

# **Savage and Savage** *Environmental*

*practical solutions for environmental issues*

4610 Haystack Drive  
Windsor, Colorado 80550

970 674 8080 telephone  
970 674 8088 facsimile  
[savageandsavage@earthlink.net](mailto:savageandsavage@earthlink.net)



September 9, 2010

Terry McKee  
U.S. Army Corps of Engineers  
9307 South Wadsworth Blvd.  
Littleton, Colorado 80128-6901

**RE: Artificially Induced Wetland Concurrence Request for Noble Energy, Inc.  
Five Rivers K04-32D, K04-20D, K04-21D, K04-25, K09-30D, K09-29D Pad Site,  
Weld County, Colorado**

Dear Mr. McKee:

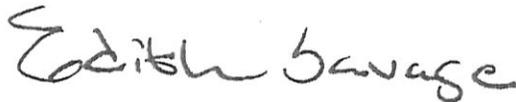
Savage and Savage conducted a wetland delineation at the Noble Energy Five Rivers K04-32D, K04-20D, K04-21D, K04-25, K09-30D, K09-29D pad site on September 1, 2010. The proposed well pad is located northeast of the intersection of Weld County Roads 27½ and 396 in Weld County, Colorado. From Milliken, the site is accessed by traveling east on State Highway 60 to Weld County Road 396, immediately east of the intersection of Weld County Roads 27½ and 396 proceed east on an undeveloped access road for approximately 0.75 miles to the site. The latitude of the project site is 40.3378 degrees North and longitude is 104.788 degrees West. The average elevation of the project site is 4700 feet. The site lies within Section 4, Township 4 North, Range 66 West of the 6<sup>th</sup> Prime Meridian, Weld County, Colorado.

The Five Rivers drill site is located between the South Platte River to the east and agricultural fields on the secondary terrace to the west. The proposed drill site is used for cattle grazing.

Three drain pipes that drain the agricultural fields were discharging significant amounts of irrigation tailwater onto the proposed project site and immediate vicinity. Therefore, we concluded that the wetlands identified during our site investigation were artificially induced due to irrigation from the agricultural fields above on the secondary terrace.

A portion of a wetland, approximately 0.5 acres, will be filled for this development site. As we concluded that the wetland was artificially induced by agricultural tailwater runoff from adjacent agricultural fields to the north of the proposed project site, we concluded the wetland was a artificially induced wetland and should be considered non-jurisdictional. We request the Corps concurrence with this conclusion. If you have any questions or require further information about this site please contact me.

Sincerely,

A handwritten signature in black ink that reads "Edith Savage". The signature is written in a cursive, slightly slanted style.

Edith Savage  
Principal

attachment: Noble Energy, Inc. Five Rivers K04-32D, K04-20D, K04-21D, K04-25, K09-30D, K09-29D Drill Pad, Waters of the United States Identification and Wetland Delineation, Weld County, Colorado

c: ✓ Brian DeRose, Noble Energy Production, Inc.

**NOBLE ENERGY, INC.  
FIVE RIVERS K04-32D, K04-20D, K04-21D, K04-25, K09-30D, K09-29D  
DRILL PAD  
WATERS OF THE UNITED STATES IDENTIFICATION  
AND WETLAND DELINEATION  
WELD COUNTY, COLORADO**



**Prepared by: Savage and Savage, Inc.  
4610 Haystack Drive  
Windsor, CO 80550  
970 674 8080**

**September 2010**

## TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1.
STUDY METHODS	1.
PROJECT DESCRIPTION	2.
SITE DESCRIPTION	2.
RESULTS/CONCLUSION	3.
LITERATURE CITED	4.
FIGURES	5.
APPENDIX	11.

### FIGURES

1. Noble Energy Five Rivers K04-32D, K04-20D, K04-21D, K04-25, D09-30D, K09-29D Well Pad Location Map
2. Sample Point 001 Facing North Toward Agricultural Field
3. Sample Point 002 Facing North Toward Agricultural Field
4. Agricultural Field with Water Draining from Pipe into Wetland
5. Noble Energy Five Rivers K04-32D, K04-20D, K04-21D, K04-25, K09-30D, K09-29D Well Pad Wetland Delineation

