ENSOLUM

September 17, 2024

REVIEWED
By Mike Buchanan at 2:25 pm, Oct 21, 2024

New Mexico Oil Conservation Division
New Mexico Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Sampling Plan
Stan 32 State 71H
Incident Number NRM2004938133
Eddy County, New Mexico

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of XTO Energy, Inc. (XTO), has prepared this *Sampling Plan* to summarize investigation status at the Stan 32 State 71H (Site; Incident Number NRM2004938133) and request approval for the proposed locations of four additional boreholes that will be converted into montioring wells, if water is present, to further assess the subsurface.

A *Remediation Work Plan* (*Work Plan*) was prepared by WSP USA, Inc. (WSP) and submitted to the New Mexico Oil Conservation Division (NMOCD) on April 2, 2021, requesting additional time to complete full delineation, which included the installation of four additional soil borings. The NMOCD denied the Work Plan for the following reasons:

> *rhamlet (7/28/2021), The OCD will need additional data collected before a remediation plan can be approved. Additional sampling is warranted north, west, and east of the well pad. Please make sure additional borehole locations are pre-approved by OCD before drilling takes place. Soil sampling will need to take place in 5' increments during the drilling process of the boreholes. If fluid is encountered, convert to monitoring well. Construct by installing a 15' screened casing across the groundwater interface (7 ½' above/below) and solid casing to the surface. The wells should be constructed with 2" inside diameter (ID) Schedule 40 polyvinyl chloride (PVC) casing and 0.010" slotted screen. A "Calander Snapshot" of all groundwater data will need to be collected after additional boreholes have been completed.*

This *Sampling Plan* requests approval of delienation borehole locations as outlined in the NMOCD's denial. Background information is included below as well as the proposed borehole locations.

SITE DESCRIPTION AND RELEASE RESPONSE

The Site is located in Unit H, Section 32, Township 26 South, Range 30 East, in Eddy County, New Mexico and is associated with oil and gas exploration and production operations on New Mexico State Trust Land managed by the New Mexico State Land Office (NMSLO) (Figure 1).

On February 2, 2020, pressure was lost, and a substantial water flow was encountered during drilling of the Stan 32 State 71H production well, which resulted in fluids surfacing in two locations in the pipeline ROW north of the well pad (Figure 2) and south of the well pad in Texas. The well pad was in New

Mexico just north of the New Mexico-Texas State Line. Water flow from the well was stopped and the well was ultimately plugged. Earthen berms were constructed to contain the surfacing fluids. A vacuum truck was dispatched to the Site to recover free-standing fluids; approximately 1,330 bbls were recovered. XTO reported the release to the NMOCD on a Release Notification and Corrective Action Form C-141 (Form C-141) on February 17, 2020. The release was assigned Incident Number NRM2004938133. Between November 30, 2020, and December 7, 2020, XTO excavated soil from the top four feet of the ground surface in the two areas where fluids surfaced, then initiated a subsurface investigation to assess potential impacts to soil and groundwater. Between January 20, 2021 and February 10, 2021, XTO advanced 19 boreholes as part of delineation activities. Groundwater was encountered in disconnected sandstone lenses in 13 of the 19 boreholes at depths ranging from 19.19 feet bgs to 34.25 feet bgs. These activities were described in the *Work Plan* dated April 2, 2021.

SITE CHARACTERIZATION AND CLOSURE CRITERIA

Site characterization was presented in the *Work Plan*, and due to the presence of shallow groundwater, the following NMOCD Table I Closure Criteria (Closure Criteria) were applied:

- Benzene: 10 milligrams per kilogram (mg/kg)
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX): 50 mg/kg
- Total Petroleum Hydrocarbons (TPH): 100 mg/kg; and
- Chloride: 600 mg/kg.

