

Stormwater Management Plan

North Cheyenne
Oil and Gas Development

Pfaffly 1-12

This Stormwater Management Plan (Plan) has been prepared by Navex Resources, LLC (Navex) for its North Cheyenne Pfaffly 1-12 Oil and Gas Location in Kit Carson County, Colorado. The Plan addresses Colorado Oil & Gas Conservation Commission (COGCC) guidance and the requirement at Rule 304.c.(15) to prepare a Stormwater Management Plan consistent with Rule 1002.f.

1.0 Oil and Gas Location and Construction Site Details

1.1 Proposed Oil and Gas Operations

Navex is proposing to develop an exploratory oil and gas well for production of oil and condensate, natural gas, natural gas liquids, and inert gases, including helium. The well will be developed as a conventional vertical well, approximately 6,000 feet deep. It will be in the following location:

NW ¼ SW ¼ Section 12, Township 11 South, Range 46 West

The well will be on fee surface for production of fee minerals. The Oil and Gas Location will be approximately 3.0 acres during development with a Working Pad Surface of approximately 2.7 acres. After interim reclamation, the production pad will be downsized to an estimated 2.0 acres.

1.2 Site Description

The Oil and Gas Location is on farmland leased from a private landowner. The area is disturbed from agricultural production of grain crops. There is no nearby surface water. The location is not immediately upgradient of a wetland or riparian corridor. An environmental field review was conducted on September 29 – October 1, 2021. The review identified an upland swale approximately 630 feet cross gradient from the location to the east. The swale lacks an ordinary high water mark or hydrophytic vegetation. The finding and photograph are shown on the Hydrology Map submitted with the Form 2A application.

1.3 Nature of Construction Activity

The location is on disturbed farmland that requires minimal site clearing and grading to level areas for drilling and completion equipment and production. Areas of disturbance are shown on the attached Construction Layout Drawing. An estimated 1,140 cubic yards of soil will be disturbed during site preparation. The well will be drilled using a closed-loop drilling system and a water-based drilling fluid. Produced water and fluids from the well bore will be contained in a steel tank inside of lined steel secondary containment and will be transported for off-site disposal at a commercial underground injection control well described in the Waste Management Plan prepared for the location.

1.4 Sequence of Construction Activities

Each location is expected to require 2 days to construct. Well drilling is expected to require 7 to 14 days. Completion is expected to require 6 days. Interim reclamation is expected to require 2 days. Revegetation will occur during the first growing season and within 3 months after well development is complete.

1.5 Access Road and Flowline Corridor Construction

An approximately 1,010-foot-long dirt access road will be used to access the location from County Road (CR) 35. The road will be approximately 20 feet wide. It will be constructed by grading a dirt road crowned in the middle for drainage.

During production, a 2-inch-diameter off-location flowline will be buried from the location to a tie in with the Ladder Creek Gathering System operated by Tumbleweed Midstream. The flowline will be approximately 200 feet long. The flowline is shown on the Related Location and Flowline Map submitted with the Form 2A application. The flowline trench will be an estimated 8 inches wide and approximately 4 feet deep with 3 feet of soil cover.

2.0 Supplemental Site Information

2.1 Site Area and Disturbance Area

The Oil and Gas Location is largely flat. There is little variation in grade across the location. Cut and fill to support the location is estimated to be limited to discrete areas on the working pad surface and is shown on the attached Construction Layout Drawing.

A 0.5-acre area will be disturbed for access road construction. A 200-foot by 8-inch area (0.003 acres) will be disturbed for flowline installation.

2.2 Soil Description, Data, and Erosion Potential

Soil at the Oil and Gas Location is Soil Unit 52: Norka and Soil Unit 56: Norka-Colby, according to the Natural Resources Conservation Service Map Unit Descriptions. The typical profile for these soil types is silt loam with 0 to 15 percent slopes. The A-horizon is 0 to 7 inches of silt loam overlaying 5 to 67 inches of silt loam and loam. The soil type is well drained. The depth to the restrictive feature is more than 60 inches.

Soil at the access road and flowline locations is Norka.

2.3 Vegetation Description

The Oil and Gas Location is located in a previously cultivated, non-irrigated agricultural field that supported grain crops, most recently a harvested wheat crop.

2.4 Pre-disturbance Coverage Estimate

The pre-disturbance coverage is an estimated 30 percent, based on the environmental site review conducted on September 29 – October 1, 2021.

2.5 Known Weed Infestations

No weed infestations were identified on the Oil and Gas Location during the environmental review conducted September 29 – October 1, 2021.

2.6 Non-stormwater discharges

The location will have no non-stormwater discharges.

2.7 Receiving Waters

The location has no nearby surface water or receiving water.

3.0 Stormwater Management Control Measures

3.1 Potential Pollution Sources

Potential pollution sources during construction are soils and sediment from disturbed areas and potential fluid drips, leaks, or spills during well development and production. The sources are described below.

3.2 Locations Listed in Rule 1002.f.(3).A

Locations listed in Rule 1002.f.(3).A are described below. Locations on the Working Pad Surface and areas of cut and fill are shown on Navex's Construction Layout Drawing.

