U.S. Department of the Interior
Bureau of Land Management
White River Field Office
220 E Market St
Meeker, CO 81641

ENVIRONMENTAL ASSESSMENT

NUMBER: DOI-BLM-CO-N05-2014-0034-EA

CASEFILE/PROJECT NUMBER: COC118326-01, COC118327-01, COC118327-01
COC76585 (ROW for access road)

PROJECT NAME: Natural Soda, Inc. Resource Drilling Program

LEGAL DESCRIPTION: Sixth Principal Meridian
T 1S, R 98 W
Sections 15, 21, 22, 23, 25, 26, 27, and 36

APPLICANT: Natural Soda Inc. (NSI)

PURPOSE & NEED FOR THE ACTION:
The purpose of the Proposed Action is to manage the exploration and development of sodium resources on public lands in a manner that avoids, minimizes, reduces, or mitigates potential impacts to other resource values. The need for the action is to respond to a request to better define the sodium resources on existing federal leases in accordance with the requirements of the Mineral Leasing Act of 1920 (MLA), the Federal Land Policy and Management Act of 1976 (FLMPA), National Environmental Policy Act of 1969 (NEPA), 43 CFR 3500, and all other applicable laws, rules, regulations, standards, policies, and guidelines. The BLM is required to facilitate the recovery of known Federal sodium reserves; to make Federal sodium reserves accessible for development; and to foster and encourage the orderly development of domestic sodium reserves.

Decision to be Made: The BLM will decide whether or not to all allow NSI to conduct a resource drilling program for the purpose of defining recoverable sodium resources on their existing federal sodium leases, and if so, under what conditions.

SCOPING, PUBLIC INVOLVEMENT, AND ISSUES:

Scoping: Scoping was the primary mechanism used by the BLM to initially identify issues. Internal scoping was initiated when the project was presented to the White River Field Office (WRFO) interdisciplinary team on 1/7/2014. External scoping was conducted by posting this project on the WRFO's on-line National Environmental Policy Act (NEPA) register on

1/14/2014. The BLM also notified Jennifer Thurston of the Information Network for Responsible Mining (INFORM) of the project on 1/29/14 (as an identified interested party).

Issues No issues were identified during public scoping.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES:

Background/Introduction: Natural Soda Inc. (NSI) operates an in-situ sodium bicarbonate (nahcolite) solution mining operation on federal sodium leases and has been in continual operations since 1991. Their operation and facilities are located at the termination of Rio Blanco County (RBC) Road 31 (Figures 1 and 2) in the Piceance Creek Basin, approximately 37 miles west and south of Meeker, Colorado. NSI current mining operations involve solution mining from five available mining well pairs. A plant expansion completed in spring of 2013 was designed to increase plant capacity from 125,000 tons per year to 250,000 tons per year. Production for 2014 is projected for approximately 180,000 tons and is anticipated to increase to the new plant capacity within the next two years.

Solution mining of the nahcolite occurs at a depth of greater than 1,900 feet in a 35 to 40 foot depositional horizon of nahcolite, oil shale, and nahcolitic-halite identified as the Boies Bed. In the current mining area the Boies Bed assays between 80 to 85 percent nahcolite. As the Boies Bed progresses towards the depositional center of the basin a facies change from nahcolite to halite (sodium chloride) occurs (Figures 1 and 2). Halite is an impurity in the sodium bicarbonate solution mining recovery process and final product. And since solution mining does not differentiate between nahcolite and halite it is critical that solution mining occur in the halite free area of the Boies Bed.

Proposed Action: NSI is proposing to drill core holes on up to 21 locations as a resource definition exploration program to define NSI's recoverable nahcolite resources for planning and future well field development. NSI may determine not to drill all 21 holes. Drilling order will be approached in such a manner that some holes would only be drilled if insufficient or unexpected data is collected from the previously drilled holes. These core holes would further define the thickness and areal extent of the Boies Bed nahcolite and other saline mineral intervals in the Parachute Creek Member of the Green River Formation. Total depth of the holes would range from approximately 2,000 feet to 3,000 feet depending on location and desired geologic horizon. The upper portion of the holes would be rotary drilled to 10 to 20 feet above the dissolution surface, temporarily cased, and cored from that point to the desired geologic horizon. Holes not used for future water or subsidence monitoring would be abandoned by removing the temporary casing and filling the hole with cement from the bottom of the coring to the surface. In holes utilized for future monitoring, the temporary casing would be removed, cement would be placed from the bottom of the hole to the bottom of the desired monitoring zone, the monitoring level sanded across, and casing would be set and cemented from the top of the monitoring zone to the surface.

It is anticipated the entire drilling program would occur in 2014 however depending on rig availability and timing of approval the program may be divided into two drilling phases, Phase I

and Phase II. Phase I drilling would commence as soon as permitted in 2014 and conclude in summer or late fall of 2014. This phase could include 13 hole locations (A through M) located in closer proximity to the NSI plant and current mining operations. Eight of the core hole locations (E, F, G, and I through M) would help define the nahcolite/halite boundary in the Boies Bed (Figures 1 and 2). More than one drilling rig could be used.

Phase II drilling could include up to eight hole locations (N through U; see Figures 1 and 2) and occur from 2015 through 2018 by drilling two to three holes annually. Holes that are drilled would be plugged and abandoned, the associated disturbance immediately reclaimed and fenced. Pads on which holes are converted for monitoring purposes would be re-contoured, reseeded to the anchors and fenced with a gate. Monitoring well interim reclamation would reduce the disturbed area to approximately 0.25 acres. Reclamation and seed mix of disturbed areas would follow the NSI's approved Mine Plan.

Table 1 identifies holes that could be completed as ground water monitoring wells and/or subsurface subsidence monitoring wells for future mining operations.

Table 1 List of Proposed NSI Resource Core Holes

Well	Permitted Area (acres)	Minimum Anticipated Pad Surface Disturbance within the Permitted Area (acres)		Maximum Anticipated Pad Surface Disturbance within the Permitted Area (acres)		Potential Groundwater Monitoring Well	Potential Subsurface Subsidence Monitoring Well	Access Road Length (feet)	Access Road (acres) (Based on 15 feet average width)	Existing Access
Phase I		Short term	Long term	Short term	Long term					
A	1.5	0.5	0.25	1.5	0.25	No	Yes	100	0.03	New
B	1.5	0.5	0.25	1.5	0.25	No	Yes	1,220	0.42	New
C	1.5	0.5	0.25	1.5	0.25	No	Yes	1,050	0.36	New
D	1.5	0.5	0.25	1.5	0.25	No	Yes	2,320	0.80	Existing
E	10	0.5	0.25	1.5	0.25	Yes	No	980	0.34	New
F	10	0.5	0.25	1.5	0.25	Yes	No	800	0.28	New
G	10	0.5	0.25	1.5	0.25	Yes	No	100	0.03	New
H	1.5	0.5	0.25	1.5	0.25	No	Yes	1,060	0.37	New
I	10	0.5	0.25	1.5	0.25	Yes	No	120	0.04	New
J	10	0.5	0.25	1.5	0.25	Yes	No	0	0	New
K	10	0.5	0.25	1.5	0.25	Yes	No	910	0.31	New
L	10	0.5	0.25	1.5	0.25	Yes	No	2,550	0.88	Existing
								800	0.28	New
M	10	0.5		1.5	0	No	No	800	0.28	New
Phase II										
N	1.5	0.5	0.25	1.5	0.25	No	Yes	1,210	0.42	New
O	1.5	0.5		1.5	0	No	No	1,080	0.37	New
P	1.5	0.5		1.5	0	No	No	1,780	0.61	Existing
								1,320	0.45	New
Q	1.5	0.5		1.5	0	No	No	1,120	0.39	New
R	1.5	0.5		1.5	0	No	No	1,800	0.62	Existing
								590	0.20	New
								3,400 (pvt)	1.17	Existing
S	1.5	0.5		1.5	0	No	No	1,930	0.66	New
T	1.5	0.5		1.5/0	0	No	No	2,400	0.83	New
U	1.5	0.5		1.5	0	No	No	2,040	0.70	Existing
								400	0.14	New
								2,650 (pvt)	0.91	Existing
Total	99.5	10.5	3.25	31.5	3.25	7 water monitoring wells	6 subsidence wells	10,490	3.6	Existing
								17,990	6.2	New
								6,050 (pvt)	2.1	Existing
								34,530	11.9	Total

Thirteen drilling locations (A through D, H, N through U) located away from the halite transition area would require a maximum 1.5 acre location area (Figures 1 and 2) to allow sufficient space to skid over and drill a contingency hole if needed. The typical pad size, including cut and fill slopes, will be 0.5 to 0.7 acres (Figure 3). NSI does not intend to disturb the entire 1.5 acres.

The remaining eight proposed locations for (E, F, G, I, J, K, L and M) are along the suspected boundary of the Upper Boies Bed (UBB) Transition Facies (nahcolite to halite). Core holes along the facies transition area would be located within a 10 acre contingency area (Figures 1 and 2). The entire 10 acres would be not disturbed, only the minimum required to drill the holes. If a contingency hole is needed due to operational or other problems NSI would make every effort to utilize the existing pad (typically 0.5 to 0.7 acres) without creating additional disturbance. A maximum of 1.5 acres would be disturbed within the 10 acre permitted area to allow sufficient space to skid over and drill a contingency hole if needed. NSI's pads are designed to avoid creating additional disturbance by offsetting the initial holes from the center of the well pad (Figure 3). This would allow the drill rig to skid a short distance from the original core hole if a contingency (re-drill) hole becomes necessary. Topsoil would be stored immediately adjacent to location, covered, and clearly marked. NSI does not intend to disturb any more ground than is necessary.

NSI is requesting up to two drill holes per location; an initial core hole and a contingency hole. The contingency hole may be drilled if unexpected operational problems are experienced while drilling the initial core hole; for example, core is lost, the coring bottom hole assembly (BHA) is lost downhole, the hole is lost, etc., or if it is determined more data is needed in the immediate vicinity (i.e., if halite is found where only nahcolite was predicted). To date, NSI has not needed to re-drill a hole due to operational problems.

Access roads would be approximately 15 feet wide, and NSI would utilize existing routes wherever possible (Table 1). Approximately 6½ miles of access (1 mile private surface, 5½ miles BLM surface) are identified. Most of the locations will be accessible from the RBC 83, RBC 91, and from RBC 31 (Figures 1 and 2). Prior to any access utilization or construction (to allow for entry onto proposed locations) landowner permissions would be secured as necessary. Due to the temporary nature of the locations only native material would be used to construct necessary access. Access roads will be designed to reduce disturbance of forested areas and existing drainages. Access roads would be cut at the edge of forested areas whenever possible to minimize tree damage and disturbance.

Generally two weeks of construction and drilling activity would be required per hole. Each additional hole within the pad location area could add 7 to 10 days.

If all 21 hole locations and access roads are used, the total maximum estimated short term disturbance would be approximately 43.4 acres (31.5 acres for well pads and 11.9 acres for access; Table 1). However, it is highly unlikely the maximum amount of surface disturbance would occur and actual short term disturbance would be somewhere between the minimum surface acreage of 22.4 acres (10.5 acres for well pads and 11.9 acres for access; Table 1) and the

maximum estimated 43.4 acres. Long term new disturbance would be approximately 6.1 acres (3.25 acres for well pads and 2.88 acres for new access to monitoring wells; Table 1)

Design Features: All operations would conform to Natural Soda's approved Mine and Reclamation Plans.

No Action Alternative: The resource drilling program would not occur and acquisition of site specific geologic resource information would not be obtained. Lack of resource information could lead to poor placement of production well pairs which could create unnecessary surface disturbance and the potential for loss of recoverable sodium bicarbonate.

ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD:
The original proposal located well pad areas F, O, and R within proximity of cultural concerns. The project proponent relocated pad areas O and R and reduced pad area F (a 10 acre halite transition pad area) from 10 acres to 2.3 acres to mitigate cultural concerns.

Access routes to the original Q pad area and between the B and C pad areas were located in intact big game habitat parcels. The project proponent agreed to an alternate access between the B and C pad areas and relocated the Q pad area and access to reduce the impacts on the habitat.

PLAN CONFORMANCE REVIEW: The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

> Name of Plan: White River Record of Decision and Approved Resource Management Plan (White River ROD/RMP).
>
> Date Approved: July 1, 1997
>
> Decision Number/Page: Pages 2-6 and 2-7
>
> Decision Language: "Facilitate the orderly and environmentally sound development of sodium resources occurring on public lands."

AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

Standards for Public Land Health: In January 1997, the Colorado BLM approved the Standards for Public Land Health. These standards cover upland soils, riparian systems, plant and animal communities, special status species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. Because a standard exists for these five categories, a finding must be made for each of them in an environmental analysis (EA). These findings are located in specific elements listed below.

Cumulative Effects Analysis Assumptions: Cumulative effects are defined in the Council on Environmental Quality (CEQ) regulations (40 CFR 1508.7) as "...the impact on the environment that results from the incremental impact of the action when added to other past, present, and

reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." Table 1 lists the past, present, and reasonably foreseeable future actions within the area that might be affected by the Proposed Action; for this project the area considered was the Natural Resources Conservation Service (NRCS) 5th Level Watershed. However, the geographic scope used for analysis may vary for each cumulative effects issue and is described in the Affected Environment section for each resource.

Table 2. Past, Present, and Reasonably Foreseeable Actions

Action Description	STATUS		
	Past	Present	Future
Livestock Grazing	X	X	X
Wild Horse Gathers	X	X	X
Recreation	X	X	X
Invasive Weed Inventory and Treatments	X	X	X
Range Improvement Projects : Water Developments Fences & Cattleguards	X	X	X
Wildfire and Emergency Stabilization and Rehabilitation	X	X	X
Wind Energy Met Towers			X
Oil and Gas Development: Well Pads Access Roads Pipelines Gas Plants Facilities	X	X	X
Power Lines	X	X	X
Oil Shale	X	X	X
Seismic	X	X	X
Vegetation Treatments	X	X	X

Affected Resources:

The CEQ Regulations state that NEPA documents "must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail" (40 CFR 1500.1(b)). While many issues may arise during scoping, not all of the issues raised warrant analysis in an environmental assessment (EA). Issues will be analyzed if: 1) an analysis of the issue is necessary to make a reasoned choice between alternatives, or 2) if the issue is associated with a significant direct, indirect, or cumulative impact, or where analysis is necessary to determine the significance of the impacts. Table 3 lists the resources considered and the determination as to whether they require additional analysis.

Table 3. Resources and Determination of Need for Further Analysis

Determination[1]	Resource	Rationale for Determination
Physical Resources		

Determination[1]	Resource	Rationale for Determination
PI	Air Quality	See discussion below.
PI	Geology and Minerals	See discussion below.
PI	Soil Resources*	See discussion below.
PI	Surface and Ground Water Quality*	See discussion below.
	Biological Resources	
NI	Wetlands and Riparian Zones*	The majority of the Proposed Action lies in the Yellow Creek watershed. The nearest downstream riparian community (an isolated 1.25 mile perennial reach of Yellow Creek) is separated from surface disturbance associated with the Proposed Action by about 7.7 miles of ephemeral channel. Vegetation clearing and pad/road construction within 2.4 channel miles of the Yellow Creek channel would be temporary and subject to immediate recontouring, reclamation, and fencing. Longer-term monitoring features would be no closer than 9.9 channel miles from the nearest riparian in Yellow Creek. Total surface disturbance attributable to the project would be widely dispersed and involve a total estimated range of 14 to 28 acres. Three pads would be located in the Piceance Creek watershed and would be located no closer than 3.1 ephemeral channel miles from riparian communities in Piceance Creek. Total surface disturbance attributable to the project would involve an estimated range of 3-9.5 acres. Seventy to ninety percent of all project-related surface disturbance would be subject to immediate reclamation. Longer-term unreclaimed surface disturbance at these sites would account for 5.1 acres in the Yellow Creek drainage and 1.1 acres in the Piceance Creek drainage. Considering the limited extent and dispersed nature of surface disturbance, applied reclamation (including fencing), required compliance with State and federal drilling and completion regulations, and lengthy separation of project work from perennial streams that support riparian vegetation, there is no foreseeable likelihood that the Proposed Action would contribute sediments or contaminants capable of adversely influencing riparian resources or processes.
PI	Vegetation*	See discussion below.
PI	Invasive, Non-native Species	See discussion below.
PI	Special Status Animal Species*	See discussion below.
PI	Special Status Plant Species*	See discussion below.
PI	Migratory Birds	See discussion below.
NP	Aquatic Wildlife*	The discussion for Riparian/Wetland Zones above is pertinent to aquatic habitats as well. Higher order aquatic communities nearest proposed project work include Yellow Creek below Barcus Creek (19.7 channel miles downstream) and Piceance Creek (3.1 channel

Determination[1]	Resource	Rationale for Determination
		miles downstream). Both streams support BLM sensitive fish and amphibians, but the likelihood of the Proposed Action contributing to sediment or contaminant levels capable of adversely influencing these species or their habitats would be remote.
PI	Terrestrial Wildlife*	See discussion below.
NI	Wild Horses	The proposed project is not located within the Piceance-East Douglas Herd Management Area (HMA), therefore this project will generate no impacts to wild horses, however, it is known that some wild horses have relocated outside the HMA in this general area. Wild horse gather operations have taken place in this area due to these wild horses located outside HMA.
Heritage Resources and the Human Environment		
PI	Cultural Resources	See discussion below.
PI	Paleontological Resources	See discussion below.
PI	Native American Religious Concerns	See discussion below.
PI	Visual Resources	See discussion below.
PI	Hazardous or Solid Wastes	See discussion below.
PI	Fire Management	See discussion below.
NI	Social and Economic Conditions	There would not be any substantial changes to local social or economic conditions.
NP	Environmental Justice	According to recent Census Bureau statistics (2000), there are no minority or low income populations within the WRFO.
NP	Lands with Wilderness Characteristics	There are no lands with wilderness characteristics identified within or near the Proposed Action.
Resource Uses		
PI	Forest Management	See discussion below.
PI	Rangeland Management	See discussion below.
NI	Floodplains, Hydrology, and Water Rights	The Proposed Action is not in a floodplain and is unlikely to impact surface hydrology. The project will use freshwater for operations with valid water rights.
PI	Realty Authorizations	See discussion below.
PI	Recreation	See discussion below.
PI	Access and Transportation	See discussion below.
NP	Prime and Unique Farmlands	There are no Prime and Unique Farmlands within the project area.
Special Designations		
NP	Areas of Critical Environmental Concern	The Proposed Action is located near two Areas of Critical Environmental Concern (ACECs) Duck Creek and Ryan Gulch, but

Determination[1]	Resource	Rationale for Determination
		should have no effect on either ACEC. Site "U " is the closest project; it is 325 meters away from the boundary line of the Duck Creek ACEC. The Ryan Gulch ACEC is over 600 meters away from any project sites and or access routes.
NP	Wilderness	There are no Wilderness Study Areas or designated Wilderness areas within or near the Proposed Action.
NP	Wild and Scenic Rivers	There are no Wild and Scenic Rivers in the WRFO.
NP	Scenic Byways	There are no Scenic Byways within the project area.

