MEMORANDUM

GLENN LUKOS ASSOCIATES
Regulatory Services

PROJECT NUMBER: 0551-5CUSH

TO: Mr. David Rib
Environmental Manager
Mitsubishi Cement Corporation
5808 State Highway 18
Lucerne Valley, California 92356

FROM: Martin Rasnick

DATE: December 18, 2018

SUBJECT: Cushenbury Mine South Pit Expansion Project, Located in the Community of Lucerne Valley, San Bernardino County, California: CDFW Jurisdictional Delineation Impact Analysis and Supplement to 2012 Report.

Mr. Rib:

This memorandum summarizes our updated findings and impact analysis of California Department of Fish and Wildlife (CDFW) jurisdiction associated with the Cushenbury Mine South Pit Expansion Project (Project) located in the Community of Lucerne Valley, San Bernardino County, California [Exhibit 1]. The Project comprises approximately 150 acres of land and contains no blue-line drainages (as depicted on the U.S. Geological Survey (USGS) topographic map Big Bear City, California [dated 1971 and photorevised in 1979]) [Exhibit 2].

Glenn Lukos Associates (GLA) conducted a jurisdictional delineation of the Project site and associated offsite areas (collectively, "Study Area") and prepared a report for Mitsubishi Cement Corporation (Mitsubishi) in 2009 and 2010, and the delineation report was updated in May 2012 (2012 Report). The 2012 Report identified two streambeds in the Study Area that could be affected by the Project (referenced herein as "Tributary to Marble Canyon Creek" and "Drainage A"). In 2018, CDFW requested a re-examination of those identified streambed areas that could be affected by the Project to confirm the extent of CDFW jurisdiction associated with the Project. On November 5, 2018, regulatory specialists of GLA re-examined the Project site to confirm the limits of CDFW jurisdiction pursuant to Division 2, Chapter 6, Sections 1600-1617 of the Fish and Game Code. The delineation was limited to the Project footprint/impact area to document updated site conditions associated with Tributary to Marble Canyon Creek and Drainage A. Areas outside of the Project impact area were not re-examined as part of this analysis; therefore,

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total CDFW jurisdiction associated with the Project avoidance areas may be deferred to the results contained in the 2012 Report[1].

Enclosed is a 650-scale map [Exhibit 3] that depicts the areas of CDFW jurisdiction. A photograph location map and site photographs documenting the topography, vegetative communities, and general widths of each of the waters are provided as Exhibits 4a and 4b, respectively.

CDFW jurisdiction associated with the Project totals 0.74 acre, none of which consists of vegetated riparian habitat. A total of 3,622 linear feet of streambed is present. The Project, as proposed, would permanently impact up to 0.74 acre and 3,622 linear feet of non-riparian streambed. No temporary impacts are associated with the Project.

I. METHODOLOGY

Prior to beginning the field delineation, a color aerial photograph, Google Earth imagery, a topographic base map of the property, and the previously cited USGS topographic map were examined to determine the locations of potential areas of CDFW jurisdiction. Several CDFW guidance resources were taken into consideration to determine the limits of jurisdiction[2]. Suspected jurisdictional areas were field checked for the presence of definable channels and/or riparian vegetation and hydrology. While in the field, the limits of CDFW jurisdiction were recorded onto a color aerial photograph using visible landmarks and GPS Trimble equipment. In areas lacking a well-defined bed, bank, and channel, the lateral extent of CDFW jurisdiction (defined below) was expanded to the point in which fluvial processes were no longer distinguishable from the terrestrial landscape. In these cases, jurisdiction was generally expanded to include the outermost bounds of reasonable flow sign as evidenced by physical and biological indicators, including, but not limited to, the presence of high water marks, sediment sorting, and canyon bottom. Site photographs, including GPS photo point locations were recorded for reference. Except for a small offsite portion of Tributary to Marble Canyon Creek, this updated delineation was limited to the Project impact footprint itself. Additional areas outside of the Project impact footprint are being deferred to the results contained in the 2012 Report.

