South Railroad Mine Project
Compensatory Mitigation Plan

SPK-2018-00673

Prepared for:

Gold Standard Ventures (US) Inc.
Subsidiary of Orla Mining Ltd.

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Acronyms / Abbreviations

amsl	above mean sea level
BEHI	Bank Erodibility Hazard Index
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
FACU	facultative upland
FACW	facultative wetland
ft^2	square feet
GSV	Gold Standard Ventures (US) Inc., a subsidiary of Orla Mining Ltd.
HUC	Hydrologic Unit Code
Mine Project	South Railroad Mine Project
NWI	National Wetlands Inventory
OBL	obligate
PEM	palustrine emergent
PRM	Permittee Responsible Mitigation
RBP	Rapid Bioassessment Protocols
SAG	stem area at groundline
SDG	stem diameter at groundline
Stantec	Stantec Consulting Services Inc.
USACE	U.S. Army Corps of Engineers
WOTUS	waters of the U.S.

1 Introduction

Stantec Consulting Services Inc. (Stantec) was contracted to assist with compensatory mitigation requirements to offset unavoidable impacts to waters of the U.S. (WOTUS) from the South Railroad Mine Project (Mine Project), as required by the Final Mitigation Rule (Title 33 Code of Federal Regulations [CFR] Parts 325 and 332).

Stantec updated and consolidated Mine Project WOTUS data (Stantec 2024) and inventoried restoration and rehabilitation opportunities within the Dixie Creek watershed to offset impacts from mining roads and facilities built in WOTUS. Potential restoration sites were reviewed for the practicability of completing restoration, proximity to the impacted watershed, and availability of hydrology.

1.1 Background

As part of the Mine Project baseline data collection requirements, an aquatic resources delineation was conducted by Stantec from 2018 to 2024 (Stantec 2024; Appendix A). This delineation was conducted in accordance with the *Corps of Engineers Wetland Delineation Manual* (U.S. Army Corps of Engineers [USACE] 1987) and the *Regional Supplement of the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (USACE 2008). In addition, drainages and channels were evaluated using Regulatory Guidance Letter 05-05, Ordinary High Water Mark Identification (USACE 2005), and *A Field Guide to the Identification of the Ordinary High Water Mark* (Lichvar and McColley 2008) to define the ordinary high water mark. Streamflow duration was assessed using the *User Manual for a Beta Streamflow Duration Assessment Method for the Arid West of the United States* (Mazor et al. 2021).

Impacts from the Mine Project footprint were determined using the updated *Consolidated Aquatic Resources Delineation Report* (Stantec 2024).

Gold Standard Ventures (US) Inc., a subsidiary of Orla Mining Ltd. (GSV), looked at numerous opportunities to offset the wetland losses from Mine Project impacts. There are no mitigation banks or in-lieu fee providers available in the Mine Project service area. The only available method to meet compensatory mitigation requirements for the Mine Project is to prepare a Permittee Responsible Mitigation (PRM) plan. The PRM plan follows the watershed approach and 404 sequencing and components as outlined by 33 CFR 332.4(c).

As part of the PRM planning process, the types and locations of WOTUS being filled by this action were reviewed to determine if they could be reclaimed upon closure of the proposed Mine Project. The wetlands filled to create the roads, pits, and facility pads are small in size, less than 0.10 acre each; it is unlikely the removal of fill at the end of mining would create conditions to re-establish these WOTUS features.

An offsite and onsite compensatory mitigation feasibility study was conducted within the same watershed to identify potential compensatory mitigation sites in response to Mine Project impacts to jurisdictional aquatic resources. Offsite analyses revealed several properties that could be used for mitigation; however, land restrictions and unresponsive landowners have necessitated the focus on one property for mitigation.

Stream reaches experiencing instability that could benefit from restoration and enhancement activities, as well as channels worthy of preservation, were identified within the Mine Project study area. Additional wetland resources were located to offset Mine Project impacts.

The Mine Project will fill nine stream segments, with one classified as perennial and the remaining eight as intermittent. Total length and size of the stream channels impacted are shown in Table 1. Ephemeral channels are not jurisdictional and are not shown as impacted WOTUS.

Mine Project impacts include the filling/loss of seven small individual wetlands, totaling 0.28 acre (Table 1). All are classified as palustrine emergent (PEM), with the largest of the wetlands totaling 0.10 acre. Small wetlands without surface connections to other WOTUS are not shown in Table 1, as they are not jurisdictional.

This PRM plan describes how and where the mitigation activity will be implemented. GSV is committed to mitigating for the streams and wetlands lost (Table 1).

Table 1. Mine Project WOTUS Permanent Impacts

Stream	**NWI Code**	**Count**	**Length (feet)**	**Acres**	**Percentage of Project Impact**
Perennial Stream	R3UB	1	1,138	0.05	
Intermittent Stream	R4SB	8	9,514	0.40	
Stream Total		*9*	*10,652*	*0.45*	*0.03*
Wetland	**NWI Code**	**Count**	**Acres**		**Percentage of Project Impact**
Freshwater Emergent	PEM	7	0.28		0.01
Impacted Aquatic Resources Total			**0.73**		**0.04**
Impacted Uplands Total			**1,726.67**		**99.96**
Project Area Total			**1727.40**		**100.0**

Note: NWI = National Wetlands Inventory

The main access road and the various haul roads will cross streams and require culverts. The access road will be a combination of new and/or replacement of existing culverts and upgrading the current older series of culverts. Culverted streams are not considered filled or lost but will have lesser mitigation required; see Table 2.

Table 2. Mine Project Streams with Culverts

Stream	NWI Code	Count	Length (feet)	Acres
Perennial Stream	R3UB	6	1,486	0.10
Intermittent Stream	R4SB	8	1,733	0.06
Stream Total		**14**	**3,219**	**0.16**

2 Mitigation Plan Requirements

2.1 Objectives

The PRM Project proposes to restore, enhance, and preserve segments of tributaries/wetlands to the Humboldt River. Onsite, in-kind wetland restoration and stream enhancements in the Dixie Creek Valley watershed were evaluated with the following objectives:

- Protect channels with a stable pattern, profile, and dimension;
- Protect (cattle exclusion) and enhance existing riparian vegetation;
- Remove and replace invasive plants with native trees, shrubs, and herbaceous vegetation; and
- Restore lost in-stream function with geomorphic improvements and habitat augmentation.

2.2 Site Selection Criteria

Site selection to offset aquatic resources lost from the Mine Project were driven by land ownership and the desire to maintain water quality and quantity within the Dixie Creek Hydrologic Unit Code (HUC) 10 watershed. Lands within the same watershed as the mining impacts were evaluated and determined to be best suited for WOTUS restoration and rehabilitation. Sites were needed in extensive continuous corridors of aquatic resources large enough to be considered compensatory for the proposed Mine Project impacts and to benefit the watershed.

The PRM plan considered the following factors:

- **Proximity to Lost Wetlands and Streams:** The mitigation site(s) need to be within the same HUC 10 watershed of the impact to replace and restore aquatic resource functions and values impacted by Mine Project activities.
- **Potential for Site Restoration Success:** The restored aquatic habitat must be self-sustaining with existing hydrologic inputs.
- **Timing of the Mitigation:** A location where the PRM Project can be constructed concurrently with the Mine Project impacts in order to reduce the possibility of lag between the loss of aquatic resource functions caused by the Mine Project and the replacement of aquatic resource function with the PRM Project area.
- **Ecological Site Factors:** Restoration needs to increase aquatic habitat diversity, provide habitat for ecologically and socioeconomically important animal species, and help maintain water quality.
- **Water Rights and Sources of Water:** There are three water right points of diversion that are located approximately 1.29 miles north of the PRM Project and 2.52 miles north of the Mine Project

impact area. These points of diversion occur within an unnamed tributary to Dixie Creek, which is a separate reach from the PRM Project. Based on the proposed point of diversion and place of use maps for these three water rights, the points of diversion occur along three spring sites in Township 30 North, Range 53 East, Sections 1 and 2. These drainages empty into Dixie Creek downstream of the proposed PRM Project and thus will not affect the hydrology of the stream reaches in the PRM Project area.

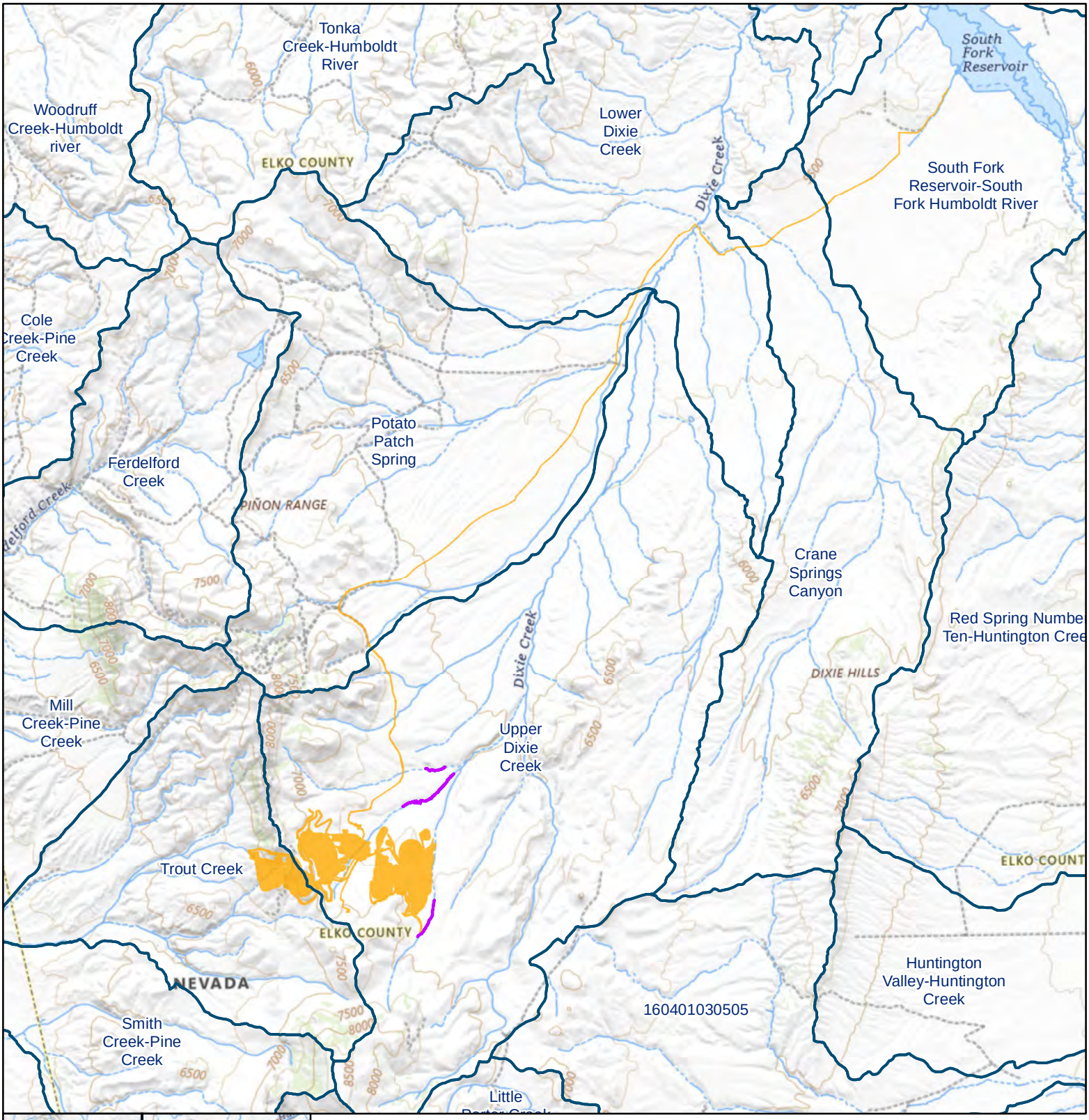
2.3 Site Protection Instrument

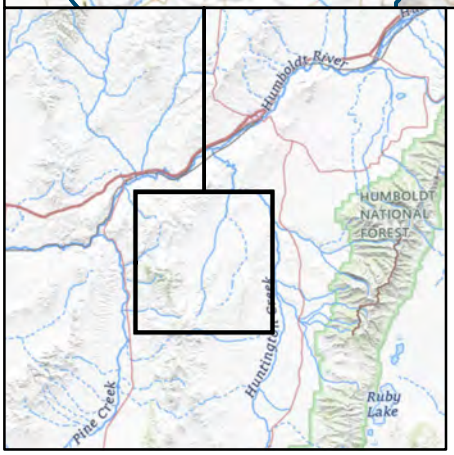
2.3.1 Ownership Agreements

The Permittee will be the owner of the PRM Project. A landowner agreement will require that the property owner records restrictive covenants or conservation easements on those portions of land designated for mitigation. The agreement will also designate right-of-way, access, and easements necessary to perform the required design, construction, and monitoring/maintenance activities within the mitigation areas of the property. It will also establish the right to enforce site protection measures for the Long-Term Steward of the PRM Project. Details of specific agreements will be coordinated with USACE during the Standard Permit review process.