### APPENDIX

U.S. Army Corps of Engineers Great Plains – Interim Version Data Sheets

## INTRODUCTION

Savage and Savage conducted a wetland delineation for the proposed Five Rivers K04-32D, K04-20D, K04-21D, K04-25, K09-30D, K09-29D drill pad for Noble Energy, Inc. on September 1, 2010. The proposed well pad is located northeast of the intersection of Weld County Roads 27½ and 396 in Weld County, Colorado (Figure 1.). From Milliken, the site is accessed by traveling east on State Highway 60 to Weld County Road 396, immediately east of the intersection of Weld County Roads 27½ and 396 proceed east on an undeveloped access road for approximately 0.75 miles to the site. The latitude of the project site is 40.3378 degrees North and longitude is 104.788 degrees West. The average elevation of the project site is 4700 feet. The site lies within Section 4, Township 4 North, Range 66 West of the 6<sup>th</sup> Prime Meridian, Weld County, Colorado.

## STUDY METHODS

A wetland delineation was conducted within the boundary of the proposed disturbance site in accordance with the requirements of the U.S. Army Corps of Engineers Wetlands Delineation Manual and Interim Supplement (USACE, 1987, 2008). To determine the areas subject to Corps jurisdiction, three criteria were evaluated: (1) evidence of a hydrologic regime reflecting saturation or periodic inundation by surface or ground water of sufficient duration and frequency, (2) soils which are considered hydric by classification or field characteristics indicating anaerobic conditions, and (3) a prevalence of vegetation typically adapted to areas of wetland hydrology and soils.

At two sample points within the proposed disturbance envelope the three wetland criteria were evaluated. Dominant individual plant species were identified, and their wetland indicator status was assessed (USFWS, 1988). Evidence of the hydrologic regime was collected and evaluated. Soil test pits were dug using a core auger to approximately 20 inches from the soil surface. Soil horizons were inspected and described using

texture, soil color (Munsell, 1992), and moisture. Observations were recorded on the attached USACE Great Plains – Interim Version approved data sheets.

## **PROJECT DESCRIPTION**

Proposed temporary disturbance will include construction of one drill pad that is approximately 3.6 acres in size within the investigated disturbance envelope. Permanent disturbance will include six fenced well heads located on the drill pad remnant. The drill pad will be accessed by an existing access road.

## **SITE DESCRIPTION**

The Five Rivers drill site is located between the South Platte River to the east and agricultural fields on the secondary terrace to the north and west. The proposed drill site is used for cattle grazing. An elevated rail line defines the boundary of the site to the south, and an earthen levee bounds the site to the east.

The proposed project site contains relict braided surface drainage channel features that have been isolated from the South Platte River by the rail line and the levee.

Three drain pipes were observed that drain the agricultural fields to the north. Significant amounts of surface water were draining onto the primary terrace where the investigation was conducted.

According to the Soil Survey of Weld County, Southern Part (1980), Aquolls and Aquent, gravelly substratum, are located throughout the project site. These soils are comprised of deep, poorly drained soils formed in recent alluvium. No one pedon is typical. Surface layers are loamy or clayey and are underlain by sand or sand and gravel. Aquolls and Aquent are listed as hydric by the U.S. Army Corps of Engineers (USACE,

1987). The soil sample examined at sample point 001 confirmed the presence of the Aquolls and Aquents unit. Sample point 002 contained soil significantly more mesic than that at Sample Point 001 and was not indicative of hydric conditions.

Vegetation within the site (Sample Points 001 and 002) was dominated by inland saltgrass, Baltic rush, and white clover (Figures 2. and 3.).

