

Draft Environmental Assessment

Grosgarth Grout Injection Project

Sheridan County, Montana

Montana Department of Environmental Quality

Abandoned Mine Lands Program

Prepared pursuant to the Montana Environmental Policy Act (MEPA), Title 75, chapter 1, MCA, and ARM 17.4.607 through 17.4.610.

Public Notice

DEQ will provide public notice of this EA by posting it on the DEQ website for 30 days. Written public comment will be accepted and reviewed during this time. All comments should be in writing and addressed to John Babcock, AML Environmental Project Officer, DEQ, P.O. Box 200901, Helena, MT 59620-0901 or DEQMontanaAML@mt.gov. The deadline for submittal is 5 p.m. on July 25, 2026.

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1. Agency and Action

The Montana Department of Environmental Quality (DEQ), Abandoned Mine Lands (AML) Program, proposes to conduct a phased grout-injection project near an occupied rural residence in the Grosgarth Mine area south of Rose Hill Road near Medicine Lake, Sheridan County, Montana. The purpose of the proposed action is to identify, access, and fill subsurface voids and low-density zones associated with historic underground coal mining and collapse of overlying materials in order to reduce the risk of continued subsidence, improve public safety, and protect the residence, drain field, yard, and associated improvements.

This EA is prepared pursuant to the Montana Environmental Policy Act (MEPA), Title 75, chapter 1, MCA, and the MEPA model rules at ARM 17.4.607 through 17.4.610. Consistent with ARM 17.4.607, this EA uses the natural and social sciences and available engineering, geophysical, historical, soils, and cultural information to analyze the proposed action, alternatives, mitigation, significance, and the direct, secondary, and cumulative potential impacts of the proposed action.

1.1 Purpose and Need

DEQ AML has documented recurring subsidence features and structural settlement near the residence since 2018, including damage to the drain field, landscaping, a concrete pad, and evidence of settlement within the house such as cracks and doors that do not close properly. Earlier repairs in 2018 and 2023 addressed individual surface expressions of subsidence, but recurring failures and later investigations showed that the deeper mechanism remained unresolved.

Historic and investigative information indicates that the problem area is more closely associated with the former Grosgarth Mine than with the reclaimed Hancock Mine workings north of Rose Hill Road. The Grosgarth Mine reportedly operated from roughly the World War I era until 1952, with extensive underground workings developed in a lignite seam approximately 85 to 100 feet below ground surface and about 7 feet thick. The current need for action is supported by 2024 and 2025 drilling, downhole GPR, and pilot grouting, which identified a stratigraphy consisting generally of cohesive clayey sand from the surface to about 55 feet, non-cohesive clayey sand from about 55 to 90 feet, and a coal seam from about 90 to 97 feet, with likely voids both near the 55-foot interface and in the coal seam. The project record concludes that migration of dry sand into mine voids is the likely mechanism propagating subsidence upward toward the surface.

1.2 Proposed Action

DEQ proposes to implement a full grout-injection remediation project to stabilize mine-related voids and low-density zones beneath and adjacent to the residence using drilling and grout injection, with associated limited excavation, landscape repair, and drain field area work as needed to carry out and restore the project. The work is anticipated to include landscape work using an excavator, skid steer, haul truck, and dozer; drain field work using an excavator and pickup with trailer; exploratory drilling using a drill rig (air rotary), compressor, semi-truck, and pickup truck with trailer; and the principal grout injection phase using a track-mounted air-rotary drill rig, all-terrain forklift, concrete batch truck with hydraulic pump, and skid steer.

The equipment schedule provided by the Project Engineer indicates that site preparation and drainfield work would be relatively limited in duration. It includes 24 hours of landscape excavation, 18 hours of landscape skid-steer use, 8 hours of haul-truck use, 6 hours of dozer use, 48 hours of excavator use for drainfield excavation, and 16 hours of pickup-and-trailer use for drainfield work. The grout injection phase would account for most of the construction effort and would require air-rotary drill rigs, large air compressors rated at 500 CFM, and a concrete batch truck with a hydraulic grout pump for 960 hours each. That phase would also require boundary and higher-slump grout in larger low-porosity areas. The report estimated that future work may inject approximately 25 to 50 cubic yards of low-mobility grout per day and up to 200 cubic yards of higher-mobility grout, depending on conditions encountered.