[1] Please note, Tributary to Marble Canyon Creek was delineated in its entirety prior to its confluence with Marble Canyon Creek; therefore, a small avoidance area associated with this feature was re-delineated as part of this analysis and is depicted in Exhibit 3.
[2] https://www.wildlife.ca.gov/Conservation/LSA/Resources

II. CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE JURISDICTION

Pursuant to Division 2, Chapter 6, Sections 1600-1617 of the California Fish and Game Code, the CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, which supports fish or wildlife.

CDFW defines a stream (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation." CDFW's definition of "lake" includes "natural lakes or man-made reservoirs." CDFW also defines a stream as "a body of water that flows, or has flowed, over a given course during the historic hydrologic regime, and where the width of its course can reasonably be identified by physical or biological indicators."

It is important to note that the Fish and Game Code defines fish and wildlife to include: all wild animals, birds, plants, fish, amphibians, invertebrates, reptiles, and related ecological communities including the habitat upon which they depend for continued viability (FGC Division 5, Chapter 1, section 45 and Division 2, Chapter 1 section 711.2(a) respectively). Furthermore, Division 2, Chapter 5, Article 6, Section 1600 et seq. of the California Fish and Game Code does not limit jurisdiction to areas defined by specific flow events, seasonal changes in water flow, or presence/absence of vegetation types or communities.

III. RESULTS

The Project contains a total of 0.74 acre and 3,622 linear feet of non-riparian CDFW jurisdiction, all of which will be permanently impacted by Project development. No temporary impacts are associated with the Project[3]. Table Two below depicts impacts to CDFW jurisdiction, followed by a description of each drainage. A graphic depicting the Project's impacts to CDFW jurisdiction is provided as Exhibit 3 and site photographs are provided as Exhibits 4a and 4b.

[3] Except for a small off-site portion of Tributary to Marble Canyon Creek that was re-delineated as part of this updated analysis and depicted in Exhibit 3, total CDFW jurisdiction associated with the off-site avoidance areas (i.e., the drainages not being impacted by Project development) may be deferred to the results contained in the 2012 Report.

Table One. Total CDFW Jurisdiction/Impacts

Drainage Feature	Total CDFW Jurisdiction/Permanent Impact (Acres)	Total Drainage Length/Permanent Impact (Feet)
Tributary to Marble Canyon Creek	0.14	639
Drainage A	0.60	2,984
Total(s)	**0.74**	**3,622**

1. Tributary to Marble Canyon Creek

CDFW jurisdiction associated with the Tributary to Marble Canyon Creek totals 0.14 acre and 639 linear feet of non-riparian streambed, all of which will be permanently impacted by Project development. No temporary impacts are associated with the Project.

Tributary to Marble Canyon Creek is an ephemeral drainage that originates within the south-central portion of the Project area and flows in a southwesterly direction for approximately 639 linear feet before continuing offsite towards its confluence with Marble Canyon Creek. Marble Canyon Creek is an isolated feature that terminates within a massive quarry pit located west of the Study Area. Historically, Marble Canyon Creek flowed in a northerly direction from its current terminus for an additional 12 miles where it ultimately discharged into the Lucerne Dry Lake.

The substrate of the Tributary to Marble Canyon Creek is predominantly unvegetated and consists of boulders, rocks, cobbles, and gravel due to the velocity of ephemeral water flow and extreme gradient of the drainage feature. The tributary exhibits a bed, bank, and channel ranging from seven (7) to 13 feet in width as evidenced by changes in sediment deposition, the presence of scour, and terracing. The downstream off-site portion of the tributary extends beyond 19 feet in width prior to its confluence with the main stem drainage. In areas lacking a well-defined bed, bank, and channel, the lateral extent of CDFW jurisdiction was expanded to the point in which fluvial processes were no longer distinguishable from the terrestrial landscape. In these cases, jurisdiction was generally expanded to include the canyon bottom.

