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DRAFT DELINEATION OF AQUATIC RESOURCES

Crystal Creek Aggregate Mine

Shasta County, California

September 2022

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Crystal Creek Aggregates
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DRAFT DELINEATION OF AQUATIC RESOURCES,

Crystal Creek Aggregate Mine, Shasta County, California

Introduction and Project Location

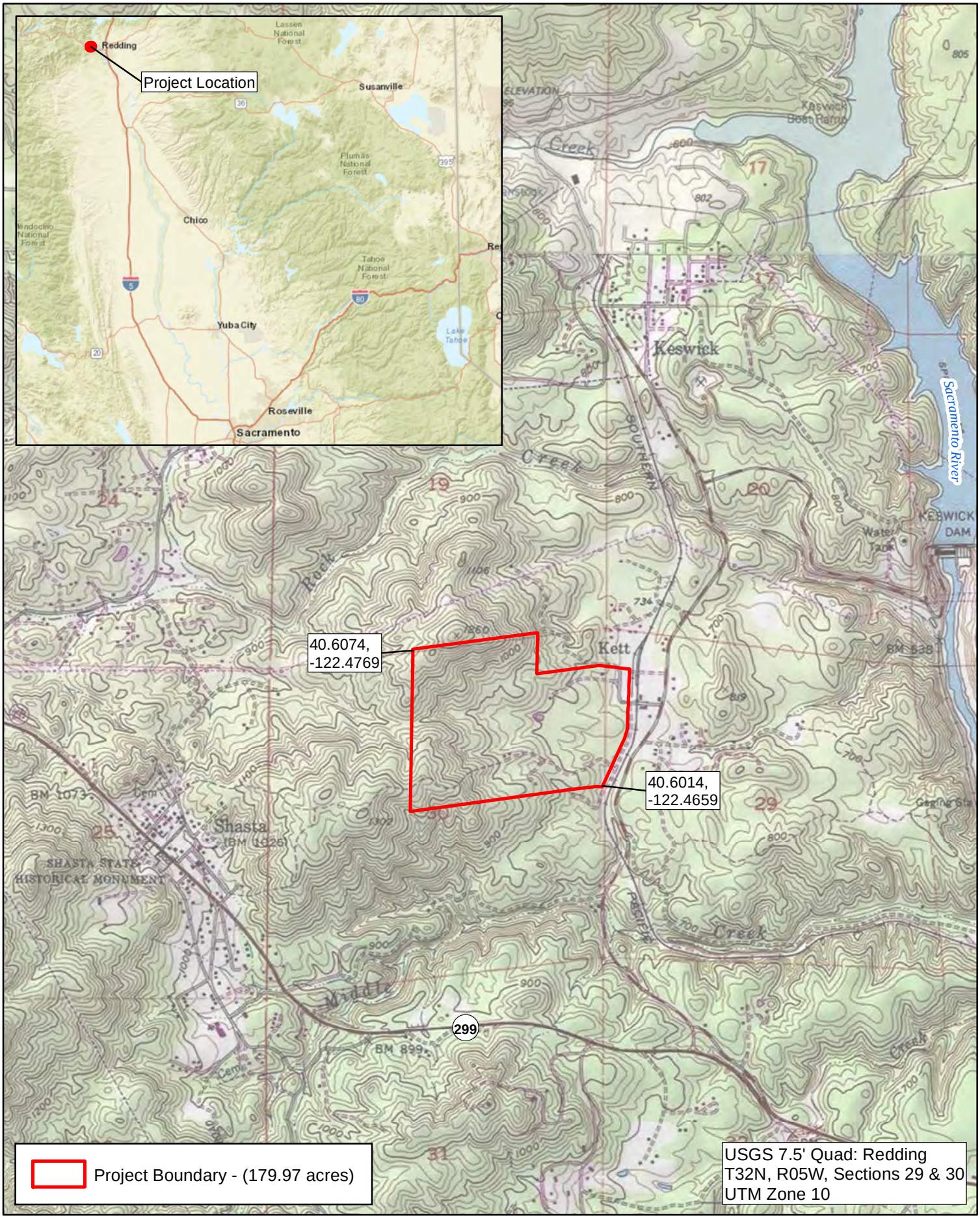
Gallaway Enterprises conducted a delineation of aquatic resources, including waters of the United States (WOTUS) and waters of the State (WOTS), for the Crystal Creek Aggregate Mine Use Permit Amendment project (Project) site consisting of 179.97 acres off of Iron Mountain Road in unincorporated Shasta County, California (**Figure 1 and 2**). The Project site is composed of the existing permitted mining area including the active mining and aggregate plant (Mine), approximately 110 acres, and adjacent Mineral Resource Area (MRA), approximately 70 acres (**Figure 2**). The Project site is located within the United States Geological Survey (USGS) Redding Quadrangle, primarily within Section 30, Township 32 N, Range 5 W.

Access to the site is from Highway 299 traveling west from Redding, CA. Take Highway 299 for approximately 3.5 miles west of Redding and then turn right onto Iron Mountain Road. Continue on Iron Mountain Road for 1.4 miles and the mine entrance occurs on the west side of the road.

A survey of WOTUS was originally conducted on May 27 and June 2 and 4, 2020, by senior botanist Elena Gregg. An additional field survey was conducted on April 28, 2022 to document current site conditions and assess the site per the current definition of WOTUS. Data regarding the location and extent of WOTUS and other aquatic resources were collected using a Trimble Geo Explorer 6000 Series GPS Receiver. The survey involved an examination of botanical resources, soils, hydrological features, and determination of wetland characteristics based on the *United States Army Corps of Engineers Wetlands Delineation Manual* (1987) (1987 Delineation Manual); the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (2008) (Arid West Manual); the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (2007); the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (2008), and the *2020 Arid West Regional Wetland Plant List* and the *2020 National Wetland Plant List.* Gallaway Enterprises have prepared this report in compliance with the Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (January 2016).

Environmental Setting and Site Conditions

The Project site is located within the foothills at the transition between the northern Sacramento Valley and the Klamath Mountains in unincorporated Shasta County. To the west of the Project site is the Whiskeytown National Recreation Area and to the east is the City of Redding, California. The site is located within the burn scar of the Carr Fire and is composed of the barren active aggregate mine and surrounding natural land. The surrounding natural land is hilly to very steep mixed chaparral and montane hardwood-conifer habitat that is currently in a state of regeneration after the fire. Incidental to the existing and historic mining operation on the site was the construction of multiple excavated ponds and pits. Further, numerous drainages occur on the site, the majority of which are ephemeral drainages that form along the steep hillsides. A steep ridgeline occurs along the western and northern boundary, as such, all but a few ephemeral drainages located in the southwestern corner of the site boundary flow to the east and into the controlled active mining ponds. The current mining activities within the Mine area are permitted under Shasta County Use Permit Amendment 07-020 and Reclamation Plan Amendment 07-002. An amendment to these existing documents is currently proposed. The Use Permit and Reclamation Plan Amendments do not propose any changes to the limits of the currently approved/permitted Mine area.



NORTH

1:24,000

0 0.25 0.5 Miles

Data Sources: ESRI, Shasta County, USGS, DKM Engineering

Crystal Creek Aggregate Mine
Regional Location
Figure 1

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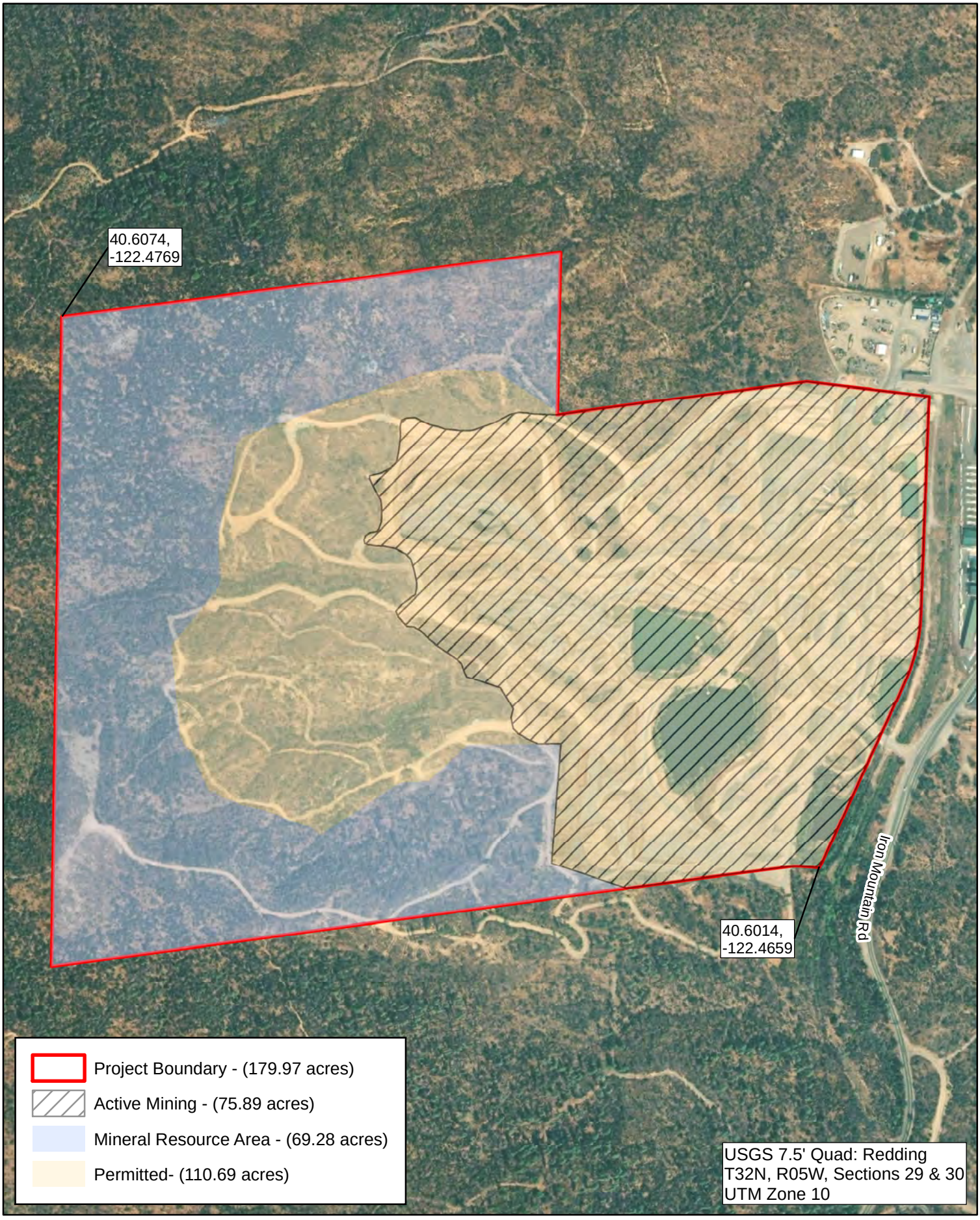
GE: #22-050 Map Date: 05/13/2022



NORTH

1:6,000

0 200 400 Feet

Data Sources: ESRI, Shasta County, Maxar 09/15/2021

Crystal Creek Aggregate Mine
Project Location
Figure 2

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GE: #22-050 Map Date: 09/27/2022

The average annual precipitation is 33.68 inches and the average annual temperature is 62.45° F (WRCC 2022) in the region where the Project is located. The elevation of the Project site ranges from 740 to 1190 feet above sea level. The Project site contained slopes ranging from 0 to 50 percent. Soils within the site were rocky and sandy loams with a restrictive bedrock layer ranging from 0 to 54 inches deep.

Survey Methodology

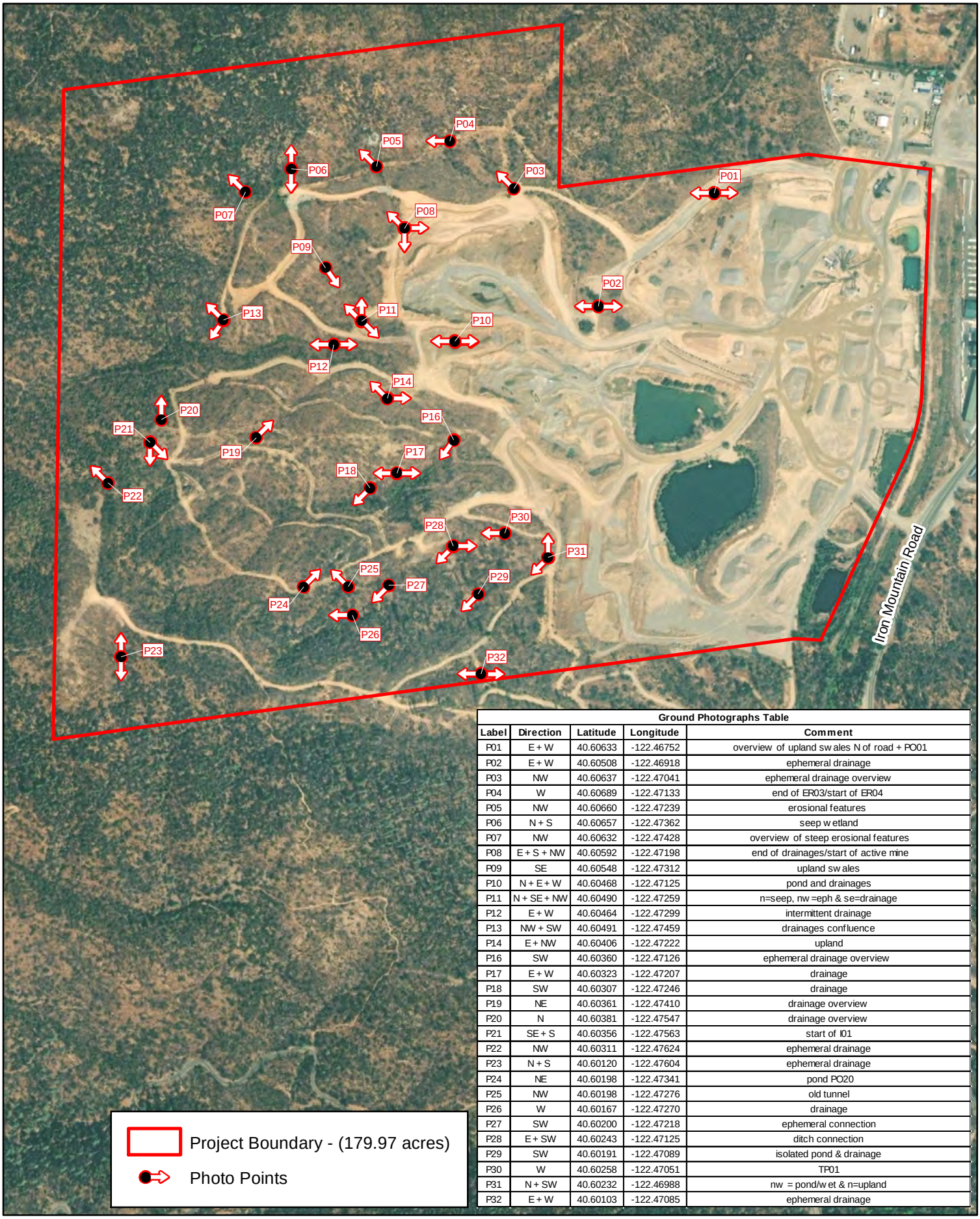
The entire Project site was traversed by Gallaway Enterprises staff on May 27 and June 2 and 4, 2020 and on April 28, 2022 to identify any potentially jurisdictional features. The survey, mapping efforts, and report production were performed according to the current valid legal definitions of WOTUS in effect as of September 20, 2021. The boundaries of non-tidal, non-wetland waters, when present, were delineated at the ordinary high water mark (OHWM) as defined in 33 Code of Federal Regulations (CFR) 328.3. The OHWM represents the limit of United States Army Corps of Engineers (Corps) jurisdiction over non-tidal waters (e.g., streams and ponds) in the absence of adjacent wetlands (33 CFR 328.04) (Curtis, et. al. 2011). Historic aerial photographs available on Google Earth were analyzed prior to conducting the field visit. Areas identified as having potential wetland or unusual signatures on historical aerial photos were assessed in the field to determine the current conditions.

