CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	A.M. Welles Pit Expansion
Proposed Implementation Date:	Summer 2022
Proponent:	AM Welles PO Box 2808 Norris, MT 59745
Location:	Southeast Quarter of Section 16 T5S R1W
County:	Madison County

I. TYPE AND PURPOSE OF ACTION

A.M. Welles, Inc. has applied for, and successfully obtained an amendment to DEQ opencut mining permit OC# 674. A.M. Welles also applied for and obtained a two-year renewal of Montana DNRC gravel permit G-1273-94. In both the DEQ opencut amendment, and the renewed DNRC permit, approximately 23.2 acres was added to the previously permitted area. This 23.2 acres will serve as the "project area" as it pertains to this document.

Prior to disturbing the project area, MEPA must be conducted in accordance with Montana State law.

This document will analyze the environmental impacts relevant to the proposed expansion into the project area.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project.

The Montana DNRC (formerly the Department of State Lands) has managed and maintained a gravel permit with the proponent on this tract since 1994. Recently, the Department was approached by the proponent about the possibility of expanding the permitted area to include approximately 23 new acres. It was explained to the proponent that amendments within both the DNRC and DEQ permits would be necessary, and that MEPA would be conducted by both agencies. Both the DNRC and DEQ have issued permits, and the Montana DEQ has conducted MEPA. This document serves as the MEPA analysis for the DNRC.

Valley Garden Land and Cattle, LLC, the surface lessee and sole neighbor, will be scoped for comments on the environmental analysis.

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

Montana DEQ – Opencut Mining Permit
Montana DNRC – Aggregate take and remove permit

3. ALTERNATIVES CONSIDERED:

No Action Alternative: The proponent would not be authorized to disturb the project area.

Action Alternative: The proponent would be authorized to mine aggregate within the project area.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:
Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify any cumulative impacts to soils.

No unique or unusual geologic features are present within the project area.

Per the Montana Bureau of Mines and Geology, the project area contains one geologic member, Gravel. The member is described as variable deposits that range from pebble to boulder size and include sand, silt, and clay. Dominantly alluvial terrace abandoned channel and floodplain, remnant alluvial fan, and local glacial outwash.

Soils in the project area contain the Scravo-Thess complex.

Soil characteristics in the project area include no rating for erosion hazard, moderate resistance to soil compaction, high potential for soil restoration and are well suited for roads on the natural surface.

Per the agreement of both DEQ opencut permit, and the Montana DNRC take and remove permit, all topsoil and overburden will be stockpiled and reserved for reclamation of the site.

No action alternative: The current geology and soils in the project area would remain undisturbed, as they currently exist.

Action alternative: The proponent would strip and stockpile the topsoil and overburden from the project area and proceed with mining the subsurface for aggregate resources.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:
Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify cumulative effects to water resources.

Section 16 contains an ephemeral drainage that is a tributary of Moore Creek. Moore creek drains into Fletcher channel, which ultimately drains into Ennis Lake.

Per the DEQ permit, the project area will be mined to 20 feet below the existing elevation. The current ground elevation of the project area is approximately 4936 feet ASL. The maximum elevation of the surface water in the ephemeral drainage in section 16 of Township 5S, Range 1W, is 4858 feet ASL.

A search on the Montana Ground Water Information Center website yielded there are three groundwater wells located within one-half mile of the project location, all of which are owned by the Montana Bureau of Mines and Geology. The maximum static water elevation in the three wells 4871 ft ASL. Therefor, approximately a 45-foot buffer of gravel and soil will exist between the lowest mined pit elevation and the static ground water level.

Within the DEQ permit, the proponent has applied for, and obtained authorization from the DEQ to have an asphalt plant within the permitted area. However, per stipulation i. within provision 35. of the Montana DNRC take and remove permit G-1273-94, "The use of an Asphalt plant will be requested by the permittee and approved or denied by the Department on a written case-by-case basis." The permittee has not requested the use of an asphalt plant at this juncture. Due to this fact, this EA will not evaluate the impacts that an asphalt plant may have on surface or ground water quality. If an asphalt plant is requested by the permittee, a separate MEPA analysis will be constructed to evaluate the environmental impact.

No action alternative: The current ground and surface water in the area will not change in abundance or quality.

Action alternative: Due to the apparent elevation of the ground and surface water levels in the surrounding area, and the proposed depth of mining, there are no additional anticipated long-term impacts to the quality of the surface or ground water by implementing the action alternative. The groundwater table will receive infiltration from the pit floor. The pit floor consists of rock and associated fines that have been in place for thousands of years and have contributed to the composition of the groundwater. Any fuels or hazardous substances stored onsite would be kept in a secondary impermeable container to prevent seepage into the groundwater. Per the DEQ opencut permit, the proponent plans to use water from two of the MBMG water wells referenced above in their operations. This will affect the abundance of ground water in the direct vicinity of the project area. A proper water right shall be obtained through the Montana DNRC's Water Rights Bureau for use. Runoff from large rain events may collect and distribute particles from the pit area to the ephemeral drainage. A berm on the eastern edge of the pit area will remain unmined until the final phases of the project in order to mitigate effects from large rain events on the ephemeral drainage. The frequency of these events and the associated contaminants that may travel to the nearby surface water are expected to be negligible.