Vegetation within and adjacent to the Tributary to Marble Canyon Creek includes limited areas of upland species consisting of thickleaf yerba santa (*Eriodictyon crassifolium*), holly-leaved redberry (*Rhamnus ilicifolia*), buckwheat (*Eriogonum* sp.), brickellbush (*Brickellia* sp.), canyon

live oak (*Quercus chrysolepis*), antelope bitterbrush (*Pursia tridentata*), California juniper (*Juniperus californica*), singleleaf pinyon (*Pinus monophylla*), ephedra (*Ephedra* sp.), ceanothus (*Ceanothus* sp.), and rubber rabbitbrush (*Chrysothamnus nauseosus*). These species extend far up the canyon slopes and occur throughout the adjacent uplands in a pattern that is consistent throughout much of the site.

Site photographs are provided as Exhibits 4A and 4B.

2. Drainage A

CDFW jurisdiction associated with Drainage A totals 0.60 acre and 2,984 linear feet of non-riparian streambed, all of which will be permanently impacted by Project development. No temporary impacts are associated with the Project.

Drainage A is an ephemeral drainage that originates within the northern portion of the Project site and flows in a northeasterly direction for approximately 2,984 linear feet before it terminates within the Cushenbury Mine East to the north. Historically, Drainage A flowed in a northeasterly direction for approximately one mile where it discharged into Cushenbury Creek and then flowed for 1.5 miles where it discharged into Marble Canyon Creek, which flowed in a northerly direction for an additional 10.5 miles where it discharged into the Lucerne Dry Lake.

The substrate of Drainage A is predominantly unvegetated and consists of boulders, rocks, cobbles, and gravel due to the velocity of the water flow and extreme gradient of the drainage feature. Drainage A exhibits a bed, bank, and channel ranging from three (3) to 12 feet in width as evidenced by changes in sediment deposition, the presence of scour, and terracing. In areas lacking a well-defined bed, bank, and channel, the lateral extent of CDFW jurisdiction was expanded to the point in which fluvial processes were no longer distinguishable from the terrestrial landscape. In these cases, jurisdiction was generally expanded to include the canyon bottom.

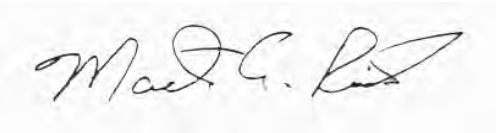
Vegetation within and adjacent to Drainage A includes limited areas of upland species consisting of manzanita (*Arctostaphylos* sp.), antelope bitterbrush (*Pursia tridentata*), California juniper (*Juniperus californica*), Mojave yucca (*Yucca schidigera*), rubber rabbitbrush (*Chrysothamnus nauseosus*), Joshua tree (*Yucca brevifolia*), singleleaf pinyon (*Pinus monophylla*), ephedra (*Ephedra* sp.), and ceanothus (*Ceanothus* sp.). These species extend far up the canyon slopes and occur throughout the adjacent uplands in a pattern that is consistent throughout much of the site.

Site photographs are provided as Exhibits 4A and 4B.

If you have any questions regarding this memorandum, please call me. Thank you.

Sincerely,

GLENN LUKOS ASSOCIATES, INC.