Chemicals and Materials

During well development, materials will consist predominantly of water-based drilling fluid and lubricants. The well will be drilled with a closed-loop drilling system. Lubricants will be properly stored and capped in their original containers. During production, the product to support well treatment will be inside of a skid-mounted chemical tank with integrated polyethylene containment.

Fueling

The drill rig will have an integrated fuel tank. A liner will be placed beneath the fuel tank to monitor for and capture potential drips and leaks. Vehicles will not be fueled on site.

Produced Water and Drilling Fluids

Produced water will be transferred by transfer line and stored in a steel tank. It will be transported by truck to an off-site commercial underground injection control well described in the Waste Management Plan. Drilling fluids in the closed loop drilling system will be captured, cleaned, and reused throughout well drilling. Final disposition will be disposal in an underground injection control well, as described in the Waste Management Plan.

Outdoor Processing Activities

On-site processing will consist of a 75-bbl heated separator.

Significant Dust or Particulate Generating Processes

Exposed soils and drilling have potential to generate dust. Dust will be controlled when needed using a water truck to form a crust.

Erosion and Vehicle Tracking

There is not a sufficient elevation change between the Working Pad Surface and surrounding topography to result in significant erosion. The access road will tie into the unpaved CR 35 with aggregate placed at the apron to act as a wheel shaker and to control erosion.

Waste Disposal Practices

Waste is limited to drill cuttings that will be contained on location inside of a bermed area until sampling and analysis are complete. Drill cuttings then will be buried in an on-location cuttings trench. Trash will consist of domestic trash and packaging. It will be containerized to prevent it from blowing. Unused material will be removed for reuse at another location.

Leaks and Spills

The location for the drill rig and support equipment is shown on the Preliminary Drill Rig Layout.

Ground Disturbing Maintenance Activities

After construction and interim reclamation, there will be no anticipated ground disturbing maintenance activities.

3.3 Pollution Prevention

Erosion Control

There will be an approximately 9-foot elevation change across the Working Pad Surface. The flow direction is shown on the Construction Layout Drawing. The Construction Layout Drawing shows areas of cut and fill to level portions of work area. The approximately 1,140 cubic yards of soil removed will be mounded on a topsoil stockpile with an approximately 1:3 slope to avoid loose soils. Topsoil will be used on the 0.7-acre portion of the Working Pad Surface identified for interim reclamation during the first growing season after well development is complete.

Secondary Containment

Tanks during well drilling will be contained and integrated with the closed loop drilling system. Tanks during production will have steel secondary containment sized to contain 150 percent of the volume of the largest tank. The drill rig and other motors will have liners underneath to capture drips or leaks. There will be no fuel storage on the location during production; the pump jack will be powered using source gas. The chemical tank to support well treatment will have integrated polyethylene containment.

Spill Prevention

Loading and unloading will occur inside of steel secondary containment. Catch basins will be installed on loadout piping. Loadout piping will contain bull plugs when not in use. Transfer lines will be monitored visually at the connection points for stains, drips, or other signs of leakage requiring correction and will be repaired promptly. The operator will maintain isolation valves by performing function tests and maintaining the valves in accordance with its manufacturer's specifications per Rule 1103.a.

Reclamation

The location will be reduced to approximately 2.0 acres after well development is complete. The remaining area will be revegetated and stabilized during interim reclamation.

3.4 Structural and Non-structural Practices

Structural Practices

The location will have wattles to control run on. Wattles will be placed on the west and portions of the north and south sides of the location, as shown on the attached layout drawings. A drainage ditch and sediment basin will be located on the east side of the location, as shown on the attached layout drawings. The erosion controls will minimize run on to the location and run off of soils and sediment in the event of a significant storm event and prior to interim reclamation. After interim reclamation, if vegetation does not provide sufficient armoring, erosion controls will be maintained and inspected to prevent soils and sediment from leaving the location. If there is evidence of ponding or erosion from the location, stormwater diversions will be created to avoid stormwater channelization. During well development, tanks and other equipment will have secondary containment or liners, as described in Section 3.3. During production, structural controls will be the steel secondary containment around the tank battery and polyethylene containment around the chemical tank.

Non-structural Practices

Disturbances will be limited to the portions of the Oil and Gas Location needed to support well development and production so that vegetation and/or stable soils remain in place. Disturbed portions of the Working Pad Surface not needed for production will be stabilized and revegetated as part of interim reclamation. Trash will be contained. Vehicles and equipment will be monitored for leaks during well development. Booms and absorbents will be made available to address inadvertent spills. Ingress, egress, and parking will occur in designated areas. Inspections will be performed daily during well drilling. Inspections will be performed routinely during well production, as described below. The location and stormwater controls will be maintained to prevent deterioration resulting in erosion or transport of soils and sediments off site.

3.5 Erosion Controls

Erosion controls using wattles, a diversion ditch, and sediment basin are shown on the attached Layout Drawings. They will prevent movement of sediment and soils from stormwater runoff. Designated vehicle ingress and egress will help to avoid vegetation and soil disturbance resulting in erosion. Interim reclamation and revegetation will occur when well drilling is complete. Seeding will occur during the next favorable growing season. Revegetation will be monitored for growth and a vegetative cover that reflects 80 percent of the reference area condition.