2.4 Baseline Information

The proposed PRM Project occurs within the Mine Project area (Figure 1). The PRM Project occurs solely on private land owned by Lehi Mink on portions of Township 30 North, Range 53 East, Section 13, Mount Diablo Baseline and Meridian, which is subject to a surface use agreement with a purchase option between Lehi Mink and GSV. A coordinate reference for the northern boundary of the PRM Project is –115.950 longitude and 40.491 latitude (Figure 2).





Hydrologic Unit 12 Watershed Boundary

Mitigation Area

Fill Footprint

0 1.5 3 Miles

(At original document size of 8.5x11)

1:150,000 1 inch = 2.37 miles

N W E S

Client

Gold Standard Ventures

Project

South Railroad Project

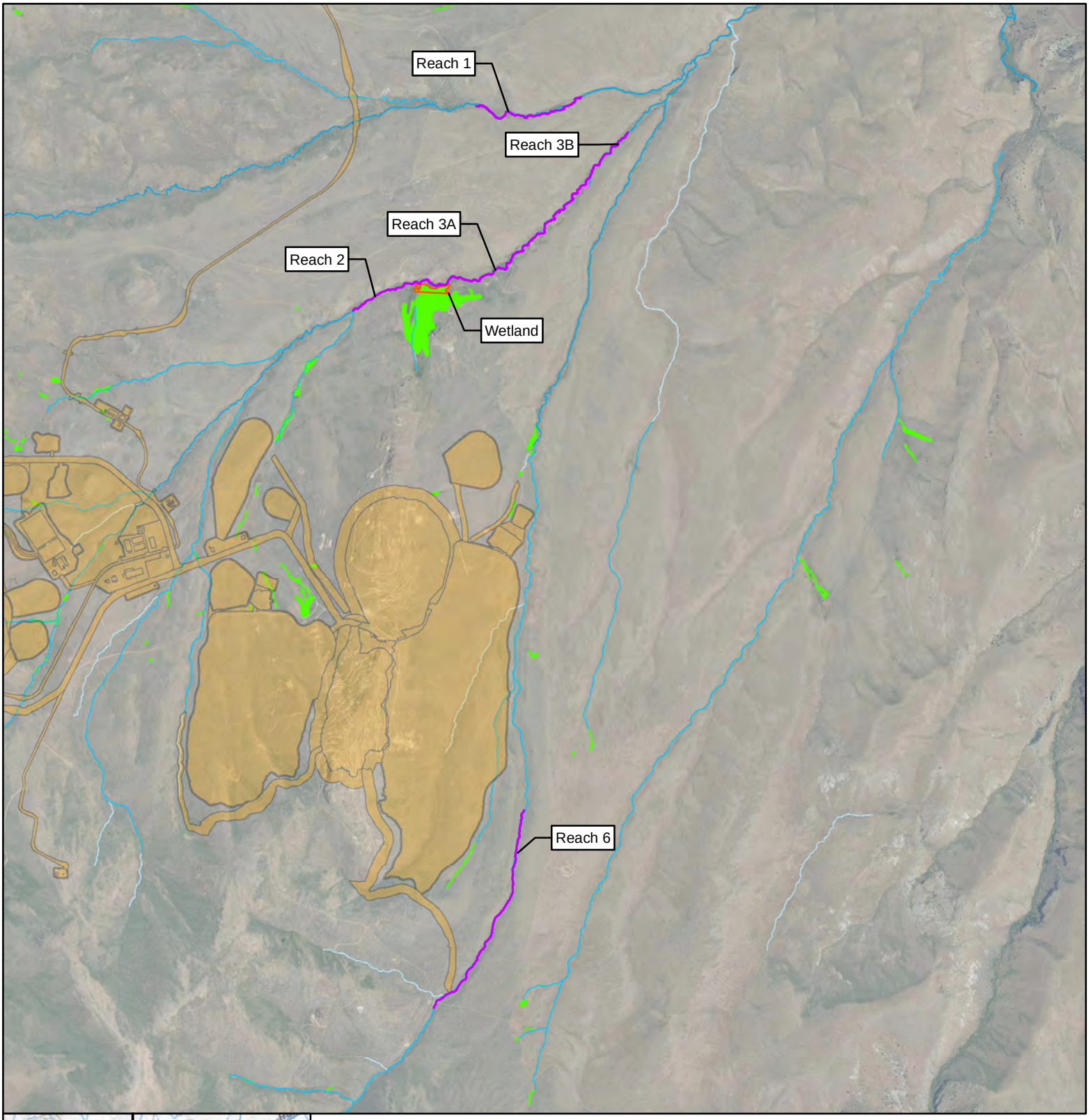
Figure

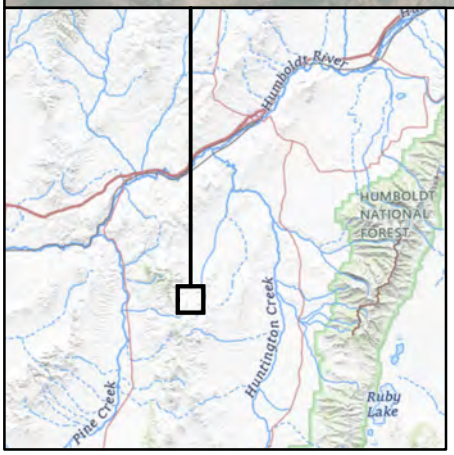
Mitigation Areas Overview

Figure Number

1

Stantec





Stream Mitigation Area
Wetland Mitigation Area
Fill Footprint

Mapped Aquatic Resource

Wetland
Pond
Ephemeral Stream
Intermittent Stream
Perennial Stream

0 2,000 4,000 Feet

(At original document size of 8.5x11)

1:28,000 1 inch = 2,333.33 feet

N
W E
S

Client

Gold Standard Ventures

Project

South Railroad Project

Figure

Mitigation Areas Detail

Figure Number

2

Stantec

The proposed PRM Project includes four reaches and a wetland northeast and downstream of the proposed Mine Project area. These stream systems are tributaries to the Humboldt River. The proposed PRM Project area contains valley-constrained degraded channels with limited access to grassland floodplains. Restrictions on stream geometry have led to actively eroding vertical stream banks and largely channelized reaches. Sediment generated from bank erosion and a lack of microhabitat diversity due to geometric instability has led to negative impacts on both water quality and functional habitat. Additional impacts include those from cattle grazing and crossing, which have contributed to bank instability and decreased the abundance of buffer and wetland vegetation.

The PRM Project proposes to restore, enhance, and preserve segments of tributaries/wetlands to the Humboldt River. Immediately upstream of the proposed mitigation area drains portions of Bunker Hill and the Piñon Range within land managed by the Bureau of Land Management (BLM). Headwaters of the proposed PRM Project reaches are largely stable with gradual bed slopes, abundant vegetation, and minimal human activity. Upstream of the mitigation reach proposed for preservation (Reach 6) includes portions of BLM land and riparian zone protected using cattle exclusion techniques. The mitigation reaches converge downstream to form a meandering stable channel within an open valley area. Stream banks along the reach are well vegetated and show minimal signs of instability. As an additional measure of protection, the restoration and enhancement areas will have in-stream grade control structures installed, which will protect against future headcutting. These features will also add habitat to the restored and enhanced system(s). As such, it is not anticipated that there are any current conditions or land use changes expected to adversely impact the water quality, channel stability, or physical habitat of the PRM Project.

Hydrology in the Mine Project impact area is dependent on the emergence of springs, storm events, and snowmelt. Baseline monitoring data show that flows in the spring are dominated by snowmelt/runoff and by storms in the summer and fall (Stantec 2022a).

Data from long-term monitoring indicated that Dixie Creek is characterized by net losing conditions from July to February and net gaining conditions during spring runoff from March to May (BLM 2025).

Springs are most likely perched features and are the origin for some intermittent and ephemeral stream channels' flow (Stantec 2022a).

2.4.1 Stream Impact Assessment, Methodology, and Quantification

As part of the compensatory mitigation assessment, Stantec performed a stream and wetland impact assessment within the proposed limits of disturbance of the Mine Project from September 9, 2019, to September 13, 2019, and have been revisited in 2022 and 2024. These efforts were designed to evaluate the quality and function of aquatic resources identified by the delineation that would be impacted by the footprint of the mine operations and facilities. The aquatic functional assessment was completed using the U.S. Environmental Protection Agency's (EPA's) Rapid Bioassessment Protocols (RBP) (Barbour et al. 1999). Table 3 details the RBP Habitat Assessment metric rating descriptions. Habitat Assessment Field Data Sheets from this assessment are provided in Appendix B, with photologs in Appendix C. Table 4 details the habitat condition rating assessed from field data collected during the survey and total impacts to jurisdictional channels associated with the Mine Project.

Prior to conducting fieldwork, Stantec consulted U.S. Geological Survey 7.5-minute topographical maps and the previously conducted onsite stream delineation to identify impacted channels within the limits of disturbance. All proposed jurisdictional stream impacts are unnamed tributaries to the Humboldt River within the Dixie Creek HUC 10. These streams are within a rangeland land use type. USACE was contacted in September 2019 to advise on existing quantitative protocols for assessing stream impacts. Stantec was notified that same month that no USACE-approved functional assessment methodology, or quantitative protocol, for the geographic area was available for aquatic resources at the time of assessment. As such, a qualitative protocol was chosen to assess stream impacts using methodology described in the EPA's RBP. Stantec received USACE's approval to use this methodology for the Mine Project area through email correspondence in September 2019.

The EPA's RBP were designed to provide a practical methodology for conducting cost-effective and qualitative habitat, biological, and water quality surveying within streams and wadeable rivers. To quantify impacts to streams within the Mine Project area, RBP-derived freshwater habitat surveys were performed to assess habitat quality within each reach. These methods involved ranking 10 habitat parameters between zero and 20, corresponding with Poor (0 to 5), Marginal (6 to 10), Suboptimal (11 to 15), and Optimal (16 to 20) parameter ratings. Categories included Epifaunal Substrate/Available Cover, Embeddedness, Velocity/Depth Regime, Sediment Deposition, Channel Flow Status, Channel Alteration, Frequency of Riffles (or Bends), Bank Stability, Vegetative Protection, and Riparian Vegetative Zone Width. All habitat parameters included standard category descriptions to assist with scoring (Table 3). A total habitat score was calculated for each reach by summing the individual metric scores. The corresponding total score was used to rate the overall habitat within the reach as Poor (0 to 59), Marginal (60 to 109), Suboptimal (110 to 159), or Optimal (160 to 200). Additionally, wetland impacts were evaluated as acres of wetland located within the Mine Project footprint. The associated linear feet of each channel, habitat rating, stream type, and acres of wetlands located were used to quantify impacts to the surrounding watershed (Table 4).