Martin A. Rasnick
Principal/Sr. Regulatory Specialist

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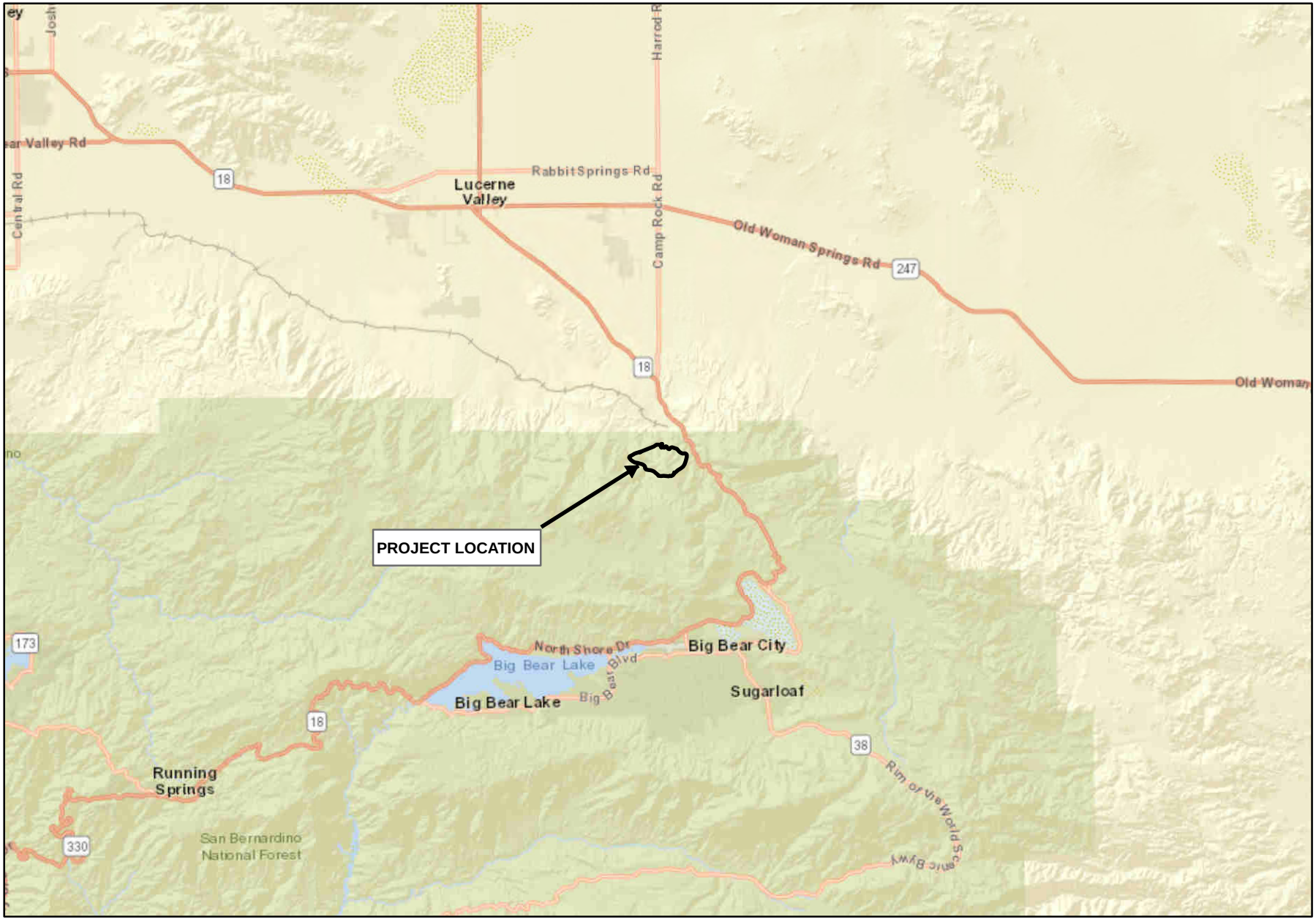