3.6 Vehicle Tracking Control

The location's access road ties into the unpaved CR 35. Aggregate will be placed at the apron where the access ties into the county road to act as a wheel shaker and to control erosion.

3.7 Materials Handling and Spill Prevention

Routine inspection of valves, transfer lines, tanks, and secondary containment will identify potential damage, deterioration, or signs of staining and leaks. Shut off valves and bull plugs will be function tested to ensure adequate containment of fluids. Trash will be containerized to prevent it from blowing and will be transported off site for disposal. Vehicles and equipment used on site will be properly maintained and will be monitored for leakage. Site personnel will be trained in spill prevention, response, and response equipment. Training will include how spills or releases will be investigated, controlled, and contained in accordance with Rule 912.a.

3.8 Management of Waste Material

An estimated 222 cubic yards of drill cuttings will be generated. After testing, drill cuttings will be buried on site in a cuttings trench. Trash will be containerized to secure it from blowing. It will be hauled off site using a light duty pickup truck. Produced water will be transported off site by truck for disposal at an underground injection control well. Unused material during well development will be removed from the location to use at another well site. Tank bottoms and workover fluid will be contained in the oil production tank until cleaned out by vacuum truck and transported by truck to a processing facility. Oily waste will be collected in a 100-gallon polyethylene tote and transported for disposal to Clean Harbors. Waste generation, management, and disposal are described in the Waste Management Plan submitted with the Form 2A application.

4.0 Site-specific Construction and Stormwater/Erosion Control Measure Drawings

In accordance with COGCC guidance, this section refers to the attached Construction Layout Drawing and Facility Layout Drawing.

5.0 Inspection and Maintenance Procedures

5.1 Trained and Qualified Site Inspections

Stormwater inspections will be conducted by personnel trained on the content of this Stormwater Management Plan. Personnel will be qualified regarding stormwater preventative measures, practices, controls, and maintenance in the field.

5.2 Scope of the Inspection

During stormwater inspections, personnel will review the Oil and Gas Location perimeter; erosion control measures (wattles, sediment ditch, sediment basin); disturbed areas and reclaimed areas; equipment, material, and storage areas; and vehicle access. Inspections will look for damaged or missing wattles, missing staking, evidence of erosion or uncontrolled stormwater, pooled or ponding stormwater, improper drainage, and evidence of soils or sediment leaving the location. Inspections will review the location for signs of erosion. Stormwater control maintenance needs will be identified and addressed with appropriate follow up.

5.3 State and Local Inspection Requirements

The operator will comply with construction stormwater management requirements administered by the Colorado Department of Public Health and Environment (CDPHE). Kit Carson County does not regulate the proposed wells, provided that the operator provides the county with a copy of the permit issued by the COGCC and a map of all drilling sites (Kit Carson Land Use Code Section 2-104.B).

5.4 Inspection Procedures and Frequency

The Oil and Gas Location and stormwater controls will be monitored daily during site preparation and well development. Evidence of soil or sediment runoff, maintenance needs, and any spills or leaks will be addressed. Following well development, stormwater inspection will occur at a minimum of once every 7 days, consistent with stormwater requirements administered by CDPHE. Inspection frequency may be reduced to once every 30 days after ground disturbance is complete and the site is stabilized with interim reclamation. During inspection, the site operator will look for evidence of erosion, runoff, and stabilization and vegetative success from interim reclamation. Inspections will ensure that erosion and sediment controls identified in this plan are maintained, functioning properly, and that there is no evidence of movement of soils, ponding, or erosion.

5.5 Reporting and Recordkeeping Requirements

Recordkeeping will include conformance with recordkeeping requirements administered by CDPHE. During well drilling, stormwater records will be included with drilling operations records. During production, the site operator will record stormwater inspections and maintenance needs as part of the maintenance records for the location. Documentation will be kept in the operator's Dallas, Texas office.

6.0 Site-specific Construction and Stormwater/Erosion Control BMPs

The table below lists site-specific BMPs to control and minimize stormwater and sediment run-on and run-off.

Table 1. Best Management Practices

Structural	
•	Wattles will be placed on the west and portions of the north and south sides of the location. A drainage ditch and sediment basin will be located on the east side of the location. The controls are shown on the attached layout drawings.
•	Stormwater diversions will be created when there is evidence of ponding or erosion runnels.
•	The fuel tank used during well development will be integrated with the drill rig. There will be no separate fueling on the location.
•	Equipment with motors will have a liner under the motor to capture drips or leaks.
•	Tanks will be located inside of steel secondary containment sized to contain 150 percent of the volume of the largest tank.
•	The chemical tank for well treatment will have polyethylene secondary containment.
•	A drum will remain on site during well drilling, completion, and production that contains booms and absorbents. The drum will be approximately 85 feet west of the well. The spill response materials will support cleanup of small leaks or spills. In the event of a larger incident, a backhoe will remain on site during initial production. If needed, the backhoe can be used to create a berm to contain a spill.
Non-Structural	
•	Valves and bull plugs will be routinely function tested. Deficiencies will be corrected promptly.
•	Waste materials will be bagged or containerized to avoid contact with precipitation.
•	The well pad will be inspected for excessive erosion. Where needed, areas will be recompacted. Diversions will be installed if there is evidence of runnels or ponding.
•	Vehicles and equipment will be monitored for leaks during well development.

