

BIOLOGICAL SURVEY REPORT

TEP ROCKY MOUNTAIN, LLC RYAN GULCH PHASE 2 DEVELOPMENT PLAN



Cover Photo: View of habitat conditions surrounding proposed project.

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INTRODUCTION

TEP Rocky Mountain, LLC (TEP) requested that WestWater Engineering (WestWater) conduct biological surveys for their proposed Ryan Gulch Phase 2 Development Plan. The proposed project would be located in the vicinity of existing well pads, access roads, and pipeline rights-of-way (ROWs). The entire project would be located in Rio Blanco County on lands administered by the Bureau of Land Management (BLM) White River Field Office (WRFO) in Sections 7 and 18, Township 2 South, Range 97 West; and Section 13, Township 2 South, Range 98 West (Figure 1).

Biological surveys were conducted during May 2021. Follow-up vegetation assessments were completed for this project during June 2021. The objectives of the survey were to document the following natural resources and biological attributes:

- Identify and map areas where sensitive and rare plant and animal species occur;
- Identify and map areas of suitable and potential habitat for federally listed threatened and endangered species;
- Locate raptor (bird of prey) nest sites and identify potential raptor habitat and use areas;
- Identify species of vegetation, including noxious weeds, and generally characterize habitats within the proposed project boundaries on BLM lands;
- Perform vegetation assessments and establish reference areas;
- Identify Birds of Conservation Concern (BCC) occurrence, nest sites, and habitat; and
- Identify aquatic habitat areas, including potential Corps of Engineers jurisdictional areas (i.e. wetlands and potential Waters of the U.S. crossings) and Waters of the State.

PROJECT AREA DESCRIPTION

Current Land Use

The current land use in the project area is non-cropland - rangeland. According to the Rio Blanco County zoning map, this area has been classified as agricultural (Rio Blanco County 2021). The proposed project would occur on lands administered by the BLM WRFO. There are no designated critical habitat areas, conservation easements, conservation resources lands, wild and scenic areas, State Parks, State Trust Lands, or State Wildlife Areas within 1-mile of the project area.

Terrain

The proposed project would be located along the dividing ridge between Ryan Gulch and Black Sulphur Creek (Figure 1). The proposed pipelines associated with this project would follow existing access roads and ROWs. The project is divided by intermittent drainages that typically flow north toward Ryan Gulch or south toward Black Sulphur Creek. Ryan Gulch and Black Sulphur Creek are tributaries to Piceance Creek which is located east of the project area. Elevation in the project area ranges from approximately 6,618 feet to approximately 6,667 feet.

Soils

The proposed project would be located on several soil types as described in Table 1 (NRCS 2021).

Table 1. Soil types in the project area.

Project Feature	Map Unit Symbol	Soil Unit Name	Farmland Status
Federal 298-13-1 Pad Disturbance	70	Redcreek-Rentsac complex, 5 to 30 percent slopes	Not prime farmland
Temporary Surface Frac Pipeline	73	Rentsac channery loam, 5 to 50 percent slopes	Not prime farmland
RG 11-13-298 Gas Pipeline	70	Redcreek-Rentsac complex, 5 to 30 percent slopes	Not prime farmland
	73	Rentsac channery loam, 5 to 50 percent slopes	Not prime farmland
RG 11-13-298 Access Road Disturbance	70	Redcreek-Rentsac complex, 5 to 30 percent slopes	Not prime farmland
	73	Rentsac channery loam, 5 to 50 percent slopes	Not prime farmland
RG 11-13-298 Pad Disturbance	73	Rentsac channery loam, 5 to 50 percent slopes	Not prime farmland

Vegetation

The primary vegetation communities within the area of the proposed development plan include pinyon/juniper woodlands and Wyoming sagebrush shrublands along ridgetops and sideslopes. A list of common plant species observed throughout the surveyed area is described in Table 2. The pinyon/juniper woodlands surrounding the project area are mature, open, and dry woodland sites.

Table 2. Common plant species occurring in the project area.

Common Name	Scientific Name	Abundance*	Habitat Type
Grasses			
Blue grama	<i>Bouteloua gracilis</i>	xx	Sagebrush shrublands, Pinyon juniper
Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>	xxx	Rocky hillsides, pinyon/juniper, reclaimed areas
Cheatgrass	<i>Bromus tectorum</i>	x	Disturbed areas, pinyon/juniper
Indian ricegrass	<i>Achnatherum hymenoides</i>	xx	Rocky hillsides
Intermediate wheatgrass	<i>Thinopyrum intermedium</i>	xx	Reclaimed areas, disturbed areas
James' galleta	<i>Pleuraphis jamesii</i>	x	Pinyon/juniper
Prairie Junegrass	<i>Koeleria macrantha</i>	xx	Pinyon/juniper, rocky hillsides
Western wheatgrass	<i>Pascopyrum smithii</i>	xx	Reclaimed areas, rocky hillsides
Forbs			

Table 2. Common plant species occurring in the project area.

Common Name	Scientific Name	Abundance*	Habitat Type
Plains prickly pear	<i>Opuntia polyacantha</i>	xx	Pinyon/juniper, sagebrush shrublands
Ballhead ipomopsis	<i>Ipomopsis congesta</i>	xx	Pinyon/juniper
Colorado bedstraw	<i>Galium multiflorum var. coloradoense</i>	xx	Rocky hillsides
Curlycup gumweed	<i>Grindelia squarrosa</i>	xx	Disturbed areas, Pinyon/juniper
Dusty penstemon	<i>Penstemon comarrhenus</i>	xx	Pinyon/juniper, rocky hillsides
Egg milkvetch	<i>Astragalus oophorus</i>	xx	Pinyon/juniper
Fineleaf hymenopappus	<i>Hymenopappus filifolius</i>	xx	Pinyon/juniper, rocky hillsides
Fremont's beardtongue	<i>Penstemon fremontii</i>	x	Rocky hillsides
Heartleaf twistflower	<i>Streptanthus cordatus</i>	xxx	Pinyon/juniper
Hoary tansyaster	<i>Machaeranthera canescens</i>	xx	Roadsides, sagebrush shrublands
Hoary Townsend daisy	<i>Townsendia incana</i>	xxx	Pinyon/juniper
Lewis flax	<i>Linum lewisii</i>	xx	Reclaimed areas
Lobeleaf groundsel	<i>Packera multilobata</i>	xxx	Pinyon/juniper
Longleaf phlox	<i>Phlox longifolia</i>	xxx	Pinyon/juniper, sagebrush shrublands
Low pussytoes	<i>Antennaria dimorpha</i>	xx	Pinyon/juniper, sagebrush shrublands
Mountain pepperweed	<i>Lepidium montanum</i>	xx	Pinyon/juniper
Rayless tansyaster	<i>Machaeranthera grindelioides</i>	xx	Pinyon/juniper, rocky hillsides
Rosy pussytoes	<i>Antennaria rosea</i>	xxx	Pinyon/juniper
Roughseed cryptantha	<i>Cryptantha flavoculata</i>	xxx	Pinyon/juniper, sagebrush shrublands
Scarlet gilia	<i>Ipomopsis aggregata</i>	xx	Pinyon/juniper
Scarlet globemallow	<i>Sphaeralcea coccinea</i>	xx	Disturbed areas, Pinyon/juniper
Sharpleaf twinpod	<i>Physaria acutifolia</i>	xxx	Pinyon/juniper, rocky hillsides
Spiny phlox	<i>Phlox hoodii</i>	xx	Pinyon/juniper, rocky hillsides
Stemless four-nerve daisy	<i>Tetraneris acaulis</i>	xx	Pinyon/juniper
Stemless mock goldenweed	<i>Stenotus acaulis</i>	xx	Pinyon/juniper

Table 2. Common plant species occurring in the project area.

Common Name	Scientific Name	Abundance*	Habitat Type
Tailcup lupine	<i>Lupinus caudatus</i>	xx	Pinyon/juniper, sagebrush shrublands
Thickleaf beardtongue	<i>Penstemon pachyphyllus</i>	xxx	Rocky hillsides
Thickstem wild cabbage	<i>Caulanthus crassicaulis</i>	xx	Pinyon/juniper
Thrift mock goldenweed	<i>Stenotus armerioides</i>	xx	Pinyon/juniper
Tufted milkvetch	<i>Astragalus spatulatus</i>	xx	Pinyon/juniper, rocky hillsides
Twolobe larkspur	<i>Delphinium nuttallianum</i>	xxx	Pinyon/juniper
Uintah Basin stickleaf	<i>Mentzelia multicaulis var. uintahensis</i>	x	Rocky hillsides
Utah sweetvetch	<i>Hedysarum boreale</i>	xx	Pinyon/juniper
Wooly groundsel	<i>Packera cana</i>	xxx	Pinyon/juniper
Shrubs/Trees			
Antelope bitterbrush	<i>Purshia tridentata</i>	xxx	Pinyon/juniper
Broom snakeweed	<i>Gutierrezia sarothrae</i>	xxx	Reclaimed areas, Disturbed areas, Pinyon/juniper
Four-winged saltbush	<i>Atriplex canescens</i>	xx	Reclaimed areas, rocky hillsides
Longflower rabbitbrush	<i>Chrysothamnus depressus</i>	xx	Pinyon/juniper, rocky hillsides
Mountain snowberry	<i>Symphoricarpos oreophilus</i>	xx	Pinyon/juniper
Rubber rabbitbrush	<i>Ericameria nauseosa</i>	xx	Reclaimed areas, Disturbed areas, Pinyon/juniper
Twoneedle pinyon	<i>Pinus edulus</i>	xxx	Pinyon/juniper
Utah juniper	<i>Juniperus osteosperma</i>	xxx	Pinyon/juniper
Wyoming sagebrush	<i>Artemisia tridentata wyomingensis</i>	xx	Sagebrush shrublands, pinyon/juniper
Yellow rabbitbrush	<i>Chrysothamnus viscidiflorus</i>	xx	Pinyon/juniper, rocky hillsides
*Abundance: xxx= High frequency; with uniform distribution across project area. xx= Moderate frequency; occurrence scattered throughout project area. x= Infrequent; only a small number of individuals noted within project area.			

VEGETATION ASSESSMENT

Sampling Methods

The vegetation sampling protocol used involves a modified “line point-intercept method” based on the National Park Service Fire Monitoring Handbook (USDI National Park Service 2003) and Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume 1: Core Methods (Herrick et al 2015). The line point-intercept method uses the contact of a point to measure cover. The theory behind this method is that if an infinite number of points are placed in a two-dimensional area, the exact cover of a plant species can be determined by counting the number of points that intersect that species.

For proposed well pads that will be newly constructed, one pre-disturbance transect was established within the project footprint. For all well pads included in the project (new and existing locations) a reference area was established within an area near the well pad in a similar vegetation community to what was present on the project location (Figure 2). Each transect was 50-meters in length (164 feet in length) The following techniques were used to collect the sample data along each transect:

1. Each sample site was randomly selected within an area representative of the vegetative community being affected by the project.
2. The transect was designated Transect 1 (pre-disturbance) and Transect 2 (reference).
3. A metal rebar stake was placed in the ground to anchor a 50-meter measuring tape (0-meters) and the tape extended across the vegetation on the site. A second rebar stake was placed and anchored the 50-meter end of the tape.
4. The beginning and ending point of the transect was recorded using a GPS receiver. Azimuths from the 0-meter to the 50-meter point were recorded.
5. Photographs were taken along the transect that recorded vegetation condition from 0 to 50-meters.
6. Point count data were collected at 1.0-meter intervals along a 50-meter tape measure using a thin, straight metal rod for a total of fifty samples taken along the transect.
7. The first plant species encountered was recorded in the “Top Layer” column. Subsequent species and litter were recorded in the “Lower Canopy Layers” columns. Each species was recorded by 4 letter code (first two letters each of genus and species); unique species were recorded only once per sample point.
8. Ground cover was recorded as a species code (for a basal intercept), rock, bedrock, moss, soil, embedded litter, or duff as defined by the sampling protocol.
9. Other species of vegetation incidentally observed in the sample area were recorded (in addition to those recorded during sampling).

Results

Vegetation monitoring was conducted by WestWater scientists during the site assessment in June 2021. A summary of percent foliar cover and percent basal cover results from the line-point intercept reference transects and pre-disturbance transects are provided in Appendix B. An illustration of the vegetation transects are provided in Figure 2 and photos of the transects and four photos of the reference areas are attached in Appendix A.

