

Shelduck South **Site-Specific Stormwater** **Management Plan**

In accordance with:

COGCC Rule 304.c.(15), requiring a Stormwater Management Plan consistent with the requirements of COGCC Rule 1002.f.



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Appendix A	Stormwater Management Plan Maps: <ul style="list-style-type: none"> - Initial Construction SWMP Overview Map - Initial Construction SWMP Site Map - Interim Reclamation Map - Soils & Erosion Maps - Pre-Disturbance Land Use Map - Pre-Disturbance Vegetation Identification/Analysis and Photo Series
Appendix B	Soils Reports
Appendix C	Seed Mix & Methodology
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1. Introduction

Mallard Exploration (Mallard) has prepared this document to satisfy the requirements of COGCC Rule 304.c.(15) to develop a stormwater management plan, consistent with the requirements of COGCC Rule 1002.f., to accompany the Form 2A in order to demonstrate the Commission's Rules for the operation of the proposed oil and gas location in a manner that is protective of and minimizes adverse impacts to public health, safety, welfare, the environment, and wildlife resources.

2. Project Summary

2.1. Stormwater Permit Coverage

Mallard has a field-wide master SWMP that covers their construction activities within the Denver-Julesburg Basin. Construction activities within this area are covered under the CDPS General Permit for Discharges Associated with Construction Activity (Permit No. COR-400000). The Shelduck South construction will occur within this permitted area. The subject project consists of upstream exploration and production pad construction and activities. BMPs will be employed in accordance with good engineering, hydrologic, and pollution control practices in order to prevent pollution in stormwater discharges associated with the construction of the subject facility.

All information and conditions represented herein are estimated and intended as a preliminary plan. This site-specific SWMP is intended to be a living document that will change and be updated routinely as field conditions change. Actual placement of BMP's etc. may deviate from the preliminary plan based on actual conditions discovered in the field and updates will be made accordingly.

2.2. Site Description

The Shelduck South is located in the NW ¼, SW ¼, Section 6, Township 7 North, Range 60 West, in Weld County, Colorado. The total area of disturbance is planned to be 11.3 acres. Mallard plans to reclaim 3.8 acres after the location is producing, leaving 7.5 acres for the working pad and production pad surface. Construction of the location is anticipated to take approximately 20 working days. Initial drilling will include eight wells and is anticipated to take approximately 52 working days. Completions and flowback are anticipated to take another 56 and 30 days, respectively, and production operations will commence following flowback of each well.

2.3. Nature of Construction

The subject project consists of building an oil and gas exploration and production pad. After initial construction, wells are drilled and completed onsite and brought into production. Once the wells are in production and no further drilling or completions are planned, the well pad will have the disturbance area reduced and the pad pulled-back by reclaiming areas not needed for ongoing operations. The producing well pad will then continue to operate as long as economics dictate. At some point in the future, the wells will be plugged and abandoned (P&A'd). If the location will not be used for other oil and gas operations, then the location will typically be reclaimed to pre-disturbance conditions.

The following outlines the typical sequence of construction activities. Some activities will partially overlap or occur simultaneously, but commonly occur in the following order.

2.3.1. Access Road

Construction of the new access road starts by clearing and stripping the topsoil along the planned route from Weld County Road 86 (CR #86), south to the planned pad disturbance. Topsoil is stored onsite for future use in reclaiming disturbed areas. Cut and fill, grading, and compaction activities are conducted as necessary to construct the road. Installation of culverts, cattle guards and other permanent BMPs will be installed where needed. Once the access road is constructed, the road will be surfaced with gravel or other surfacing materials.

2.3.2. Facility Construction

To begin construction, the location will be cleared and stripped of topsoil. Topsoil is stored onsite for future use in reclaiming disturbed areas. Cut and fill, grading, and compaction activities are conducted as necessary to prepare the location as designed. The working/driving surface areas will be armored with crushed rock or road base when necessary, to prevent rutting and erosion.

Installation of storage tanks, separators, other tank battery equipment, and any associated appurtenances will typically begin once pad construction is complete and may continue through the drilling or completion phases.

2.3.3. Drilling & Completions

Once the facility construction is complete, a drilling rig will mobilize to the site and begin drilling the wells. The timing of the rig moving onsite can be variable due to any number of factors, but initial drilling at the Shelduck South (8 wells) is anticipated to take place over approximately 52 working days.

In support of the drilling rig, portable offices, dining facilities, storage containers, chemical storage, and/or living/sleeping quarters are sometimes moved onsite. Light-duty and heavy-duty vehicle traffic becomes prominent at this phase.

Once drilling is complete, the drill rig is mobilized offsite and a completions rig and the associated equipment and personnel arrive onsite. Completions and flowback are anticipated to be completed within 56 and 30 days, respectively.

The completions phase requires extensive onsite equipment and materials, especially during the stimulation process. Typically, the largest disturbance footprint for a location will occur during the completions phase.

2.3.4. Disturbance Reduction (Pad Pull-Back) / Interim Reclamation

Once all drilling and completion activities are complete, the pad size will be reduced to 7.5 acres to minimize the long-term disturbance during the production phase. Enough working area must remain to ensure a safe working environment for continued work by pumpers, liquids haulers, and periodic work over operations, etc. All areas needed for ongoing operations will be stabilized for the long-term life of the interim pad. The remainder of the pad will be stripped of topsoil, decompacted, ripped, recontoured

to pre-existing conditions and topsoil is reapplied. These areas will be seeded/mulched and monitored until final stabilization and interim reclamation are achieved. Mallard will be using a Colorado Parks and Wildlife (CPW) – recommended pronghorn seed mix at the Shelduck South pad. Utilizing the Habitat Seeding Calculator, Mallard has designed an optimum seeding methodology during reclamation at the Shelduck South pad. The seed mix and application rates can be found in Appendix C. Final stabilization is achieved when all construction activities are complete, all areas needed for ongoing operation are stabilized for the long-term life of the pad, and when all areas that are seeded/mulched have achieved a vegetation density of 70% of predisturbance levels. Interim reclamation is achieved when the vegetation reaches a desirable coverage of 80% of predisturbance levels. Since the subject project will be built on non-agricultural land, interim reclamation activities are to be commenced within 3-months (weather permitting) following the pad being brought into production, as long as subsequent operations will not be conducted within 12-months. Once interim reclamation is achieved, a COGCC Form 4 Sundry Notice will be submitted to document interim reclamation completion, accompanied by the requisite photos documenting the reclamation.

2.3.5. Production

The production phase of the pad is characterized by the time from when the wells become productive until P&A and the final reclaim of the site. All areas not needed for ongoing operation will have been reclaimed and all areas needed for ongoing operation will have been stabilized for the long-term operating life of the pad.

2.3.6. Abandonment/Final Reclaim

Once the wells are no longer economical to operate, they will be P&A'd and the location recontoured and reclaimed to pre-disturbance conditions and/or in accordance with the surface owner's wishes.

When a well is P&A'd, the well head assembly is removed and the well permanently plugged downhole. All equipment associated with the well is removed from the location unless the equipment is also used by other wells on the pad or in the area. Flow lines may be re-routed or abandoned as necessary.

Once all equipment has been removed from the location and the well or wells are P&A'd, the location and associated access roads will be recontoured and reclaimed to pre-disturbance conditions and/or in accordance with the surface owner's wishes.

Rock surfacing on the pad and access roads will be removed for beneficial re-use or offsite disposal. Topsoil will be respread following recontouring and decompaction to pre-disturbance conditions. All culverts, cattle guards, or other extractable structural BMPs will be removed and either reused at new construction sites, recycled as scrap, or disposed of as solid waste.

Once the location is recontoured, topsoil is reapplied across the location in preparation for seeding. Appropriate seed mixtures are determined based on surface owner requirements, pre-existing site conditions and terrain characteristics.

3. Supplemental Site Information

3.1.Distance to Water/Receiving Waters

The immediate and ultimate receiving waterway is an unnamed intermittent freshwater lake/pond located ~1.2 miles west of the project disturbance.

3.2.Disturbance Estimates

The initial pad disturbance is expected to be 11.3 acres. After drilling, completions, and interim reclamation, the interim pad disturbance is expected to be reduced to 7.5 acres, which is the anticipated size for the remainder of the life of the pad.

3.3.Soils & Erosion Risk

To determine anticipated site characteristics for the project site, Geographic Information System (GIS) data from the Natural Resource Conservation Service (NRCS) along with aerial photography was overlain on the site proposed disturbance boundary to derive potential ecological site descriptions (ESDs) and NRCS soil map units. A desktop review of the proposed project area indicates the presence of one soils map units – 100% consisting of Olney fine sandy loam (0% to 6% slopes).

The Olney fine sandy loam (0% to 6% slopes) soils map unit shows an anticipated top soil depth of 0 to 6 inches. The depth to a restrictive feature is more than 80 inches. The drainage class is well drained, and the available water capacity is moderate (about 8.1 inches).

Slopes in the project area range from 0-6%. The risk of susceptibility to erosion/runoff is moderate based on K factor values; the overall erosion hazard is slight.

Soils and erosion maps and soils reports can be found in Appendix A and B, respectively.

3.4.Pre-Disturbance Land Use and Vegetation

The pre-disturbance land use at the subject location is non-agricultural grassland/rangeland.

The plant community includes predominantly switchgrass and deergrass, with smaller populations of black bindweed and yellow salsify. Much of the future project area consisted of dead and unidentifiable grasses, while vegetated areas showed a wide range of coverage and density.

Known noxious weed infestations – no plants from Colorado’s A, B, or C lists were found onsite.

Vegetation Coverage (COGCC): ten semi-random quadrat (2.25 ft²) samples were analyzed in the future project area in order to determine pre-disturbance vegetation coverage. COGCC coverage estimates include all plants, excluding noxious weeds. Pre-disturbance plant coverage ranged from 8% to 70%, averaging 26% over the ten semi-random samples. The pre-disturbance desirable coverage metric can be used to help determine COGCC interim reclamation completion and final reclamation in the future.

Vegetation Density (CDPHE): ten semi-random quadrats (2.25 ft²) were analyzed in the future project area in order to determine pre-disturbance perennial vegetation density. The pre-disturbance density ranged

from 1 to 30 perennial plants per quadrat, with an average of 13.7 perennial plants per quadrat. A standard error of the mean of 10% or less was not achieved, indicating relatively high variability and non-uniform coverage over the project area.

The vegetation density metric will be used to assess CDPHE final stabilization – the CDPHE requirement for final stabilization is that all areas of ground disturbing activities, where a uniform vegetative cover has been established, have an individual plant density of perennial species of at least 70 percent of pre-disturbance levels.

Pre-disturbance vegetation identification/analysis and photo series can be found in Appendix A.

4. Potential Sources of Pollution

This section considers potential pollutant sources generated by the construction process. A table of potential pollutant sources by phase of construction is included in Appendix B.

4.1. Disturbed and Stored Soils

The construction process will expose topsoil and sub-soils to wind and water erosion which can become pollutants to stormwater and waters of the state. The process of removing topsoil, cut and fill, grading and compaction operations will greatly decrease infiltration rates and increase runoff potential. Increased erosion and sediment movement by stormwater and wind will occur once existing vegetation is disturbed, especially along cut and fill slopes and large areas of disturbance.

Topsoil will be stockpiled onsite for later use in the reclamation process. Subsoils may also be stockpiled and stored depending on the cut and fill designs. Stockpiled soils are susceptible to erosion/sediment movement and can become a pollutant to stormwater and waters of the state. All stockpiled soils will be shown on the site-specific maps/diagrams along with appropriate BMPs.

When possible, existing vegetation will be preserved in place to minimize the disturbance footprint and prevent erosion using natural controls.

Stormwater runoff from all disturbed areas and soil storage areas for which permanent or temporary stabilization is not implemented, must flow to at least one control measure to minimize sediment in the discharge. This may be accomplished through filtering, settling, or straining. The control measure must be selected, designed, installed and adequately sized in accordance with good engineering, hydrologic and pollution control practices. The control measure(s) must contain or filter flows in order to prevent the bypass of flows without treatment and must be appropriate for stormwater runoff from disturbed areas and for the expected flow rate, duration, and flow conditions (i.e., sheet or concentrated flow).

The site-specific maps/diagrams in Appendix A and in future inspection reports show the areas of disturbance including cut and fill and soils stock piles, along with the BMPs implemented to manage stormwater.

4.2. Vehicle Tracking Controls

Offsite sediment tracking by vehicles is a potential pollutant source to stormwater and waters of the state. To address offsite sediment tracking, access roads shall be properly built to specifications and surfaced with rock/road base. Also, the working area on pads will be surfaced with rock/road base to limit the potential for vehicles to track mud offsite.

The Shelduck South will utilize a vehicle track pad/construction entrance on the access road near where it meets the pad disturbance, which will assist in removing mud and sediment from vehicles leaving the site.

Staff and contractor training will also reduce the likelihood of offsite sediment tracking by limiting the areas of operations during muddy conditions. If offsite sediment tracking onto adjacent paved roads is identified during inspections, street sweeping will be implemented as necessary and where practicable.