The *Work Plan* noted the presence of elevated chloride concentrations in soil upgradient of the release and documented vertical isolation of those elevated concentrations in soil samples collected from individual boreholes. These patterns suggested soil in this area contains naturally occurring elevated chloride concentrations. Boreholes BH01 and BH02 were drilled as background locations. They were drilled far enough away from the pipeline corridor (known surface impact) and in an area of no previous surface disturbance. Chloride concentrations within those boreholes ranged from 40.6 mg/kg to 874 mg/kg. WSP proposed those soil samples served as representative background samples and a concentration of 874 mg/kg chloride be established. Similarly, groundwater sampled from upgradient monitoring well MW01 contained 3,340 milligrams per liter (mg/L) of chloride. Based on Site conditions presented in the *Work Plan*, Ensolum agrees that 874 mg/kg and 3,340 mg/L are reasonable background concentrations for chloride in soil and groundwater, respectively, and requests it be applied to define vertical and lateral delineation of chloride concentrations for this portion of the investigation. Since the concentration is naturally occurring, it is equally protective of human health, the environment, and groundwater as the Table I Closure Criteria for chloride.

BOREHOLE PLACEMENT APPROVAL

According to the *Work Plan*, soil impacts were delineated vertically but not laterally east of the Site and west/northwest of BH11. Groundwater impacts were delineated north, south, and west, but additional investigation was recommended to assess potential impacts to the east. As such, Ensolum requests approval for the placement of four additional boreholes (BH20 through BH23) as depicted in Figure 2. The proposed borehole locations are based on achieving delineation of potential soil and groundwater impacts within the limitations of topography or vegetation and/or set by NMSLO following cultural resource surveys completed at the Site.

During advancement of each borehole, continuous soil sampling will be conducted, which includes describing the lithology based on the Unified Soil Classification System (USCS) as specified in American Society for Testing and Materials (ASTM) D2488, documenting observations of staining and odors, and

field screening of volatile organic compounds (VOCs) and chloride. Observations and field screenings will be documented on lithologic soil sampling logs.

Discrete soil samples will be collected at least every 5 feet for laboratory analysis. Soil samples will be placed into pre-cleaned glass jars, labeled with the location, date, time, sampler name, method of analysis, and immediately placed on ice. The soil samples will be shipped under strict chain-of-custody procedures to Eurofins Laboratories (Eurofins) in Carlsbad, New Mexico, for analysis of BTEX following United States Environmental Protection Agency (EPA) Method 8021B; TPH–gasoline range organics (TPH-GRO), TPH–diesel range organics (TPH-DRO), and TPH-oil range organics (TPH-ORO) following EPA Method 8015M/D; and chloride following EPA Method 300.0 or SM4500.

If groundwater is encountered, groundwater monitoring wells will be constructed by installing a screened casing across the groundwater interface and solid casing to the surface. The monitoring wells will be constructed with 2-inch inside diameter (ID) Schedule 40 polyvinyl chloride (PVC) casing and 0.010-inch slotted screen. In unconfined conditions, the screen will be placed approximately 7.5 feet into the groundwater unit to approximately 7.5 feet above the groundwater unit. A 10-20 size silica sand pack will be used to fill the annular space surrounding the well screen and set to 2 feet above the top of the screen. The wells will be sealed with at least 2 feet of hydrated bentonite chips, then grouted to the ground surface. Ensolum expects to encounter confining/semi-confining conditions. When this is observed, screen size will be determined based on thickness of the water-bearing unit. To avoid generating a conduit to overlying lithologies as water rises within those wells under confining conditions, the sand pack will be sealed at the top of the screen, which is typically the contact between the water bearing unit (usually sand/sandstone) and overlying confining unit (usually clay/claystone).

After allowing the newly constructed monitoring wells to set for at least 24 hours, the monitoring wells will be developed by purging a minimum of 10-casing volumes, or purging until the wells go dry. Once installed, Ensolum will survey the top-of-casing and top-of-ground surface elevations for each monitoring well so groundwater flow direction can be determined. Ensolum will sample groundwater from all new and existing monitoring wells at the Site using disposable bailers or low flow sampling techniques, depending on the volume of water identified in each monitoring well. The groundwater samples will be analyzed for BTEX and chloride.