Table 3. RBP Habitat Assessment Metric Rating Descriptions

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover.	40% to 70% mix of stable habitat; well suited for full colonization potential.	20% to 40% mix of stable habitat. Substrate frequently disturbed.	Less than 20% stable habitat. Substrate unstable or lacking.
2. Embeddedness	Gravel, cobble, and boulder particles are 0% to 25% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 25% to 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50% to 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
3. Velocity/ Depth Regime	All four velocity/depth regimes are present.	Only three of the four regimes are present.	Only two of the four regimes are present.	Dominated by one velocity/depth regime (usually slow-deep).

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of bottom affected by deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment. 5% to 30% of bottom affected.	Moderate deposition of new gravel, sand, or fine sediment. 30% to 50% of bottom affected.	Heavy deposits of fine material. More than 50% of the bottom changing frequently.
5. Channel Flow	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel, or <25% of channel substrate is exposed.	Water fills 25% to 75% of the available channel, or riffle substrates are mostly exposed.	Very little water in channel and mostly present in standing pools.
6. Channel Alteration	Channelization absent or minimal. Stream with normal pattern.	Some channelization present but nonrecent.	Channelization may be extensive throughout 40% to 80% of the reach.	Greater than 80% of the stream reach is channelized.
7. Frequency of Riffles (or Bends)	Occurrence of riffles is frequent; ratio of distance between riffles divided by stream width is <7:1.	Occurrence of riffles infrequent; distance between riffles divided by stream width is between 7 and 15 ft.	Occasional riffle; distance between riffles divided by the width of the stream is between 15 and 25 ft.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by stream width is >25:1.
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5% to 30% of bank affected.	Moderately unstable; 30% to 60% of bank affected; high erosion potential during floods.	Unstable; many eroded areas; 60% to 100% of bank affected.
9. Vegetative Protection	More than 90% of stream bank surfaces and immediate riparian zone covered by native vegetation.	70% to 90% of stream bank surfaces and immediate riparian zone covered by native vegetation.	50% to 70% of stream bank surfaces and immediate riparian zone covered by vegetation.	Less than 50% of stream bank surfaces and immediate riparian zone covered by vegetation.
10. Riparian Zone Width	Width of riparian zone >18 meters; human activities have not impacted zone.	Width of riparian zone 12 to 18 meters; human activities have impacted zone minimally.	Width of riparian zone 6 to 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters.

Table 4. Aquatic Functional Assessment of Impacted Channels

Aquatic Functional Assessment Reach ID[1]	Aquatic Resources Inventory ID[2]	Facility	Stream Classification	Stream Length (feet)	Total Score	Habitat Condition Rating
D9	UDC-R4-07	Dark Star Diversion Ditch	Intermittent	51.1	125	Suboptimal
D9	UDC-R4-07	Dark Star Growth Media Stockpile	Intermittent	23.1	125	Suboptimal
C19	UDC-R4-10	Upper Heap Leach Pad	Intermittent	1,519.9	128	Suboptimal
C17	UDC-R4-10	Lower Heap Leach Pad	Intermittent	2,357.3	130	Suboptimal
C14–15	UDC-R4-10	Facility Pad	Intermittent	2,516.5	114, 125	Suboptimal
D28	UDC-R4-11	Upper Facility Pad	Intermittent	917.6	109	Marginal
D24–25	UDC-R4-12	Heap Leach Pad, Growth Media Stockpile	Intermittent	437.3	144, 146	Optimal
C29	UDC-R4-14	Diversion Ditch Terminus	Intermittent	32.2	132	Suboptimal
C28	UDC-R4-15	Waste Rock Facility, Dark Star East	Intermittent	1,659.1	79	Marginal
D29	UDC-R3-09	Lower Facility Pad	Perennial	1,138.3	133	Suboptimal
		Total		**10,652.4**		

1. Appendix B
2. *Consolidated Aquatic Resources Delineation Report* (Stantec 2024)

All channels filled by the Mine Project contain varying substrates and channel sizes. Most of the stream reaches were scored within the Suboptimal category (Table 4). High condition scores were largely due to the prevalence of stable and well-vegetated stream banks, low impacts related to human/cattle activity, lack of channelization, and high frequency of riffles. Despite Suboptimal scoring, many of the stream systems possessed poor epifaunal substrate availability, velocity, and depth regimes. Poorly scored assessment categories were largely due to the intermittent nature of most stream reaches and the subsequent lack of continuous flow. Reach assessment data and total scoring are provided in Appendix B. A photolog of the impacted stream channels appears in Appendix C.

Approximately 9,514 linear feet of intermittent channels and approximately 1,138 linear feet of perennial channels would be filled by the Mine Project (Table 1). In addition to channel disturbance, the Mine Project would impact approximately 0.28 acre of jurisdictional wetlands. Impacts to these resources are assumed to be a total loss of the resource, as they would be filled for construction of the proposed Mine Project.

2.5 Determination of Credits

Stantec identified existing onsite streams and wetlands that could be restored or enhanced through mitigation activities. Habitat Assessment Field Data Sheets from this assessment are provided in Appendix D. A photolog of each evaluated stream channel is provided in Appendix E. Table 5 details the aquatic functional assessment findings for the PRM Project.

Stantec conducted a qualitative assessment of stream and wetland degradation in the proposed PRM Project area (Table 5). Evaluations were determined based on indications of insufficient plan/pattern, dimension, and profile within existing reaches or disturbed hydrology and/or vegetation in existing wetlands. Stream reaches proposed in the PRM Project are considered perennial and intermittent.

Table 5. Aquatic Functional Assessment of Proposed PRM Project

Aquatic Functional Assessment Reach ID	Aquatic Resources Inventory ID*	Stream Classification	Comp. Length (feet)	Total Score	Habitat Condition Rating	Size (Acres)
Stream Reaches						
Reach 1	UDC-R3-12	Perennial	2,284	129	Suboptimal	1.16
Reach 2	UDC-R3-06&07	Perennial	2,108	113	Suboptimal	5.55
Reach 3A	UDC-R3-06	Perennial	1,103	132	Suboptimal	
Reach 3B	UDC-R3-05&06	Perennial	4,278	162	Optimal	
Reach 6	UDC-R4-14	Intermittent	6,116	188	Optimal	
	Channel Total		*15,889*			*6.71*
Wetland						
UDC-PEM-04		PEM				1.374

* "Aquatic Resources Inventory ID" is based on the 2024 *Consolidated Aquatic Resources Delineation Report* (Stantec 2024).

Streams to be filled total 10,652 linear feet of channel (Table 1). To approach the concept of no net loss of aquatic function, an aquatic function assessment was completed at each stream impact site (Table 4). Based on the data from the aquatic function assessment, proposed mitigation ratios were developed to determine mitigation requirements to reach no net loss of aquatic function based on USACE document 12501-SPD, *Regulatory Program Standard Operating Procedures for Determinations of Mitigation Ratios* (USACE 2021). Based on the aquatic functional assessments completed for both the Mine Project and the PRM Project (Table 4 and Table 5, respectively), impacts to intermittent stream reaches disturbed were assessed at a 0.77:1 mitigation ratio and impacts to perennial stream reaches disturbed were assessed at a 1:1.1 mitigation ratio. Previous assessment also included ephemeral stream resources, which were estimated to be at a 0.26:1 mitigation ratio (Appendix F), prior to removal of those resources as jurisdictional (recent legislative changes).

Table 6 lists the stream types filled and those that will have new culverts. Culverted streams are not considered filled, but there is some impact to aquatic function. Therefore, culverted perennial streams will be mitigated at the intermittent ratio and culverted intermittent streams will be mitigated at the ephemeral ratio.

Table 6. Mine Project Stream Mitigation Ratios

Impact	Stream	NWI Code	Count	Length (feet)	Ratio	Credit
Fill	Perennial	R3UB	1	1,138	1.1:1	1,252
	Intermittent	R4SB	8	9,514	0.77:1	7,326
Culvert	Perennial Stream	R3UB	6	1,486	0.77:1	1,142
	Intermittent Stream	R4SB	8	1,733	0.26:1	451
				Total Credits		**10,171**

Based on impacts associated with the Mine Project and the calculated ratios as shown above, a total of stream compensation credits of **10,171** would be needed to mitigate for the aquatic functional losses. The proposed PRM Project consists entirely of intermittent or perennial reaches and offers greater opportunities for watershed enhancement than those impacted. As such, it is Stantec's opinion that the proposed level of mitigation will exceed the negative effects of Mine Project construction as described in the impact summary (Table 4).

Based on the analysis utilizing the 12501-SPD *Regulatory Program Standard Operating Procedures for Determinations of Mitigation Ratios*, approximately 13,844 linear feet of stream channel activities and associated buffer would be required. The current PRM Project and associated design (Appendix G) provides 10,242 stream credits, which exceeds the compensatory mitigation requirement of 10,171. Table 7 details the compensation ratios for various mitigation tasks.

Of the 13,844 linear feet of streams proposed for compensation, they include approximately 7,477 linear feet consisting of stream channel enhancement that includes riparian enhancement and cattle exclusion and approximately 2,251 linear feet of stream channel restoration consisting of full dimension, pattern, and profile adjustments. Total acreage associated with riparian buffer mitigation consisting of stream buffer enhancement will be approximately 29.29 acres (which also includes 4,114 Liner feet of preservation), and total wetland mitigation consisting of wetland enhancement will be approximately 1.37 acres.

These watershed enhancements will include channel stability to increase water quality leading to biological uplift, which will benefit aquatic species and habitat. In addition, a 50-foot riparian buffer will be established on both sides of the stream channel with fencing and livestock exclusion to preserve vegetation.

A total of 0.28 acre of PEM wetlands would be disturbed by the Mine Project. While all these wetlands were classified as PEM, it is anticipated that given a reprieve from grazing pressure, they would naturally trend

toward wetlands with a woody vegetative component. Therefore, the plan for wetland compensation involves incorporating wetlands with woody components that would naturally exist in this ecosystem. Within the PRM Project, there is a wetland (UDC-PEM-04 from Table 5) that is adjacent to the stream mitigation area. Approximately 1.37 acres of this wetland are proposed for wetland enhancement. This ensures a 5:1 ratio for wetland mitigation activities, ensuring no net loss of these aquatic resources. As part of the wetland mitigation plan, wetland creation, in the form of oxbow wetlands, is to be incorporated into the mitigation matrix in addition to restoring and enhancing existing degraded wetlands.