4.3. Management of Contaminated Soils

If contaminated soils are excavated at a Mallard location, BMPs will be implemented to protect stormwater from contacting or becoming polluted by contaminated soils. Stockpiles of contaminated soil will be placed inside berms or containers, place on a liner and/or removed from the site and disposed of as soon as practicable at a location certified to handle such material.

4.4. Loading & Unloading

Loading and unloading operations of various materials can occur during any phase of construction, with the majority of events occurring during drilling and completions. Well drilling and completion surfactants, friction reducers, dilute hydrochloric acid, potassium chloride solutions, drilling mud, and other fluids/materials can be transported or unloaded directly into the well or to onsite tanks. Dry drilling mud components are contained in packaging and are stacked on pallets, which are unloaded using a forklift and stored in designated areas. Chemical loading and unloading will be conducted by onsite personnel and/or third-party contractors.

4.5. Outdoor Storage Activities

Outdoor storage is a potential pollutant source primarily during drilling and completion phases. Chemicals used in drilling and completion phases are stored in designated material storage areas and in staging areas. Dry and liquid materials are typically stored in original containers until ready for use. Dry materials are kept wrapped, covered or otherwise protected from contact with stormwater. Liquid materials are kept in sealed impermeable containers including bottles, buckets, drums and tanks. Secondary containment will be implemented under/around dry and liquid materials.

Storage areas shall be kept clean and organized in order to reduce the risk of polluting stormwater and facilitating identification of leaks and spills.

Diesel fuel, propane, gasoline, oil, hydraulic fluids, and solvents may be stored onsite. Materials of these types will be properly labeled and stored in temporary enclosures or bermed containment areas to avoid contact with stormwater. Dry chemicals, including dry drilling mud and similar materials, may be stored

onsite. These materials will be properly labeled and stored off the ground surface or on ground protection to avoid impact from adverse weather conditions. Mallard personnel are trained in spill response procedures that are established in the field-wide SPCC plan. Mallard also implements waste control measures when appropriate at its construction sites.

A list by phase of the potential chemicals stored onsite is included in Appendix B. The location of outdoor storage areas is indicated on the site-specific maps/diagrams.

4.6. Vehicle & Equipment Maintenance and Fueling

Routine vehicle and equipment maintenance and fueling operations shall be conducted offsite when possible. If required onsite, operations shall be conducted a safe distance from streams, wetlands, or other conveyances to waters of the state. All maintenance and fueling operations shall be continually monitored by the personnel conducting the operations to prevent or minimize leaks or spills. Maintenance and fueling operations typically occur during the facility construction, drilling and completions phases.

If bulk storage tanks are stored on location, secondary containment will be installed according to the applicable SPCC regulations and the Mallard field-wide SPCC plan.

4.7. Dust or Particulates

Dust/particulates are a potential pollutant source generated by earthmoving equipment during facility construction, vehicular traffic on graveled access roads, and during high wind events at sites with un-stabilized soils. Dust/particulates potential as a pollutant increases during hot and dry times of the year. All dirt/gravel roads and areas of disturbed soil shall be watered as often as necessary to mitigate dust/particulates as a pollutant. The Construction Foreman (construction phase), Company Man (drilling/completion phases), or Mallard EHS personnel (production phase) shall be responsible for determining when onsite conditions warrant applying dust suppression BMPs.

Dust suppression is typically achieved by applying either freshwater or a magnesium chloride solution. Mallard staff will obtain any local, county or state required permits as applicable.

4.8. Routine Maintenance

Maintenance involving fertilizers, pesticides, detergents, fuels, solvents, and oils may periodically be conducted on location. Maintenance associated with detergents, fuels, solvents and oils during each phase is possible, but predominantly occurs during the drilling and completions phases to support the drill rig and ancillary equipment.

There exists the potential for one-off applications of fertilizers and/or herbicides to a location primarily during the production phase. An example would be where reclamation success has not been achieved due to a soil limiting factor or where undesirable vegetation has become established.

Herbicides shall only be applied by trained personnel under the direct supervision of a licensed pesticide applicator.

Fertilizers will only be applied by experienced applicators. Fertilizers used for soil augmentation, hydro mulching, etc. will not be stored onsite and only brought onsite at the time of intended application. The amount of fertilizer brought onsite will vary by location and will be based on the application rate required and the size of the facility. Fertilizers will be stored in sealed containers, inside enclosed trailers or as otherwise protected to prevent contact with stormwater. Personnel applying the fertilizer will be responsible for monitoring leaks and spills. In the event of a leak or spill, applicator personnel shall notify Mallard EHS staff as soon as possible.

4.9. Onsite Waste Management Practices

Non-hazardous wastes generated during each operational phase will be collected in appropriate receptacles and periodically transported to licensed disposal or recycling facilities. Storage receptacles shall be designed to prevent contact of stormwater to stored wastes. Storage receptacles shall be routinely emptied on a schedule deemed appropriate by the Construction Supervisor, Company Man, or EHS personnel depending on the phase.

In the event that hazardous wastes are generated, the storage, transport and disposal shall meet all applicable local, state and federal regulations.

Hazardous and non-hazardous wastes will only be disposed of offsite. The dumping, burying or littering of wastes on the location are strictly prohibited. Proper training and enforcement for staff and contractors will ensure compliance with this plan and the protection of waters of the state.

4.10. Non-Industrial Waste Sources

The disposal of trash and litter on location or along the associated access roads is strictly prohibited except in designated receptacles. All trash and litter found on location or along access roads shall be cleaned up when found provided it is non-hazardous. Proper training of staff and contractors will mitigate the potential for trash and litter on locations.

Portable toilets and/or living facilities with sanitary waste systems will typically be onsite during the construction, drilling, and completions phases. Portable toilets may be stored at select locations throughout the field during the production phase. All portable toilets shall be staked, anchored or trailer mounted to prevent accidental tipping.

The routine cleaning and maintenance of these sanitary waste systems is handled by contractors on a schedule dictated by the volume of use.

5. Implementation of Control Measures

5.1. Structural Practices for Erosion & Sediment Control

Structural practices are those that require physical construction, installation, or manipulation. This includes structural features of a facility or access road designed to prevent erosion or control sediment movement. Structural erosion and sediment controls focus on two different processes although some of the BMP's can be applicable to both.

5.1.1. Erosion Control

Erosion control is the preferred method for protecting stormwater quality from degradation by sediment. Erosion control focuses on preventing soil from moving from its original/current location. Successful implementation of erosion control BMPs can prevent the need for sediment control BMPs. Erosion control BMPs will be implemented at each phase of construction, with site specific circumstances driving the selection of BMP type and installation location.

Structural erosion controls include, but are not limited to, the following (*indicates planned use at Shelduck South):

- Earthen dike/berm*
- Ditch/drainage swale*
- Check dam
- Culvert with armored inlet / outlet*
- Surface roughening*
- Erosion control blanket / rolled product*
- Hydro mulch / seeding*
- Mulching*
- Rip-rap*
- Surface armor*
- Slope drain*
- Slope grade / terracing
- Stream / water crossing
- Wind fence / walls

5.1.2. Sediment Control

Sediment control BMPs are designed to retain sediment onsite and prevent degradation of stormwater quality. Sediment controls focus on settling or capturing suspended soil in stormwater before stormwater leaves the location. Sediment control BMPs will be implemented at each phase of construction, with site-specific circumstances driving the selection of BMP type and installation location.

Structural sediment control BMPs include, but are not limited to, the following (*indicates planned use at Shelduck South):

- Check dam
- Surface roughening*
- Sediment trap / basin*
- Sediment log / sock / wattle
- Silt fence / s-fence
- Straw bale
- Vehicle track pad* / cattle guard

5.2. Non-Structural Practices for Erosion & Sediment Control

Non-structural practices are those which are not physical, but instead consist of rules, practices, or procedures acquired through policy, planning, or training.

5.2.1. Erosion Control

Non-structural erosion controls include, but are not limited to, the following (*indicates planned use at Shelduck South):

- Minimize disturbance footprint*
- Minimize soil compaction in reclaimed areas*
- Preserving vegetation
- Protecting sensitive habitats
- Proper site selection*
- Re-vegetation*
- Wind erosion/dust control

5.2.2. Sediment Control

Non-structural sediment controls include, but are not limited to, the following (*indicates planned use at Shelduck South):

- Preserving vegetation
- Proper site selection*
- Routine inspections*
- Street sweeping*
- Vegetative buffer

5.2.3. Good Housekeeping

Good housekeeping practices must be implemented in order to prevent storm water contamination with solid and liquid wastes generated in the construction process. Good housekeeping practices include but are not limited to employee and contractor training, designating material storage/staging areas, having standard policies and procedures regarding materials handling and waste management, implementing spill prevention procedures, developing spill response and cleanup procedures, and having equipment and vehicle fueling and maintenance policies and procedures.

Training

- Is key to ensuring all employees and contractors understand the importance of good housekeeping and the protection of storm water from pollutant sources
- Ensures all employees and contractors understand the requirements of the storm water plan and associated BMPs
- Ensures all employees and contractors are prepared to identify and respond to an uncontrolled pollutant source
- Facilitates discussion between the owner/construction manager and their employees and contractors

Material Handling and Storage/Staging

- Retain all Safety Data Sheets (SDS) in an accessible location for all stored materials, chemicals, and hydrocarbons
- Do not remove original manufacturer labels
- Keep stored materials, chemicals, and hydrocarbons in original containers or properly designated containers
- Keep bagged and boxed materials on pallets or similar elevated storage area (do not place directly on ground)
- Provide appropriately sized secondary containment or storage containers for applicable materials, chemicals, and hydrocarbons
- Clearly designate delivery and storage areas
- Routinely inspect storage for damaged, leaking, or improperly stored materials, chemicals, or hydrocarbons
- Storage sheds/containers must be leak free
- Minimize storage of materials, chemicals, and hydrocarbons on location (limit to anticipated need in a timely manner)
- Keep well organized and leave adequate room between stored products to facilitate inspection, cleanup, or emergency response actions

Waste Management

- Provide designated containers for trash disposal and recycling (if applicable)
- Ensure all waste containers are covered to prevent storm water contact or wind movement
- Segregate wastes by type for proper disposal
- Ensure all employees and contractors working on location are routinely cleaning the construction site of trash
- Locate waste collection containers near waste sources or at the construction entrance
- Routinely empty waste containers to prevent overfilling

Hazardous Materials and Waste

- If applicable, designate hazardous waste collection area(s)
- Provide adequately sized secondary containment for all hazardous waste storage
- Properly label and handle all hazardous wastes
- Follow company specific waste management guidelines

Sanitary and Septic Waste

- Provide onsite toilet facilities while construction is ongoing
- Locate toilet facilities in convenient locations but away from waterways, wetlands, or other sensitive areas
- All portable toilets must be staked, tied, or otherwise secured to prevent tipping
- Routinely dispose of sanitary and septic waste in accordance with state or local regulations

Equipment/Vehicle Fueling and Maintenance

- Minimize the fueling and maintenance of equipment and vehicles on the construction site
- Only minor unscheduled maintenance should be conducted on location, provided it can be done while protecting storm water
- Routine and major maintenance should be conducted off location

- Keep spill kits/materials on location near on-site fueling and maintenance areas
- Routinely inspect vehicles and equipment for leaks
- All chemical and fuel transfer operations shall be continuously monitored to minimize the risk of spills
- Use absorbent pads, drip pans, or other fluid control measures when drips or spills are possible

Equipment/Vehicle Washing

- Minimize on-site vehicle and equipment washing
- Use off-site dedicated washing facilities when possible
- Keep wash water on location and treat with applicable BMPs
- Do not allow wash water to discharge off of the construction location

Spill Prevention and Response Plan

- Develop a written spill prevention and response plan (may incorporate SPCC plan(s))
- Identify employees and/or contractors responsible for spill prevention and response
- All employees and contractors shall adhere to company specific environmental, health, and safety plans, rules, and programs
- Prioritize employee, contractor, and public safety followed by stopping the source of a spill and containing on-site
- Keep an ample supply of spill cleanup materials and equipment near storage, loading/unloading, and refueling areas
- Adhere to all federal, state, and local rules and regulations for response, cleanup, reporting, and disposal

5.2.4. Other Considerations

Other related BMPs or considerations that indirectly affect erosion and sediment control:

- Implement controls before, during, and after construction as necessary to manage stormwater
- Implement temporary stabilization where construction activities will stop for 14 days or more
- Maintain clearly defined construction boundaries
- Preservation of topsoil for reclamation is key to re-establishing vegetation during the production and abandonment phases
- Preconstruction site selection is important for minimizing the potential for erosion (level/gentle slopes)
- Restriction of livestock access to seeded/reclaimed areas until mature vegetation is established
- Run-on stormwater shall be avoided/mitigated through the use of BMPs including diversion ditches, berms, and dikes
- Slopes steeper than 3:1 on cut and fill areas shall be avoided or minimized where possible (in the event that a 3:1 slope is unavoidable, additional planning and BMPs may be required)

5.2.5. Preventative Maintenance

Preventative maintenance of pipes, pumps, storage tanks, and stormwater management devices to ensure equipment and structures are in good condition and will not pollute stormwater. This includes replacing worn gaskets and valves before leaks occur and removing trash and residue from overflowing containers and receptacles.