[1] NP = Not present in the area impacted by the Proposed Action or Alternatives. NI = Present, but not affected to a degree that detailed analysis is required. PI = Present with potential for impact analyzed in detail in the EA.
* Public Land Health Standard

AIR QUALITY

Affected Environment: The Proposed Action is located within the White River Basin which is an attainment area for national and state air quality standards. The attainment designation means that no violations of ambient air quality standards have been documented in the area (EPA 2013). The Proposed Action is located more than 10-miles from any non-attainment or special designation airshed. Non-attainment areas are designated by U.S. Environmental Protection Agency (EPA) as having air pollution levels that persistently exceed the National Ambient Air Quality Standards (NAAQS). The closest non-attainment areas are along the Front Range corridor in Colorado and are in non-attainment for ozone. The closest special designation areas are Dinosaur National Monument which is located northwest of the project area (designated Class II airshed with Prevention of Significant Deterioration (PSD) with thresholds for sulfur oxides and visibility), and the Flat Tops Wilderness Area located east of the Proposed Action (designated Class I).

Projects that could impact special designation areas and/or non-attainment areas may require special consideration from the Colorado Department of Public Health and Environment (CDPHE) and the EPA. General conformity regulations require that federal activities do not cause or contribute to a new violation of NAAQS; that actions do not cause additional or worsen existing violations of the NAAQS; and that attainment of these standards is not delayed by federal actions in non-attainment areas.

The Clean Air Act (CAA) requires the Environmental Protection Agency (EPA) to set NAAQS (40 CFR part 50) for criteria pollutants. Criteria pollutants are air contaminants that are commonly emitted from a majority of emissions sources and include carbon monoxide (CO), lead (Pb), sulfur dioxide (SO_2), particulate matter smaller than 10 and 2.5 microns (PM_{10} and $PM_{2.5}$), ozone (O_3), and nitrogen dioxide (NO_2).

The EPA regularly reviews the NAAQS (every five years) to ensure that the latest science on health effects, risk assessment, and observable data such as incidence rates are evaluated. The Colorado Air Pollution Control Commission (CAPCC), by means of an approved State Implementation Plan (SIP) and/or delegation by EPA, can establish state ambient air quality

standards for any criteria pollutant that are at least as stringent as, or more so, than the federal standards. Ambient air quality standards must not exceed Colorado Ambient Air Quality Standards (CAAQS) and NAAQS in areas where the general public has access.

The Proposed Action is in Rio Blanco County within the Western Counties Monitoring Region of Colorado (APCD 2010). Local air quality parameters including particulates and ozone are measured at monitoring sites located at Meeker, Rangely, Dinosaur, and near the Flat Tops Wilderness Area. Ozone data have been collected at Federal reference air quality sites supported by the BLM since 2010 and located outside Meeker and Rangely. The closest location for an Interagency Monitoring of Protected Visual Environments (IMPROVE) site is near the Flat Tops Wilderness, northeast of the Project Area. IMPROVE sites measure visibility impairment from air borne particles.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: This action would include the drilling and operation of monitoring and exploratory wells to define the nahcolite resource.

The Proposed Action would result in short-term impacts on air quality near the drilling pads. Implementation of the Proposed Action would result in emissions of criteria pollutants, hazardous air pollutants (HAPs), and greenhouse gases (GHGs). Air quality would be impacted by engine exhaust from vehicles and any stationary fuel combustion sources during drilling activities. Increases in the following criteria pollutants would occur due to combustion of fossil fuels: carbon monoxide, nitrogen dioxide, sulfur dioxide, and ozone (a secondary pollutant formed photochemically from volatile organic compounds (VOCs) and nitrogen oxides (NO_x). Emissions of particulate matter would be generated from construction, drilling and during the operational phases.

Particulate matter or dust is made up of a number of components, including acidic aerosols (such as nitrates and sulfates), organic chemicals, metals, soil or dust particles, and allergens (such as fragments of pollen or mold spores). Dust production is most likely during construction and drilling activities, especially when conditions are dry and/or windy. Fine particles (less than 2.5 μm) are efficient in scattering and absorbing light and are the primary contributor to visibility problems. The effects of particulates include visibility degradation, climate change, vegetation damage and human health impacts. The chemical composition of $PM_{2.5}$ consists of five major components sulfate, nitrate, organic carbon, elemental carbon (also called black carbon), and crustal (rock and soil) material.

EPA's NAAQS uses NO_2 as an indicator of NO_x which are generated by the combustion of fossil fuels and therefore will be an emitted during drilling and completion operations, from transportation vehicles during rig moves, maintenance and during operation. NO_2 forms quickly from cars, trucks and buses, power plants, and off-road equipment emissions. The main effect of NO_2 is that it inflames the lining of the lungs and increases the likelihood of respiratory problems such as wheezing, coughing, colds, flu and bronchitis. People with asthma or heart disease are most at risk.

In summary, soil disturbance resulting from construction of pads and roads and drilling operations are expected to cause increase airborne fine particulate matter in the project area and may contribute to reductions in regional visibility. In addition, increases in the following criteria pollutants: carbon monoxide, VOCs, ozone, nitrogen dioxide, and sulfur dioxide would also occur due to combustion of fossil fuels during drilling and operational activities. Non-criteria pollutants such as carbon dioxide, nitrous oxides, total suspended particulates (TSP), and increased impacts to visibility and atmospheric deposition may also increase as a result of the Proposed Action.

Even with these increased pollutants the Proposed Action is unlikely to result in an exceedance of NAAQS or CAAQS, is not likely to be located in a future non-attainment area, and is likely to comply with applicable PSD increments and other significant impact thresholds.

Cumulative Effects: Air quality in Region 11 (Western Slope of Colorado) is affected by both mobile and stationary emitters of air pollutants (CAPCD 2013). Fugitive dust can come from natural sources that are not preventable, such as volcanic eruptions, large regional dust storms, and wildfires. PM_{10} and $PM_{2.5}$ are created from windblown dust and soil from fields, agricultural crops, agricultural livestock, paved road re-entrained dust, unpaved roads, construction activities, and mining and quarrying, construction sites, automobile and diesel engine exhaust, waste burning, soot from wood fires, and sulfates and nitrates from combustion sources such as industrial boilers (CAPCD 2013). Emissions of particulate matter would be generated from construction, drilling, and during the operational phase. The following criteria pollutants would be emitted during the combustion of fossil fuels during construction, drilling and operation: CO, NO_2, SO_2, and ozone (a secondary pollutant formed photochemically from VOCs and NOx).

Downward trends in annual NO_2, CO, and SO_2 have been measured at air quality monitoring sites in the region and are likely the result of national emissions control programs. For example, between 1990 and 2012, national emissions of NO_x and VOC emissions have declined 56 percent and 35 percent, respectively (CAPCD 2013). Decreases in SO_x emissions from diesel fuel and power plants coincides with a decrease in SO_2 measured at IMPROVE and other air quality monitoring programs. Even though concentrations of these pollutants are low and decreasing, EPA continues to track these pollutants because of their contribution to secondary air pollutants and issues (e.g., ozone, $PM_{2.5}$, and visibility).

In general air quality within the region is good due to few emission sources, good dispersion characteristics and national trends showing a decrease in some air pollutants. However, some emissions have caused localized or regional level increases in pollution monitoring values such as ozone and $PM_{2.5}$ within the past ten years. This has led to an increase in air quality monitoring in the region including the BLM supported Federal reference air quality monitoring sites in Rangely and Meeker.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: No increase in impacts to air quality would occur from the No Action Alternative.

Cumulative Effects: Impacts for the Western Slope of Colorado would be similar to those described for the action alternative.

Mitigation:

1. The operator will limit unnecessary emissions from point or nonpoint pollution sources and prevent air quality deterioration from necessary pollution sources in accordance with all applicable state, federal and local air quality law and regulation.
2. The operator will treat all access roads with water during construction and drilling activities so that there is not a visible dust trail behind vehicles. The use of chemicals or treated produced water as a dust suppressant on BLM lands will require prior written approval from BLM.

GEOLOGY AND MINERALS

Affected Environment: Surficial geology of proposed well pads A through P, R, T and U is the Uinta Formation and pads S and Q is alluvium (Duncan). NSI's targeted zone is in the Parachute Creek member of the Green River Formation. During exploration drilling potential water, oil shale, oil, gas, and sodium resources would be encountered from surface to the targeted zone. Fresh water aquifer zones that may be encountered during drilling are the Perched in the Uinta, the A-Groove, B-Groove, and dissolution surface in the Green River Formation. These geologic zones along with upper portion of the Wasatch are known for difficulties in drilling and cementing. All of the proposed pads are located on existing federal sodium leases as identified Table 4.

Table 4 Proposed Well Pads and Associated Sodium Leases

Well Pads	Sodium Lease
P through U	COC118326-01
D through M	COC118327-01
A, through D, N, and O	COC119986-01

All of the proposed pads except T and U are also located within the Ryan Gulch Federal Oil and Gas Exploratory Unit COC 68239X. Table 5 identifies the individual oil and gas leases with the associated proposed pads.

Table 5 Proposed Well Pads and Associated Oil and Gas Leases

Well Pads	Oil and Gas Lease
A, B, C, N, and P through S	COC60731
D through I	COC60732
J through M	COC60733
O	COC62051
T and U	COC70221

Pads A, B, and O are located in the area identified as available for oil shale leasing. Oil and gas exploration and development has occurred within a one mile radius of the proposed pads (approximately 9,200 acres). This consists of 1 drilled and abandoned well, 92 producing wells, 10 shut-in wells and 50 proposed wells on 19 well pads (COGCC).

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: There is potential for commingling of the aquifer zones during drilling coring operations, however, the drilling, completing, and plugging procedure of the Proposed Action would isolate the aquifer zones preventing the migration of water between aquifer zones. Geologic information of the saline zone obtained from the drilling program would be used to define future sodium solution mining areas Drilling of the core holes would have little to no impact on oil and gas development due to the short term of the holes. Holes that are converted to monitoring wells could affect the future placement of oil and gas wells.

Cumulative Effects: As mentioned above, the COGCC database identifies 152 producing, shut-in, or proposed oil and gas wells. An additional 307 wells for full development of the natural gas resource within this one mile radius would be required if bottom hole spacing of 20 acres is necessary for the recovery of the natural gas resources.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Site specific geologic information of the sodium resources would not be acquired at this time and defining future areas for sodium would be limited to existing data.

Cumulative Effects: There would be no contribution for potential conflicts between sodium, and natural gas or oils shale development.

Mitigation: None

SOIL RESOURCES

Affected Environment: The classifications of soils within 30 meters of the proposed pad areas and centerlines of the access roads that could be impacted by the Proposed Action are shown in Table 5. The Proposed Action would disturb approximately 31.5 acres for the pads and 6.2 acres for access roads. Long-term disturbance is expected to be 6.1 acres.

Table 5. Soil Classifications within 30 Meters of the Pad and the Centerline of Roads and Pipelines (NRCS, 2008).

Soil Classification	Surface Texture	Erosion Hazard	Rutting Hazard	Potentially Impacted (Acres)
Rentsac channery loam, 5 to 50 percent slopes	channery loam	Severe	Slight	110
Yamac loam, 2 to 15 percent slopes	loam	Severe	Severe	80
Redcreek-Rentsac complex, 5 to 30 percent slopes	sandy loam	Severe	Moderate	58
Piceance fine sandy loam, 5 to 15 percent slopes	fine sandy loam	Severe	Severe	26
Glendive fine sandy loam	fine sandy loam	Moderate	Severe	25

Rentsac-Piceance complex, 2 to 30 percent slopes	channery loam	Severe	Slight	22
Torriorthents-Rock outcrop complex, 15 to 90 percent slopes	channery loam	Severe	Severe	15
Rentsac-Piceance complex, 2 to 30 percent slopes	channery loam	Severe	Slight	14

Of the 324 acres analyzed no surface disturbance would occur on fragile soils or soils with landslide potential. Nearly all the soils have a severe erosion hazard rating (92 percent) and about 45 percent of the soils have severe rutting hazard.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: With proper BMPs for stormwater, reclamation and mitigation, impacts to soils outside the 30 meter buffer around surface disturbance are not expected.

Direct impacts from the construction of the well pads and access roads would include soil compaction, removal of vegetation, exposure of subsoil, mixing of soil horizons, loss of topsoil productivity, and an increase in the susceptibility of soils to wind and water erosion. Compaction due to construction activities would reduce aeration, permeability and water-holding capacities of soils in some locations. Removal of vegetation exposes soils to erosion from rainfall, wind and surface runoff. Exposure of subsoil and mixing of soil horizons can change the physical characteristics of subsoil and may reduce the productivity of these soils before reclamation is complete. Loss of topsoil productivity can occur during soil storage due to nutrient loss through percolation of precipitation through the soils, physical loss and mixing of less productive soil layers during moving and a loss of structure. An increase in surface runoff and sedimentation could be expected from impacted soils and these soils are likely to be less resilient to erosion from surface runoff after disturbance.

These direct impacts from the Proposed Action could result in increased indirect impacts to soils off the construction sites such as increased runoff and erosion. Implementation of BMPs for stormwater and reclamation will reduce impacts from this project and should limit impacts to construction sites. However, there is still the potential for intense storm events or BMP failures resulting in erosion off site. This type of erosion would be addressed by mitigation to require a plan to address problems as they develop.

Indirect impacts from this project could result in contamination of surface and subsurface soils due to unintentional leaks or spills from equipment and if these spills occurred they would affect the productivity of soils. Impacted soils would typically be removed or remediated on site and therefore loss of soil productivity would be temporary maybe 3 to 5 years.

Cumulative Effects: The well pads are on a ridgeline that separates the Piceance Outlet and Yellow Creek 5th-Level Hydrologic Unit Code watersheds. These watersheds are within the Mesaverde Play Area for natural gas. This area is expected to have 2 to3 well pads per section. Natural gas production wells include surface disturbance for well pads, pipelines, roads and support facilities. In addition to other oil and gas activity, dispersed recreation (hunting) might make use of access roads adding to the use. Use of access roads during poor conditions could

result in failure of drainage features and additional road maintenance activities may be needed. Livestock grazing occurs on public and private lands in the area and these activities may reduce canopy cover and lead to localized erosion in some reclamation areas.

In general, soil disturbance in the Proposed Action and other activities are likely to reduce soil productivity in the localized areas of disturbance, but are unlikely to impact overall soil productivity for the long term.

Environmental Consequences of the No Action Alternative:
Direct and Indirect Effects: No impacts to soils would occur.

Cumulative Effects: Impacts would be similar to those described for the action alternative.

Mitigation:
1. In order to protect public land health standards for soils, erosion features such as rilling, gullying, piping and mass wasting on the surface disturbance or adjacent to the surface disturbance as a result of this action will be addressed immediately after observation by contacting the AO and by submitting a plan to assure successful soil stabilization with BMPs to address erosion problems.
2. Road maintenance on the access roads should be done as needed to maintain drainage features and reduce erosion on the road surface.

Finding on the Public Land Health Standard #1 for Upland Soils: With mitigation, this action is unlikely to reduce the productivity of soils on public lands.

SURFACE & GROUND WATER QUALITY

Affected Environment: Surface Water: The well pad and access road are on a ridgeline that separates the Piceance Outlet and Yellow Creek 5th-Level Hydrologic Unit Code watersheds. Table 7 describes water segments that may be impacted by this project.

Table 7. Water Quality Classification Table (CWQCC 2013)

Segment	Segment Name	Use Protected	Protected Beneficial Uses			
			Aquatic Life	Recreation	Agriculture	Water Supply
16	All tributaries to Piceance Creek from the headwaters to the White River	No	Warm 2	Potential Primary Contact Recreation	Yes	No
13b	Tributaries to Yellow Creek	No	Warm 2	Not Primary Contact Recreation	Yes	No

Segment 13b and 16, tributaries to Yellow Creek and Piceance Creek are protected for warm water aquatic life (Warm 2). The warm designation means the classification standards would be protective of aquatic life normally found in waters where the summer weekly average

temperatures frequently exceed 20 °C. The Warm 2 designation means that it has been determined that these waters are not capable of sustaining a wide variety of warm water biota. These segments are protected for potential primary recreation and agriculture. Segment 16 is on the monitoring and evaluation list for *E.coli.* Duck Creek which a tributary to Yellow creek is on the 303d Colorado's impaired waters and monitoring and evaluation list for aquatic life (CWQCC 2012).

Groundwater: Precipitation in this area generally moves from areas of recharge to surface waters via alluvial aquifers and on the surface during spring melt and rain storms. A portion of annual precipitation infiltrates to deeper bedrock aquifers that contribute to springs. Springs and groundwater inputs generally occur in both bedrock and alluvial aquifers along valley bottoms. Perched groundwater zones occur locally when saturated zones contact differences in permeability and solubility of individual formations. These contact zones can occur in the ridges between surface water drainages and may be manifested as springs and seeps above the valley floor in outcrop areas.

Geological formations important for freshwater aquifers in this area are the Uinta and Green River Formations. The Green River Formation can be subdivided into an upper and lower aquifers separated by the Mahogany confining unit. The Uinta Formation and the upper Green River can be referred to as the upper aquifers and the primary aquifer is called the A-Groove. The zone in the Green River Formation below the Mahogany zone can be referred to as the lower aquifers were the primary aquifer is the B-Groove. Oil shale and nacholite mining have occurred in and below the Mahogany zone. The upper aquifer in particular the Uinta formation is important for stock wells. Natural springs in the area are typically associated with the A- or B-Groove aquifers. This area is also an important recharge area for the baseflows in both Yellow Creek and Piceance Creek.