Temporary work features would include equipment access, staging, spoil and cuttings handling, utility locates, material delivery, and demobilization and cleanup. Disturbed areas would be graded and restored after construction, with coordination with the landowner regarding yard restoration and stockpiling or disposal of remaining sand or other materials.

The proposed action should be implemented consistently with the federal AML funding and oversight record, including the OSMRE categorical exclusion documentation already prepared for associated subsidence work. DEQ intends this EA to analyze the same general remedial action reflected in the current project record and not a separate or segmented action.

2. Alternatives

2.1 Proposed Action

Under the proposed action, DEQ would proceed with the grout-injection remediation described above. This alternative directly addresses the identified cause of repeated sinkholes and ongoing settlement by treating both the coal-seam voids and the overlying non-cohesive strata shown by drilling and GPR to be contributing to subsidence.

2.2 No-Action Alternative

Under the no-action alternative, DEQ would not undertake additional drilling or grout injection at this time. Existing conditions would remain, including the demonstrated risk of continued void migration, recurrence of sinkholes, ongoing settlement of the dwelling, possible further damage to the drain field and yard improvements, and continuing hazards to residents and visitors.

No action would avoid short-term construction disturbance, noise, and emissions, but it would leave the known mining-related hazard in place. Given the recurring history of failure and the pilot-study findings that indicate incomplete stabilization and remaining open pathways, the no-action alternative would not satisfy the project purpose and need.

2.3 Alternatives Considered But Not Analyzed in Detail

DEQ considered whether additional reasonable alternatives should be analyzed in detail beyond the proposed action and no-action alternative. Surface repair of individual sinkholes without additional subsurface investigation and grout injection was not carried forward as a separate detailed alternative because prior surface repairs in 2018 and 2023 did not resolve the deeper mechanism responsible for recurring subsidence and structural settlement. Likewise, the project record supports a phased grout-injection approach informed by drilling and GPR, rather than a materially different full-scale remedial method, because the existing investigations were specifically undertaken to design that response.

2.4 Agencies and Persons Consulted

The following agencies, entities, and records informed this EA and are part of the administrative record for the proposed action:

- Montana Department of Environmental Quality, Abandoned Mine Lands Program, including project management and historical site files.
- Herrera Environmental Consultants, including project planning, construction oversight, drilling records, and the February 2026 Construction Completion Report.
- Aesir Consulting LLC, through the downhole ground-penetrating radar investigations summarized in the project record.

- Office of Surface Mining Reclamation and Enforcement (OSMRE), through AML eligibility and categorical exclusion documentation associated with the federal AML funding context.
- State archeologists who prepared the recent cultural resource report and concurrence letters.
- Historic cultural reports prepared in 1986 and summarized in the Grosgarth cultural excerpts.
- Sheridan County Sanitarian information referenced during prior drain-field repair.
- USDA Natural Resources Conservation Service Web Soil Survey materials for the broader site area.
- Climatic data provided by Western Regional Climate Center for Medicine Lake, Montana (site 245572).

3. Affected Environment

The project area is a rural residential property and adjacent mine-affected ground south of Rose Hill Road near Medicine Lake in Sheridan County, Montana. The surrounding landscape includes agricultural lands, reclaimed mine features, county roads, and scattered rural residences.

4. Geology and Soils

Site-specific drilling indicates the local geologic profile consists of topsoil and organics, cohesive clayey sand in the upper roughly 55 feet, a thin rock or shale layer, dry non-cohesive clayey sand from about 55 to 89 feet, lignite coal around 89 to 96 feet, and deeper non-cohesive material below that depth in some holes. The coal seam is within the Fort Union Formation and is generally about 7 feet thick in this area according to historic and site-specific geology information.

Soil information collected from the NRCS Web Soil Survey for the broader area identifies three mapped surface soil units: Lambert-Zahill complex (LcF) at more than 50 percent of the area, Vida-Zahill loams (WzC) at approximately 40 percent, and Zahill loam (ZaE) at less than 10 percent of the study area. The soils in the Lambert-Zahill association formed in glacial till and other material of mixed origin. They are moderately steep, well drained silty clay loams and clay loams, with no flooding or ponding and more than 80 inches to a restrictive feature or water table.