SPECIAL STATUS SPECIES (SSS) OF PLANTS AND NOXIOUS WEEDS

Survey Methods

All observations and survey tracks were recorded using handheld Global Positioning System (GPS) receivers and locations were recorded as Universal Transverse Mercator (UTM) coordinates (Datum: NAD 83, Zone: 12). Photographs were taken of the habitat, terrain, and biological features found during the survey.

Vegetation types were determined through field identification of plants, aerial photography, and on-the-ground assessment of plant abundance visible during the survey. Identification of plant species was aided by using pertinent published field guides (Ackerfield 2015, Kershaw et al. 1998, Whitson et al. 2006, CWMA 2009, Weber and Wittmann 2012) and descriptions of habitat provided by the CNHP (Spackman et al. 1997 and BLM 2015a).

The entire project area has been surveyed previously by WestWater biologists for other projects. Areas that had been surveyed during 2019 and 2020 were excluded from surveys during 2021. Based on guidance provided by the WRFO, only areas where known suitable, marginal, and occupied habitats for the Dudley Bluffs bladderpod and twinpod within 300 meters of project features were surveyed during 2021 (Figure 3). Surveys for other Special Status Species of Plants (SSS) and noxious weeds were conducted within 100 meters of project features as shown on Figure 3.

WestWater biologists identified survey routes and transect spacing based on aerial photographs, geologic mapping of the project area, and WestWater's previous observations in the area for other projects. Transect spacing varied from approximately 15 to 20 meters apart along suitable habitat (i.e. suitable tongues of the Green River Formation) up to greater than 50 meters or within line-of-sight in non-suitable habitat. Prior to conducting surveys, WestWater biologists verified that the Dudley Bluffs bladderpod and twinpod were in bloom and/or were identifiable at known locations along the Ryan Gulch ACEC. Surveys were conducted in accordance with WRFO Draft Standards for Contractor Inventories for Special Status Plants and Noxious Weeds (BLM 2019).

RESULTS

SSS Plants

Plants with potential to occur in the WRFO are described below in Table 3, which is based on WestWater's knowledge of the area, documented occurrences by CNHP (Spackman et al. 1997), geologic formations present in the project area, and WRFO plant protocol (BLM 2019).

Table 3. Federally-listed threatened, endangered, candidate, and BLM sensitive plant species in the WRFO.

Common Name	Scientific Name	Habitat Type	Status	Potential Occurrence in Project Area
Bessey's locoweed	<i>Oxytropis besseyi</i> var. <i>obnapiformis</i>	Barren fine-textured or sandy soils in pinyon-juniper and sagebrush communities; elevation range from 5,350 to 8,450 ft.	BLM Sensitive	No-Unlikely to occur in project area due to distance from known occurrences.
Cathedral Bluff meadow-rue	<i>Thalictrum heliophilum</i>	Barren shale slopes of the Green River Formation.	BLM Sensitive	No-Unlikely to occur in project area due to distance from known occurrences.
Cathedral Bluff dwarf gentian	<i>Gentianella tortuosa</i>	Barren shale slopes of the Green River Formation, elev. 8500-10,800ft.	BLM Sensitive	No-Unlikely to occur in project area due to distance from known occurrences.
Colorado feverfew	<i>Parthenium ligulatum</i>	Barren shale knolls. Elev. 5,400-6,500ft. Occurs in Rio Blanco and Moffat counties.	BLM Sensitive	No-Unlikely to occur in project area due to distance from known occurrences and the project is located outside the species known elevation ranges.
Debris milkvetch	<i>Astragalus detritalis</i>	Pinyon/juniper woodlands and shrub communities; around sandstone or shale outcrops. Occurs on far western boundary of WRFO.	BLM Sensitive	No-Unlikely to occur in project area due to distance from known occurrences.
Duchesne milkvetch	<i>Astragalus duchesnensis</i>	Limestone and sandstone outcrops in mixed pinyon/juniper and shrub communities. Occurs in Moffat county.	BLM Sensitive	No- Unlikely to occur in project area due to lack of suitable habitat and distance from known occurrences.

Table 3. Federally-listed threatened, endangered, candidate, and BLM sensitive plant species in the WRFO.

Common Name	Scientific Name	Habitat Type	Status	Potential Occurrence in Project Area
Dudley Bluffs bladderpod	<i>Physaria congesta</i>	Occurs on 13-Mile Creek Tongue and Yellow Creek Tongue, of the Green River Formation. Barren white shale outcrops.	Threatened	No- unlikely to occur in project area due to lack of suitable habitat.
Dudley Bluffs twinpod	<i>Physaria obcordata</i>	Occurs on 13-mile Creek Tongue, Yellow Creek Tongue, Parachute Creek Tongue, Dry Fork Tongue, and Garden Gulch Tongue of the Green River Formation. Barren white shale outcrops.	Threatened	No- unlikely to occur in project area due to lack of suitable habitat.
Ephedra buckwheat	<i>Eriogonum ephedroides</i>	White shale slopes of the Green River Formation; in p/j and mixed shrub communities. Occurs on far western boundary of WRFO.	BLM Sensitive	No-Unlikely to occur in project area due to distance from known occurrences.
Flaming Gorge evening primrose	<i>Oenothera acutissima</i>	Endemic to Utah; may occur in Moffat Co. Sandy, gravelly, and rocky soils, in seasonally wet areas; meadows, depressions, or along arroyos. Elev. 5300-8,500ft. Moffat County.	BLM Sensitive	No-Unlikely to occur in project area due to distance from known occurrences.
Graham's beardtongue	<i>Penstemon grahamii</i>	Barren shale slopes of the Green River Formation.	Proposed Threatened	No- Unlikely to occur within project area due to distance from known occurrences.
Narrow-stem gilia	<i>Aliciella stenothyrsa</i>	Silty to gravelly loam soils derived from the Green River Formation.	BLM Sensitive	Potential to occur along shale slopes of the Green River Formation.
Piceance bladderpod	<i>Lesquerella parviflora</i>	Shale outcrops of the Green River formation; on ledges and slopes of canyons in open areas; elevation 6,200 to 8,600 feet.	BLM Sensitive	Potential to occur along shale slopes of the Green River Formation.

Table 3. Federally-listed threatened, endangered, candidate, and BLM sensitive plant species in the WRFO.

Common Name	Scientific Name	Habitat Type	Status	Potential Occurrence in Project Area
Rollins' cryptanth	<i>Cryptantha rollinsii</i>	P/J and mixed desert shrub communities; often rocky soils from sandy clays to sandy loams, alluvial terraces with cobbles. Elev. 5,400-7,200ft. Occurs in Moffat and Rio Blanco counties.	BLM Sensitive	No- Unlikely to occur due to distance from known occurrences.
Tufted cryptanth	<i>Cryptantha caespitosa</i>	Sparsely vegetated shale slopes in p/j and sagebrush communities (usually with other cushion plants). Occurs in Moffat county only.	BLM Sensitive	No-Unlikely to occur in project area due to distance from known occurrences.
Ute Ladies'-tresses	<i>Spiranthes diluvialis</i>	Along irrigated streams, open meadows, and floodplains.	Threatened	No-Unlikely to occur in project area due to distance from known occurrences.
White River beardtongue	<i>Penstemon scariosus</i> var. <i>albifluvis</i>	Barren shale slopes in mixed shrub and pinyon/juniper communities.	Proposed Threatened	No-Unlikely to occur within project area due to distance from known occurrences.

Observations

No suitable or occupied habitat was observed for SSS plants within 300 meters of the proposed project features during 2021 surveys. The proposed well pads and pipelines associated with this development plan are located greater than 600 meters from occupied Dudley Bluffs bladderpod and twinpod habitats.

Recommendations

Due to the distance of the project features from occupied habitat for SSS plants, it is unlikely that the proposed project will have any direct impact on SSS plants or their associated habitats.

Noxious Weeds

Observations

Two Colorado State listed noxious weed species were observed within the survey area. Noxious weeds were primarily observed near existing disturbances such as roads, pads, and pipeline

ROWs (Figure 3). Cheatgrass (*Bromus tectorum*) is present in low densities throughout the understory of the sagebrush shrublands in the project area. Due to its scattered distribution, cheatgrass was not mapped. Noxious weeds observed in the survey area are described in Table 4, below and weed locations are displayed on Figure 3.

Table 4. Noxious weed observations.

Common Name	Scientific Name	State Listing Status	Location
Cheatgrass	<i>Bromus tectorum</i>	State C List	Scattered throughout the survey area.
Common mullein	<i>Verbascum thapsus</i>	State C List	Scattered along existing pipeline ROWs and access roads within project area.

Other non-native nuisance weed species, not listed by the state of Colorado as noxious, were also documented along areas of previous disturbance. This included Russian thistle, kochia (aka burning bush), and knotweed.

Recommendations

Soil disturbance associated with construction in the project area may promote conditions that facilitate the spread of invasive noxious weeds. The application of an aggressive weed management plan for this project site is recommended to: 1) prevent the invasion and expanded range of noxious weeds; and 2) ensure the establishment of desirable plant life upon rehabilitation of the proposed project features.

It is recommended that TEP develop and implement an integrated vegetation and noxious weed management plan in accordance with BLM WRFO standards.

WILDLIFE – TERRESTRIAL AND AQUATIC

Survey Methods

Data locations were recorded using handheld Global Positioning System (GPS) units (Datum: Zone 12, NAD83) and photographs were taken of the habitat, terrain, and biological features found during the survey. Aerial photographs were consulted to determine survey routes and areas of suitable raptor nesting habitat.

Raptor and Birds of Conservation Concern (BCC) surveys were conducted on foot within a 0.25-mile radius of project features in suitable woodland raptor nesting habitat and within 0.5 mile of the project features for cliff nests (Figure 4). Other biological features and sensitive wildlife habitats were recorded as they were encountered.

Raptor surveys for the project were conducted in accordance with WRFO protocols (Smithers 2012) during May of 2019, 2020, and 2021. Survey transects in suitable woodland habitat were spaced approximately 50 meters apart or less in areas of highly suitable habitat. Woodland raptor nest surveys were aided by using call playback methodology (Iverson and Fuller 1991;

Kennedy and Stahlecker 1993; Mosher and Fuller 1996; Mosher et. al. 1990; Reynolds et. al. 1992) using electronic digital game calls. Call station locations are displayed on Figure 4. Data collected included cliff/tree height, nest height, tree diameter at breast height (DBH), nest diameter, nest depth, nest slope, nest aspect, nest status, (occupied, unoccupied, or unknown), and general condition of the nest.

Results

Raptors

Mature pinyon/juniper woodlands are present throughout the project area. The pinyon/juniper woodlands are composed of trees ranging in height from 10 feet to over 35 feet tall. The understory on south and west facing slopes is open and dry. The north and east facing slopes are intermixed with mountain mahogany, sagebrush shrublands, and serviceberry. Approximately 1,085 acres were surveyed for nesting raptors during woodland raptor surveys (Figure 4). Of that total, approximately 720.76 acres were surveyed during 2021, while the remaining 364 acres were surveyed during 2019 and 2020. Suitable rock outcrops and cliffs within 0.5 mile of the project area were searched for nesting raptors with the use of binoculars and spotting scopes. Known nests within the survey area were checked for status and results are shown on Figure 4.

Several species of raptors may potentially inhabit the project area (Table 5) (Andrews and Righter 1992, Wickersham 2016, and Poole 2021). Four of the raptors that may potentially occur are also on the Birds of Conservation Concern (BCC) list.

Table 5. Raptor species that may be present in the project area.

Common Name	Scientific Name	BCC
American Kestrel	<i>Falco sparverius</i>	No
Cooper's Hawk	<i>Accipiter cooperii</i>	No
Golden Eagle	<i>Aquila chrysaetos</i>	Yes
Great Horned Owl	<i>Bubo virginianus</i>	No
Long-eared Owl	<i>Asio otus</i>	Yes
Northern Goshawk	<i>Accipiter gentilis</i>	No
Northern Pygmy Owl	<i>Glaucidium gnoma</i>	No
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	No
Peregrine Falcon	<i>Falco peregrinus</i>	Yes
Prairie Falcon	<i>Falco mexicanus</i>	Yes
Red-tailed Hawk	<i>Buteo jamaicensis</i>	No
Sharp-shinned Hawk	<i>Accipiter striatus</i>	No

Observations

One occupied raptor nest was observed within 0.25 miles of the proposed development plan as shown on Figure 4. The nest was occupied by a Cooper's Hawk (COHA-1). Two other nests (COHA-2 and COHA-3) that had been recorded during previous surveys by WestWater biologists were observed as destroyed during the 2021 surveys (Figure 4). The distance to the nearest project feature from the occupied nest is described in Table 6. A description of the nest and photographs are attached in Appendix C.