Field data were entered onto data sheets using the most current format (**Appendix A**). Wetland perimeters based on the 1987 Delineation Manual and the Arid West Manual were recorded and defined according to their topographic and hydrologic orientation. Sample points were established for each wetland and the corresponding upland zone. Test pit sampling was performed in areas displaying wetland signatures on past aerial photographs and problem areas. Test pit sampling points involved physical sampling of soils and vegetation, and investigation regarding hydrological connectivity. Only areas exhibiting the necessary wetland parameters according to the 1987 Delineation Manual and Arid West Manual on the date surveyed were mapped as wetlands. Photographs were taken to show wetland features, test pit areas, and/or areas identified as having unusual aerial signatures. The locations of the photo points are depicted in **Figure 3** and the associated photographs are provided at the end of the report.

Many of the terms used throughout this report have specific meanings relating to the federal wetland delineation process. Term definitions are based on the Corps 1987 Delineation Manual*; the Arid West Manual; Field Guide to the Identification of the Ordinary High Water Mark* (OHWM) in the *Arid West Region of the Western United States*, (Lichvar and McColley 2008) and the Corps *Jurisdictional Determination Form Instructional Guidebook* (2007). The terms defined below have specific meaning relating to the delineation of WOTUS as prescribed by §404 of the Clean Water Act (CWA) and described in 33 CFR Part 328 and 40 CFR Parts 110, 112, and 116, and 122.

Determination of Hydrophytic Vegetation

The presence of hydrophytic vegetation was determined using the methods outlined in the 1987 Delineation Manual and the Arid West Manual. Areas were considered to have positive indicators of hydrophytic vegetation if they pass the dominance test, meaning more than 50 percent of the dominant species are obligate wetland, facultative wetland and facultative plants. Plant species were identified to the lowest taxonomy possible. Plant indicator status was determined by reviewing the 2020 Arid West Region Wetland Plant List and the 2020 National Wetland Plant List. In situations where dominance can be misleading due to seasonality, the prevalence index will be used to determine hydrophytic status of the community surrounding sample sites.



Ground Photographs Table

Label	Direction	Latitude	Longitude	Comment
P01	E + W	40.60633	-122.46752	overview of upland swales N of road + PO01
P02	E + W	40.60508	-122.46918	ephemeral drainage
P03	NW	40.60637	-122.47041	ephemeral drainage overview
P04	W	40.60689	-122.47133	end of ER03/start of ER04
P05	NW	40.60660	-122.47239	erosional features
P06	N + S	40.60657	-122.47362	seep wetland
P07	NW	40.60632	-122.47428	overview of steep erosional features
P08	E + S + NW	40.60592	-122.47198	end of drainages/start of active mine
P09	SE	40.60548	-122.47312	upland swales
P10	N + E + W	40.60468	-122.47125	pond and drainages
P11	N + SE + NW	40.60490	-122.47259	n=seep, nw =eph & se=drainage
P12	E + W	40.60464	-122.47299	intermittent drainage
P13	NW + SW	40.60491	-122.47459	drainages confluence
P14	E + NW	40.60406	-122.47222	upland
P16	SW	40.60360	-122.47126	ephemeral drainage overview
P17	E + W	40.60323	-122.47207	drainage
P18	SW	40.60307	-122.47246	drainage
P19	NE	40.60361	-122.47410	drainage overview
P20	N	40.60381	-122.47547	drainage overview
P21	SE + S	40.60356	-122.47563	start of I01
P22	NW	40.60311	-122.47624	ephemeral drainage
P23	N + S	40.60120	-122.47604	ephemeral drainage
P24	NE	40.60198	-122.47341	pond PO20
P25	NW	40.60198	-122.47276	old tunnel
P26	W	40.60167	-122.47270	drainage
P27	SW	40.60200	-122.47218	ephemeral connection
P28	E + SW	40.60243	-122.47125	ditch connection
P29	SW	40.60191	-122.47089	isolated pond & drainage
P30	W	40.60258	-122.47051	TP01
P31	N + SW	40.60232	-122.46988	nw = pond/wet & n=upland
P32	E + W	40.60103	-122.47085	ephemeral drainage

NORTH

1:6,000

0 250 500 Feet

Data Sources: ESRI, Shasta County, Maxar 09/15/2021

Crystal Creek Aggregate Mine
Ground Photographs Map
Figure 3

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GE: #22-050 Map Date: 05/13/2022

Plant indicator status categories:

Obligate wetland plants (OBL) – plants that occur almost always (estimated probability 99%) in wetlands under normal conditions, but which may also occur rarely (estimated probability 1%) in non-wetlands.

Facultative wetland plants (FACW) - plants that usually occur (estimated probability 67% to 99%) in wetlands under normal conditions, but also occur (estimated probability 1% to 33%) in non-wetlands.

Facultative plants (FAC) – Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands.

Facultative upland plants (FACU) – Plants that occur sometimes (estimated probability1% to 33%) in wetlands, but occur more often (estimated probability 67% to 99%) in non-wetlands.

Obligate upland plants (UPL) – Plants that occur rarely (estimated probability 1%) in wetlands, but occur almost always (estimated probability 99%) in non-wetlands under natural conditions.

Determination of Hydric Soils

Soil survey information was reviewed for the current site condition. Field samples were evaluated by using the Munsell soil color chart (2009 Edition), hand texturing, and assessing soil features (e.g. oxidized root channels, evidence of hardpan, Mn and Fe concretions). Information regarding local soil and series descriptions is provided in **Appendix B.** Several test pits (**Appendix A**) were dug within portions of the site that demonstrated wetland signatures in historic aerial photographs but did not meet the wetland test parameters upon investigation in the field. The current Natural Resources Conservation Service (NRCS) *Field Indicators of Hydric Soils in the United States, Version 8.2* (NRCS 2018) was used in conjunction with the Arid West Manual to determine the presence of hydric soil indicators.

Determination of Wetland Hydrology

Wetland hydrology was determined to be present if a site supported one or more of the following characteristics:

- Landscape position and surface topography (e.g. position of the site relative to an up-slope water source, location within a distinct wetland drainage pattern, and concave surface topography),
- Inundation or saturation for a long duration either inferred based on field indicators or observed during repeated site visits, and
- Residual evidence of ponding or flooding resulting in field indicators such as scour marks, sediment deposits, algal matting, surface soil cracks and drift lines.

The presence of water or saturated soil for approximately 12% or 14 consecutive days during the growing season typically creates anaerobic conditions in the soil, and these conditions affect the types of plants that can grow and the types of soils that develop (Wetland Training Institute 1995).

Historic aerial photographs were analyzed to look for primary and secondary wetland hydrology indicators of inundation or saturation. The historic aerial imagery reviewed was the public, readily available imagery provided on Google Earth (1994-2018). If aerial signatures demonstrated the presence of surface water on 1 or more of the historic aerial photographs viewed, inundation and a primary indicator of wetland hydrology was determined to be present. Saturation, a secondary indicator of wetland hydrology, was determined to be present if saturation, “darker patches within the field,” were observed on 1 or more historic aerial photographs viewed and the presence of hydric soils was confirmed in these areas during the field survey.

Determination of Ordinary High Water Mark

Gallaway utilized methods consistent with the Arid West Manual and *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States,* (Lichvar and McColley 2008*)* to determine the OHWM. The lateral extents of non-tidal water bodies (e.g. intermittent and ephemeral streams) were based on the OHWM, which is "the line on the shore established by the fluctuations of water" (Corps 2005). The OHWM was determined based on multiple observed physical characteristics of the area, which can include scour, multiple observed flow events (from current and historical aerial photos), shelving, and changes in the character of soil, presence of mature vegetation, deposition, and topography. Due to the wide extent of some floodplains, adjacent riparian scrub areas characterized by hydric soils, hydrophytic vegetation, and hydrology may be included within the OHWM of a non-tidal water body (Curtis, et. al. 2011). Inclusion of minor special aquatic areas is an acceptable practice as outlined in the Arid West Manual.

OHWM Transects:

Representative OHWM widths measured in the field in feet as required by the Corps *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program (2016)* and presented as an average for the entire drainage. These transect measurements are used to ensure that the other waters of the United States identified within the area surveyed are mapped and calculated at the appropriate average width for each channel segment based on the Corps definition of OHWM as defined in the Arid West OHWM Field Guide and the Ordinary High Water Mark Identification RGL 05-05 (2005) (RGL 05-05). At the transect line Gallaway used multiple observed physical indicators in determining the OHWM. The lateral extents of the transect lines identify the location of the OHWM where benches, drift, exposed root hairs, changes in substrate/particle size, and, if appropriate, changes in vegetation were observed.

Determination of Wetland Boundaries in Difficult Wetland Situations

The difficult wetland situation procedures for determining hydrophytic vegetation were used when mapping the boundary of wetlands within the Project site due to the extreme drought conditions experienced in California in 2021 and the winter of 2021/2022 (NOAA 2022). To aid in the determination, spatial patterns, analysis of aerial photographs, topography, and landscape position were used in conjunction with vegetation data to determine the wetland boundary. Areas where wetland vegetation or wetland hydrology was lacking but where the landscape position was likely to concentrate water were closely inspected. Gallaway Enterprises mapped these areas as wetlands if hydric soil indicators were detected and at least one other hydric indicator was present (i.e. wetland hydrology or hydrophytic vegetation).

Aquatic Resource Boundary Determination and Acreage Calculation

Most of the feature boundaries were previously mapped within the Project site by Wildland Resource Managers in 2019. Gallaway Enterprises used the shapefiles from this previous mapping effort to assess, update and verify the extent of current aquatic resources within the Project site. The wetland-upland boundary was determined based on the presence or inference of positive indicators of all mandatory criteria. Soil samples were taken within wetland and upland areas. The site was traversed on foot to identify wetland features and boundaries. The spatial data obtained by Gallaway Enterprises during the preparation of this wetland delineation was collected using a Trimble Geo Explorer 6000 Series GPS Receiver. No readings were taken with fewer than 5 satellites. Point data locations were recorded for at least 25 seconds at a rate of 1 position per second. Area and line data were recorded at a rate of 1 position per second while walking at a slow pace. All GPS data were differentially corrected for maximum accuracy. In some cases, when visual errors and degrees of precision are identified due to environmental factors

negatively influencing the precision of the GPS instrument (i.e. dense tree cover, steep topography, and other factors affecting satellite connection) mapping procedures utilized available topographic and aerial imagery datasets in order to improve accuracy in feature alignment and location.

Non-Wetland and Non-Jurisdictional Feature Boundary Determination

Areas were determined to be non-wetlands if they did not meet the necessary wetland test parameters (hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4) and were determined to be potentially non-jurisdictional if they were consistent with the description of non-jurisdictional features as presented in the *Corps Jurisdictional Determination Form Instructional Guidebook* (2007).

There were a number of areas that exhibited wetland or drainage signatures within the Project site, however, based on the visual assessment and data collected at these locations the areas lacked the necessary parameters and were not mapped as features. A few of these areas exhibited wetland signatures, but test pit data collected at these locations determine that they lacked the necessary wetland parameters to be considered wetland features (see TP01-TP03 on **Figure 4** and in **Appendix A**). There were also numerous upland swales present within the Project site that lacked an OHWM and were dominated by upland vegetation. Photo points were taken to document the lack of OHWM and wetland parameters that was typical within these upland swales (**Figure 3**).

Numerous erosional features occur within the Project site (ER01-ER13 on **Figure 4**). These features occur within dirt access roads or occur on extremely steep hillsides and are characterized by eroded, unstable banks and a bed with scour. Further, no evidence of an OHWM was observed within these erosional features. As such, these features meet the definition of non-jurisdictional erosional features per the *Corps Jurisdictional Determination Form Instructional Guidebook*.

There were also a number of features that met the parameters of a wetland or OW but were consistent with the description of non-jurisdictional features per the *Corps Jurisdictional Determination Form Instructional Guidebook* within the Project area. **Table 1** summarizes the potentially non-jurisdictional features within the Project site. Multiple ponds and pits excavated in upland incidental to mining are present within the site and are isolated features (**Figure 4**). These ponds, some of which currently function as seasonal wetlands, were created by the historic mining operations conducted in the 1960's (PO10-PO20 and WF01-WF03) or more recently as part of the existing and currently active mining operation (PO01-PO09). The ponds used in the current and ongoing mining operation (PO01-PO09) are regularly managed for vegetation and are engineered to be isolated in order to control runoff and function as sediment ponds. Water from PO07 is pumped into PO03 as makeup water for evaporation that occurs in PO03. Water from PO03 is pumped into the wash plant on the site. There are three controlled outfalls that, when in use/opened, flow into OW01 or the offsite unnamed tributary of Middle Creek. These controlled outfalls include: the culvert C01 that transports water from PO08 to OW01; the culvert C04 that transports water from PO06 into an offsite tributary of Middle Creek; and the culvert C03 that has a slide gate that outfalls into OW01. As such, all of these ponds within the Project site meet the definition of a non-jurisdictional WOTUS. There is also one ephemeral ditch (D01) that was created in upland to be used as an emergency overflow ditch. Due to the function of this ditch and the fact that it is not within or a realignment of a natural drainage, this ditch meets the definition of a non-jurisdictional WOTUS.