<ul style="list-style-type: none"> • Ingress, egress, and parking will occur in designated areas.
<ul style="list-style-type: none"> • During pre-production, inspection of equipment will occur daily during well development to detect staining, drips, or leaks that could result in spills.
<ul style="list-style-type: none"> • The Oil and Gas Location and stormwater controls will be monitored daily during site preparation and well development. After well development, stormwater inspections will occur at a minimum of once every 7 days, consistent with stormwater requirements administered by CDPHE. The inspection frequency may be reduced to once every 30 days after ground disturbance is complete and the site is stabilized with interim reclamation.
<ul style="list-style-type: none"> • The location and access road will not be accessible to the public to prevent unauthorized access and excessive wear on access roads.
<ul style="list-style-type: none"> • Stabilization and revegetation will be performed as part of interim reclamation during the first growing season and within 3 months after well development is complete.
<ul style="list-style-type: none"> • During production, an operator will be on site daily to oversee areas that require corrective action.

Attachments

Layout Drawings



SCALE: 1" = 50'

- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- WATTLES
- FILL AREA
- WELLHEAD
- PROPOSED DRAINAGE
- EXISTING DRAINAGE

WELLHEAD ELEVATIONS

GRADED ELEVATION: 4,467.93'
UNGRADED ELEVATION: 4,466.88'

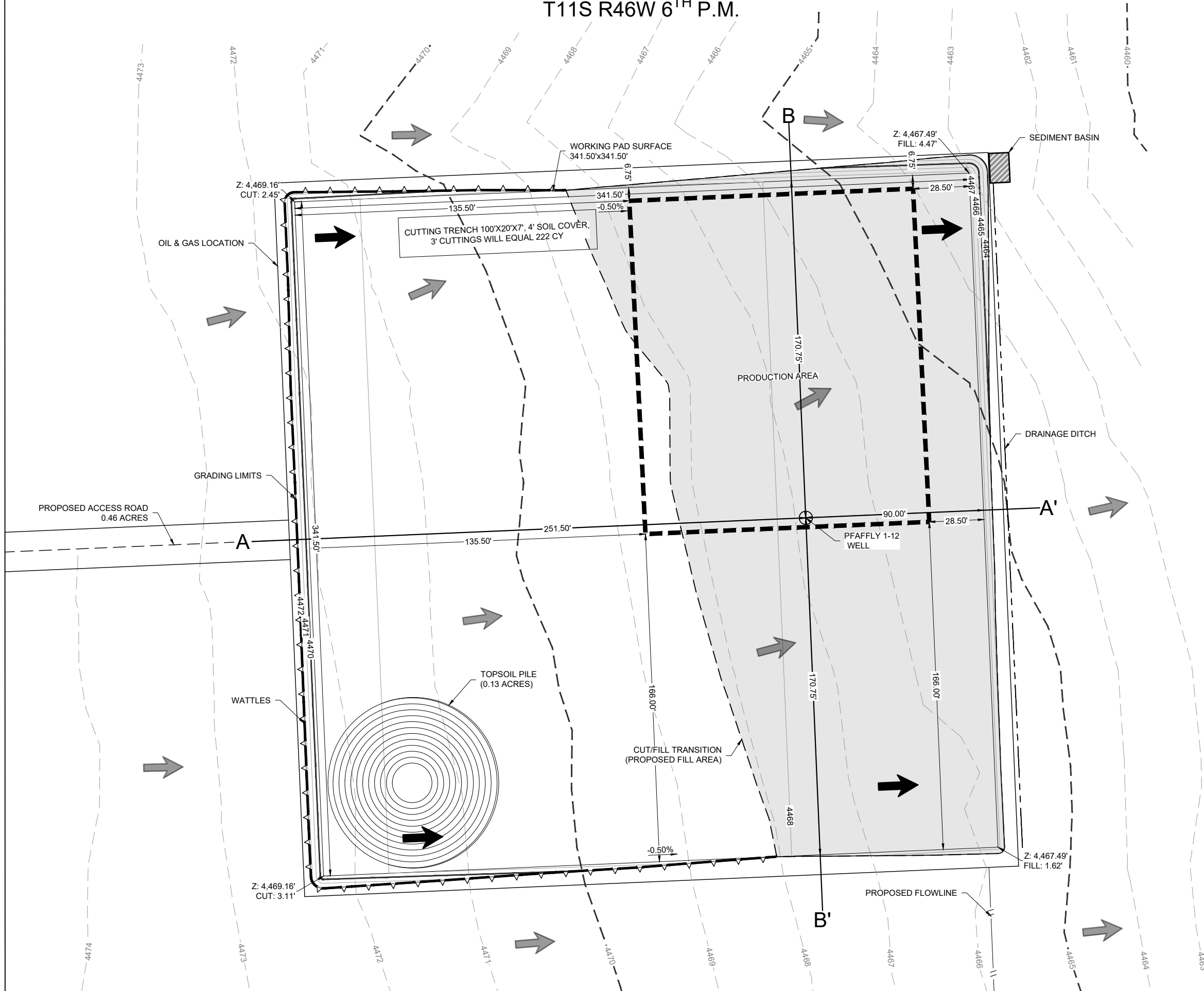
EARTHWORK QUANTITIES:

CUT: 4,270 CY
FILL: 3,100 CY
TOPSOIL (3"): 1,140 CY
EXPORT: 30 CY
FILL FACTOR: 1.10

DISTURBANCE ACREAGES:

WORKING PAD SURFACE (AC): 2.68
OIL & GAS LOCATION (AC): 3.00
PROPOSED ACCESS ROAD (AC): 0.46
FLOWLINE ROW (AC): 0.003

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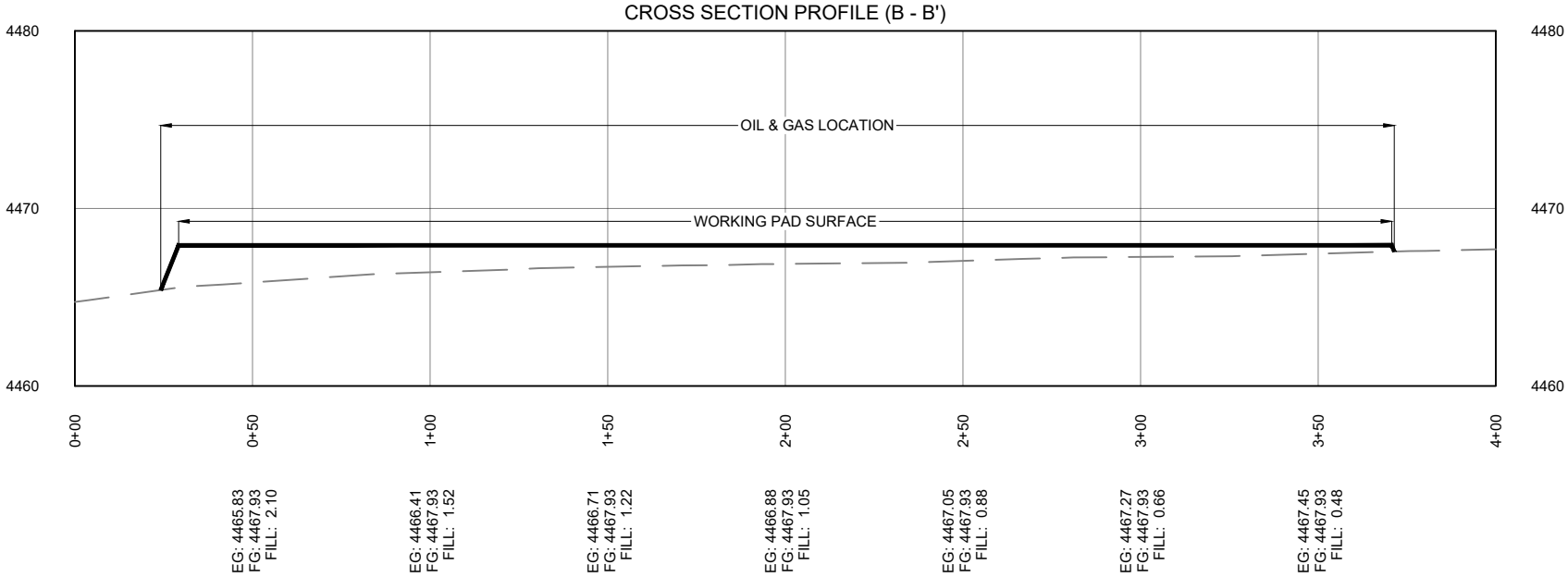
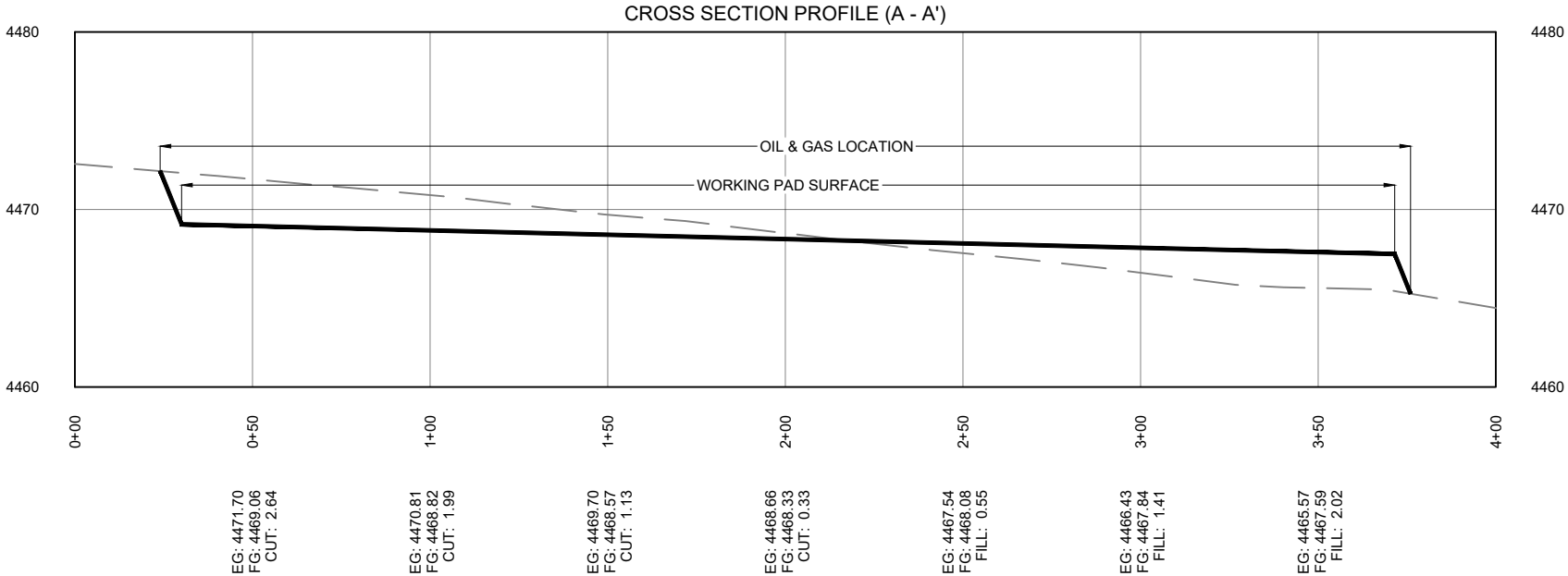
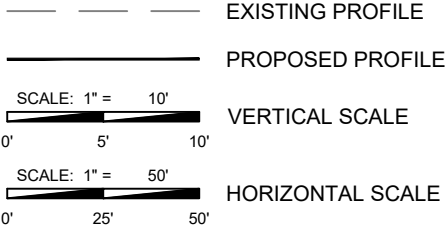
CONSTRUCTION LAYOUT - PLAN VIEW