5.2.6. Routine Inspections

Routine inspections ensure equipment, machinery, vehicles, and storage tanks are not leaking. Mallard employees and contract personnel perform routine visual inspections at all Mallard locations.

6. Inspections

6.1. Inspection Frequency

Active Construction Inspections: site inspections shall start within 7 calendar days of the commencement of construction activities at a new site. Inspections will then be conducted either, at least every 7 calendar days, or, at least every 14 calendar days and after precipitation and melting-events that cause surface erosion.

Non-Cropland Sites – Inactive/30-Day Inspections: at sites that are not located in cropland, once all ground disturbing activities have been completed and the location has been pulled-back and has been seeded/mulched (or is awaiting seeding/mulch), and all final stabilization measures have been implemented, the inspection frequency will be reduced to the 30-day/inactive frequency. Inspections will proceed until the site has met CDPHE final stabilization criteria, at which point it will move into the COGCC post-construction stormwater program.

Post-Construction Locations: when a location moves into the COGCC post-construction stormwater program, the location will be assessed against the COGCC Tier 1 criteria to determine COGCC Tier 1 exemption applicability. If the location is not Tier 1-exempted, annual post-construction stormwater inspections will be conducted until final reclamation, or until conditions change to allow a transition to being Tier 1-exempted.

6.2. Inspection Scope

At a minimum, the following will be inspected for adequate protection of stormwater and compliance:

- Construction site perimeter
- All disturbed areas
- Designated haul routes
- Material and waste storage areas
- Discharge or potential discharge locations
- Vehicle access locations
- All BMPs

Inspection requirements:

- Visually verify whether all implemented control measures are in effective operational condition and are working as designed in their specifications to minimize pollutant discharges.
- Determine if there are new potential sources of pollutants.
- Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges.
- Identify all areas of non-compliance with the permit requirements and, if necessary, implement corrective action(s) in accordance with the general permit (Part I.B.1.c.).

At a minimum, the following information is recorded with each inspection:

- Inspection date
- Names and titles of personnel conducting the inspection
 - Inspector needs to be a Qualified Stormwater Manager (see Section 6.5)
- Weather
- Phase of construction
- Estimate acreage of disturbance
- Location(s) and identification of control measures requiring routine maintenance
- Location(s) and identification of discharges of sediment or other pollutants from the site
- Location(s) and identification of inadequate control measures
- Location(s) and identification of additional control measures needed that were not in place at the time of inspection
- Description of corrective action(s) for previous three items above, dates corrective action(s) were completed, including requisite changes to the SWMP, as necessary
- Description of minimum inspection frequency
- Deviations from inspection schedule
- After adequate corrective action(s) and maintenance have been taken, or where a report does not identify any incidents requiring corrective action or maintenance, the report shall contain the following statement, to be signed by the Qualified Stormwater Manager (QSM):

I verify that, to the best of my knowledge and belief, all corrective action and maintenance items identified during the inspection are complete, and the site is currently in compliance with the permit.

6.3. Site Map

Site-specific maps/diagrams are generated for each facility and include the following information at a minimum:

- Construction site boundaries
- Flow arrows that depict stormwater flow directions onsite and runoff direction
- All areas of ground disturbance including cut and fill
- Areas used for storage of soil
- Locations of all waste accumulation
- Locations of dedicated asphalt, concrete batch plants (if applicable)
- Locations of all structural control measures

- Locations of all non-structural control measures
- Locations of springs, streams, wetlands, and other state waters, including areas that requires pre-existing vegetation to be maintained within 50 feet of a receiving water, where determined feasible
- Locations of all stream crossings located within the construction site boundary
- Locations where alternative temporary stabilization schedules apply

6.4. Maintenance Procedures for BMPs

The operator is responsible for implementing control measures (BMPs) and performing routine maintenance, as needed, to ensure BMPs are in effective operating condition. BMPs requiring maintenance are identified in inspection reports and are addressed in the field as soon as practicable.

6.5. Training Requirements

The CDPHE general permit does not indicate any specific training or certifications required to manage a stormwater program/project or conduct inspections. The permit does, however, indicate that the person designated as responsible for implementing the SWMP, and the persons responsible for conducting inspections, need to meet the definition of a Qualified Stormwater Manager (QSM). A QSM is defined as an individual knowledgeable in the principles and practices of erosion and sediment control and pollution prevention, and with the skills to assess conditions at construction sites that could impact stormwater quality and to assess the effectiveness of stormwater controls implemented to meet the requirements of the permit. The person responsible for implementing the SWMP at Shelduck South, and all stormwater inspectors are QSMs.

6.6. Reporting and Recordkeeping Requirements

Copies of documentation required by the CDPHE general permit, including records of all data used to complete the application for permit coverage, must be retained for at least three years from the date that permit coverage expires or is terminated.

7. Summary of Best Management Practices (BMPs)

The following is a list of minimization and mitigation BMPs related to Mallard's stormwater management plan and approach at the Shelduck South:

- Culvert – culverts are a means of subsurface storm water conveyance where surface transport is not feasible. Culverts will be used under the access road at the entrance to the pad to convey water through the perimeter ditch.
- Culvert protection - culvert protection may be required at the inlet (upstream side) of the culvert and/or the outlet (downstream side) of the culvert located at the entrance to the pad.
- Ditch/drainage swale – a ditch or drainage swale will be used in conjunction with earthen berm as perimeter control around the pad disturbance.
- Earth dike/berm: an earth dike (berm) will be used in conjunction with ditch/drainage swale as perimeter control around the pad disturbance.
- Fencing – Mallard is using CPW-recommended fence designs (three or four strand with the top strand height maximum of approximately 42-inches, and a lower smooth strand without barbs at

a height of approximately 18-inches) when consistent with the surface owner's approval and any relevant local government requirements. The entire pad will be fenced initially during active construction. The fence will be pulled-in to surround only the reclamation area during interim reclamation activities.

- Mulching – mulching will be used in conjunction with seeding on areas that will be reclaimed during interim reclamation. The entire pulled-back area surrounding the interim pad will be seeded and mulched during the interim reclamation phase of construction.
- Riprap – riprap will be used to establish a stabilized outlet on the sediment trap/basin located on the eastern edge of the pad.
- Sediment trap/basin – a sediment trap/basin will be implemented on the eastern edge of the pad disturbance to temporarily pond and capture eroded soil transported in storm water runoff and allow sediment to fall out of suspension prior to discharge.
- Seeding – seeding will be used in conjunction with mulching on areas that will be reclaimed during interim reclamation. The entire pulled-back area surrounding the interim pad will be seeded and mulched during the interim reclamation phase of construction. Mallard will be using a Colorado Parks and Wildlife (CPW) – recommended pronghorn seed mix at the Shelduck South pad. Utilizing the Habitat Seeding Calculator, Mallard has designed an optimum seeding methodology during reclamation at the Shelduck South pad. The seed mix and application rates can be found in Appendix C.
- Surface armor – surface armor will be applied as a stabilization measure to the working surface of the location throughout the life of the pad.
- Surface roughening – surface roughening, using tracked equipment will be employed as a temporary stabilization to the topsoil pile on location in order to minimize erosion by reducing runoff velocity, decreasing wind exposure, increasing infiltration, and to a minor extent, trapping sediment.
- Street sweeping – street sweeping of adjacent paved local and county roads will be employed as needed to remove sediment tracked offsite by vehicles leaving the construction site.
- Vehicle track pad – a vehicle track pad will be implemented near the site entrance to provide a temporary stabilized entrance to the construction location and help minimize off-site tracking of sediment onto public roads.
- Weed control – the location will be inspected for weed infested areas and prompt action consisting of spraying and/or mowing, where appropriate, will be taken to mitigate any identified infested areas. All noxious weeds identified will not be allowed to reach the flowering or seed dispersal stage. Vehicles will not be allowed to drive through, and machinery will not be parked, within weed infested areas. Routine inspections throughout the life of the pad will aid in identifying when weed mitigation is needed.
- Wind erosion/dust control – wind erosion/dust control measures (primarily water application) will be implemented as needed on areas of exposed soil during construction to control vehicle or wind generated dust.

Appendix A

Stormwater Management Plan Maps:

- Initial Construction SWMP Overview Map
- Initial Construction SWMP Site Map
- Interim Reclamation Map
- Soils & Erosion Maps
- Pre-Disturbance Land Use Map
- Pre-Disturbance Vegetation Identification/Analysis and Photo Series



Stormwater Management Plan Overview Map

Shelduck South



0 1,100 2,200

Feet

Scale: 1:10,000

Prepared by:

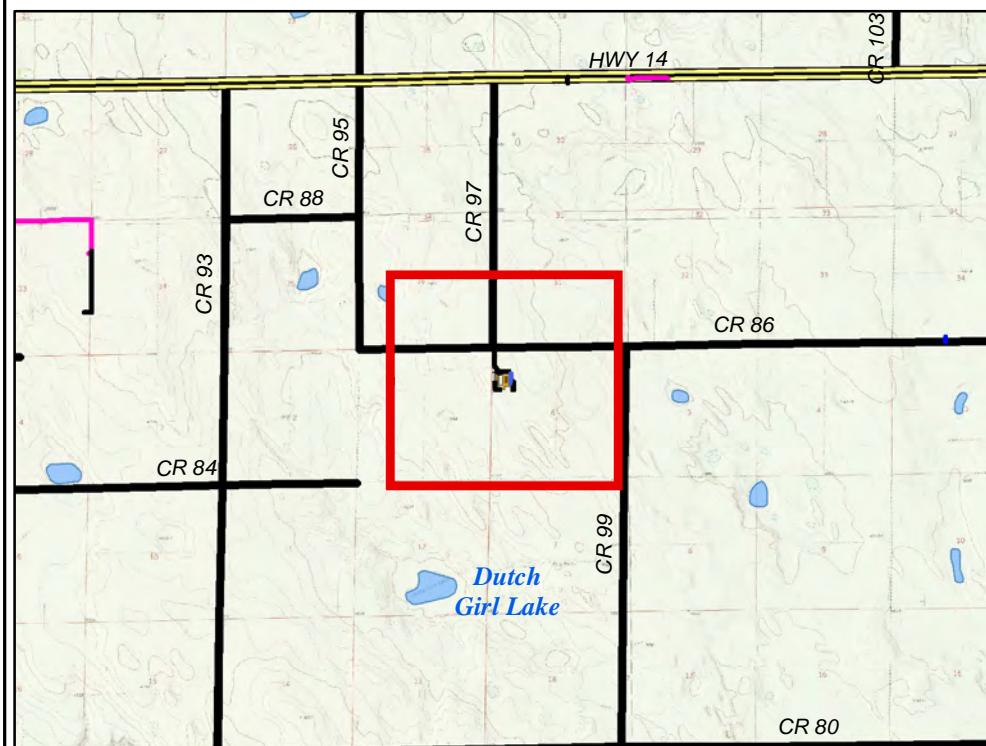


Editor: nwilson

Date: 6/14/2021

File: Mallard_PreConstr_Overview_V1

- | | | |
|--------------------------|-------------------|-----------|
| Construction Boundary | Access Road | Highway |
| Equipment | County/Local Road | Waterbody |
| Disturbance | Waterway | |
| Pad Drilling (Road Base) | | |
| Pad Drilling | | |
| Sediment Trap | | |
| Topsoil | | |
| Trackpad | | |





Stormwater Management Construction Plan Site Map

Shelduck South

Prepared by:



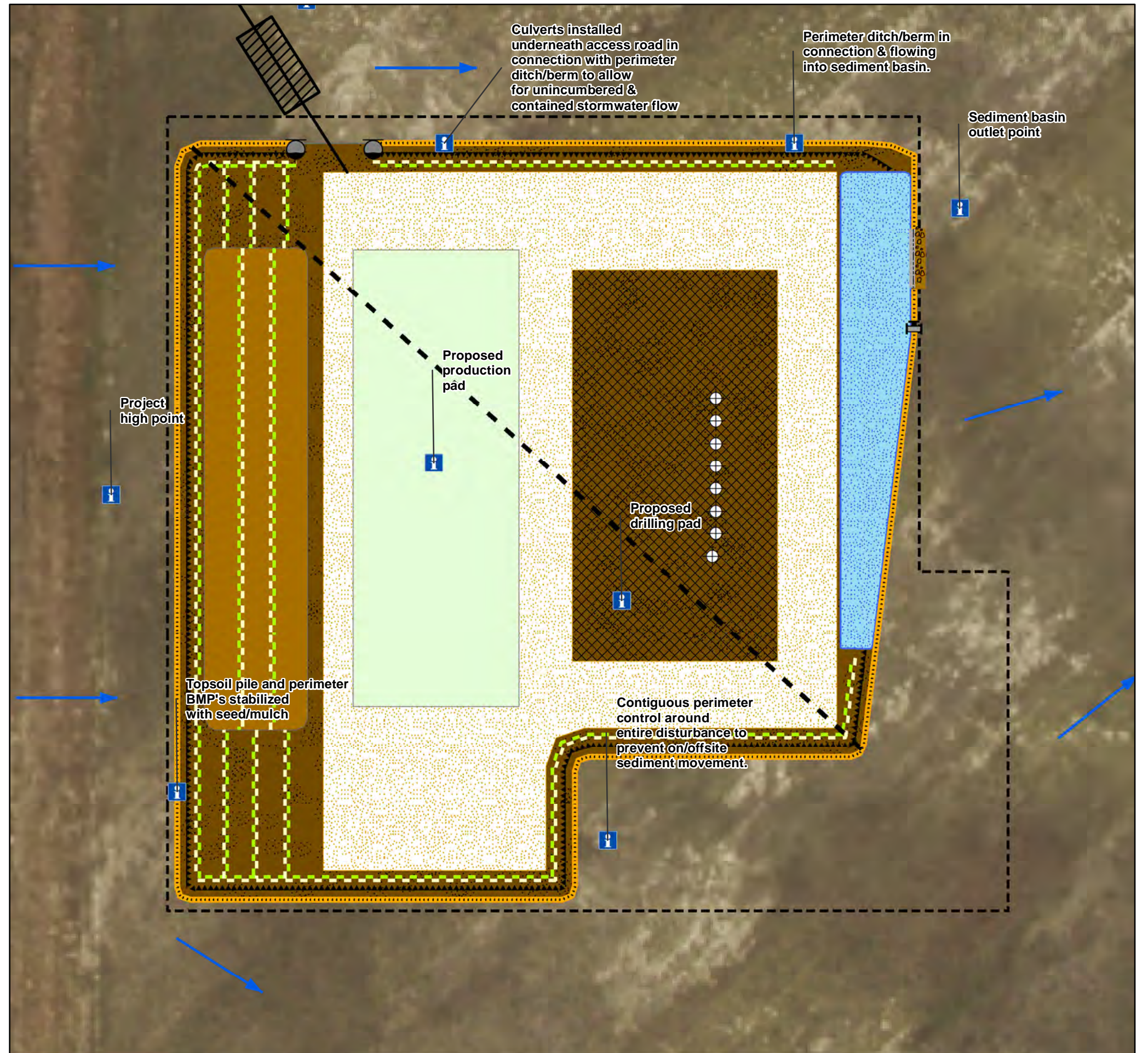
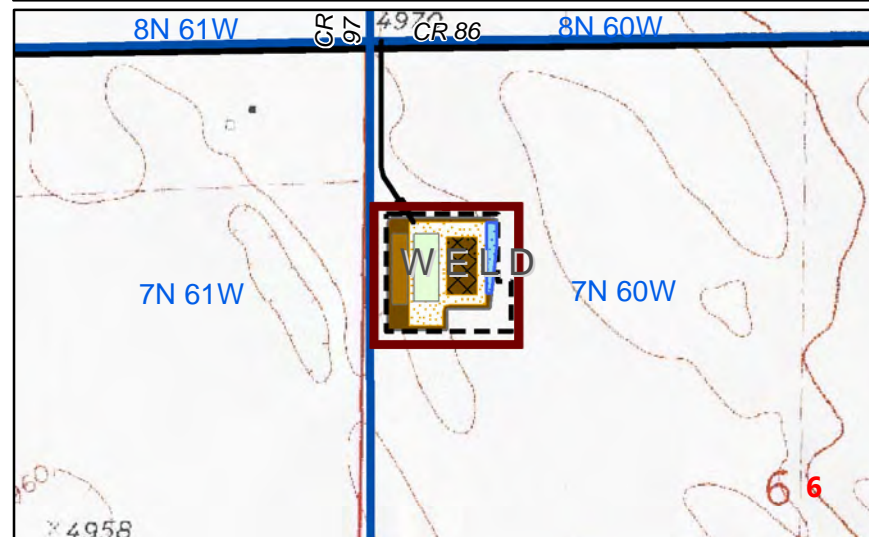
Scale: 1:1,100
Date: 6/14/2021



Editor: nwilson
File: Mallard_Construction_V4

- Wells
- Information
- Slope Drain
- Culvert w/Armor
- Erosion Control Blanket
- Surface Tack/Hydroseed
- Diversion Ditch
- Earthen Berm
- Riprap
- Cut/Fill
- Flow
- Construction Boundary
- Equipment
- Disturbance
- Pad Drilling (Road Base)
- Pad Drilling
- Sediment Trap
- Topsoil
- Trackpad
- Access Road

Note: Only disturbance boundary is to scale, all other diagram features are for representative purposes only.

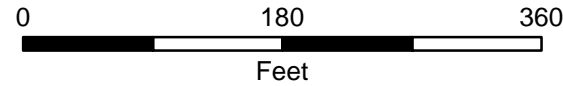
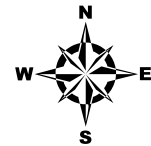




Stormwater Management Construction Plan Site Map

Shelduck South

Prepared by:



Editor: nwilson

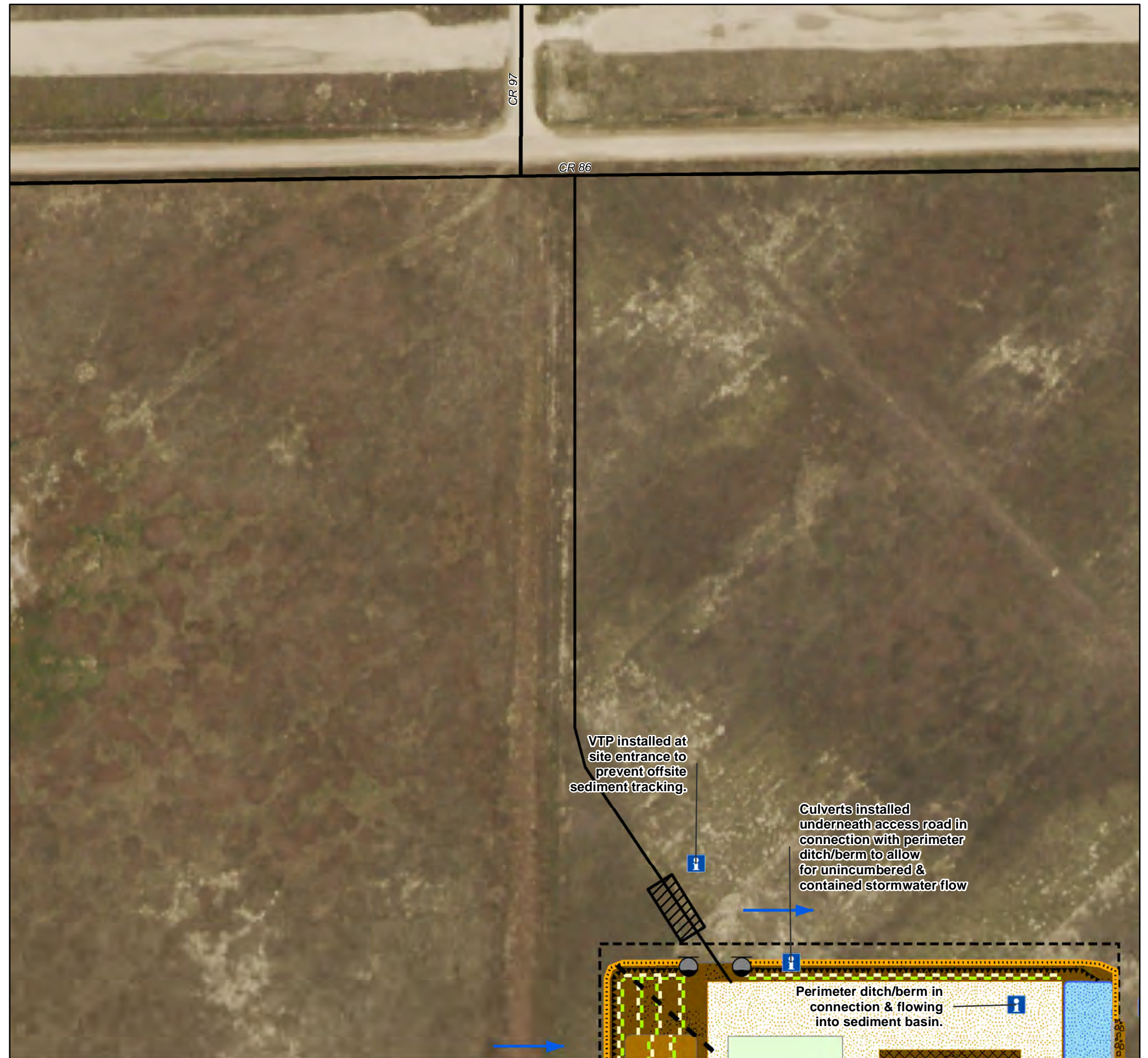
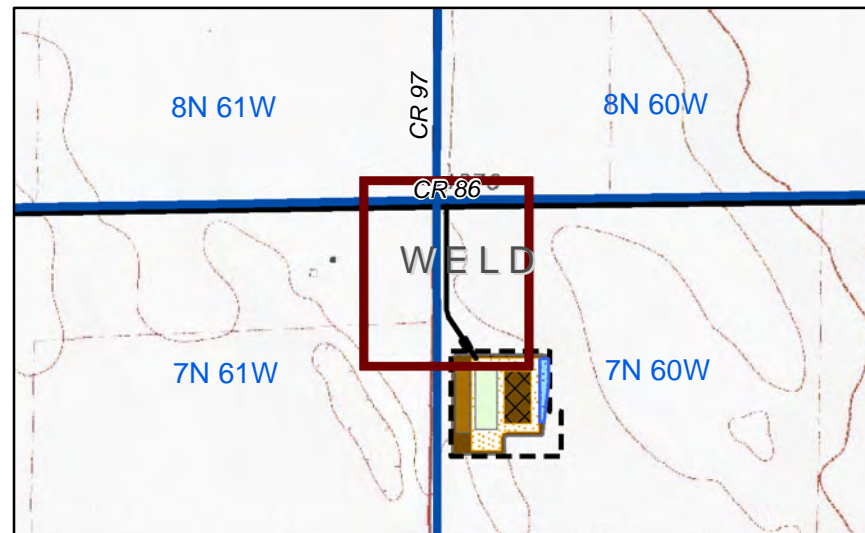
File: Mallard_Construction_V4

Scale: 1:1,600

Date: 6/14/2021

- Wells
- Information
- Culvert w/Armor
- Erosion Control Blanket
- Surface Tack/Hydroseed
- Diversion Ditch
- Earthen Berm
- Riprap
- Cut/Fill
- Flow
- Construction Boundary
- Equipment
- Disturbance
- Pad Drilling (Road Base)
- Pad Drilling
- Sediment Trap
- Topsoil
- Trackpad
- Access Road
- Weld Local

Note: Only disturbance boundary is to scale, all other diagram features are for representative purposes only.