## RESULTS/CONCLUSION

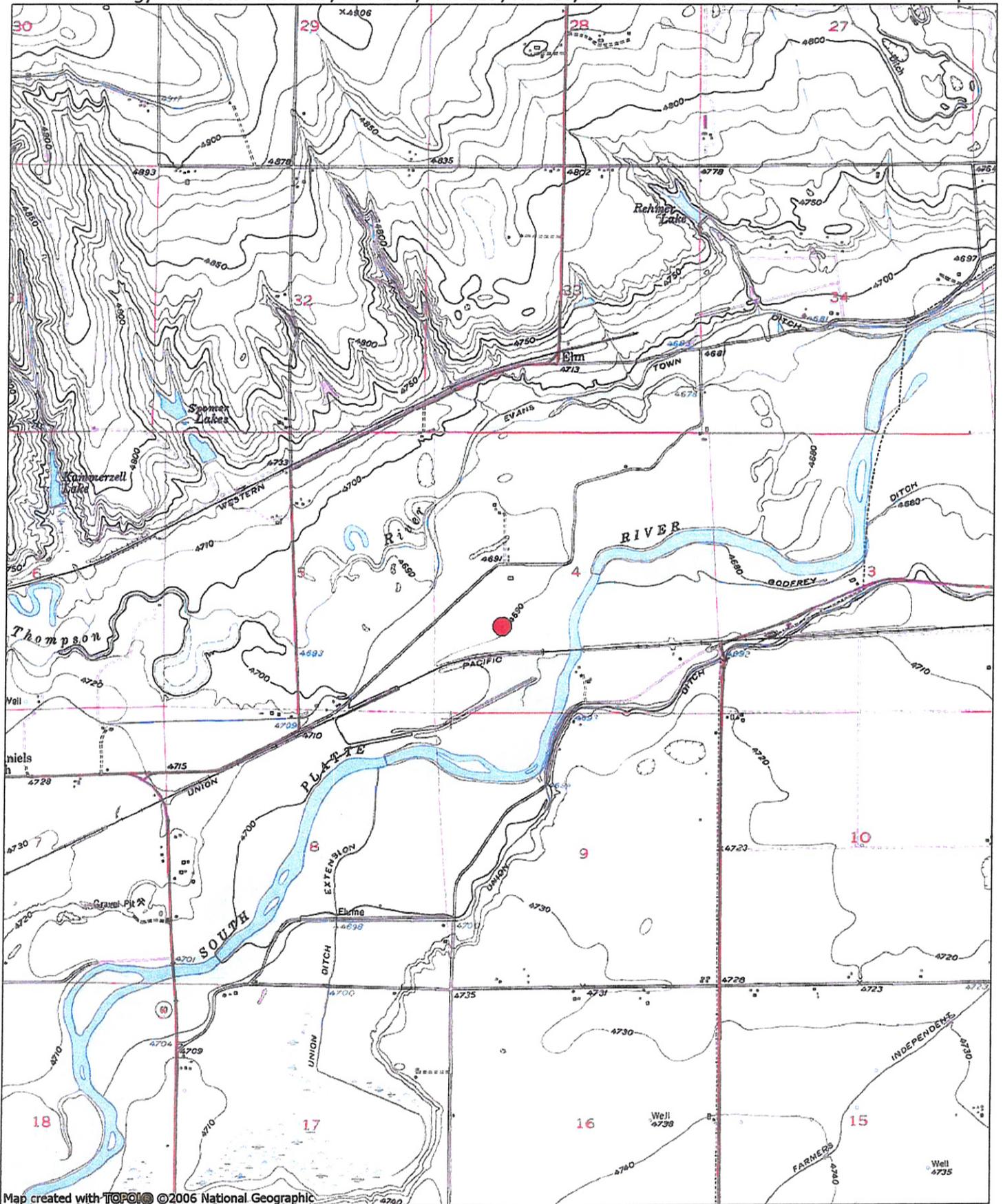
Savage and Savage conducted a wetland delineation at the proposed Noble Energy, Inc. Five Rivers K04-32D, K04-20D, K04-21D, K04-25, K09-30D, K09-29D well pad site on September 1, 2010. This delineation was conducted in order to determine the presence and extent of wetlands. Wetlands were found to be present within relict alluvial features on the site. We concluded that the wetlands identified during our site investigation were artificially induced due to irrigation from the agricultural fields on the secondary terrace above the proposed project site (Figures 4 and 5).

## LITERATURE CITED

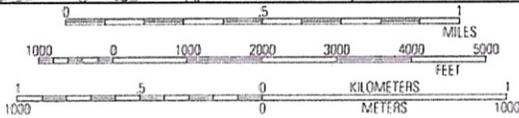
- Killmorgen Instruments Corp. 1992. Munsell® Soil Color Charts. Newburg, NW.
- U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi.
- U.S. Army Corps of Engineers. 2008. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region, ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble, ERDC/EL TR-08-12. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U.S. Department of Agriculture Soil Conservation Service. 1980. Soil Survey of Weld County, Colorado, Southern Part.
- U.S. Fish and Wildlife Service. 1988. National List of Plant Species that Occur in Wetlands: Central Plains (Region 5). U.S. Department of Interior, Fish and Wildlife Service Research and Project, Biological Report 88(26.5), Washington, D.C.

