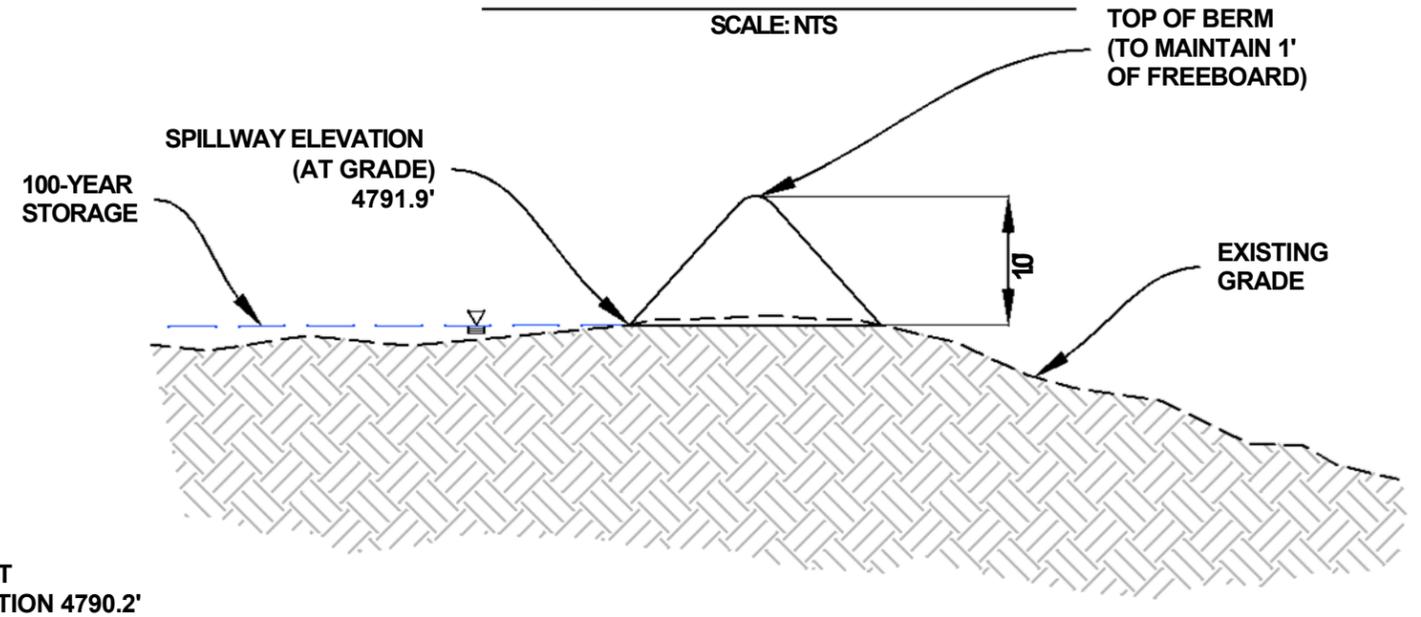
TEMPORARY OUTLET PROFILE

SCALE: NTS



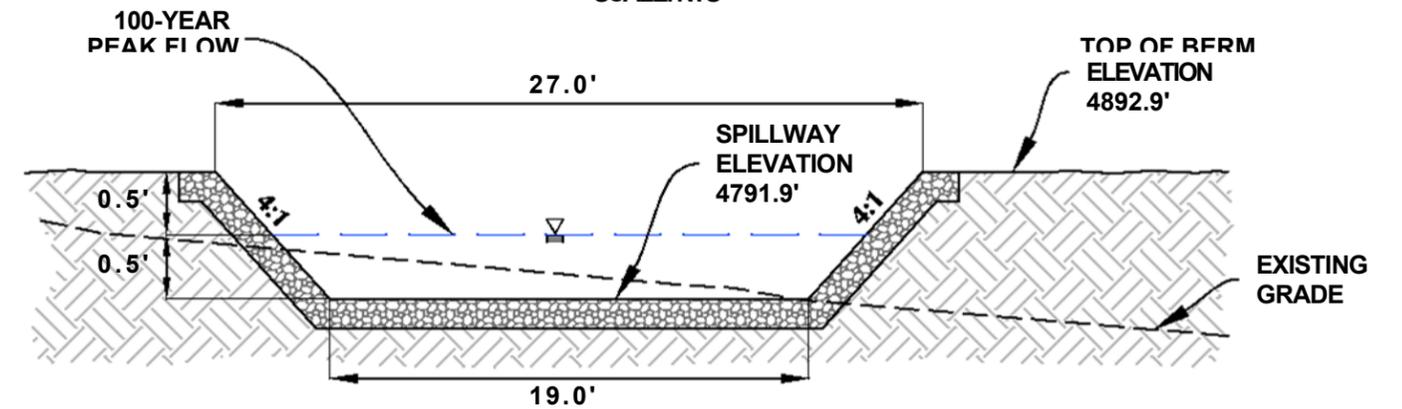
TEMPORARY SPILLWAY PROFILE

SCALE: NTS



TEMPORARY SPILLWAY SECTION

SCALE: NTS



GENERAL NOTES:

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2. ELEVATIONS