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Kerr County
Voluntary Guidance Document for
Aggregate Production Operations

Introduction

Sand and gravel mining operations have been occurring in Kerr County for decades due to the abundance of natural material deposits. Recently, Kerr County citizens, municipalities, businesses, and other organizations have had increased concerns regarding the impact mining activities have on the environment and their quality of life. To address these concerns, the Kerr County Commissioners' Court formed the Kerr County APO (Aggregate Production Operations) Community Advisory Council in June 2021 to offer a positive and collaborative forum for communication. This first of its kind committee brings aggregate production operators, businesses, residents, and local governing agencies together to the same table so that they can work toward common solutions and better outcomes for all.

This voluntary guidance document was developed by the members of the Kerr County APO Community Advisory Council through collaboration with the Upper Guadalupe River Authority. It describes best management practices (BMPs) for sand and gravel mining operations that, when implemented, can address concerns for:

A. Surface Water Quality
B. Water Consumption
C. Adjacent Roadway Conditions
D. Air Quality
E. Noise
F. Lighting
G. Reclamation
H. Quality of Life
I. Other Best Practices

A. Surface Water Quality

Sand and gravel mining operations disturb land and soil when preparing the site for operation as well as once the operations are fully functional. Soil that is not stabilized can wash into adjacent waterways during rainfall. Establishing and maintaining BMPs can minimize soil exposure and erosion, manage runoff, and conserve water.

Sand and gravel mining activities in Texas are regulated statewide by the Texas Pollutant Discharge Elimination System (TPDES) program. Various rules prevent or minimize water pollution from stormwater runoff including the requirements of the statewide TPDES stormwater Construction General Permit (TXR150000) and Multi-Sector General Permit (TXR050000), as applicable.

A.1. Vegetative Controls

Vegetation is an inexpensive and effective way to protect soil from erosion. It also decreases erosion from flowing water by reducing its velocity. Roots hold soil and increase infiltration. In areas that are outside the active mining operation and not expected to handle vehicle traffic, vegetative stabilization of disturbed soil can be achieved by using the BMPs described below.

Vegetative controls should consist of native plants appropriate for the Texas ecoregion where the site is located and must not include any noxious or invasive species. As a resource, refer to the Texas Parks and Wildlife Department website for more information about the appropriate plant species to be used in the site's ecoregion. Noxious and invasive species are identified by the Texas Department of Agriculture. Vegetation is often not established until one year from planting and may require irrigation during this time.

To increase the effectiveness of vegetative controls, operators should routinely inspect the areas where the controls are being used to ensure they are installed properly and functioning to reduce erosion. Additional inspections should be made before and after significant rain events.

Types of vegetative controls include the following.

1. Vegetative buffer zones
2. Sod stabilization
3. Seeding
4. Mulching
5. Erosion and sediment control blankets
6. Promote revegetation in mined out areas

A.2. Structural Controls

Structural controls divert flows away from disturbed areas, reduce runoff velocities, filter sediment, and remove sediment by ponding. Berms are an example of a structural control that can help achieve pollution prevention goals. Berms prevent runoff of surface drainage into a quarry pit by routing flow around it. Berms are also useful for creating a visual and physical buffer between the quarry pit and adjacent property. Drainage areas are those locations of the site where runoff will flow in one preferential direction or towards particular discharge points. Understanding the flow of water on your site will greatly enhance the selection, design, and placement of appropriate structural controls like berms and the other BMPs discussed below.

To increase the effectiveness of structural controls, operators should routinely inspect the areas where the controls are being used to ensure they are installed properly and functioning to reduce runoff. Additional inspections should be made before and after significant rain events.

Types of structural controls include the following.

1. Diversion ridges, berms, or channels of stabilized soil

2. Silt fences
3. Straw bale barriers
4. Sediment basins
5. Riprap outlet protection
6. Check dams
7. Retention ponds

A.3. Riparian Area Controls

Riparian areas are found where the land and water meet and are the site of many vital interactions between the waterway and the riverbank. This part of the floodplain contains distinct soil and diverse native vegetation that form a network of roots and ground cover. Riparian areas act like a buffer and provide a variety of functions. These functions include capturing rushing flood waters and slowing them down so contaminants can be filtered out and water can be absorbed into the soil. These areas also reduce erosion, dissipate flood energy, provide wildlife habitat, increase baseflows to the river, and create shade to control water temperature.