6. AIR QUALITY:
What pollutants or particulate would be produced? Identify air quality regulations or zones (e.g. Class I air shed) the project would influence. Identify cumulative effects to air quality.

Airborne pollutants and particulates already occur during mining operations from vehicle and heavy equipment exhaust used to mine. Dust particulates also occur due to mining operations and truck traffic.

If the proponent requests the use of an asphalt plant from the DNRC, the impacts to air quality will be evaluated at that time under a separate MEPA analysis.

No action alternative: The proponent would continue to mine within the pre-existing disturbance. The current operations produce airborne pollutants and dust from gravel mining.

Action alternative: The proponent would mine new undisturbed ground within the project area. This may create a temporary increase in airborne pollutants and dust particulates. Prevailing winds in the area are SSW, the nearest home in the direction of prevailing winds from the pit is over one mile away. The northern boundary of the pit is a nearly 30 foot highwall when taking into account overburden and topsoil stockpiles. This topographic barrier should help to block some of the dust that may be caried by the prevailing winds to the surrounding environment. The increase in pollutants and dust particulates from the action alternative are expected to have negligible effects to the environment.

7. VEGETATION COVER, QUANTITY AND QUALITY:
What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify cumulative effects to vegetation.

The project area consists of a variety of grasses and forbs, which are listed below.

Per the most recent range evaluation conducted by Trust Lands staff, the project area contains the following species:

Bluebunch Wheatgrass, Needle and Thread, Threadleaf Sedge, Sandberg Bluegrass, Blue Gramma, Western Wheatgrass, and others.

An inventory of the Montana Natural Heritage Program's Species of Concern database was conducted for the project area. The search yielded two invasive weed species were identified in the area, spotted knapweed and whitetop. As part of gravel agreement G-1273-94, the operator is responsible for the management and mitigation of invasive weeds in the pit area. Regular inspections by Trust Lands personnel ensure that weeds are being properly managed.

No action alternative: The current vegetation would remain relatively unchanged. Factors unrelated to pit expansion such as overgrazing or weed introduction could change the tract's vegetative composition.

Action alternative: The vegetation in the project area would stripped along with the topsoil and overburden. It would be included in the stockpiled topsoil and would provide good organic material to the soil. Upon reclamation, the topsoil and overburden would be replaced on the pit area. The operator would then reseed the affected area with a native range grass mixture approved by the Department.

8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:
Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify cumulative effects to fish and wildlife.

The project area provides habitat for a variety of wildlife species. Deer, elk, moose, and antelope are present in the vicinity of the project area. Predatory birds such as hawks and eagles may also be present. Ennis lake and its tributaries contain a resident population of artic grayling along with other species of fish. The project vicinity also contains small rodents and mammals along with small to medium sized predators such as foxes and coyotes. The project area consists of native rangeland that

provides forage to ungulate species in the area and habitat for burrowing species such as mice, gopher, fox and coyote. The project area does not contain rivers, streams, tributaries, trees or wetlands. The project area is also directly adjacent to an active pit area where mining has been occurring for more than forty years. Additionally, highway US 287 is adjacent to the project area. Noise associated with the mining of aggregate is not expected to vary significantly based upon which alternative is selected.

A fisheries resource assessment has been conducted for this project and is attached as appendix A to this document.

No action alternative: The project area would remain undisturbed by mining activities and the forage and habitat for the species in the project vicinity would remain relatively unchanged.

Action alternative: The project area would be stripped of vegetation and topsoil, then subsequently mined. This would temporarily decrease the potential forage for species identified above. The average AUM per acre for this tract is 0.24. By taking the average AUM per acre and multiplying it by the 23-acre project area, a total of 5.67 AUM's would be temporarily unavailable during the action alternative. An AUM is an Animal Unit Month, and it is a metric of how many animals a specific area of land can feed for a month. These 23 acres could feed one 1000 cow and her calf for approximately 6 months or 6 pairs of cows and calves for one month. These numbers would vary based upon the size and consumption of the ungulate species it supports. However, the size of the project area and associated AUM's that would be affected from the Action alternative are not substantiative enough to permanently disrupt a wildlife species in the area. Forage can be found throughout the valley and is expected to be able to sustain the wildlife species present during the mining of the project area.

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:
Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify cumulative effects to these species and their habitat.

An inventory of the Montana Natural Heritage Program's animal Species of Concern database was conducted for the project area. The project area yielded no observations for species of concern. However, there were observations within the project vicinity. Observations in the project area vicinity included: wolverine, artic grayling, Ferruginous Hawk, long-billed curlew, American white pelican, and great blue heron. As previously outlined within this document, the project area consists of native rangeland with no trees, water features, or wetlands. Native range grasses are abundant in the area and can be utilized by animals that may be displaced.