PFAFFLY #1-12

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CONSTRUCTION LAYOUT - CROSS SECTIONS

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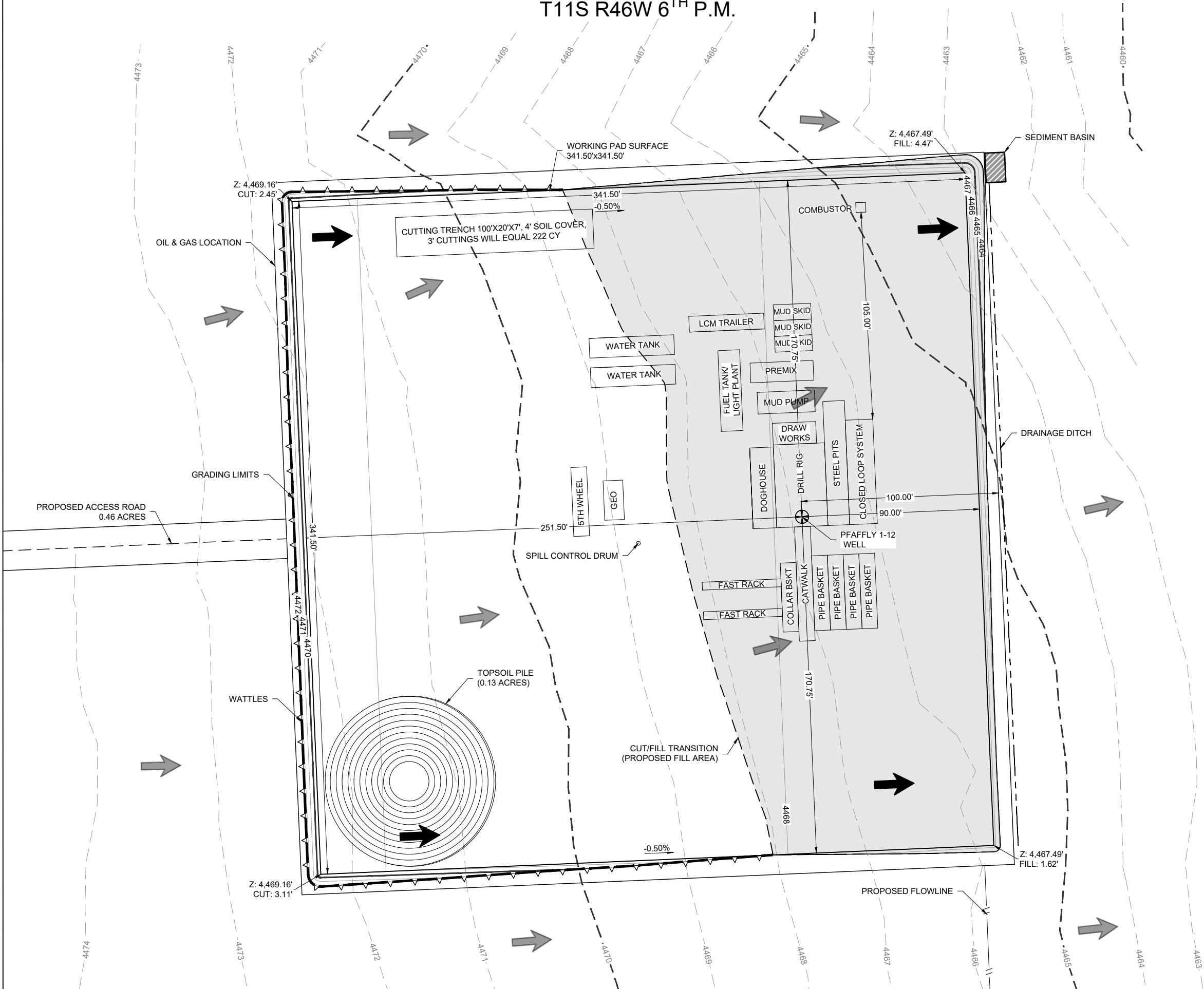