Table 6. Nest distance to nearest project feature.

Map Label	Common Name	Vacancy	Distance to Disturbance (Meters)	Nearest Project Feature
COHA-1	Cooper's Hawk	Occupied	39	Frac Line

Recommendations

Timing limitations for construction activities should be applied for occupied raptor nests as outlined in the BLM WRFO Resource Management Plan (BLM 1997 and BLM 2015b). If construction activities take place during a subsequent nesting season, a new raptor survey conducted by qualified biologists is recommended.

Special Status Wildlife Species (excluding raptors)

In addition to raptors, WestWater biologists conducted literature reviews and surveyed the project area for the presence of Special Status Species (SSS) of wildlife and their habitat including: species listed under the Endangered Species Act (ESA) as candidate, threatened, and endangered; BLM Sensitive Species (BLM 2015a); and Birds of Conservation Concern (USFWS 2021a). Species that could potentially occur are described in Table 7.

Literature reviews of species occurrence in the project area included BCC habitat and nesting records as described in the Colorado Breeding Bird Atlas (Wickersham 2016) and Colorado Birds (Andrews and Righter 1992), references in Mammals of Colorado (Fitzgerald et al. 2011), and references in Amphibians and Reptiles in Colorado (Hammerson 1999).

Table 7. Status of Candidate, Threatened, Endangered, BLM sensitive species and BCC species that may occur within project area.

Species Common Name	<i>Species Scientific Name</i>	Status	Habitat Description	Habitat or Species Potentially Occurring within Landscape Area
MAMMALS				

Table 7. Status of Candidate, Threatened, Endangered, BLM sensitive species and BCC species that may occur within project area.

Species Common Name	<i>Species Scientific Name</i>	Status	Habitat Description	Habitat or Species Potentially Occurring within Landscape Area
Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>	S	Semi-desert shrublands, pinyon/juniper woodlands, and open montane forests associated with caves or crevices in rockfaces. Elevations up to 9,500 ft. Known in all W. CO counties.	May roost in pinyon/juniper woodlands.
Spotted bat	<i>Euderma maculatum</i>	S	Rocky cliffs, caves, crevices, or mines near coniferous woodlands or open semi-desert shrublands accessible to water. Elevation ranges from sea- level to 10,600 ft. Known in Moffat County and likely to occur elsewhere in W CO.	May roost in pinyon/juniper woodlands.
Fringed Myotis	<i>Myotis thysanodes</i>	S	Roosts in caves or mines near ponderosa pine forests, oakbrush, greasewood, or saltbush shrublands. Feeds on insects. Elevation up to 7,500 ft.	May roost in pinyon/juniper woodlands.
BIRDS				
Greater Sage- grouse	<i>Centrocercus urophasianus</i>	S	Broad, continuous big sagebrush habitat on flat or gently sloping terrain north of the Colorado River. Elevation range is broad in appropriate habitat. Confirmed breeder in Moffat, Rio Blanco, and Garfield Counties.	Potential to occur. Located within historic habitat.

Table 7. Status of Candidate, Threatened, Endangered, BLM sensitive species and BCC species that may occur within project area.

Species Common Name	<i>Species Scientific Name</i>	Status	Habitat Description	Habitat or Species Potentially Occurring within Landscape Area
Brewer's Sparrow	<i>Spizella breweri</i>	S	Expanses of big sagebrush with little shrub diversity on relatively level ground. Elevations up to and above timberline. Confirmed breeder in all W CO counties.	Observed during surveys. Likely nests in sagebrush shrublands surrounding project area.
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	BCC	Predominately pinyon/juniper woodlands. Year-round resident of W CO. Elevation 5,000 to 8,000 ft. Confirmed breeder in all W CO counties.	Observed during surveys. Likely nests in pinyon/juniper woodlands surrounding project area.
Juniper Titmouse	<i>Baealophus griseus</i>	BCC	Year-round resident of pinyon/juniper woodlands. Confirmed breeder in all W CO counties.	Observed during surveys. Likely nests within pinyon/juniper woodlands surrounding project area.
Cassin's Finch	<i>Carpodacus cassinii</i>	BCC	Nests in ponderosa pine, Douglas-firs, and conifer forests. May occur in pinyon/juniper forests.	May occur in the pinyon/juniper woodlands of the project area.
FISH				
Bluehead sucker	<i>Catostomus discobolus</i>	S, SC	Small to mid-size tributaries in the Upper Colorado River Basin and suitable habitat in larger main-stem streams; runs and riffles with rocky or gravelly substrate and cool temperatures.	Known to occur downstream of the project area in Piceance Creek.

Table 7. Status of Candidate, Threatened, Endangered, BLM sensitive species and BCC species that may occur within project area.

Species Common Name	<i>Species Scientific Name</i>	Status	Habitat Description	Habitat or Species Potentially Occurring within Landscape Area
Colorado pikeminnow	<i>Ptychocheilus lucius</i>	E, ST	The Colorado River and its major tributaries; adults require pools, deep runs, and eddy habitats and high spring run-off flows that flush sediment from spawning areas; spawn on gravel and cobble substrates; nursery habitat includes backwaters and flooded lowlands.	Known to occur downstream of the project area in the White River.
Flannelmouth sucker	<i>Catostomas latipinnis</i>	S	Medium and large low elevation rivers of the Upper Colorado River system; slow, warmer waters in the mouths of tributaries, pools, and deep runs, as well as riffles and backwaters; as habitat generalists, this fish will utilize most riverine habitats in some season or life stage, but does avoid cold tail waters and headwaters.	Known to occur downstream of the project area in Piceance Creek.
Mountain sucker	<i>Catostomus platyrhynchus</i>	S, SC	Small streams to large rivers (lakes and reservoirs to a lesser extent); in streams, low gradient segments with riffles, runs, and pools associated with cover and woody debris and a variety of substrates; spawn in riffles below pools; shallow, slow moving water behind obstructions or aquatic vegetation provides nursery habitat.	Known to occur downstream of the project area in Piceance Creek.

Table 7. Status of Candidate, Threatened, Endangered, BLM sensitive species and BCC species that may occur within project area.

Species Common Name	<i>Species Scientific Name</i>	Status	Habitat Description	Habitat or Species Potentially Occurring within Landscape Area
Razorback sucker	<i>Xyrauchen texanus</i>	E, SE	Main-stem of the Colorado River and its major tributaries; seasonal pattern to habitat use by adult fish; fall/winter preference for pools and slow eddies, runs and backwaters in early spring, backwaters and flooded lowlands in June, and runs and pools in late summer and early fall; may also utilize reservoir habitats.	Known to occur in the White River downstream of the project area.
Roundtail chub	<i>Gila robusta</i>	S, SC	Medium and large tributaries to the Colorado River Stream reaches with pool and riffle habitats, often occupying deep, slow areas with debris and cover on a rocky, gravel, silt, or sandy substrate.	Known to occur in the White River downstream of the project area.
AMPHIBIANS				
Great Basin spadefoot	<i>Spea intermontana</i>	S	Rocky canyons, shrublands, semi-desert shrubland, or pinyon-juniper woodland with available water sources for reproduction; known in Moffat, Rio Blanco, Garfield, and Mesa Counties.	May occur near Piceance Creek and other temporary/perennial water sources.
Northern leopard frog	<i>Lithobates (Rana) pipiens</i>	S, SC	Wet meadows and the banks and shallow areas of ponds, marshes, lakes, streams, reservoirs, ditches; known in all W CO counties.	Known to occur along perennial water sources downstream of the project area (i.e. Piceance Creek).
REPTILES				

Table 7. Status of Candidate, Threatened, Endangered, BLM sensitive species and BCC species that may occur within project area.

Species Common Name	<i>Species Scientific Name</i>	Status	Habitat Description	Habitat or Species Potentially Occurring within Landscape Area
Midget faded rattlesnake	<i>Crotalus viridis concolor</i>	S, SC	Habitat varies from riparian to semi-desert shrublands and foothills. Elevation to appx. 7,500 ft. Known in Mesa, Delta, and Garfield Counties.	May occur within the project area.

*BCC- Birds of Conservation Concern, E – USFWS Endangered Species, C- USFWS Candidate species, S-BLM Sensitive Species, SC – Colorado Sensitive Species, ST – Colorado Threatened Species

Observations

Mammals: BLM sensitive species of bats may roost and occupy the pinyon/juniper woodlands present throughout the project area. It is unlikely that they would breed within the project boundaries due to lack of suitable habitat (i.e. mines, caves, rocky outcrops). No bat-specific surveys were conducted for this project.

Birds: Brewer’s Sparrow, Pinyon Jay, and Juniper Titmouse were observed within the sagebrush shrublands and pinyon/juniper woodlands surrounding the project area. It is likely that they are also nesting in the area; however, no nesting was observed. Cassin’s Finch likely occur and nest within the pinyon/juniper woodlands; however, none were observed.

The project area includes sagebrush and mountain shrubland habitats suitable for nesting and brood rearing sage-grouse. The project area is located within mapped historic Greater Sage-grouse range (CPW 2021); however, none of the project features fall within currently mapped occupied habitat. No sage-grouse sign (i.e. fecal pellets, cecal pellets, feathers, etc.) or birds were observed during surveys.

Fish: The Colorado pikeminnow and razorback sucker, which are federally listed endangered fish species, occur within the White River downstream of the project area. The White River from Rio Blanco Lake downstream to the confluence with the Green River is designated critical habitat for the Colorado pikeminnow (USFWS 1994). Downstream of the White River in the Green and Colorado Rivers is designated critical habitat for the razorback sucker (USFWS 1994). No records indicate that the humpback chub and bonytail occur in the White River at the confluence with Piceance Creek; however, USFWS designated critical habitat for these two species occur downstream in the Green River (USFWS 1994).

Several BLM sensitive species of fish are known to occur in Piceance Creek which is located downstream of the proposed well pads. These species include bluehead sucker, flannelmouth sucker, mountain sucker, and roundtail chub. Colorado River endangered fishes and BLM sensitive fish species and their habitats could be impacted by project development related to any increase in sediment to waterways and contamination from spills.

Amphibians: In Colorado, Great Basin spadefoot are found in pinyon/juniper woodlands, sagebrush, and semi-desert shrublands where they utilize permanent and temporary water sources for breeding. It is possible that the species could occur near the project area along Piceance Creek, Ryan Gulch, and other intermittent/perennial water sources.

Northern leopard frogs are known to occur downstream of the project area along Black Sulphur Creek and along Piceance Creek.

Reptiles: The midget faded rattlesnake (*Crotalus viridis concolor*) is listed by the BLM WRFO as a sensitive species, and is known to occur in northwestern Colorado in a variety of habitats, including pinyon/juniper woodlands and shrublands (Hammerson 1999). It is a subspecies of the prairie (western) rattlesnake (*C. viridis*), and Hammerson (1999) states that intergradation occurs between the subspecies *concolor* and the subspecies *viridis*. None were observed during surveys.

Recommendations

Mammals: It is unlikely that project development would impact populations of BLM sensitive species of bats. During project construction bats would likely relocate to alternate roosting sites; therefore, the species would not be directly impacted by the project.

Birds: Impacts to migratory bird species which nest in sagebrush and pinyon/juniper woodlands can be minimized if surface disturbing construction activities take place outside the nesting season. Nesting season is generally considered from April 1 to July 30 in this area. May 1 to July 15 is the peak period when most incubation and brood rearing takes place. If brush clearing can occur prior to May 1, most affected birds will relocate to alternate nesting sites. After mid-to-late July, most fledging has occurred and brush clearing impacts would be minimized.

Fish/Amphibians: TEP plans to use freshwater for dust suppression and during drilling operations. No freshwater will be used during completions. Water depletions associated with this project and stormwater run-off may affect special status aquatic species downstream. Appropriate mitigation for depletions includes measures outlined in the Programmatic Biological Opinion issued by the USFWS for minor water depletions related to the BLM's fluid minerals program (USFWS 2017). Stormwater management plans and spill prevention and counter control measures should be implemented as appropriate for projects of this nature.