No action alternative: The project area would not be disturbed, and the species of concern would see little to no change to the current environment.

Action alternative: The project area would be mined, and the rangeland would be temporarily disturbed. The cumulative effects to the species of concern listed above are expected to be negligible. Rangelands are abundant in the project vicinity and animals would utilize surrounding areas during the temporary disturbance with the ability to return to the site upon reclamation. Gravel mining has

occurred at this site for decades, the species mentioned, have been observed utilizing the adjacent lands despite the mining activity. This would be expected to continue if the action alternative is selected.

10. HISTORICAL AND ARCHAEOLOGICAL SITES:
Identify and determine effects to historical, archaeological or paleontological resources.

A Class III (literature review and pedestrian inventory) level review was conducted by the DNRC staff archaeologist for the area of potential effect (APE). This entailed inspection of project maps, DNRC's sites/site leads database, land use records, General Land Office Survey Plats, and control cards. It also involved an on-site inspection of the area of potential effect and the excavation of five of the constituent cairns in site 24MA1399. Literature review and field investigative work confirmed that the cairns of site 24MA1399 are probably the result of clearing rock from an adjacent cultivated field and dumping the collected rock along the margin of the upper valley wall. Expansion of the proposed gravel pit will have *No Effect* to *Antiquities*. No additional archaeological investigative work will be conducted in response to this proposed development. However, if previously unknown cultural or paleontological materials are identified during project related activities, all work will cease until a professional assessment of such resources can be made.

No action alternative: The project area would remain undisturbed, and the existing ground would remain unchanged.

Action alternative: The project area would be mined for aggregate resources. No effects to cultural, archeological, or paleontological resources are anticipated resulting from the action alternative. However, if any of these resources are encountered during mining activities it is the operator's responsibility to cease action and call the Central Land Office per provision 32 of permit G-1273-94.

11. AESTHETICS:
Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify cumulative effects to aesthetics.

The pit is currently mostly blocked from view by utilizing berms and existing topography along the edges of the pit. This has been effective in reducing the impacts to aesthetics. The pit is only visible from highway 287 at the entrance. Berms along the north, south and east boundaries also help to shield the pit.

No action alternative: Aesthetics would remain relatively unchanged.

Action alternative: The expanded pit area would be shielded from the surrounding areas using the same methodology currently utilized by the existing pit. As a final step in the mining plan, the operator would daylight the pit to the valley directly to the east. This would create a more natural look for final reclamation. During the daylighting process, aesthetics east of the pit would be altered temporarily both visibly and audibly.

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:
Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify cumulative effects to environmental resources.

The primary limited resource that the project would require is water for operations. Other resources such as gravel, the temporary decrease of grazing vegetation, and fuel are all resources that are abundant in the vicinity. Mined, sorted, and processed gravel is a limited resource in the area. Aggregate produced from the pit has been a needed resource for local construction and maintenance projects in the area's vicinity.

No action alternative: The new area would not be mined, and aggregate needed to support the local infrastructure would not be sourced from this pit beyond its current limitations. Gravel from another source would need to fill the void created by the no-action alternative.

Action alternative: The action alternative would continue to utilize fresh ground water provided by a groundwater well. Water rights for the quantity of water utilized would be maintained through the Montana DNRC's Water Rights Bureau. The wells being utilized by the proponent currently are exempt wells, meaning they are authorized for use up to 10-acre feet per year. The action alternative is not expected to adversely affect environmental resources and would allow the operator the to continue to provide a source of aggregate to local infrastructure projects for the foreseeable future.

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:
List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

The Montana DEQ constructed an Environmental Assessment as part of their permitting process. The document can be found on the DEQ's website. The project area is currently leased for grazing activities by Valley Garden Land & Cattle LLC through the Montana DNRC's Trust Lands Management Division.

No action alternative: The project area would not be mined, and current grazing operations would continue.

Action alternative: The project area would be mined for the underlying gravel resource. This would temporarily render the project area incapable of grazing due to the stripping of vegetation and topsoil. The grazing lessee would be compensated for surface damages to their lease and the lease would be adjusted for lost acreage in subsequent years.

IV. IMPACTS ON THE HUMAN POPULATION

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

14. HUMAN HEALTH AND SAFETY:
Identify any health and safety risks posed by the project.

No human and health safety risks were identified because of the proposed project, other than the typical occupational hazards that coincide with gravel mining operations.

No action alternative: Negligible effects

Action alternative: Negligible effects

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:
Identify how the project would add to or alter these activities.

The proposed project would provide a needed resource for industrial and commercial projects.

No action alternative: The mineable material left in the pre-existing area is dwindling. Without mining the project area, the life of the pit would be significantly reduced, and a gravel resource would have to be developed elsewhere to meet demand.