A New Mexico licensed drilling contractor is tentatively scheduled to complete these drilling activities in November 2024 pending approval by NMOCD. Once the boreholes are drilled and completed as monitoring wells, if groundwater is present, groundwater sampling will be completed within one week of development. A revised *Remediation Work Plan* will be submitted to NMOCD 90 days following final receipt of all soil and groundwater analytical results.

If you have any questions or comments, please contact Ms. Ashley Ager at (970) 946-1093 or aager@ensolum.com.

Sincerely,
Ensolum, LLC

Daniel R. Moir, PG (licensed in WY & TX)
Senior Managing Geologist

Ashley Ager, MS, PG (licensed in LA)
Principal

cc: Christopher Bear, ExxonMobil Environmental and Property Solutions Company
New Mexico State Land Office

Attachments:

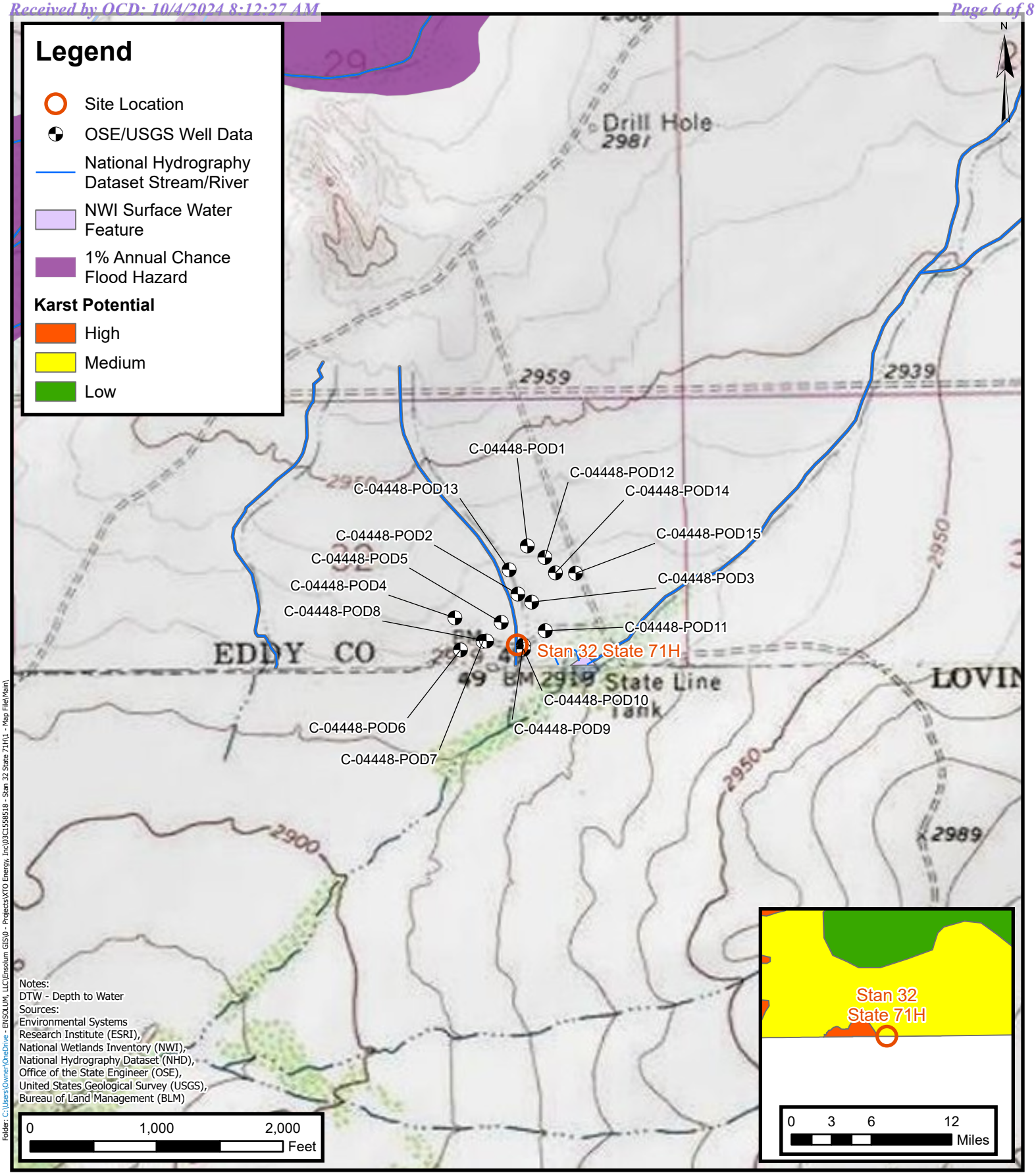
Figure 1 Site Receptor Map
Figure 2 Proposed Monitoring Well Locations