Reptiles: Rattlesnakes may den communally or individually in a variety of habitat features that offer insulation and security, including deep crevices in rocky outcroppings and rodent dens. Rock outcrops and crevices near the project area may provide suitable denning habitat for snakes. Rattlesnakes are uncommon in the Piceance Basin, but construction personnel and surveyors should be educated on snake identification and conflict avoidance in an effort to prevent injury to personnel and mortality to snakes that may be encountered during the project development.

Elk and Mule Deer

The proposed Ryan Gulch Phase 2 Development Plan would be located outside of mapped HPH areas for mule deer and elk. The proposed RG 11-13-298 well pad would be located approximately 138 meters from mapped mule deer severe winter range and winter concentration areas (Figure 5). The Federal 298-13-1 well pad is located approximately 302 meters and 1,492 meters from mule deer severe winter range and mule deer winter concentration areas, respectively (COGCC 2021). The proposed adjoining temporary surface frac line would be located within mule deer severe winter range as shown on Figure 5.

Recommendations

In order to reduce impacts to mule deer during the winter months it is recommended that project construction activities do not occur from December 1st to April 30th (BLM 2015b).

Implementation of a noxious weed management and revegetation plan would reduce the impacts of habitat alteration. A reclamation plan should be implemented to reduce the establishment of noxious weeds in disturbed areas. Reclamation of disturbed areas not utilized as part of the facilities would decrease the presence of noxious weeds and provide forage for mule deer and elk. Any necessary fencing should be constructed consistent with published standards that reduce impacts to big game (Hanophy 2009).

Black Bear and Mountain Lion

CPW mapping shows the project area to be within overall range for black bear and mountain lion (CPW 2021). Black bears are omnivorous and the diet depends largely on what kinds of food are seasonally available, although their mainstay is vegetation. In spring, emerging grasses and succulent forbs are favored. In summer and early fall, bears take advantage of a variety of berries and other fruits. In late fall, preferences are for berries and mast (acorns), where available. Black bears are in hibernation from mid-November through May. Mountain lions typically follow migrating deer herds in search of deer as the primary food source. They tend to have large territories and are highly mobile as they search for food or new territories.

Recommendations

Black bear will likely be foraging in the habitat surrounding the project site, particularly when berries and acorns ripen. Personnel may be unfamiliar with wildlife in the area and should be informed of the potential for bear interactions. Personnel should not feed bears at any time. Bears should not be approached if encountered in the project area. All garbage and any food items should be stored in bear-proof receptacles and/or removed from the site on a daily basis to prevent attracting bears to the site to prevent interactions that result in euthanasia of problem bears.

Aquatic Wildlife (excluding SSS)

The proposed well pad locations associated with this project would be located greater than one mile from any perennial water resources. Piceance Creek would be located downstream of the project area and provides suitable habitat for a variety of native and non-native fish and amphibian species.

Recommendations

Due to the distance of the proposed well pad locations from Piceance Creek and with the implementation of proper erosion control methods and stormwater management plans, the proposed project should have little to no impact on aquatic species present downstream of the project.

Aquatic Habitat Waters

Aquatic habitat waters as identified by the Colorado Parks and Wildlife and indicated as No Surface Occupancy (NSO) habitats by COGCC are described below (COGCC 2021).

Aquatic Cutthroat Trout Designated Crucial Habitat Waters: There are no waters identified as Aquatic Cutthroat Trout Designated Crucial Habitat Waters within the project vicinity (greater than 1 mile from project area) (COGCC 2021).

Aquatic Gold Medal Waters: There are no waters identified as Aquatic Gold Medal Waters within the project vicinity (greater than 5 miles from project area) (COGCC 2021).

Aquatic Native Species Conservation Waters: Black Sulphur Creek and Piceance Creek have been classified as an Aquatic Native Species Conservation Waters and are located downstream of the Ryan Gulch Phase 2 project. The nearest aquatic native species conservation waters to each well pad is described in Table 8, below (COGCC 2021).

Table 8. Nearest Downstream Aquatic Native Species Conservation Waters to Project Features.

Well Pad	Stream Name	Distance (Miles)
Federal 298-13-1 Pad Disturbance	Black Sulphur Creek	0.84
RG 11-13-298 Pad Disturbance	Piceance Creek	2.71

Aquatic Sportfish Management Waters: Ryan Gulch, which is located downstream of the proposed project, is considered Aquatic Sportfish Management Waters (COGCC 2021). This segment of Ryan Gulch is an intermittent stream and does not contain water during much of the year. The distance of the area mapped as Aquatic Sportfish Management Waters from each well pad included in the Ryan Gulch Development Plan Phase 2 is shown in Table 9, below.

Table 9. Distance to Ryan Gulch from Project Features.

Project Feature	Distance (meters)
Federal 298-13-1 Well Pad	2,190
RG 11-13-298 Well Pad	859

Recommendations

It is recommended that a stormwater management plan is prepared and implemented for the proposed project to prevent increased sediment from reaching Ryan Gulch and eventually Piceance Creek.

WATER RESOURCES – SURFACE AND GROUND

Sensitive Areas Determination

A sensitive area is an area vulnerable to potential significant adverse groundwater impacts, due to factors such as the presence of shallow groundwater or pathways for communication with deeper groundwater and the proximity to surface water, including lakes, rivers, perennial or intermittent streams, creeks, irrigation canals, and wetlands. Additionally, areas classified for domestic use by the Water Quality Control Commission, local (water supply) wellhead protection areas, areas within 1/8 mile of a domestic water well, areas within 1/4 mile of a public

water supply well, ground water basins designated by the Colorado Ground Water Commission, and surface water supply areas are considered sensitive areas. A sensitive areas determination was completed for this project and is attached as Appendix D to this report. Based on the current design of the proposed project and topographic features surrounding the site, it was determined that the Federal 298-13-1 and RG 11-13-298 well pads are not located within a hydrologically sensitive area. The sensitive areas determination for each location is included in Appendix D along with hydrological maps.

Waters of the U.S. (including wetlands)/Waters of the State

Waters of the U.S. (WoUS) include wetlands and drainages that fall under the jurisdiction of the U.S. Army Corps of Engineers (ACOE). Waters of the State (WoS) include all surface and subsurface waters which are contained in or flow in or through the state. Perennial, intermittent, and ephemeral streams and drainages, as indicated on U.S. Geological Survey mapping, are considered WoUS/WoS if they exhibit evidence of flow (i.e. ordinary high water mark – OHWM) and are hydrologically connected to a perennial stream.

Prior to conducting surveys, WestWater biologists reviewed the National Wetland Inventory (NWI) database to determine if there were potential wetland areas within 500 feet of the project features (USFWS 2021b). Potential wetlands as indicated by NWI mapping were field-verified to determine the presence or absence of jurisdictional wetlands. Wetland areas were identified on the basis of hydrology, vegetation, and the presence of hydric soils.

WestWater biologists surveyed the project area for aquatic resources including springs, seeps, wetlands, and WoUS crossings that would fall under the jurisdiction of the ACOE or would be considered WoS in conjunction with other surveys that were conducted for this report.

Observations

No WOUS or WoS would be directly impacted by the proposed project. There are also no ACOE jurisdictional wetlands within 0.5-miles of the proposed well pad locations. Based on a review of the NWI database, three intermittent streams occur within the 0.5-mile buffer of the well pad locations; however, no wetland features were observed along these channels during surveys (Figure 6). The NWI has classified these stream segments as Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC) (USFWS 2021b). The nearest surface water feature to the Federal 298-13-1 well pad location is an intermittent stream located approximately 1,942 feet downstream of the project area. The nearest surface water feature to the RG 11-13-298 well pad is approximately 1,497 feet located cross-gradient from the well pad location. Hydrology maps depicting the nearest surface water to each well pad and the downgradient areas are attached in Appendix D of this report.

Recommendations

To protect the integrity of perennial streams and associated riparian ecosystems downstream of the project area, Best Management Practices (BMPs), including adequate barriers and filtration methods, should be used to prevent soil erosion and sedimentation of perennial streams and riparian areas.