Source: ESRI World Street Map

N

0 2 4 8 Miles

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Regional Map

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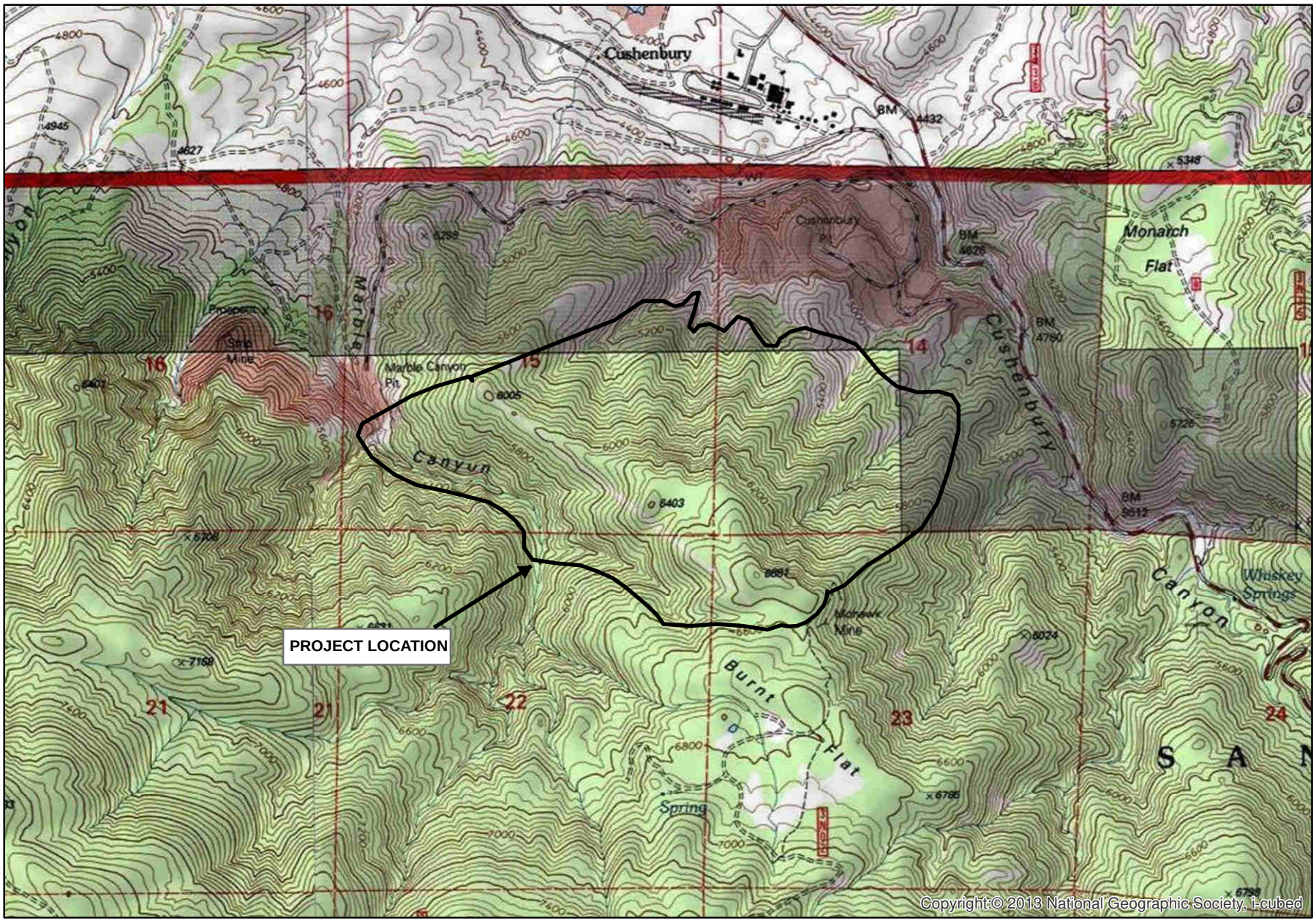
Exhibit 1