5. Water Resources

The project area is in an upland setting with no identified perennial stream, wetland, or pond within the active work area. Previous project materials state that a Clean Water Act Section 404 permit was not anticipated for the grout-injection work because no discharge to jurisdictional waters is proposed. Total disturbance for the proposed action will be less than 1 acre, so MPDES construction stormwater permit coverage is not required for the project.

6. Vegetation, Wildlife, and Habitat

The property is already disturbed by residential use, previous landscaping, drain field work, prior sinkhole repairs, and nearby historic mine reclamation. The broader species list for the area includes federal and state species of concern, but the project footprint is a small residential and previously disturbed area rather than intact native habitat.

7. Cultural and Historic Resources

Historic information documents the Hancock, Jones, and Grosgarth mines as related historic coal operations in the vicinity, with Grosgarth described as a larger shaft mine southwest of Hancock with extensive underground workings and shafts to a seam 85 to 100 feet deep. The cultural excerpts primarily support historic context and mine-history description for the EA record.

8. Human Environment

The primary persons who would be impacted are the homeowners of the property, nearby rural neighbors, and users of Rose Hill Road. The residence has experienced documented impacts from subsidence and settlement, including damage to the drain field, recurring sinkholes in the yard, and structural symptoms within the home. The proposed action would directly affect private property improvements during construction, including temporary disturbance around the residence, drain field, yard, landscaping, driveway, patio area, and other appurtenant improvements needed for access, drilling, grout injection, and restoration. In the long term, the purpose of the project is to reduce the risk of additional damage to the residence, drain field, landscaping, and other private property improvements by stabilizing the subsurface conditions causing repeated settlement and sinkhole formation.

9. Environmental Impacts

ARM 17.4.609 requires analysis of impacts to the human and physical environment, including direct, secondary, and cumulative potential impacts and consideration of mitigation and alternatives. The following narrative addresses each category listed in ARM 17.4.609(3)(d) and (e), plus noise and lighting, based on the current record.

10. Geology and Soil Quality, Stability, and Moisture

10.1 Direct Impacts

Direct impacts under the proposed action would include localized soil disturbance, compaction, rutting, and temporary mixing of shallow soil horizons in the work area from drilling, excavation, staging, and restoration. These direct adverse impacts would be small in area and short term, while the principal direct subsurface impact would be beneficial because grout injection is intended to fill voids and densify the non-cohesive layer and coal-seam voids that are causing instability.

10.2 Secondary Impacts

Secondary impacts could include short-term erosion or altered micro-drainage if disturbed soils are not promptly graded and stabilized, and limited weed colonization on bare ground if reclamation is delayed.

10.3 Cumulative Impacts

Cumulative impacts to soils and geologic stability would be minor because the property has already experienced repeated sinkhole repairs and disturbance, and the proposed action would add a small increment of disturbance while reducing the long-term subsidence hazard.

11. Water Quality, Quantity, and Distribution

11.1 Direct Impacts

Direct water impacts are limited because the work occurs in upland, well-drained soils with no identified surface waters in the active construction area. The main direct risk is accidental surface release of fuel, lubricants, drilling fluids, or grout slurry, which could infiltrate disturbed soils if not contained.

11.2 Secondary Impacts

Secondary impacts could include minor localized changes in shallow infiltration or percolation where grout reduces porosity in targeted zones, but such changes would be very limited in extent relative to the overall site and would not be expected to affect regional groundwater quantity or distribution.

11.3 Cumulative Impacts

Cumulatively, the project adds a small temporary spill risk to a site already affected by residential use and historic AML work, but that risk is controllable and short-lived.

12. Air Quality

12.1 Direct Impacts

Direct air impacts would consist of exhaust emissions and fugitive dust from equipment operation, spoil handling, and vehicle traffic during construction. Because the project is localized and temporary, these impacts would be minor and short term.

12.2 Secondary Impacts

Secondary air impacts could include dust resuspension from disturbed ground after construction until areas are stabilized.