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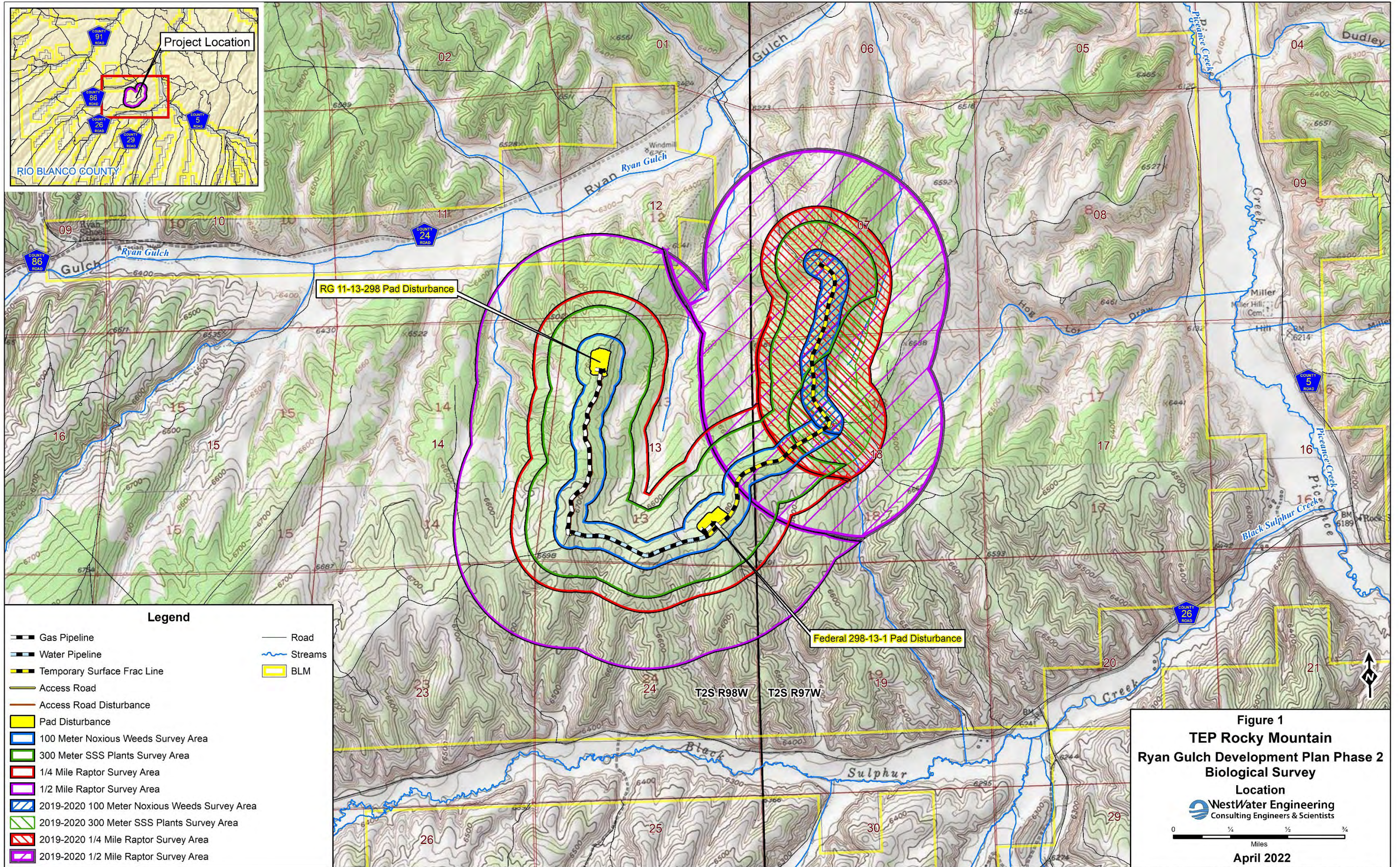
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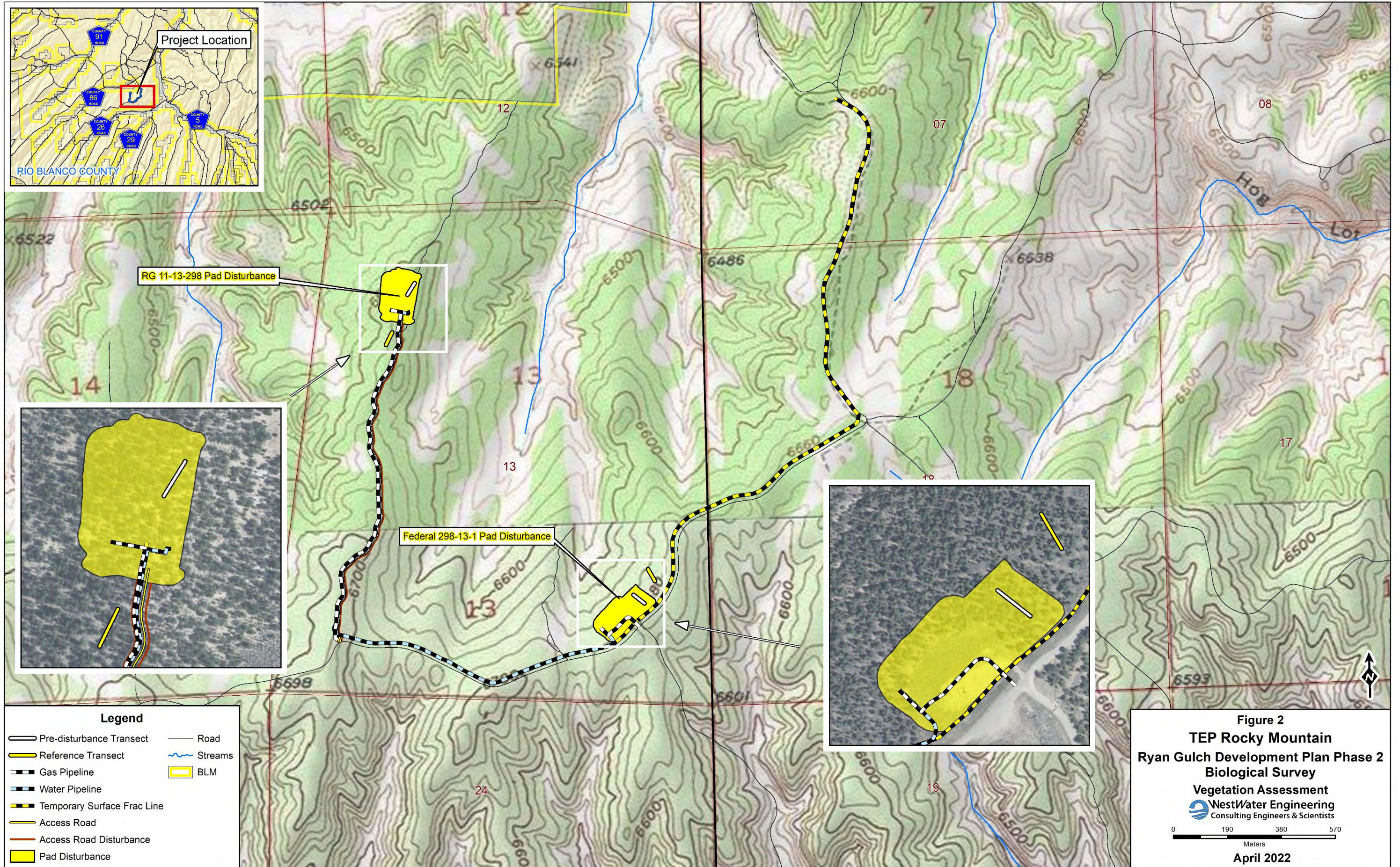
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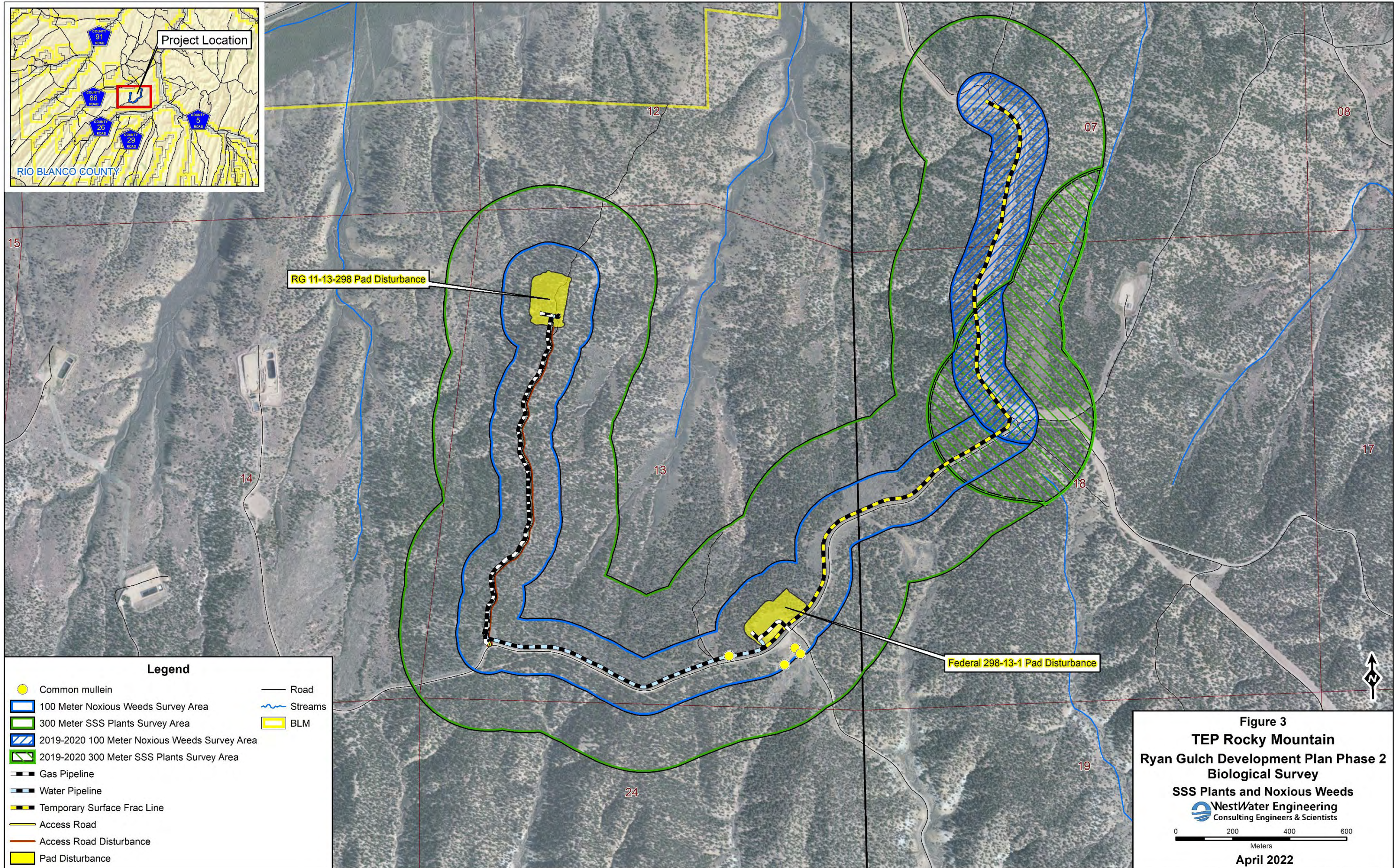
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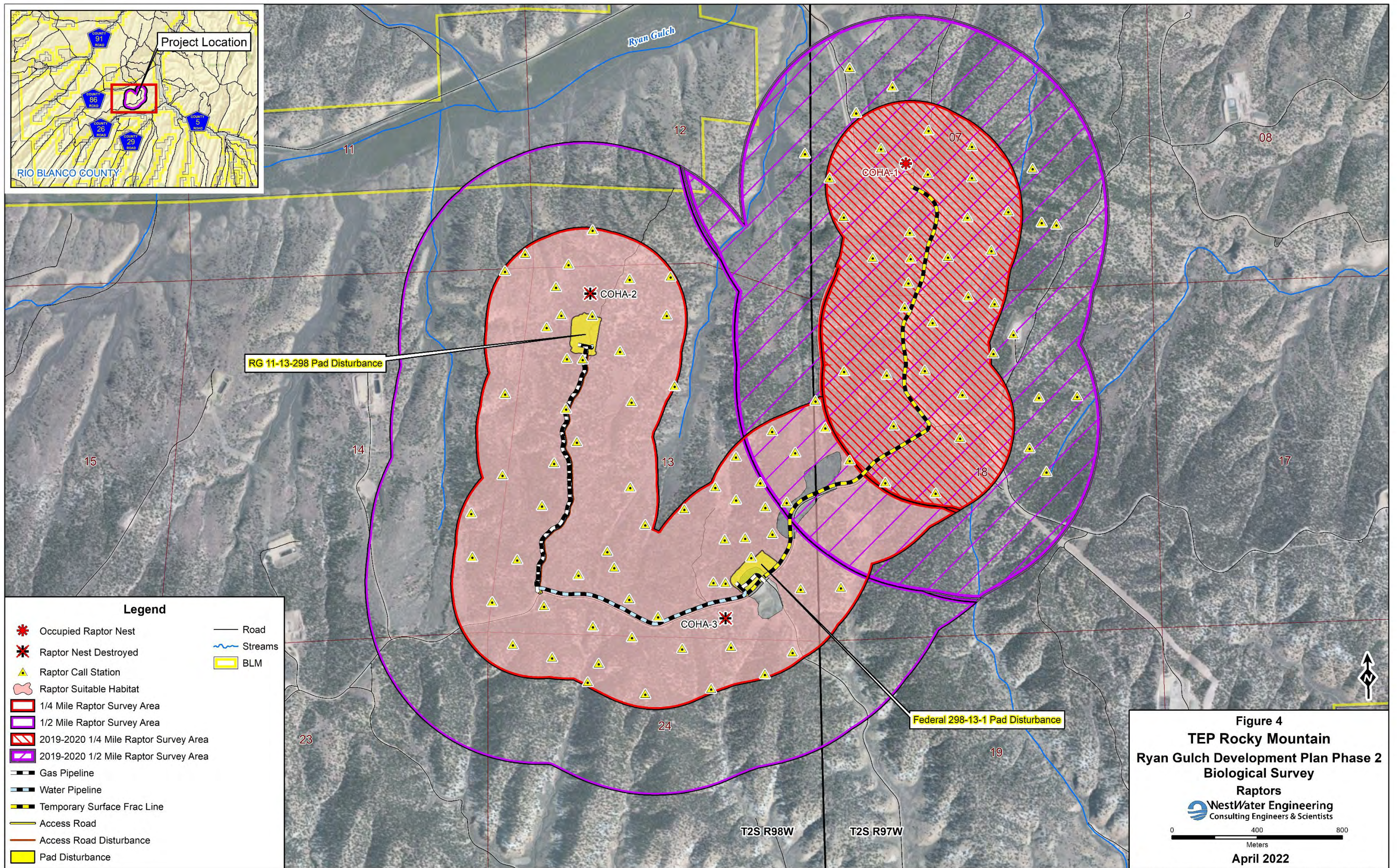
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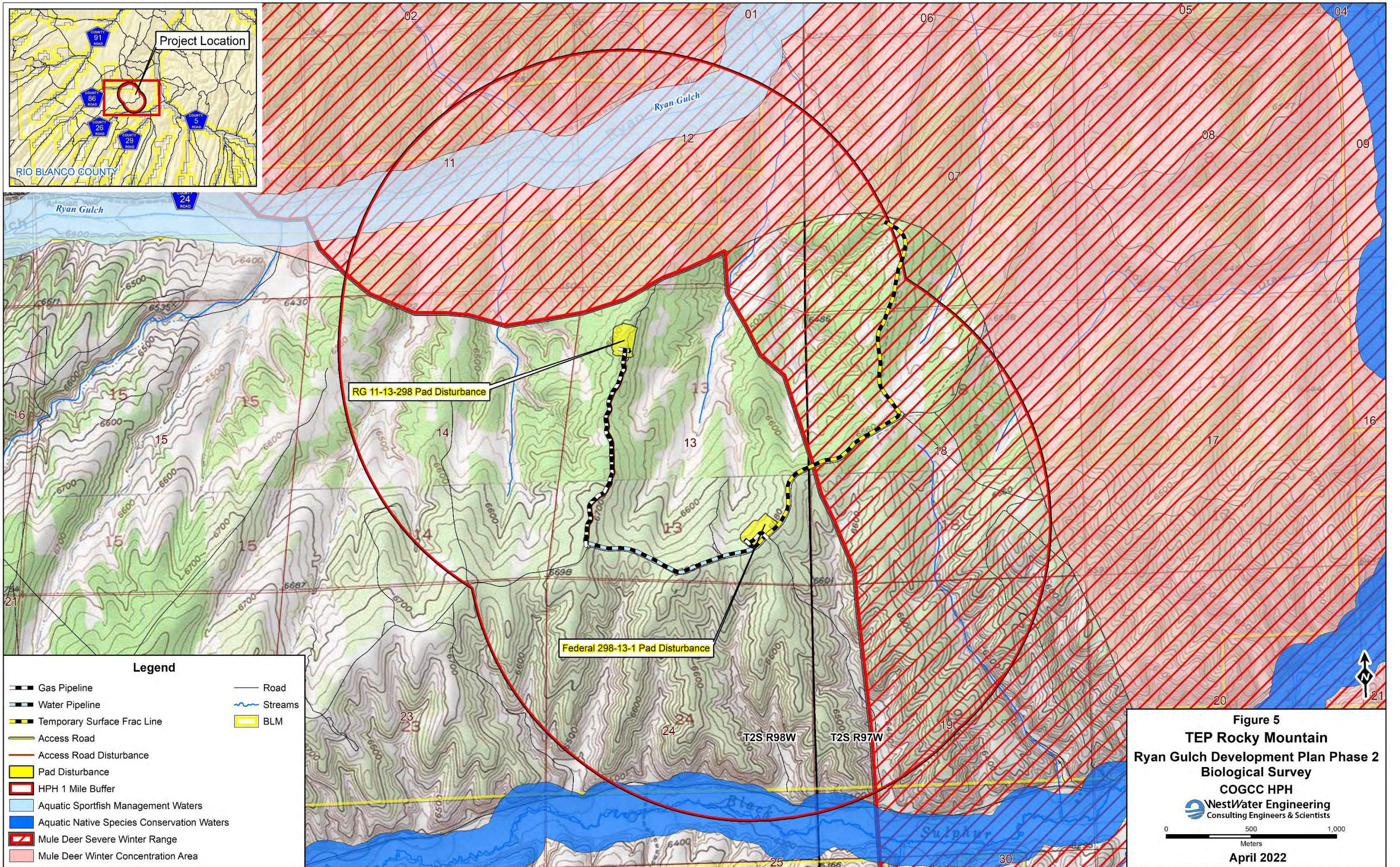
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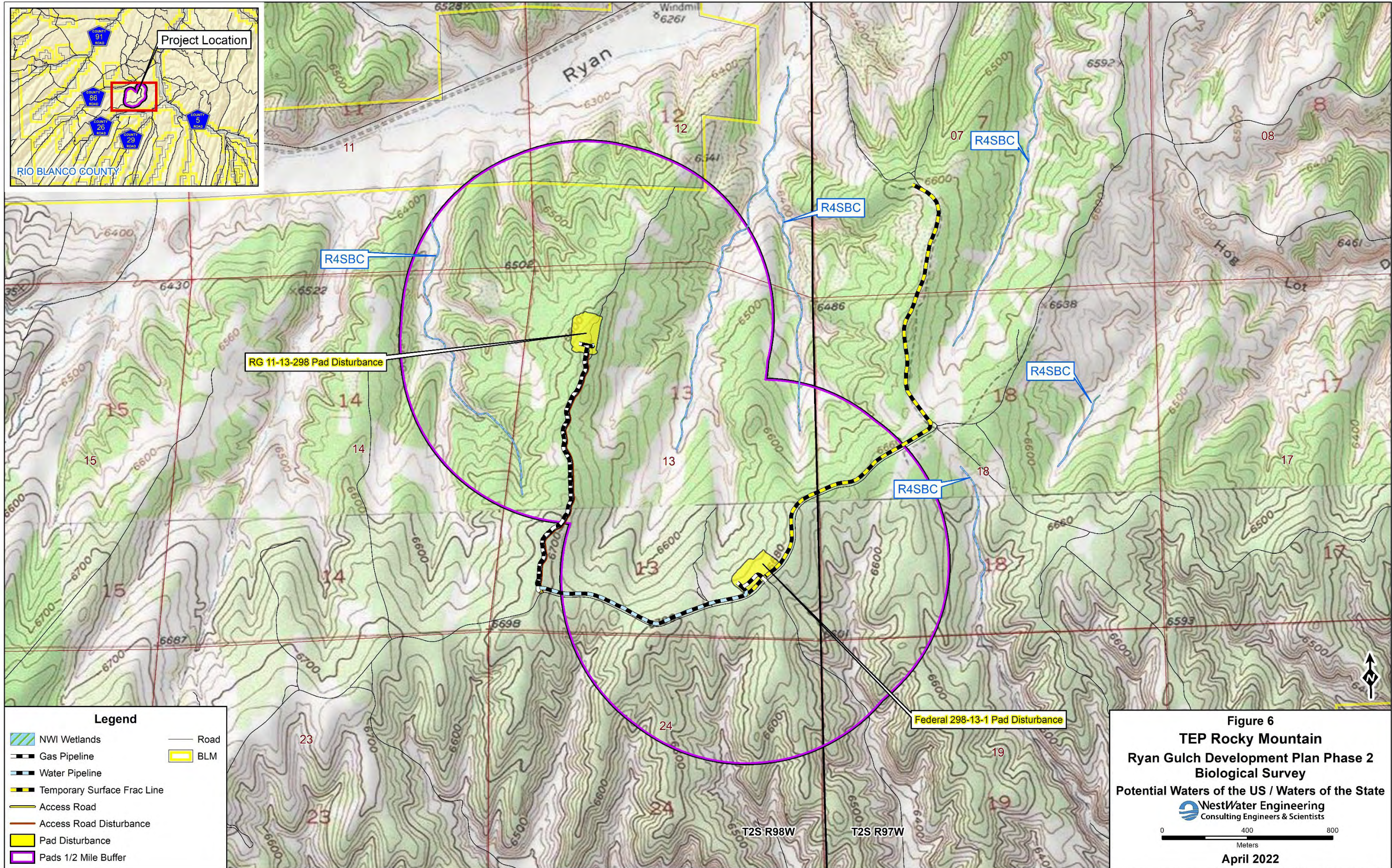