Action alternative: The action alternative would allow for a reliable aggregate resource to continue serving the surrounding areas.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:
Estimate the number of jobs the project would create, move or eliminate. Identify cumulative effects to the employment market.

No action alternative: If the proponent were not allowed to mine the project area, the end life of the pit would approach quickly. The closure of the pit could result in lost jobs realized by the proponent.

Action alternative: If the proponent were allowed to mine the project area, the life of the pit would be extended into the future. This would sustain the current employment level and may add jobs as well.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:
Estimate tax revenue the project would create or eliminate. Identify cumulative effects to taxes and revenue.

No action alternative: If the project area is not mined, an additional gravel resource would be developed to replace the market supply void. The costs associated with permitting and opening a new aggregate source can be extensive. In most cases, private operators pass those associated costs along to their consumers in the form of rate increases. Most of the aggregate used for Montana Department of Transportation projects comes from privately operated pits such as this one. If the operator passes increased rates to MDT, that will ultimately result in an increased tax on the local economy.

Action Alternative: The action alternative will provide a reliable, quality source of aggregate for local infrastructure projects. The action alternative is expected to have minimal effects local or state taxes.

18. DEMAND FOR GOVERNMENT SERVICES:
Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify cumulative effects of this and other projects on government services.

No action alternative: Traffic patterns and density of haul trucks may decrease overtime from the no action alternative. This would be a result of a limited resource reaching the end of its viability.

Action alternative: Traffic patterns are not expected to change from the action alternative. The action alternative is expected to maintain current truck patterns entering and exiting the pit.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:
List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

No action alternative: The project area would not be mined and therefor zoning and local management plans would not be applicable.

Action alternative: The project area has obtained zoning clearance through Madison County. This is obtained as a condition of the DEQ operating permit.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:
Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify cumulative effects to recreational and wilderness activities.

No action alternative: There will be no cumulative affects to recreation or wilderness activities if the project area is not mined.

Action alternative: The project area would temporarily render approximately 23 acres of public land inaccessible and unusable in terms of recreation. This project area does not provide access to wilderness activities.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:
Estimate population changes and additional housing the project would require. Identify cumulative effects to population and housing.

No action alternative: No impact.

Action alternative: The action alternative is not expected to significantly change population or housing.

22. SOCIAL STRUCTURES AND MORES:
Identify potential disruption of native or traditional lifestyles or communities.

No action alternative: No impact

Action alternative: The action alternative is not expected to affect or disrupt traditional lifestyles or communities.

23. CULTURAL UNIQUENESS AND DIVERSITY:
How would the action affect any unique quality of the area?

No action alternative: No impact

Action alternative: The pit has existed in this spot for decades. The action alternative of choosing to expand the pit is not expected to affect any unique quality of the area.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:
Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify cumulative economic and social effects likely to occur as a result of the proposed action.

No action alternative: Currently, the project area is being utilized as grazing ground and is leased by Valley Garden Land and Cattle LLC. The lease is for approximately 104 acres and it generates approximately $400 annually. This equates to approximately $4/acre/year If the no action alternative is selected, the grazing lease will continue as it is currently.

Action alternative: If the action alternative were selected the grazing lessee would be compensated by the proponent for losses to their grazing lease in the current year. In subsequent years the grazing lease would be adjusted to subtract the project area's acreage. Assuming a 50% reject, and a mining depth of 20 feet, the project area has the ability to generate nearly 375,000 yd^3 of aggregate. Currently, G-1273-94 has a royalty of $1.50/$yd^3$. If that price were to remain unchanged over the life of the project, the project area has the potential to create $562,000 for the Trust. In a direct comparison to potential grazing revenue, 23.2 acres would generate approximately $93/year. At current prices for both gravel and grazing, it would take over 6,000 grazing years on the project area to generate the same revenue as the action alternative. Upon reclamation of the gravel pit, the entirety of the pit acreage will be returned to grazing land.

EA Checklist Prepared By:	**Name:** Zackary Winfield	**Date:** 9/6/2022
	Title: Petroleum Engineer	

V. FINDING

25. ALTERNATIVE SELECTED:

This is a draft MEPA document and alternatives are still being analyzed.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

☐ EIS ☐ More Detailed EA ☐ No Further Analysis

EA Checklist Approved By:	**Name:**	
	Title:	
Signature:		**Date**:

APPENDIX A

Fisheries Resources Assessment

Assessment Prepared By:

Name: Mike Anderson

Title: Fisheries Biologist, Montana DNRC

Introduction

The following assessment will disclose anticipated effects to fisheries resources within the A. M. Welles Gravel Pit Expansion project area, Bozeman Unit, Montana DNRC.

Assessment Areas

The assessment area for direct, indirect and cumulative effects will be used to evaluate the existing and potential impacts to fisheries resources associated with the proposed project. The assessment area was chosen because it includes (1) the watershed of known or potential fish-bearing streams and (2) the proposed actions may have foreseeable, measurable, or detectable impacts to those fisheries resources.