There is also one intermittent drainage (I01) and 18 ephemeral drainages present within the Project site, (E07, E08, E24-E28, E31-E39, E47 and E48) that do not have a direct hydrologic connection to a TNW. As such, even though these drainages meet the definition of an intermittent or ephemeral, they may not be considered jurisdictional due to their isolated nature.

Finally, there are four intermittent drainages (OW04-OW05), 21 ephemeral drainages (E01-E06 and E09-E23), two wetlands (WF04 and WF05), and one pond (PO21) that all drain into one of the active mining

- Project Boundary - (179.97 acres)
- 25 Foot Contours
- Culvert - C#
- Flow Direction
- Photo Points* - P#
- Erosional - ER# - (0.253 acres)
- Active Mining - (75.89 acres)
- Mineral Resource Area - (69.28 acres)
- Permitted- (110.69 acres)

Data Points

- Test Pit - TP#
- Upland - U#
- Wetland - W#

Aquatic Resources - (10.070 acres)

Other Waters - OW# - (9.483 acres)

- Ditch - D# - (0.066 acres)
- Ephemeral - E# - (1.217 acres)
- Intermittent - OW# - (0.529 acres)
- Intermittent (Isolated) - I# - (0.053 acres)
- Pond - PO# - (7.618 acres)

Wetland Features - WF# - (0.587 acres)

- Seasonal Wetland - WF# - (0.587 acres)

*See Figure 3, Ground Photographs Map, for additional information on Photo Points.

Draft Delineation of Aquatic Resources

Active Mining

Other Waters

Label	Cowardin	Description	Location (Lat, Long)		Width*	Length (ft)	Area (sq ft)	Acres
D01	R4	Ditch	40.604593	-122.464525	19.9	467.2	2885.3	0.066
E01	R6	Ephemeral	40.603786	-122.466961	15.6	200.9	2656.3	0.061
E02	R6	Ephemeral	40.604418	-122.467543	43.3	474.2	2842.6	0.065
E03	R6	Ephemeral	40.605099	-122.469019	137.7	445.3	2887.3	0.066
E04	R6	Ephemeral	40.606256	-122.470266	116.1	435.4	1937.5	0.044
E05	R6	Ephemeral	40.606732	-122.470797	1.9	4.0	6.7	0.000
E06	R6	Ephemeral	40.606641	-122.466121	36.6	196.3	826.7	0.019
OW01	R4	Intermittent	40.602896	-122.465282	9.5	126.6	914.1	0.021
OW02	R4	Intermittent	40.604567	-122.469920	81.9	495.6	6943.1	0.159
OW03	R4	Intermittent	40.604717	-122.471183	13.8	120.2	728.9	0.017
OW04	R4	Intermittent	40.605418	-122.472657	38.0	338.3	1030.4	0.024
OW05	R4	Intermittent	40.604533	-122.474275	13.0	82.5	705.8	0.016
PO01	PUB	Pond	40.606395	-122.466973	43.7	119.0	2866.0	0.066
PO02	PUB	Pond	40.605861	-122.464720	105.3	113.9	9356.7	0.215
PO03	PUB	Pond	40.605467	-122.464643	65.5	136.0	8446.8	0.194
PO04	PUB	Pond	40.603419	-122.464930	104.8	312.1	24592.6	0.565
PO05	PUB	Pond	40.602676	-122.465514	112.1	136.3	12369.1	0.284
PO06	PUB	Pond	40.601961	-122.465808	107.1	355.5	24689.9	0.567
PO07	PUB	Pond	40.602954	-122.467573	348.4	526.5	137201.2	3.150
PO08	PUB	Pond	40.603956	-122.468151	262.4	492.1	73423.3	1.686
PO09	PUB	Pond	40.604607	-122.470810	60.8	95.3	4467.4	0.103
						Active Mining Other Waters Totals =	321777.6	7.387
						Aquatic Resources Totals =	321777.6	7.387

Permitted

Wetland Features

Label	Cowardin	Description	Location (Lat, Long)		Width*	Length (ft)	Area (sq ft)	Acres
WF04	PUB	Seasonal Wetland	40.605013	-122.472637	N/A	N/A	962.8	0.022
						Permitted Wetland Features Totals =	962.8	0.022

Other Waters

Label	Cowardin	Description	Location (Lat, Long)		Width*	Length (ft)	Area (sq ft)	Acres
E04	R6	Ephemeral	40.606256	-122.470266	70.5	338.0	1273.8	0.029
E05	R6	Ephemeral	40.606732	-122.470797	18.2	223.2	809.0	0.019
E08	R6	Ephemeral	40.605905	-122.47272	29.3	254.7	738.9	0.017
E09	R6	Ephemeral	40.604914	-122.472702	19.3	179.1	429.4	0.010
E12	R6	Ephemeral	40.605388	-122.474656	7.5	39.9	121.8	0.003
E19	R6	Ephemeral	40.604039	-122.473521	71.1	465.4	2110.9	0.048
E24	R6	Ephemeral	40.603152	-122.472362	73.6	647.4	2956.0	0.068
E25	R6	Ephemeral	40.603277	-122.471557	45.7	263.6	2604.3	0.060
E26	R6	Ephemeral	40.602975	-122.472182	6.7	59.2	117.5	0.003
E27	R6	Ephemeral	40.602878	-122.474584	27.8	305.7	941.5	0.022
E35	R6	Ephemeral	40.601781	-122.475354	21.8	356.4	1004.8	0.023
I01	R4	Intermittent (Isolated)	40.603218	-122.474586	65.8	471.7	1935.5	0.044
OW04	R4	Intermittent	40.605418	-122.472657	101.2	754.7	3191.3	0.073
OW05	R4	Intermittent	40.604533	-122.474275	88.5	781.4	4890.5	0.112
PO10	PUB	Pond	40.603459	-122.471078	27.4	40.6	880.3	0.020
PO13	PUB	Pond	40.602946	-122.472371	23.7	46.8	803.9	0.018
PO14	PUB	Pond	40.602934	-122.473461	86.8	98.7	5265.5	0.121
PO18	PUB	Pond	40.603314	-122.471337	27.5	47.2	915.5	0.021
PO19	PUB	Pond	40.603006	-122.472007	41.2	77.6	2251.5	0.052
PO20	PUB	Pond	40.602054	-122.473311	21.9	28.0	484.0	0.011
						Permitted Other Waters Totals =	33725.9	0.774
						Aquatic Resources Totals =	34688.7	0.796

Mineral Resource Area

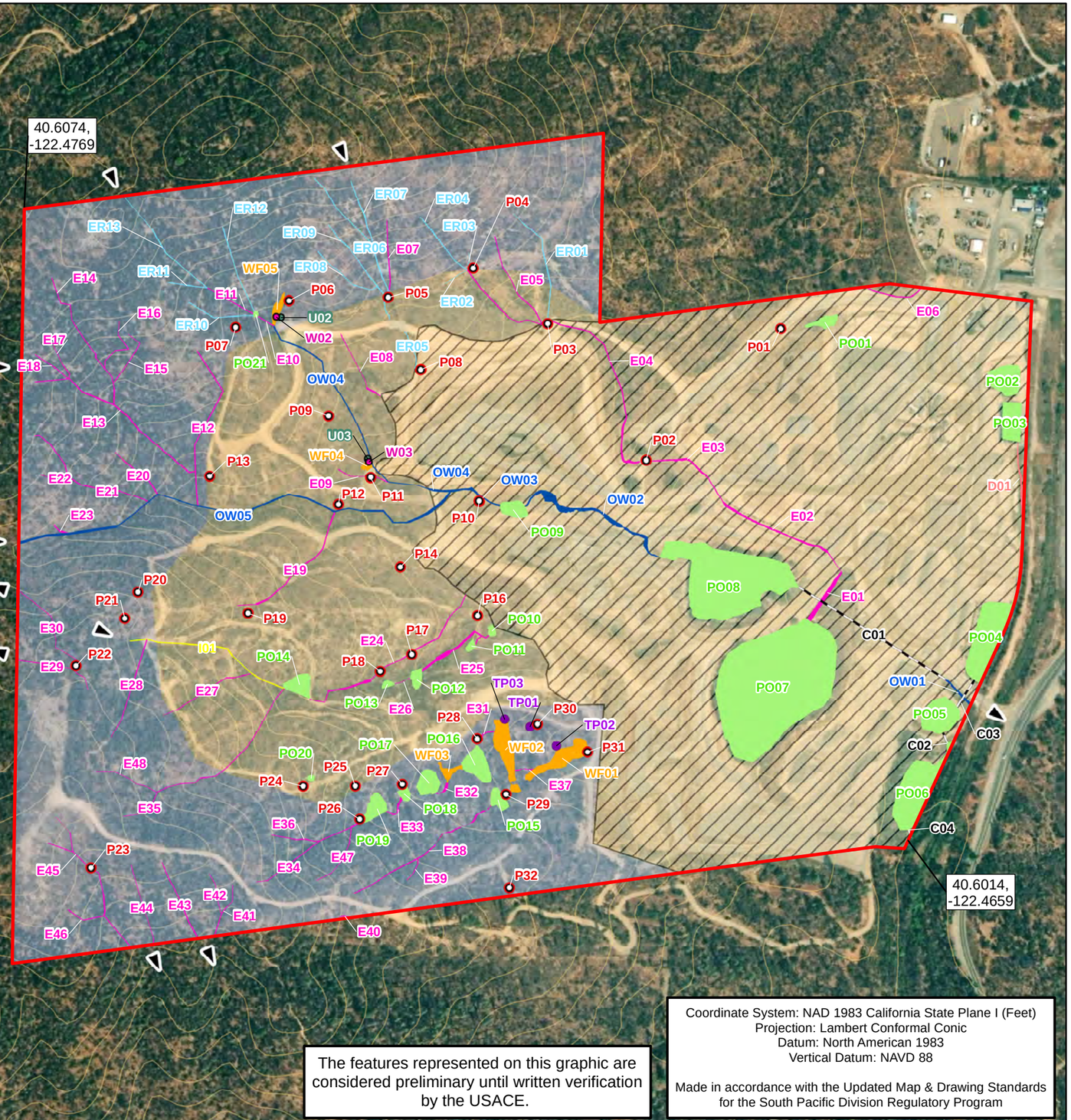
Wetland Features

Label	Cowardin	Description	Location (Lat, Long)		Width*	Length (ft)	Area (sq ft)	Acres
WF01	PUB	Seasonal Wetland	40.602259	-122.470198	N/A	N/A	9827.3	0.226
WF02	PUB	Seasonal Wetland	40.602331	-122.470898	N/A	N/A	10566.9	0.243
WF03	PUB	Seasonal Wetland	40.602124	-122.471602	N/A	N/A	1930.2	0.044
WF05	PUB	Seasonal Wetland	40.606485	-122.473758	N/A	N/A	2288.6	0.053
						Mineral Resource Area Wetland Features Totals =	24613.1	0.565

Other Waters

E04	R6	Ephemeral	40.606256	-122.470266	2.2	4.5	5.7	0.000
E05	R6	Ephemeral	40.606732	-122.470797	7.9	124.4	373.7	0.009
E07	R6	Ephemeral	40.606982	-122.472385	9.1	245.8	879.6	0.020
E10	R6	Ephemeral	40.606373	-122.473897	4.2	64.9	226.4	0.005
E11	R6	Ephemeral	40.606481	-122.474161	3.8	182.4	623.6	0.014
E12	R6	Ephemeral	40.605388	-122.474656	91.4	533.5	2208.7	0.051
E13	R6	Ephemeral	40.605454	-122.475702	73.9	633.2	2811.2	0.065
E14	R6	Ephemeral	40.606157	-122.476116	41.0	486.6	1679.4	0.039
E15	R6	Ephemeral	40.606009	-122.475605	49.0	175.9	590.6	0.014
E16	R6	Ephemeral	40.606119	-122.475746	65.3	167.0	633.1	0.015
E17	R6	Ephemeral	40.605965	-122.476420	12.3	124.3	313.5	0.007
E18	R6	Ephemeral	40.605941	-122.476558	7.7	140.9	415.7	0.010
E20	R6	Ephemeral	40.604917	-122.475455	17.4	206.8	757.3	0.017
E21	R6	Ephemeral	40.604895	-122.476104	73.6	450.9	1776.8	0.041
E22	R6	Ephemeral	40.604892	-122.476523	8.5	95.0	189.2	0.004
E23	R6	Ephemeral	40.604387	-122.476441	13.2	57.3	264.7	0.006
E27	R6	Ephemeral	40.602878	-122.474584	2.0	31.7	63.4	0.001
E28	R6	Ephemeral	40.602945	-122.475531	15.5	356.9	1155.0	0.027
E29	R6	Ephemeral	40.603086	-122.476511	51.8	271.0	737.9	0.017
E30	R6	Ephemeral	40.603479	-122.476562	48.1	327.4	705.4	0.016
E31	R6	Ephemeral	40.602459	-122.471173	20.3	79.9	405.2	0.009
E32	R6	Ephemeral	40.601963	-122.471652	19.5	54.7	407.8	0.009
E33	R6	Ephemeral	40.601782	-122.472243	32.2	69.9	514.9	0.012
E34	R6	Ephemeral	40.601378	-122.473301	23.7	409.2	1277.0	0.029
E35	R6	Ephemeral	40.601781	-122.475354	44.2	378.0	1001.7	0.023
E36	R6	Ephemeral	40.601483	-122.473502	9.0	166.0	495.2	0.011
E37	R6	Ephemeral	40.602145	-122.470668	7.6	65.9	185.8	0.004
E38	R6	Ephemeral	40.601375	-122.471896	27.9	560.2	1929.0	0.044
E39	R6	Ephemeral	40.601199	-122.472023	10.9	84.5	225.2	0.005
E40	R6	Ephemeral	40.600749	-122.472884	8.5	40.3	176.1	0.004
E41	R6	Ephemeral	40.600773	-122.474390	21.9	188.5	511.0	0.012
E42	R6	Ephemeral	40.600962	-122.474480	12.4	141.6	292.1	0.007
E43	R6	Ephemeral	40.600866	-122.474918	9.1	290.4	997.4	0.023
E44	R6	Ephemeral	40.600835	-122.475384	10.0	283.9	596.9	0.014
E45	R6	Ephemeral	40.601052	-122.476019	84.4	512.7	1934.6	0.044
E46	R6	Ephemeral	40.600736	-122.476108	30.2	125.4	407.0	0.009
E47	R6	Ephemeral	40.601325	-122.472941	37.7	217.4	519.1	0.012
E48	R6	Ephemeral	40.602037	-122.475597	20.8	220.8	442.0	0.010
I01	R4	Intermittent (Isolated)	40.603218	-122.474586	12.5	93.0	371.2	0.009
OW04	R4	Intermittent	40.605418	-122.472657	4.9	25.5	123.9	0.003
OW05	R4	Intermittent	40.604533	-122.474275	86.8	664.7	4501.1	0.103
PO11	PUB	Pond	40.601916	-122.472148	40.7	60.9	1701.7	0.039
PO12	PUB	Pond	40.601771	-122.472524	73.0	117.5	5254.3	0.121
PO15	PUB	Pond	40.601861	-122.470984	56.6	85.9	3212.8	0.074
PO16	PUB	Pond	40.602187	-122.471249	96.9	122.3	7768.0	0.178
PO17	PUB	Pond	40.602015	-122.471857	74.9	95.3	5459.4	0.125
PO21	PUB	Pond	40.605441	-122.474027	19.2	20.8	325.2	0.007
						Mineral Resource Area Other Waters Totals =	57446.6	1.319
						Wetland Features Totals =	25576.1	0.587
						Other Waters Totals =	413077.3	9.483
						Aquatic Resources Totals =	4386553.3	10.070

*Widths are represented as averges



The features represented on this graphic are considered preliminary until written verification by the USACE.