APPENDIX A
REFERENCE PHOTOGRAPHS



Reference Area Looking North



Reference Area Looking South



Reference Area Looking East



Reference Area Looking West

Notes:

- 1) Please see the Reference Area Map for an aerial overview of the reference area.
- 2) Reference Area Location: Lat: 39.86006266 / Long: -108.4757003
- 3) Please see the Vegetation Assessment conducted on June 9, 2021 for additional details on the reference area including a list of dominant vegetation within the reference area.

**FEDERAL 298-13-1 PAD
REFERENCE PICTURES**

TEP ROCKY MOUNTAIN LLC
Taken By: West Water Engineering
Date Taken: 06/9/2021





Reference Area Overhead

Notes:

- 4) Please see the Reference Area Map for an aerial overview of the reference area.
- 5) Reference Area Location: Lat: 39.86006266 / Long: -108.4757003
- 6) Please see the Vegetation Assessment conducted on June 9, 2021 for additional details on the reference area including a list of dominant vegetation within the reference area.

**FEDERAL 298-13-1 PAD
REFERENCE PICTURES**

TEP ROCKY MOUNTAIN LLC
Taken By: West Water Engineering
Date Taken: 06/09/2021





Reference Area Looking North



Reference Area Looking South



Reference Area Looking East



Reference Area Looking West

Notes:

- 1) Please see the Reference Area Map for an aerial overview of the reference area.
- 2) Reference Area Location: Lat: 39.88234922 / Long: -108.3461108
- 3) Please see the Vegetation Assessment conducted on June 9, 2021 for additional details on the reference area including a list of dominant vegetation within the reference area.

**RG 11-13-298 PAD
REFERENCE PICTURES**

TEP ROCKY MOUNTAIN LLC
Taken By: West Water Engineering
Date Taken: 06/9/2021





Reference Area Overhead

Notes:

- 4) Please see the Reference Area Map for an aerial overview of the reference area.
- 5) Reference Area Location: Lat: 39.88234922 / Long: -108.3461108
- 6) Please see the Vegetation Assessment conducted on June 9, 2021 for additional details on the reference area including a list of dominant vegetation within the reference area.

**RG 11-13-298 PAD
REFERENCE PICTURES**

TEP ROCKY MOUNTAIN LLC
Taken By: West Water Engineering
Date Taken: 06/9/2021



APPENDIX B
VEGETATION ASSESSMENT DATA

Table 1. Percent Foliar and Basal Cover for Pre-disturbance Transect

Transect 1 - Within RG 11-13-298 Disturbance Area		
Transect Location (UTM Zone 12, NAD83 datum) 0-meter terminus: 4418070N, 726939E 50-meter terminus: 4418111N, 726964E Azimuth (true north): 24°		
Group	% Foliar Cover	% Basal Cover
Native Perennial Graminoids	6	0
Introduced Perennial Graminoids	0	0
Native Annual Graminoids	0	0
Introduced Annual Graminoids	0	0
Native Perennial Forbs	4	0
Introduced Perennial Forbs	0	0
Native Annual/Biennial Forbs	0	0
Introduced Annual/Biennial Forbs	0	0
Subshrubs/Shrubs	2	0
Trees	38	0
Total	50	0
Bare ground %	50	

Table 2. Percent Foliar and Basal Cover for Reference Transect

Transect 2 - RG 11-13-298 Reference		
Transect Location (UTM Zone 12, NAD83 datum) 0-meter terminus: 4417937N, 726885E 50-meter terminus: 4417894N, 726863E Azimuth (true north): 208°		
Group	% Foliar Cover	% Basal Cover
Native Perennial Graminoids	4	0
Introduced Perennial Graminoids	0	0
Native Annual Graminoids	0	0
Introduced Annual Graminoids	0	0
Native Perennial Forbs	2	0
Introduced Perennial Forbs	0	0
Native Annual/Biennial Forbs	0	0
Introduced Annual/Biennial Forbs	0	0
Subshrubs/Shrubs	2	0
Trees	24	0
Total	32	0
Bare ground %	68	

Table 3. Plant Species Recorded Along RG 11-13-298 Pre-Disturbance Transect

Common Name	Scientific Name	Percent Foliar Cover
Antelope bitterbrush	<i>Purshia tridentata</i>	2
Indian ricegrass	<i>Achnatherum hymenoides</i>	2
Needle and thread	<i>Hesperostipa comata</i>	2
Pinyon pine	<i>Pinus edulis</i>	16
Prairie Junegrass	<i>Koeleria macrantha</i>	2
Torrey's milkvetch	<i>Astragalus calycosus</i>	4
Utah juniper	<i>Juniperus osteosperma</i>	22
Total		50

Table 4. Plant Species Recorded Along RG 11-13-298 Reference Transect

Common Name	Scientific Name	Percent Foliar Cover
Antelope bitterbrush	<i>Purshia tridentata</i>	2
Indian ricegrass	<i>Achnatherum hymenoides</i>	2
Pinyon pine	<i>Pinus edulis</i>	12
Sandberg's bluegrass	<i>Poa secunda</i>	2
Torrey's milkvetch	<i>Astragalus calycosus</i>	2
Utah juniper	<i>Juniperus osteosperma</i>	12
Total		32

Table 5. Percent Foliar and Basal Cover for Pre-disturbance Transect

Transect 1 - Within Fed. 298-13-1 Disturbance Area		
Transect Location (UTM Zone 12, NAD83 datum)		
0-meter terminus: 4417013N, 727734E		
50-meter terminus: 4418070N, 726939E		
Azimuth (true north): 275°		
Group	% Foliar Cover	% Basal Cover
Native Perennial Graminoids	16	0
Introduced Perennial Graminoids	0	0
Native Annual Graminoids	0	0
Introduced Annual Graminoids	0	0
Native Perennial Forbs	2	0
Introduced Perennial Forbs	0	0
Native Annual/Biennial Forbs	0	0
Introduced Annual/Biennial Forbs	0	0
Subshrubs/Shrubs	0	0
Trees	42	
Total	60	
Bare ground %	40	

Table 6. Percent Foliar and Basal Cover for Reference Transect

Transect 2 – Fed. 298-13-1 Reference		
Transect Location (UTM Zone 12, NAD83 datum)		
0-meter terminus: 4417062N, 727809E		
50-meter terminus: 4417103N, 727785E		
Azimuth (true north): 323°		
Group	% Foliar Cover	% Basal Cover
Native Perennial Graminoids	10	2
Introduced Perennial Graminoids	0	0
Native Annual Graminoids	0	0
Introduced Annual Graminoids	0	0
Native Perennial Forbs	4	0
Introduced Perennial Forbs	0	0
Native Annual/Biennial Forbs	0	0
Introduced Annual/Biennial Forbs	0	0
Subshrubs/Shrubs	2	0
Trees	14	0
Total	30	2
Bare ground %	66	