Understanding the components of a healthy, functioning riparian area is important to maintaining the health of these systems. Learn more about riparian areas through resources included in the Upper Guadalupe River Authority's Education Center webpage.

Sand and gravel mining activities often occur in or near riparian areas because of the abundance of material that can be found in these locations. Mining activities have the potential to degrade riparian areas, but operators also have an opportunity to preserve and enhance these areas through their management practices.

The following is a list of suggested BMPs for riparian areas. Incorporating these practices into your operations will demonstrate stewardship of riparian areas and preserve the quality of the land and water:

1. Maintain undisturbed setback from at least 50 feet from the water's edge and preferably 200 feet.
2. Create a buffer between mining activities and the waterway.
3. Leave large woody debris in the floodplain.
4. Mine above the water table only.
5. Minimize use of heavy equipment in riparian areas to protect vegetation and reduce soil compaction.

B. Water Consumption

Sand and gravel mining operations use water to clean, sort, and process the extracted materials. In drought prone regions, like central Texas, water consumption should be limited where possible. This can be accomplished through conservative use and reuse.

The following is a list of suggested BMPs to reduce water consumption:

1. Identify water needs including source and sustainability. Develop a water conservation plan for each source.

2. Capturing and retaining stormwater:
    - Will reduce runoff and create a water source for future use.
    - It is necessary to understand the locations of the site where runoff will flow in one preferential direction or towards a particular discharge point to maximize the effectiveness of retention structures.
3. Rainwater harvesting system:
    - Can achieve both water conservation and stormwater retention goals.
4. Maximizing use of process wastewater:
    - Can not be discharged without treatment but can be reused in site operations.
5. Control runoff from stockpiles:
    - Route this water to retention areas for future use.
    - Do not allow this water to become runoff during rain events.

C. Adjacent Roadway Conditions

BMPs should be implemented at construction entrances and exits to reduce sediment tracked onto adjacent public roads and to reduce the generation of dust.

The following is a list of suggested BMPs to improve adjacent roadway conditions:

1. Roads and parking areas for vehicles that will leave the site should be paved.
2. Additionally, roads leaving the site should be designed to force drivers to remain on the pavement by the use of large boulders, railings, or other obstructions along the shoulder.
3. Areas used for material stockpiles do not need to be paved, but should contain a system to remove mud and dirt from wheels of vehicles that have traveled on unpaved sections of the quarry. Vehicles traveling more than 1,000 feet on paved portions of the site before leaving the property are excepted from this recommendation.
4. A rumble grate should be used to dislodge sediment from the wheels and undercarriage. This should be placed at least 100 feet from a public road.
5. Tire-wash system
    - System should be located in front of some type of traffic restriction such as the quarry scale or a stop sign to encourage its proper use.
    - System should be set back at least 300 feet from the public road.
    - System should recycle water to minimize consumption and to prevent discharge (tire-wash water cannot be discharged to surface water) or infiltration through the quarry floor.

D. Air Quality

Dust from quarrying activities—including excavation, product processing, storage, and vehicle traffic—should be controlled by suitable management practices. Proper management practices for dust control reduce or prevent wind erosion by protecting and roughening the soil surface and reducing the surface wind velocity.

The following is a list of suggested BMPs to control dust and improve air quality:

1. Wind breaks are barriers (either natural or constructed) that reduce wind velocity through a site and, therefore, reduce the possibility of suspended particles. Wind breaks can be trees or shrubs left in place during site clearing or artificial barriers such as wind fences, tarp curtains, hay bales, crate walls, or sediment walls (U.S. EPA, 1992). Barriers placed at right angles to prevailing currents at intervals of about 15 times their height are effective in controlling soil blowing.
2. Cover conveyor belts and drop points throughout facility.
3. Enclosed crusher with air filtered exhaust if applicable.
4. Stone can be an effective dust deterrent for unpaved haul roads or groundcover in areas where vegetation cannot be established. Pave internal roads and parking areas.
5. Trucks exiting the site should be tarped to minimize dust.
6. Posted speeds of 10–15 mph for unpaved haul roads to minimize dust.
7. Sprinkling (irrigation) of the ground surface with water until it is moist is an effective dust control method for unpaved haul roads and other traffic routes. This method does consume water and should be used sparingly in drought prone regions like central Texas.
8. Use commercially available, biodegradable dust suppressants appropriate for your operations and site with consideration for potential impacts on surrounding water bodies and wildlife.
9. Place site specific air monitors upwind, downwind, and on facility perimeter with online alarms and public access to data. Establish a graduated response to severity of monitor alarms ranging from water sprays to biodegradable dust suppressants, to an air classifying system.