Piceance and Yellow Creek are largely fed by groundwater or base flow and less from snowmelt or rain storms. Irrigation for hay meadows along the valley alluvium comprises most of the water use out of Piceance Creek. Typically the highest sustained flows in Piceance Creek occur in the late fall and winter after irrigation ceases and the baseflow from groundwater again dominates the hydrograph. Groundwater is particularly critical for maintaining surface flows and providing water sources for wildlife and livestock in the form of stock wells and springs in this area.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Surface Waters: Clearing, grading, and soil stockpiling activities associated with the Proposed Action would alter overland flow and natural infiltration patterns. Potential direct impacts include surface soil compaction caused by construction equipment and vehicles, removal of vegetation and disturbance of surface soils, which would increase rain-splash erosion and reduce the soil's ability to absorb water and increase the volume and rate of surface runoff, which in turn would increase surface erosion. Stormwater measures and best management practices including periodic monitoring of any erosion problems would be essential to avoid erosion and increased sedimentation to surface waters.

The soil analysis indicated the potential for severe rutting on the access roads, therefore good road maintenance for drainage features and surfacing the road and mitigation in the soils section

would reduce impacts. Typical road maintenance includes restoring the travel surface shape. This should reduce the risk of increased sedimentation to surface waters.

Surface runoff associated with storm events may increase sediment loads in surface waters down gradient of disturbed areas. Sediment can be deposited and stored in minor drainages where it would be moved into Yellow Creek and Piceance Creek during heavy convective storms. Surface erosion for this project is most likely during the construction and early production phases of the project and would be mitigated using BMPs for stormwater.

Groundwaters: As described in the Affected Environment, groundwater and the baseflow it provides to perennial surface waters is critical to maintaining the function of surface water systems. The proposed drilling program for each of the wells has been designed to protect and/or isolate all usable water zones.

Impacts to groundwater resources could occur due to failure of well integrity, failed cement, surface spills, and/or the loss of drilling, completion fluids into groundwater. Types of chemical additives used in drilling activities may include acids, hydrocarbons, thickening agents, lubricants, and other additives that are operator and location specific. Concentrations of these additives also vary considerably and are not always known since different mixtures can be used for different purposes in the same well bore. According to COGCC requirements, all chemicals (greater than 500 pounds) used during drilling, completion, and work-over operations, including hydraulic fracturing treatments will be disclosed in a chemical disclosure form by well site.

Known groundwater bearing zones in the project area would be protected by the drilling plan, including the contact springs, perched aquifers, and groundwater zones described in the Affected Environment. With proper drilling and completion practices contamination of groundwater resources is unlikely.

Cumulative Effects: The well pads and access roads are on a ridgeline that separates the Piceance Outlet and Yellow Creek 5th-Level Hydrologic Unit Code watersheds. This watershed is within the Mesaverde Play Area for natural gas and is expected to have 2-3 well pads per section. Natural gas production wells result in surface disturbance for well pads, pipelines, roads and support facilities. In addition to other oil and gas activity, dispersed recreation (hunting) will make use of access roads and will add to the wear of the roads. Use of the roads during poor conditions could result in failure of drainage features and additional road maintenance activities may be needed to keep the roads in good shape. Livestock grazing occurs on public and private lands in the area and these activities may reduce canopy cover and lead to localized erosion in some reclamation areas. Nahcolite mining and oil shale research and development occur in Yellow Creek to the west of the Proposed Action.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Neither ground nor surface water quality would be impacted by the no action alternative.

Cumulative Effects: Impacts would be similar to those described for the action alternative, but would not include the impacts from the Proposed Action.

Mitigation: None.

Finding on the Public Land Health Standard #5 for Water Quality: It is unlikely that construction of these well pads, access roads or drilling would result in an exceedence of state water quality standards.

VEGETATION

Affected Environment: The proposed resource exploration area is located on Rolling Loam and Pinyon Juniper Woodland ecological sites. Throughout the area there is a moderate level of pinyon/juniper encroachment into the Wyoming sagebrush (*Artemesia tridentata spp. wyomingensis*) dominated plant community. There are some Pinyon/Juniper plant communities characterized by young and mid age Utah juniper (*Juniperus osteosperma*) and a sparse herbaceous understory. Throughout the Proposed Action area a small percentage of the total acreage is previously disturbed with existing pads and roads. Primarily in these areas associated with earthen disturbances there is a component of cheatgrass (*Bromus tectorum*) that would readily spread into newly disturbed areas. A summary of observed vegetation classes is indicated in Table 8 below.

Table 8. Ecological Sites / Vegetation Classes Present on Proposed Drilling Sites

Ecological Site / Woodland Type	Plant Community Appearance	Predominant Plant Species in the Plant Community
Rolling Loam	Sagebrush / Grass Shrubland	Wyoming big sagebrush, winterfat, low rabbitbrush, horsebrush, bitterbrush, western wheat grass, Indian rice grass, squirreltail, June grass, Nevada and Sandberg bluegrass
Pinyon/Juniper	Pinyon/Juniper Woodland	Pinyon pine, Utah juniper, mountain mahogany, bitterbrush, serviceberry, Wyoming big sagebrush, beardless bluebunch wheatgrass, western wheatgrass, June grass, Indian rice grass, mutton grass

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Vegetation resources would be directly affected by the drilling activities on 22.4 (likely) to 43.4 (potential) acres. Direct effects would involve removal of native vegetation potentially including some mature trees. Soil could be removed and/or damaged during the life of the projects due to erosion, mixing of soil horizons. Factors affecting re-vegetation success of disturbed soils could be exacerbated by continued operational activities and inadvertently by livestock grazing on reclaimed areas except where fenced as described.

Noxious/invasive plant species could become an increased component of plant communities due to ground disturbance and seed dispersing activity in the area. Cheatgrass may be particularly problematic, as this species is capable of invading a variety of habitats, often becoming a dominant species. Cheatgrass is only palatable as a forage source for wildlife and livestock for a short portion of the growing season and its annual production is variable and unreliable.

Successful reclamation of disturbed sites with species listed in the seed mixture tables of Section 8 (Reclamation) of NSI's approved Mine Plan, as modified in the mitigation section below to better reflect the desired native plant communities, would reduce affects to plant communities where disturbance occurs.

Cumulative Effects: The proposed disturbance that could be associated with the Proposed Action, when added to other projects and developments, in and near the project area, as well as within the Yellow Creek and Piceance Creek watershed as a whole, would result in an increase in short-term removal of existing vegetation on public land. Long-term changes in plant community composition and structure would also occur in the project sites and on a broader scale from activities such as livestock grazing. Of the total potential vegetation removal near the project area and the Piceance Basin, the proposed project would not result in a noteworthy increase in vegetation disturbance or long-term changes in plant community.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Denial of the proposed core hole pads would result no direct or indirect impacts to vegetation in the proposed exploration area.

Cumulative Effects: Denial of the proposed project would have little impact on the cumulative effect of primarily oil and gas development impacts to the vegetative communities in the Yellow Creek/Ryan Gulch area or in the Piceance Basin as a whole.

Mitigation:

1. For reclamation actions described in Section 8 (Reclamation) of NSI's approved Mine Plan seed mixture tables; replace pubescent wheatgrass with Bluebunch wheatgrass (Whitmar) and replace Russian wildrye with Needle and Thread grass (*Hesperostipa comata* spp. *comata*) as listed below in Table 9 and Table 10.

Table 9. Reclamation Seed Species List

Species	Variety	Pounds Pure Live Seed/Acre
Grasses		
Thickspike wheatgrass	Critana	0.5
Streambank wheatgrass	Sodar	0.5
Western wheatgrass	Arriba	1.0
Bluebunch wheatgrass	Whitmar (*Pseudoroegneria spicata* spp. *inermis*)	1.0
Basin wildrye	Magnar	0.5
Needle and thread grass	(*Hesperostipa comata* spp. *comata*)	1.0
Green needlegrass	Common or Lodorm	2.0
Forbs		
Lewis flax	Appar	0.2
Cicer milkvetch	Monarch*	0.5
Alfalfa	50% Ladak*	0.75

	50% Nomad*	0.75
Scarlet globemallow	VNS or common	0.2
Palmer's penstemon	Cedar	0.2
Shrubs		
Fourwing saltbush	Rincon (dewinged)	1.5
Winterfat	VNS or common	0.5
Antelope bitterbrush	VNS or common	1.0
* preinoculated	**Total**	**12.1**

Table 10. Monitoring Well Interim Seed Species List

Species	Variety	Pounds Pure Live Seed/Acre
Grasses		
Bluebunch wheatgrass	Whitmar (*Pseudoroegneria spicata* spp. *inermis*)	3
Thickspike wheatgrass	Critana	2
Forb		
Alfalfa	Ladak	2
* preinoculated		

2. Successful reclamation must reflect a plant community of at least five desirable plant species where no one species may exceed 70 percent relative cover and desired foliar cover, bare ground, and shrub and/or forb density must have 80 percent similarity in relation to the identified DPC.
3. Seed mixes for final abandonment of well pads and access retained for monitoring purposes will be based on the recommendations made by the BLM at that time.

Finding on the Public Land Health Standard #3 for Plant and Animal Communities: Due to the historic, current, and future development of mineral resources and continued grazing in this area, the overall vegetative cover and productivity is diminished from the potential for this area. With implementation of mitigation measures and successful re-vegetation, the Proposed Action would likely increase vegetative cover and productivity to at least equal or possibly better than the surrounding landscape due to the application of reclamation measures and monitoring. Overall with successful reclamation of disturbances there would be no negative effect on the status of Land Health Standard 3 in the project area or at a landscape scale.

INVASIVE, NON-NATIVE SPECIES

Affected Environment: The Colorado Noxious Weed Act (Title 35 Article 5.5, enacted 1996) defines noxious weeds as plant species that are not indigenous to the State of Colorado and which aggressively invade or are detrimental to economic crops or native plants; are poisonous to livestock; are carriers of detrimental insects, diseases, or parasites; or the presence of the plant is detrimental to the environmentally sound management of natural or agricultural ecosystems. Recognized noxious weeds are grouped into three categories: Lists A, B, and C (Colorado Weed

Management Association 2009). List B includes species for which a state noxious weed management plan is required to stop their spread. List C includes species that are common in Colorado. Optional programs provide resources to governing bodies that choose to require management of List C species, however, prevention of these weed species is not state-mandated (CWMA 2009).

According to "Natural Soda's Botanical Survey for Special Status Species of Plants For Natural Soda's Proposed 2014 Exploration Drilling Program" (Roberts), conducted in the spring of 2014, there were no State "A" or "B" list species encountered within the project area. Only common mullein and cheatgrass, both State "C" list species were encountered within the overall project area. There are several List "B" and List "C" noxious (weed) species known to occur in the general area surrounding the proposed exploration activities including bull thistle, halogeton, diffuse knapweed, common mullein, Russian thistle, yellow sweetclover, curleycup gumweed, and cheatgrass. Diffuse knapweed, a list "B" status species, occurs along CR 83. This species is not widespread in the Piceance Basin, and should be controlled and monitored closely. Halogeton, a list "C" species, occurs in association with several existing well pads in the area. Most of the other weeds listed occur in association with disturbance including access roads, county roads, and pipelines.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The 22.4 to 43.4 acres of surface-disturbance associated core hole drilling actions could create or exacerbate noxious weed problems by importing weed seed or plant parts (rhizomes) on vehicles and construction equipment and by creating suitable conditions in the form of non-vegetated disturbed areas. Cheatgrass establishment is very likely if disturbed surfaces are not re-seeded at the first appropriate seeding window following each disturbance. Diffuse knapweed should be controlled and monitored closely. The proposed monitoring for further infestation and application of weed control or eradication measures would reduce the risk and effects of noxious weeds in the resource definition exploration area.

Cumulative Effects: Noxious and invasive weeds present in the proposed exploration area are primarily associated with existing areas of development/disturbance. Further development actions association with this proposal would create additional opportunity for noxious/invasive weed establishment. Existing roads and development related disturbances throughout the general area are common sources of weeds so elimination of these species from the general area is unlikely. The extent of infestation and persistence of weeds would be dependent on monitoring and treatment as part of future projects and activities in the general Yellow Creek/Ryan Gulch/Piceance Creek area. Section 8 of NSI's Mine Plan (Reclamation) including long term weed control, along with the mitigation measures listed below, would ensure compliance, improve effectiveness, and reduce risk of long term negative impacts associated with the Proposed Action

Environmental Consequences of the No Action Alternative

Direct and Indirect Effects: Noxious and invasive plants would continue to be present within the vicinity of the proposed exploration area and, depending on the aggressiveness of weed treatment activities, may continue to spread.

Cumulative Effects: Cumulative effects would be similar to those from the Proposed Action.

Mitigation:

1. Application of herbicides must comply with the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environments Impact Statement* (EIS), and the WRFO Integrated Weed Management Plan (DOI-BLM-CO-110-2010-0005-EA).
2. All seed, straw, mulch, or other vegetative material to be used on BLM and split-estate lands will comply with United States Department of Agriculture (USDA) state noxious weed seed requirements and must be certified by a qualified Federal, State, or county office as free of noxious weeds. Any seed lot with test results showing presence of State of Colorado A or B list species will be rejected in its entirety and a new tested lot will be used instead. All areas identified to be disturbed under this proposal will be monitored and treated for noxious weeds on an annual basis for the life of the project until Final Abandonment has been approved by the Authorized Officer.
3. Pesticide Use Proposals (PUPs) must be submitted to and approved by the BLM before applying herbicides on BLM lands. The PUP will include target weed species, the herbicides to be used, application rates and timeframes, estimated acres to be treated, as well as maps depicting the areas to be treated and known locations of weeds. The WRFO recommends that all PUPs be submitted no later than March 1st of the year anticipating herbicide application.

SPECIAL STATUS ANIMAL SPECIES

Affected Environment: The White River and its 100-year floodplain are designated critical habitat for the Colorado pikeminnow from Rio Blanco Lake (upstream of Yellow Creek mouth) downstream to the Green River, though occupied habitat is confined to the river below Taylor Draw dam, about 28 river miles downstream of Yellow Creek (see Riparian/Wetland and Aquatic Wildlife discussions in Table 3). The White River is also inhabited by a number of BLM-sensitive fish, including roundtail chub and the flannelmouth, bluehead, and mountain sucker. Major tributaries in the Piceance Basin draining to the White River, including Yellow Creek and Piceance Creek, are also widely inhabited by BLM-sensitive mountain sucker and northern leopard; flannelmouth suckers are generally confined to these systems near their mouths.

The White River and its cottonwood gallery forests are central to year-round (e.g., nesting and winter roosting) bald eagle (BLM sensitive, FWS Bird of Conservation Concern) distribution in the WRFO. Although cottonwood-willow riparian habitats are ostensibly suited for occupation by the proposed threatened yellow-billed cuckoo, there are no recent records of cuckoo on the White River and, based on recent literature, its vegetation condition and configuration are generally unsuited for nesting.

BLM-sensitive northern goshawk are known to nest in modest numbers in the Piceance Basin's mature pinyon-juniper woodlands above 6,500 feet elevation. Woodlands associated with the proposed project are on the lower margin of this elevation range (maximum elevation 6,750 feet with half of project area below 6,500 feet) and no goshawk nesting activity was detected during raptor nest surveys conducted in the spring of 2014.

Midget faded rattlesnakes (BLM-sensitive) are generally confined to the Green River geologic formation in southeast Wyoming, eastern Utah, and western Colorado. Narrowly adapted to denning habitat composed of bedded sandstone outcrops with fallen mid-slope slabs on south to southeast exposures below 7,000 feet in elevation, this snake was documented in scattered locations across the WRFO during the summer of 2012 and may be the only species of rattlesnake in the Piceance Basin. There are no rock outcrops with appropriate aspect closely associated with proposed surface disturbance.

The BLM-sensitive Brewer's sparrow is addressed in the Migratory Bird section; the nearest mapped sage-grouse habitat is 6 miles from project-related influence.

There are no water features known to be capable of supporting a breeding population of Great Basin spadefoot within the general project area.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The Proposed Action would have no effect on Colorado pikeminnow and other downstream endangered Colorado River fish or habitat designated as critical for their support and recovery. Separated from the nearest designated critical habitat by 14 miles of ephemeral channel and 9 miles of intermittent and perennial tributary channels in the Yellow Creek watershed and 3.1 miles of ephemeral channel and 13.4 valley miles of perennial channel in the Piceance Creek watershed, the WRFO believes there is no reasonable potential for proposed activities to contribute measurably to sediment or other contaminant loads in the unoccupied reach of the White River capable of directly affecting downstream populations of Colorado pikeminnow. Similarly, the Proposed Action would pose no risk of physically destroying or adversely modifying critical habitat designated for this or any downstream population of endangered fish. Projected lease exploration and monitoring activities are expected to have no effect on the condition or function of the White River's 100-year floodplain.

It has been established that depletion of flow from the Upper Colorado River system is likely to jeopardize the continued existence of the four endangered fish of the Upper Colorado River Basin (including bonytail, humpback chub, razorback sucker) and destroy or adversely modify designated critical habitat. Proposed exploration and monitoring well development is expected to require a total volume of 0.5 acre-foot of water.

Water depletions attributable to this mining operation were addressed in the original Section 7 consultation (Biological Opinion SE/SLC: 6-5-86-F-019, August 28, 1986). The Service determined that project depletion impacts could be satisfactorily offset with a monetary contribution to help fund conservation measures implementing the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program). Receipt of Wolf Ridge Corporation's balance of payment for implementing conservation measures and avoiding jeopardy for the endangered Colorado River fishes was verified in that Biological Opinion.

Although proposed exploration and monitoring activities would temporarily increase the rate of water use (depletion) from the Upper Colorado River system as habitat for the four endangered Colorado River fishes, the increment of annual depletion attributable to these actions would be

exceedingly small (i.e., about 0.02 acre-foot per year) and well within the depletion volumes established for the mine operation within the consultation process. Average annual water depletion attributable to solution mining and nahcolite processing consulted on in the original BA/BO was 219 acre-feet per year. Since operations began in 1990 annual water use has averaged 101.4 acre-feet per year, ranging from 25.3 acre-feet in 1991 to 222.9 acre-feet in 2013. It is projected that nearly 3 decades of current water use rates could be accommodated before the average annual net depletion figure of 219 acre-feet was exceeded.