Table 7. Plant Species Recorded Along Fed. 298-13-1 Pre-Disturbance Transect

Common Name	Scientific Name	Percent Foliar Cover
Pinyon pine	<i>Pinus edulis</i>	22
Plains pricklypear	<i>Opuntia polyacantha</i>	2
Prairie Junegrass	<i>Koeleria macrantha</i>	16
Utah juniper	<i>Juniperus osteosperma</i>	20
Total		60

Table 8. Plant Species Recorded Along Fed. 298-13-1 Reference Transect

Common Name	Scientific Name	Percent Foliar Cover
Antelope bitterbrush	<i>Purshia tridentata</i>	2
Hood's phlox	<i>Phlox hoodii</i>	2
Prairie Junegrass	<i>Koeleria macrantha</i>	10
Rayless tansyaster	<i>Machaeranthera grindelioides</i>	2
Utah juniper	<i>Juniperus osteosperma</i>	14
Total		30

APPENDIX C
RAPTOR NEST PHOTOGRAPHS AND INFORMATION

Table C-1. Raptor Nest Locations and Nest Data

Label	Vacancy	Nearest Disturbance	Distance to Disturbance (Meters)	UTM Zone	Easting	Northing	Nest Base	Base Height	Tree Species	Tree DBH	Tree Condition	Nest Height	Nest Material	Nest Condition	Nest Diameter	Nest Depth	Primary Evidence	Secondary Evidence
COHA-1	Occupied	Frac Line	39.02	12				0	Juniper	0	Alive	16	Stick	Stable	16	7	Adults	
COHA-2	Destroyed	RG 11-13-298 Pad Disturbance	94.63	12			Tree	20	Juniper	30	Alive	16	Stick	Stable	22	16	Adults	Defensiveness
COHA-3	Destroyed	Water Pipeline	84.17				Tree	38	Pinon	17	Alive	30	Stick	Stable	22	12		

COHA-1



APPENDIX D

SENSITIVE AREAS DETERMINATIONS AND HYDROLOGICAL MAPS

Government Federal 298-13-1 Pad Sensitive Area Determination Checklist



TEP Rocky Mountain, LLC	
Person (s) Conducting Field Inspection	
Name: Dean Goebel	Date: August 17, 2021
Comment: Desktop analysis	
Site Information	
Location Name: Govt. Federal 298-13-1 Pad	COGCC Location ID: 315513
Type of Facility: Well Pad	
Environmental Conditions	
Temperature (°F): NA	
Comments	

Sensitive Area: A sensitive area is an area vulnerable to potential significant adverse groundwater impacts, due to factors such as the presence of shallow groundwater or pathways for communication with deeper groundwater; proximity to surface water, including lakes, rivers, perennial or intermittent streams, creeks, irrigation canals, and wetlands. Additionally, areas classified for domestic use by the Water Quality Control Commission, local (water supply) wellhead protection areas, areas within 1/8 mile of a domestic water well, areas within 1/4 mile of a public water supply well, ground water basins designated by the Colorado Ground Water Commission, and surface water supply areas are sensitive areas.

Has the proposed, new, or existing location been designated as a sensitive area?

☐ Yes ☒ No

SURFACE WATER

1. Are there any intermittent surface water features or Surface Water Supply Areas (SWSAs) adjacent to or within 1/4 mile of the proposed or existing facility?

☐ Yes ☒ No

If yes, list type of surface water feature(s), i.e. rivers, creeks, streams, seeps, springs, wetlands:

If yes, describe location relative to facility:

2. Could a potential release from the facility reach intermittent surface water features?

☐ Yes ☒ No

If yes, describe the pathway a release from the facility would likely follow to determine if the potential to impact surface water is high or low.

Is the potential to impact surface water from a facility release high or low?

☐ High ☒ Low

GROUNDWATER

1. Will the proposed/new or existing facility have any pits which will contain hydrocarbons and chlorides or other E&P wastes?

☐ Yes ☒ No

If yes, List the pit type(s):.

2. Is the site of the proposed facility underlain by an unconfined aquifer or recharge zone?
☐ Yes ☒ No
3. Is the hydraulic conductivity of the underlying soil or geologic material $\leq 1.0 \times 10^{-7}$ cm/sec?
☒ Yes ☒ No
4. Is the proposed facility located within 1/8 mile of a domestic water well or 1/4 mile of a public water supply well which would use the same aquifer?
☐ Yes ☒ No
5. Is the proposed facility located within a 100-year floodplain?
☐ Yes (Sensitive) ☒ No (If no, proceed to question #6)
6. Is the depth to groundwater known?
☐ Yes (If yes, follow instructions provided in 6(a) of this section).
☒ No (If no, follow instructions provided in 6(b) of this section).
 - a. If yes, could a potential release from the proposed facility reach groundwater?
☐ Yes ☐ No
If yes, explain:
 - b. If no:
 - i. Evaluate surrounding soils, topography, and vegetation which may suggest the presence of shallow groundwater.
 - ii. Gather information from surrounding well data in order to determine a depth to groundwater, i.e. State Engineers Office.
7. Is the potential to impact ground water from the facility in the event of a release high or low?
☐ High ☒ Low

Additional Comments:

Potential surface water impacts are deemed low for the sensitive area determination for the proposed expansion of an existing well pad. Identified intermittent streams are not located within a 1/4 mile of the proposed pad. Intermittent streams identified within the 1/2-mile site radius are 2,066 feet north and 1,942 feet northeast, respectively from the well pad. Although the drainages are downgradient of the site, the lack of a defined bed and bank pathway promotes sheet flow rather than concentrated flow thus limiting offsite migration to these drainages. The drainages qualify as Water of the United States (WOUS) defined as a riverine aquatic resources with intermittent flow regimes providing seasonally flooded stream beds. The intermittent drainages flow to Ryan Gulch discharging to perennial Piceance Creek. Site grading will provide control measures minimizing potential fluid migration off site. Best Management Practices (BMPs) slated during site construction will eliminate preferential pathways for offsite depression flow using earthen berms and diversion ditches. All newly constructed BMPs will be closely monitored and maintained to ensure complete on-site containment of a potential release.

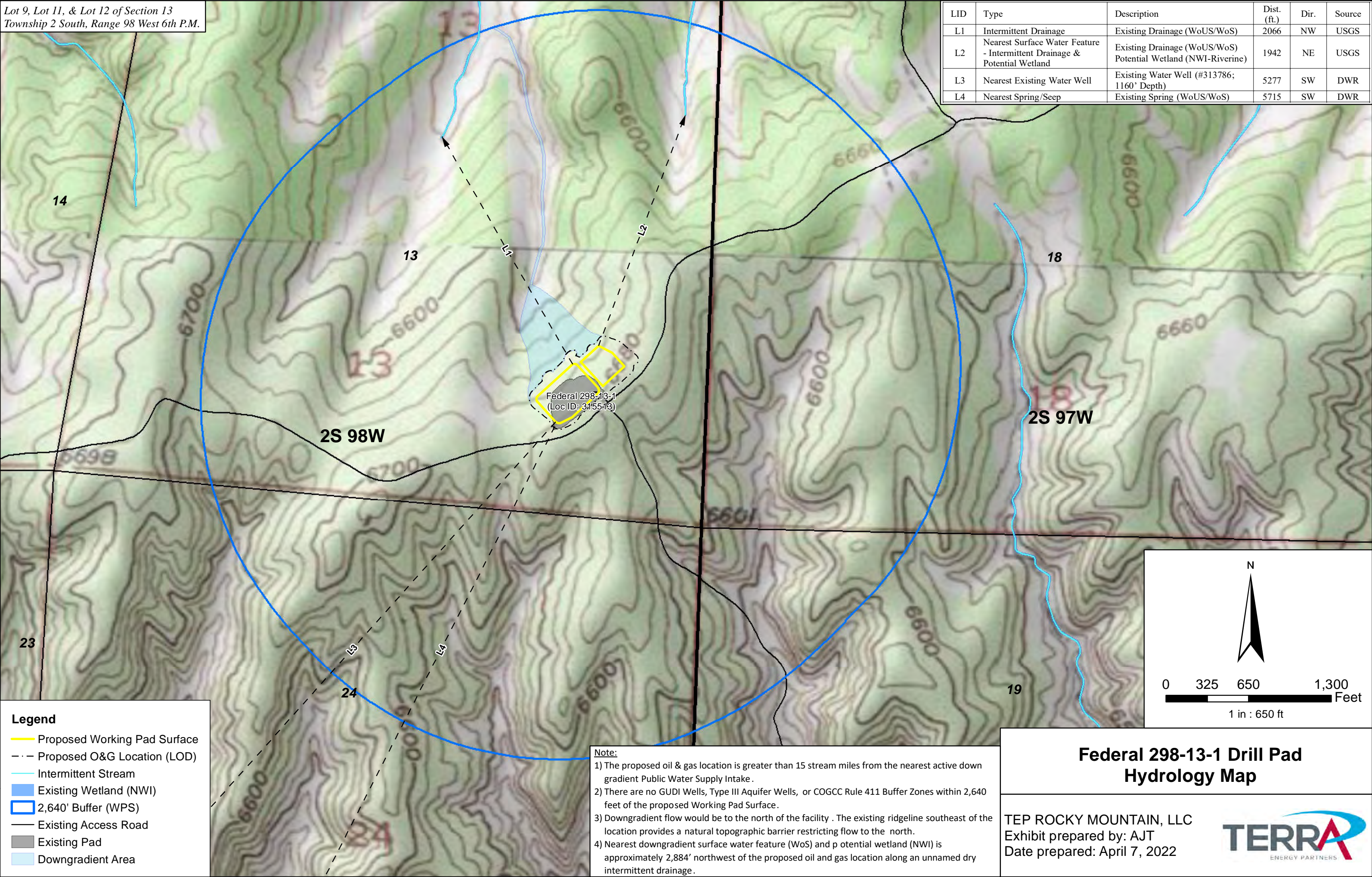
State Engineers Office and USGS records were reviewed indicating there are no constructed water wells within 1-mile of the well pad location. Visual observations of the site based on site photos taken during the biological survey and aerial photography indicates scrub pinyon and juniper vegetation and sagebrush shrublands. Depth to shallow groundwater residing in the local flow system is greater than 80 inches (6.67 feet) based on NRCS soil properties and qualities for Redcreek-Rentsac complex and Rentsac channery loam soil mapped units occurring at the site. Typical soil profiles for this mapped soil units indicates bedrock subcrops 5 to 16 inches below the ground surface. Saturated hydraulic conductivity (Ksat) for the mapped soils is less than 1.0×10^{-7} cm/sec for the Rentsac channery loam but greater than for the Redcreek-Rentsac complex soils.

Dominant upland vegetation indicates pervasive dry antecedent soil conditions conducive with thin soil horizons overlying shallow bedrock not in hydraulic connection with the local groundwater flow system. Evidence of springs or seeps in project vicinity were not detected during site reconnaissance and vegetation assessment conducted for the Biological Survey Report. Hydrogeological indicators do not support the occurrence of shallow groundwater at the site, depth to groundwater is probably greater than 100 feet in the underlying bedrock. Potential impact to groundwater resources at the site is deemed to be low based on the site hydrogeology.

Based on the information collected during the desktop review, the potential for impacts to surface water, and groundwater is deemed to be low. Therefore, the proposed expanded well pad should be designated as being in a non-sensitive area.

Lot 9, Lot 11, & Lot 12 of Section 13
Township 2 South, Range 98 West 6th P.M.