Table 7. Compensation Ratios for Compensatory Mitigation Requirements

Total Length of Restoration Area					
Restoration/ Mitigation Type	**Preservation** Riparian Preservation, Cattle Exclusion	**Enhancement** Riparian Enhancement, Cattle Exclusion	**Enhancement** Bank Grading, Habitat Improvements, Cattle Exclusion	**Restoration** Full Dimension, Pattern and Profile Adjustments, Cattle Exclusion	
Length (linear feet)	4,116	5,696	1,172	2,251	
Compensation Length of Restoration Area Based on Ratio Adjustments					
Mitigation Type		**Length (linear feet)**			**Compensation Ratio**
Preservation					
Riparian Preservation	576				0.14
Livestock Exclusion	412				0.1
Enhancement					
Stream Bank Planting		513	160		0.09
Habitat Structures			196		0.11
Stream Bank Grading			267		0.15
Livestock Exclusion		1,139	356		0.2
Riparian Enhancement		2,164	677	855	0.38
Restoration				2,251	1
Livestock Exclusion				675	0.3
Subtotal (linear feet)	*988*	*3,816*	*1,656*	*3,782*	
Credit Grand Total			**10,242**		

2.6 Mitigation Work Plan

2.6.1 Compensatory Mitigation Design and Construction Specifications

Stream and buffer restoration, enhancement, and preservation will utilize standard design techniques to create a resilient and productive ecosystem. Wetland restoration, creation, and enhancement will focus on creation of oxbow wetlands in abandoned stream channels and enhancement of existing degraded wetlands through cattle exclusion and woody species planting. The goal of the design will be to create a largely self-sustaining, functional aquatic system to replace the functional values of streams and wetlands anticipated to be adversely affected within the proposed Mine Project impact area. All existing and prospective demand for mitigation compensation is expected to be satisfied by the proposed PRM Project. Some of the targeted functions will include improvements to aquatic and terrestrial wildlife habitat, water quality, and erosion control. Erosion control will be mitigated through the implementation of natural channel design, bank stabilization and bioengineering techniques, grade control, in-stream structures, and the removal of detrimental land use activities (e.g., cattle grazing) in the immediate riparian corridors. The re-establishment, enhancement, and/or preservation of riparian buffers will also contribute to this erosion control. These mitigation practices are expected to increase the ecological value of the PRM Project, enabling it to more efficiently replace functional values of streams and wetlands anticipated to be impacted as part of the Mine Project.

2.6.2 Compensatory Mitigation Determination and Construction Methods

Details regarding establishment of desired plant communities, grading plans, elevation and slopes, soil management, erosion control measures, planform geometry, channel form (including cross sections), and riparian establishment are described below and illustrated in the Plan Set provided in Appendix G.

2.6.3 Compensatory Mitigation Work Plan

The proposed PRM Project includes four reaches and a wetland northeast and downstream of the proposed Mine Project impact area (Figure 2). This section provides details on the compensatory mitigation proposed.

- Reach 1 includes eroding valley walls, partly due to cattle crossing, and insufficient geometry along stream bends.
- Reach 2 contains unstable slopes, large vertical eroding banks, and channelized sections. The wetland area located along Reach 2 has been impacted by cattle grazing outside the fenced area, reducing the abundance of vegetation.

- Reach 3 includes a partially braided channel with vertical bank erosion and sections of beaver impoundments.
- Reach 6 includes stream preservation and cattle exclusion.

Enhancement activities are proposed for Reach 1 and the wetland area along Reach 2, which will include channel realignment and planting. Reach 2 contains proposed restoration and enhancement through channel realignment, centerline slope stabilization, and the creation of stable bank angles. Reach 3 includes channel realignment for restoration and preservation of stable areas. Reach 6 is full preservation, and all areas will include 50-foot buffers and cattle exclusion, promoting the creation of stable riparian vegetative communities. All cattle exclusion fencing will be installed to avoid culturally sensitive areas but will be adjusted to meet the agreed-upon average buffer widths.

A variety of mitigation treatments are proposed for the reaches described above, and treatments are illustrated in Appendix G. The four primary treatment types are described in Table 8.

Table 8. Mitigation Type Descriptions

Mitigation Type	Description
Type 1: Lower bank stabilized slope adjustment	Includes slope grading and removing approximately 6 to 12 inches of the vegetated top of bank surface with sufficient root mass to maintain integrity of vegetated mat. In this treatment, the eroded bank will be over-excavated to sufficient depth, allowing the vegetated mat to sit in over-excavated areas with vegetated surface at final grade, to maintain 2:1 to 3:1 side slope.
Type 2: Lower bank stabilized slope adjustment	Includes restoring channel slope following bank dimensions of typical riffle. In this treatment, the reinforced bed mix shall extend up to bankfull elevation; any area above bankfull should be graded at no steeper than 3:1 slope and stabilized with coir fiber matting and seeded immediately upon reaching final grade. In this treatment type, the exposed vertical bank will be at approximately the same level as the bankfull elevation.
Type 3: Willow bench enhancement	Similar to Type 2, Type 3 includes restoring channel slope following bank dimensions of typical riffle. In this treatment, the reinforced bed mix shall extend up to bankfull elevation; any area above bankfull should be graded at no steeper than 3:1 slope and stabilized with coir fiber matting and seeded immediately upon reaching final grade. In this treatment, existing willows and associated root masses will be entirely avoided and benches installed directly behind existing vegetation.
Type 4	Includes six to nine inches of over-excavation, or as required, to adequately transport existing herbaceous plant material with sufficient root mass. This type includes laying back the top three to four inches of bare, vertically unstable banks at 3:1 slope.

Detailed drawings for additional mitigation methods are also included in Appendix G, as identified in Table 9 below.

Table 9. Additional Mitigation Features and Methods

Mitigation Features/Methods	Reference Sheet in Appendix G
Constructed riffle, geotextile placement, meander bend facets for alluvial channels	Sheet 22
Rock toe protection, brush trench	Sheet 23
Boulder jam step	Sheet 24
Erosion control matting, headcut stabilization	Sheet 25
Beaver dam spillway stabilization, harvested sod mat, clay plug, existing shrub relocation	Sheet 26
Fencing	Sheet 27

The following is a general description of the mitigation types and methods that will be applied to Reaches 1, 2, 3, and 6 for the PRM Project. The Plan Set for the PRM Project is located in Appendix G. Reference sheets for various design elements are noted in the reach descriptions below.

The goal of the PRM Project is to protect channels with a stable pattern, profile, and dimension, as well as stabilize actively eroding banks from the pumping of groundwater. Natural channel design will be used with data collected from identified reference reaches to develop design geometry and stream bank stabilization techniques. Grade control structures will be installed within portions of the PRM Project reaches to improve the likelihood of a successful restoration project. Existing vegetation will be protected, and invasive plants will be removed and replaced with native trees, shrubs, and herbaceous vegetation.

2.6.3.1 Reach 1

Reach 1 is the northernmost reach in the proposed mitigation design area, located at the lowest elevation (approximately 6,050 to 6,140 feet above mean sea level [amsl]), with water in this reach flowing east. For Reach 1, plan and profile design drawings are on Sheets 4 through 6, cross sections are on Sheet 18, erosion and sediment control measures are on Sheets 28 and 29, and planting plans are on Sheets 37 and 38.

Proposed mitigation for Reach 1 includes multiple treatments. Willow bench enhancement (Type 3 treatment) is recommended on multiple segments of the right and left banks of the reach (Sheets 4 and 5). Mitigation consisting of seed and mat/straw placement of denuded areas is recommended along the westernmost stretch of Reach 1 (Sheet 4).

Mitigation on slopes 2:1 or gentler includes seed and mat placement on denuded areas of the bank, and bed material will be salvaged for channel lining in realignment areas (Sheets 5 and 6). Mitigation also includes transplanting willows that will be displaced in the channel realignment area or impacted by subsequent grading to a temporary onsite location (Sheet 5). Following grading operations, willows will be replanted on outer bends of the channel at the base above the bankfull elevation or along the toe of the valley wall in the floodplain (Sheets 5 and 6). When existing willows cannot be avoided, every effort will be made to salvage and replant willow clumps that will otherwise be disturbed in stream restoration activities.

Salvaged willows will be kept watered and relocated in floodplain areas, prioritizing placement in areas of high shear stress (outer bends) and along toes of eroded valley slopes (Sheet 4).

Heavy and light planting of the upland riparian buffer will include upland species including Wyoming big sagebrush (*Artemesia tridentata* ssp*. wyomingensis*), greasewood (*Sarcobatus vermiculatus*), and rubber rabbitbrush (*Ericameria nauseosa*), among other species. Within the floodplain riparian buffer, light planting will include a variety of facultative wetland (FACW) species including red osier dogwood (*Cornus sericea*) and coyote willow (*Salix exigua*) and facultative upland (FACU) species including Woods' rose (*Rosa woodsii*). A stabilization seed mix of various FACU, FACW, and upland species will be applied in the upland areas in Reach 1. More details of species and planting specifications are found on Sheets 37, 38, and 45.

2.6.3.2 Reach 2

Reach 2 is in the westernmost stretch of the middle drainage in the PRM Project area and ranges in elevation from approximately 6,170 to 6,230 feet amsl. The water in this reach flows northeast. Reach 2 crosses through the western portion of the existing wetland area (UDC-PEM-04 from Table 4) where seeps and springs are the sources of perennial flow to the lower reach of Channel 2. For Reach 2, plan and profile design drawings are on Sheets 7 through 9, cross sections are on Sheet 19, erosion and sediment control are on Sheets 30 and 31, and planting plans are on Sheets 39 and 40.

Proposed mitigation for Reach 2 includes channel restoration along multiple segments of the reach (Sheets 7, 8, and 9). Restoration includes transplanting willows that will be displaced within channel realignment areas (or by subsequent grading) in temporary onsite locations. Following grading operations, willow clumps will be replanted on outer bends of the channel or along toes of valley wall in the floodplain (Sheet 8).

Mitigation will include Type 2 treatment along multiple segments of the left and right banks of the reach (Sheets 7 and 8). Mitigation will also include Type 1 mitigation treatment along multiple segments of the left and right banks of the reach (Sheets 7, 8, and 9). Mitigation includes channel restoration on several segments of the reach (Sheet 7). Along one segment of the reach, mitigation includes Type 1 treatment on the right bank and reinforcing the channel bottom with bed mix up to the bankfull elevation (Sheet 9).

Along two segments of the reach, mitigation will include plants staggered in a double row of shrubs at four feet on center along the left bank, with seed and mat placed at denuded areas of the bank (Sheet 8). Mitigation will also include willow planting at the base of the valley above the bankfull elevation (Sheet 9).

Along one segment of the reach (at approximately Station 18+00), a Type 4 treatment will occur on the left valley wall (Sheet 8). For slopes 2:1 or gentler, seed and mat will be placed in denuded areas of the bank. Bed material will be salvaged for channel lining where needed as part of realignment. Clay plugs will be installed at the top and bottom of abandoned channels; abandoned channels will not be backfilled (Sheet 8).

Planting plans for Reach 2 include heavy and light planting within the upland riparian buffer of upland species including Wyoming big sagebrush, greasewood, and rubber rabbitbrush. Within the floodplain riparian buffer, heavy and light planting will include a variety of FACW species including red osier dogwood, coyote willow, and narrowleaf cottonwood (*Populus angustifolia*), as well as FACU species including

Woods' rose. Planting in the wetland buffer for Reach 2 will include red osier dogwood and coyote willow. A stabilization seed mix of various FACU, FACW, and upland species will be applied to the upland areas, and one obligate (OBL) species, Nebraska sedge (*Carex nebrascensis*), will be applied within the floodplain areas within Reach 2. More details of species and planting specifications are found on Sheets 39, 40, and 45.

2.6.3.3 Reach 3A

Reach 3A is between Reach 2 and 3B and ranges in elevation from approximately 6,120 to 6,170 feet amsl. Reach 3A crosses through the eastern portion of the existing wetland area (UDC-PEM-04). For Reach 3A, plan and profile design drawings are on Sheets 10 and 11, cross sections are on Sheet 20, erosion and sediment control are on Sheet 32, and planting plans are on Sheet 41.

Mitigation includes headcut stabilization and side channel stabilization treatments along multiple segments of the reach. Channel restoration will be completed on certain segments where abandoned channels will be filled, and willows will be transported at the base of eroded valley walls (Sheets 10 and 11). Mitigation will also include Type 1 treatment on a segment on the left bank and Type 4 treatment on multiple segments of the right bank (Sheets 10 and 11).