12.3 Cumulative Impacts

Cumulative air impacts would be negligible in the regional context because the additional emissions are small compared to ongoing agricultural activity, rural traffic, and other background sources.

13. Vegetation

13.1 Direct Impacts

Direct vegetation impacts would include loss or disturbance of lawn, ornamental plantings, or small patches of ruderal or pasture vegetation in the work area. These effects would be localized and generally reversible through grading and restoration after construction.

13.2 Secondary Impacts

Secondary impacts could include weed introduction or spread if equipment is not cleaned or if disturbed areas are not stabilized.

13.3 Cumulative Impacts

Cumulative vegetation impacts would be minor because the project occurs within an already disturbed residential setting rather than native habitat and would not cause a meaningful long-term reduction in vegetation cover at the landscape scale.

14. Fish and Wildlife

14.1 Direct Impacts

No fish habitat occurs within the active project area, so direct fish impacts are not expected. Direct wildlife impacts would be limited to temporary disturbance or displacement of common birds, small mammals, and other wildlife using the yard or adjacent disturbed areas due to noise, vehicles, and human activity.

14.2 Secondary Impacts

Potential secondary impacts could include temporary avoidance of the immediate area during active construction.

14.3 Cumulative Impacts

Cumulative wildlife impacts would be minor because the footprint is small and the landscape already includes roads, residences, agricultural uses, and previous mine reclamation; reduced sinkhole risk may also provide a small long-term safety benefit for people and animals using the property.

15. Land Use

15.1 Direct Impacts

Direct land-use impacts would consist of temporary interference with normal residential use of portions of the yard, driveway, patio area, and drain field area during construction. The proposed action would not change the parcel's long-term residential land use.

15.2 Secondary Impacts

Secondary impacts would be beneficial because stabilization of subsidence-prone ground would improve the usability and safety of the property and reduce recurring disruptions to residential use.

15.3 Cumulative Impacts

Cumulatively, the project would support continued safe residential use within a landscape that has already been shaped by historic mining and previous AML reclamation.

16. Risk of Accidents and Health and Safety

16.1 Direct Impacts

Direct short-term risks include those typical of construction: moving equipment, open drill holes, grout handling, and work near utilities and a residence. These risks are manageable through utility locates, access control, contractor safety procedures, and standard construction controls.

The principal long-term direct effect would be beneficial because the project is intended to reduce the likelihood of future sinkholes, settlement, and associated injury or property damage.

16.2 Secondary Impacts

Secondary benefits include reduced likelihood of emergency repairs and improved confidence in safe use of the residence and yard.

16.3 Cumulative Impacts

Cumulative health and safety impacts would be net beneficial because the project addresses a recurring mine-subsidence hazard documented over multiple years at the property and in the surrounding mine-affected setting.

17. Social Structures, Aesthetics, and Community Cohesion

17.1 Direct Impacts

Direct impacts would include temporary visual intrusion from equipment and materials, short-term construction presence in a rural residential setting, and inconvenience to occupants and nearby neighbors. These potential impacts would be small in extent and temporary.

17.2 Secondary Impacts

Potential secondary impacts are likely positive because reducing a chronic hazard can reduce stress on the affected household and preserve residential continuity.

17.3 Cumulative Impacts

Potential cumulative impacts on community cohesion or social structure would be negligible because the action would affect one rural property and would not alter broader community patterns.

18. Cultural, Historical, and Archaeological Resources

18.1 Direct Impacts

Direct impacts to known cultural resources are not expected if construction remains within the planned disturbed footprint and if any required cultural-resource review and inadvertent-discovery procedures are followed. The cultural excerpts support the mine-history context but do not indicate a known intact historic feature within the small work footprint requiring preservation in place.

18.2 Secondary Impacts

Secondary impacts could occur only if previously unidentified buried materials are encountered during excavation or drilling.

18.3 Cumulative Impacts

Cumulative cultural impacts are expected to be negligible because the area has already been heavily altered by mining, reclamation, and residential use.

19. Economics and Employment

19.1 Direct Impacts

Direct economic impacts would be modestly positive because the project would provide short-term work for contractors, suppliers, and professional service providers. For the landowner, the project would reduce future private costs associated with repeated repairs and property damage.