ARE BASED ON NAVD88 (GEOID12B).



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DB FARMS 40-12HZ
DRAINAGE AND EROSION CONTROL PLAN
STORAGE BERM - CONSTRUCTION PHASE

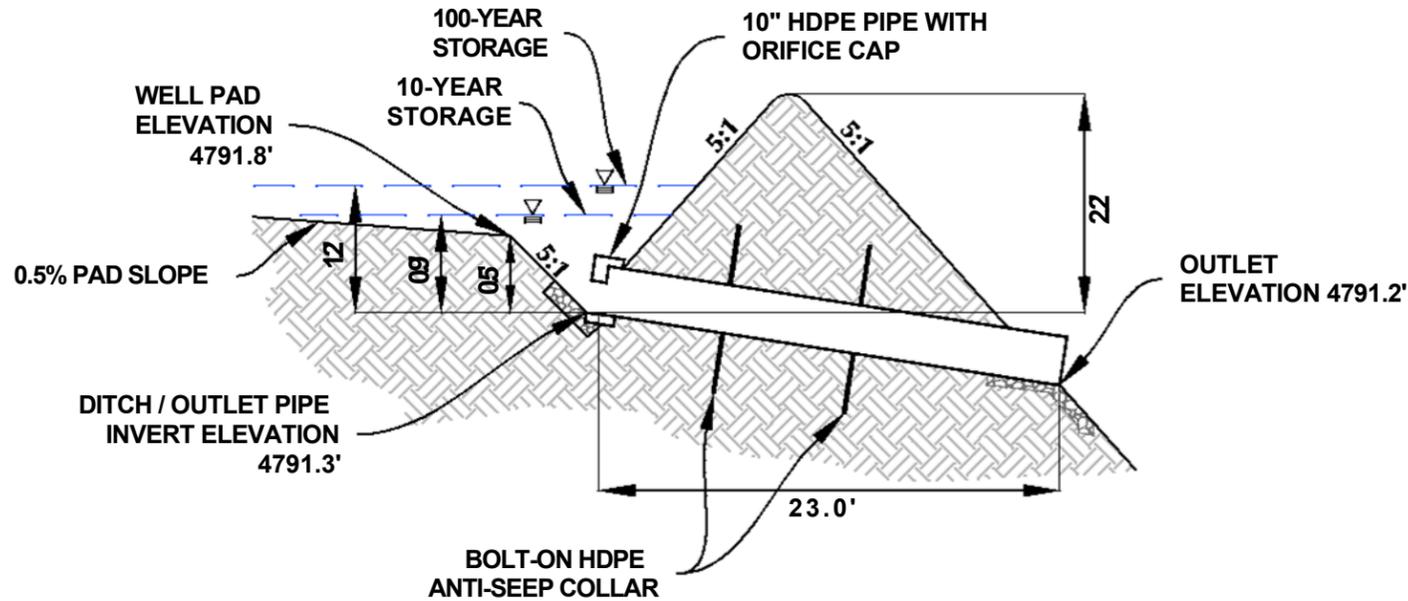
SCALE: VARIES
JOB NUMBER: 17-182
DRAFTED BY: HJL