**FIGURES**

Noble Energy Five Rivers K04-32D, K04-20D, K04-21D, K04-25, K09-30D and K09-29D Well Pad Location Map



Map created with TOPO! © 2006 National Geographic



TN 1 MN  
9 1/2°  
09/09/10



**Figure 2. Sample Point 001 Facing North Toward Agricultural Field**



**Figure 3. Sample Point 002 Facing North Toward Agricultural Field**



**Figure 4. Agricultural Field with Water Draining from Pipe into Wetland**

**Noble Energy Five Rivers K04-32D, K04-20D, K04-21D, K04-25, K09-30D, and K09-29D Well Pad  
Wetland Delineation**



**Irrigated Agricultural Fields**

**Field Discharge** ■

**Field Discharge** ■

**Field Discharge** ■

■ 001

■ 002

**Earthen Levee**

**Elevated Rail Line**

595 ft



Image © U.S. Geological Survey  
© 2010 Google  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

© 2010 Google™

APPENDIX

**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: FIVE RIVERS City/County: WZCD Sampling Date: SEPT 1, 2010  
 Applicant/Owner: NOBLE ENERGY State: CO Sampling Point: CO1  
 Investigator(s): R.S. SNAPE E.A. SNAPE Section, Township, Range: S4, T4N, R66W 6TH PM  
 Landform (hillslope, terrace, etc.): 1° ALLUVIAL TERRACE Local relief (concave, convex, none): none Slope (%): 1  
 Subregion (LRR): \_\_\_\_\_ Lat: 40.3378° Long: -104.788° Datum: \_\_\_\_\_  
 Soil Map Unit Name: AQUOLLS & AQUENTS, GRANULY SUBSTRATUM NWI classification: HYDRIC  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: <u>Photograph facing NE</u> <u>sample point @ edge of relict alluvial feature</u>	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>N/A</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>N/A</u>)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	<b>Hydrophytic Vegetation Indicators:</b> ___ Dominance Test is >50% ___ Prevalence Index is ≤3.0 <sup>1</sup> ___ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ___ Wetland Non-Vascular Plants <sup>1</sup> ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
= Total Cover				
<b>Herb Stratum (Plot size: <u>10x10'</u>)</b>				
1. <u>Juncus bellicus</u>	<u>35</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Infolium repens</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Distichlis spicata</u>	<u>20</u>	<u>Y</u>	<u>NI/FAC</u>	
4. <u>Hordeum jubatum</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
5. <u>Plantago major</u>	<u>2</u>	<u>N</u>	<u>FAC</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
= Total Cover				
<b>Woody Vine Stratum (Plot size: <u>N/A</u>)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
= Total Cover				
<b>% Bare Ground in Herb Stratum <u>10</u></b>				
Remarks: _____				

**SOIL**

Sampling Point: 01

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-8"	7.5YR 2.5/1	98	N/A				clay	saturated
8-13"	7.5YR 3/1	98	N/A				sand	"
13-20"	7.5YR 5/3	98	N/A				sand	"

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	<sup>3</sup> Indicators of hydrophytic vegetation and welland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one required; check all that apply)</b>	<b>Secondary Indicators (2 or more required)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): 18"

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: FIVE RIVERS City/County: WELD Sampling Date: SEPT 1, 2010  
 Applicant/Owner: NOBIS ENERGY State: CO Sampling Point: 002  
 Investigator(s): MSSWAGE EA SAVAGE Section, Township, Range: S4, T4N, R66W 6<sup>th</sup> PM  
 Landform (hillslope, terrace, etc.): 1<sup>o</sup> ALLUVIAL TERRACE Local relief (concave, convex, none): (none) Slope (%): 1  
 Subregion (LRR): \_\_\_\_\_ Lat: 40-3378<sup>o</sup> Long: -104-753<sup>o</sup> Datum: \_\_\_\_\_  
 Soil Map Unit Name: AGUILAS ± AQUENTS, GRAVELLY SUBSTRANNA NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: <u>SLIGHTLY ELEVATED TOPOGRAPHIC POSITION OUTSIDE ELUCT ALLUVIAL FEATURE</u>	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>N/A</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>N/A</u>)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot size: <u>10'x10'</u>)</b>				
1. <u>Dactylis spicata</u>	<u>50%</u>	<u>Y</u>	<u>NI (FK)</u>	<b>Hydrophytic Vegetation Indicators:</b> ___ Dominance Test is >50% ___ Prevalence Index is ≤3.0 <sup>1</sup> ___ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ___ Wetland Non-Vascular Plants <sup>1</sup> ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Plantago major</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
3. <u>Juncus balticus</u>	<u>2</u>	<u>N</u>	<u>OBL</u>	
4. <u>Taraxacum officinale</u>	<u>1</u>	<u>N</u>	<u>FACU</u>	
5. <u>Trifolium repens</u>	<u>1</u>	<u>N</u>	<u>FACU</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
= Total Cover				
<b>Woody Vine Stratum (Plot size: <u>N/A</u>)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
= Total Cover				
<b>% Bare Ground in Herb Stratum <u>5%</u></b>				
= Total Cover				
Remarks: _____				