Planting plans for Reach 3A include heavy and light planting within the upland riparian buffer of a variety of upland species including Wyoming big sagebrush, greasewood, and rubber rabbitbrush. Within the floodplain riparian buffer, heavy and light planting will include a variety of FACW species including red osier dogwood, coyote willow, and narrowleaf cottonwood, as well as FACU species including Woods' rose. Planting in the wetland buffer for Reach 3A will include red osier dogwood and coyote willow. A stabilization seed mix of various FACU, FACW, and upland species will be applied in the upland areas, and one OBL species, Nebraska sedge, will be applied within the floodplain areas within Reach 3A. More details of species and planting specifications are found on Sheets 41 and 45.

2.6.3.4 Reach 3B

Reach 3B is the northeasternmost stretch of the channel and ranges in elevation from 6,110 to 6,120 feet amsl, flowing northeast. For Reach 3B, plan and profile design drawings are on Sheets 12 through 16, cross sections are on Sheet 21, erosion and sediment control are on Sheets 33 through 35, and planting plans are on Sheets 42 through 44.

Mitigation for multiple segments of this reach will include channel restoration, including filling abandoned channels, headcut stabilization, side channel stabilization, and beaver dam spillway stabilization treatments (Sheets 12 through 16). Along the middle segment of this reach, approximately Station 53+70, the typical cross section of the channel will be restored and relic beaver dams will be removed to open up the floodplain (Sheet 13). Mitigation will also include Type 4 treatments along segments of the left and right banks (Sheets 12 and 13). Additionally, a double row of livestakes will be placed along the lower segment of the channel (Sheet 16).

Planting plans for Reach 3B include heavy and light planting within the upland riparian buffer with a variety of upland species including Wyoming big sagebrush, greasewood, and rubber rabbitbrush. Within the floodplain riparian buffer, heavy and light planting will include a variety of FACW species including red osier dogwood, coyote willow, and narrowleaf cottonwood, as well as FACU species including Woods' rose. A stabilization seed mix of various FACU, FACW, and upland species will be applied in the upland area, and one OBL species, Nebraska sedge, will be applied within the floodplain areas within Reach 3B. More details of species and planting specifications are found on Sheets 42 through 45.

2.6.3.5 Reach 6

Reach 6 is located in the southernmost portion of the mitigation area (see Insert Map, Sheet 3). Cattle exclusion fencing will be implemented as a preservation measure to prevent downstream impacts to aquatic resources. The fencing plan for Reach 6 is illustrated on Sheets 46 and 47.

2.6.3.6 Construction Timing and Phasing

Notes for construction, erosion, and sediment control are included on Sheet 36. The planting schedule and additional planting details are included on Sheet 45. In general, construction will occur in two phases. Phase one will be site preparation, which includes a preconstruction contractor meeting, installing temporary stone access roads, installation of perimeter controls and tree protection, and implementation of phase one erosion and sediment control measures. Phase one also includes clearing and grubbing operations, tree removal (as needed), installation of timber mats, mulch or gravel access road stabilization, and invasive plant species removal. Phase two consists of the stream restoration construction activities discussed above and detailed in the Plan Set (Appendix G). Work will be completed upstream to downstream. In-stream work will be completed in the dry, approved clean water diversion measures (i.e., check dam and pump around diversion pump with dewatering bag) to reduce sediment-laden water discharge into the stream channels. Daily construction segments will be determined by the contractor, but the streams will be permanently or temporarily stabilized and reconnected at the end of each workday. Phase two will also consist of demobilization after restoration activities are completed and approved, and removal of temporary erosion and sediment control measures will occur within 30 days after the final site walkthrough with the engineer of record and USACE representative. Planting of woody vegetation will be conducted during phase two but cannot be completed within the construction window and will follow the planting specifications and schedule detailed in the Plan Set (Appendix G).

2.6.3.7 Channel Water Discharge Impacts

Excess water generated from the dewatering system associated with Mine Project dewatering operations will be pumped to the water treatment and discharge system. Treated water will be piped and discharged to a riprap-lined plunge pool in the existing drainage to dissipate energy from the discharge. This discharged water will flow through Reach 2, Reach 3A, and Reach 3B of the PRM Project. A section of haul road that crosses the drainage will be incorporated into the design of the plunge pool to provide retention capacity to further control the force of the discharge. The plunge pool is designed to maintain a minimum depth of three feet of water and not exceed total stored volume of 20 acre-feet or exceed a total depth of 20 feet

during the design storm event. Drainage culverts will also be installed in the existing drainage through the haul road crossing and be incorporated into the plunge pool design in order to manage the discharge into the existing drainage. This activity will require a National Pollutant Discharge Elimination System permit from the Nevada Division of Environmental Protection (EM Strategies 2022). Following the first four years of dewatering, groundwater pumping rates will be decreased to meet consumptive use demands; thus, no discharge will be required (Stantec 2022b). Stream restoration designs have accounted for the hydrologic and hydraulic conditions entering the PRM Project to ensure proper dimensional sizing, plan/pattern, profile, and in-stream habitat structures.

2.7 Maintenance Plan

The Permittee shall maintain the PRM Project during operation in addition to construction, monitoring, and adaptive management as needed. The Maintenance Plan is a description and schedule of maintenance requirements to ensure the continued viability of the mitigation resources from PRM Project approval to the start of long-term management. The Permittee shall continue with such maintenance activities until the PRM Project is closed and the Long-Term Steward assumes its responsibilities.

Upon the conclusion of the 10-year monitoring period, the Permittee will revisit this Maintenance Plan and submit an updated Maintenance Plan, if warranted.

The following regular maintenance and bookkeeping will be conducted for the PRM Project, at a minimum:

- Maintain an activities ledger, which describes the date, purpose, description of activities performed, and outcome of each maintenance visit. This ledger is not required to be submitted on a regular basis but may be requested by USACE at any time;
- Conduct regular inspections of all mitigation areas, including preservation areas, particularly during non-reporting years of operation (annual inspections recommended, at a minimum);
- Maintain and repair all mitigation areas to meet or exceed the objectives and functions of the PRM Project, including all mitigation-related berms and structures;
- Proactively manage invasive and noxious weed species in the PRM Project area;
- Ensure that no trespass, illegal dumping, or trash accumulation occurs on the PRM Project;
- Post and repair PRM Project limits and conservation easement signs;
- Maintain, repair, and/or replace fences, as necessary;
- Maintain and repair maintenance access roads, as necessary; and
- Other maintenance responsibilities to PRM Project operation and adaptive management.

2.8 Performance Standards

The wetland Performance Standards should demonstrate that the wetlands that were preserved, enhanced, restored, or created meet the intended objectives and functions of the PRM Project. The stream Performance Standards should demonstrate that the stream channels that were preserved, enhanced, or restored meet the intended objectives and functions of the PRM Project, attaining dynamic equilibrium. The Permittee and USACE will use monitoring reports, visual observations, and best professional judgment to evaluate attainment of Performance Standards and in determining whether the PRM Project has met its goals and objectives or whether corrective action or adaptive management is warranted. Any decision on whether the PRM Project meets the Performance Standards is within the sole discretion of USACE.

The PRM Project will utilize the *Regulatory Program Uniform Performance Standards for Compensatory Mitigation Requirements* (12505-SPD) South Pacific District 12505.1 Table of Uniform Performance Standards for Compensatory Mitigation Requirements (USACE 2012), as applicable to the PRM Project, to determine whether the PRM Project is achieving its objectives (Appendix H). Considering the purpose, location, and nature of the PRM Project, Performance Standards will monitor native vegetative coverage, longitudinal profile and cross-sectional deviations from as-built dimensions, and in-stream habitat quality because of surface and/or substrate diversity.

2.9 Monitoring Requirements

During the geomorphic assessment of the current channel conditions, a reference stream channel was found just downstream of the PRM Project area. This reference stream channel has provided target geomorphic ratios for the proposed compensatory restoration and enhancement activities, further augmenting the design assumptions for the PRM Project. The reference feature will also be used to document the Performance Standards to demonstrate the success of the proposed PRM Project (postconstruction), as it provides a direct comparative measure on how changes in the watershed are affecting the local aquatic resources.

2.9.1 Monitoring and Reporting Requirements

After the PRM Project is completed, the Permittee shall monitor the PRM Project according to the PRM Project–specific monitoring requirements (presented below). The Permittee shall not deviate from these monitoring requirements without written approval from the regulatory agencies.

The performance monitoring period for this PRM Project shall be over 10 years. The monitoring period begins at the end of the first full growing season following PRM Project completion, and the year one monitoring report is due January 31 of the year following each monitoring year. The Permittee shall prepare and submit monitoring reports during years one, two, three, five, seven, and 10 of the monitoring period. Monitoring reports may also be requested by USACE during any non-monitoring years (years four, six, eight, and/or nine) at the reasonable discretion of USACE and may be limited to monitoring of areas that did not attain Performance Standards or require adaptive management as identified in previous monitoring

reports or site visits. If the Permittee fails to submit one or more required monitoring reports, USACE may require one or more additional years of monitoring and reporting to document PRM Project compliance.

USACE may reduce the monitoring period or monitoring requirements if it concludes that the PRM Project has met its Performance Standards and that the full monitoring requirements are not necessary to ensure that the PRM Project will meet its objectives. Conversely, USACE may extend the monitoring period if it is determined that Performance Standards have not been met or the PRM Project is not on track to meet its objectives. Even if the monitoring period or monitoring requirements are reduced, USACE may require a full year 10 monitoring report in order to provide a baseline for long-term management. In no case shall a reduction of monitoring requirements be interpreted to preclude USACE from requiring this year 10 report.

2.9.2 As-Built Monitoring and Reporting

An as-built report shall be submitted to USACE within 90 days of completion of mitigation activities for the PRM Project. The as-built report shall include comparisons of the design plan to the as-built plan, using the following components:

- Plan view maps of the stream channel enhancements, stream channel restoration, stream buffer enhancement, and wetland enhancement that depict the PRM Project boundaries, as-built topography, all mitigation activities (including buffer activities), and the locations of all monitoring stations (photograph stations, anticipated vegetation sampling plots, wetland monitoring areas, soil-boring locations, stream gages, precipitation gages, cross sections, longitudinal profiles, pattern and bank vegetation monitoring stations, chemical and biological monitoring stations, etc.);
- As-built longitudinal profiles of stream reaches taken from permanent locations and overlaid with and compared to design longitudinal profiles;
- As-built cross sections of stream reaches taken at locations and overlaid with and compared to design cross sections;
- Photographs of the completed construction taken at permanent photograph stations;
- Summary stream geomorphologic data presented in a side-by-side comparison of the design, reference, and as-built channels;
- Planting composition, locations, and densities; and
- Details of any modifications that were made during construction, explaining the reasoning for the modifications.

2.9.3 General Mitigation Monitoring Guidelines

Monitoring activities will follow the timing and guidelines set forth in the monitoring and reporting sections according to the following monitoring schedules, requirements, and reporting requirements. General conditions on monitoring and reporting include the following:

- For any year in which planting was conducted, monitoring of vegetation shall take place at least six months following planting.
- Monitoring of all vegetation shall be conducted during the growing season.
- After year two, physical monitoring of stream condition (e.g., longitudinal profiles, cross sections, and pattern monitoring) may be conducted outside the growing season.
- If all Performance Standards have not been met in the 10th monitoring year, then a monitoring report may be required for each consecutive year until two sequential annual reports indicate that all criteria have been satisfied.
- For stream chemical and biological monitoring, the monitoring event shall occur consistently in either the spring or fall of each monitoring year. Spring sampling shall be conducted between March 1 and May 31. Fall sampling shall be conducted between September 1 and November 30.