There is no projected risk to riparian, wetland, or riverine-related habitats or the animals they support, including bald eagle, northern leopard frog, and special status fish. See the Riparian/Wetland and Aquatic Wildlife discussions in Table 3).

Although there is potential for midget faded rattlesnakes to occupy the general project area, because of the lack of appropriate habitat features in close proximity to proposed well development sites, it is unlikely that project implementation would result in adverse habitat modification or vehicle-related mortality.

Cumulative Effects: Incremental flow depletions from the Upper Colorado River system contribute to cumulative reductions in flow volume that affect seasonal fluctuations in flow, water quality, and channel/floodplain structure as important determinants of endangered fish habitat. However, the consequences of depletion were considered and conservation measures applied in the context of basin-wide water use in previous Section 7 consultation with the FWS. Because most of the longer-term monitoring-related features are integral with and clustered around current mining operations and more distant core-sampling work would be brief, temporary, and subject to immediate reclamation and abandonment, the Proposed Action would not be expected to contribute cumulatively to influences on other special status animals addressed in this section (e.g., midget faded rattlesnake, riparian/wetland-associated species).

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Failure to authorize the Proposed Action would not be expected to benefit or relieve impacts on special status species to any measurable degree.

Cumulative Effects: Same as the Proposed Action.

Mitigation: None.

Finding on the Public Land Health Standard #4 for Special Status Species: The project area does not contribute substantively to the support of special status animals, nor does the Proposed Action contribute measurably to influences on off-site populations or habitat of special status species. Neither alternative would have notable influence on factors that are considered important in affecting the land health standard for special status animals.

SPECIAL STATUS PLANT SPECIES

Affected Environment: A Special Status Plant Species (SSPS) survey was conducted in the spring (Roberts 2014). Sixteen areas within 600 meters of the project area for site "U" were

mapped as suitable habitat for the federally threatened species Dudley Bluffs bladderpod (*Physaria congesta*). The nearest occupied population of the Dudley Bluffs bladderpod is approximately 545 meters to the north of proposed site "U" and was observed within the area surveyed for the proposed access route.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Disturbances within 600 meters of habitat occupied by the Dudley Bluffs bladderpod could result in direct adverse effects (FWS 2010). Therefore, direct disturbances to both occupied and unoccupied suitable habitat can be expected from construction of the access road to the site "U". Any type of surface disturbance can negatively impact special status plant habitat directly and indirectly by generating fugitive dust, trampling and/or removing plants, removing and/or disturbing pollinator habitat, and contributing to the spread of invasive species and noxious weeds. Encroachment of invasive species could result in the loss of suitable habitat a potential reduction of the future expansion range of the species.

Cumulative Effects: The Proposed Action would cumulatively increase surface disturbance in the area and contribute to greater fragmentation of natural communities. The estimated 43.4 acres of short term disturbance and 6.1 acres of long term surface disturbance may increase the potential for establishment of non-native plant species in the project area and could adversely impact suitable habitat. An adverse impact to suitable habitat could result in the reduction of potential for the species to expand their range into previously unoccupied habitat. Long term disturbance and use of access routes could increase the overall levels of fugitive dust in the area.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no effects to federally-listed or BLM sensitive plant species under the No Action Alternative.

Cumulative Effects: There would be no contribution to previous or existing disturbances under the No Action Alternative.

Mitigation:

1. Dust suppression is required on all road and work areas for access to site "U" using water only.
2. Construction within 600 meters of occupied Dudley Bluffs bladderpod habitat must occur outside of the growing season from August to March.
3. During construction, reclamation, and any ground disturbing maintenance activities within 600 meters of the Dudley Bluffs bladderpod occupied habitat, the operator shall install a silt fence on outer edges of disturbance to protect the special status plant species from construction activity. All silt fencing will be maintained until disturbance is stabilized and interim reclamation is completed. Silt fencing will be required for any new reclamation activities.

Finding on the Public Land Health Standard #4 for Special Status Species: By following the mitigation measures, the Proposed and No-Action Alternatives are not expected to affect populations

or habitats of plants associated with the Endangered Species Act or BLM sensitive species and, as such, should have no influence on the status of applicable Land Health Standards.

MIGRATORY BIRDS

Affected Environment: Breeding birds associated with the project area's woodlands and sagebrush shrublands nest principally from mid-May through mid-July (May 15 to July 15) with an estimated overall nest density of 0.5 to 1 nest per acre. Birds that have been identified for heightened management attention include Brewer's sparrow (BLM-sensitive) in sagebrush habitats, and juniper titmouse and pinyon jay (FWS Birds of Conservation Concern) in pinyon-juniper woodlands. These birds are widely distributed at appropriate densities throughout the Piceance Basin and northwest Colorado.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The Proposed Action would involve the clearing and occupation of an estimated 11 to 26 acres of sagebrush and 5 to 12 acres of woodland habitats used by nesting migratory birds. Effects on migratory birds would include the reduced availability of shrubland or woodland nesting habitat, reduced utility of habitat adjacent to development caused by bird avoidance of human activities, and mortality of eggs or dependent young from nest destruction or disruptive incidents that prompt excessive absence of incubating, brooding, or tending adults.

Although the redevelopment of woody vegetation as nest substrate would require several decades (sagebrush) to over a century (woodlands) once a site is reclaimed, considering the relatively small individual dimensions, the small total extent, and widely dispersed nature of vegetation clearing, it is unlikely that direct habitat modifications would alter (reduce) overall nest densities or species distribution in the general project area.

Effective habitat loss, or the avoidance and disuse of otherwise suitable habitat, could be expected to extend to as much as 20 additional acres of nesting habitat adjacent to access roads and pads that would be used for monitoring. Monitoring would likely entail light vehicle use and these residual, longer-term effects would likely be minor. These effects would not occur on core-hole locations that are developed outside the nesting season and are to be promptly reclaimed (westerly half of project area).

Because migratory birds are relatively abundant and well-distributed across the WRFO during the nesting season, it is considered impractical for vegetation clearing or dirt work to avoid ongoing nest attempts from May 15 through July 15 (e.g., siting adjustments to avoid nests). Although development activities that occur during the core nesting season would not affect adult birds, direct destruction of nests or disturbances that lead to inopportune absences of brooding adults result in mortality of eggs or nestlings and contradict 'take' provisions of the Migratory Bird Treaty Act.

Project-wide, physical damage to nests and nest disruption capable of failing nesting efforts would be limited, at most, to the final 1-2 weeks of the 2014 nesting season. Given the anticipated development schedule in 2014, more intensive effects associated with vegetation

clearing and well development would take place largely after the core nesting season (after July 15). Strategic development of up to several wells in close proximity to existing roads or active mine or natural gas locations during the final weeks of the 2014 nesting season would be expected to limit potential involvement of special status birds (i.e., Brewer's sparrow) to no more than 1-2 nests. Residual effects at reduced intensity would persist on those locations used as monitoring wells. Restricting development of pads, access, and wells in subsequent nesting seasons would avoid any substantive risk of direct mortality.

Cumulative Effects: Although adverse effects on nest habitat attributable to the Proposed Action would be minor in light of site-specific circumstances, the Proposed Action would contribute incrementally to long-term habitat modification and disturbance-induced disuse of nesting habitat associated with fluid mineral development in the Piceance Basin. Based on projections in the Draft Oil and Gas Development RMP Amendment/EIS, migratory bird effects attributable to the Proposed Action would be integral with effective habitat losses on the order of 5 or 6 percent in the Piceance Basin.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Failure to allow acquisition of more detailed geologic information may ultimately increase the extent of woody nesting habitat cleared and roaded due to inefficient siting of production wells.

Cumulative Effects: Same as the Proposed Action.

Mitigation:

1. Development of pads and access, and well drilling/coring operations would not be authorized during the core migratory bird nesting season (from May 15 to July 15).

TERRESTRIAL WILDLIFE

Affected Environment: The entire project area is encompassed by big game (deer) severe winter range composed of variable density stands of pinyon-juniper liberally interspersed with Wyoming big sagebrush parks. These Colorado Parks and Wildlife (CPW)-delineated ranges, by definition, support 90 percent of a Game Management Unit's deer population when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten. The lands between the existing Natural Soda nahcolite mine and Yellow Creek support concentrated winter deer use most importantly from December 1 to April 30. The study area for an ongoing multi-year CPW big game research project, designed to better define the response of deer to active fluid mineral development on severe winter range in the Piceance Basin, involves much of the existing mine and this Proposed Action. The existing mine facilities and the eastern half of the proposed project sites are encompassed by the treatment area. Locations A-C, N, and O-U lie in the adjacent control area.

Overall route density in the general project area is about 3.7 miles per square mile and exceeds route density objectives established for severe winter range in the White River RMP (i.e., 1.5 miles per square mile). Based on inspection of 2011 NAIP imagery, route density in the easterly half of the project area is double that to the west (5/mi^2 v.s. 2.3 mi^2).

Raptor nest surveys were conducted by a consultant in 2014 consistent with WRFO survey protocols. The only recorded nests at risk of disruption from project activity is a 4-nest cluster that lies between 54 and 110 meters from the authorized boundary of the "L" location. Ongoing nest activity by a long-eared owl was evidenced in the nest located at 110 meters. This nest cluster is or was likely associated with a nesting pair of Cooper's hawk. Cooper's hawk nests are often periodically occupied by long-eared owl.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Woody forage or cover sources lost in the longer term from vegetation clearing (12-26 acres of sagebrush, 5-11 acres of woodland) or longer-term facility occupation (~6.2 acres) are minor relative to that available in the general project area (roughly 7,000 acres). Sagebrush would likely require decades to develop productive forage properties, but the process of shrub recolonization and successional advance to that state would be initiated with the immediate reclamation of seventy to ninety percent of all project-related disturbance. Herbaceous forage loss would be short-term and reclaimed acreage would likely produce comparable quality and quantities of herbaceous forage within 2-3 years.

The tendency for big game to avoid areas influenced by human activity has been demonstrated consistently since the 1970's, and has become more precisely defined with modern GPS technology. This disturbance is generally most evident and widely imposed on big game by vehicle use of access networks. Behavioral avoidance of activities directly or indirectly associated mineral development in the Piceance Basin is thought to exert pervasive and substantive influences on wildlife populations. The consequences of those impacts primarily involve elevated energetic costs (increased metabolism, locomotion, and use of steeper terrain) and disuse of available resources which can have important implications in influencing fitness and performance (e.g., survival, reproduction) at the individual and population level. The utility of affected habitat would be expected to be largely regained once activity levels subside and assuming secondary activity (e.g., recreation) is controlled.

Phase I work, scheduled for summer/fall 2014, is closely associated with existing mine facilities. At present, the existing mine influences about 550 acres of big game severe winter habitat (about 0.4 percent of severe winter range habitat in the Piceance Basin). All proposed project work would be located within 0.6 mile of existing mine operations or other active mineral developments. Locations G-J are situated on the edge of existing mine facilities, pads K-M are tightly clustered east of the mine, and the remaining pads form a series along the western boundary of the mine. Phase II extends as a series of pads to the north and west, but all these sites would be subject to immediate reclamation after core sampling was complete. In the event all project work were conducted simultaneously and extended into the period of big game occupation, the extent of disturbance imposed on wintering big game would roughly be double that of present (an additional 0.4 percent of severe winter range). This figure represents the worst case during the initial year of construction and drilling.

Assuming core sampling sites are promptly reclaimed and access effectively abandoned, there would be no residual behavioral effects attributable to these sites (i.e., primarily the project's west half). As the intensity and frequency of human activity diminishes at longer-term

monitoring sites during the second and subsequent years (low frequency/intensity monitoring activity) there is evidence to suggest that avoidance distance may be reduced by 50 percent (Sawyer et al. 2009), which would reduce the areal extent of avoidance by 75 percent. All considered, after the initial year or two of well development and reclamation, residual activity on monitoring pads and their access would increase the disturbance footprint of this mine by an estimated 15 percent (about 85 acres; less than 0.1 percent of severe winter range in Piceance).

This project would involve up to 1.3 miles of temporary access (west half; subject to immediate reclamation and abandonment) and 1.6 miles of longer-term access roads (monitoring wells). Longer term access for monitoring wells would add up to 1.6 miles to existing route networks, adding up to 0.15 mile per square mile to overall road density and up to 0.3 mile per square mile (i.e., 5.02 to 5.31 mi/mi^2) to route density in the more-industrialized eastern half of the general project area. The applicant agreed to adopt alternate access to the Q pad (reduction of 950 meters) and between the B and C pads (N-C-B-H series) (net reduction of 250 meters) in an effort to reduce road-related intrusion on intact habitat parcels.

Access routes proposed for development in the project's west half (Phase II) are largely temporary for core sampling and would be reclaimed promptly after coring operations are complete. It is intended that these routes be obliterated and unavailable for further use. Importantly, under this assumption, temporary access would not add cumulatively to lighter road density in the western half of the general project area. Once cleared of vegetation and graded, these access routes are often difficult to abandon and represent permanent sources of disturbance. It is important in a cumulative sense (i.e., maintenance of winter range utility) to apply persistent and progressive efforts to ensure effective abandonment of these access routes.

A slight increase in road density in the project's eastern half and maintaining road density in the western half would likely have little, if any, practical influence on big game habitat utility or animal distribution within the general project area. This effect is predicated on the operator successfully abandoning access routes on BLM-administered lands in a manner that effectively deters subsequent vehicle use.

Pad location 'L' is the only feature that is located in close proximity to woodland raptor nests. Very minor adjustments in pad alignment (generally less than 20 meters) would avoid impinging on the extent of this woodland stand and ensure that the integrity of the stand for subsequent nesting functions are maintained. Vegetation clearing, pad and access construction, and well development would be subject to RMP-approved timing limitations that would prohibit these activities from taking place within 200 meters of an active raptor nest while the nest was in use.

Cumulative Effects: The proposed monitoring and exploration program represents an exceedingly small and probably discountable contribution to direct and indirect forms of big game habitat loss (i.e., <0.1 percent after well development years) that is primarily associated with anticipated fluid mineral development in the Piceance Basin (projected up to 14 percent of land base). With siting considerations, project features would not be expected to compromise the current utility of woodlands in the project area for subsequent raptor nesting activity and would not contribute measurably to cumulative declines in the availability of suitable nest habitat.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Failure to allow acquisition of more detailed geologic information may ultimately increase the extent of winter range habitat subject to physical modification and behavioral influence due to inefficient siting of production wells.

Cumulative Effects: Although impossible to predict, inefficient well-pair placement (e.g., lengthy access requirements) and would be expected to increase physical and behavioral influences exerted on big game severe winter range. In a relative sense, these increases would likely remain small, such that the cumulative effects of the No-Action Alternative would likely be similar in nature to those discussed for the Proposed Action.

Mitigation:

1. Any pad constructed within site 'L' should remain outside of the perimeter of the woodland stand along its northern and northeasterly margin (involving less than 1 acre within the authorized area).
2. Vegetation clearing, pad and access construction, and well development activity would not be permitted within 200-meters of active raptor nests from April 1through August 15, or until young are fledged and independent of the nest.
3. Locations A, B, C, N, and O through U are located in big game severe winter range and outside an area where winter timing limitations have been excepted in support of ongoing CPW research. Vegetation clearing, pad and access construction, and well development activity would not be permitted on these sites from December 1 through April 30.

Finding on the Public Land Health Standard #3 for Plant and Animal Communities: The general project area continues to support concentrated big game use during the winter season and woodland raptor nesting without serious impairment from ongoing mineral development. The Proposed Action, as proposed and conditioned, would not add appreciably to existing patterns and intensity of mineral development or human activity and would be consistent with continued meeting of the standard. The No Action Alternative is less well defined, but would likely have similar, though more deleterious, consequences with respect to continued meeting of the standard.

CULTURAL RESOURCES

Affected Environment: The proposed exploration and development area has been inventoried at the Class III (100 percent) pedestrian level by four relatively recent project inventories (Conner 1998 compliance dated 10/5/1998, Conner *et. al.* 2013 compliance dated 12/18/2013 compliance dated 7/10/2014, Elkins 2011 compliance dated 10/6/2011). The inventories resulted in the re-visitation to or recording of 17 sites; 7 of which are considered eligible for listing on the National Register of Historic Places (NRHP) and 3 sites which are potentially eligible (need data) for nomination to the NRHP. Many Isolated Finds (IFs) were also recorded but since they are not considered NRHP eligible they will not be discussed further for this analysis.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Core hole RDP-R was moved to provide a 330 foot (100 meter) buffer to protect site 5RB.5810 which is considered NRHP eligible. There should be no direct impacts to the site. However as long as the proposed access road remains in place and is not closed and rehabilitated there is a potential for increased human activity in the area during and after the drilling operation which could potentially lead to unlawful collection or excavation of artifacts at the site.

Core hole RDP-Q is located approximately 423 feet (126 meters) from NRHP eligible site 5RB.5993. This distance should be sufficient to keep the site out of the area of direct impacts from the drilling operations. However, the improved access into the area and increased human access and activity to the area during drilling operations (and until the proposed access road is closed and rehabilitated) means that the site could be subject to unlawful collection of artifacts and excavations. Disturbance of the site due to unlawful collection or excavation add to the cumulative permanent, long term irreversible and irretrievable loss of data from the regional archaeological database.

Core hole RDP-F is surrounded by five sites that are eligible for nomination to and/or listing on the NRHP. NSI has moved the core hole to provide a 330 foot (100 meter) buffer between the core hole and all of the sites to avoid direct impacts to the sites. This limits the area available for the drilling operation but is necessary to avoid costly delays and or the need to begin a data recovery and mitigation program on one or more or of the sites. There should be no new direct impacts to the sites however the increased activity in the area from drilling and the increased access to the area could cause indirect impacts from unauthorized collection of artifacts or unlawful excavation within the sites. By limiting access to the core hole area when the hole is converted to a monitoring location it should be possible to limit the potential for unlawful artifact collection on any of the sites.

NSI has altered proposed access routes and other core holes were located well beyond 330 feet (100 meters) to avoid impacting other NRHP-eligible sites.

There is some limited potential for previously undetected remains in portions of the project area. Earth disturbing activity for pad leveling and road construction has the potential to impact previously unknown cultural resources. These impacts could potentially result in a very serious impact to cultural resources, but current technology does not allow for adequate evaluation of the potential impacts without extensive and potentially destructive excavations.