SCALE: 1" = 50'

- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- WATTLES
- FILL AREA
- WELLHEAD
- PROPOSED DRAINAGE
- EXISTING DRAINAGE

WELLHEAD ELEVATIONS
GRADED ELEVATION: 4,467.93'
UNGRADED ELEVATION: 4,466.88'

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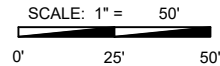
PRELIMINARY DRILL RIG LAYOUT

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EXISTING 1' CONTOUR

EXISTING 5' CONTOUR

PROPOSED 1' CONTOUR

PROPOSED 5' CONTOUR

WATTLES

FILL AREA

WELLHEAD

WELLHEAD ELEVATIONS

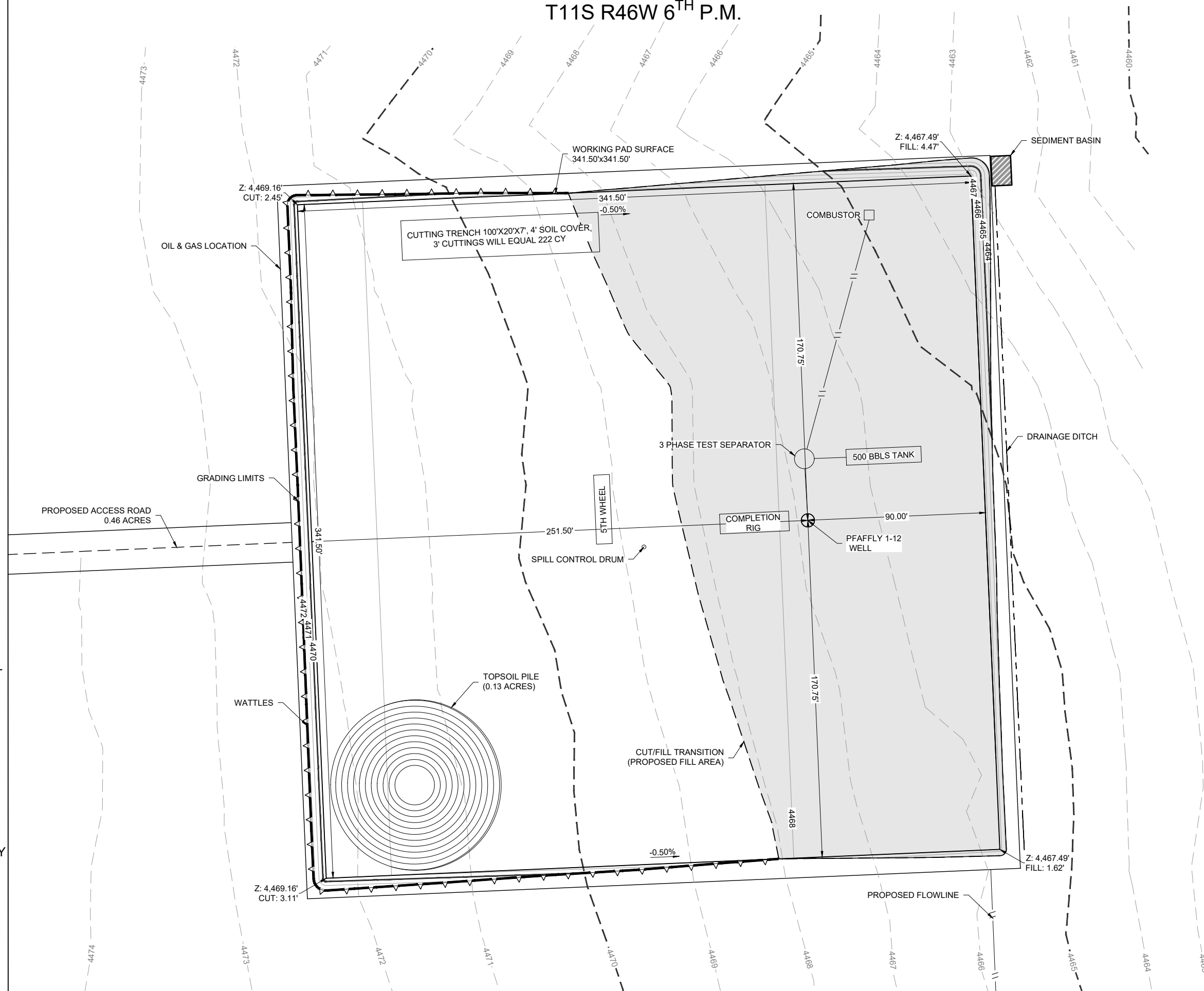
GRADED ELEVATION: 4,467.93'
UNGRADED ELEVATION: 4,466.88'

NOTE:

THE WELL WILL BE A CONVENTIONAL VERTICAL WELL WITH NO HYDRAULIC FRACKING, STIMULATION, OR FLOWBACK. ALL FORMATION WATER DURING WELL COMPLETION AND ALL PRODUCED WATER DURING PRODUCTION WILL FLOW TO AN ON-SITE SEPARATOR FOR SEPARATION OF OIL AND WATER. OIL AND WATER WILL BE STORED IN TANKS. OIL WILL BE TRUCKED TO A COMMERCIAL TRANSFER POINT. WATER WILL BE TRUCKED FOR DISPOSAL AT A COMMERCIAL UIC WELL. THE GAS STREAM DURING PRODUCTION WILL BE PIPED UNDERGROUND TO THE EXISTING LADDER CREEK GATHERING SYSTEM OPERATED BY TUMBLEWEED MIDSTREAM FOR PROCESSING OFF SITE.