2.9.4 Mitigation Monitoring and Reporting

All monitoring reports, other than the as-built report, will include the following general items in addition to all monitoring and reporting requirements that are relevant to the PRM Project:

- Title page, including, where applicable, the PRM Project name, site name, phase, monitoring year(s), requested actions (bond release, adaptive management, etc.), Permittee identification (name, address, phone number, and email address), and report preparer identification (name, address, phone number, and email address);
- Vicinity map of the PRM Project area, including latitude and longitude at the entrance of the PRM Project;
- A section with all Performance Standards and monitoring requirements for the PRM Project;
- Complete maintenance summary for the PRM Project, including any adaptive management or corrective action (e.g., supplemental planting, structure repair, invasive treatment, etc.);
- A map or drawing based on the as-built drawings of the PRM Project that depicts topography, all mitigation activities, and the locations of all monitoring stations (permanent photograph stations, vegetation sampling plots, wetland monitoring locations, soil-boring locations, stream gages, precipitation gages, cross sections, longitudinal profiles, pattern monitoring stations, etc.);
- Overall Performance Standard table for the PRM Project, showing each plot, cell, or area and whether that area met Performance Standards during the current monitoring year and each previous monitoring year;
- Beginning year three, a detailed narrative discussing the objectives of the PRM Project, as described in the Mitigation Work Plan, and the degree to which the PRM Project meets those objectives; and

- Corrective action plan, if necessary, including the current deficiencies or issues within the PRM Project; proposed adaptive management, corrective actions, or maintenance activities; and an estimated schedule for completion.

2.9.5 Riparian or Upland Buffer Monitoring and Reporting

In all restored or enhanced riparian and upland buffer areas, monitoring and reporting will be driven by the Performance Standards for vegetation and will include the following:

2.9.5.1 Vegetation

2.9.5.1.1 Monitoring

Scrub/Shrub (i.e., Woody) Monitoring Plots

Riparian and/or upland buffers shall be stratified into relatively homogeneous sample areas. These sample areas may correspond to planting zone proposed habitat, cover/community type, or other characterizations. These sample areas do not have to be contiguous. Appropriate methods shall be used to randomly locate woody plots within sample areas (transects with random number generators, geographic information system randomization methods, etc.). Plots shall be re-established in new random locations each year. Woody plots shall be circular in dimension and measure 1,076 square feet (ft^2) (100 square meters), which is equivalent to a circle with a radius of 18.5 feet (5.6 meters). This plot size equates to 0.025 or $1/40$ of an acre, which provides a multiplier of 40 times for stem density conversion to per-acre values. At a minimum, the total area covered by woody plots shall be at least two percent of the sample area (Table 10). However, additional plots will be required if the number of plots is determined to be inadequate. Sampling adequacy can be determined using a variety of methods (e.g., species-area curves leveling off, variance stabilization, etc.) and shall be included in all monitoring reports. Conversely, after three years of sampling, if sampling adequacy analysis indicates oversampling, the number of plots may be reduced.

The woody vegetation data collected shall include identification of all live woody stems found in the sampling plot by scientific and common name with corresponding wetland indicator status, native status, stem count, dominant species, stem diameter at groundline (SDG; see below), stem height, overall canopy coverage, or others, as required by the Performance Standards.

The SDG of all individual woody vegetation (any height or diameter) including trees and shrubs should be measured to the nearest 0.1 inch. If significant swelling or malformation is present, the SDG should be measured directly above where the stem returns to normal taper. For multi-stemmed vegetation, the SDG for each individual stem should be measured and combined following conversion to stem area at groundline (SAG). This effectively forms a single stem for each individual. Total SAG shall be presented as ft^2/acre for each plot, and average SAG with measures of variance (e.g., standard deviation) shall be presented for each sample area.

Table 10. Plots per Acre for Woody Vegetation Sampling

Sample Area (acres)	Number of Plots	Sample Area (Acres)	Number of Plots
1–5	4	28, 29	23
6	5	30	24
7, 8	6	31	25
9	7	32	26
10	8	33	27
11	9	34, 35	28
12	10	36	29
13, 14	11	37	30
15	12	38	31
16	13	39, 40	32
17	14	41	33
18, 19	15	42	34
20	16	43	35
21	17	44, 45	36
22	18	46	37
23, 24	19	47	38
25	20	48	39
26	21	49	40
27	22	50+	Add 1 plot per 2 acres

1. For sample areas one to five acres in size, four plots are recommended to ensure the number of plots is adequate to appropriately assess monitoring adequacy.

Herbaceous Monitoring Plots

Herbaceous monitoring plots shall be located on a stratified random basis within riparian and upland buffers (as described above). Herbaceous vegetation sampling plots shall be square sampling frames with inside dimensions of 3.3 × 3.3 feet (1 × 1 meter), which is equivalent to an area of 10.8 ft^2 (1 square meter) or equivalent-sized circles.

A minimum of five herbaceous plots per acre is required. However, additional plots will be required if the number of plots is determined to be inadequate for determining mitigation success. Sampling adequacy can be determined using a variety of methods (e.g., species-area curves leveling off, variance stabilization, etc.) and shall be included in all monitoring reports. Conversely, after three years of sampling, if sampling adequacy analysis indicates oversampling, the number of plots may be reduced.

The vegetation data collected shall include identification of all herbaceous species found in the sampling plot by scientific and common name with corresponding estimate of absolute percent cover (including bare ground and/or open water), indicator status, native status, or others, as required by the Performance Standards. For estimating herbaceous species cover, it is recommended that cover classes be used, taking the midpoints of the classes for data analysis. Table 11 describes the cover classes that are recommended.

Table 11. Recommended Cover Classes for Herbaceous Vegetation Sampling

Class	Range (Percent)	Midpoint (Percent)[1]
1	0–1	1
2	1–5	3
3	5–25	15
4	25–50	38
5	50–75	63
6	75–95	85
7	95–100	98

1. Percentages are rounded to the nearest whole integer.

2.9.5.1.2 Reporting

The monitoring report shall include raw and summary vegetation data. The raw data can be submitted as a supplementary Microsoft Excel file and should include all vegetation data from all plots. The summary of the vegetation data shall present the averages, variance, totals, etc., for each stratum (homogeneous sample area described above), preferably in table form. These summary tables shall include comparisons of summarized data to all applicable Performance Standards. For riparian and upland buffer areas, these summary tables may include the following data (depending on the approved Performance Standards): woody stem density (stems/acre), canopy coverage (percentage), woody vegetation height (feet), change in tree height (percentage/year), SAG (ft^2/acre), herbaceous plant cover (absolute percentage), and location and cover of invasive or noxious weed species.

2.9.5.1.3 Photographs

Visual observations shall be documented and provided with each monitoring report with the following:

Either ground-level photographs will be taken facing north, south, east, and west from stations located adjacent to each vegetation plot or a one-color aerial photograph (8 inches × 10 inches or larger) depicting the entire site will be taken. An aerial photograph should be taken after site construction (including planting) and again in the fifth and 10th monitoring years. Existing aerial images (if current) may be substituted (i.e., Google Earth images or state aerial images). One aerial photograph may be used for the whole PRM Project site, including any riparian, upland, or wetland mitigation areas.

2.9.6 Wetland Restoration/Creation/Enhancement Area Monitoring and Reporting

In restored, created, or enhanced wetland areas, monitoring and reporting will be driven by the Performance Standards. Below is a description of these Performance Standards (see Section 2.8 and Appendix H).

2.9.6.1 Hydrology

2.9.6.1.1 Monitoring

The number and location of monitoring wells or other soil saturation measurement devices shall be sufficient to demonstrate that the Performance Standards for wetland hydrology are met for the proposed wetland type. The proposed monitoring well number and location shall be included on the overall proposed monitoring map in the as-built report. A minimum of one monitoring well per two acres will be required.

Specific details on the soil saturation measurement device and location or groundwater monitoring wells will be coordinated with USACE during the Standard Permit review process and will be approved by USACE.

The depth of water and the hydroperiod will be measured to demonstrate that the appropriate hydrogeomorphic standards have been met and that they are similar to the target wetland type or reference wetland. During the first two years, at least six months of water level data will be obtained, with timing sufficient to confirm the length and depth of near-surface saturation and/or ponding and the overall depth of the dry-season water level drawdown.

2.9.6.1.2 Reporting

Water level data will be submitted in each monitoring report in tabular and graph format for the current monitoring year. A hydrograph for the current monitoring year will be created and submitted. The Permittee will provide a comparison of the current monitoring year's hydrograph with a hydrograph for the wetland type that is being restored or created. Daily precipitation data for the monitoring period with a comparison to historical average precipitation data will be provided in tabular and graphic form.

2.9.6.2 Soils

2.9.6.2.1 Monitoring

A complete soil morphologic profile and description shall be documented immediately postconstruction and in the third, seventh, and 10th years following construction to document changes in overall soil morphology, particularly the development of redoximorphic features over time (such as a reduction in matrix chroma or development of redox depletions and/or concentrations), to demonstrate that soils at the site are progressing toward hydric soil conditions. Soil profiles shall be described at a distance of 10 feet from each monitoring well.

2.9.6.2.2 Reporting

Reporting will describe the soil profile, including a table with the following information for each soil profile: horizon, depth, color, texture, matrix color, redoximorphic feature type, abundance, location, and colors, as well as any documented field indicators per current Natural Resources Conservation Service guidance.

2.9.6.3 Vegetation

2.9.6.3.1 Monitoring

Vegetation monitoring will be the same as described in Section 2.9.5.1.

2.9.6.3.2 Photographs

Visual observations shall be documented in the same manner as described in Section 2.9.5.1.

2.9.6.4 Stream Monitoring and Reporting

2.9.6.4.1 Bankfull Event Documentation

For stream enhancement or restoration activities, stream gage data and documentation of any bankfull events during the monitoring year will be provided, as recorded by onsite stream gage(s) and/or onsite or nearby precipitation data.

Cross Sections

Where Performance Standards indicate that channel dimension will be measured and analyzed (Width/Depth Ratio, Bank Height Ratio, Entrenchment Ratio, Cross-Sectional Area, or others), the following shall occur:

Monitoring

Permanent cross sections shall be established to ensure that the same locations are used each monitoring year. A minimum of one cross section in appropriate stream preservation reaches, and one cross section per 1,000 linear feet in enhancement and restoration reaches, will be required. In enhancement or restoration reaches, cross sections should include at least one riffle and one pool cross section on each reach, as well as a proportionate amount of riffle and pool cross sections on each reach. Total number required will vary depending on the length and complexity. Additional cross sections may be required to show areas where aggradation, degradation, erosion, and midchannel bars have developed. Cross-sectional measurements shall include stream banks, stream bed, water surface, bankfull, and adjacent floodplain. The bankfull elevation in the channel shall be measured at the as-built monitoring, and the as-built bankfull shall be used as the bankfull elevation in each subsequent monitoring event. When calculating the Entrenchment Ratio, the floodplain may be measured separately from the cross section during field data collection. Ground-level photographs will be taken annually during November or December of the current monitoring year at all cross sections. These photographs will be taken facing upstream at the cross

section, downstream at the cross section, and the left and right banks, showing the riparian buffer area and stream bank.

Reporting

Cross-sectional reporting shall include a graph of the current monitoring year's cross section, with the cross sections for all previous monitoring years overlain. Callouts on the graph shall be appropriate for the Performance Standards and may include bankfull elevation, bankfull width, bankfull depth, floodprone elevation, floodprone depth, top of bank location and elevation, or others, as appropriate. A table of the appropriate Performance Standard parameters will be provided, showing all individual cross sections and a reach-averaged calculation and comparing the as-built to the current year's monitoring data. Ground-level photographs shall be provided with each monitoring report according to the monitoring requirements.

2.9.6.4.2 Longitudinal Profile

Where Performance Standards indicate that channel bed form or vertical stability parameters will be measured and analyzed (pool-to-pool spacing, max pool depth, slope, riffle slope, or others), the following shall occur:

Monitoring

A surveyed longitudinal profile will be conducted of the reach in the thalweg of the channel, from 20 feet upstream of the start of the reach to 20 feet downstream of the end of the reach (unless property boundaries, stream confluences, or other constraints are present). Longitudinal profile measurements should include the locations, depths, and slopes of riffles, runs, pools, and glides, as well as representative water surface elevation and bankfull surface elevation lines.