Any loss of artifacts or illegal excavation in sites within the project area would constitute a cumulative, long term, permanent, irreversible, and irretrievable loss of data from the regional archaeological database.

Cumulative Effects: Direct physical impacts to all significant cultural resources as defined by the regulations at 36 CFR 800 have been avoided by project redesign. However indirect impacts are still a possibility which could result in loss of scientifically important artifacts, cultural features, and environmental data. These losses are additive over the region and result in a loss of data from the regional archaeological database that cannot be recovered.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Under the No Action Alternative there would not be any new access road construction or drilling activity that could pose potential threats to cultural resources that have been identified in the project area. Occasional access by hunters or hikers might still occur on an infrequent basis that could result in unlawful collection of artifacts or excavations into the sites. These are not related to development in the area. Natural weathering also occurs in the area which results in some degradation of resources through erosion and weathering of surface materials. These processes are natural and have been part of the environment for centuries and are not controllable.

Cumulative Effects: Cumulative effects of natural process are ongoing and not controllable. The do result in loss of scientific data from the regional database but, there is no known mitigation to prevent such loss.

Mitigation:

1. NSI is responsible for informing all persons who are associated with the project that they will be subject to prosecution for knowingly disturbing archaeological sites or for collecting artifacts.
2. If any archaeological materials are discovered as a result of operations under this authorization, activity in the vicinity of the discovery will cease, and the BLM WRFO Archaeologist will be notified immediately. Work may not resume at that location until approved by the AO. NSI will make every effort to protect the site from further impacts including looting, erosion, or other human or natural damage until BLM determines a treatment approach, and the treatment is completed. Unless previously determined in treatment plans or agreements, BLM will evaluate the cultural resources and, in consultation with the State Historic Preservation Office (SHPO), select the appropriate mitigation option within 48 hours of the discovery. NSI under guidance of the BLM, will implement the mitigation in a timely manner. The process will be fully documented in reports, site forms, maps, drawings, and photographs. The BLM will forward documentation to the SHPO for review and concurrence.
3. Pursuant to 43 CFR 10.4(g), the NSI must notify the AO, by telephone and written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), NSI must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.
4. Due to the high site density near core hole RDP-F, monitoring by a permitted archaeologist of initial soil disturbance for the access road and pad preparation will be required.

PALEONTOLOGICAL RESOURCES

Affected Environment: The Natural Soda proposed exploration and development project area is located in an area generally mapped as the Uinta Formation (Tweto 1979). The BLM has categorized the Uinta Formation as a Potential Fossil Yield Classification (PFYC) 5 formation indicating that it is known to produce many scientifically noteworthy fossils, especially

vertebrate fossils (c. Armstrong and Wolny 1989, Conner and Langdon 1981 compliance dated 1/2/1981, Conner 1998 compliance dated 10/5/1998).

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: If it should become necessary to excavate into the underlying sedimentary rock formation to upgrade any access road or level drill pads there is a high potential to impacts scientifically noteworthy fossil resources. Fossils potentially impacted could be anything from small micro-fossils to large mammals. Loss would occur as fossils re crushed or shattered during the ground clearing and leveling process or displaced from their context destroying the fossil context and associated paleo-environmental data associated with the fossils.

Should any fossils be exposed on the surface near drilling operations there is some potential for unlawful collection of fossil resources. Inadequate or incomplete reclamation after completion of drilling and sampling operations could result in accelerated erosion in some areas which could expose previously obscured fossils which could make the fossil subject to increased erosion rates or potential unlawfully collection destroying contextual and environmental data.

Drilling through the formations has the potential to destroy and adversely affect fossil resources. However there is no technology currently available to allow for identification of fossils down a small diameter drill hole or in the cuttings brought up as a result of drilling any wells or other holes in the formation.

Core hole L is very close to paleontological locality 5RB.8408, less than 30 meters. If NSI wants or needs to drill the L core hole there is a potential for severe impacts to a vertebrate paleontology locality. Very important scientific data could be lost, along with the fossils if this well is needed. This would represent a very serious loss of data from the regional paleontological data base; this loss would be permanent, long term, irreversible and irretrievable.

Cumulative Effects: Even if paleontological monitors are in place to monitor excavation into the underlying fossil bearing formation, (except for drill holes which cannot be effectively monitored) there may be loss of some fossils, especially smaller and more fragile fossils. Should any impacts to fossils occur, including those associated with drill holes, it would represent a permanent, long term, irreversible and irretrievable loss of data from the regional paleontological database. Such losses are generally considered cumulative with losses from other activities in the area.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Under the No Action Alternative none of the proposed drilling activity would be permitted. Lack of a drilling program would eliminate the potential for impacts to fossil resources from exploration and development of the leased resources. However, some unlawful collection of fossils exposed through the natural weathering process would still be susceptible to unlawful collection. Erosion would continue as it has for centuries slowly exposing some fossils at the surface. Fossils exposed at the surface as a result of erosion would likely be lost through weathering of the fossil itself, transportation off location of smaller, lighter fossils, and possible crushing as a result of animal trampling or off highway vehicle use in the area.

Cumulative Effects: Although there would be no construction related loss of fossils and paleontological data under the No Action Alternative the natural weathering process would continue as it has for centuries. This slow erosion and weathering process does eventually result in some unquantifiable loss of fossils and related paleo-environmental data. However, this lost is not considered unacceptable at the present time.

Mitigation:

1. NSI is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for disturbing or collecting vertebrate or other scientifically important fossils, collecting large amounts of petrified wood (over 25lbs./day, up to 250lbs./year), or collecting fossils for commercial purposes on public lands.
2. If any paleontological resources are discovered as a result of operations under this authorization, NSI and/or any of his agents must stop work immediately at that site, immediately contact the BLM Paleontology Coordinator, and make every effort to protect the site from further impacts, including looting, erosion, or other human or natural damage. Work may not resume at that location until approved by the AO. The BLM or designated paleontologist will evaluate the discovery and take action to protect or remove the resource within 10 working days. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (a) following the Paleontology Coordinator's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (b) following the Paleontology Coordinator's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.
3. Any excavations into the underlying native sedimentary stone must be monitored by a permitted paleontologist. The monitoring paleontologist must be present before the start of excavations that may impact bedrock.
4. If NSI finds it necessary or desirable to drill the L core hole they shall be required to either do full mitigation and fossil collection on the fossil locality 5RB.8408 or be required to assume full site security and integrity monitoring of the site to deter unlawful collection of fossil resources during the life of the hole for core testing and monitoring should they convert the core hole to a monitoring well.

NATIVE AMERICAN RELIGIOUS CONCERNS

Affected Environment: Many cultural resources have been identified in the area (see the above Cultural Resources section) that are generally considered important by Native American groups. Concerns expressed are the intrusion of modern elements that might disrupt the setting and feeling of those sites that are considered traditionally important to the groups. Visual and sound impacts that are long lasting are of particular concern to the groups.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Mitigation measures have been put in place to limit the visual impact to sensitive sites. Buffers have been established to reduce the visual impacts to the

extent possible to avoid impact to the visual setting and feeling of the sites. Short term visual impacts may still occur while drill rigs are on the location. Depending on the equipment used short noise impact are also possible that would impact the feeling and setting of the location. These impacts should be short term and impermanent.

Equipment required for monitoring wells could represent a visual impact to some sites over the long term, depending on the nature of the equipment used. Low contrast painting should reduce the visual impacts to the setting and feeling of the area surrounding sites considered important by Native American Tribes.

Cumulative Effects: Monitoring wells generally are very quiet and low profile not presenting any cumulative impacts audibly. However some visual impact may remain for the life of the project. Upon reclamation of access roads and drill pads that are no long needed plus adequate reclamation of all facilities upon completion of the life of the project there should be no long term permanent visual or audible impacts to the resources considered important by Tribes.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no project related impact to any resources that are of particular concerns to Tribes.

Cumulative Effects: Under the No Action Alternative there would be no project related cumulative impacts that would be added to the areas of concern to Tribes.

Mitigation: See the Cultural Resources section.

VISUAL RESOURCES

Affected Environment: Visual resources are the visible physical features of a landscape that convey scenic value. The BLM developed the Visual Resource Management system to identify and evaluate an area's scenic value. The visual resource inventory (VRI) process described in BLM Manual H-8410-1 establishes VRI classes, which are used to assess visual values for areas of the landscape. VRI classes II, III, and IV are determined by using a combination of three components: scenic quality, sensitivity level, and distance zones, with Class II having a higher level of value and Class IV having the least visual value. VRI Class I areas are assigned to special management areas, such as Wilderness Study Areas, which are the most valued landscapes. The VRI classes are the baseline from which environmental effects are measured. The Proposed Action is located in Visual Resource Inventory Class IV, which means this area is a lesser valued scenic landscape. This area of the landscape was placed into VRI Class IV as a result of a composite of the three above mentioned components. The area received a Scenic Quality scoring of C, which is the lowest rating (A, B, and C type rating), because of the large amount of oil and gas development and mining activity in the area. Other determining factors for the VRI Class IV rating for this area were a result of the Sensitivity Level rating as moderate value to the public, and the project being located in a Distance Zone of background. Based on the sensitivity level rating in the October 2011 WRFO Visual Resource Inventory, this area of the landscape receives heavy use but is highly modified by oil, gas, and mineral developments.

The BLM also maintains four Visual Resource Management (VRM) classes used to describe the level of acceptable change allowable at a given location. Scenic values in the BLM White River Resource Area have been classified according to the Visual Resource Management (VRM) system into four Visual Resource Management Classes (I-IV), and corresponding VRM objectives were established in the 1997 White River ROD/RMP. VRM Class I are the most restrictive with VRM Class IV being the least restrictive for the amount of allowable change to occur on the landscape. The VRM objectives provide the amount of allowable change and are considered a resource-allocation. The Proposed Action is located within a VRM Class III area. The objective of the VRM Class III classification is to partially retain the existing character of the landscape. The level of change to the characteristic landscape in VRM III areas should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

The Proposed Action is located in the Piceance Basin in an area of dense oil, gas, and mineral development just north of Rio Blanco County (RBC) Road 83 (Bar D Mesa), just south of RBC Road 91 and around the north terminus of RBC Road 31. The landscape consists of nearly flat to gentle rolling ridges that separate the Piceance Creek drainage on the east from the Yellow Creek drainage on the west. The existing character of the landscape is modified in many areas and largely natural in other areas with several oil and gas related developments and mineral developments modifying the natural landscape in the area, such as well pads, access roads, pipeline corridors, and associated support facilities. The panoramic-type landscape and dominant form visual element is defined by the gentle flat rolling ridges and gentle sloping dry drainages. Dark green scattered pinyon-juniper along the ridges and on the slopes, contrasting with the exposed buff colored soils provides the texture visual element to the landscape. Typical casual observers of Proposed Action would most likely consist of energy development employees traveling to and from work sites in the area along the above listed county roads. Other casual observers that may notice any subsequent development of this lease modification may include a low amount local ranchers, big game hunters, and recreational OHV riders.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The construction of the proposed drilling pads and access roads would create short-term noticeable impacts. These impacts would be much smaller in size after interim reclamation has been completed. It is expected that each of these pads would be reduced to 0 to 0.25 acres in size after interim reclamation is complete. This reclaimed pad size is dependent on whether the pad is converted to a water monitoring site or fully reclaimed. There are expected to be some minimal long term impacts to visual resources as a result of the Proposed Action. Any exposed soils would contrast with the color of the existing vegetation. The square shapes of the pads or linear access road disturbance would contrast with the existing natural form and lines of the landscape. Any equipment placed on the pads for long term use would contrast with both the form and color of the existing landscape. Of the total combined number of access roads and pads, only two or three pads and three access roads are expected to be visible from the county roads in the area. These types of ground disturbing activities would not change the VRI Class IV and would be in conformance with the VRM Class III objectives so long as typical best management practices for these types of activities for reducing visual contrast are implemented. In order to reduce the contrast of any above ground equipment with

the existing landscape, it is recommended that all permanent above ground structures (on-site for six months or longer) including tanks, associated production equipment, and any piping and valves be painted, Juniper Green according to the BLM Standard Environmental Chart CC-001: June 2008. This color should best serve to blend these structures with the pinyon-juniper trees that surround the proposed well pad locations.

Cumulative Effects: Combined with other existing, ongoing, and foreseeable oil and gas development and mining development activities in the area, the Proposed Action may begin to contribute to an increasingly impacted visual landscape.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: By not implementing the Proposed Action there would be no new impacts to visual resources or casual observers in this area and there would be no changes to visual resource inventory class ratings.

Cumulative Effects: None have been identified as a result of this alternative.

Mitigation:

1. Paint and maintain the paint on all permanent above ground structures (on-site for six months or longer) including tanks, associated production equipment, and any piping and valves be painted, Juniper Green according to the BLM Standard Environmental Chart CC-001: June 2008.

HAZARDOUS OR SOLID WASTES

Affected Environment: There are no known hazardous or other solid wastes on the subject lands. No hazardous materials are known to have been used, stored, or disposed of at sites included in the project area.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The proposed activities may use regulated materials and will generate some solid and sanitary wastes. The potential for harm to human health or the environment is presented by the risks associated with spills of fuel, oil and/or hazardous substances used during sodium drilling operations. Other accidents and mechanical breakdowns of machinery are also possible. These activities may pose direct and indirect impacts to soil, water, air, and biological resources that occur in close proximity to individual disturbance features. Impacts to these resources may also occur at farther distances from individual disturbance features, though it is assumed that these impacts would be reduced because of proximity to the point source. Accidents and mechanical breakdown may also have direct and indirect effects to resources depending on the type of accidents or mechanical breakdown and when and where they occur.

Cumulative Effects: Effects to soil, water, air, and biological resources as a result of cumulative release of hazardous materials into the environment are unknown. Because some hazardous substances persist in the environment, it is reasonable to assume that multiple activities that may occur throughout the project area that result in the release of individual hazardous material spills or discharge events, may cumulatively result in impacts to soil, water,

air, and biological resources. However, freshwater-bearing formations and other resources suitable for human use or consumption are isolated from man-made materials used in exploration activities, sodium recovery and oil, and gas operations through the use and cementing of surface casing, see 43 CFR 3162.5-2(d).

Environmental Consequences of the No Action Alternative: No hazardous or other solid wastes would be generated under the No Action Alternative.

Direct and Indirect Effects: No regulated materials or waste would be associated with the proposed well under the No Action Alternative.

Cumulative Effects: Cumulative effects are the same as those analyzed in the Proposed Action in terms of the type of disturbance. In terms of duration and extent, however due to the lack of geologic information that would be obtained from drilling program, this alternative could result in increased cumulative impacts because of the potential of poorly located production well pair placements in the project area in the future. Poor well placement, or orientation, could result in additional production wells for full resource recovery.

Mitigation:

1. Comply with all Federal, State and/or local laws, rules and regulations addressing the emission of and/or the handling, use, and release of any substance that poses a risk of harm to human health or the environment. All spills or leakages of oil, gas, produced water, toxic liquids or waste materials, blowouts, fires, shall be reported by the operator in accordance with the regulations and as prescribed in applicable orders or notices.
2. Where required by law or regulation to develop a plan for the prevention of releases or the recovery of a release of any substance that poses a risk of harm to human health or the environment, provide a current copy of said plan to the BLM WRFO.
3. All substances that pose a risk of harm to human health or the environment shall be stored in appropriate containers. Fluids that pose a risk of harm to human health or the environment, including but not limited to produced water, shall be stored in appropriate containers and in secondary containment systems at 110% of the largest vessel's capacity. Secondary fluid containment systems, including but not limited to tank batteries shall be lined with a minimum 24 mil impermeable liner.
4. Construction sites and all facilities shall be maintained in a sanitary condition at all times; waste materials shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.
5. As a reasonable and prudent lessee, acting in good faith, all lessees and right-of-way holders will report all emissions or releases that may pose a risk of harm to human health or the environment, regardless of a substance's status as exempt or nonexempt and regardless of fault, to the BLM WRFO (970) 878-3800.
6. As a reasonable and prudent lessee and right-of-way holder, acting in good faith, all lessees and right-of-way holders will provide for the immediate clean-up and testing of air, water (surface and/or ground) and soils contaminated by the emission or release of any substance that may pose a risk of harm to human health or the environment, regardless of that substance's status as exempt or non-exempt. Where the lessee/operator

or right-of-way holder fails, refuses or neglects to provide for the immediate clean-up and testing of air, water (surface and/or ground) and soils contaminated by the emission or release of any quantity of a substance that poses a risk of harm to human health or the environment, the BLM WRFO may take measures to clean-up and test air, water (surface and/or ground) and soils at the lessee/operator's expense. Such action will not relieve the lessee/operator of any liability or responsibility.

FIRE MANAGEMENT

Affected Environment: The Proposed Action is located within the B6 Yellow Creek and C6 Lower Piceance Basin fire management units. These polygons consist of Wyoming big sagebrush, greasewood, and pinyon juniper woodlands. A modified suppression strategy may be utilized where the potential to burn less than 200 acres in the B6 unit and up to 500 acres in size in sagebrush types located within the C6 fire management polygon. This strategy may promote a vegetation mosaic representing a spectrum of successional stages. Local preparedness levels and proximity to infrastructure may limit fire management strategies to direct control by full suppression. The fire regime/condition class for the project area is currently at a two, or is land considered to have been moderately altered from its historical fire return interval.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: During a wildfire event, the primary objective is firefighter and public safety. While in the construction phase of the proposed project, the appropriate management response may be full suppression. Stock piled vegetation which is stored on site for future purposes creates jack pots of fuel which are susceptible to fire brands. A direct effect of the proposed project will be the temporary suspension of the use of naturally ignited fire to meet multiple resource management objectives. Once the project is complete, the man-made vegetation breaks would alter the behavior of wildfires in the area, and help to create areas that may be suitable for use as fire breaks to help control wildfires.

Cumulative Effects: A continued increase in infrastructure within the area may cause difficulties in full implementation of the Northwest Colorado Fire Program Area Fire Management Plan.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: No vegetation alteration or construction would occur under this alternative. Due to the known frequency of natural fire ignitions in the area of the proposed project, fire may again impact the site in 35 to 100 years. This natural return interval could return the site to a fire regime/condition class one.

Cumulative Effects: Without new infrastructure, there would be less human related vegetation breaks which when combined with natural mosaic vegetation patterns have been used to contain fires in the past. This could lead to increased future fire suppression costs.