Adapted from USGS Big Bear City, CA quadrangle

N

0 1,000 2,000 4,000 Feet

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Vicinity Map

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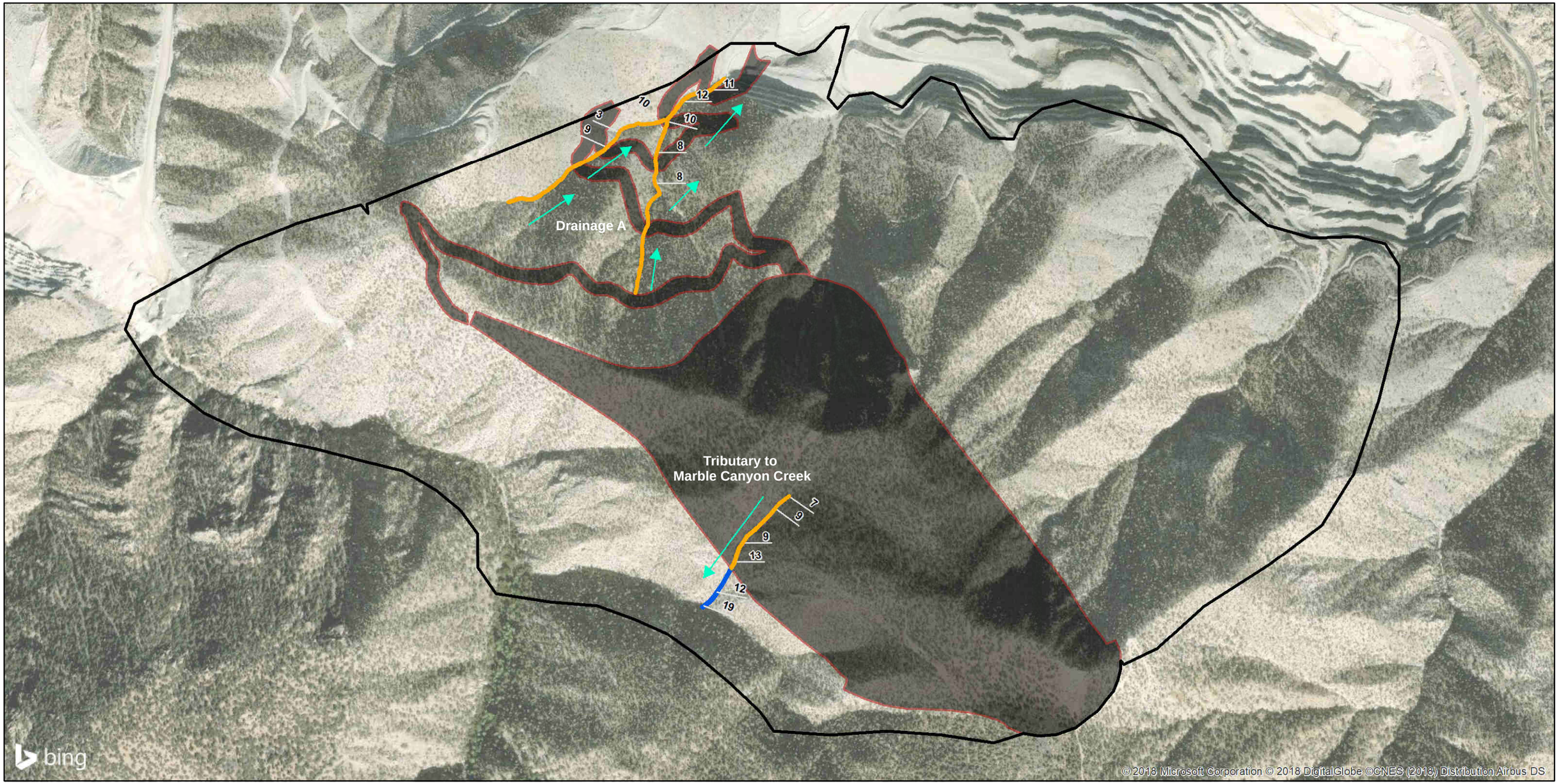
Exhibit 2