PAGE: 5 OF 9
DATE: 4/5/21
REVISED:

WELL PAD BERM - PRODUCTION PHASE

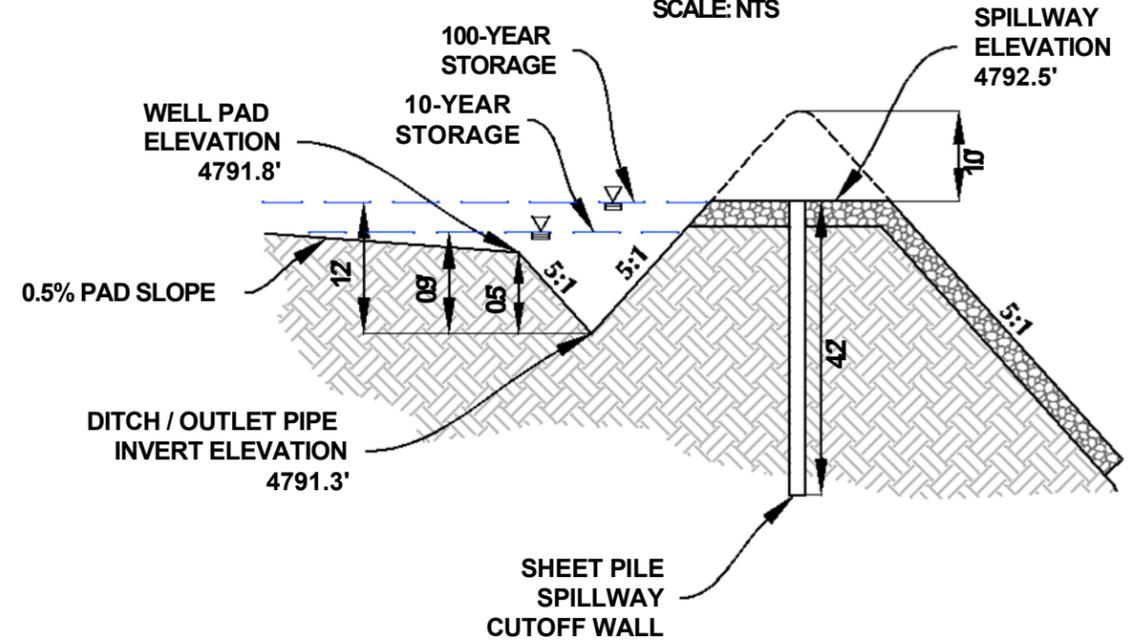
OUTLET PROFILE

SCALE: NTS



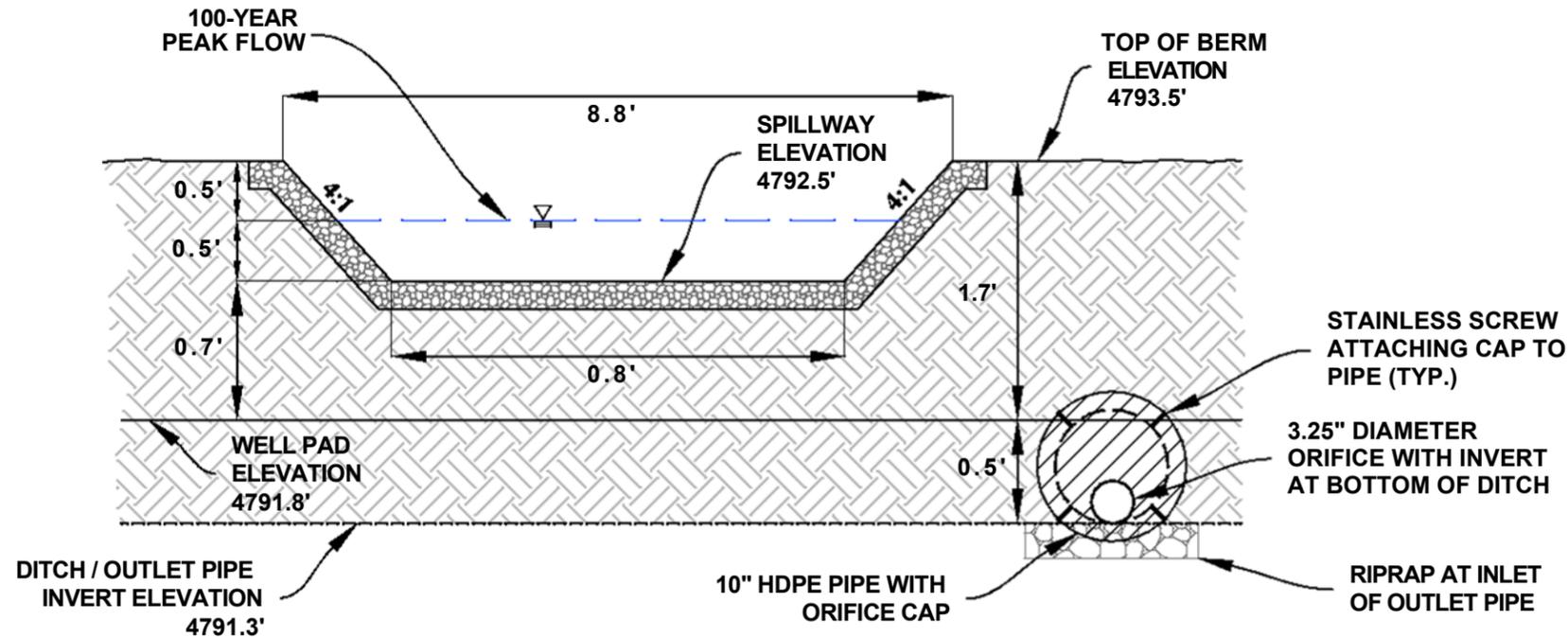
SPILLWAY PROFILE

SCALE: NTS



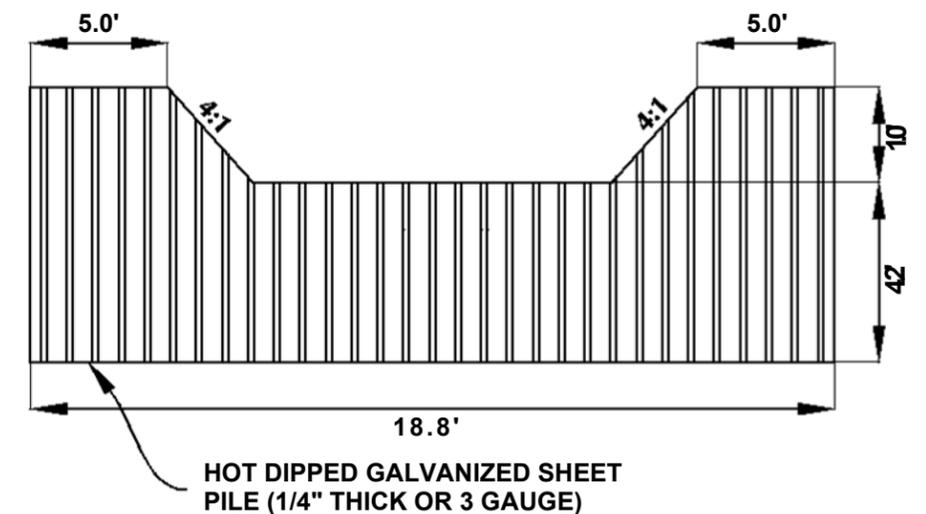
SPILLWAY SECTION

SCALE: NTS



SPILLWAY CUTOFF WALL SECTION

SCALE: NTS



GENERAL NOTES:

1. DISCLAIMER: THIS PLAN REPRESENTS AN APPROXIMATE LOCATION OF DRAINAGE AND EROSION CONTROL FEATURES; EXACT LOCATION MAY VARY DEPENDING UPON EXISTING EASEMENTS, PIPELINES, FLOWLINES AND SETBACK REQUIREMENTS.
2. ELEVATIONS ARE BASED ON NAVD88 (GEOID12B).