Review of the submitted Sampling Plan for Stan 32 State 71H is approved to include the following Conditions of Approval:

1. As a result of this release occurring in the subsurface with little knowledge of its extent of migration and magnitude, more investigation is necessary to characterize the release. Please develop a site conceptual hydrogeological model of the area and submit to OCD.
2. Include a data sheet to OCD on existing groundwater wells within a one mile radius of the area of concern, including within the Texas boundary, if possible. Provide information on historical and most recent groundwater quality and depth to groundwater for all wells in the area.
3. Please provide any groundwater monitoring data for the existing wells at the site, with information on contamination and parameters, for the past three (3) years, if such data exists.
4. In addition to the four (4) proposed boreholes, advance an additional borehole at approximately 120 feet east of BH19 and a second borehole approximately two hundred and seventy-five feet east of BH17/MW11. Collect soil samples for chloride analysis every five (5) feet in both soil borings.
5. Provide information to OCD on these conditions of approval no later than sixty (60) days upon receipt of this work plan approval.
6. Provide depth at which XTO believes water flow exited the well bore.
7. Proposed 874 mg/kg for soil remediation level is approved
8. Proposed 3340 mg/L for ground water remediation health standard is not approved at this time
8. Provide information to OCD on these conditions of approval no later than sixty (60) days upon receipt of this work plan approval.

ENSOLUM

FIGURES



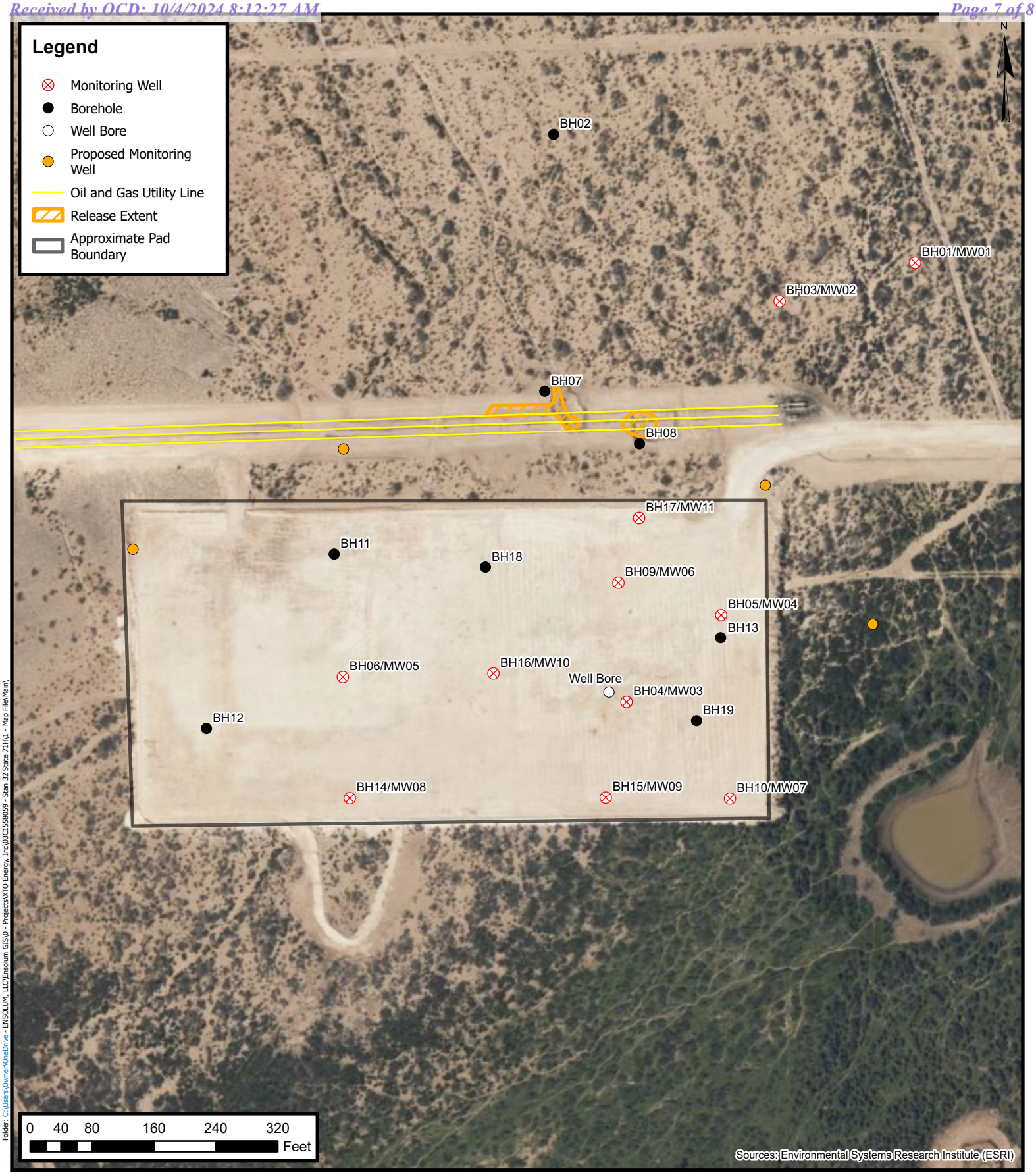
Folder: C:\Users\Owner\OneDrive - ENSOLUM, LLC\Ensolum GIS\0 - Projects\XTO Energy, Inc\03C1558518 - Stan 32 State 71H\1 - Map File\Main\