Reporting

Longitudinal profile reporting shall include a graph of the current monitoring year's profile, with the profiles for all previous monitoring years overlain. Callouts on the graph shall be appropriate for the Performance Standards and may include bankfull elevation, water surface elevation, locations of facets, or others, as appropriate. Pool-to-pool spacing is measured from the top of pool to top of pool. Max pool depth is the pool depth measured from the reach bankfull elevation to the thalweg in the deepest part of the pool. Channel bed slope shall be measured from the top of a riffle to the top of another riffle over a channel length of at least 10 bankfull widths. Riffle slope is measured from the top of the riffle to the bottom of the same riffle (top of run). A table of the appropriate Performance Standard parameters will be provided in each monitoring report, showing all individual profile calculations and a reach-averaged calculation and comparing the as-built to the current year's monitoring data for each parameter.

2.9.6.4.3 Pattern

Where Performance Standards indicate that lateral stability or bank migration parameters will be measured and analyzed (Meander Width Ratio, Sinuosity, Radius of Curvature, Bank Erodibility Hazard Index [BEHI], or others), the following shall occur:

Monitoring

Permanent pattern monitoring stations shall be established to ensure that the same locations are used each monitoring year. A minimum of three pattern monitoring stations shall be established to measure Meander Width Ratio, Radius of Curvature, or BEHI. A minimum of one pattern monitoring station shall be established to measure sinuosity. The total number of monitoring stations required will vary depending on length and complexity. Sinuosity shall be assessed along a stream reach that is a minimum of 10 bankfull widths in length. When BEHI is conducted, all individual BEHI metrics shall be measured at each permanent station in the field during each monitoring event.

Reporting

Pattern reporting shall include a table of the appropriate Performance Standard parameters, showing all individual pattern measurements and a reach-averaged calculation or ratio (if applicable) and comparing the as-built to the current year's monitoring data for each parameter. BEHI reporting shall include providing the current monitoring year's BEHI worksheet and a table of the total BEHI score for each monitoring year from as-built to the current year.

2.9.6.5 Stream Bank Vegetation

Where Performance Standards indicate that stream bank vegetation will be measured and analyzed (Livestakes, Herbaceous Coverage, Bare Ground Coverage, or others), the following shall occur:

2.9.6.5.1 Monitoring

Stream bank vegetation plots (10 ft^2 in size or larger) shall be located on each bank representative permanent cross section or pattern monitoring stations.

2.9.6.5.2 Reporting

Stream vegetation reporting may include a table of the results of the vegetation surveys, including per-plot reporting of the species and number of livestakes or woody stems, extrapolated number of livestakes per 50 ft^2, estimated herbaceous coverage, and/or estimated bare ground coverage.

2.9.6.5.3 Materials

Where Performance Standards indicate that stream bed materials will be measured and analyzed (D50 particle size or others), the following shall occur:

Monitoring

The Wolman Pebble Count technique will be conducted within a representative amount of constructed riffles in a reach. Pebble counts may be associated with representative permanent cross section or pattern monitoring stations or set up within the longitudinal profile at independent monitoring stations.

Reporting

Materials reporting shall include a table of the representative D50 of the constructed riffle pebble count for each reach during each monitoring year and the size class represented by the as-built and current monitoring year.

2.9.6.5.4 Structures

Where Performance Standards indicate that structure stability will be evaluated and analyzed, the following shall occur:

Monitoring

Ground-level photographs documenting the structural integrity and function of each in-stream structure will be taken looking upstream at the structure, showing at a minimum the in-stream structure at the thalweg (or location of buried sill), the upstream and downstream channels, and the immediately adjacent stream banks to bankfull elevation, where possible.

Reporting

Ground-level photographs shall be provided with each monitoring report, documenting structural conditions during the current monitoring year. The report shall note any structural failures or issues as listed in the Performance Standards.

2.9.6.5.5 Aquatic Habitat

Where Performance Standards indicate that aquatic habitat will be evaluated and analyzed, the following shall occur:

Monitoring

A habitat assessment shall be conducted at either each benthic macroinvertebrate monitoring station (as outlined below) or at a minimum one representative monitoring station per reach. Procedures and forms for habitat assessment are located in the *AIM National Aquatic Monitoring Framework: Field Protocol for Wadeable Lotic Systems* (BLM 2021) and/or the EPA's RBP (Barbour et al. 1999).

Reporting

Habitat reporting shall include providing the current monitoring year's Habitat Assessment Worksheet for each reach. A table shall be provided in the monitoring report that shows the habitat assessment total score for all monitoring years for each reach.

2.9.6.5.6 Chemical and Biological Monitoring

The objectives of benthic macroinvertebrate sampling are the following: to allow for comparison between areas of the PRM Project involving stream channel restoration activities, to identify issues that may need to be addressed in restoration design, to determine realistic expectations for the post-restoration aquatic community, and to inform future stream restoration designs and efforts. The following monitoring and reporting shall occur during every monitoring year within stream restoration reaches onsite:

Monitoring

Monitoring events shall occur consistently in either the spring or fall of each monitoring year. Spring sampling shall be conducted between March 1 and May 31. Fall sampling shall be conducted between September 1 and November 30. Water chemistry and benthic samples shall be collected simultaneously at each of the monitoring locations. The number and location of monitoring stations shall be determined and approved by USACE on a site-specific basis and shall remain consistent throughout the monitoring period. Surveys of other biota (e.g., fish, waterfowl, amphibians, etc.) may occur on a case-by-case basis, especially in the case of potential or confirmed presence of rare, threatened, or endangered species.

Applicable Scientific Collection permits for conducting surveys shall be obtained from the appropriate agency. All field sampling as well as laboratory sample processing shall be performed by or under supervision of an aquatic biologist. All sampling data shall be submitted to USACE and appropriate regulatory agencies using their annual reporting protocols.

Chemistry and Flow

Temperature, total dissolved oxygen, pH, and conductivity shall be collected at each designated monitoring location site using a multi-probe meter. Flow will be measured using a Cutthroat flume (or similar) or volumetrically using a polyvinyl chloride pipe with flow channelized into a graduated measurement container. Volumetric flow rate will be determined by calculating the average time required to fill the graduated measurement device to a graduated mark from at least three separate measurements. Water quality field parameters will be measured using a Horiba U-52, Myron Ultrameter II, or similar device. The water quality instrument(s) will be calibrated prior to use, and a drift check will be conducted at the end of the day. If water chemistry parameters are required that cannot be field-assessed with the above field parameter units, water quality samples will be collected directly into sample containers, from the discharge end of a decontaminated polyvinyl chloride pipe, from the discharge end of the flume, or by using a decontaminated dipper cup. Samples will be collected into laboratory-prepared containers and delivered under chain-of-custody procedures to a Nevada-certified laboratory.

Biology

A quantitative survey for benthic macroinvertebrates shall be conducted at permanent monitoring locations. Benthic macroinvertebrates shall be identified at least to the genus level. Detailed procedures and methods for biological monitoring, field methods, laboratory methods, and quality assurance can be found in the *AIM National Aquatic Monitoring Framework: Field Protocol for Wadeable Lotic Systems* (BLM 2021). This document shall serve as the basis for the field monitoring and laboratory data collection methods.

2.10 Long-Term Management Plan

2.10.1 Long-Term Steward and Responsibilities

At the end of the active monitoring period, the Permittee may offer all interest in the PRM Project to the current owners of the site(s) or their heirs. The Permittee may also transfer interest to a public resource agency, a non-profit organization engaged in conservation activities, or an academic institution engaged in research activities subject to written approval of the receiving entity by USACE. A Long-Term Steward will be selected to manage, monitor, and maintain the PRM Project in perpetuity and to preserve its habitat and conservation values in accordance with the restrictive covenants or conservation easements. Long-term management shall be funded through a Long-Term Management Fund.

The Long-Term Steward shall maintain a copy of the Long-Term Management Plan and all documents and addenda associated with the PRM Project, including all deed restrictions and easements. The Long-Term Steward shall be responsible for providing an annual report to USACE detailing the time period covered, an itemized account of the management tasks, and the total amount expended from the Long-Term Management Fund.

2.10.2 Long-Term Financing Mechanism

A Long-Term Management Fund will be set up to fund long-term management activities required by the Long-Term Steward for management in perpetuity, as well as to preserve the PRM Project's habitat and conservation values in accordance with the restrictive covenants or conservation easements. The long-term financing mechanism will be finalized in coordination with USACE through the Standard Permit review process.

2.10.3 Long-Term Management

Element 1: Streams, Wetlands, and Associated Buffers

The Long-Term Steward will monitor, conserve, and maintain the PRM Project streams, wetlands, and their associated buffers. Activities causing adverse effects to the PRM Project, such as vehicular travel near the aforementioned areas, shall be limited. At least one annual walkthrough will be conducted to qualitatively monitor the general condition of these habitats. General topographic conditions, hydrology, general vegetation cover and composition, invasive or noxious weed species, and erosion will be noted, evaluated,

and mapped during a site examination. The survey notes should include observations of species encountered, water quality, the general extent of wetlands and streams, and any occurrence of erosion, structural failure, or invasive or noxious weed species establishment. Reference photographs will be taken of the overall PRM Project at least every five years from the beginning of long-term management, with selected reference photographs taken on the ground more frequently at two times per year.

Special attention should be paid to any drainage areas outside the PRM Project limits. Streams, wetlands, and their associated buffers should be observed near PRM Project boundaries to observe if increased sediment deposition has occurred. The report should provide a discussion of any recent changes in the watershed (i.e., development upstream of the PRM Project). Maintenance of stream restoration/ enhancement features shall be performed, as necessary.

Element 2: Invasive, Non-Native, and Noxious Weed Species

The Long-Term Steward shall monitor and manage invasive, non-native, and noxious weed species that diminish the quality objectives in the PRM Project. The Long-Term Steward shall consult USACE and the appropriate regulatory agencies for guidance on which species may threaten the PRM Project and on management of those species. Each year's annual walkthrough survey (or a supplemental survey) will include a qualitative assessment (e.g., visual estimate of cover) of invasive, non-native, or noxious weed species and an inventory map. Additional actions to control invasive, non-native, or noxious weed species will be evaluated and prioritized in coordination with USACE and appropriate regulatory agencies. The Long-Term Steward shall develop and implement a management plan to control/manage invasive, non-native, and noxious weed species on the PRM Project.

Element 3: Fire Hazard Reduction

Potential wildfire fuels will be reduced as needed where approved by USACE and the appropriate regulatory agencies. The PRM Project will be maintained as required for fire control while limiting impacts to biological values. The reduction of vegetation will occur in any areas recommended by authorities and as approved by USACE and the appropriate regulatory agencies. Firebreaks will be managed, maintained, or re-established as necessary on the PRM Project.

Element 4: Security, Safety, and Public Access

The PRM Project will be fenced and appropriately marked and shall have no general public access or any regular public use. Research and/or other educational programs, hunting, fishing, and passive recreational activities may be allowed on the PRM Project as deemed appropriate by USACE, in consultation with the landowner and as provided for in the site protection instrument, but are not specifically funded or a part of this Long-Term Management Plan.

Element 5: Fences, Gates, and Property Boundaries

The Long-Term Steward shall maintain fences, gates, signage, and property boundaries to prevent casual trespass, allow necessary access, and facilitate management (if applicable). During each site visit, monitors

will record the condition of fences, gates, signs, and property boundaries. Additionally, they will record location, type, and recommendations to implement repair or replacement of fences, gates, signage, or property boundary markers, if applicable. The Long-Term Steward will maintain fences, gates, signs, and property boundary markers as necessary by replacing posts, wire, gates, and signs. Replacement of fences and/or gates will occur as necessary and as funding allows. Surveys shall note any trespass by livestock as well as any negative effects attributed to authorized livestock activities, if applicable.