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SHERIDAN OFFICE
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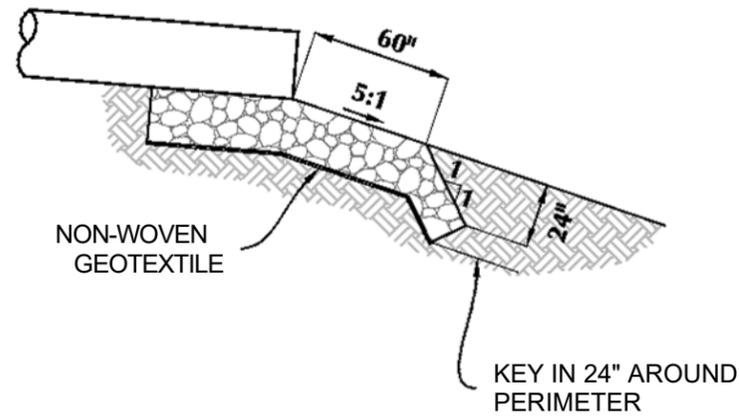
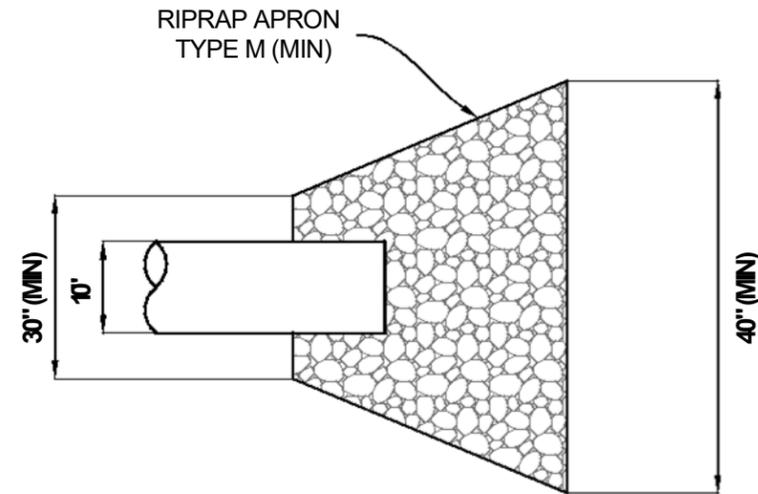
**Kerr-McGee Oil &
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Denver, Colorado 80202

DB FARMS 40-12HZ
DRAINAGE AND EROSION CONTROL PLAN
WELL PAD BERM - PRODUCTION PHASE

SCALE:	VARIES	PAGE:	7 OF 9
JOB NUMBER:	17-182	DATE:	4/5/21
DRAFTED BY:	HJL	REVISED:	