Coordinate System: NAD 1983 California State Plane I (Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88

Made in accordance with the Updated Map & Drawing Standards for the South Pacific Division Regulatory Program

NORTH

1:4,800 1 inch = 400 feet

0 200 400 Feet

Data Sources: ESRI, Shasta County, Maxar 09/15/2021

Crystal Creek Aggregate Mine
Draft Delineation of Aquatic Resources
Figure 4

Delineation by: E. Gregg
Map by: A. McLaughlin
GE: #22-050

gallaway ENTERPRISES

Map Date: 09/23/2022

Table 1. Summary of Potentially Non-Jurisdictional Features within the Crystal Creek Aggregate Mine Project.

Feature Number(s)	Non-Jurisdictional Rationale
ER01 – ER13	Erosional drainage that lacks an OHWM
PO01	Isolated pond
PO02 – PO09	Active mining pond
PO10 – PO20	Historic mining ponds that are isolated
WF01 – WF03	Seasonal wetlands that are isolated
I01	Intermittent drainage that lacks a surface hydrological connection to a TNW
E07, E08, E24 – E28, E31 – E39, E47, E48	Ephemeral drainage that lacks a surface hydrological connection to a TNW
D01	Man-made ditch created completely in upland habitat for detention pond overflow conveyance
E01-E06, E09-E23, WF04-WF05, PO21, and OW02-OW05	Aquatic features that may lack a hydrologic connection/significant nexus to a TNW due to the presence of controlled/managed outfalls

detention ponds (PO02, PO07 or PO08) that may be considered potentially non-jurisdictional due to the presence of controlled/managed outfalls that limit their hydrologic connection to OW01.

To confirm the jurisdictional status of WOTUS within the Project site, a significant nexus determination would need to be conducted by the Corps.

Results

Table 2 summarizes the area calculations for the pre-jurisdictional features within the Project site. A complete Draft Delineation of Aquatic Resources map, utilizing a 1" to 400' scale, is included as **Figure 4**.

Table 2. Draft Delineation of Aquatic Resources Acreage Table for the Crystal Creek Aggregate Mine Project.

Draft Delineation of Aquatic Resources						
Wetland Features						
Label	**Cowardin**	**Description**	**Width**	**Length (ft)**	**Area (sq ft)**	**Acres**
WF01	PUB	Seasonal Wetland	N/A	N/A	9827.4	0.226
WF02	PUB	Seasonal Wetland	N/A	N/A	10567.0	0.243
WF03	PUB	Seasonal Wetland	N/A	N/A	1930.2	0.044
WF04	PUB	Seasonal Wetland	N/A	N/A	962.9	0.022
WF05	PUB	Seasonal Wetland	N/A	N/A	2288.6	0.053
Wetland Features Totals =					25576.1	**0.587**
Other Waters						
D01	R4	Ditch	6.2	467.2	2885.3	0.066
E01	R6	Ephemeral	3.6	744.5	2656.3	0.061
E02	R6	Ephemeral	70.5	40.3	2842.6	0.065

Label	Cowardin	Description	Width	Length (ft)	Area (sq ft)	Acres
E03	R6	Ephemeral	52.8	54.7	2887.3	0.066
E04	R6	Ephemeral	46.0	69.9	3217.0	0.074
E05	R6	Ephemeral	4.2	283.9	1189.4	0.027
E06	R6	Ephemeral	5.0	166.0	826.7	0.019
E07	R6	Ephemeral	4.0	217.4	879.6	0.020
E08	R6	Ephemeral	5.9	125.4	739.0	0.017
E09	R6	Ephemeral	0.8	512.8	429.5	0.010
E10	R6	Ephemeral	1.6	141.6	226.4	0.005
E11	R6	Ephemeral	3.3	188.6	623.6	0.014
E12	R6	Ephemeral	8.0	290.4	2330.5	0.054
E13	R6	Ephemeral	5.0	560.2	2811.2	0.065
E14	R6	Ephemeral	4.9	343.7	1679.5	0.039
E15	R6	Ephemeral	7.0	84.5	590.6	0.014
E16	R6	Ephemeral	1.8	356.9	633.1	0.015
E17	R6	Ephemeral	0.9	337.0	313.5	0.007
E18	R6	Ephemeral	0.9	465.4	415.7	0.010
E19	R6	Ephemeral	4.0	533.5	2110.9	0.048
E20	R6	Ephemeral	1.2	633.2	757.3	0.017
E21	R6	Ephemeral	3.7	486.6	1776.8	0.041
E22	R6	Ephemeral	1.1	175.9	189.2	0.004
E23	R6	Ephemeral	1.6	167.0	264.7	0.006
E24	R6	Ephemeral	23.8	124.3	2956.1	0.068
E25	R6	Ephemeral	18.5	140.9	2604.3	0.060
E26	R6	Ephemeral	0.6	206.8	117.5	0.003
E27	R6	Ephemeral	2.2	450.9	1004.9	0.023
E28	R6	Ephemeral	12.2	95.0	1155.0	0.027
E29	R6	Ephemeral	3.0	245.8	737.9	0.017
E30	R6	Ephemeral	2.6	271.0	705.4	0.016
E31	R6	Ephemeral	0.6	710.9	405.2	0.009
E32	R6	Ephemeral	7.1	57.3	407.8	0.009
E33	R6	Ephemeral	1.6	327.4	515.0	0.012
E34	R6	Ephemeral	5.0	254.7	1277.0	0.029
E35	R6	Ephemeral	10.2	196.3	2006.4	0.046
E36	R6	Ephemeral	0.8	647.4	495.1	0.011
E37	R6	Ephemeral	1.0	182.4	185.8	0.004
E38	R6	Ephemeral	29.7	64.9	1929.1	0.044
E39	R6	Ephemeral	2.8	79.9	225.2	0.005
E40	R6	Ephemeral	0.4	409.2	176.1	0.004
E41	R6	Ephemeral	7.8	65.9	511.4	0.012
E42	R6	Ephemeral	1.6	179.1	292.1	0.007
E43	R6	Ephemeral	3.8	263.6	997.4	0.023

Label	Cowardin	Description	Width	Length (ft)	Area (sq ft)	Acres
E44	R6	Ephemeral	10.1	59.2	596.9	0.014
E45	R6	Ephemeral	9.6	201.0	1934.9	0.044
E46	R6	Ephemeral	0.9	474.2	407.0	0.009
E47	R6	Ephemeral	1.2	445.3	519.1	0.012
E48	R6	Ephemeral	2.0	220.8	442.0	0.010
I01	R4	Intermittent (Isolated)	2.6	885.8	2306.6	0.053
OW01	R4	Intermittent	7.2	126.6	914.1	0.021
OW02	R4	Intermittent	57.8	120.2	6943.1	0.159
OW03	R4	Intermittent	1.5	495.6	728.9	0.017
OW04	R4	Intermittent	2.9	1496.7	4345.7	0.100
OW05	R4	Intermittent	18.1	559.2	10097.4	0.232
PO01	PUB	Pond	N/A	N/A	2866.0	0.066
PO02	PUB	Pond (Active Mining)	N/A	N/A	9356.7	0.215
PO03	PUB	Pond (Active Mining)	N/A	N/A	8446.9	0.194
PO04	PUB	Pond (Active Mining)	N/A	N/A	24592.7	0.565
PO05	PUB	Pond (Active Mining)	N/A	N/A	12369.1	0.284
PO06	PUB	Pond (Active Mining)	N/A	N/A	24814.7	0.570
PO07	PUB	Pond (Active Mining)	N/A	N/A	137201.8	3.150
PO08	PUB	Pond (Active Mining)	N/A	N/A	73423.6	1.686
PO09	PUB	Pond (Active Mining)	N/A	N/A	4467.4	0.103
PO10	PUB	Pond (Historic Mining)	N/A	N/A	880.3	0.020
PO11	PUB	Pond (Historic Mining)	N/A	N/A	1701.8	0.039
PO12	PUB	Pond (Historic Mining)	N/A	N/A	5254.3	0.121
PO13	PUB	Pond (Historic Mining)	N/A	N/A	803.9	0.018
PO14	PUB	Pond (Historic Mining)	N/A	N/A	5265.5	0.121
PO15	PUB	Pond (Historic Mining)	N/A	N/A	3212.8	0.074
PO16	PUB	Pond (Historic Mining)	N/A	N/A	7768.1	0.178
PO17	PUB	Pond (Historic Mining)	N/A	N/A	5459.5	0.125
PO18	PUB	Pond (Historic Mining)	N/A	N/A	915.5	0.021
PO19	PUB	Pond (Historic Mining)	N/A	N/A	2251.5	0.052
PO20	PUB	Pond (Historic Mining)	N/A	N/A	484.0	0.011
PO21	PUB	Pond	N/A	N/A	325.1	0.007
				Other Waters Totals =	413077.3	**9.483**
				Aquatic Resources Totals =	438653.3	**10.070**

Waters of the United States: Other Waters

There are 76 drainage and/or pond features identified within the Project site, but only 10 of these features meet the definition of potentially jurisdictional "other waters of the United States" (OW) within the Project site (**Figure 4**). The area and linear footage data associated with all 76 features are provided in **Table 1**. The rationale for the remaining 66 features meeting the definition of potentially non-jurisdictional features is summarized in **Table 1**. Other waters of the United States are seasonal or

perennial water bodies, including lakes, stream channels, ephemeral and intermittent drainages, ponds, and other surface water features that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4). The boundaries of all other waters identified within the Project site were delineated based on the observed OHWM, including physical characteristics such as natural lines impressed on the bank, shelving, changes in the character of the soil, the destruction of terrestrial vegetation, debris lines and other appropriate indicators.

One potentially jurisdictional OW feature has been identified as intermittent drainage feature (OW01) and nine have been identified as ephemeral drainages (E29, E30, and E40-E46). All drainages are unnamed features. The intermittent drainage feature is classified by the Corps as a Relatively Permanent Water (RPW). The ephemeral drainages identified on the Project site are classified as Non-Relatively Permanent Waters (NRPW). Non-Relatively Permanent Waters are defined as tributaries that typically flow for less than 3 months of the year and have a documented hydrologic connection to a Traditionally Navigable Water (TNW). Relatively Permanent Waters are defined as tributaries that typically flow for more than 3 months of the year and have a documented hydrologic connection to a TNW. All of these drainages have a documented hydrologic connection to a TNW. The OW features identified within the Project site were observed to contain an OHWM and appropriate morphology of bed, bank and scour.

Waters of the United States: Wetlands

A total of five wetlands (WF01-WF05) occur within the Project site, which have been characterized as seasonal wetlands (**Figure 4**). However, none of these wetlands meet the definition of potentially jurisdictional WOTUS. Seasonal wetlands are depressional features that typically stay ponded or saturated into the early summer months. Of the five seasonal wetlands present in the Project site, three are completely isolated (WF01-WF03), and two (WF04 and WF05) are directly connected to an intermittent drainage (OW04). However, OW04 may be considered non-jurisdictional due to the presence of controlled outfalls that may limit hydrologic connectivity to a TNW. The wetlands identified within the Project site exhibited all necessary wetland parameters (**Appendix A**).

During the aerial photography review of the Project site conducted prior to the field visit, a few areas were identified that exhibited swale-like or unusual signatures. Where aerial photographs identified unusual signatures, but were found to lack wetland parameters when ground-truthed, representative test pits and/or photographs were taken (**Appendix A**, **Figure 4**). Photo points were taken at test pits, wetlands and other locations throughout the Project site to depict the current site conditions (**Figure 3**).

Soils

Gallaway collected soil data at various locations throughout the Project site. Field observations of soil characteristics included soil color, texture, structure, and the visual assessment of soil features (e.g. the presence, or absence of redoximorphic features and the depth of restrictive layers such as hardpans). Gallaway's soil texture evaluations rendered gravely and clay loams. Iron concentrations and depletions were found along root channels, pore spaces, and as soft masses in the soil matrix at varying depths within the surface horizons. Field observations of soil characteristics at the test pit sites are included in the data sheet forms presented in **Appendix A**.

The geographic region in which the Project is found is often characterized as having a naturally occurring deep hardpan, or duripan that undulates throughout the region. Duripans restrict root growth, limit water infiltration, and result in a perching of the water table in certain locations where topography allows. Within the Project site, the duripan is typically found at a depth ranging from 0 to 54 inches and is composed of lithic or paralithic bedrock. The depth of the hand dug soil pits were dug deep enough to determine or rule out the presence/absence of hydric soil indicators.

Gallaway queried the National Cooperative Soil Survey database to further evaluate the current soil conditions. A copy of the soil survey map and a description of mapped soil units for the Project site are included as **Appendix B**. A total of three soil map units occur within the Project site. The map units are listed below in **Table 3**. Based on Gallaway's review none of the soil map units identified within the Project site contain hydric components. A copy of the soil survey map and a description of mapped soil units for the Project site are included as **Appendix B**.

Table 3. Soil Map Units, NRCS hydric soil designation, and approximate totals for the Crystal Creek Aggregate Mine Project.