Stormwater Management Interim Reclamation Plan Site Map Shelduck South



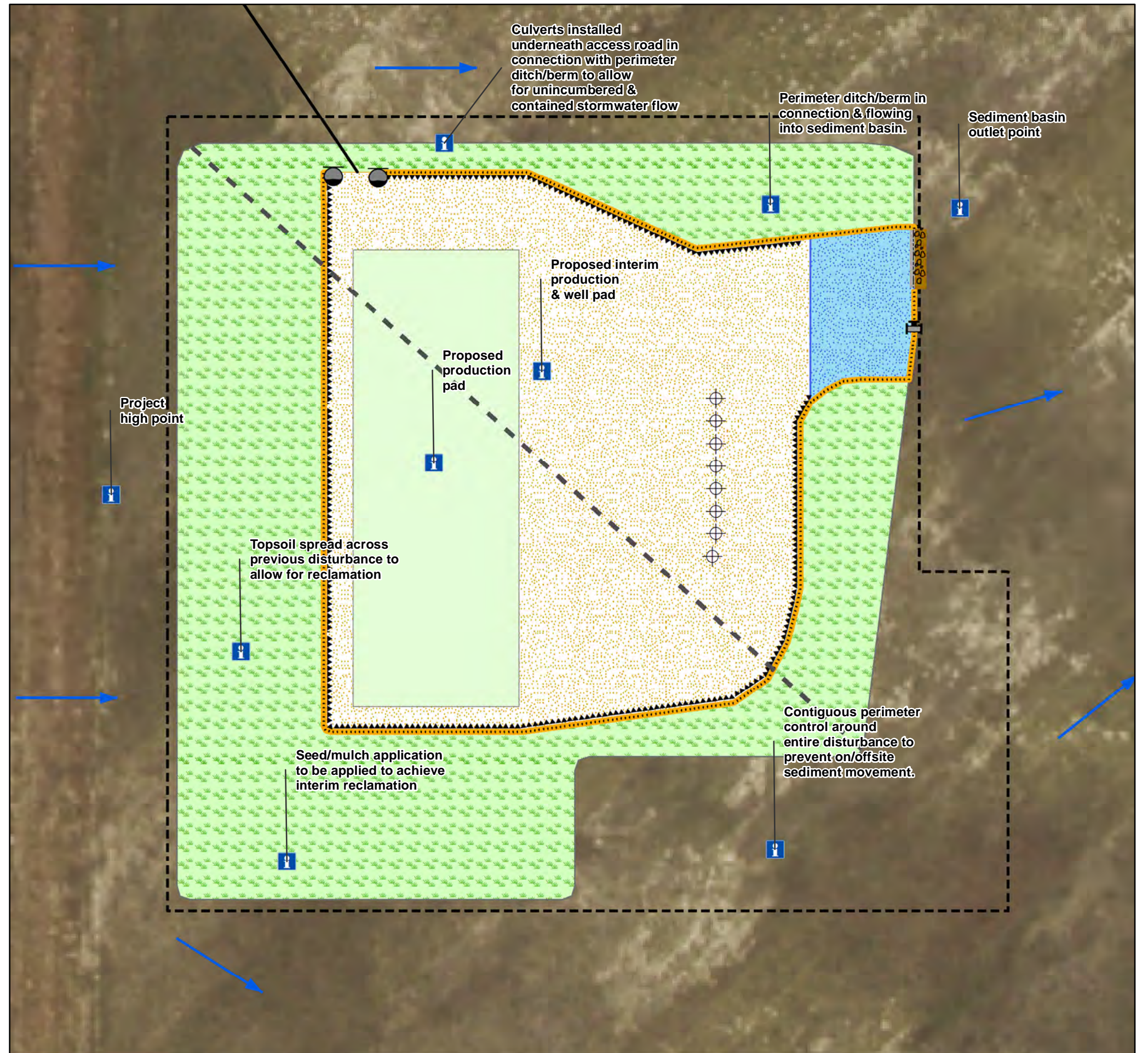
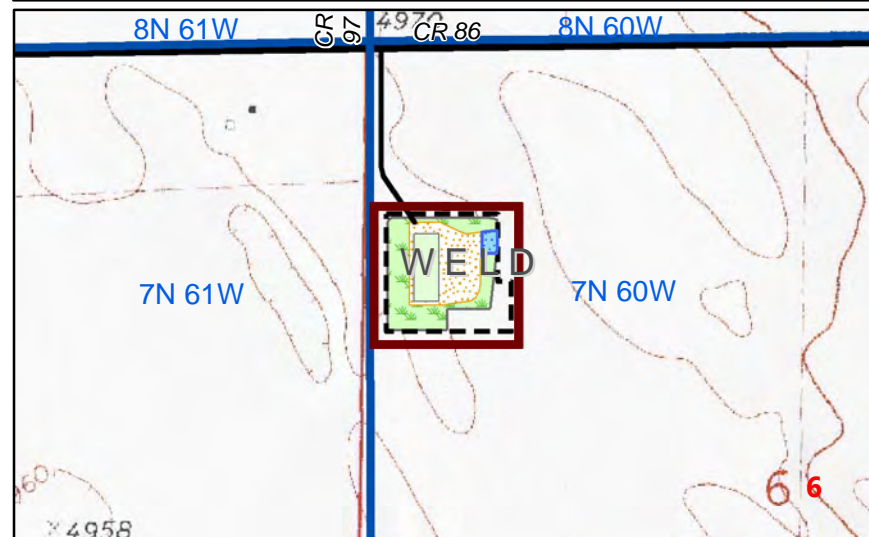
Scale: 1:1,100
Date: 6/14/2021



Editor: nwilson
File: Mallard_Construction_Interim_V1

- Wells
- Information
- Slope Drain
- Culvert w/Armor
- Erosion Control Blanket
- Diversion Ditch
- Earthen Berm
- Riprap
- Cut/Fill
- Flow
- Construction Boundary
- Equipment
- Pad Interim (Road Base)
- Reclaimed
- Sediment Trap
- Access Road

Note: Only disturbance boundary is to scale, all other diagram features are for representative purposes only.

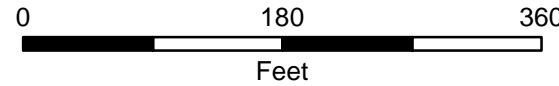
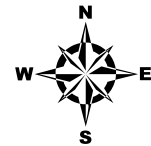




Stormwater Management Interim Reclamation Plan Site Map

Shelduck South

Prepared by:



Editor: nwilson

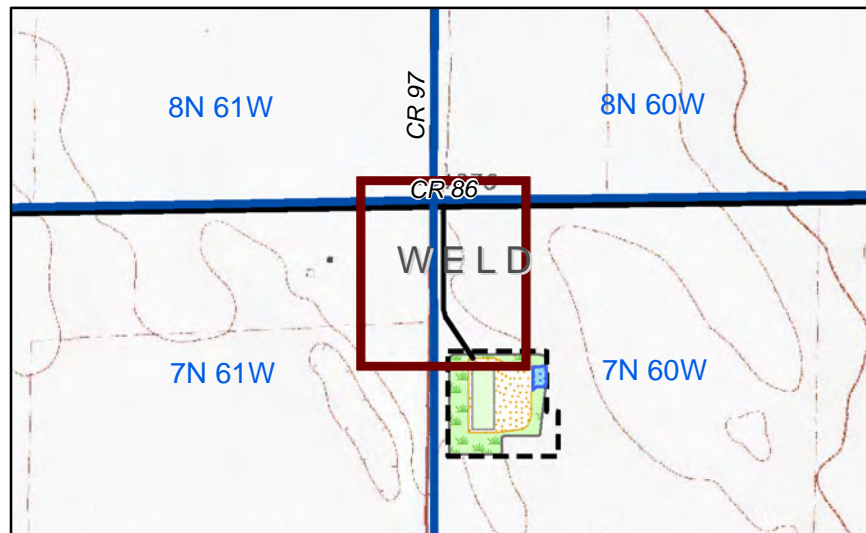
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Scale: 1:1,600

Date: 6/14/2021

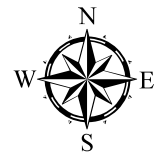
- ⊕ Wells
- i Information
- Culvert w/Armor
- Erosion Control Blanket
- ▼▼▼ Diversion Ditch
- Earthen Berm
- o o Riprap
- Cut/Fill
- Flow
- - - Construction Boundary
- Equipment
- Pad Interim (Road Base)
- Reclaimed
- Sediment Trap
- Access Road
- Weld Local

Note: Only disturbance boundary is to scale, all other diagram features are for representative purposes only.





Stormwater Management Plan
Soils Map
Shelduck South



Date: 6/7/2021
0 0.2 0.4
Miles
1:12,000



Map Unit Name:

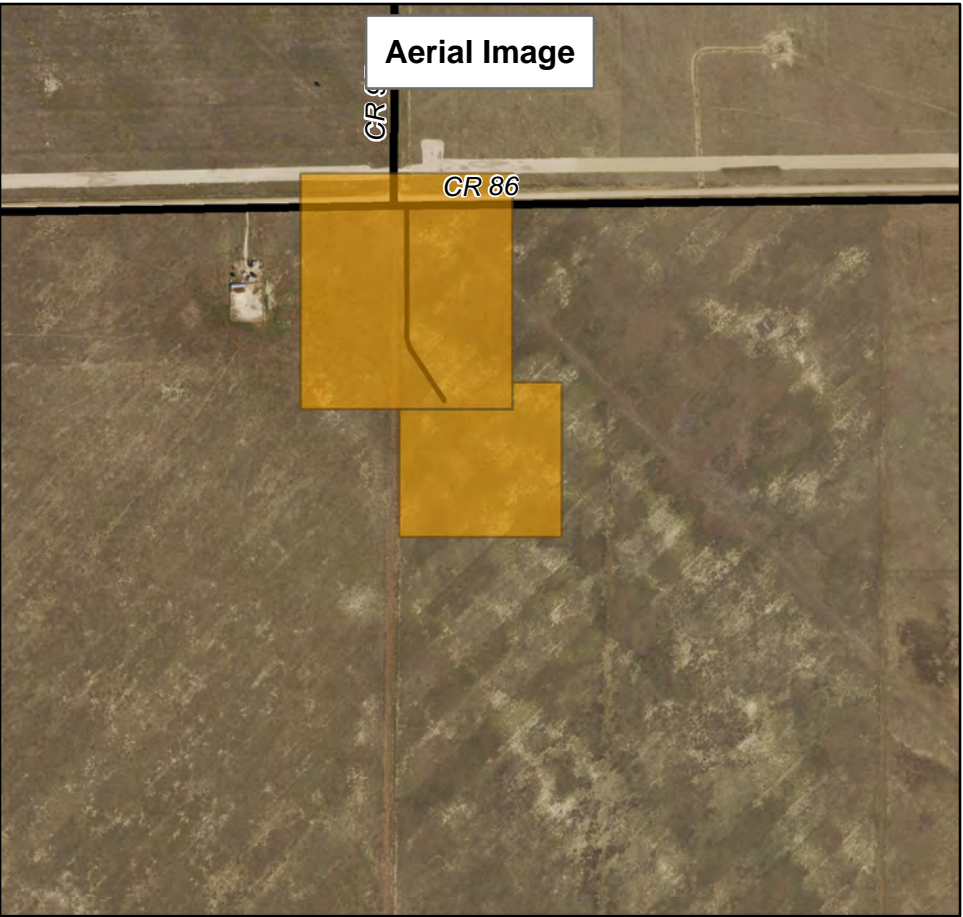
- AREA OF POTENTIAL IMPACT**
- Nunn loam, 0 to 6 percent slopes | 95133
- Olney fine sandy loam, 0 to 6 percent slopes | 95137
- Olney fine sandy loam, 6 to 9 percent slopes | 95138
- Vona sandy loam, 3 to 9 percent slopes | 95170

K Factor Value Groupings (Approximate):