Element 6: Trash and Trespass

The Long-Term Steward shall monitor sources of trash and trespass, collect and remove trash, repair vandalized structures, and rectify trespass impacts. During each site visit, occurrences of trash and/or trespass will be recorded. Field surveys will record type, location, and management mitigation recommendations to avoid, minimize, or rectify trash and/or trespass impact. At least once yearly, the Long-Term Steward will collect and remove as much trash as possible and repair and rectify vandalism and trespass impacts.

Element 7: Crossings, Trails, and Roads

The Long-Term Steward will monitor, maintain, and manage (if applicable and funding allows) trails, crossings, and roads. Surveys shall record location, type, and recommendations to implement repair or replacement of trails, crossings, and roads.

Element 8: Berms, Water Control Structures, and Grade Control Structures

The Long-Term Steward will maintain berms and structures, etc., as necessary to facilitate management (if applicable) and maintain conditions of wetlands and streams. During each site visit, monitors will record the condition of berms and structures. Additionally, they will record location, type, and recommendations to implement repair or replacement of berms and structures, if applicable.

Element 9: Annual Report

The Long-Term Steward will provide an annual report on all management tasks conducted and general PRM Project conditions to USACE, appropriate regulatory agencies, and any other appropriate parties. Each report shall include a cover page with the following information: the PRM Project name, Long-Term Steward (name, address, phone number, and email address), monitoring year, and any requested action (e.g., funding release, maintenance recommendations requiring the regulatory agencies' approval, etc.). The Long-Term Steward shall make recommendations with regard to (1) any enhancement measures deemed to be warranted; (2) any problems that need near-, short-, and long-term attention (e.g., weed removal, fence repair, erosion control, etc.); and (3) any changes in the monitoring or management program that appear to be warranted based on monitoring results to date, as well as provide documentation that the Long-Term Steward (if not an individual) is considered active and in good standing. The Long-Term Steward will provide documentation of the costs of any recommended maintenance and repairs. Moreover, the Long-Term Steward will provide a copy of the Long-Term Management Fund end-of-year statement that indicates the balance in the fund, interest accrued, withdrawals made, etc.

Element 10: Administrative and Contingency Fees

The Long-Term Steward will provide funds for regular administrative costs incurred as a result of administrative tasks, maintenance of escrow, endowment, or other funding accounts, etc. These funds shall be paid from the earnings of the account and not the principal funds. Pay all regular administrative or other fees through this element.

Element 11: Defense of Easement or Other Real Estate Issues

Ensure the perpetual protection of, and address any encroachments on, the property on which the wetland and stream mitigation activities occurred. Maintain conservation easements, declarations of restriction, or other protective instruments intended to protect the mitigation site. Hire an attorney or other legal representation for defense of easement or other proceedings, where necessary.

Element 12: Transfer

Any subsequent transfer of responsibilities under this Long-Term Management Plan to a different Long-Term Steward shall be requested in writing to USACE and the appropriate regulatory agencies. Transfer will require written approval by USACE and the appropriate regulatory agencies and will be incorporated into this Long-Term Management Plan by amendment. The Long-Term Steward shall be required to ensure that any subsequent property owners (if not identified as the Long-Term Steward) are notified of the deed restriction, conservation easement, purpose, and location of the PRM Project, as well as the requirements for long-term stewardship.

Element 13: Replacement

If the Long-Term Steward fails to implement the tasks described in this Long-Term Management Plan and is notified of such failure in writing by USACE or the other regulatory agencies, the Long-Term Steward shall have 90 days to correct such failure. If the failure is not corrected within 90 days, the Long-Term Steward may request a meeting with USACE or the other regulatory agencies to resolve the failure. Such a meeting will occur within 30 days or a longer period if approved by USACE or the other regulatory agencies.

Based on the outcome of the meeting, or if no meeting is requested, USACE or the other regulatory agencies may designate a replacement Long-Term Steward in writing by amendment of this Long-Term Management Plan. If the Long-Term Steward fails to designate a replacement Long-Term Steward, then such public land, private land, or resource management organization acceptable to, and as directed by USACE or the other regulatory agencies, may enter onto the PRM Project property in order to fulfill the purposes of this Long-Term Management Plan.

Element 14: Amendments

The Long-Term Steward, property owner, and USACE and/or the applicable regulatory agencies may meet and confer from time to time, upon the request of any one of them, or at a minimum of every five years to

revise the Long-Term Management Plan to better meet management objectives and preserve the conservation values of the PRM Project. Any proposed changes to the Long-Term Management Plan will be discussed with USACE, applicable regulatory agencies, and the Long-Term Steward. Any proposed changes will be designed with input from all parties. Amendments to the Long-Term Management Plan will be approved by USACE and the appropriate regulatory agencies in writing. The amendments will be required management components and will be implemented by the Long-Term Steward.

2.11 Adaptive Management

The goal of the PRM plan and Adaptive Management Plan are the same: a successful project by developing, implementing, monitoring, adjusting, and seeking a positive resolution while adapting to onsite conditions. The PRM plan is designed to follow the cycle of adaptive management to meet plan objectives. The restoration sites will be monitored to determine if there are unanticipated site conditions such as excessive erosion, poor vegetation regrowth, or unexpected flow conditions that require correction.

The Adaptive Management Plan will guide decisions for revising compensatory mitigation plans, addressing design revisions during construction, responding to field conditions during the monitoring period for Performance Standards, and/or implementing measures to address both foreseeable and unforeseen circumstances that may adversely affect compensatory mitigation performance.

Adaptive management may be required as a result of deficiencies detailed in one or more mitigation monitoring reports or site visits or for other noncompliance issues as deemed necessary by USACE or the other regulatory agencies. USACE or the other regulatory agencies may direct the implementation of adaptive management to address failure of the PRM Project to meet Performance Standards and/or noncompliance.

The Adaptive Management Plan is a strategy to address changes in site conditions or other components of the PRM Project, including the party or parties responsible for implementing any necessary adaptive management measures. The Adaptive Management Plan should outline the requirements necessary, including monitoring, to ensure the continued viability of the mitigation resources from approval to closure and long-term management. The Permittee shall implement the strategies outlined in the Adaptive Management Plan until the PRM Project is closed and the Long-Term Steward assumes its responsibilities. Deviation from the Adaptive Management Plan requires review and written approval from USACE, in consultation with the appropriate regulatory agencies. Adaptive management may be required for the following:

- Should changes to the Performance Standards be required, the Permittee shall engage USACE and applicable regulatory agencies and solicit through formal request the suggested changes.
- Should changes to the monitoring and reporting requirements be necessary, the Permittee shall engage USACE and applicable regulatory agencies and solicit through formal request the suggested changes.

- Should the extent and location of existing (or future) invasive, non-native, and noxious species change significantly (>20%), the Permittee shall engage USACE and the applicable regulatory agencies to determine appropriate measures for containment.
- Field changes during construction are common. As such, only major changes that adversely affect the Permittee's ability to complete the construction activities as shown on the final Mitigation Work Plan shall be coordinated with USACE and applicable regulatory agencies.
- Force Majeure: "Acts of God" such as floods, droughts, and infestation may adversely affect ecological function. In such a case, the Permittee or Long-Term Steward shall immediately engage USACE and the other regulatory agencies. Next steps may include the following:

    1) Inventory and categorize ecological resources;
    2) Determine the significant impacts;
    3) Assess and identify potential mitigation strategies/alternatives;
    4) Define and estimate cost of mitigation;
    5) Prepare the Corrective Action Plan;
    6) Receive regulatory agency approval on Corrective Action Plan;
    7) Implement selected mitigation strategy/alternative; and
    8) Conduct inspections and/or monitoring as identified in the approved Corrective Action Plan.

Should unforeseen site conditions occur, the Permittee shall engage USACE and applicable regulatory agencies and solicit comments through a formal request. Next steps may follow those provided above.

2.12 Financial Assurance

Financial assurances will be put in place prior to commencing the PRM Project and Mine Project as detailed in the Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division (USACE 2015). Sufficient financial assurances will be in place to ensure a high level of confidence that the PRM Project will be successfully completed in accordance with applicable Performance Standards. The amount of the required financial assurances will be determined in coordination with USACE during the Standard Permit review process, including any contingency costs to account for unanticipated adaptive management or other contingency expenses. The amount of the financial assurance will consider the cost of providing replacement mitigation, including costs for land acquisition (if applicable), planning and engineering, legal fees, mobilization, construction, and monitoring. The financial assurances may be in the form of performance bonds, escrow accounts, casualty insurance, letters of credit, or other appropriate instruments, subject to the approval of the district engineer and determined through the Standard Permit review process.

The Permittee is responsible for identifying a party that is acceptable to USACE as the Beneficiary of each financial assurance, which could be the Permittee if determined acceptable to USACE. The Permittee must demonstrate, to the satisfaction of USACE, that the identified Beneficiary has agreed to comply with the requirements of both the assurance and the procedures in the event USACE calls on the assurance. The assurance must provide that, if the Beneficiary fails to submit a plan to remedy the noncompliance, USACE is authorized to both cause and direct distribution of the funds.

All financial assurances must be in a form that ensures that USACE and the Beneficiary will receive notification at least 120 calendar days in advance of any termination or revocation. For third-party assurance providers, this may take the form of a contractual requirement for the assurance provider to notify the regulatory agencies at least 120 calendar days before the assurance is terminated or revoked. If the Permittee is deemed to be without required financial assurances for any reason, it shall re-establish required financial assurances within 30 calendar days.

The Permittee may, with written approval of USACE, modify an existing financial assurance or replace a third-party assurance provider with a different company, agent, or surety or another entity registered to do business in the State of Nevada. The Permittee shall provide USACE with notice of its desire to modify the assurance or replace the entity and submit a draft of the new assurance for review and written approval. The provisions of the new assurance shall comply with PRM Project requirements.

The Permittee shall notify USACE by certified mail of the commencement of a voluntary or an involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the Permittee as debtor within 15 calendar days after commencement of the proceeding. The Permittee shall notify the regulatory agencies by certified mail within 15 calendar days of receipt of notice that any financial assurance provider has filed for bankruptcy or is otherwise named as the debtor in a bankruptcy proceeding. Any financial assurance instrument prepared to meet a requirement of this PRM Project must require that the assurance provider notify USACE by certified mail within 15 calendar days of filing for bankruptcy or otherwise being named as the debtor in a bankruptcy proceeding.

If USACE determines the Permittee is in noncompliance and the Permittee has failed to remedy the noncompliance, USACE may call on the appropriate financial assurance by providing written notice to the Permittee, the Beneficiary, and the financial institution or other holder of the financial assurance. Financial assurance mechanisms must indicate that, within 30 business days of receiving notice from the regulatory agencies that the Permittee is in noncompliance, the Beneficiary shall submit to USACE a plan to (1) remedy the noncompliance to the satisfaction of USACE or (2) tender the funds necessary to remedy noncompliance to a party approved by USACE. The assurance may also provide that in exceptional cases, the Beneficiary may, subject to approval by USACE, develop an alternative mitigation plan that would provide the appropriate type of mitigation.

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Appendices

Appendix A
2024 Consolidated Aquatic Resources Report

Previously Delivered With AJD Request

Appendix B
Habitat Field Assessments for Impact Area

Appendix C
Habitat Field Assessment Photolog for Impact Site

Appendix D
Habitat Field Assessment Forms for Restoration Area

Appendix E
Habitat Field Assessment Photolog for Restoration Area

Appendix F
Compensatory Mitigation Spreadsheet

Appendix G
60 Percent Mitigation Plan Set

Appendix H
Uniform Performance Standards for Compensatory Mitigation Requirements