Mitigation:

1. When working on lands administered by the BLM WRFO, notify Craig Interagency Dispatch (970-826-5037) in the event of any fire.
    a. The reporting party will inform the dispatch center of fire location, size, status, smoke color, aspect, fuel type, and provide their contact information.
    b. The reporting party, or a representative of, should remain nearby, in a safe location, in order to make contact with incoming fire resources to expedite actions taken towards an appropriate management response.
2. The applicant and contractors will not engage in any fire suppression activities outside the approved project area. Accidental ignitions caused by welding, cutting, grinding, etc. will be suppressed by the applicant only if employee safety is not endangered and if the fire can be safely contained using hand tools and portable hand pumps. If chemical fire extinguishers are used the applicant must notify incoming fire resources on extinguisher type and the location of use.
3. Natural ignitions caused by lightning will be managed by Federal fire personnel. The use of heavy equipment for fire suppression is prohibited, unless authorized by the Field Office Manager.
4. Piled vegetation retained for reclamation as part of forest management mitigations shall be located at least twenty five feet from other receptive fuels.

FOREST MANAGEMENT

Affected Environment: The Proposed Action is located within both productive and dry exposure stand classes of Pinyon/Juniper woodlands as defined by a survey performed in 2003-2005 by White River Field Office personnel. Productive exposure types occur on primarily lower gradient slopes and on north and east aspects. Growth rates are higher in these areas due to soil features which allow for effective use of precipitation. Dry exposure types occur when slopes and soil features do not allow for the retention of precipitation. The growth rates within these areas are low and most generally the trees present are mature. These habitat types are further broken down based on the age class of the stand. In this case the affected stands are both mature and young. Mature pinyon/juniper trees on productive exposure establish themselves as the dominant plant community on the site. Young pinyon/juniper trees are a component of the plant community or encroach into sagebrush and mountain shrub communities in the absence of reproduction through time and will eventually establish as the dominant plant community. Mature stands are valuable locally as a source of fire wood and craftwood. Encroachment sites of young pinyon trees are valuable for Christmas tree harvest and posts for fence construction.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Table 11 shows the estimated loss of woodland acres as a result of the Proposed Action. At this time NSI has 21 proposed locations to drill core holes for their exploration program to locate nahcolite resources, only 16 of the 21 locations have woodlands associated with them. NSI may determine not to drill all core holes that they have proposed. Because it is unknown which permitted locations they will drill and where within the permitted locations the core holes will be placed cords to be removed for the project will be estimated. After NSI has drilled there core holes and built the necessary access routes exact cordage will be determined at that time and will be billed accordingly.

Following reclamation it is expected that pinyon and juniper will invade the site within 50-70 years and would develop a mature stand within 200-300 years.

Table11. Estimated Forestry Product Removed

Well	Permitted Area (acres)	Minimum Anticipated Surface Disturbance within the Permitted Area (acres)	Maximum Anticipated Surface Disturbance within the Permitted Area (acres)	Estimated Woodlands Removed (acres) within Permitted Area	Estimated Potential Cordage Removed[1]
Phase I					
A	1.5	0.5	1.5	.2	.5
B	1.5	0.5	1.5	1	1
D	1.5	0.5	1.5	.2	1
E	10	0.5	1.5	1	1
F	10	0.5	1.5	3.3	13.2
G	10	0.5	1.5	.6	1
H	1.5	0.5	1.5	1.5	7.5
I	10	0.5	1.5	1.2	4.8
J	10	0.5	1.5	3.8	15.2
K	10	0.5	1.5	3.4	10.2
L	10	0.5	1.5	2.1	10.5
M	10	0.5	1.5	3.2	9.6
Phase II					
N	1.5	0.5	1.5	1.5	7.5
O	1.5	0.5	1.5	1.5	7.5
P	1.5	0.5	1.5	.7	2.8
R	1.5	0.5	1.5	.2	1

[1] Estimated Potential Cordage removed is based on Estimated Woodlands Removed within the permitted area, even though maximum disturbance will only be 1.5 acres/location. Estimated Potential Cordage reflects amount of woodlands that could be removed within total permitted area.

Cumulative Effects: Removal of mature and middle-aged pinyon/juniper trees would reduce the potential for outbreak of woodland diseases and pest infestations. By reducing the stand size of juniper trees in areas historically included in sagebrush and grass communities, it would increase the open areas preferred as foraging areas by wildlife and livestock. Acceptance of mitigation measures would reduce the build-up of cleared woody material from the Project Area, reducing the likelihood of slash contributing to possible large fire.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Under this alternative there would be no removal of pinyon and juniper woodlands.

Cumulative Effects: Under this alternative, pinyon/juniper woodlands would not be removed and would continue to persist and age. The current stands contain several trees that

possess old growth characteristics. If these stands are not removed they will continue to age eventually becoming decadent old growth stands.

Mitigation:

1. In accordance with the 1997 White River RMP/ROD, all trees removed in the process of construction shall be purchased from the BLM. Trees should first be used in reclamation efforts and then any excess material made available for firewood or other uses.
2. Woody materials required for reclamation shall be removed in whole with limbs intact and shall be stockpiled along the margins of the authorized use area separate from the topsoil piles. Once the disturbance has been recontoured and reseeded, stockpiled woody material shall be scattered across the reclaimed area where the material originated. Redistribution of woody debris will not exceed 20 percent ground cover. Limbed material shall be scattered across reclaimed areas in a manner that avoids the development of a mulch layer that suppresses growth or reproduction of desirable vegetation. Woody material will be distributed in such a way to avoid large concentrations of heavy fuels and to effectively deter vehicle use. Woody materials that are to be stockpiled along margins and not used in the topsoil should not exceed pile dimensions of 8 x 8 x 8 feet. Materials used in the stockpiles should be a variety of diameters, but should be no smaller than 6 inches in diameter. Additionally the piles should be no less than 30 feet apart.
3. Trees that must be removed for construction and are not required for reclamation shall be cut down to a stump height of 6 inches or less prior to other heavy equipment operation. These trees shall be cut in four foot lengths (down to 4 inches diameter) and placed in manageable stacks immediately adjacent to a public road to facilitate removal for company use or removal by the public.

RANGELAND MANAGEMENT

Affected Environment: The Proposed Action occurs mostly in the Upper Yellow Creek pasture and to a lesser extent the Horse Draw pasture of the Square S Allotment (#06027). Core-hole pads A-I and N-T would be in the Upper Yellow Creek Pasture. Core-hole pads J, K, L, and M would be in the Horse Draw pasture. The Upper Yellow Creek pasture is grazed by cattle belonging to the LOV ranch and the Horse Draw pasture is grazed by livestock belonging to the Mantle Ranch. The total allotment consists of 75,739 acres, including 64,050 federal acres, 9,437 State of Colorado acres, and 2,252 private acres. The Square S allotment is permitted to both the LOV Ranch (Authorization #504241) and the Mantle Ranch (Authorization #501432) for livestock grazing totaling 3,522 AUMs. Currently, the Square S allotment public lands have 3,522 AUMs permitted at a stocking rate of an average 18.2 acres per AUM.

Rangeland carrying capacity is typically estimated on the basis of the Animal Unit Month (AUM). The AUM is defined as the amount of forage needed by an "animal unit" grazing for one month. The animal unit in turn is defined as one mature 1,000-pound cow and her suckling calf (43 CFR 4130.8-1 (c)). Assuming that such a cow nursing her calf will consume about 26 pounds of dry matter per day as forage, combined with a factor for tramping and waste of about

25 percent, results in an estimate of about 1,000 pounds of dry matter from forage to supply one AUM.

Range Improvements: There are two rangeland improvement projects in the general area associated with the proposed core-hole pads. Range improvement project #0204420, the Yellow Creek pipeline lateral, crosses through Sections 23, 25, and 26. This water pipeline was constructed in 1973 to provide dependable upland water sources for cattle through an approximately 30 square mile area spread through four different pastures and is essential to achieve livestock distribution through these areas. The division fence between the Horse Draw and Upper Yellow Creek pastures crosses diagonally through the eastern area of proposed core-hole pads. This fence is necessary to keep livestock owned by both LOV Ranch and Mantle Ranch in their respective use areas. These both of these projects are critical elements of the overall livestock management in this area. Their functionality must be maintained throughout the life of these projects.

The closest long term trend monitoring site to any of the proposed pads is approximately 1,100 feet from Pad G, and 1,300 feet from Pad H. Neither would be affected by this project.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Livestock grazing during the authorized periods of use would continue throughout the duration of the project. The primary impact to the grazing resource would be short-term loss of available forage as a result of construction related disturbance. In addition to direct forage loss, livestock are likely to avoid grazing in areas close to active construction and drilling activities.

Some of the projected forage loss would likely not occur as successfully reclaimed sites in other projects in the area have been shown to out-produce later-seral undisturbed vegetative cover, especially in mature PJ and sagebrush dominated sites—both in total available biomass and forage quality. Improved range carrying capacity on reclaimed lands has been observed along RBC Road 83 that passes through the project area where pinyon/juniper has been cleared for pipelines.

Short-term incremental disturbance of 22.4 to 43.4 acres associated with implementation of the proposed development actions would result in the long-term loss of less than 3 total AUMs. Most of this disturbance will be in the Upper Yellow Creek pasture. The disturbance would be somewhat incremental and to some degree be would be off-set by partial reclamation of each disturbance.

Until construction disturbances are successfully reclaimed there would be a short-term loss of less than one AUM in the Horse Draw pasture. After successful final reclamation, there would likely be a slight increase in forage production until each site progresses to a shrub dominated site. The short-term forage loss within these pastures would be less than the annual fluctuation in forage production and would not be expected to result in any need for changes in livestock numbers or grazing period.

Development activities could interfere with proper functioning of the range improvements associated with the proposal area. The fence and water line in this area are necessary for control of cattle, to achieve grazing objectives in the affected pastures, and to keep cattle from straying into the wrong grazing use area. Damage to fences or gates left open would interfere with control

of cattle and ultimately, with proper utilization of the rangeland resource. Damage to watering facilities could affect water availability and distribution of livestock, resulting in increased grazing pressure on areas that have water available for livestock. These impacts would be greatest during phases of development, especially if it coincides with the livestock use period in this area (early to mid-summer). After each development action is complete, livestock will likely be minimally affected or even unaffected by the presence of any core-hole facilities. Proposed fencing around disturbed areas would prevent livestock grazing use that would otherwise likely reduce the success of re-vegetation efforts.

Cumulative Effects: Agriculture, road development, and oil and gas development which have the potential to impact rangeland management would continue to occur. The Proposed Action would remove forage temporarily in the above mentioned grazing pastures. After project development has been completed and grass/forb communities have returned, the Proposed Action would contribute to a slight increase in forage for livestock in the area.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no direct and/or indirect effects to rangeland management under the No Action Alternative.

Cumulative Effects: Activities associated with agriculture, road development, mineral extraction, and oil and gas development would continue to occur at about the current rates and intensities in the area, which has the potential to impact rangeland management by removal of forage, impacts to range improvements, etc.

Mitigation:

1. Any range improvement projects such as fences, water developments, cattleguards, gates, or other livestock handling/distribution facilities that are damaged or destroyed either directly or indirectly as a result of implementation of the Proposed Action shall be promptly (at least prior to the livestock grazing permittee's need to utilize the range improvement) be repaired or replaced by the operator to restore it to at least its pre-disturbance functionality.
2. If the operator damages any range improvement project(s) the operator will notify the Authorized Officer through Sundry Notice (Form 3160-5) and identify the actions taken to repair the feature(s).

REALTY AUTHORIZATIONS

Affected Environment: The proposed new construction portion of the access from BLM Road 1019A to location M would be off of lease COC0118327. An access right-of-way (ROW) for this newly constructed portion of the access would be required for the construction and maintenance until all activity associated with the Proposed Action is complete and final reclamation of the ROW access is approved. The off-lease access roads to sodium leases COC0118327 and COC0119986 are existing roads and the use of the roads would be temporary. If the post drilling activity associated with the Proposed Action is no longer considered casual use, a ROW would be required. Table 12 describes the existing ROWs in the area of the wells and access roads.

Table 12. Existing ROWs Near the Proposed Action

Case File	Holder	Authorized Use
COC50047	White River Electric Association Inc.	Power lines
COC61921		
COC76327		
COC75517		*Pending power line*
COC50065	Qwest Corporation	Telephone cable
COC53195	Rio Blanco County	County Road 31
COC73830	Rio Blanco County	County Road 83
COC65453	Encana Oil & Gas (USA) Inc.	Natural gas pipelines
COC67980	Enterprise Gas Processing LLC	Natural gas pipelines
COC69548		
COC70129		
COC71400	XTO Energy Inc.	Access road
COC72181	Williams Northwest Pipeline	Natural gas pipelines
COC67991	Bargath LLC	Natural gas pipelines
COC73844		
COC74154		
COC75077		
COC76579		*Pending natural gas pipelines*
COC76580		
COC76581		
COC73180	WPX Energy Rocky Mountain LLC	Water pipelines
COC73845		
COC74155		
COC75078		
COC75171		
COC76420	Natural Soda Holdings Inc.	Access road
COC76421		Solution water pipeline

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Right-of-way (COC76585) for the access road to sodium lease COC0118327 would be 800 ft long, 15 ft wide, and contain approximately 0.28 acres. Damage to the facilities or rights of existing ROW holders could occur if construction activities are not properly planned and other ROW facilities are not properly identified prior to construction.

Cumulative Effects: As the number of ROW holders in the project area increases so would competition for suitable locations for facilities. Increased ROW densities would also lead to a higher probability of conflict between ROW users.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Failure to authorize the proposed project would not result in any increased impacts to realty authorizations in the area.

Cumulative Effects: There would not be any cumulative effects from not authorizing the proposed project.

Mitigation:

1. NSI will effectively coordinate with existing ROW holders prior to construction activity.
2. A right-of-way is required for the newly constructed access road from BLM Road 1019A to lease boundary of COC0118327 for location M.
3. At least 90 days prior to termination of the ROW, NSI shall contact the AO to arrange a joint inspection of the ROW. The inspection will result in the development of an acceptable termination and rehabilitation plan submitted by the holder. This plan shall include, but is not limited to, removal of facilities, drainage structures, and surface material (e.g., gravel or concrete), as well as final re-contouring, spreading of topsoil, and seeding. The Authorized Officer must approve the plan in writing prior to the holder's commencement of any termination activities.
4. For the purpose of determining joint maintenance responsibilities, NSI shall make road use plans known to all other authorized users of the road. Upon request, the Authorized Officer shall be provided with copies of any maintenance agreement entered into.

RECREATION

Affected Environment: The Proposed Action is located within the White River Extensive Recreation Management Area (ERMA) on BLM lands administered by the WRFO. The WRFO manages the ERMA to provide for unstructured recreation activities, and a diversity of outdoor recreation opportunities, including hunting, dispersed camping, hiking, horseback riding, wildlife viewing, and off-highway vehicle (OHV) use are to be maintained and protected.

On BLM-administered lands, the Recreation Opportunity Spectrum (ROS) is a classification system and a prescriptive tool used for recreation planning and management. The Proposed Action is located in the ROS class of Semi Primitive Motorized (SPM). The SPM physical and social recreation setting is typically characterized by a natural appearing environment with few administrative controls and low interaction between users (but evidence of other users may be present). SPM recreational experience is characterized by a high probability of isolation from the sights and sounds of humans within a setting that offers challenge and risk.

The area where the Proposed Action is located has relatively low amount of recreational use. The development and production of oil and gas resources and natural soda mining has resulted in a modified landscape with a somewhat high density of associated roads. Current recreation activities in the project area include a low amount of elk and deer hunting during the fall with some potentially very minimal bear and lion hunting through the fall and winter. There is a low amount of OHV use in this area, typically on existing routes and primarily to access public lands. There is a small amount of Christmas tree cutting in this area in the early winter. The Proposed Actions are located in CPW's Game Management Unit (GMU) 22. There is currently 1 Special Recreation Permit holder for commercial big game outfitting and guiding in this area and 13 SRP holders, which are permitted throughout the WRFO, for commercial mountain lion outfitting and guiding.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Due to the Proposed Action, there would be a direct shortterm disturbance of approximately 22.4 to 43.4 acres of land currently available for

dispersed recreation activities. Some displacement of recreationists may occur during construction, particularly to those seeking a more primitive oriented backcountry recreation experience. Based on the proposal to drill several wells in 2014, well pad construction and drilling activities may coincide with some of the various big game hunting seasons (late August through December). This means there may be a disruption to the hunting experience in these localized settings during these activities. Because this proposal is located in an area within extensive public lands, it is likely that those seeking big game hunting opportunities in this area will be able to find similar hunting and camping opportunities on nearby public lands. Operational activities for holes converted to monitoring wells would be much less disruptive to dispersed camping in the area and big game hunting. Overall, the Proposed Action results in minimal impacts to recreationalists and meets the ROS SPM objectives.

Cumulative Effects: Combined with other existing, ongoing, and foreseeable oil and gas development and mining development activities in the area, the Proposed Action may begin to contribute to an increasingly impacted landscape with reduced recreational opportunities and undesired recreational experiences, and impacts recreational settings.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Because the drilling pads and access roads would not be constructed, there would be no new impacts to recreational opportunities and experiences as a result of this alternative.

Cumulative Effects: None identified as a result of this alternative.

Mitigation: None.

ACCESS AND TRANSPORTATION

Affected Environment: The Proposed Action is located approximately 40 miles west of Meeker, CO. Primary access to the area includes traveling approximately 20 miles west of Meeker on State Highway 64, then traveling approximately 15 miles south on RBC Road 5 to RBC Road 24, then a few miles west on RBC Road 24 to RBC Road 31. Access to the Proposed Action may also include the use of RBC Road 24 to RBC 91. There are also several numbered and unnumbered BLM roads that will be used to access the drilling pads in this area. In the 1997 White River ROD/RMP, motorized vehicles are limited to existing routes from October 1 through April 30 each year in this area. Use of the routes near the Proposed Action consists of energy and mining development employees, local ranch operators, and recreational visitors.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: As a result of implementing the Proposed Action there will likely be an increase in traffic volume and potentially an increase in travel times for those using the transportation system in the area of the Proposed Action especially during the Phase I of the drilling plans. These will be short term temporary impacts. There is potential for roads and routes to be damaged if construction activities associated with the Proposed Action occur when roads

and routes are saturated. To prevent road and pipeline route damage as a result of use of these roads and routes when they are saturated is it recommended that all activity cease when soils or roads surfaces become saturated to a depth of three inches. Motorized access to small localized portions public lands may be improved in areas where the existing routes are proposed to be upgraded. There are two unnumbered BLM two-track type routes where pads D, G, and R could potentially be located in a manner that blocks further use of these routes beyond the drilling pad. In order to mitigate this access issue it is recommended that these pads be located and constructed in a manner that does not restrict the type of existing motorized use on these routes.