The assessment area for the proposed actions is the Moore Creek 6th Code watershed (100200071206). Moore Creek is a perennial tributary to the Fletcher Channel which drains into Ennis Lake (Figure 1).

Assessment Methods

Assessment methods are a function of the types and quality of data available for analysis, which varies among the different assessment areas. The assessments may either be quantitative or qualitative. The best available data for both populations and habitats will be presented for the assessment area(s). In order to adequately address the issues raised, the existing conditions and foreseeable environmental effects to fisheries in the assessment area will be explored using the following outline of issues and sub-issues.

- Fisheries Populations
- Fisheries Habitat
  - Water Quality
  - Sediment
  - Flow Regime
- Fisheries – Cumulative Effects

The descriptions of foreseeable adverse impacts to fisheries resources are described in Table F1 – Descriptions of foreseeable adverse impacts. Positive impacts to fisheries resources will also be described, if applicable, using information on impact extent and duration.

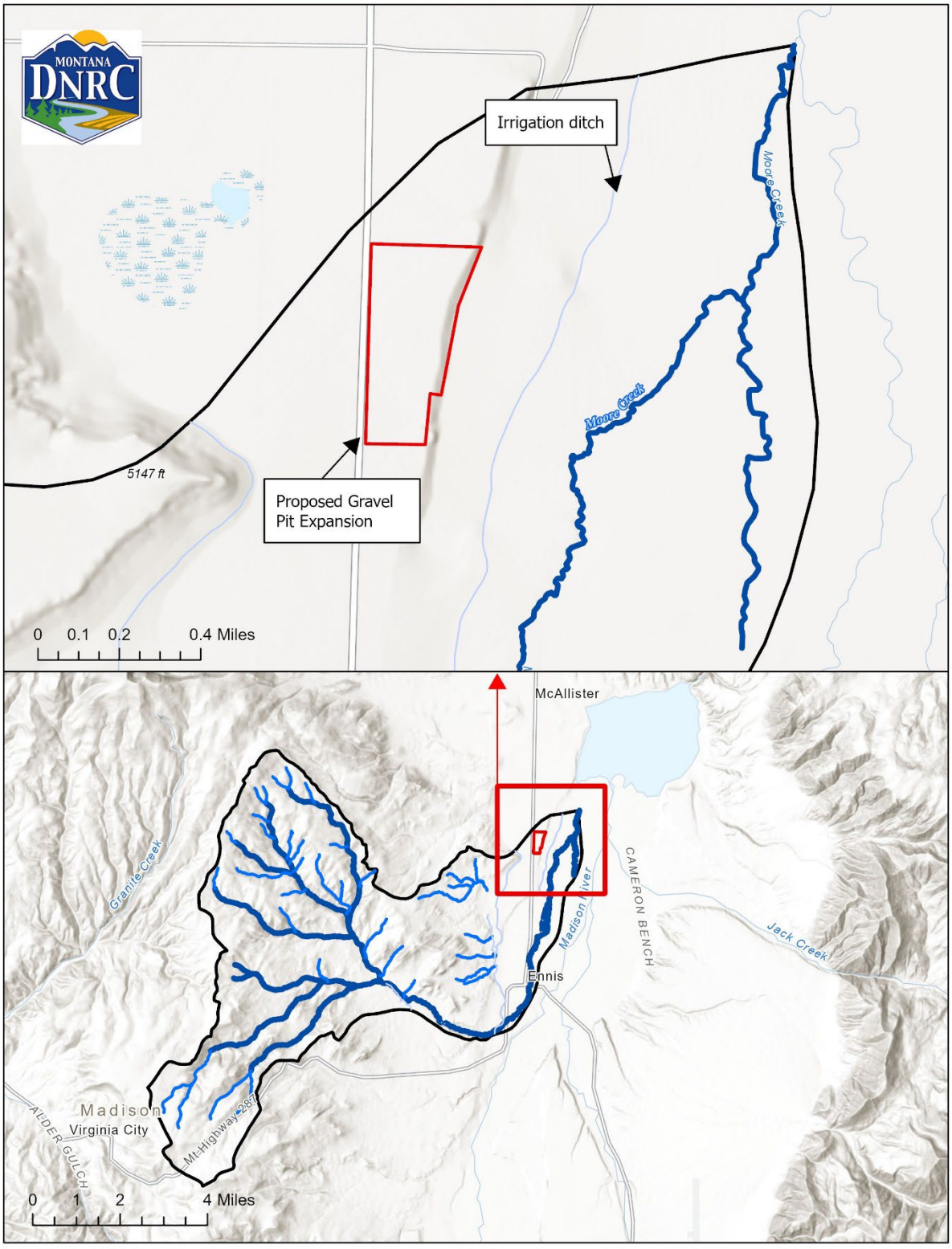

Figure F1 – Moore Creek Assessment Area and Proposed gravel pit expansion.

Table F1 – Descriptions of foreseeable adverse impacts.