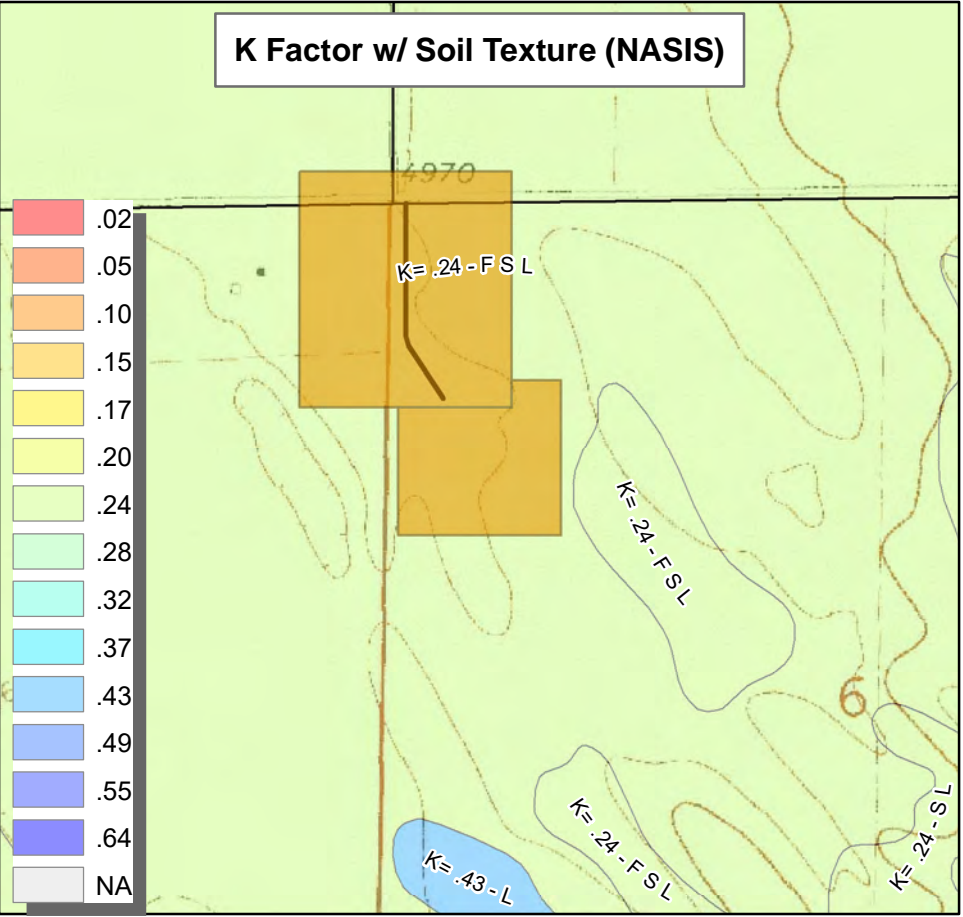
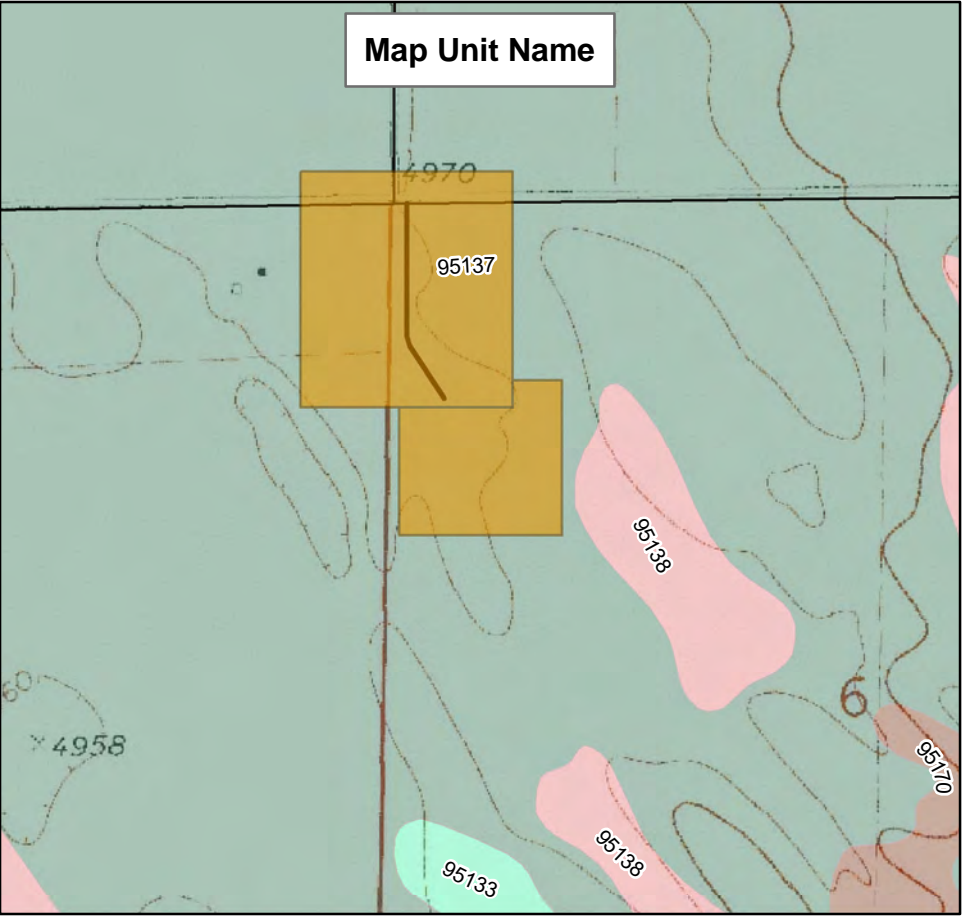
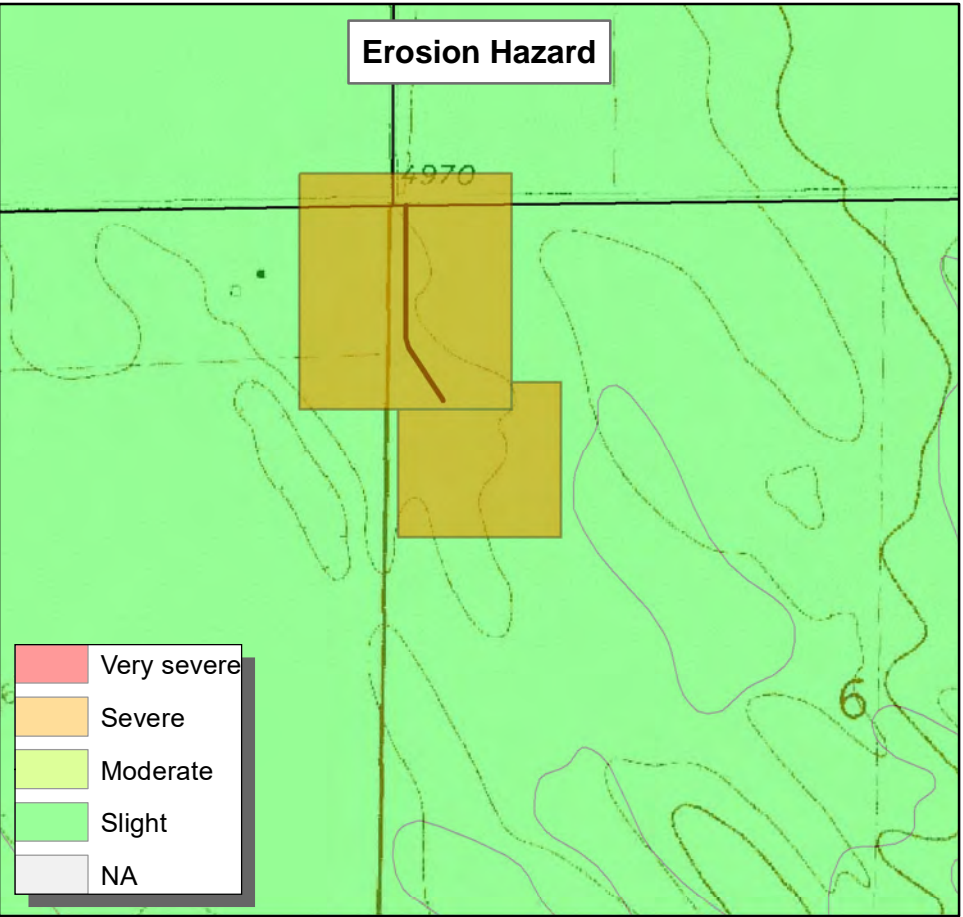
Low susceptibility to erosion/runoff: ≤ 0.2
Moderate susceptibility to erosion/runoff: $> 0.2 - 0.4$
High susceptibility to erosion/runoff: > 0.4



Document Name: Mallard_Soils_V2 User Name: nwilson



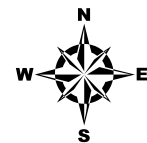
All data is from the NRCS soil surveys and is useful for overview purposes only. Onsite verifications are required to confirm accuracy when used for planning.





Stormwater Management Plan Land Use Map

Shelduck South



0 435 870

Feet

Scale: 1:3,890

Prepared by:



Editor: nwilson

Date: 6/14/2021

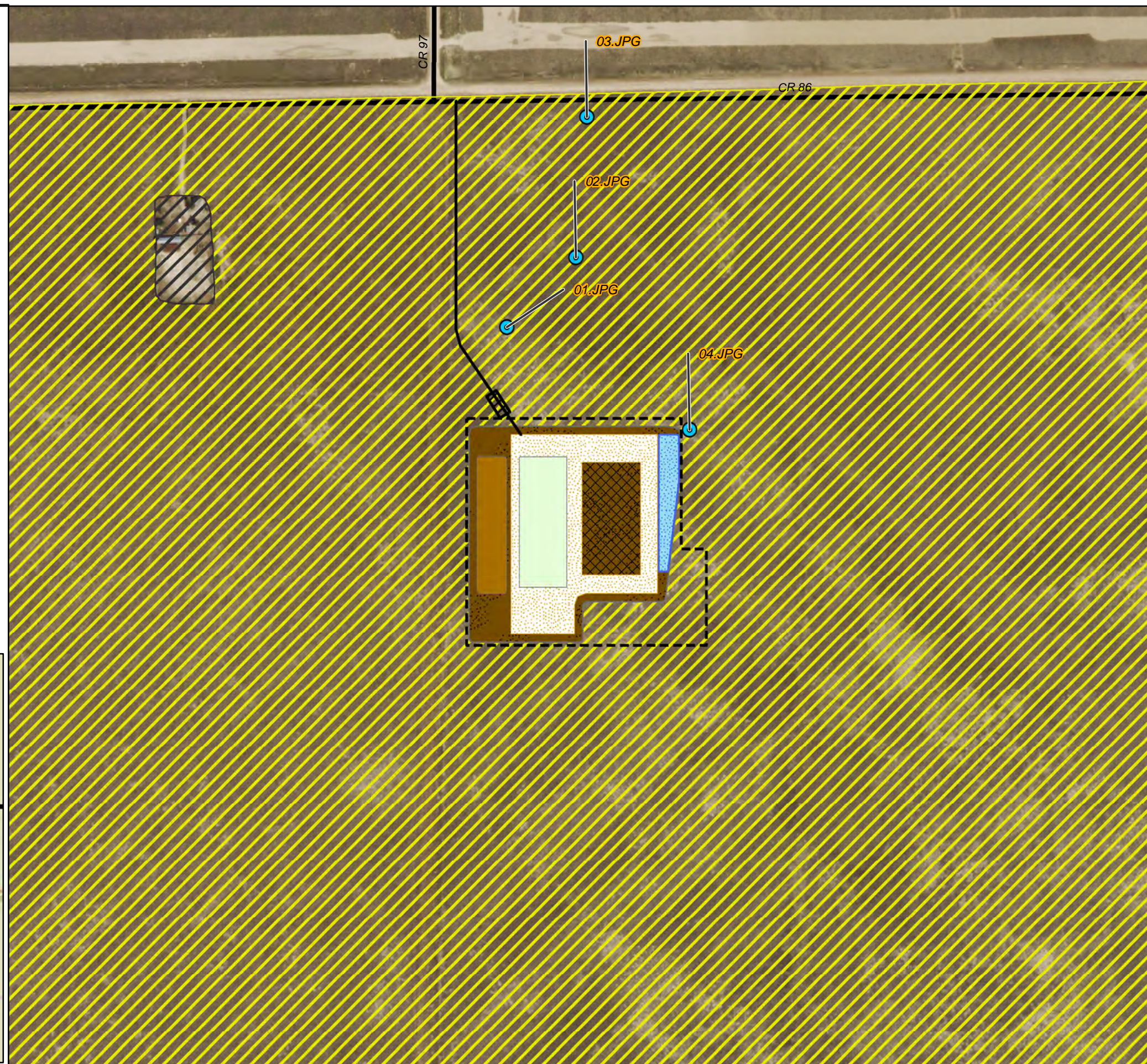
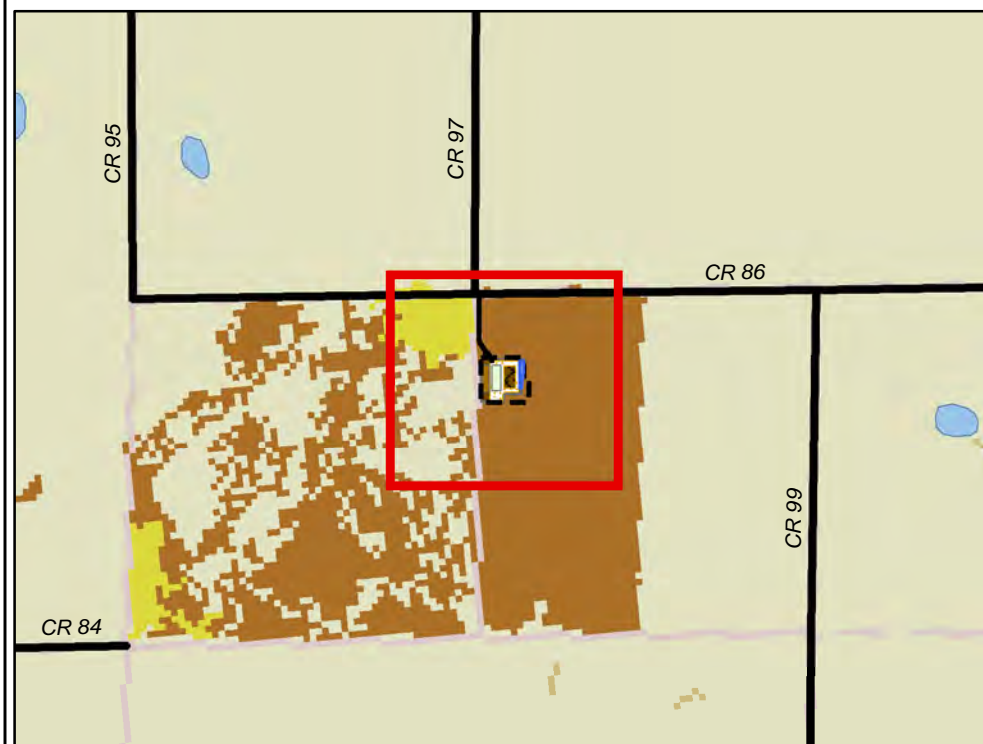
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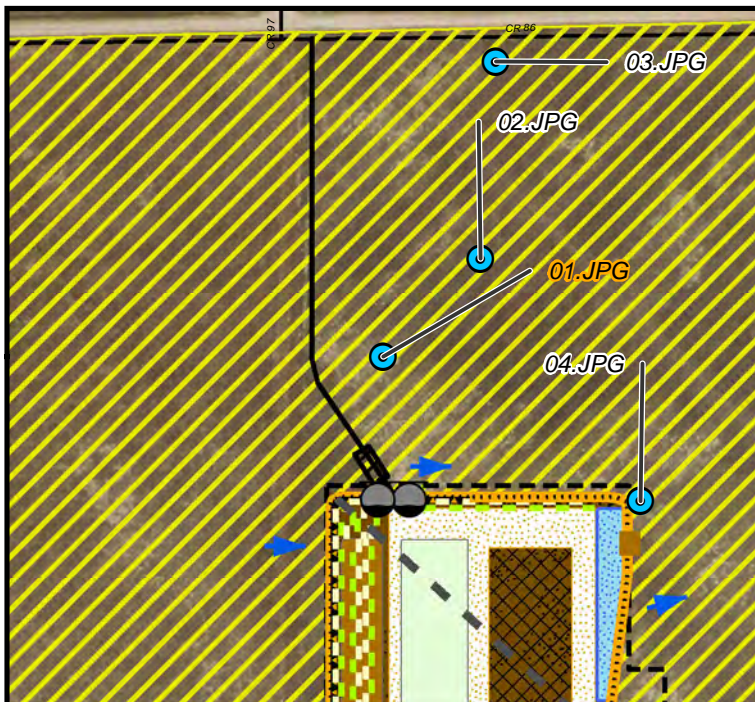
Main Map (H2E Gathered Data)