Map Unit Symbol	Map Unit Name	% Hydric Component in Map Unit	Landform of Hydric Component	% Map Unit in Site
DfD2	Diamond Springs very stony sandy loam, 8 to 30 percent slopes, eroded	N/A	N/A	49.1%
DgE2	Diamond Springs very rocky sandy loam, 30 to 50 percent slopes, eroded	N/A	N/A	4.4%
DgE3	Diamond Springs very rocky sandy loam, 30 to 50 percent slopes, severely eroded	N/A	N/A	46.5%

Vegetation

During the site visit, the identifiable vegetation within the upland portions of the Project site included a sparse overstory of black oaks (*Quercus kelloggii*) (NL), knobcone pine (*Pinus attenuata*) (UPL), ponderosa pine (*Pinus ponderosa*) (UPL), toyon (*Heteromeles arbutifolia*) (UPL), whiteleaf manazanita (*Arctostaphylos vicida*) (UPL), coffeeberry (*Frangula californica*) (UPL) and snowdrop bush (*Styrax redivivus*) (UPL). The understory in the upland habitat was dominated by lemmon's ceanothus (*Ceanothus lemmonii*) (UPL), poison oak (*Toxicodendron diversilobum*) (NL), silver hairgrass (*Aira caryophyllea*) (FACU), goldwire (*Hypericum concinnum*) (UPL), medusahead (*Elymus caput-medusae*) (UPL), tall willowherb (*Epilobium brachycarpum*) (FAC), Spanish lotus (*Acmispon americanus*) (FACU), wild oats (*Avena barbata*) (UPL), six-weeks fescue (*Festuca myuros*) (FACU), winter vetch (*Vicia villosa*) (NL) and prickly lettuce (*Lactuca serriola*) (FACU). The typical dominant vegetation found within the various wetlands present within the Project site included a variety of rushes (*Juncus* sp.) (FACW), Mediterranean barley (*Hordeum marinum ssp. gussoneanum*) (FAC), perennial ryegrass, hawkbit (*Leontodon saxatilis*) (FACU), seep monkeyflower (*Erythranthe guttata*) (OBL), sweet vernal grass (*Anthoxanthum odoratum*) (FAC) and various willow species (*Salix* sp.) (FACW).

Hydrology

Hydrology within the Project site is influenced solely by precipitation and localized runoff including hillside seeps. The intermittent drainages present within the Project are fed by seeps and numerous ephemeral drainages drain into these intermittent drainages. The intermittent drainages have historically been diverted into the ponds on the site that are incidental to the mining operation. Due to the need for the mine operation to control and filter any localized runoff, the intermittent drainages present no longer have a natural direct hydrologic connection to downgradient creeks. Middle Creek occurs to the south of the Project site but the release of water from the Project site into an offsite unnamed tributary of Middle Creek is managed through a series of settling ponds and gated culverts. Due to the managed nature of

these outfalls, all of the aquatic resources that are connected to these active mining detention ponds (PO06-PO08) may be considered isolated and, thus, non-jurisdictional WOTUS. There are also a number of highly isolated aquatic features within the Project site that meet the definition of non-jurisdictional per the *Corps Jurisdictional Determination Form Instructional Guidebook* due to the lack of a significant nexus. These isolated aquatic features include one intermittent drainage (I01), numerous ephemeral drainages that are completely isolated to the Project site (E07, E08, E24-E28, E31-E39, E47 and E48), a man-made ephemeral ditch (D01), and isolated ponds/wetlands that were historically constructed incidental to the mining operation (PO10-PO20). To confirm the jurisdictional status of WOTUS within the Project site, a significant nexus determination would need to be conducted by the Corps.

The ephemeral drainages that flow offsite to the south (E40-E46) and west (E29 and E30) and the intermittent drainage OW01 all flow directly into unnamed tributaries of Middle Creek. Middle Creek is a direct tributary of the Sacramento River, a TNW. Therefore, these drainages all meet the definition of jurisdictional WOTUS.

Flowing water was observed only within OW02, OW03 and OW05 during the June 2020 field visits.

Site Photos Taken on June 2 and 4, 2020 and April 28, 2022

P01 – PO01 looking E (taken 2022)

P02 – E04 looking W (taken 2020)

P01 – Upland swales/road looking W (taken 2022)

P03 – E05 looking NW (taken 2022)

P02 – E03 looking E (taken 2022)

P04 – end of ER03/start of E04 looking W (taken 2022)

P05 – Erosional features looking NW (taken 2022)

P07 – Overview of erosional features looking NW (taken 2022)

P06 – WF05 looking S (taken 2020)

P08 – ER05 looking NW (taken 2022)

P06 – WF05 looking N (taken 2020)

P08 – Overview of active mine area looking S (taken 2022)

P08 – Overview of active mine area looking E (taken 2022)

P10 – Confluence of OW04 and OW05 looking W (taken 2022)

P09 – Upland swale looking SE (taken 2022)

P11 – E09 looking NW (taken 2022)

P10 – PO09 looking E (taken 2022)

P11 – WF04 looking N (taken 2022)

P11 – E09/OW04 looking SE (taken 2022)

P13 – E12/OW05 looking SW (taken 2022)

P12 – Confluence of OW05 & E19 looking W (taken 2020)

P13 – E12/E13 looking NW (taken 2022)

P12 – OW05 looking E (taken 2020)

P14 – Upland swale looking slightly NW (taken 2022)

P14 – Upland swale looking E (taken 2022)

P17 – E24 looking W (taken 2020)

P16 – Overview of E25 looking SW (taken 2022)

P18 – E24 looking slightly SW (taken 2020)

P17 – E24 looking E (taken 2020)

P19– E19 looking NE (taken 2020)

P20 – Overview of ephemeral/erosional drainages looking N (taken 2020)

P22 – E29 and E30 looking NW (taken 2020)

P21 – Start of I01 looking S (taken 2020)

P23 – E45 looking N (taken 2020)

P21 – Overview of I01 looking SE (taken 2020)

P23 – E45 looking S (taken 2020)

P24 – PO20 looking NE (taken 2022)

P27 – PO18 and E33 looking SW (taken 2020)

P25 – Old mine tunnel looking NW (taken 2020)

P28 – E31/PO16 looking SW (taken 2020)

P26 – E34 looking W (taken 2020)

P28 – E31 looking E (taken 2020)

P29 – PO15 looking SW (taken 2020)

P31 – Upland looking N (taken 2020)

P30 – TP01 looking W (taken 2020)

P32 – Upland swale looking W (taken 2020)

P31 – WF01 looking SW (taken 2020)

P32 – Upland swale looking E (taken 2020)

Glossary

Abutting: When referring to wetlands that are adjacent to a tributary, abutting defines those wetlands that are not separated from the tributary by an upland feature, such as a berm or dike.

Adjacent: Adjacent as used in "Adjacent to traditional navigable water," is defined in Corps and EPA regulations as "bordering, contiguous, or neighboring." Wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes and the like are 'adjacent wetlands. A wetland "abuts" a tributary if it is not separated from the tributary by uplands, a berm, dike, or similar feature.

While all wetlands that meet the agencies' definitions are considered adjacent wetlands, only those adjacent wetlands that have a continuous surface connection because they directly abut the tributary (e.g., they are not separated by uplands, a berm, dike, or similar feature) are considered jurisdictional under the plurality standard. (CWA Jurisdiction Following Rapanos v US and Carabell v US 12-02-08).

The regulations define "adjacent" as follows: "[t]he term adjacent means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are 'adjacent wetlands.'" Under this definition, a wetland does not need to meet all criteria to be considered adjacent. The agencies consider wetlands to be bordering, contiguous, or neighboring, and therefore "adjacent" if at least one of following three criteria is satisfied:

(1) There is an unbroken surface or shallow sub-surface hydrologic connection between the wetland and jurisdictional waters; or

(2) The wetlands are physically separated from jurisdictional waters by "manmade dikes or barriers, natural river berms, beach dunes, and the like;" or,

(3) Where a wetland's physical proximity to a jurisdictional water is reasonably close, that wetland is "neighboring" and thus adjacent. For example, wetlands located within the riparian area or floodplain of a jurisdictional water will generally be considered neighboring, and thus adjacent. One test for whether a wetland is sufficiently proximate to be considered "neighboring" is whether there is a demonstrable ecological interconnection between the wetland and the jurisdictional waterbody. For example, if resident aquatic species (e.g., amphibians, reptiles, fish, mammals, or waterfowl) rely on both the wetland and the jurisdictional waterbody for all or part of their life cycles (e.g., nesting, rearing, feeding, etc.), that may demonstrate that the wetland is neighboring and thus adjacent. The agencies recognize that as the distance between the wetland and jurisdictional water increases, the potential ecological interconnection between the waters is likely to decrease.

The agencies will also continue to assert jurisdiction over wetlands "adjacent" to traditional navigable waters as defined in the agencies' regulations. Under EPA and Corps regulations and as used in this guidance, "adjacent" means "bordering, contiguous, or neighboring." Finding a continuous surface connection is not required to establish adjacency under this definition. The Rapanos decision does not affect the scope of jurisdiction over wetlands that are adjacent to traditional navigable waters. The agencies will assert jurisdiction over those adjacent wetlands that have a continuous surface connection with a relatively permanent, non-navigable tributary, without the legal obligation to make a significant nexus finding.

Atypical situation (significantly disturbed): In an atypical (significantly disturbed) situation, recent human activities or natural events have created conditions where positive indicators for hydrophytic vegetation, hydric soil, or wetland hydrology are not present or observable.

Channel. "An open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water" (Langbein and Iseri 1960:5).

Channel bank. The sloping land bordering a channel. The bank has steeper slope than the bottom of the channel and is usually steeper than the land surrounding the channel.

Cobbles. Rock fragments 7.6 cm (3 inches) to 25 .4 cm (10 inches) in diameter.

Debris flow. A moving mass of rock fragments, soil, and mud where more than 50% of the particles are larger than sand-sized.

Ditch. A constructed or excavated channel used to convey water.

Drift. Organic debris oriented to flow direction(s) (larger than small twigs).

Ephemeral stream. An ephemeral stream has flowing water only in direct response to precipitation events in a typical year. Ephemeral streambeds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Facultative wetland (FACW). Wetland indicator category; species usually occurs in wetlands (estimated probability 67–99%) but occasionally found in non-wetlands.

Flat. A level landform composed of unconsolidated sediments usually mud or sand. Flats may be irregularly shaped or elongate and continuous with the shore, whereas bars are generally elongate, parallel to the shore, and separated from the shore by water.

Gravel. A mixture composed primarily of rock fragments 2mm (0 .08 inch) to 7.6 cm (3 inches) in diameter. Usually contains much sand.

Growing season. The frost-free period of the year (see U.S. Department of Interior, National Atlas 1970:110-111 for generalized regional delineation).

Herbaceous. With the characteristics of an herb; a plant with no persistent woody stem above ground.

Hydric soil. Soil is hydric that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic (oxygen-depleted) conditions in its upper part (i.e., within the shallow rooting zone of herbaceous plants).

Hydrophyte, **hydrophytic.** Any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

Intermittent stream. An intermittent stream has flowing water during certain times of the year and more than in direct response from precipitation, when elevated groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water.

Jurisdictional Waters. Features that meet the definition of waters of the Unites States provided below and that fall under Corps regulations pursuant to Section 404 of the CWA are considered jurisdictional features.

Litter. Organic debris oriented to flow direction(s) (small twigs and leaves).

Man-induced wetlands. A man-induced wetland is an area that has developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities.

Non-Relatively Permanent Water: A non-relatively permanent water (NRPW) is defined as a tributary that is not a TNW and that typically flows for periods for less than 3 months. NRPWs are jurisdictional

when they have a documented significant nexus to TNWs. All NRPWs must also contain appropriate morphology of bed, bank and scour and be clearly connected to a TNW.

Normal circumstances. This term refers to the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed.

Obligate hydrophytes. Species that are found only in wetlands e.g., cattail (*Typha latifolia*) as opposed to ubiquitous species that grow either in wetland or on upland-e .g., red maple (*Acer rubrum*).

Obligate wetland (OBL). Wetland indicator category; species occurs almost always (estimated probability 99%) under natural conditions in wetlands.

Other Waters of the United States. Other waters of the United States are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4).

Palustrine the Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 parts per thousand. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2 m (6.6 feet) at low water; and (4) salinity due to ocean-derived salts is less than 0.5 parts per thousand.

Perennial stream. A perennial stream has flowing water year-round during atypical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Ponded. Ponding is a condition in which free water covers the soil surface (e.g., in a closed depression) and is removed only by percolation, evaporation, or transpiration.

Problem area. Problem areas are those where one or more wetland parameters may be lacking because of normal seasonal or annual variations in environmental conditions that result from causes other than human activities or catastrophic natural events**.**

Relatively Permanent Waters of the U.S. Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months).

Scour. Soil and debris movement.

Sheetflow. Overland flow occurring in a continuous sheet; a relatively high-frequency, low-magnitude event.

Shrub. A woody plant which at maturity is usually less than 6 m(20 feet) tall and generally exhibits several erect, spreading, or prostrate stems and has a bushy appearance ; e.g., speckled alder (*Alnus rugosa*) or buttonbush (*Cephalanthus occidentalis*).

Succession. Changes in the composition or structure of an ecological community.

Traditional Navigable Waters (TNWs)."[a]ll waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide." These waters are referred to in this guidance as traditional navigable waters. The traditional navigable waters include all of the "navigable waters of the United States," as defined in 33 C.F.R. Part 329 and by numerous decisions of the federal courts, plus all other waters that are navigable-in-fact (for example, the Great Salt Lake, UT, and Lake Minnetonka, MN). Thus, the traditional

navigable waters include, but are not limited to, the "navigable waters of the United States" within the meaning of Section 10 of the Rivers and Harbors Act of 1899 (also known as "Section 10 waters").

Tree. A woody plant which at maturity is usually 6 m (20 feet) or more in height and generally has a single trunk, unbranched for 1 m or more above the ground, and a more or less definite crown; e.g., red maple (*Acer rubrum*), northern white cedar (*Thuja occidentalis*).

Typical Year. Defined by the EPA and Corps as meaning when precipitation and other climactic variables are within the normal periodic range for the geographic area based on a rolling thirty-year period.

Water table. The upper surface of a zone of saturation. No water table exists where that surface is formed by an impermeable body.

Waters of the United States (WOTUS). This is the encompassing term for areas under federal jurisdiction pursuant to Section 404 of the CWA. Waters of the United States are divided into "wetlands" and "other waters of the United States."

Watershed (drainage basin). An area of land that drains to a single outlet and is separated from other watersheds by a divide.

Wetland. Wetlands are defined as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 [b], 40 CFR 230.3). To be considered under potential federal jurisdiction, a wetland must support positive indicators for hydrophytic vegetation, hydric soil, and wetland hydrology.