19.2 Secondary Impacts

Secondary impacts could include protection of property value and avoidance of future emergency response or infrastructure repair costs.

19.3 Cumulative Impacts

Cumulative regional economic effects would be small but consistent with the broader benefits of ongoing AML program investment in legacy mine-safety remediation.

20. Energy Resources

20.1 Direct Impacts

The project would directly consume diesel fuel and smaller amounts of other energy inputs for equipment and vehicle operation during construction.

20.2 Secondary Impacts

Secondary impacts on energy resources would be negligible because the project does not create a new long-term operational energy demand.

20.3 Cumulative Impacts

Long-term direct or cumulative impacts on regional energy resources would be negligible.

21. Noise

21.1 Direct Impacts

Direct noise impacts would come from the drill rig, batch truck, forklift, skid steer, excavators, dozer, haul truck, and support vehicles during working hours. These effects would be clearly noticeable at the residence and nearby area but temporary and limited to the construction period.

21.2 Secondary Impacts

Secondary noise impacts could include temporary disturbance to wildlife and annoyance to nearby residents.

21.3 Cumulative Impacts

Cumulatively, project noise would be minor relative to the combination of local road traffic, farm activity, and previous AML construction in the area.

22. Lighting

22.1 Direct Impacts

Direct lighting impacts would likely be limited because the record does not indicate regular night work and similar AML tasks have generally been conducted during daytime hours. If temporary task lighting were needed for short periods, direct impacts would consist of localized glare or light spill in a rural setting.

22.2 Secondary Impacts

Secondary lighting impacts would be negligible because any lighting use would be temporary and confined to active work periods.

22.3 Cumulative Impacts

Cumulative lighting impacts would be negligible because no permanent lighting is proposed and any temporary construction lighting would cease at project completion.

23. Greenhouse Gas Emissions and Climate

23.1 Direct Impacts

The project would generate greenhouse gas emissions primarily from fuel combustion by construction equipment and vehicles. The U.S. EPA Greenhouse Gas Equivalencies Calculator converts energy or emissions data into carbon dioxide-equivalent emissions and equivalency measures.

23.2 Secondary Impacts

Using the updated equipment hours in the project file and documented planning-level diesel fuel-use assumptions for each equipment type, the project is estimated to consume approximately 18,327 gallons of diesel fuel during construction. Applying the EPA mobile-combustion diesel emission factor of 10.447428 kilograms CO₂e per gallon yields an estimated 191,470 kilograms CO₂e, or about 191.5 metric tons CO₂e, for the project.

23.3 Cumulative Impacts

The project's greenhouse gas emissions would be non-zero and would incrementally contribute to climate change, but the contribution would be short term and limited to a one-time construction campaign rather than a permanent operational source. In the context of statewide and national emissions, the incremental cumulative contribution from this project, estimated at about 191.5 metric tons CO₂e, would be small.

23.4 Greenhouse Gas Methods Note

DEQ estimated project greenhouse gas emissions by applying planning-level fuel-use rates to the equipment hours provided in the project record and then converting the estimated fuel consumption to carbon dioxide-equivalent emissions using EPA mobile-combustion emission factors. For diesel combustion, EPA factors indicate approximately 10,180 grams of CO₂ per gallon of diesel, and EPA-derived mobile-combustion CO₂e factors that include CH₄ and N₂O equal approximately 10.447428 kilograms CO₂e per gallon. For this EA, DEQ applied the following planning assumptions for diesel consumption: excavators 4.0 gallons per hour, skid steers 2.5 gallons per hour, haul trucks and semi-trucks 6.0 gallons per hour, dozers 5.0 gallons per hour, pickup trucks with trailers 1.5 gallons per hour, track-mounted air-rotary drill rigs 8.0 gallons per hour, large air compressors rated at 500 CFM 3.0 gallons per hour, all-terrain forklifts 2.5 gallons per hour, and concrete batch trucks with hydraulic grout pumps 6.0 gallons per hour. Applying those assumptions to the updated equipment-hour table results in an estimated total of approximately 18,327 gallons of diesel and approximately 191.5 metric tons CO₂e for the project. DEQ may refine this estimate further if contractor-specific fuel-use records become available before final decision-making.