- | | |
|--------------------------|-------------------|
| Photo Point | Topsoil |
| Disturbed Grassland | Trackpad |
| Industrial | Access Road |
| Construction Boundary | County/Local Road |
| Equipment | |
| Disturbance | |
| Pad Drilling (Road Base) | |
| Pad Drilling | |
| Sediment Trap | |

Inset Map (National Land Cover Data)

- | | |
|------------------------------|--------------------|
| Barren Land | Evergreen Forest |
| Cultivated Crops | Hay/Pasture |
| Deciduous Forest | Herbaceous |
| Developed, High Intensity | Mixed Forest |
| Developed, Low Intensity | Open Water |
| Developed, Medium Intensity | Perennial Snow/Ice |
| Developed, Open Space | Shrub/Scrub |
| Emergent Herbaceous Wetlands | Woody Wetlands |





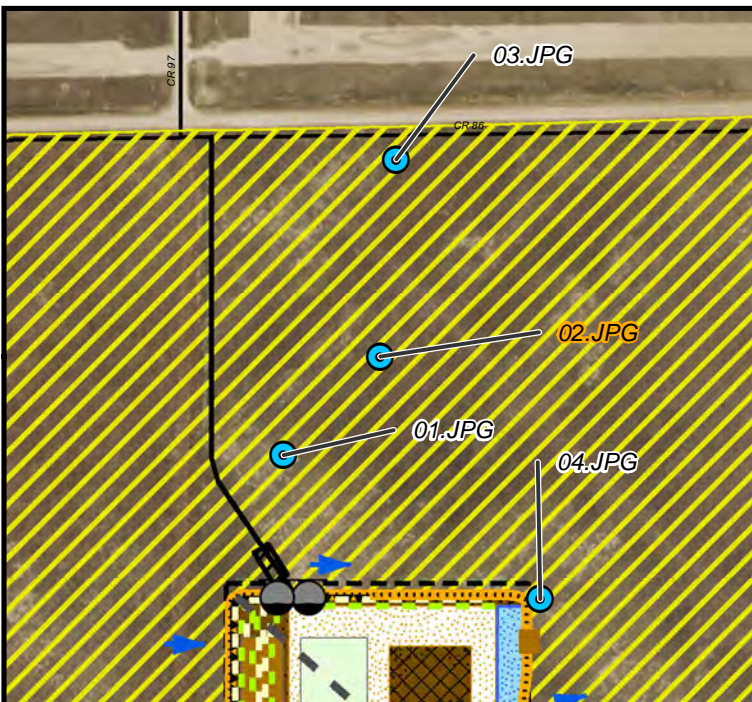
Stormwater Management Plan Map

01.JPG Shelduck South

D_WGS_1984: 40.6094 -104.144

	Photo Point		Earthen Berm		Pad Drilling (Road Base)
	Culvert w/Armor		Riprap		Pad Drilling
	Cut/Fill		Access Road		Sediment Trap
	Flow		Construction Boundary		Topsoil
	Surface Tack/Hydroseed		Equipment		Trackpad
	Diversion Ditch		Disturbance		Disturbed Grassland

Photo taken facing N towards CR #86, ~150' E of the proposed access road. Identifiable vegetation species found in the photo include deer grass and switchgrass.



Stormwater Management Plan Map

02.JPG Shelduck South

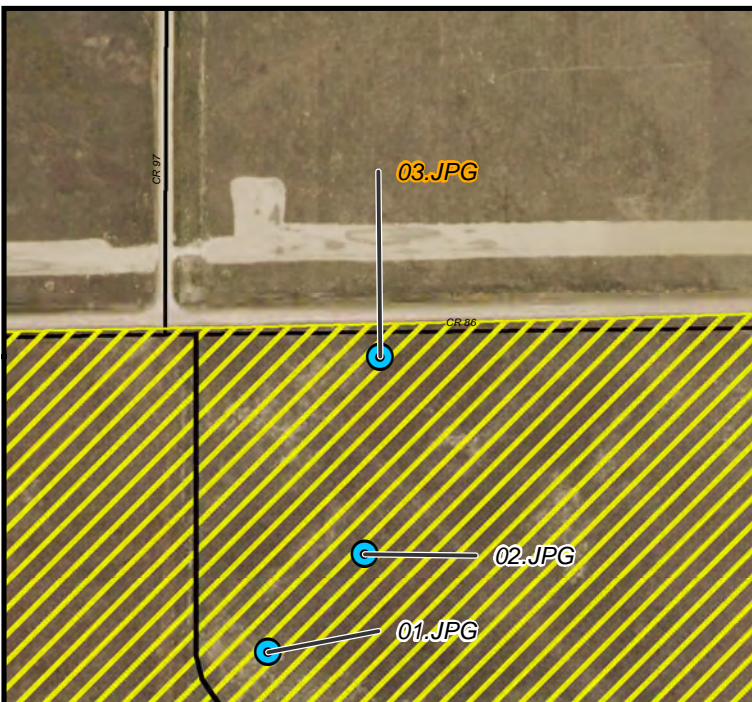
D_WGS_1984: 40.60998 -104.1433

	Photo Point		Earthen Berm		Pad Drilling (Road Base)
	Culvert w/Armor		Riprap		Pad Drilling
	Cut/Fill		Access Road		Sediment Trap
	Flow		Construction Boundary		Topsoil
	Surface Tack/Hydroseed		Equipment		Trackpad
	Diversion Ditch		Disturbance		Disturbed Grassland

Photo taken facing E towards CR #99, N of the proposed facility. Identifiable vegetation species found in the photo include deer grass and switchgrass.



05.17.2021



Stormwater Management Plan Map

03.JPG Shelduck South

D_WGS_1984: 40.61116 -104.1431



Photo Point



Access Road

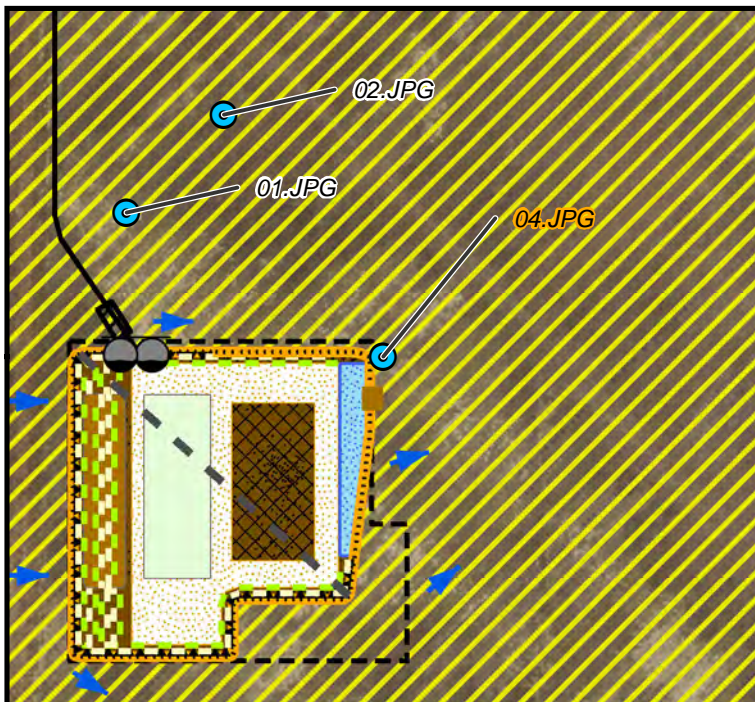


Disturbed Grassland

Photo taken facing S across the future disturbance area, ~50' S of CR #86. This photo provides an overview of the locations overall vegetational profile and land use. Identifiable vegetation species found in the photo include deer grass and switchgrass.



05.17.2021



Stormwater Management Plan Map

04.JPG Shelduck South

D_WGS_1984: 40.60852 -104.142

	Photo Point		Earthen Berm		Pad Drilling (Road Base)
	Culvert w/Armor		Riprap		Pad Drilling
	Cut/Fill		Access Road		Sediment Trap
	Flow		Construction Boundary		Topsoil
	Surface Tack/Hydroseed		Equipment		Trackpad
	Diversion Ditch		Disturbance		Disturbed Grassland

Photo taken facing W across the proposed facility towards the project's high point at the northeastern edge of the future sediment basin. The primary vegetation species found in the photo are switchgrass and deer grass.

Appendix B

Soils Reports

Weld County, Colorado, Northern Part

44—Olney fine sandy loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 35zy

Elevation: 3,500 to 5,800 feet

Mean annual precipitation: 11 to 15 inches

Mean annual air temperature: 46 to 54 degrees F

Frost-free period: 125 to 175 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Olney and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Olney

Setting

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Calcareous loamy alluvium

Typical profile

H1 - 0 to 6 inches: fine sandy loam

H2 - 6 to 18 inches: sandy clay loam

H3 - 18 to 60 inches: sandy loam

H4 - 60 to 64 inches: sandy loam

Properties and qualities

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.57 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4c

Hydrologic Soil Group: B

Ecological site: R067BY002CO - Loamy Plains

Hydric soil rating: No

Minor Components

Stoneham

Percent of map unit: 9 percent

Hydric soil rating: No

Ascalon

Percent of map unit: 6 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: Weld County, Colorado, Northern Part

Survey Area Data: Version 15, Jun 5, 2020

Appendix C

Seed Mix and Methodology

Appendix 1: CPW-NE Region Recommended Mitigation Seed Mix for Pronghorn

Instructions for the Habitat Seeding Calculator

Welcome to the Habitat Seeding Calculator. This tool allows for the design of specific rate, high diversity mixes for wildlife, pollinator and other conservation uses.

Begin designing your mix on the Pollinator Calculator tab. Enter your desired seeds/sqft at the top. Then choose your plant species in Column A. Enter your desired % of mix in Column F. Enter estimated price per PLS pound in Column I if you want a seedmix cost estimate calculated (not required for tool to function).

The Pollinator Calculator tab will automatically populate into the ECS-05 tab. Enter Landowner name, location and other information at the top of the ECS-05. **Please note that the ECS-05 by Seed Type (Bag) tab fills from Box G7/H7 on the ECS-05 tab, and thus must be entered correctly for that tab to function.**

Cultivars appropriate to eastern Colorado will automatically populate on both the ECS-05 and ECS-05 by Seed Type (Bag) tabs.

On the ECS-05 tab, the plant list will automatically populate in the "Applied" section.

Once the Pollinator Calculator and ECS-05 tabs are filled out, the ECS-05 by Seed Type (Bag) tab will automatically populate all boxes. No additional entries are needed unless you want to edit comments in the "Requirements for Seed" section.

The ECS-05 is the official jobsheet and documentation for Colorado NRCS programs and technical assistance and must be in the project folders. The ECS-05 by Seed Type (Bag) tab can be given to landowners and seed dealers to clarify seedmix, bagging, and origin source requirements.



Pollinator Calculator

Desired Seeds/ft²

20

Species	Scientific Name	Bloom Time	Status (N/I)	Seed Rate	% Mix	Seeds/ft ²	PLS/AC	Cost/PLS	Cost/AC
Green needlegrass	Nassella viridula	0	N	4.81	5	1.00	0.24		0.00
Needleandthread	Hesperostipa comata	0	N	5.45	5	0.99	0.27		0.00
Sandberg bluegrass	Poa secunda	0	N	0.94	5	1.06	0.05		0.00
Indian ricegrass	Achnatherum hymenoides	0	N	6.22	5	1.00	0.31		0.00
Slim-leaf penstemon	Penstemon angustifolius	Early Mid	N	2.78	5	1.01	0.14		0.00
Alfalfa	Medicago sativa	Early Mid Late	I	3.96	5	1.01	0.20		0.00
Blanketflower	Gaillardia aristata	Mid Late	N	4.38	5	1.01	0.22		0.00
Dotted Gayfeather	Liatris punctata	Late	N	13.83	1	0.20	0.14		0.00
Blue flax	Linum perenne	Early Mid	I	2.95	5	1.02	0.15		0.00
Cicer milkvetch	Astragalus cicer	Early Mid Late	I	4.40	5	0.62	0.22		0.00
Tahoka Daisy	Machaeranthera Tanacetifolia	Early Mid Late	N	2.14	5	1.03	0.11		0.00
Pale evening primrose	Oenothera pallida	Early	N	1.34	5	1.04	0.07		0.00
Prairie Coneflower	Ratibida columnifera	Early Mid Late	N	0.97	5	1.03	0.05		0.00
Sainfoin	Onobrychis vicifolia	Early Mid Late	I	34.85	5	1.00	1.74		0.00
Rocky Mountain Beeplant	Cleome serrulata	Mid Late	N	13.61	5	1.00	0.68		0.00
Prickly poppy	Argemone polyanthemosa	Early Mid Late	N	0.55	5	1.09	0.03		0.00
Purple prairie clover	Dalea purpurea purpurea	Mid Late	N	3.17	5	1.01	0.16		0.00
Rocky mtn. penstemon	Penstemon strictus	Early Mid	N	1.78	5	1.01	0.09		0.00
Small burnet	Sanguisorba minor	Early Mid	I	20.74	5	1.00	1.04		0.00
Scarlet globemallow	Sphaeralcea coccinea	Early Mid Late	N	1.74	5	1.03	0.09		0.00
Shrubs									
Winterfat	Krascheninnikovia lanata	Late	N	7.08	2	0.40	0.14		0.00
Fourwing Saltbush	Atriplex canescens	Late	N	19.80	2	0.40	0.40		0.00
Rubber rabbitbrush	Ericameria nauseosa	Late	N	2.18	2	0.37	0.04		0.00
Total					102	20.33	6.58		0.00