LID	Type	Description	Dist. (ft.)	Dir.	Source
L1	Intermittent Drainage	Existing Drainage (WoUS/WoS)	2066	NW	USGS
L2	Nearest Surface Water Feature - Intermittent Drainage & Potential Wetland	Existing Drainage (WoUS/WoS) Potential Wetland (NWI-Riverine)	1942	NE	USGS
L3	Nearest Existing Water Well	Existing Water Well (#313786; 1160' Depth)	5277	SW	DWR
L4	Nearest Spring/Seep	Existing Spring (WoUS/WoS)	5715	SW	DWR



- Legend**
- Proposed Working Pad Surface
 - Proposed O&G Location (LOD)
 - Intermittent Stream
 - Existing Wetland (NWI)
 - 2,640' Buffer (WPS)
 - Existing Access Road
 - Existing Pad
 - Downgradient Area

Note:

- 1) The proposed oil & gas location is greater than 15 stream miles from the nearest active down gradient Public Water Supply Intake.
- 2) There are no GUDI Wells, Type III Aquifer Wells, or COGCC Rule 411 Buffer Zones within 2,640 feet of the proposed Working Pad Surface.
- 3) Downgradient flow would be to the north of the facility . The existing ridgeline southeast of the location provides a natural topographic barrier restricting flow to the north.
- 4) Nearest downgradient surface water feature (WoS) and p otential wetland (NWI) is approximately 2,884' northwest of the proposed oil and gas location along an unnamed dry intermittent drainage.

**Federal 298-13-1 Drill Pad
Hydrology Map**

TEP ROCKY MOUNTAIN, LLC
Exhibit prepared by: AJT
Date prepared: April 7, 2022

Federal RG 11-13-298 Pad

Sensitive Area Determination Checklist



TEP Rocky Mountain, LLC	
Person (s) Conducting Field Inspection	
Name: Dean Goebel	Date: August 17, 2021
Comment: Desktop analysis	
Site Information	
Location Name: RG 11-13-298 Pad	COGCC Location ID: New Location
Type of Facility: Well Pad	
Environmental Conditions	
Temperature (°F): NA	
Comments	

Sensitive Area: A sensitive area is an area vulnerable to potential significant adverse groundwater impacts, due to factors such as the presence of shallow groundwater or pathways for communication with deeper groundwater; proximity to surface water, including lakes, rivers, perennial or intermittent streams, creeks, irrigation canals, and wetlands. Additionally, areas classified for domestic use by the Water Quality Control Commission, local (water supply) wellhead protection areas, areas within 1/8 mile of a domestic water well, areas within 1/4 mile of a public water supply well, ground water basins designated by the Colorado Ground Water Commission, and surface water supply areas are sensitive areas.

Has the proposed, new, or existing location been designated as a sensitive area?

☐ Yes ☒ No

SURFACE WATER

- Are there any intermittent surface water features or Surface Water Supply Areas (SWSAs) adjacent to or within 1/4 mile of the proposed or existing facility?

☐ Yes ☒ No

If yes, list type of surface water feature(s), i.e. rivers, creeks, streams, seeps, springs, wetlands:

If yes, describe location relative to facility:

- Could a potential release from the facility reach intermittent surface water features?

☐ Yes ☒ No

If yes, describe the pathway a release from the facility would likely follow to determine if the potential to impact surface water is high or low.

Is the potential to impact surface water from a facility release high or low?

☐ High ☒ Low

GROUNDWATER

- Will the proposed/new or existing facility have any pits which will contain hydrocarbons and chlorides or other E&P wastes?

☐ Yes ☒ No

If yes, List the pit type(s):.

2. Is the site of the proposed facility underlain by an unconfined aquifer or recharge zone?
☐ Yes ☒ No
3. Is the hydraulic conductivity of the underlying soil or geologic material $\leq 1.0 \times 10^{-7}$ cm/sec?
☒ Yes ☒ No
4. Is the proposed facility located within 1/8 mile of a domestic water well or 1/4 mile of a public water supply well which would use the same aquifer?
☐ Yes ☒ No
5. Is the proposed facility located within a 100-year floodplain?
☐ Yes (Sensitive) ☒ No (If no, proceed to question #6)
6. Is the depth to groundwater known?
☐ Yes (If yes, follow instructions provided in 6(a) of this section).
☒ No (If no, follow instructions provided in 6(b) of this section).
 - a. If yes, could a potential release from the proposed facility reach groundwater?
☐ Yes ☐ No
If yes, explain:
 - b. If no:
 - i. Evaluate surrounding soils, topography, and vegetation which may suggest the presence of shallow groundwater.
 - ii. Gather information from surrounding well data in order to determine a depth to groundwater, i.e. State Engineers Office.
7. Is the potential to impact ground water from the facility in the event of a release high or low?
☐ High ☒ Low

Additional Comments:

Potential surface water impacts are deemed low for the sensitive area determination for this proposed expanded well pad. The two identified intermittent streams are greater than a 1/4 mile of the proposed facility. Offsite migration of a potential release to the intermittent streams located 1,679 feet southwest of proposed site and 1,497 feet to the east. Flow along these pathways would be most likely sheet flow which has limited potential travel distance than concentrated flow contained in a defined drainage. Both drainages have designated Water of the United States (WOUS) defined as a riverine aquatic resources with a intermittent flow regimes tied to a seasonally flooded stream beds. The drainages flow to the intermittent drainage in Ryan Gulch which discharges to perennial Piceance Creek. Site grading will provide control measures minimizing potential fluid migration off site. Best Management Practices (BMPs) slated during site construction will eliminate preferential pathways for offsite depression flow using earthen berms and diversion ditches. All newly constructed BMPs will be closely monitored and maintained to ensure complete on-site containment of a potential release.

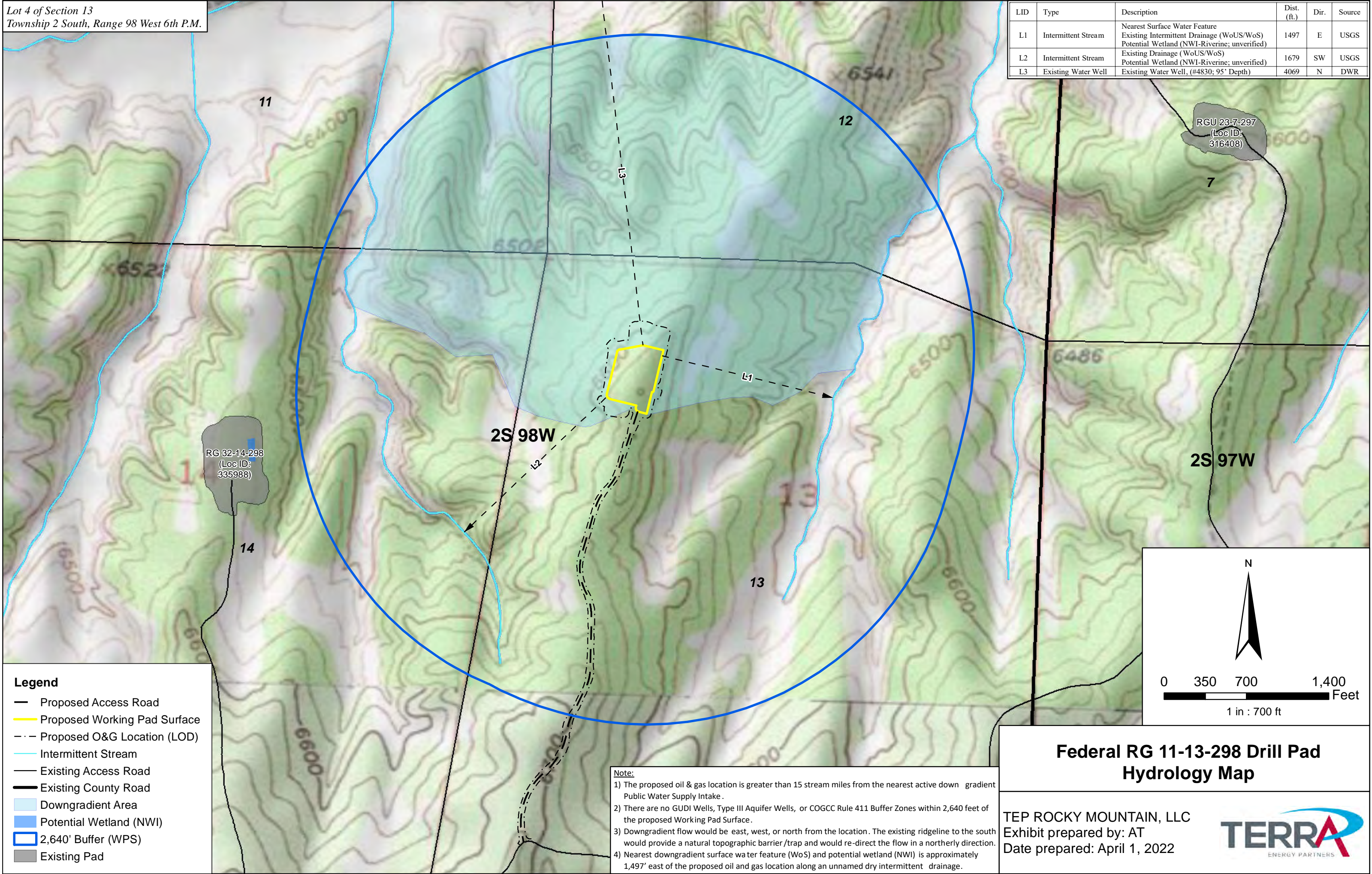
State Engineers Office and USGS records were reviewed indicating only one permitted water well (permit no. 4830) drilled in 1960 in an alluvial aquifer adjacent to Ryan Gulch and located 4,069 feet north of the proposed well pad. The well was drilled to 95 feet and screened from 80 to 95 feet with a well yield of 10 gallons per minute and static water level of 50 feet permitted as a livestock water well. Based on the static water level of this well and subsurface geology in vicinity of proposed well pad, shallow groundwater does not occur at the site. Visual observations of the site based on site photos taken during the biological survey and aerial photography indicates upland vegetation including scrub pinyon and juniper vegetation and sagebrush shrublands. Depth to shallow groundwater residing in the local flow system is greater than 80 inches (6.67 feet) based on NRCS soil properties and qualities for Rentsac channery loam and Redcreek-Rentsac complex mapped soil units occurring at the site. Typical soil profiles for these mapped soils indicate bedrock subcrops 5 to 22 inches below ground surface. The saturated hydraulic conductivity (Ksat) for the mapped soils is less than 1.0×10^{-7} cm/sec for the Rentsac channery loam but greater than for the Redcreek-Rentsac complex soils.

Dominant upland vegetation indicates pervasive dry antecedent soil conditions conducive with thin soil horizons overlying shallow bedrock not in hydraulic connection with the local groundwater flow system. Evidence of springs or seeps in project vicinity were not detected during site reconnaissance and vegetation assessment conducted for the Biological Survey Report. Hydrogeological indicators do not support the occurrence of shallow groundwater at the site, depth to groundwater is probably greater than 100 feet in the underlying bedrock. Potential impact to groundwater resources at the site is deemed to be low based on the site hydrogeology.

Based on the information collected during the desktop review, the potential for impacts to surface water, and groundwater would be deemed to be low. Therefore, the proposed expanded well pad should be designated as being in a non-sensitive area.

Lot 4 of Section 13
Township 2 South, Range 98 West 6th P.M.

LID	Type	Description	Dist. (ft.)	Dir.	Source
L1	Intermittent Stream	Nearest Surface Water Feature Existing Intermittent Drainage (WoUS/WoS) Potential Wetland (NWI-Riverine; unverified)	1497	E	USGS
L2	Intermittent Stream	Existing Drainage (WoUS/WoS) Potential Wetland (NWI-Riverine; unverified)	1679	SW	USGS
L3	Existing Water Well	Existing Water Well, (#4830; 95' Depth)	4069	N	DWR



Legend

- Proposed Access Road
- Proposed Working Pad Surface
- Proposed O&G Location (LOD)
- Intermittent Stream
- Existing Access Road
- Existing County Road
- Downgradient Area
- Potential Wetland (NWI)
- 2,640' Buffer (WPS)
- Existing Pad

Note:

1) The proposed oil & gas location is greater than 15 stream miles from the nearest active down gradient Public Water Supply Intake .

2) There are no GUDI Wells, Type III Aquifer Wells, or COGCC Rule 411 Buffer Zones within 2,640 feet of the proposed Working Pad Surface.

3) Downgradient flow would be east, west, or north from the location. The existing ridgeline to the south would provide a natural topographic barrier/trap and would re-direct the flow in a northerly direction.

4) Nearest downgradient surface water feature (WoS) and potential wetland (NWI) is approximately 1,497' east of the proposed oil and gas location along an unnamed dry intermittent drainage.

**Federal RG 11-13-298 Drill Pad
Hydrology Map**

TEP ROCKY MOUNTAIN, LLC
Exhibit prepared by: AT
Date prepared: April 1, 2022