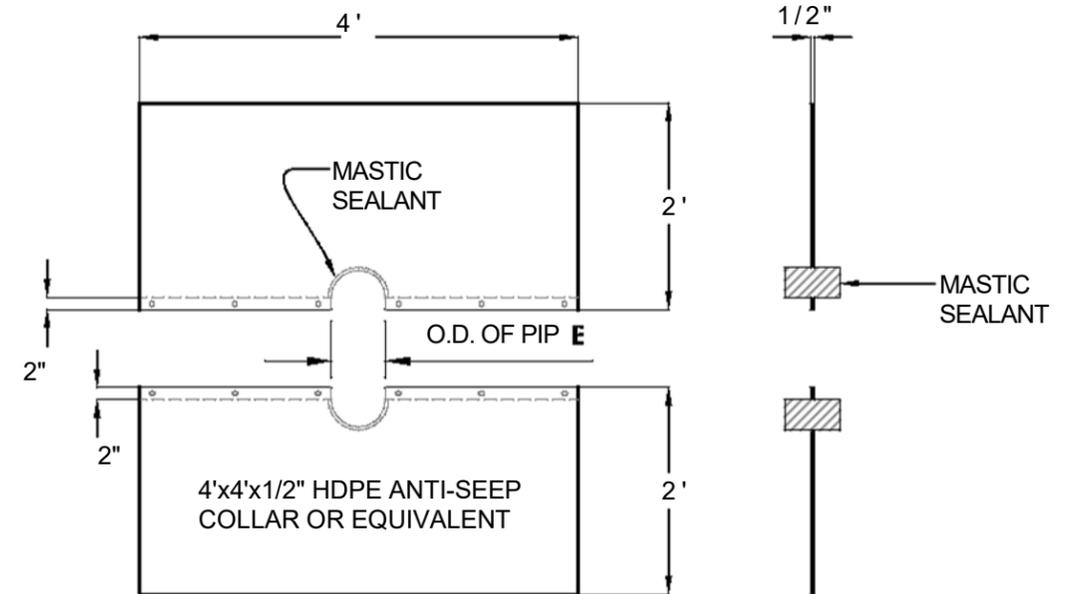
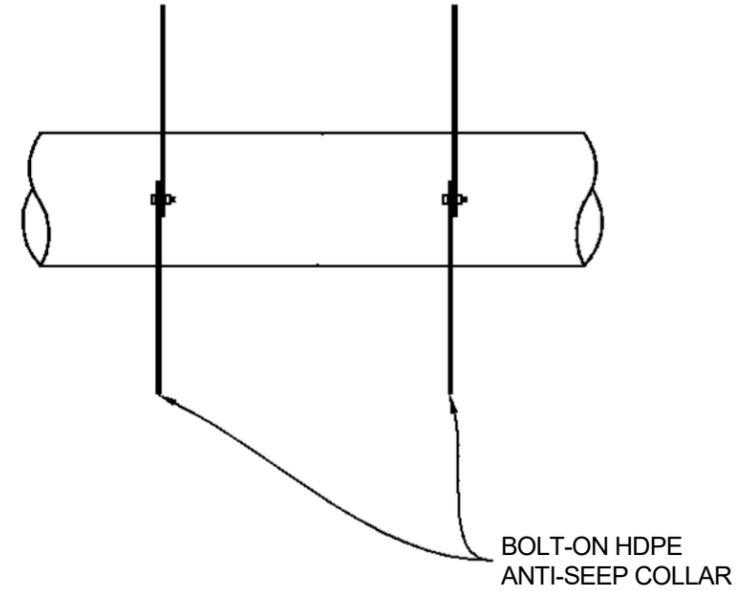
OUTLET PROTECTION

SCALE: NTS



ANTI-SEEP COLLAR

SCALE: NTS



GENERAL NOTES:



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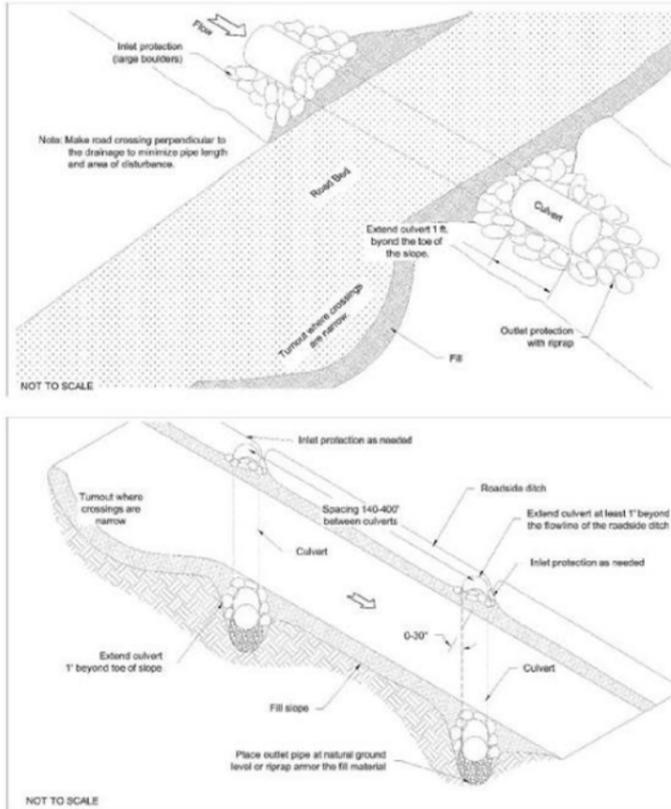
CONSULTING, LLC

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Gas Onshore L.P.**
1099 18th Street
Denver, Colorado 80202