24. Mitigation and Design Features

DEQ will require the following mitigation and design features as conditions of project implementation in order to avoid or reduce impacts:

- Limit disturbance to the minimum area necessary for safe access, drilling, injection, drain field work, and restoration.
- Conduct utility locates before drilling and excavation, including private services.
- Use phased drilling and grout injection informed by prior drilling, GPR, and pilot-study results to target the 55-foot and 90-foot zones most likely to contain voids or low-density material.

- Maintain equipment to prevent leaks, keep spill response materials on site, and promptly clean up any fuel, oil, or grout releases.
- Control dust as needed through work practices and, if necessary, water application appropriate to site conditions.
- Restrict work to normal daytime hours to reduce noise and lighting effects where practicable.
- Segregate, manage, and properly dispose of drill cuttings and waste materials, or stockpile remaining sand only in agreed locations with the landowner and where environmentally appropriate.
- Grade and restore disturbed ground after construction, including replacement of disturbed surface materials and revegetation or landscaping repair as appropriate.
- Implement stop-work and notification procedures if previously unidentified cultural materials are discovered.
- Conduct the grout-injection work in a manner consistent with applicable underground injection requirements; based on the current record, the work is intended to remediate mine voids and unstable strata rather than to inject into a drinking-water source, and DEQ does not currently expect the project to require Class V UIC permitting, but any applicable UIC requirements will be met before implementation if they are determined to apply.

25. Significance Analysis Under ARM 17.4.608

ARM 17.4.608 requires DEQ to determine the significance of impacts associated with the proposed action based on seven criteria, including severity, duration, geographic extent, frequency, probability, cumulative context, resource characteristics, social importance, precedent, and conflicts with laws or plans. The significance discussion in this EA uses the MEPA rule framework and related definitions governing cumulative impacts and significance.

Applying those criteria here, the adverse impacts of the proposed action are not significant. First, the severity, duration, geographic extent, and frequency of adverse impacts are limited. Most adverse effects are short-term construction disturbances—soil disturbance, dust, noise, vehicle presence, and temporary access limitations—occurring within a small, previously disturbed residential and mine-affected area.

Second, the probability of major adverse effects is low and the project record provides reasonable assurance that significant impacts can be avoided with the identified design features and mitigation. The pilot grouting and post-injection geophysical work showed that grout placement can reduce porosity in the sandy layer and that the investigations materially improved understanding of where instability remains, allowing a more targeted full-scale design.

Third, the project has no growth-inducing character and no meaningful growth-inhibiting effect beyond the short construction period. It does not create a new residential subdivision, utility corridor, industrial use, or transportation facility; instead, it remediates a legacy hazard at an existing residence.

Fourth, the affected resources are not unusually unique or fragile in the project footprint. Surface soils are common upland map units, the footprint is already disturbed, and the historic and cultural value of the area is primarily contextual rather than tied to a known intact resource in the work area.

Fifth, while the residence is obviously important to the landowner and mine-hazard remediation is important to the AML program, the project does not adversely affect a resource of exceptional statewide importance. Sixth,

the action does not establish a problematic precedent because grout injection and related AML stabilization methods are established remedial tools, and this action is site-specific rather than a policy commitment to broader development.

Seventh, the project appears consistent with applicable legal and planning requirements and does not conflict with formal land-use plans or environmental requirements identified in the record. Considering all criteria together, DEQ can reasonably conclude that the proposed action will not significantly affect the quality of the human environment and that an EIS is not required.

26. Public Review

ARM 17.4.610 provides that an EA is a public document and that the scope of public review should be scaled to the seriousness and complexity of the issues and the level of public interest. DEQ will provide public notice of this EA by posting it on the DEQ website for 30 days. Written public comment will be accepted and reviewed during this time.

DEQ must consider substantive comments received and then either determine that an EIS is necessary, revise the EA, or determine that an EIS is not necessary and make a final decision with any appropriate modifications resulting from the EA and comments.