% Grass

% Introduced

Notes:

Grass Seeding Planned and Applied Worksheet

Grass Seeding PART I - Planned

Cooperator	CPW recommended mitigation mix for pronghorn			Date	3/17/2021
Tract/Field No				Acres	1
Soil Survey Area				Map Unit (s)	
Contract No.				CIN	
Seeding dates	Nov 1 - May 1			Purpose	Other
Seedbed preparation	No Till			Seed rate	20
Drill type	no-till grass			Acres to be seeded	1.00
Planting depth-Drill spacing (in)	1/4" deep, 7-10" spacing				
Planned fertilizer application (lb/ac)	N	P ₂ O ₅	K ₂ O	A Nutrient Management Plan is not required for the establishment of vegetative conservation practices.	
Planned weed control activities	Description	Herbicide		Attach WIN-PST Soil-Pesticide Interaction Risk Report for all chemical suppression activities	
	Date(s)	As needed prior to seeding			
Planned residue cover or mulch	Type	Sorghum			
	Amount (lb/ac)				
	Application method				

Seed Mix Recommendation, † ‡

Common name N=Native, I=introduced	Genus, species	Recommended Cultivar	% of seed mix	Pounds (lbs) pure live seed (PLS)
Grasses, forbs				
Green needlegrass	N <i>Nassella viridula</i>	Lodorm	5.0	0.24
Needleandthread	N <i>Hesperostipa comata</i>		5.0	0.27
Sandberg bluegrass	N <i>Poa secunda</i>		5.0	0.05
Indian ricegrass	N <i>Achnatherum hymenoides</i>	Paloma	5.0	0.31
Slim-leaf penstemon	N <i>Penstemon angustifolius</i>		5.0	0.14
Alfalfa	I <i>Medicago sativa</i>	Ladak	5.0	0.20
Blanketflower	N <i>Gaillardia aristata</i>		5.0	0.22
Dotted Gayfeather	N <i>Liatris punctata</i>		1.0	0.14
Blue flax	I <i>Linum perenne</i>	Appar	5.0	0.15
Cicer milkvetch	I <i>Astragalus cicer</i>	Lutana, Monarch	5.0	0.22
Tahoka Daisy	N <i>Machaeranthera Tanacetifolia</i>		5.0	0.11
Pale evening primrose	N <i>Oenothera pallida</i>		5.0	0.07
Prairie Coneflower	N <i>Ratibida columnifera</i>		5.0	0.05
Sainfoin	I <i>Onobrychis vicifolia</i>	Shoshone	5.0	1.74
Rocky Mountain Beeplant	N <i>Cleome serrulata</i>		5.0	0.68
Prickly poppy	N <i>Argemone polyanthemus</i>		5.0	0.03
Purple prairie clover	N <i>Dalea purpurea purpurea</i>	Kaneb	5.0	0.16
Rocky mtn. penstemon	N <i>Penstemon strictus</i>	Bandera	5.0	0.09
Small burnet	I <i>Sanguisorba minor</i>	Delar	5.0	1.04
Scarlet globemallow	N <i>Sphaeralcea coccinea</i>		5.0	0.09
Shrubs				
Winterfat	N <i>Krascheninnikovia lanata</i>		2.0	0.14
Fourwing Saltbush	N <i>Atriplex canescens</i>		2.0	0.40
Rubber rabbitbrush	N <i>Ericameria nauseosa</i>		2.0	0.04
			Total lbs PLS	6.58
			Seed Rate (lbs PLS/acre)	6.58

† Certified Seed is required for all NRCS cost share programs

‡ Complete a Tree and Shrub Establishment 612 Job Sheet for bare-root shrub plantings

ADDITIONAL REQUIREMENTS

Seed **MUST** be sorted by size and type (e.g., large hard, small, fluffy). All seed must be USA or Canada origin, unless approved by NRCS before seed purchase.

Certified Planner

Date

Grass Seeding PART II - Applied (Seed tags must be attached)

Cooperator W recommended mitigation mix for prongh
Acres seeded _____
Seedbed preparation _____
Weed control _____
Residue cover or mulch type _____
Residue/mulch amount (lb/ac) _____

Seed rate _____
Seeding date _____
Suppression date(s) _____

Common name		Cultivar	Bulk pounds	% Germination	% Purity	% PLS	lb PLS
Grasses, forbs							
Green needlegrass	N					0.00	0.00
Needleandthread	N					0.00	0.00
Sandberg bluegrass	N					0.00	0.00
Indian ricegrass	N					0.00	0.00
Slim-leaf penstemon	N					0.00	0.00
Alfalfa	I					0.00	0.00
Blanketflower	N					0.00	0.00
Dotted Gayfeather	N					0.00	0.00
Blue flax	I					0.00	0.00
Cicer milkvetch	I					0.00	0.00
Tahoka Daisy	N					0.00	0.00
Pale evening primrose	N					0.00	0.00
Prairie Coneflower	N					0.00	0.00
Sainfoin	I					0.00	0.00
Rocky Mountain Beeplant	N					0.00	0.00
Prickly poppy	N					0.00	0.00
Purple prairie clover	N					0.00	0.00
Rocky mtn. penstemon						0.00	0.00
Small burnet						0.00	0.00
Rocky mtn. penstemon	N					0.00	0.00
Shrubs							
Winterfat	N					0.00	0.00
Fourwing Saltbush	N					0.00	0.00
Rubber rabbitbrush	N					0.00	0.00
						Total lbs PLS	0.00

Approved By _____

Seed Ordering and Mixing Sheet

Cooperator/Project Name CPW recommended mitigation mix for pronghorn
Tract/Field No

Date 3/17/2021
Acres 1

Requirements for Seed: All seed must be of USA or Canada origin. Seed must be mixed and bagged as shown below. Any substitutions for plant species or cultivars must be approved by NRCS. Bulk pounds for each species must be on the seed tag or provided on a separate sheet from the seed dealer.

Common Name	Genus, species	Cultivar	Pounds Pure Live Seed (PLS)
Fluffy Seeds (Bag 1):			
Blanketflower	Gaillardia aristata		0.22
Fourwing Saltbush	Atriplex canescens		0.40
Large Hard Seeds (Bag 2):			
Green needlegrass	Nassella viridula	Lodorm	0.24
Needleandthread	Hesperostipa comata		0.27
Indian ricegrass	Achnatherum hymenoides	Paloma	0.31
Slim-leaf penstemon	Penstemon angustifolius		0.14
Dotted Gayfeather	Liatris punctata		0.14
Tahoka Daisy	Machaeranthera Tanacetifolia		0.11
Sainfoin	Onobrychis vicifolia	Shoshone	1.74
Rocky Mountain Beeplant	Cleome serrulata		0.68
Small burnet	Sanguisorba minor	Delar	1.04
Winterfat	Krascheninnikovia lanata		0.14
Rubber rabbitbrush	Ericameria nauseosa		0.04
Small Hard Seeds (Bag 3):			
Sandberg bluegrass	Poa secunda		0.05
Alfalfa	Medicago sativa	Ladak	0.20
Blue flax	Linum perenne	Appar	0.15
Cicer milkvetch	Astragalus cicer	Lutana, Monarch	0.22
Pale evening primrose	Oenothera pallida		0.07
Prairie Coneflower	Ratibida columnifera		0.05
Prickly poppy	Argemone polyanthemus		0.03
Rocky mtn. penstemon	Penstemon strictus	Bandera	0.09
Scarlet globemallow	Sphaeralcea coccinea		0.09

Appendix D

Chemical/Pollutant List

Chemical / Potential Pollutant List

Pollutant	State ¹	Pollutant Description	Applicable BMPs ^{2,3}	Phase ⁴
Acetylene	L/G	Fuel	Proper Storage/Handling	D, P, A
Antifreeze	L	Coolant (storage tanks and in vehicles)	Storage in DA; Elevated storage of tanks >55 gal; SC; VI	D, P, A
Carbon Injectate	L	Cleanup contaminated soil	Storage in DA; Keep C/S	D, P, A
Contaminated Soils	S	Hydrocarbon or chemical contaminated soils	Ero/Sed controls; offsite removal; onsite treating; store in DA	D, P, A
Corrosion Inhibitors	L	Decreases Corrosion Rate	Storage in DA; Keep C/S; Elevated storage of tanks >55 gal; SC; VI	D, P
Diesel Fuel	L	Fuel	Storage in DA; Elevated storage of tanks >55 gal; SC; VI	D, P, A
Drive Chain Fluid	L	Lubricant	Storage in DA; Keep C/S	D, P, A
Emulsion Breakers	L	Separate Emulsions	Storage in DA; Elevated storage of tanks >55 gal; SC; VI	D, P
Grease	L	Lubricant	Storage in DA; Keep C/S	D, P, A
Methanol	L	Various uses	Storage in DA; Elevated storage of tanks >55 gal; SC; VI	D, P
Miscellaneous Garbage	L/S	Miscellaneous Waste Generated From Human Activities	Disposal Bin; Storage Containers; Oversight	D, P, A
Oil-Chain	L	Lubricant	Storage in DA; Keep C/S	D, P
Oil-Crude	L	Produced Oil From Well	Storage in DA; Sized SC; VI	D, P
Oil-Gear 80-90W	L	Lubricant	Storage in DA; Keep C/S	D, P, A
Oil-Hydraulic	L	Lubricant	Storage in DA; Keep C/S	D, P, A
Oil-Motor	L	Lubricant	Storage in DA; Elevated storage of tanks >55 gal; SC; VI	D, P, A
Paints - Gloss	L	Paint	Storage in DA; Keep C/S	D, P
Paints - Industrial Enamel	L	Paint	Storage in DA; Keep C/S	D, P
Paints - Primer	L	Primer	Storage in DA; Keep C/S	D, P
Paints - Thinner	L	Paint Thinner	Storage in DA; Keep C/S	D, P
Produced Water	L	Produced Water From Well	Storage in DA; Sized SC; VI	D, P
Propane	L/G	Fuel	Proper Storage/Handling	D, P
Scale Removers	L	Remove Carbonate or Sulfate Scales	Storage in DA; Elevated storage of tanks >55 gal; SC; VI	P
Sediment	S	Soils	Ero/Sed controls	D, P, A
Septic Fluid	L	Portable Toilets and Human Waste Storage	Storage in DA; Keep C/S; Stake/secure in place; routine maintenance/cleaning; VI	D, P, A
Starting Fluid	L/G	Various uses	Storage in DA; Keep C/S	D, P, A
Surfactants	L	Cleaning Applications	Storage in DA; Keep C/S	D, P, A
Thread Compound	L/S	Various uses	Storage in DA; Keep C/S	D, P
WD-40	L	Lubricant/Drying Agent	Storage in DA; Keep C/S	D, P, A

Drilling and Completion Products				
Pollutant	State ¹	Pollutant Description	Applicable BMPs ^{2,3}	Phase ⁴
Flocculent	L	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Barite	L	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Bentonite (Gel)	L	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Caustic Soda	L	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Cottonseed Hulls	L	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Defoamer	L	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Thinner	L	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Liquid Polymer	L	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Polymer	L	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Lignite	S	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Lime	S	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Soda Ash	S	Drilling Fluid Product	Storage in DA; Keep C/S; VI	D
Water Based Cuttings	S/L	Drilling Bi-Product	Keep C/S to protect SW; storage in DA ; VI	D
Oil Based Cuttings	S/L	Drilling Bi-Product	Keep C/S to protect SW; storage in DA ; VI; SC	D
Oil Based Drilling Mudd	S/L	Drilling Fluid Product	Keep C/S to protect SW; storage in DA ; VI; SC	D
Rig Wash	L	Various uses	Storage in DA; Keep C/S; Containment to prevent SW contact; VI	D

¹ States: S = Solid; L = Liquid; G = Gas.

² Installation instructions are located in Appendix A.

³ Acronyms: VI = Visual Inspection; DA = Designated Area; SC = Secondary Containment; C/S = Covered/Sealed; SW = Stormwater; Ero/Sed = Erosion and Sediment

⁴ Phase: D = Development, P = Production, A = Abandonment

Note 1: Erosion and Sediment Control may include: Ditch and Berms, Check Dams, Erosion Control Blankets, Hydro-Mulching, Land Grading, Ripping, Riprap, Sediment Ponds and Traps, Seeding, Silt Fences, Soil Roughening, Tracking, Vegetative Buffer, Wattles, etc.

Note 2: Secondary Containment may include: Earthen Berm, Steel Berm, Containment Wall, or related items used in containing pollutants on site.

Note 3: Elevated Storage may include use of wooden pallets or steel racks used to keep containers and materials off the ground; elevated storage facilitates identification of leaks/spills and minimizes contact with SW.