Woody plant. A seed plant (gymnosperm or angiosperm) that develops persistent, hard, fibrous tissues, basically xylem; e.g., trees and shrubs.

Xeric. Relating or adapted to an extremely dry habitat.

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Appendix A: Wetland Delineation Data Sheets

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Crystal Creek Aggregate Mine | City/County: Shasta County | Sampling Date: 6-2-20

Applicant/Owner: Crystal Creek Aggregate, Inc. | State: CA | Sampling Point: TP01

Investigator(s): E. Gregg | Section, Township, Range: Section 30, Township 32N, Range 5W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): sloped | Slope (%): 3

Subregion (LRR): C - Mediterranean California | Lat: 40.602553 | Long: -122.470598 | Datum: NAD 83

Soil Map Unit Name: Diamond Springs very rocky sandy loam, 30-50% slopes, severely eroded | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks: Low rainfall year. Within the Carr Fire burn scar. Disturbance in this portion of the project site are historical and are thus "normal circumstances." Area was historically disturbed when the old mining ponds were excavated. Area is sloped at the base of one of the pond berms.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Juncus xiphoides*	30	Yes	OBL
2. *Anthoxanthum odoratum*	40	Yes	FAC
3. *Acmispon americanus*	10	No	FAC
4. *Leontodon saxatilis*	10	No	FACU
5. *Lactuca serriola*	10	No	FACU
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species		x 2 =	0
FAC species	50	x 3 =	150
FACU species	20	x 4 =	80
UPL species		x 5 =	0
Column Totals:	100 (A)		260 (B)

Prevalence Index = B/A = 2.60

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: TP01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/4	96	2.5YR 3/4	4	C	PL	coarse sandy loam	
5-10	10YR 5/3	68	2.5YR 4/6	25	C	M	coarse sandy loam	few Mn stains present
			10YR 6/6	7	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. CS=Covered or Coated Sand Grains

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils: [3]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present. unless distributed or problematic

Restrictive Layer (if present):

Type: cobble

Depth (inches): 10

Hydric Soil Present? Yes ○ No ◉

Remarks: Soil pit dug deep enough to determine the presence/absence of hydric soil indicators. Does not meet any hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Only sheetflow patterns were present. No other wetland hydrology indicators were observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Crystal Creek Aggregate Mine | City/County: Shasta County | Sampling Date: 6-2-20

Applicant/Owner: Crystal Creek Aggregate, Inc. | State: CA | Sampling Point: TP02

Investigator(s): E. Gregg | Section, Township, Range: Section 30, Township 32N, Range 5W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): sloped | Slope (%): 3

Subregion (LRR): C - Mediterranean California | Lat: 40.602374 | Long: -122.470271 | Datum: NAD 83

Soil Map Unit Name: Diamond Springs very rocky sandy loam, 30-50% slopes, severely eroded | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks: Low rainfall year. Within the Carr Fire burn scar. Disturbance in this portion of the project site are historical and are thus "normal circumstances." Area was historically disturbed when the old mining ponds were excavated. Area is sloped adjacent to one of the man-made wetlands/ponds.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Anthoxanthum odoratum*	20	Yes	FAC
2. *Juncus xiphoides*	15	Yes	OBL
3. *Acmispon americanus*	15	Yes	FAC
4. *Leontodon saxatilis*	15	Yes	FACU
5. *Linum bienne*	15	Yes	Not Listed
6. *Elymus caput-medusae*	10	No	UPL
7. *Plantago lanceolata*	5	No	FAC
8. *Briza maxima*	5	No	UPL
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species		x 2 =	0
FAC species	40	x 3 =	120
FACU species	15	x 4 =	60
UPL species	30	x 5 =	150
Column Totals:	100 (A)		345 (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: TP02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/4	96	2.5YR 3/4	4	C	PL	coarse sandy loam	
5-10	10YR 5/3	68	2.5YR 4/6	25	C	M	coarse sandy loam	few Mn stains present
			10YR 6/6	7	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. CS=Covered or Coated Sand Grains

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils: [3]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present. unless distributed or problematic

Restrictive Layer (if present):

Type: cobble

Depth (inches): 10

Hydric Soil Present? Yes ○ No ◉

Remarks: Soil pit dug deep enough to determine the presence/absence of hydric soil indicators. Does not meet any hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Only sheetflow patterns were present. No other wetland hydrology indicators were observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Crystal Creek Aggregate Mine | City/County: Shasta County | Sampling Date: 6-2-20

Applicant/Owner: Crystal Creek Aggregate, Inc. | State: CA | Sampling Point: TP03

Investigator(s): E. Gregg | Section, Township, Range: Section 30, Township 32N, Range 5W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): convex | Slope (%): 0.5

Subregion (LRR): C - Mediterranean California | Lat: 40.60262 | Long: -122.470914 | Datum: NAD 83

Soil Map Unit Name: Diamond Springs very rocky sandy loam, 30-50% slopes, severely eroded | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks: Low rainfall year. Within the Carr Fire burn scar. Disturbance in this portion of the project site are historical and are thus "normal circumstances." Area was historically disturbed when the old mining ponds were excavated. Area is adjacent to one of the man-made wetlands/ponds.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Acmispon americanus*	35	Yes	FAC
2. *Anthoxanthum odoratum*	15	Yes	FAC
3. *Briza maxima*	15	Yes	UPL
4. *Lactuca serriola*	15	Yes	FACU
5. *Elymus caput-medusae*	10	No	UPL
6. *Festuca perennis*	5	No	FAC
7. *Bromus diandrus*	5	No	UPL
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	55	x 3 =	165
FACU species	15	x 4 =	60
UPL species	30	x 5 =	150
Column Totals:	100 (A)		375 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators:

- (●) Dominance Test is >50%
- (●) Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: TP03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/4	100					coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. CS=Covered or Coated Sand Grains

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils: [3]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present. unless distributed or problematic

Restrictive Layer (if present):

Type: dense gravel

Depth (inches): 8

Hydric Soil Present? Yes ○ No ◉

Remarks: Soil pit dug deep enough to determine the presence/absence of hydric soil indicators. Does not meet any hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators were observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Crystal Creek Aggregate Mine | City/County: Shasta County | Sampling Date: 6-4-20

Applicant/Owner: Crystal Creek Aggregate, Inc. | State: CA | Sampling Point: W02

Investigator(s): E. Gregg | Section, Township, Range: Section 30, Township 32N, Range 5W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): concave | Slope (%): 2

Subregion (LRR): C - Mediterranean California | Lat: 40.606416 | Long: -122.473774 | Datum: NAD 83

Soil Map Unit Name: Diamond Springs very stony sandy loam, 8-30% slopes, eroded | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: Low rainfall year. Within the Carr Fire burn scar. This location is a hillslope seep wetland.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Salix lasiolepis*	40	Yes	FACW
2. *Ailanthus altissima*	10	No	FACU
3.			
4.			
5.			
Total Cover:	50 %		
Herb Stratum			
1. *Typha sp.*	25	Yes	OBL
2. *Juncus effusus*	25	Yes	FACW
3. *Vitis californica*	20	Yes	FACU
4. *Acmispon americanus*	15	No	FACW
5. *Rubus armeniacus*	10	No	FAC
6. *Paspalum dilatatum*	5	No	FAC
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	80	x 2 =	160
FAC species	15	x 3 =	45
FACU species	30	x 4 =	120
UPL species		x 5 =	0
Column Totals:	150 (A)		350 (B)

Prevalence Index = B/A = 2.33

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: W02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/4	70	5YR 4/6	20	C	PL	coarse sandy loam	
	10YR 4/1	10						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. CS=Covered or Coated Sand Grains

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☒ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils: [3]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present. unless distributed or problematic

Restrictive Layer (if present):

Type: dense gravel

Depth (inches): 8

Hydric Soil Present? Yes ◉ No ○

Remarks: Soil pit dug deep enough to determine the presence/absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☒ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Crystal Creek Aggregate Mine | City/County: Shasta County | Sampling Date: 6-4-20

Applicant/Owner: Crystal Creek Aggregate, Inc. | State: CA | Sampling Point: U02

Investigator(s): E. Gregg | Section, Township, Range: Section 30, Township 32N, Range 5W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none/sloped | Slope (%): 2

Subregion (LRR): C - Mediterranean California | Lat: 40.60641 | Long: -122.473715 | Datum: NAD 83

Soil Map Unit Name: Diamond Springs very stony sandy loam, 8-30% slopes, eroded | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks: Low rainfall year. Within the Carr Fire burn scar. This location was relatively flat on a slight slope adjacent to a swale/seep wetland.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Heteromeles arbutifolia*	15	Yes	UPL
2.			
3.			
4.			
5.			
Total Cover:	15 %		
Herb Stratum			
1. *Avena barbata*	40	Yes	UPL
2. *Festuca myuros*	25	Yes	Not Listed
3. *Lactuca serriola*	20	Yes	FACU
4. *Acmispon americanus*	10	No	FAC
5. *Vitis californica*	5	No	FACU
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum: % | % Cover of Biotic Crust: 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	10	x 3 =	30
FACU species	25	x 4 =	100
UPL species	80	x 5 =	400
Column Totals:	115 (A)		530 (B)

Prevalence Index = B/A = 4.61

Hydrophytic Vegetation Indicators:

- [●] Dominance Test is >50%
- [●] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: U02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/4	100					coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. CS=Covered or Coated Sand Grains

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils: [3]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present. unless distributed or problematic

Restrictive Layer (if present):

Type: dense gravel

Depth (inches): 8

Hydric Soil Present? Yes ○ No ◉

Remarks: Soil pit dug deep enough to determine the presence/absence of hydric soil indicators. Does not meet any hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators were observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Crystal Creek Aggregate Mine | City/County: Shasta County | Sampling Date: 6-4-20

Applicant/Owner: Crystal Creek Aggregate, Inc. | State: CA | Sampling Point: W03

Investigator(s): E. Gregg | Section, Township, Range: Section 30, Township 32N, Range 5W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): sloped | Slope (%): 4

Subregion (LRR): C - Mediterranean California | Lat: 40.605047 | Long: -122.472617 | Datum: NAD 83

Soil Map Unit Name: Diamond Springs very stony sandy loam, 8-30% slopes, eroded | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: Low rainfall year. Within the Carr Fire burn scar. This location is a hillslope seep wetland.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Calycanthus occidentalis*	20	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	20 %		
Herb Stratum			
1. *Woodwardia fimbriata*	40	Yes	FACW
2. *Acmispon americanus*	20	Yes	FAC
3. *Juncus tenuis*	10	No	FACW
4. *Cyperus eragrostis*	5	No	FACW
5. *Festuca perennis*	5	No	FAC
6.			
7.			
8.			
Total Cover:	80 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	55	x 2 =	110
FAC species	45	x 3 =	135
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	100 (A)		245 (B)

Prevalence Index = B/A = 2.45

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: W03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/4	20	5YR 4/6	20	C	PL	coarse sandy loam	
	10YR 4/1	60						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. CS=Covered or Coated Sand Grains

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils: [3]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present. unless distributed or problematic

Restrictive Layer (if present):

Type: dense gravel

Depth (inches): 8

Hydric Soil Present? Yes ◉ No ○

Remarks: Soil pit dug deep enough to determine the presence/absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Crystal Creek Aggregate Mine | City/County: Shasta County | Sampling Date: 6-4-20

Applicant/Owner: Crystal Creek Aggregate, Inc. | State: CA | Sampling Point: U03

Investigator(s): E. Gregg | Section, Township, Range: Section 30, Township 32N, Range 5W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): convex | Slope (%): 1

Subregion (LRR): C - Mediterranean California | Lat: 40.605077 | Long: -122.472629 | Datum: NAD 83

Soil Map Unit Name: Diamond Springs very stony sandy loam, 8-30% slopes, eroded | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks: Low rainfall year. Within the Carr Fire burn scar. This location is a convex area above/adjacent to a hillslope seep.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Acmispon americanus*	35	Yes	FAC
2. *Festuca myuros*	25	Yes	Not Listed
3. *Lactuca serriola*	10	No	FACU
4. *Leontodon saxatilis*	10	No	FACU
5. *Hypericum perforatum*	5	No	FACU
6.			
7.			
8.			
Total Cover:	85 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 15 % | % Cover of Biotic Crust 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	35	x 3 =	105
FACU species	25	x 4 =	100
UPL species	25	x 5 =	125
Column Totals:	85 (A)		330 (B)

Prevalence Index = B/A = 3.88

Hydrophytic Vegetation Indicators:

- [●] Dominance Test is >50%
- [●] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: U03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/4	100					coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. CS=Covered or Coated Sand Grains

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils: [3]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present. unless distributed or problematic

Restrictive Layer (if present):

Type: dense gravel

Depth (inches): 8

Hydric Soil Present? Yes ○ No ◉

Remarks: Soil pit dug deep enough to determine the presence/absence of hydric soil indicators. Does not meet any hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators were observed.