Impact Description	Probability of Impact	Severity of Impact	Duration of Impact
Negligible	The resource impact is not expected to be detectable or measureable	The impact is not expected to be detrimental to the resource	Not applicable
Low	The resource impact is expected to be detectable or measureable	The impact is not expected to be detrimental to the resource	Short- or long-term
Moderate	The resource impact is expected to be detectable or measureable	The impact is expected to be moderately detrimental to the resource	Short- or long-term
High	The resource impact is expected to be detectable or measureable	The impact is expected to be highly detrimental to the resource	Short- or long-term

Cumulative impacts are those collective impacts on the human environment of the proposed action when considered in conjunction with other past, present, and future actions related to the proposed action by location or generic type (75-1-220, MCA). The potential cumulative impacts to fisheries resources in the assessment area(s) are determined by assessing the collective anticipated direct and indirect impacts, other related existing actions, and future actions affecting the fisheries resources.

Issues

For the purposes of this environmental assessment, issues will be considered actual or perceived effects, risks, or hazards as a result of the proposed alternatives. Issues, in respect to this environmental assessment, are not specifically defined by either the Montana Environmental Policy Act or the Environmental Quality Council.

Fisheries resource issues raised publicly include:

1. The proposed actions may have an impact on native fish populations in Moore Creek
2. The proposed actions may have an impact on water quality in the project area.

Fisheries resource issues raised internally include: the proposed actions may adversely affect fisheries habitat features, including water quality, sediment, flow regime, and cumulative effects.

Regulatory Framework

Arctic grayling (*Thymallus arcticus*) is currently listed as an S1 state species of concern due to limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state (MTNHP 2022).

DNRC is a cooperator and signatory to the following relevant agreements: Memorandum of Understanding (2007) Concerning Montana Arctic Grayling Restoration.

All waterbodies contained in the fisheries analysis area(s) are classified as B-1 in the Montana Surface Water Quality Standards (ARM 17.30.623). The B-1 classification is for multiple beneficial-use waters, including the growth and propagation of cold-water fisheries and associated aquatic life. Among other criteria for B-1 waters, a 1-degree Fahrenheit maximum increase above naturally occurring water temperature is allowed within the range of 32 to 66 degrees Fahrenheit (0 to 18.9 degrees Celsius), and no increases are allowed above naturally occurring concentrations of sediment or suspended sediment that will harm or prove detrimental to fish or wildlife. In regard to sediment, naturally occurring includes conditions or materials present from runoff or percolation from developed land where all reasonable land, soil, and water conservation practices have been applied (ARM 17.30.603[17]). Reasonable practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses (ARM 17.30.603[23]).

Existing Conditions

Moore Creek Assessment Area

The entire Moore Creek (6th Code HUC: 100200071206) watershed defines the boundary of this assessment area. Specifically, the anticipated effects of the proposed actions will be evaluated on waterbodies downstream from the existing gravel pit, including portions of the gravel pit that would be expanded under the proposed actions. This includes the unnamed irrigation ditch/canal at the foot of the terrace east of the project area and Moore Creek downstream to the confluence with the Fletcher Channel (Figure F-1).

Fisheries populations present in the assessment area include native and non-native species in Moore Creek between the confluence with Fletcher Channel and the headwaters of Moore Creek on the east side of the Tobacco Root Mountains (Table F2). Arctic grayling (*Thymallus arcticus*) restoration efforts have been undertaken in Moore Creek, during which remote site incubators were utilized to incubate fertilized eggs in-stream (MFWP 2017). Based on the current fisheries assemblage in the assessment area, there is an existing moderate impact on native fish populations due to competition with and predation by non-native species (Kaya 1992, Klemetsen et al. 2003, McCullough 2017, MFWP 2020).

Table F2 – Fisheries Populations Present in the Project Area.

	Species	Moore Creek	
		Present	Estimated River Miles Occupied
Native	Arctic grayling	X	8.3
	Longnose dace	X	8.3
	Mottled sculpin	X	11.3
Non-Native	Rainbow trout	X	17.0
	Brown trout	X	17.0

Alterations to water quality that may impact native fish populations include alterations to the riparian community or flow regime that may result in increased solar radiation resulting in changes to the thermal regime which may negatively impact the distribution, abundance and structure of fisheries assemblages in the project area. Additional influence of water chemistry on native fish populations may include increased sediment loading which may negatively influence spawning and rearing habitat through increases in fine sediment loading (Hubert et al. 1985). Moore Creek is currently classified under the 303(d) as not fully supporting aquatic life, drinking water, or recreation due to increased levels of arsenic (Abandoned mines), Escherichia coli (irrigated crop production), total Nitrogen (loos of riparian habitat), total Phosphorus (Natural sources), sedimentation/siltation (On-site septic treatment systems), and temperature (streambank modification, transfer of water from outside watershed) (MDEQ 2020). Considering the existing water quality conditions in Moore Creek, there is an existing high impact to water quality and subsequently high indirect impact on native fish populations in the assessment area.