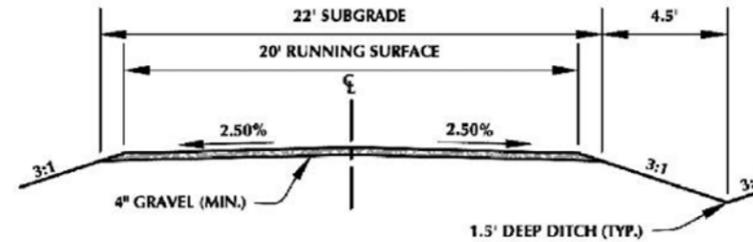
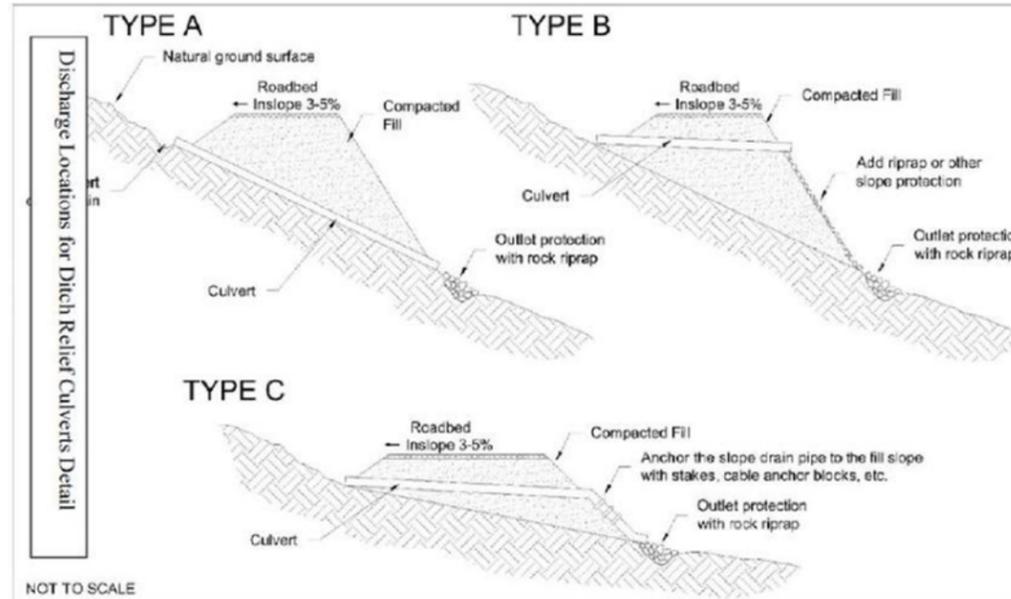
**DB FARMS 40-12HZ
DRAINAGE AND EROSION CONTROL PLAN
OUTLET DETAILS**

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Culvert



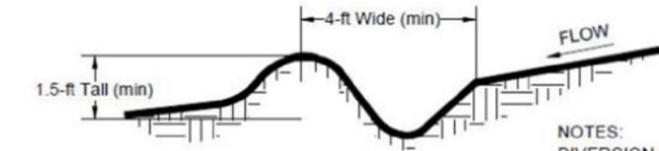
Culvert



Diversion Ditch and Berm

DD

DD-1 Temporary Diversion Ditch and Berm



NOTES:
DIVERSION SWALE SHALL SLOPE BETWEEN 0.50% AND 8% TO A STABILIZED OUTLET SUCH AS A SEDIMENT TRAP.
ALL BERMS MUST BE FULLY COMPACTED SO THAT THERE IS NO LOOSE SOIL.

Temporary and Permanent Seeding (TS/PS)

TS/PS

Table TS/PS-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)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Sudangrass	Warm	5-10	½ - ¾
7. Sorghum	Warm	5-10	½ - ¾
8. Winter wheat	Cool	20-35	1 - 2
9. Winter barley	Cool	20-35	1 - 2
10. Winter rye	Cool	20-35	1 - 2
11. 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 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.

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**DB FARMS 40-12HZ
DRAINAGE AND EROSION CONTROL PLAN
BMP TYPICALS**

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