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WELL COMPLETION LAYOUT

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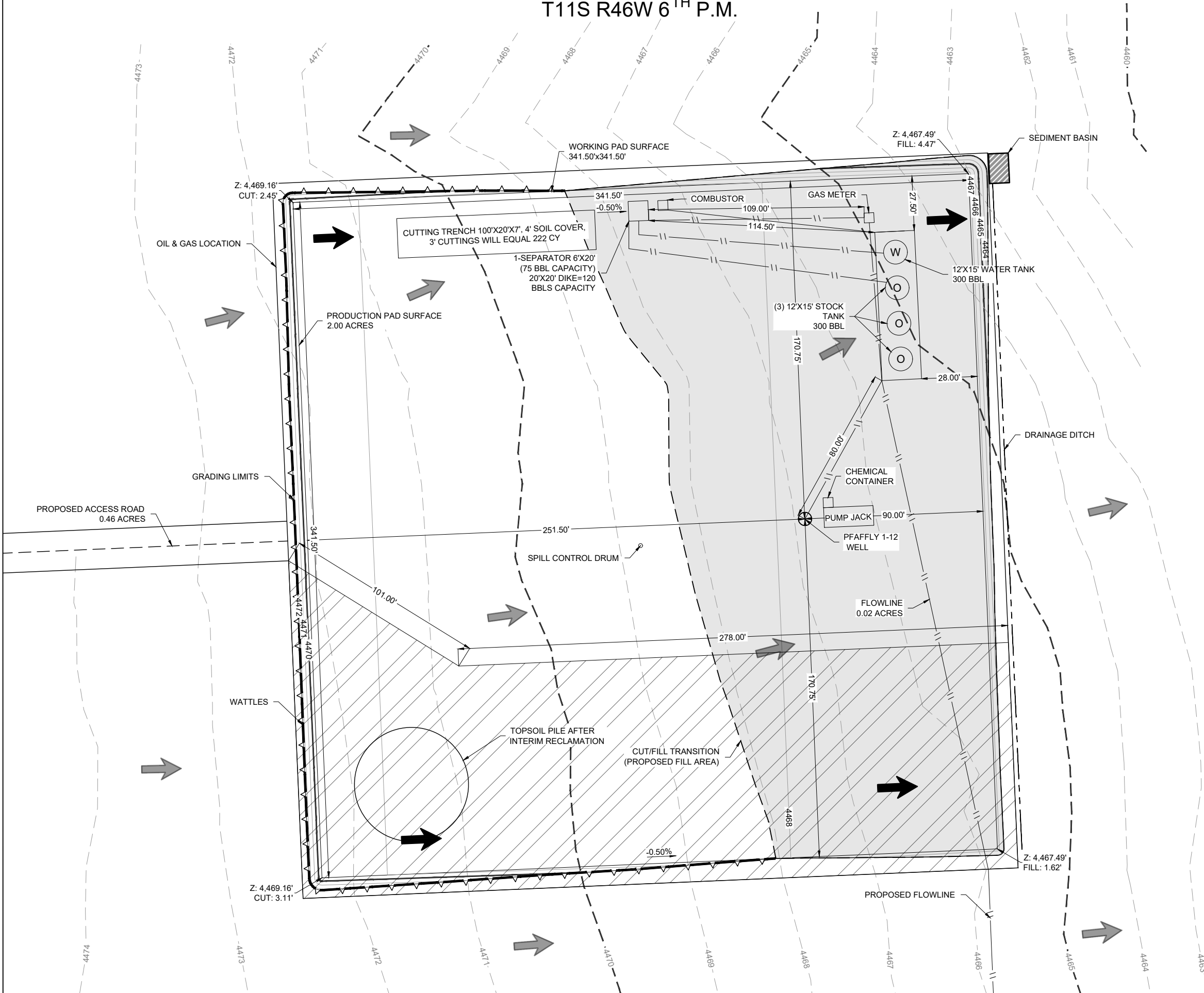
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- WATTLES
- PROPOSED PIPELINE
- RECLAMATION AREA
- WELLHEAD
- PROPOSED DRAINAGE
- EXISTING DRAINAGE

WELLHEAD ELEVATIONS

GRADED ELEVATION: 4,467.93'
UNGRADED ELEVATION: 4,466.88'

DISTURBANCE ACREAGES:
ORIGINAL DISTURBANCE (AC): 3.00
INTERIM RECLAIM AREA(AC): 1.00
UNRECLAIMED AREA (AC): 2.00
FLOWLINE ROW (AC): 0.003

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FACILITY LAYOUT

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