Instream habitat for native species may also be affected by alterations to the natural flow regime. Review of the Montana DNRC water right query system (accessed August 2022) indicated multiple points of diversion for both irrigation and livestock use in Moore Creek upstream and downstream from the proposed project area. While water rights may impact the existing flow regime in Moore Creek and impacts the volume of water in the irrigation ditch within 1,000 feet of the proposed gravel pit expansion, the impact of these flow alterations is largely unknown with respect to native fish populations in the Moore Creek watershed downstream from the project area. Based on MFWP reports, remote site incubation between 2015 and 2020 resulted in successful, albeit low, recruitment of Arctic grayling (MFWP 2020), indicating that the existing flow regime is at minimum supporting sufficient instream flow to meet the incubation and hatching requirements of Arctic grayling in Moore Creek. Based on the current condition, there is an existing moderate impact to native fish populations due to permitted surface water utilization in the Moore Creek watershed.

Other existing impacts to fisheries resources in all of the analysis areas include: moderate impacts to native fish species through competition, displacement and predation by nonnative species; grazing

impacts that may exacerbate in-stream sedimentation, adverse effects to riparian vegetation, stream temperature and nutrient inputs; recreational fishing pressures; and surface and ground water utilization for agricultural or other purposes. The combination of direct and indirect effects and other existing impacts are expected to have an existing moderate cumulative impact to fisheries resources in the assessment area.

Environmental Effects

The proposed activities that may affect fisheries resources in the assessment area include: the expansion of an existing 40-acre gravel pit by an additional 23.2 acres, to a depth of 20 feet below the existing gravel pit elevation, resulting in a total gravel pit acreage of 63.2 acres. The fisheries resource variables potentially affected by the proposed actions are populations, water quality, sediment, flow regime, and cumulative effects.

The environmental effects section will compare the existing conditions to the anticipated effects of the proposed No-Action and Action Alternatives to determine the foreseeable impacts to associated fisheries resources.

Moore Creek Assessment Area

No Action Alternative: Direct, Indirect, and Cumulative Effects

As a result of implementing the No-Action Alternative, no additional direct or indirect effects to fisheries resources would be expected to occur within the assessment area beyond those described in the Existing Conditions.

Future-related actions considered part of cumulative impacts include; continued moderate impacts to native fish species by nonnative species; continued high impacts due to water quality departures from surface water quality standards; ongoing surface and ground water utilization for agricultural or other purposes; and ongoing livestock grazing impacts on private land.

Consequently, foreseeable cumulative impacts to fisheries resources are expected to be similar to those described in Existing Conditions.

Action Alternative: Direct, Indirect, and Cumulative Effects

The proposed actions and affected fisheries resources in all analysis areas are broadly described in the Type and Purpose of Action portion of this document, as well as within the MDEQ Application for Standard Opencut Mining Permit #674. All impact descriptions are short-term unless otherwise noted.

Fisheries Populations

Based on the proposed action, there would be no introduction, removal, or suppression of native or non-native species as a part of this project into the Moore Creek watershed. As such, there would be no additional direct effect on fisheries populations as a result of selection of the Action Alternative outside of those described in the Existing Condition. Direct impacts of non-native species through competition, displacement, and predation would continue at moderate levels. Indirect effects to populations are further discussed in the water quality and flow regime portions of this analysis.

Water Quality

The proposed actions that may result in negative impact to fisheries resources in the project area include the following; utilization of on-site wash plants to process gravel following excavation, and storage of asphalt awaiting recycling. Based on the detail provided in the MDEQ permit #674, water will be stored on-site for use in wash plants in a lined retention pond. The current settling pond is directly adjacent to the wash plant and lined retention pond and is approximately 0.75 acres. The approximate depth of the settling pond is 8 feet, which would result in an approximate maximum capacity of the settling pond of 2 million gallons. Wash plant water would not be treated prior to use, and allowed to infiltrate the groundwater table or be reused in the wash plant. Asphalt storage may occur as a part of the proposed Action Alternative, with up to 5,000 cubic yards of material stored on-site. As stated in Permit #674, all asphalt must not be buried or disposed of on-site, and during the reclamation process must be removed from the site and disposed of in a lawful manner. Given the elevational differences between the maximum groundwater table depth (4871 feet ASL) and the current ground elevation in the project area (4936 feet ASL) the 65 feet of infiltration distance is sufficient to filter contaminants from the project area. As such there is an anticipated negligible risk of low impact to water quality would result from selection of the Action Alternative. None of the proposed actions in the Action Alternative would be expected to impact riparian vegetation or waterways of either Moore Creek or the irrigation ditch directly east of the project area, resulting in no impact to stream temperature resulting from the proposed actions.