Appendix B: NRCS Soils Map and Soil Series Description

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Shasta County Area, California

Crystal Creek Aggregate Mine

June 11, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:7,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 14, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 12, 2010—Jul 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DfD2	Diamond Springs very stony sandy loam, 8 to 30 percent slopes, eroded	85.6	49.1%
DgE2	Diamond Springs very rocky sandy loam, 30 to 50 percent slopes, eroded	7.7	4.4%
DgE3	Diamond Springs very rocky sandy loam, 30 to 50 percent slopes, severely eroded	81.2	46.5%
Totals for Area of Interest		**174.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Shasta County Area, California

DfD2—Diamond Springs very stony sandy loam, 8 to 30 percent slopes, eroded

Map Unit Setting

National map unit symbol: hfn7
Elevation: 1,000 to 4,000 feet
Mean annual precipitation: 40 inches
Mean annual air temperature: 54 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Diamond springs and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Diamond Springs

Setting

Landform: Mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from metavolcanics

Typical profile

H1 - 0 to 10 inches: very stony sandy loam
H2 - 10 to 15 inches: sandy loam
H3 - 15 to 29 inches: sandy clay loam
H4 - 29 to 50 inches: sandy loam
H5 - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 8 to 30 percent
Percent of area covered with surface fragments: 5.0 percent
Depth to restrictive feature: 50 to 54 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Kanaka

Percent of map unit: 10 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 5 percent
Hydric soil rating: No

DgE2—Diamond Springs very rocky sandy loam, 30 to 50 percent slopes, eroded

Map Unit Setting

National map unit symbol: hfn8
Elevation: 1,000 to 4,000 feet
Mean annual precipitation: 40 inches
Mean annual air temperature: 54 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Diamond springs and similar soils: 70 percent
Rock outcrop: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Diamond Springs

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from metavolcanics

Typical profile

H1 - 0 to 10 inches: very stony sandy loam
H2 - 10 to 15 inches: sandy loam
H3 - 15 to 29 inches: sandy clay loam
H4 - 29 to 50 inches: sandy loam
H5 - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 50 to 54 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from metavolcanics

Typical profile

H1 - 0 to 4 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 0 to 4 inches to lithic bedrock
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Low to very high (0.01 to 19.98 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Kanaka

Percent of map unit: 10 percent
Hydric soil rating: No

Goulding

Percent of map unit: 3 percent
Hydric soil rating: No

Aiken

Percent of map unit: 2 percent
Hydric soil rating: No

DgE3—Diamond Springs very rocky sandy loam, 30 to 50 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: hfn9
Elevation: 1,000 to 4,000 feet
Mean annual precipitation: 40 inches
Mean annual air temperature: 54 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Diamond springs and similar soils: 70 percent
Rock outcrop: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Diamond Springs

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from metavolcanics

Typical profile

H1 - 0 to 2 inches: very stony sandy loam
H2 - 2 to 7 inches: sandy loam
H3 - 7 to 21 inches: sandy clay loam
H4 - 21 to 30 inches: sandy loam
H5 - 30 to 34 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 30 to 34 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from metavolcanics

Typical profile

H1 - 0 to 4 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 0 to 4 inches to lithic bedrock
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Low to very high (0.01 to 19.98 in/hr)
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Kanaka

Percent of map unit: 10 percent
Hydric soil rating: No

Goulding

Percent of map unit: 3 percent
Hydric soil rating: No

Aiken

Percent of map unit: 2 percent
Hydric soil rating: No

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Technical Memorandum:
Assessment of Aquatic Resources within the Crystal Creek Aggregate Mine Expansion Project Site, Shasta County, California
October 2022

Gallaway Enterprises conducted an aquatic resources assessment to determine the extent of any aquatic feature(s) that would be considered waters of the United States (WOTUS) or waters of the State (WOTS) for the Crystal Creek Aggregate Mine Use Permit Amendment (Project) survey area consisting of 179.97 acres[1]. The determination of WOTUS is based on the current definition of WOTUS[2] as defined by the Clean Water Act (CWA) and the determination of WOTS is based on the final definition[3] adopted April 2, 2019. The results of this assessment are provided in this Technical Memorandum.

Methodology

The assessment of aquatic resources was conducted by senior botanist Elena Gregg on May 27 and June 2 and 4, 2020 and April 28, 2022. The field survey was conducted by traversing all accessible portions of the property. Wetland feature boundaries were previously mapped within the Project site by Wildland Resource Managers in 2019. Gallaway Enterprises used the shapefiles from this previous mapping effort to assess, update/revise and verify the extent of aquatic resources within the Project site. Locational data collected by Gallaway Enterprises was collected using a Trimble Geo Explorer 6000 Series GPS Receiver and field data was entered onto data sheets using the most current format.

The wetland-upland boundary was determined based on the presence or inference of positive indicators of all mandatory criteria. The survey involved an examination of botanical resources, soils, hydrological features, and determination of wetland characteristics based on the *United States Army Corps of Engineers Wetlands Delineation Manual* (1987) (1987 Delineation Manual); the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (2008) (Arid West Manual); the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (2008); the *2020 Arid West Regional Wetland Plant List* and the *2020 National Wetland Plant List*; the 2007 *Corps Jurisdictional Determination Form Instructional Guidebook*, the *State Wetland Definition and Procedures for Discharges of Dredge or Fill Material to Waters of the State* (State Procedures), April 2, 2019 and the *Implementation Guidance for the State Wetland Definition and*

[1] This Delineation of WOTUS was conducted over a 179.97 acre project area owned by Crystal Creek Aggregates (CCA). The 179.97 acre survey area includes the existing approved 110.69 acre Reclamation Plan Area. The 110.69 acre Reclamation Plan Area comprises the existing Plant Area where aggregate material processing occurs and the area where currently approved aggregate mining activities occur.

[2] On August 30, 2021 the Final Navigable Waters Protection Rule (Final Rule) was remanded resulting in the re-instating of the pre-2015 WOTUS definitions and regulatory regime.

[3] The April 2, 2019 State Wetland Definition and Procedures for the Discharges of Dredged or Fill Material to Waters of the State (Procedures) became effective on May 28, 2020.

Procedures for Discharges of Dredge or Fill Material to Waters of the State (State Implementation Guidance), April 2020.

The results of this field visit have been prepared in a formal Delineation of Waters of the United States which can be referenced for more information including specific survey methodology and site photographs.

Results

Numerous erosional features occur within the Project site (ER01-ER13 on **Attachment 1**). These features occur within dirt access roads or occur on extremely steep hillsides and are characterized by eroded, unstable banks and a bed with scour. These features typically flow so rapidly immediately after rain events that they lack an OHWM and lack any wetland vegetation. No evidence of an OHWM was observed within any of these erosional features. As such, these features do not meet the criteria to be considered jurisdictional WOTUS or WOTS.

Waters of the United States

There are 10 features identified as potentially jurisdictional "other waters of the United States" (OW) within the Project site (**Attachment 1**). One OW feature has been identified as intermittent drainage feature (OW01) and nine have been identified as ephemeral drainages (E29, E30, and E40-E46 totaling 0.167 acre) (**Attachment 1**). These 10 have a documented hydrologic connection to a TNW via unnamed tributaries of Middle Creek.

A total of 28 features (E01-E06, E09-E23, WF04-WF05, PO21, and OW02-OW05) are hydrologically connected to one of the active mining ponds within the Project site (PO02, PO07 or PO08) which are engineered to be isolated in order to control runoff and function as sediment ponds. There are three controlled outfalls associated with the active mining ponds that the 28 features ultimately drain into (PO06 and PO07) that, when in use/opened, flow into OW01 or the offsite unnamed tributary of Middle Creek. However, due to the controlled/managed nature of these three outfalls, the hydrologic connectivity to OW01 is limited and these 28 feature may be considered potentially non-jurisdictional due to a lack of a significant nexus.

There were also a number of features that met the parameters of a wetland or OW but were consistent with the description of non-jurisdictional features per the Corps Jurisdictional Determination Form Instructional Guidebook within the Project site. Multiple ponds and pits excavated in upland incidental to mining are present within the site and are isolated features (**Attachment 1**). These ponds, some of which currently function as seasonal wetlands, were created by the historic mining operations conducted in the 1960's (PO10-PO19, PO20 and WF01-WF03) or more recently as part of the existing and ongoing mining operation (PO01-PO09). The ponds used in the current and ongoing mining operation (PO01-PO09) are regularly managed for vegetation and, as mentioned previously, are engineered to be isolated detention ponds in order to control runoff. Water from PO07 is pumped into PO03 as makeup water for evaporation that occurs in PO03. Water from PO03 is pumped into the wash plant on the site. The three controlled outfalls include: the culvert C01 that transports water from PO08 to OW01; the culvert C04 that transports water from PO06 into an offsite tributary of Middle Creek; and the culvert C03 that has a slide gate that outfalls into OW01. As such, all of these ponds within the Project site meet the definition of a non-jurisdictional WOTUS. There is also one ephemeral ditch (D01) that was created in upland to be used as an emergency overflow ditch. Due to the function of this ditch and the fact that it is not within or a realignment of a natural drainage, this ditch meets the definition of a non-jurisdictional WOTUS.

There is also one intermittent drainage, I01, and 18 ephemeral drainages present within the Project site, E07, E08, E24-E28, E31-E39, E47 and E48, that do not have a direct hydrologic connection to a TNW. As such, even though these drainages meet the definition of an intermittent or ephemeral, they may not be considered jurisdictional due to their isolated nature.

To confirm the jurisdictional status of WOTUS within the Project site, a significant nexus determination would need to be conducted by the Corps. **Table 1** summarizes the potentially non-jurisdictional features within the Project site.

Table 1. Acreage Summary of Potentially Non-Jurisdictional Features within the Crystal Creek Aggregate Mine.

Feature Number(s)	Non-Jurisdictional Rationale	Acreage Totals
PO01	Isolated pond incidental to mining	0.066
PO02 – PO09	Active mining pond	6.765
PO10 – PO20	Historic mining ponds that are isolated	0.780
WF01 – WF03	Seasonal wetlands that are isolated	0.513
I01	Intermittent drainage that lacks a surface hydrological connection to a TNW	0.053
E07, E08, E24 – E28, E31 – E39, E47, E48	Ephemeral drainage that lacks a surface hydrological connection to a TNW	0.410
D01	Man-made ditch created completely in upland habitat for detention pond overflow conveyance	0.066
E01-E06, E09-E23, WF04-WF05, PO21, and OW02-OW05	Aquatic features that may lack a hydrologic connection/significant nexus to a TNW due to the presence of controlled/managed outfalls	1.250
	Potentially Non-Jurisdictional Totals =	9.903

Waters of the State

As described in the State Procedures, WOTS are broadly defined in the Water Code as including "any surface water or groundwater, including saline waters, within the boundaries of the state" and include all WOTUS. The State Implementation Guidance further states that WOTS "include both historic and current definitions of waters of the United States." Therefore, all features within the Project site that have been identified as potential WOTUS and meet the necessary wetland parameters or OW parameters are also WOTS. However, all of the features present within the Project site that have been identified as potentially non-jurisdictional WOTUS in **Table 1** require further assessment to determine if they fall under the jurisdiction of the State.

Pursuant to the State Procedures, all of the actively used and maintained mining ponds within the site are jurisdictionally exempt under Section II.3.d.viii since they are part of the active surface mining facility. There is also one ephemeral ditch that is part of the active mining facility (D01) that is also included under this jurisdictional exemption. Therefore, the following should be considered jurisdictionally exempt and are not WOTS; PO01-PO09 and D01 (totaling 6.896 acres).

The remaining isolated ponds are all historical mining ponds; however, since they have not been part of an active mining operation in recent history, these ponds have become naturalized and meet the definitions of being jurisdictional WOTS. The following ponds are potentially jurisdictional WOTS: PO10-PO20 (totaling 0.780 acre).

The State Procedures only define wetland WOTS, so there is currently no clear definition for determining what other aquatic features such as drainages or lakes are jurisdictional WOTS. Therefore, state jurisdiction over the natural ephemeral and intermittent drainages within the Project site will need to be determined by the local Regional Water Quality Control Board (RWQCB). Although, as mentioned previously, the definition of WOTS in the Water Code is broad, the State Implementation Guidelines reference Corps manuals that define what physical parameters are required for a stream to meet the past or current definitions of jurisdictional WOTUS. Both past and present Corps manuals and guidelines identify the need for the presence of a bed, bank, scour and an Ordinary High Water Mark (OHWM) in order for a drainage to be considered a jurisdictional feature. Therefore, if these parameter requirements used by the Corps for drainages are to be used to define WOTS, then a jurisdictional drainage would be required to have an OHWM to be considered jurisdictional and erosional features that lack an OHWM would not be considered jurisdictional.

Conclusions and Recommendations

Potentially jurisdictional WOTUS and WOTS occur throughout the property. It is recommended that all potentially jurisdictional features that occur outside of the approved Reclamation Plan Area be avoided until the formal delineation is verified by the Corps and RWQCB. A minimum 50-foot buffer around all wetlands and a 25-foot buffer around all drainages outside of the approved Reclamation Plan Area should be constantly maintained.

Unapproved direct impacts to jurisdictional WOTUS as a result of filling or dewatering activities would require a permit from the Corps (CWA section 404 permit) and compensatory mitigation. Secondly, a CWA section 401 water quality certification from the Central Valley Regional Water Quality Control Board (RWQCB) would most likely be needed. If impacts to the pond or drainages are anticipated, then a Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW) would be needed.

Included as attachments are the following:
Attachment 1 – Draft Delineation of Waters of the United States Map

Prepared by,

Elena Gregg, Senior Botanist
Gallaway Enterprises

Project Boundary - (179.97 acres)

25 Foot Contours

Culvert - C#

Flow Direction

Photo Points* - P#

Erosional - ER# - (0.253 acres)

Active Mining - (75.89 acres)

Mineral Resource Area - (69.28 acres)

Permitted- (110.69 acres)

Data Points

Test Pit - TP#

Upland - U#

Wetland - W#

Aquatic Resources - (10.070 acres)

Other Waters - OW# - (9.483 acres)

Ditch - D# - (0.066 acres)

Ephemeral - E# - (1.217 acres)

Intermittent - OW# - (0.529 acres)

Intermittent (Isolated) - I# - (0.053 acres)

Pond - PO# - (7.618 acres)

Wetland Features - WF# - (0.587 acres)

Seasonal Wetland - WF# - (0.587 acres)

***See Figure 3, Ground Photographs Map, for additional information on Photo Points.**

Draft Delineation of Aquatic Resources
Active Mining
Other Waters

Label	Cowardin	Description	Location (Lat, Long)		Width*	Length (ft)	Area (sq ft)	Acres
D01	R4	Ditch	40.604593	-122.464525	19.9	467.2	2885.3	0.066
E01	R6	Ephemeral	40.603786	-122.466961	15.6	200.9	2656.3	0.061
E02	R6	Ephemeral	40.604418	-122.467543	43.3	474.2	2842.6	0.065
E03	R6	Ephemeral	40.605099	-122.469019	137.7	445.3	2887.3	0.066
E04	R6	Ephemeral	40.606256	-122.470266	116.1	435.4	1937.5	0.044
E05	R6	Ephemeral	40.606732	-122.470797	1.9	4.0	6.7	0.000
E06	R6	Ephemeral	40.606641	-122.466121	36.6	196.3	826.7	0.019
OW01	R4	Intermittent	40.602896	-122.465282	9.5	126.6	914.1	0.021
OW02	R4	Intermittent	40.604567	-122.469920	81.9	495.6	6943.1	0.159
OW03	R4	Intermittent	40.604717	-122.471183	13.8	120.2	728.9	0.017
OW04	R4	Intermittent	40.605418	-122.472657	38.0	338.3	1030.4	0.024
OW05	R4	Intermittent	40.604533	-122.474275	13.0	82.5	705.8	0.016
PO01	PUB	Pond	40.606395	-122.466973	43.7	119.0	2866.0	0.066
PO02	PUB	Pond	40.605861	-122.464720	105.3	113.9	9356.7	0.215
PO03	PUB	Pond	40.605467	-122.464643	65.5	136.0	8446.8	0.194
PO04	PUB	Pond	40.603419	-122.464930	104.8	312.1	24592.6	0.565
PO05	PUB	Pond	40.602676	-122.465514	112.1	136.3	12369.1	0.284
PO06	PUB	Pond	40.601961	-122.465808	107.1	355.5	24689.9	0.567
PO07	PUB	Pond	40.602954	-122.467573	348.4	526.5	137201.2	3.150
PO08	PUB	Pond	40.603956	-122.468151	262.4	492.1	73423.3	1.686
PO09	PUB	Pond	40.604607	-122.470810	60.8	95.3	4467.4	0.103
						Active Mining Other Waters Totals =	321777.6	7.387
						Active Mining Aquatic Resources Totals =	321777.6	7.387