Cumulative Effects: Combined with other existing and foreseeable oil and gas and mining authorized routes in the area, BLM roads and county roads, the Proposed Action may begin to contribute to an increasingly dense transportation system in this area.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Because the Proposed Action would not be implemented, there are no expected impacts to public lands access or the transportation system as a result of this alternative.

Cumulative Effects: None identified as a result of this alternative.

Mitigation:

1. All construction activity shall cease when soils or roads surfaces become saturated to a depth of three inches unless approved by the Authorized Officer.
2. Drilling pads will be located and constructed in a manner that does not restrict motorized use on existing routes beyond the drilling pads.

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TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED:
History Colorado (State Historic Preservation Office)

INTERDISCIPLINARY REVIEW:

Name	Title	Area of Responsibility	Date Signed
Bob Lange	Hydrologist	Air Quality; Surface and Ground Water Quality; Floodplains, Hydrology, and Water Rights; Soils	6/10/2014
Justina Thorsen	Ecologist	Areas of Critical Environmental Concern; Special Status Plant Species	7/8/2014
Heather Woodruff/Matt Dupire	Rangeland Management Specialist	Forest Management	5/15/2014
Michael Selle	Archaeologist	Cultural Resources; Native American Religious Concerns; Paleontological Resources	7/18/2014
Mary Taylor	Rangeland Management Specialist	Invasive, Non-Native Species; Vegetation; Rangeland Management	6/10/2014
Ed Hollowed	Wildlife Biologist	Migratory Birds; Special Status Animal Species; Terrestrial and Aquatic Wildlife; Wetlands and Riparian Zones	6/20/2014

Name	Title	Area of Responsibility	Date Signed
Aaron Grimes	Outdoor Recreation Planner	Wilderness; Visual Resources; Access and Transportation; Recreation,	6/04/14
Kyle Frary	Fire Management Specialist	Fire Management	6/12/2014
Paul Daggett	Mining Engineer	Geology and Minerals; Hazardous or Solid Wastes; Project Lead – Document Preparer	6/30/2014
Stacey Burke	Realty Specialist	Realty	6/9/2014
Melissa J. Kindall	Range Technician	Wild Horse Management	6/5/2014
Heather Sauls	Planning & Environmental Coordinator	NEPA Compliance	7/18/2014

ATTACHMENTS:

Figure 1: Topographic and Surface Ownership Map of the Project
Figure 2: Aerial Map of the Project
Figure 3: Typical Pad Layout

Figure 1: Topographic and Surface Ownership Map of the Project

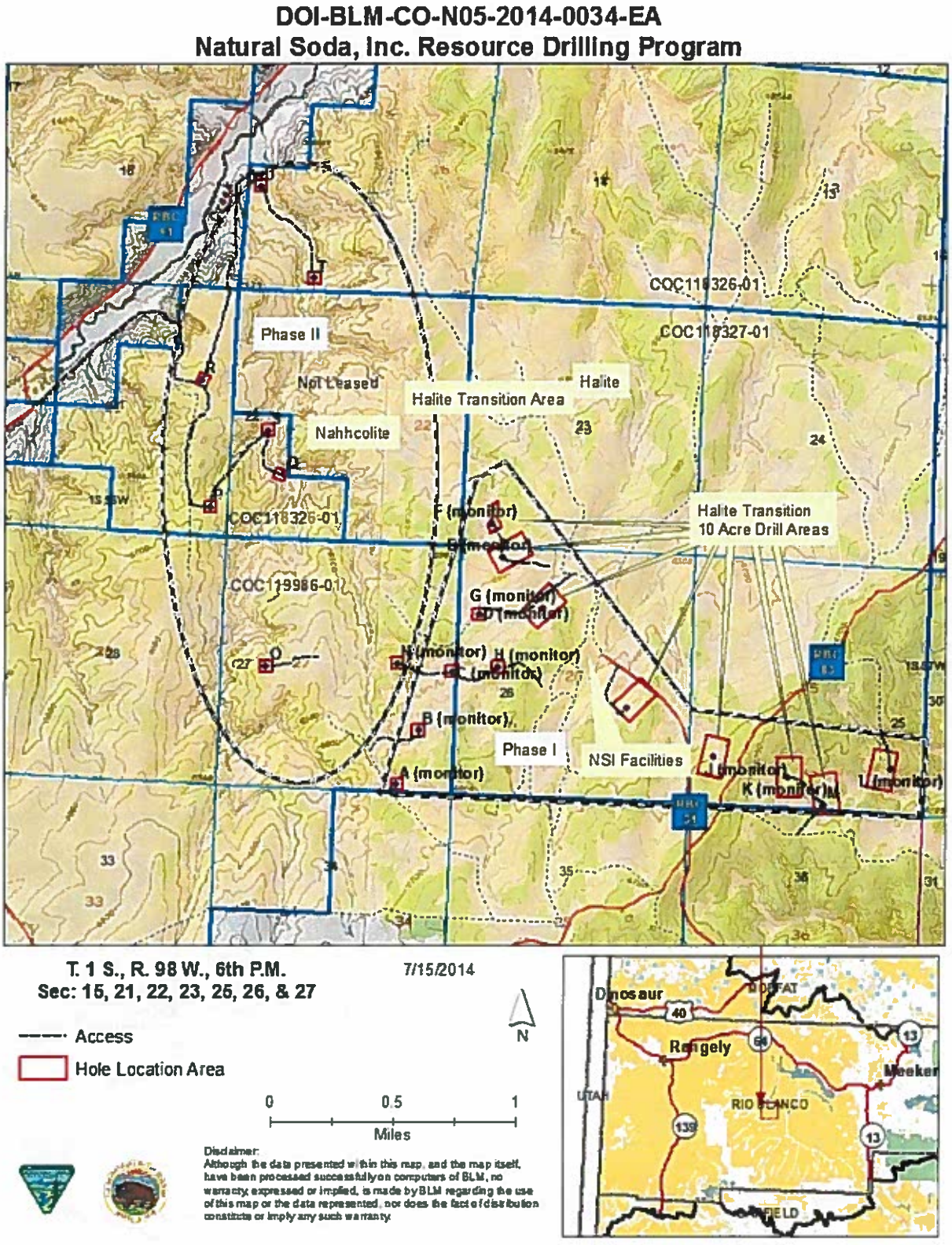


Figure 2: Aerial Map of the Project

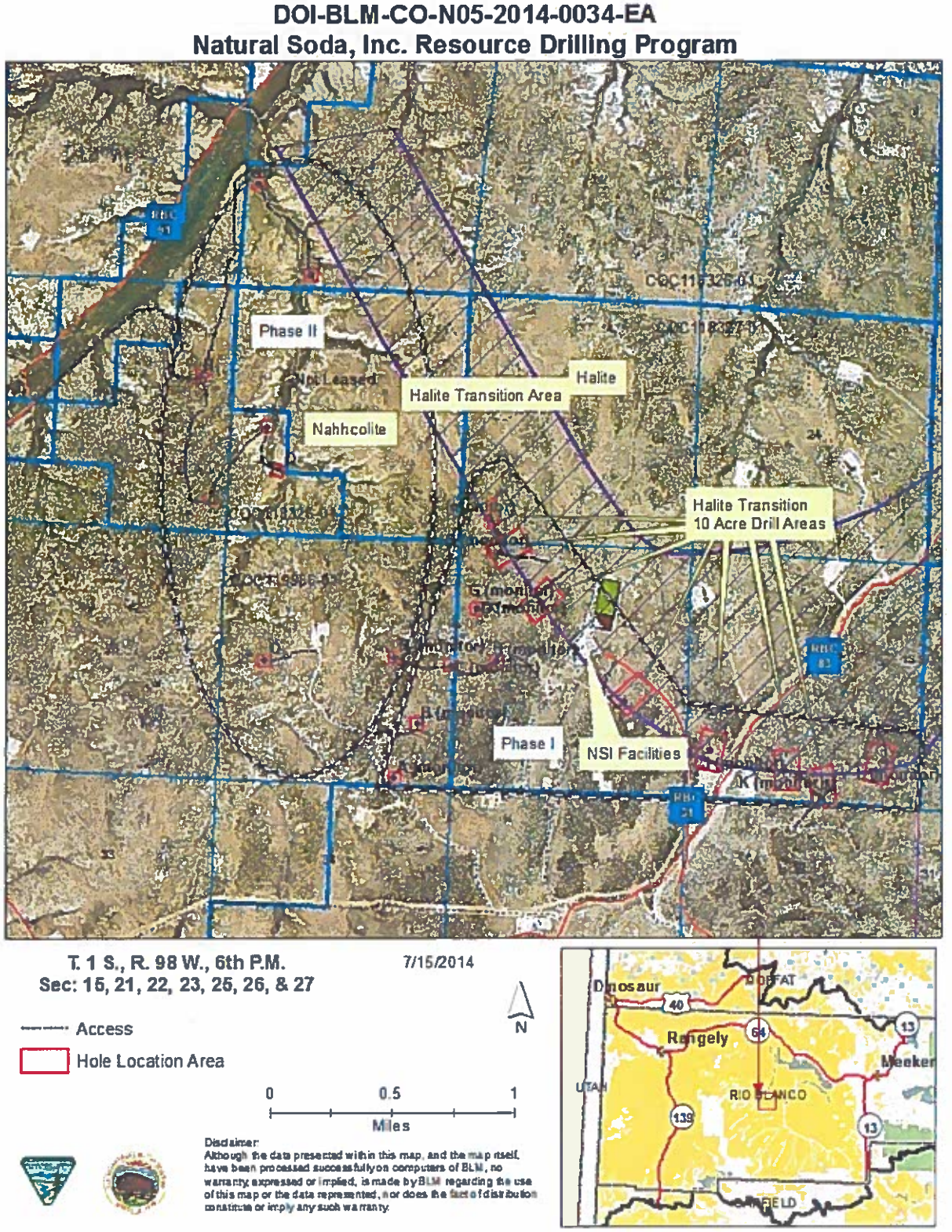
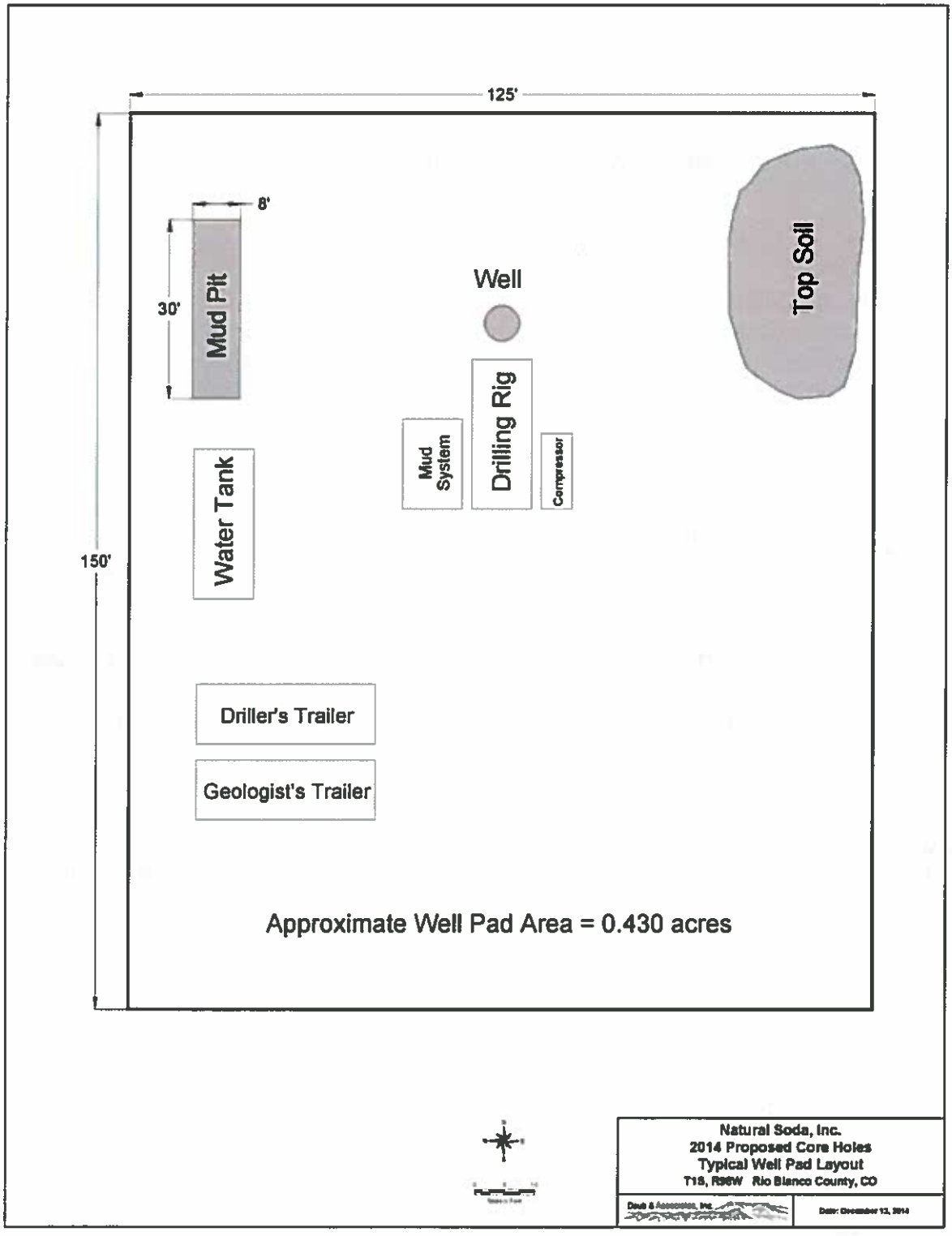


Figure 3: Typical Pad Layout



U.S. Department of the Interior
Bureau of Land Management
White River Field Office
220 E Market St
Meeker, CO 81641

Finding of No Significant Impact (FONSI)

DOI-BLM-CO-N05-2014-0034-EA

BACKGROUND

Natural Soda Inc. (NSI) operates an in-situ sodium bicarbonate (nahcolite) solution mining facility on federal sodium leases and has been in continual operations since 1991. NSI submitted a resource evaluation program that identifies 21 locations within in their existing federal sodium leases that would be drilled and cored to better define and evaluate the sodium resources. Information obtained from the core holes would be used to more accurately determine the available mineable resources and aid in the future planning of their existing solution mining operations.

FINDING OF NO SIGNFICANT IMPACT

Based upon a review of the EA and the supporting documents, I have determined that the Proposed Action will not have a significant effect on the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity, as defined at 40 CFR 1508.27 and do not exceed those effects as described in the White River Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement (1996). Therefore, an environmental impact statement is not required. This finding is based on the context and intensity of the project as described below.

Context

This project is a site-specific action directly involving the short term surface impact of up to a maximum of approximately 43.4 acres and a long term impact of approximately 6.1 acres of BLM lands on NSI's existing sodium leases. Direct surface impact would be limited to light use access and temporary drill pads that would be plugged, abandoned and reclaimed, or converted to groundwater/subsidence monitoring wells for future solution mining panels. The land disturbance associated with this project would not change the existing character of the local landscape. There would be a short term socioeconomic benefit related to drilling program.

The primary human influences on the project area are oil and gas development, current oil shale Research Development and Demonstration, sodium bicarbonate solution mining, and livestock grazing. Existing environmental conditions in the project area reflect changes based on past projects and activities. The project area is rural and relatively undeveloped but is experiencing growth related to energy development

Intensity

The following discussion is organized around the 10 Significance Criteria described at 40 CFR 1508.27. The following have been considered in evaluating intensity for this Proposed Action:

1. Impacts that may be both beneficial and adverse.

Beneficial and adverse impacts of the Proposed Action were described in the EA. Mitigating measures and design features to reduce potential short-term impacts to air quality, soils, water, vegetation, wildlife, cultural, paleontological and rangeland management were incorporated. None of the environmental effects discussed in the EA are considered significant.

2. The degree to which the Proposed Action affects public health or safety.

The design features, environmental commitments, permit requirements, and industry standards and regulations for the construction, drilling, and maintenance of subsequent monitoring wells would minimize any public safety effects of the Proposed Action. Drilling and construction operations would have to comply with the BLM's approved mine plan and Colorado Division of Reclamation Mining and Safety's mining permit.

3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

There are no known park lands, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas in the project area. As a result of cultural inventories seven cultural sites are considered eligible for listing on the National Register of Historic Places (NRHP) and three sites are potentially eligible for nomination to the NRHP. Access routes and drilling locations are located to provide 100 meter buffer of the sites. In addition, the mitigation contains requirements and contingencies in the event that previously unknown cultural resources are identified.

4. Degree to which the possible effects on the quality of the human environment are likely to be highly controversial.

The decision to allow core drilling to define mineral resources and its effects are not unique. Exploratory drilling for resource definition in the area has been occurring for over 60 years. More specifically, sodium leasing decisions have been made in this area for over 40 years with ongoing sodium solution mining activities for over 20 years. There are currently over 16,000 acres associated with seven authorized federal sodium leases. There is no scientific controversy on the nature of the impacts. Reclamation and re-vegetation have been successful in the past and can continue to be successful. The potential intensity of effects on the quality of the human environment is minimal.

5. Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risk.

The Proposed Action is not unique or unusual in this area. Drilling and coring would utilize conventional techniques currently used in exploration activities. Commercial sodium solution mining activities, including core drilling have been occurring in the immediate area since 1991. There are no predicted potential effects to the human environment that are considered to be highly uncertain or to involve unique or unknown risks.

6. Degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
The Proposed Action neither establishes a precedent for future BLM actions with significant effects nor represents a decision in principle about a future consideration. The Proposed Action was considered in the context of past, present, and reasonable foreseeable actions. It is not unusual and significant cumulative effects are not predicted; nor does it entail any known issues or elements that would create a precedent for future resource definition activities. The White River ROD/RMP analyzes and allows for the development of the sodium resources within the Proposed Action area.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.
The Proposed Action was considered in the context of past, present, and reasonable foreseeable actions. No cumulative impacts related to other actions that would have a significant adverse impact were identified or are anticipated.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
The project area contains seven cultural sites are considered eligible for listing on the National Register of Historic Places (NRHP) and three sites are potentially eligible for nomination to the NRHP. Access routes and drilling locations are located to provide 100 meter buffer of the sites. In addition, the mitigation contains requirements and contingencies in the event that previously unknown cultural resources are identified.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (ESA) of 1973.
No special status plant species were found in the area of the Proposed Action when surveyed in 2014. The nearest occupied population of federally threaten plant species is 545 meters from the access to two drilling locations. Dust suppression, timing limitations and silt fencing are included as mitigation measures to minimize impacts. The holes of both drilling locations would not be converted into monitoring wells, are short term and the duration of activity along the access within the 600 meters of threaten plant species is estimated to be two months or less.

Exploration activities would temporarily increase the rate of water use (depletion) from the Upper Colorado River system as habitat for the four endangered Colorado River fishes, the increment of annual depletion attributable to these actions would be exceedingly small (i.e., about 0.02 acre-foot per year) and well within the depletion volumes established for the mine operation within the consultation process.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.
Neither the Proposed Action nor impacts associated with it violate any laws or requirements imposed for the protection of the environment.

Based on the above analysis of the context and intensity of potential impacts resulting from the Proposed Action, the BLM has determined that the proposed lease modification would have no significant impact on health or the human environment.

SIGNATURE OF AUTHORIZED OFFICIAL: Est M McCoy

Acting Field Manager

DATE SIGNED: 7/18/14

U.S. Department of the Interior
Bureau of Land Management
White River Field Office
220 E Market St
Meeker, CO 81641

DECISION RECORD

PROJECT NAME: Natural Soda, Inc. Resource Drilling Program

ENVIRONMENTAL ASSESSMENT NUMBER: DOI-BLM-CO-N05-2014-0034-EA

DECISION

It is my decision to implement the Proposed Action, as mitigated in DOI-BLM-CO-N05-2014-0034-EA, authorizing the construction, drilling, and maintenance of core holes and any holes subsequently converted to monitoring wells at 21 locations within NSI's federal sodium leases. This action could involve a maximum short term surface disturbance of 43.4 acres and a long term disturbance of 6.1 acres.

Mitigation Measures

Design Features

1. All operations would conform to Natural Soda's approved Mine and Reclamation Plans.

Air Quality

2. The operator will limit unnecessary emissions from point or nonpoint pollution sources and prevent air quality deterioration from necessary pollution sources in accordance with all applicable state, federal and local air quality law and regulation.
3. The operator will treat all access roads with water during construction and drilling activities so that there is not a visible dust trail behind vehicles. The use of chemicals or treated produced water as a dust suppressant on BLM lands will require prior written approval from BLM.

Soils

4. In order to protect public land health standards for soils, erosion features such as rilling, gullying, piping and mass wasting on the surface disturbance or adjacent to the surface disturbance as a result of this action will be addressed immediately after observation by contacting the AO and by submitting a plan to assure successful soil stabilization with BMPs to address erosion problems.
5. Road maintenance on the access roads should be done as needed to maintain drainage features and reduce erosion on the road surface.

Vegetation

6. For reclamation actions described in Section 8 (Reclamation) of NSI's approved Mine Plan seed mixture tables; replace pubescent wheatgrass with Bluebunch wheatgrass (Whitmar)

and replace Russian wildrye with Needle and Thread grass (*Hesperostipa comata* spp. *comata*) as listed in the Tables below.

Reclamation Seed Species List

Species	Variety	Pounds Pure Live Seed/Acre
Grasses		
Thickspike wheatgrass	Critana	0.5
Streambank wheatgrass	Sodar	0.5
Western wheatgrass	Arriba	1.0
Bluebunch wheatgrass	Whitmar (*Pseudoroegneria spicata* spp. *inermis*)	1.0
Basin wildrye	Magnar	0.5
Needle and thread grass	(*Hesperostipa comata* spp. *comata*)	1.0
Green needlegrass	Common or Lodorm	2.0
Forbs		
Lewis flax	Appar	0.2
Cicer milkvetch	Monarch*	0.5
Alfalfa	50% Ladak*	0.75
	50% Nomad*	0.75
Scarlet globemallow	VNS or common	0.2
Palmer's penstemon	Cedar	0.2
Shrubs		
Fourwing saltbush	Rincon (dewinged)	1.5
Winterfat	VNS or common	0.5
Antelope bitterbrush	VNS or common	1.0
* preinoculated	**Total**	**12.1**

Monitoring Well Interim Seed Species List

Species	Variety	Pounds Pure Live Seed/Acre
Grasses		
Bluebunch wheatgrass	Whitmar (*Pseudoroegneria spicata* spp. *inermis*)	3
Thickspike wheatgrass	Critana	2
Forb		
Alfalfa	Ladak	2
* preinoculated		

7. Successful reclamation must reflect a plant community of at least five desirable plant species where no one species may exceed 70 percent relative cover and desired foliar cover, bare ground, and shrub and/or forb density must have 80 percent similarity in relation to the identified DPC.

8. Seed mixes for final abandonment of well pads and access retained for monitoring purposes will be based on the recommendations made by the BLM at that time.

Invasive, Non-Native Species

9. Application of herbicides must comply with the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environments Impact Statement* (EIS), and the WRFO Integrated Weed Management Plan (DOI-BLM-CO-110-2010-0005-EA).
10. All seed, straw, mulch, or other vegetative material to be used on BLM and split-estate lands will comply with United States Department of Agriculture (USDA) state noxious weed seed requirements and must be certified by a qualified Federal, State, or county office as free of noxious weeds. Any seed lot with test results showing presence of State of Colorado A or B list species will be rejected in its entirety and a new tested lot will be used instead. All areas identified to be disturbed under this proposal will be monitored and treated for noxious weeds on an annual basis for the life of the project until Final Abandonment has been approved by the Authorized Officer.
11. Pesticide Use Proposals (PUPs) must be submitted to and approved by the BLM before applying herbicides on BLM lands. The PUP will include target weed species, the herbicides to be used, application rates and timeframes, estimated acres to be treated, as well as maps depicting the areas to be treated and known locations of weeds. The WRFO recommends that all PUPs be submitted no later than March 1st of the year anticipating herbicide application.

Special Status Plants

12. Dust suppression is required on all road and work areas for access to site "U" using water only.
13. Construction within 600 meters of occupied Dudley Bluffs bladderpod habitat must occur outside of the growing season from August to March.
14. During construction, reclamation, and any ground disturbing maintenance activities within 600 meters of the Dudley Bluffs bladderpod occupied habitat, the operator shall install a silt fence on outer edges of disturbance to protect the special status plant species from construction activity. All silt fencing will be maintained until disturbance is stabilized and interim reclamation is completed. Silt fencing will be required for any new reclamation activities.

Migratory Birds

15. Development of pads and access, and well drilling/coring operations are not authorized during the core migratory bird nesting season (from May 15 to July 15).

Terrestrial Wildlife

16. Any pad constructed within site 'L' should remain outside of the perimeter of the woodland stand along its northern and northeasterly margin (involving less than 1 acre within the authorized area).
17. Vegetation clearing, pad and access construction, and well development activity would not be permitted within 200-meters of active raptor nests from April 1 through August 15, or until young are fledged and independent of the nest.

18. Locations A, B, C, N, and O through U are located in big game severe winter range and outside an area where winter timing limitations have been excepted in support of ongoing CPW research. Vegetation clearing, pad and access construction, and well development activity would not be permitted on these sites from December 1 through April 30.

Cultural Resources

19. NSI is responsible for informing all persons who are associated with the project that they will be subject to prosecution for knowingly disturbing archaeological sites or for collecting artifacts.
20. If any archaeological materials are discovered as a result of operations under this authorization, activity in the vicinity of the discovery will cease, and the BLM WRFO Archaeologist will be notified immediately. Work may not resume at that location until approved by the AO. NSI will make every effort to protect the site from further impacts including looting, erosion, or other human or natural damage until BLM determines a treatment approach, and the treatment is completed. Unless previously determined in treatment plans or agreements, BLM will evaluate the cultural resources and, in consultation with the State Historic Preservation Office (SHPO), select the appropriate mitigation option within 48 hours of the discovery. NSI under guidance of the BLM, will implement the mitigation in a timely manner. The process will be fully documented in reports, site forms, maps, drawings, and photographs. The BLM will forward documentation to the SHPO for review and concurrence.
21. Pursuant to 43 CFR 10.4(g), the NSI must notify the AO, by telephone and written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), NSI must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.
22. Due to the high site density near core Hole RDP-F, monitoring by a permitted archaeologist of initial soil disturbance for the access road and pad preparation will be required.

Paleontological Resources

23. NSI is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for disturbing or collecting vertebrate or other scientifically important fossils, collecting large amounts of petrified wood (over 25lbs./day, up to 250lbs./year), or collecting fossils for commercial purposes on public lands.
24. If any paleontological resources are discovered as a result of operations under this authorization, NSI and/or any of his agents must stop work immediately at that site, immediately contact the BLM Paleontology Coordinator, and make every effort to protect the site from further impacts, including looting, erosion, or other human or natural damage. Work may not resume at that location until approved by the AO. The BLM or designated paleontologist will evaluate the discovery and take action to protect or remove the resource within 10 working days. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (a) following the Paleontology Coordinator's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (b) following the Paleontology Coordinator's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

25. Any excavations into the underlying native sedimentary stone must be monitored by a permitted paleontologist. The monitoring paleontologist must be present before the start of excavations that may impact bedrock.
26. If NSI finds it necessary or desirable to drill the L core hole they shall be required to either do full mitigation and fossil collection on the fossil locality 5RB.8408 or be required to assume full site security and integrity monitoring of the site to deter unlawful collection of fossil resources during the life of the hole for core testing and monitoring should they convert the core hole to a monitoring well.

Visual Resources

27. Paint and maintain the paint on all permanent above ground structures (on-site for six months or longer) including tanks, associated production equipment, and any piping and valves be painted, Juniper Green according to the BLM Standard Environmental Chart CC-001: June 2008.

Hazardous or Solid Wastes

28. Comply with all Federal, State and/or local laws, rules and regulations addressing the emission of and/or the handling, use, and release of any substance that poses a risk of harm to human health or the environment. All spills or leakages of oil, gas, produced water, toxic liquids or waste materials, blowouts, fires, shall be reported by the operator in accordance with the regulations and as prescribed in applicable orders or notices.
29. Where required by law or regulation to develop a plan for the prevention of releases or the recovery of a release of any substance that poses a risk of harm to human health or the environment, provide a current copy of said plan to the BLM WRFO.
30. All substances that pose a risk of harm to human health or the environment shall be stored in appropriate containers. Fluids that pose a risk of harm to human health or the environment, including but not limited to produced water, shall be stored in appropriate containers and in secondary containment systems at 110% of the largest vessel's capacity. Secondary fluid containment systems, including but not limited to tank batteries shall be lined with a minimum 24 mil impermeable liner.
31. Construction sites and all facilities shall be maintained in a sanitary condition at all times; waste materials shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.
32. As a reasonable and prudent lessee, acting in good faith, all lessees and right-of-way holders will report all emissions or releases that may pose a risk of harm to human health or the environment, regardless of a substance's status as exempt or nonexempt and regardless of fault, to the BLM WRFO (970) 878-3800.
33. As a reasonable and prudent lessee and right-of-way holder, acting in good faith, all lessees and right-of-way holders will provide for the immediate clean-up and testing of air, water (surface and/or ground) and soils contaminated by the emission or release of any substance that may pose a risk of harm to human health or the environment, regardless of that substance's status as exempt or non-exempt. Where the lessee/operator or right-of-way holder fails, refuses or neglects to provide for the immediate clean-up and testing of air, water (surface and/or ground) and soils contaminated by the emission or release of any

quantity of a substance that poses a risk of harm to human health or the environment, the BLM WRFO may take measures to clean-up and test air, water (surface and/or ground) and soils at the lessee/operator's expense. Such action will not relieve the lessee/operator of any liability or responsibility.

Fire Management

34. When working on lands administered by the BLM WRFO, notify Craig Interagency Dispatch (970-826-5037) in the event of any fire.
    a. The reporting party will inform the dispatch center of fire location, size, status, smoke color, aspect, fuel type, and provide their contact information.
    b. The reporting party, or a representative of, should remain nearby, in a safe location, in order to make contact with incoming fire resources to expedite actions taken towards an appropriate management response.
35. The applicant and contractors will not engage in any fire suppression activities outside the approved project area. Accidental ignitions caused by welding, cutting, grinding, etc. will be suppressed by the applicant only if employee safety is not endangered and if the fire can be safely contained using hand tools and portable hand pumps. If chemical fire extinguishers are used the applicant must notify incoming fire resources on extinguisher type and the location of use.
36. Natural ignitions caused by lightning will be managed by Federal fire personnel. The use of heavy equipment for fire suppression is prohibited, unless authorized by the Field Office Manager.
37. Piled vegetation retained for reclamation as part of forest management mitigations shall be located at least twenty five feet from other receptive fuels.

Forest Management

38. In accordance with the 1997 White River RMP/ROD, all trees removed in the process of construction shall be purchased from the BLM. Trees should first be used in reclamation efforts and then any excess material made available for firewood or other uses.
39. Woody materials required for reclamation shall be removed in whole with limbs intact and shall be stockpiled along the margins of the authorized use area separate from the topsoil piles. Once the disturbance has been re-contoured and reseeded, stockpiled woody material shall be scattered across the reclaimed area where the material originated. Redistribution of woody debris will not exceed 20 percent ground cover. Limbed material shall be scattered across reclaimed areas in a manner that avoids the development of a mulch layer that suppresses growth or reproduction of desirable vegetation. Woody material will be distributed in such a way to avoid large concentrations of heavy fuels and to effectively deter vehicle use. Woody materials that are to be stockpiled along margins and not used in the topsoil should not exceed pile dimensions of 8 x 8 x 8 feet. Materials used in the stockpiles should be a variety of diameters, but should be no smaller than 6 inches in diameter. Additionally the piles should be no less than 30 feet apart.
40. Trees that must be removed for construction and are not required for reclamation shall be cut down to a stump height of 6 inches or less prior to other heavy equipment operation. These trees shall be cut in four foot lengths (down to 4 inches diameter) and placed in manageable stacks immediately adjacent to a public road to facilitate removal for company use or removal by the public.

Rangeland Management

41. Any range improvement projects such as fences, water developments, cattleguards, gates, or other livestock handling/distribution facilities that are damaged or destroyed either directly or indirectly as a result of implementation of the Proposed Action shall be promptly (at least prior to the livestock grazing permittee's need to utilize the range improvement) be repaired or replaced by the operator to restore it to at least its pre-disturbance functionality.
42. If the operator damages any range improvement project(s) the operator will notify the Authorized Officer through Sundry Notice (Form 3160-5) and identify the actions taken to repair the feature(s).

Realty Authorizations

43. NSI will effectively coordinate with existing ROW holders prior to construction activity.
44. A right-of-way is required for the newly constructed access road from BLM Road 1019A to lease boundary of COC0118327 for location M.
45. At least 90 days prior to termination of the ROW, NSI shall contact the AO to arrange a joint inspection of the ROW. The inspection will result in the development of an acceptable termination and rehabilitation plan submitted by the holder. This plan shall include, but is not limited to, removal of facilities, drainage structures, and surface material (e.g., gravel or concrete), as well as final re-contouring, spreading of topsoil, and seeding. The Authorized Officer must approve the plan in writing prior to the holder's commencement of any termination activities.
46. For the purpose of determining joint maintenance responsibilities, NSI shall make road use plans known to all other authorized users of the road. Upon request, the Authorized Officer shall be provided with copies of any maintenance agreement entered into.

Access and Transportation

47. All construction activity shall cease when soils or roads surfaces become saturated to a depth of three inches unless approved by the Authorized Officer.
48. Drilling pads will be located and constructed in a manner that does not restrict motorized use on existing routes beyond the drilling pads.

COMPLIANCE WITH LAWS & CONFORMANCE WITH THE LAND USE PLAN

This decision is in compliance with the Endangered Species Act and the National Historic Preservation Act. It is also in conformance with the 1997 White River Record of Decision/Approved Resource Management Plan.

ENVIRONMENTAL ANALYSIS AND FINDING OF NO SIGNIFICANT IMPACT

The Proposed Action was analyzed in DOI-BLM-N05-2014-0034-EA and it was found to have no significant impacts, thus an EIS is not required.

PUBLIC INVOLVEMENT

Scoping was the primary mechanism used by the BLM to initially identify issues. Internal scoping was initiated when the project was presented to the White River Field Office (WRFO) interdisciplinary team on 1/7/2014. External scoping was conducted by posting this project on

the WRFO's on-line National Environmental Policy Act (NEPA) register on 1/14/2014. The BLM also notified Jennifer Thurston of the Information Network for Responsible Mining (INFORM) of the project on 1/29/14 (as an identified interested party). As of 7/15/2014 no issues or comments have been received.

RATIONALE

Analysis of the Proposed Action has concluded that there are no significant negative impacts and that it meets Colorado Standards for Public Land Health. Allowing for sodium resource drilling on existing federal sodium leases is consistent with the White River ROD/RMP decision to "Facilitate the orderly and environmentally sound development of sodium resources occurring on public lands." The identified mitigation measures avoid or minimize impacts to other resource values.

ADMINISTRATIVE REMEDIES

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 Code of Federal Regulation (CFR), Part 4.400 and Form 1842-1. If an appeal is taken, your notice of appeal must be filed in this office (at the above address) within 30 days from date of publication this decision. The appellant has the burden of showing that the Decision appealed from is in error. If you wish to file a petition for a stay of the effectiveness of this Decision during the time that your appeal is being reviewed by the Board, the petition for stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. A copy of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals (IBLA) and to the appropriate Office of the Solicitor (see 43 CFR4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for obtaining a stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

1. The relative harm to the parties if the stay is granted or denied;
2. The likelihood of the appellant's success of the merits;
3. The likelihood of immediate and irreparable harm if the stay is not granted, and;
4. Whether the public interest favors granting the stay.

SIGNATURE OF AUTHORIZED OFFICIAL: Est M M. Gf

Acting Field Manager

DATE SIGNED: 7/18/14