E. Noise

Quarry locations are determined by the location of geologic deposits. This can result in quarry sites that are established close to existing or future residential or commercial areas. Material processing and truck traffic contribute to noise, vibration, and dust that may impact local residents.

The following is a list of suggested BMPs to reduce noise:

1. Implement white noise alarms over traditional beepers when applicable.
2. Cover conveyors and drop points.
3. Utilize berms and native vegetation to create noise abatement buffers.

F. Lighting

Quarry facility and access road lighting must consider safety, security, and regulations governing lighting practices. As a result, quarry facility lighting can negatively impact night-sky viewing, nocturnal wildlife, and the neighboring public. These impacts can be reduced through lighting solutions that can be simple, cost effective, and can improve nighttime visibility and increase worker safety.

The following is a list of suggested BMPS for lighting. Additional information on any of these BMPs can be found in the document “Recommended Lighting Practices” published by

the MacDonald Observatory:

1. Make a lighting plan that addresses:
    - The number of lights and lumen output of each. Minimum number of lights and the lowest luminosity consistent with safe and secure operation of the facility.
    - Alternatives to lighting. Retro-reflective or luminescent markers in lieu of permanent lighting where feasible.
    - Fixture design. Lights of the proper design, shielded to eliminate up-light, placed and directed to eliminate light spill and trespass to offsite locations.
    - Lamp color temperature. Lights of the proper color to minimize night-sky impacts.
    - Standard operating procedures. Minimization of unnecessary lighting use through alternatives to permanent lighting, such as restricting lighting usage to certain time periods.
    - Any activities that may be restricted to avoid night-sky impacts.
    - A process to promptly address and mitigate complaints about potential lighting impacts.
2. Use fully shielded luminaires.
3. Use adaptative controls such as night security cameras, motion sensors, timers, and dimmers.
4. Direct light properly and use perimeter barriers to eliminate sky glow, light trespass, and glare.
5. Use amber light instead of blueish white light (3000K CCT or less is best)
6. Minimize duration and amount of light used during construction, operations, and non-operating periods. Limit nightlight operations to emergency situations.

G. Reclamation

Reclamation of APO sites is most effective when initiated at the beginning of operations. Reclamation will improve the aesthetic appeal of the site post mining and the ability of the site to support wildlife.

The following is a list of suggested BMPs to support reclamation:

1. Develop a reclamation plan in consultation with Texas Agricultural Extension Service.
2. Reclaim quarry sites in phases upon completion of each operation site.
3. Initiate post-mining stabilization plan to prevent wind or water erosion.
4. Stabilize slopes and create gentler slopes through careful grading and revegetation.
5. Construct diversions at top of slopes to divert runoff away from the slope to a stable outlet.
6. Practice good soil conservation through active revegetation of all bare ground using native perennial plants.

H. Quality of Life

Quarry locations are determined by the location of geologic deposits. This can result in quarry sites that are established close to human habitation, or development may occur after establishment of the quarry site. Quarry operations like blasting, cutting, and truck traffic can impact quality of life for local residents.

In addition to the BMPs listed above, the following is a list of suggested BMPs to limit negative effects on quarry neighbors:

1. Limit facility operation to daylight hours, no weekend, holiday, or nighttime operation with exceptions for emergencies only. Update working hours as sunrise and sunset shift throughout the year.
2. Prepare a production operation plan and present to impacted stakeholders to include:
    - Proposed mining method
    - Mine block plan
    - Mining schedule
    - Mitigation practices (BMPs)
3. Inform stakeholders of plan progress at regular intervals
4. Clear roads for school buses by not loading trucks for 30 minutes before and after school bells.
5. Fund turn lanes for entrance and egress.
6. Do not load trucks with faulty or no tarps, lapsed licenses and safety inspections.

I. Other Best Practices

Pollutants like petroleum products, paints, solvents, litter, debris, sanitary waste, and sediment from unstabilized areas may enter stormwater from mining sites because of poor housekeeping practices.

The following is a list of suggested good housekeeping practices:

1. Designate areas for equipment maintenance and repair.
2. Promptly address leaks of petroleum and other liquids from equipment.
3. Waste receptacles at convenient locations.
4. Regular collection of waste.
5. Protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic or hazardous materials.
6. Adequately maintained sanitary facilities.
7. Frequently inspect all control measures (BMPs) for effectiveness and necessary maintenance.

References

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