SOIL

Sampling Point: 002

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-11"	7.5YR 4/2	98					loam	dry
11-20+"	7.5YR 5/3	98					sand	dry

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) <u>N/A</u>		Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_  
 Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply) <u>N/A</u>		Secondary Indicators (2 or more required) <u>N/A</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:  
 Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)  
 Wetland Hydrology Present? Yes \_\_\_\_\_ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# Savage and Savage *Environmental*

*practical solutions for environmental issues*

4610 Haystack Drive  
Windsor, Colorado 80550

970 674 8080 telephone  
970 674 8088 facsimile  
savageandsavage@earthlink.net



---

## Transmittal

To: Brian DeRose  
Company: Noble Energy, Inc.  
Address: 804 Grand Avenue  
City, State, Zip: Platteville, CO 80651

From: Edith Savage  
Company: Savage and Savage, Inc.  
Project: Five Rivers Drill Pad  
Phone: 970-674-8080  
Fax: 970-674-8088  
Date: September 14, 2010

Attached for your files is concurrence from the U.S. Army Corps of Engineers that the wetlands located at the Five Rivers K04-32D, K04-20D, K04-21D, K04-25, D09-30D, K09-29D drill pad are artificially induced and that a Corps permit will not be required for this project.



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, OMAHA DISTRICT  
DENVER REGULATORY OFFICE, 9307 S. Wadsworth Boulevard  
LITTLETON, COLORADO 80128-6901

September 13, 2010

Ms. Edith Savage  
Savage and Savage  
4610 Haystack Drive  
Windsor, CO 80550-2597

**RE: Noble Energy, Inc., Five Rivers K04-32D, KO4-20D, K04-25, K09-30D, K09-29D Pad Sites,  
Artificially Induced Wetland  
Corps File No. NWO-2010-2058-DEN**

Dear Ms. Savage:

Reference is made to your recent telephone conversation with Mr. Terry McKee of my office and subsequent September 9, 2010 letter concerning the above-mentioned project located at 40.3378; - 104.788, Weld County, Colorado.

This project has been reviewed in accordance with Section 404 of the Clean Water Act under which the U.S. Army Corps of Engineers regulates the discharge of dredged and fill material, and any excavation activity associated with a dredge and fill project in waters of the United States. The wetlands located at this site as identified in your September 9, 2010 Report to my office are not waters of the U.S.

Reference is made to the November 13, 1986 Federal Register (Page 41217), Part 328 (a) Non-tidal drainage and irrigation ditches excavated on dry land, (b) artificially irrigated areas which would revert to upland if the irrigation ceased, (c) artificial lakes, ponds or irrigation ditches created by excavation and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering and irrigation, (d) artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons, and (e) waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States (as defined in 33 CFR 328.3(a)).

The Corps of Engineers generally does not consider these types of aquatic resources waters of the U.S. except on a case-by-case basis. The wetlands located at this site as identified in your September 9, 2010 Report to our office artificially irrigated areas which would revert to upland if the irrigation ceased. Based on the information provided, a Department of the Army (DA) Permit will not be required for the work at this site. Although a DA Permit will not be required for this project, this does not eliminate the requirement that other applicable federal, state, and local permits be obtained as needed.

If there are any questions call Mr. Terry McKee of my office at (303) 979-4120 and reference Corps File No. NWO-2010-2058-DEN.

Sincerely,

*Rena Q. Brand*

*TT* Timothy T. Carey  
Chief, Denver Regulatory Office

tm