Permitted
Wetland Features

Label	Cowardin	Description	Location (Lat, Long)		Width*	Length (ft)	Area (sq ft)	Acres
WF04	PUB	Seasonal Wetland	40.605013	-122.472637	N/A	N/A	962.8	0.022
						Permitted Wetland Features Totals =	962.8	0.022

Other Waters

E04	R6	Ephemeral	40.606256	-122.470266	70.5	338.0	1273.8	0.029
E05	R6	Ephemeral	40.606732	-122.470797	18.2	223.2	809.0	0.019
E08	R6	Ephemeral	40.605905	-122.47272	29.3	254.7	738.9	0.017
E09	R6	Ephemeral	40.604914	-122.472702	19.3	179.1	429.4	0.010
E12	R6	Ephemeral	40.605388	-122.474656	7.5	39.9	121.8	0.003
E19	R6	Ephemeral	40.604039	-122.473521	71.1	465.4	2110.9	0.048
E24	R6	Ephemeral	40.603152	-122.472362	73.6	647.4	2956.0	0.068
E25	R6	Ephemeral	40.603277	-122.471557	45.7	263.6	2604.3	0.060
E26	R6	Ephemeral	40.602975	-122.472182	6.7	59.2	117.5	0.003
E27	R6	Ephemeral	40.602878	-122.474584	27.8	305.7	941.5	0.022
E35	R6	Ephemeral	40.601781	-122.475354	21.8	356.4	1004.8	0.023
I01	R4	Intermittent (Isolated)	40.603218	-122.474586	65.8	471.7	1935.5	0.044
OW04	R4	Intermittent	40.605418	-122.472657	101.2	754.7	3191.3	0.073
OW05	R4	Intermittent	40.604533	-122.474275	88.5	781.4	4890.5	0.112
PO10	PUB	Pond	40.603459	-122.471078	27.4	40.6	880.3	0.020
PO13	PUB	Pond	40.602946	-122.472371	23.7	46.8	803.9	0.018
PO14	PUB	Pond	40.602934	-122.473461	86.8	98.7	5265.5	0.121
PO18	PUB	Pond	40.603314	-122.471337	27.5	47.2	915.5	0.021
PO19	PUB	Pond	40.603006	-122.472007	41.2	77.6	2251.5	0.052
PO20	PUB	Pond	40.602054	-122.473311	21.9	28.0	484.0	0.011
						Permitted Other Waters Totals =	33725.9	0.774
						Permitted Aquatic Resources Totals =	34688.7	0.796

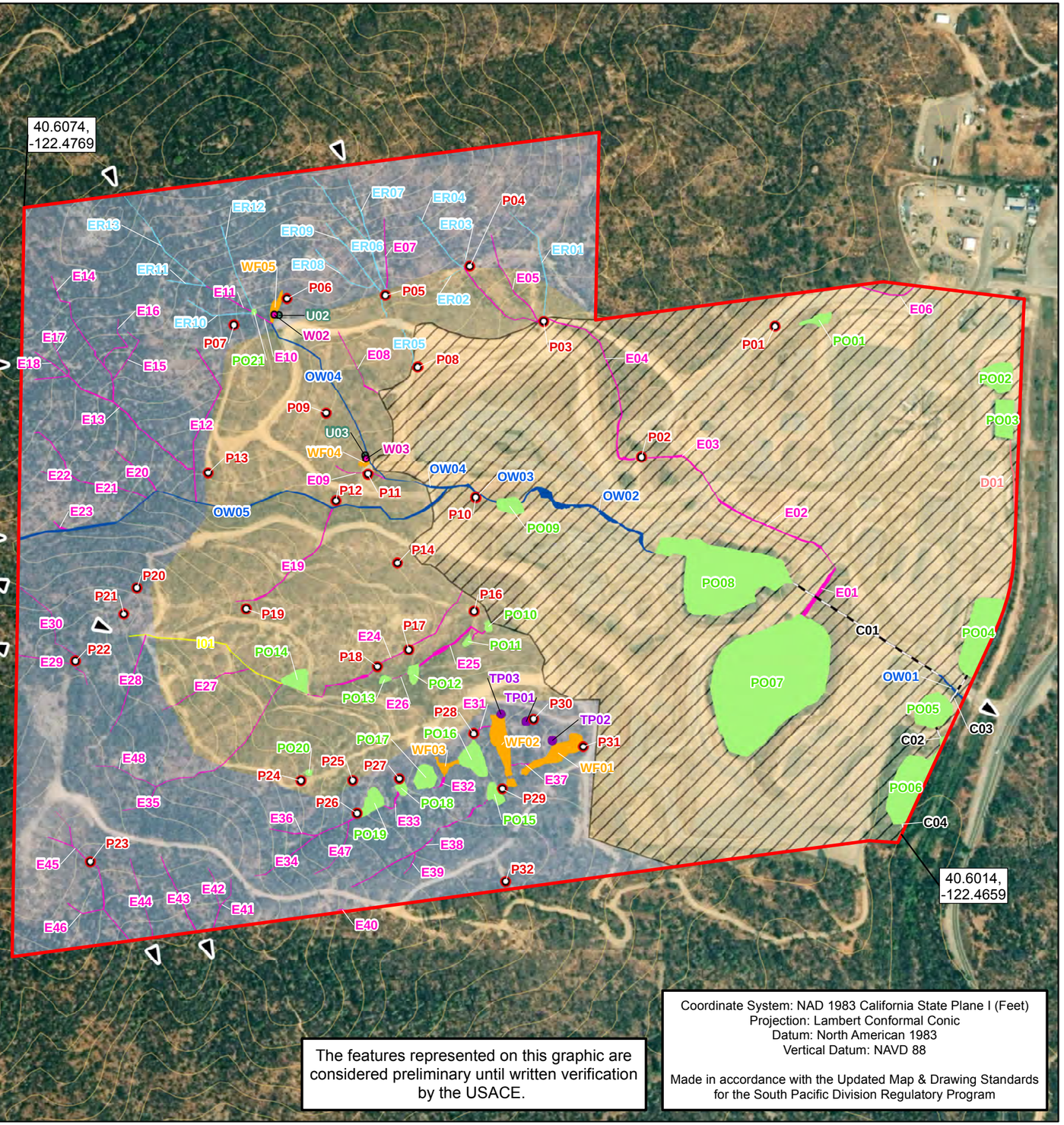
Mineral Resource Area
Wetland Features

Label	Cowardin	Description	Location (Lat, Long)		Width*	Length (ft)	Area (sq ft)	Acres
WF01	PUB	Seasonal Wetland	40.602259	-122.470198	N/A	N/A	9827.3	0.226
WF02	PUB	Seasonal Wetland	40.602331	-122.470898	N/A	N/A	10566.9	0.243
WF03	PUB	Seasonal Wetland	40.602124	-122.471602	N/A	N/A	1930.2	0.044
WF05	PUB	Seasonal Wetland	40.606485	-122.473758	N/A	N/A	2288.6	0.053
						Mineral Resource Area Wetland Features Totals =	24613.1	0.565

Other Waters

E04	R6	Ephemeral	40.606256	-122.470266	2.2	4.5	5.7	0.000
E05	R6	Ephemeral	40.606732	-122.470797	7.9	124.4	373.7	0.009
E07	R6	Ephemeral	40.606982	-122.472385	9.1	245.8	879.6	0.020
E10	R6	Ephemeral	40.606373	-122.473897	4.2	64.9	226.4	0.005
E11	R6	Ephemeral	40.606481	-122.474161	3.8	182.4	623.6	0.014
E12	R6	Ephemeral	40.605388	-122.474656	91.4	533.5	2208.7	0.051
E13	R6	Ephemeral	40.605454	-122.475702	73.9	633.2	2811.2	0.065
E14	R6	Ephemeral	40.606157	-122.476116	41.0	486.6	1679.4	0.039
E15	R6	Ephemeral	40.606009	-122.475605	49.0	175.9	590.6	0.014
E16	R6	Ephemeral	40.606119	-122.475746	65.3	167.0	633.1	0.015
E17	R6	Ephemeral	40.605965	-122.476420	12.3	124.3	313.5	0.007
E18	R6	Ephemeral	40.605941	-122.476558	7.7	140.9	415.7	0.010
E20	R6	Ephemeral	40.604917	-122.475455	17.4	206.8	757.3	0.017
E21	R6	Ephemeral	40.604895	-122.476104	73.6	450.9	1776.8	0.041
E22	R6	Ephemeral	40.604892	-122.476523	8.5	95.0	189.2	0.004
E23	R6	Ephemeral	40.604387	-122.476441	13.2	57.3	264.7	0.006
E27	R6	Ephemeral	40.602878	-122.474584	2.0	31.7	63.4	0.001
E28	R6	Ephemeral	40.602945	-122.475531	15.5	356.9	1155.0	0.027
E29	R6	Ephemeral	40.603086	-122.476511	51.8	271.0	737.9	0.017
E30	R6	Ephemeral	40.603479	-122.476562	48.1	327.4	705.4	0.016
E31	R6	Ephemeral	40.602459	-122.471173	20.3	79.9	405.2	0.009
E32	R6	Ephemeral	40.601963	-122.471652	19.5	54.7	407.8	0.009
E33	R6	Ephemeral	40.601782	-122.472243	32.2	69.9	514.9	0.012
E34	R6	Ephemeral	40.601378	-122.473301	23.7	409.2	1277.0	0.029
E35	R6	Ephemeral	40.601781	-122.475354	44.2	378.0	1001.7	0.023
E36	R6	Ephemeral	40.601483	-122.473502	9.0	166.0	495.2	0.011
E37	R6	Ephemeral	40.602145	-122.470668	7.6	65.9	185.8	0.004
E38	R6	Ephemeral	40.601375	-122.471896	27.9	560.2	1929.0	0.044
E39	R6	Ephemeral	40.601199	-122.472023	10.9	84.5	225.2	0.005
E40	R6	Ephemeral	40.600749	-122.472884	8.5	40.3	176.1	0.004
E41	R6	Ephemeral	40.600773	-122.474390	21.9	188.5	511.0	0.012
E42	R6	Ephemeral	40.600962	-122.474480	12.4	141.6	292.1	0.007
E43	R6	Ephemeral	40.600866	-122.474918	9.1	290.4	997.4	0.023
E44	R6	Ephemeral	40.600835	-122.475384	10.0	283.9	596.9	0.014
E45	R6	Ephemeral	40.601052	-122.476019	84.4	512.7	1934.6	0.044
E46	R6	Ephemeral	40.600736	-122.476108	30.2	125.4	407.0	0.009
E47	R6	Ephemeral	40.601325	-122.472941	37.7	217.4	519.1	0.012
E48	R6	Ephemeral	40.602037	-122.475597	20.8	220.8	442.0	0.010
I01	R4	Intermittent (Isolated)	40.603218	-122.474586	12.5	93.0	371.2	0.009
OW04	R4	Intermittent	40.605418	-122.472657	4.9	25.5	123.9	0.003
OW05	R4	Intermittent	40.604533	-122.474275	86.8	664.7	4501.1	0.103
PO11	PUB	Pond	40.601916	-122.472148	40.7	60.9	1701.7	0.039
PO12	PUB	Pond	40.601771	-122.472524	73.0	117.5	5254.3	0.121
PO15	PUB	Pond	40.601861	-122.470984	56.6	85.9	3212.8	0.074
PO16	PUB	Pond	40.602187	-122.471249	96.9	122.3	7768.0	0.178
PO17	PUB	Pond	40.602015	-122.471857	74.9	95.3	5459.4	0.125
PO21	PUB	Pond	40.606441	-122.474027	19.2	20.8	325.2	0.007
						Mineral Resource Area Other Waters Totals =	57446.6	1.319
						Mineral Resource Area Aquatic Resource Totals =	82059.7	1.884
						Wetland Features Totals =	25575.9	0.587
						Other Waters Totals =	412950.1	9.483
						Aquatic Resources Totals =	4386553.3	10.070

*Widths are represented as averges



The features represented on this graphic are considered preliminary until written verification by the USACE.

Coordinate System: NAD 1983 California State Plane I (Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88

Made in accordance with the Updated Map & Drawing Standards for the South Pacific Division Regulatory Program

1:4,800 1 inch = 400 feet

0 200 400 Feet

NORTH

Data Sources: ESRI, Shasta County, Maxar 09/15/2021

Crystal Creek Aggregate Mine
Draft Delineation of Aquatic Resources
Attachment 1

Delineation by: E. Gregg
Map by: A. McLaughlin
GE: #22-050

gallaway ENTERPRISES

Map Date: 09/28/2022

Crystal Creek Aggregates
Comprehensive Project Plan & Wetland Delineation

Legend

- Project Boundary - (179.97 acres)
- 25 Foot Contours
- Culvert
- Flow Direction
- Photo Points
- Erosional - (0.253 acres)

Data Points

- Test Pit
- Upland
- Wetland

Aquatic Resources - (10.070 acres)

Other Waters - (9.483 acres)

- Ditch - (0.066 acres)
- Ephemeral - (1.217 acres)
- Intermittent - (0.529 acres)
- Intermittent (Isolated) - (0.053 acres)
- Pond - (7.618 acres)

Wetland Features - (0.587 acres)

- Seasonal Wetland - (0.587 acres)

Crystal Creek Aggregates

Crystal Creek Aggregates
10936 Iron Mountain Road
Redding, CA 96001

Duane K. Miller Civil Engineer, Inc.
PO Box 130
6172 Meister Way, Unit 1
Anderson, CA 96007
530-365-5610

Draft Delineation of Waters of the U.S by Gallaway Enterprises, Inc.
Delineation by: E. Gregg
Map by: A. McLaughlin & B. Reaves
GE: #22-050
Map Date: 02/03/2021
Revised Map Date: 08/04/2022

Data Sources: ESRI, Shasta County, Maxar 09/15/2021

1 inch = 400 feet 1:4,800

0 0.05 0.1 0.2 Miles

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