Sediment Delivery

The primary source of sediment delivery resulting from the proposed action would be through overland runoff from the project area during operation as a result of large precipitation events that may contribute sediment to the ephemeral drainage in the project area, and overland flow following reclamation of the gravel pit to slopes identified in the permit application. Reclamation of the gravel pit would utilize stockpiled topsoil to regrade the site to slopes of approximately 3:1 with flow directed from north and south to the center of the reclaimed area, with flow directed from west to east across the project site. Runoff prior to reclamation resulting from large precipitation events is unlikely to result in substantial amounts of sediment delivery, as the pit elevations during excavation will likely be lower than surrounding areas, concentrating the majority of overland flow within the project area. Following reclamation, the site would be recontoured to 3:1 slopes and reseeded with site-appropriate seed mixes as specified in the MDEQ permit #674. The minimum distance between the edge of the gravel pit expansion and the irrigation ditch east of the project area is approximately 950 feet, with approximately 1,100 feet of the irrigation ditch east of the project area within 1,000 feet of the gravel pit boundary. The lower terrace between the gravel pit and the irrigation diversion ranges from 600 to over 1,000 feet, with slopes of less than 1.0 percent. Overland flow during runoff events would likely be captured by the ephemeral drainage on the lower terrace, which subsequently delivers to the irrigation ditch east of the project area approximately 2,700 feet downstream from the northern boundary of the DNRC section. Based on the proposed actions, there is a negligible risk of low impacts to fisheries resources from sediment delivery that would result from selection of the Action Alternative.

Flow Regime

The primary mechanism through which alterations to the flow regime would impact fisheries resources would be as a result of impacting the existing groundwater table, leading to changes in the timing,

magnitude, and duration of instream flows in Moore Creek. Based on the proposed actions, gravel would be excavated to a depth of 20 feet below the existing elevation. Current elevation in the project area is 4936 feet ASL. The maximum elevation of the ephemeral drainage in the project area is 4858 feet ASL, resulting in 78 feet of elevational difference between the existing elevations, and based on the approved permit excavation depth of 20 feet a minimum of 58 feet of elevational difference between the gravel pit and the ephemeral drainage at the end of operations. Additionally, elevations on the floodplain adjacent to the project area, from the base of the lower terrace to the Madison River average 4844 feet ASL. The existing elevational difference between the project area and the floodplain elevation is 92 feet, if the Action Alternative is selected and the excavation depth is maximized based on the permitted depth, there would be a minimum of 72 feet between the final excavation depth and the floodplain. Given the elevational differences between the maximum excavation depth and the floodplain, there is a low risk of moderate impact to the flow regime in Moore Creek, and subsequently indirectly impacting fisheries resources in the assessment area.

Cumulative Impacts

The primary cumulative impact risk factors associated with the Action Alternative would be those associated with alterations to water quality, sediment delivery, and the flow regime. No additional direct effects to fisheries populations are anticipated as a result of implementation of the Action Alternative. Ongoing cumulative effects including adverse interactions between native and non-native species, impaired water quality, and alteration to the existing flow regime due to ground- and surface water utilization would continue as described in the Existing Conditions, and would occur under selection of either the No Action or Action Alternative. Selection of the Action Alternative would result in an additional negligible risk of low to moderate impacts on fisheries resources in the project area.

Fisheries References

Hubert, W. A., R. S. Helzner, and P. C. Nelson. 1985. Habitat suitability index model and instream flow suitability curves: Arctic Grayling riverine populations. U. S. Fish and Wildlife Service Biological Report, Washington, D. C.

Kaya, C. M. 1992. Restoration of fluvial Arctic Grayling to Montana streams: assessment of reintroduction potential of streams in the native range., the upper Missouri River drainage above Great Falls. A status report submitted to the Montana Chapter of the American Fisheries Society and Montana Fish, Wildlife, and Parks. Montana State University, Bozeman, Montana.

Klemetsen, A., P. A. Amundsen, J. B. Dempson, B. Jonasson, N. Jonasson, M. F. O'Connell, and E. Mortensen. 2003. Atlantic salmon *Salmo salar,* Brown trout *Salmo trutta* and Arctic char *Salvelinus alpines*: a review of aspects of their life histories. Ecology of Freshwater Fish. 12: 1–59.

McCullough, A. R. 2017. Relations among Arctic grayling, nonnative salmonids, and abiotic conditions in the Big Hole River, Montana. M.S. Thesis. Montana State University, Bozeman, Montana. 153 pp.

Montana Dept. of Environmental Quality. 2020. Final 2020 Water Quality Integrated Report, Appendix A-Impaired Waters. https://deq.mt.gov/water/resources. Accessed August 2022.

Montana Dept. of Fish, Wildlife, and Parks. 2017. Madison River Drainage Aquatic Native Species Conservation and Restoration Program. Annual report to Northwestern Energy-Environmental Division. 143 pp.

Montana Dept. of Fish, Wildlife, and Parks. 2020. Madison River Drainage 2188 Project Monitoring Report 2020. Submitted to: Northwestern Energy-Environmental Division. 68 pp.