27. Regulatory Compliance

This EA has been prepared to satisfy ARM 17.4.609 by describing the proposed action, alternatives, the affected human and physical environment, and the direct, secondary, and cumulative impacts of the action, together with mitigation and significance analysis. The record also reflects related federal and programmatic context, including AML eligibility and prior OSMRE categorical exclusion documentation relevant to associated federal funding and oversight. The documents cited in this EA, including the pilot-study report, GPR materials, soils information, cultural excerpts, equipment-hours file, and updated project description, are part of the project record supporting this analysis.

28. Impact Table

Resource category	Direct impacts	Secondary impacts	Cumulative impacts	Significance conclusion
Geology and soils	Localized disturbance and compaction; beneficial filling of voids and densification of unstable sands and coal-seam voids.	Short-term erosion or minor drainage changes if not restored promptly.	Minor added disturbance in a previously disturbed AML/residential setting; net long-term stabilization benefit.	Not significant.
Water quality/quantity	Low spill risk in upland setting; no direct work in surface waters.	Minor localized change in infiltration or deep percolation in treated zones.	Negligible relative to background site conditions and prior activities.	Not significant

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Resource category	Direct impacts	Secondary impacts	Cumulative impacts	Significance conclusion
Air quality	Temporary exhaust and fugitive dust from construction equipment.	Short-lived post-construction dust until stabilization.	Negligible in regional context.	Not significant.
Vegetation	Small-area disturbance to lawn, landscaping, and ruderal cover.	Weed introduction risk if disturbed ground is not reclaimed.	Minor in an already disturbed residential setting.	Not significant.
Fish and wildlife	Temporary disturbance to common wildlife; no fish impacts expected.	Temporary avoidance of site during construction.	Minor given roads, agriculture, residences, and prior reclamation nearby.	Not significant.
Land use	Temporary interference with yard, patio, driveway, and drain field use.	Improved long-term residential usability and safety.	Supports ongoing safe residential use of the property.	Not significant.
Health and safety	Temporary construction hazards; long-term reduction in sinkhole and settlement risk.	Reduced chance of emergency repairs and injury in the future.	Net beneficial in context of recurring subsidence history.	Not significant adverse impact.
Social/aesthetic	Temporary construction presence, visual clutter, and inconvenience.	Reduced household stress from hazard abatement.	Negligible community-scale effect.	Not significant.
Cultural/historic	No known direct effect expected if cultural procedures are followed.	Possible inadvertent-discovery risk during ground disturbance.	Negligible in previously altered mine landscape.	Not significant.
Economics/employment	Short-term contractor and service-provider work; reduced landowner repair costs.	Protection of property value and avoidance of future repair costs.	Small positive contribution consistent with AML remediation investment.	Not significant adverse impact.
Energy	Temporary fuel use by project equipment.	None meaningful beyond construction period.	Negligible regional demand effect.	Not significant.
Noise	Temporary daytime construction noise from drilling, pumping, earthwork, and support vehicles.	Temporary disturbance to residents and wildlife.	Minor relative to rural traffic and agricultural background.	Not significant.

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Resource category	Direct impacts	Secondary impacts	Cumulative impacts	Significance conclusion
Lighting	Limited temporary lighting only if needed outside daylight hours.	Short-lived localized glare or light spill.	No permanent lighting; negligible cumulative effect.	Not significant.
Greenhouse gases	Temporary fuel-combustion emissions from equipment and vehicles.	Estimated project emissions are approximately 191.5 metric tons CO ₂ e using documented EPA diesel factors and planning-level fuel-use assumptions.	Small in state and national context.	Not significant.

29. Conclusion

Based on the project record, alternatives analysis, mitigation, and significance review under ARM 17.4.608, DEQ may reasonably conclude that the proposed Grosgarth grout-injection project will not significantly affect the quality of the human environment. The project would result in temporary, localized construction-related potential impacts, but those impacts are outweighed by the long-term public-safety and property-protection benefits of reducing ongoing mine-subsidence hazards at the site.

30. Signatures

Prepared by:

John Babcock
Environmental Project Officer
DEQ AML Program

Signature: _____

Date: _____

Approved by:

Jorri Dyer
DEQ AML Section Supervisor

Signature: _____

Date: _____

31. AI Assistance Disclosure

This document was prepared with the assistance of artificial intelligence and was reviewed and edited by DEQ staff.