ENSOLUM
Environmental, Engineering and Hydrogeologic Consultants

Site Receptor Map

XTO Energy, Inc.
Stan 32 State 71H
Incident Number: NRM2004938133
Unit H, Section 32, Township 26 South, Range 30 East
Eddy County, New Mexico

FIGURE 1



ENSOLUM
Environmental, Engineering and Hydrogeologic Consultants

Proposed Monitoring Well Locations

XTO Energy, Inc
Stan 32 State 71H
Incident Number: NRM2004938133
LOTS 1 & 2 SEC 32 T26S R30E
Eddy County, New Mexico

FIGURE 2

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 389920

CONDITIONS

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 389920
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Review of the submitted Sampling Plan for Stan 32 State 71H is approved to include the following Conditions of Approval: 1. As a result of this release occurring in the subsurface with little knowledge of its extent of migration and magnitude, more investigation is necessary to characterize the release. Please develop a site conceptual hydrogeological model of the area and submit to OCD. 2. Include a data sheet to OCD on existing groundwater wells within a one mile radius of the area of concern, including within the Texas boundary, if possible. Provide information on historical and most recent groundwater quality and depth to groundwater for all wells in the area. 3. Please provide any groundwater monitoring data for the existing wells at the site, with information on contamination and parameters, for the past three (3) years, if such data exists.	10/21/2024
michael.buchanan	4. In addition to the four (4) proposed boreholes, advance an additional borehole at approximately 120 feet east of BH19 and a second borehole approximately two hundred and seventy-five feet east of BH17/MW11. Collect soil samples for chloride analysis every five (5) feet in both soil borings. 5. Provide information to OCD on these conditions of approval no later than sixty (60) days upon receipt of this work plan approval. 6. Provide depth at which XTO believes water flow exited the well bore. 7. Proposed 874 mg/kg for soil remediation level is approved 8. Proposed 3340 mg/L for ground water remediation health standard is not approved at this time 8. Provide information to OCD on these conditions of approval no later than sixty (60) days upon receipt of this work plan approval.	10/21/2024