Study Area

Project Footprint

Avoided CDFW Non-riparian Streambed

Impacted CDFW Non-riparian Streambed

Width in Feet

Drainage Flow Direction

N

0 325 650 1,300

Feet

1 inch = 650 feet

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

November 2018 CDFW Jurisdictional Delineation/Impact Map

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Exhibit 3

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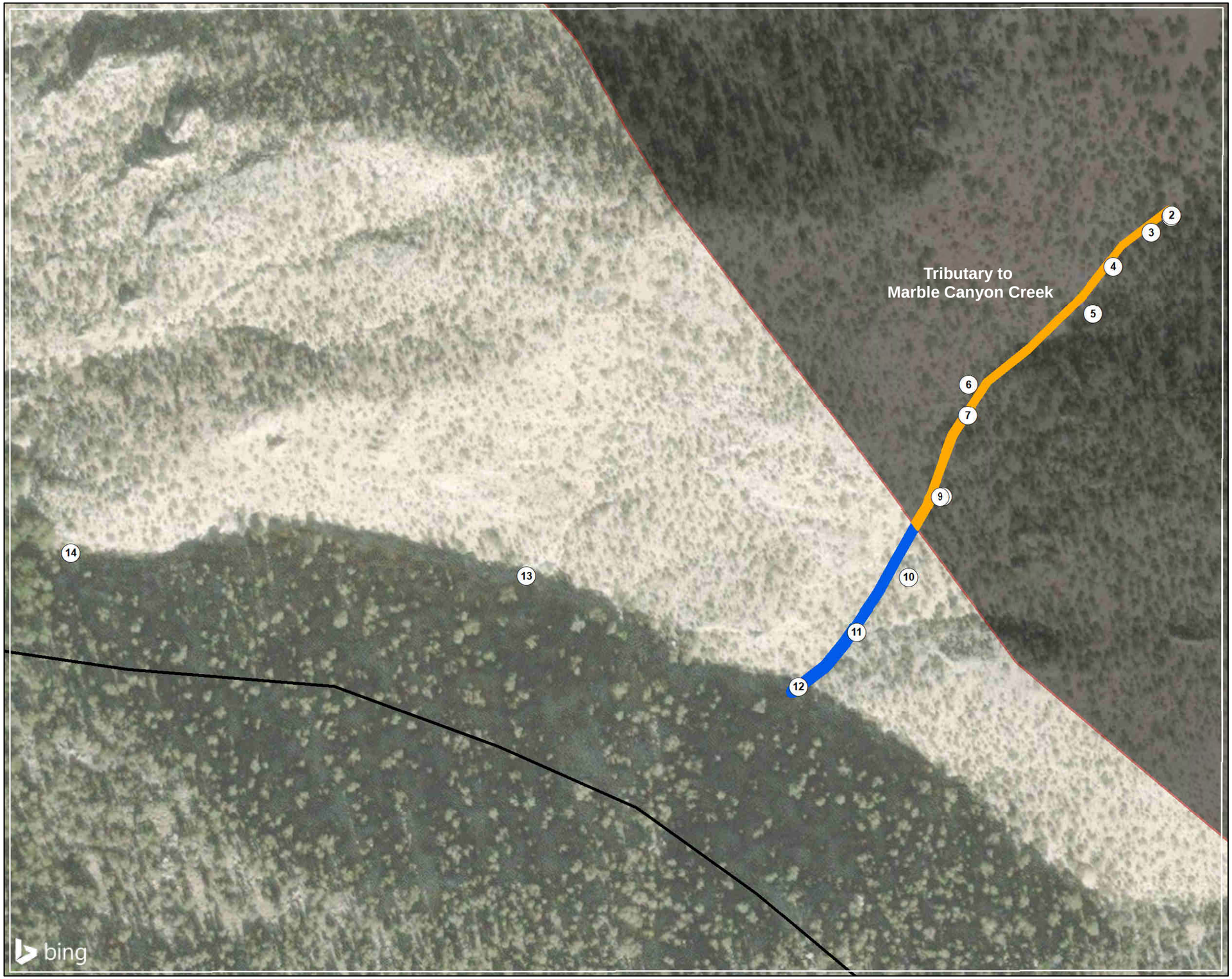

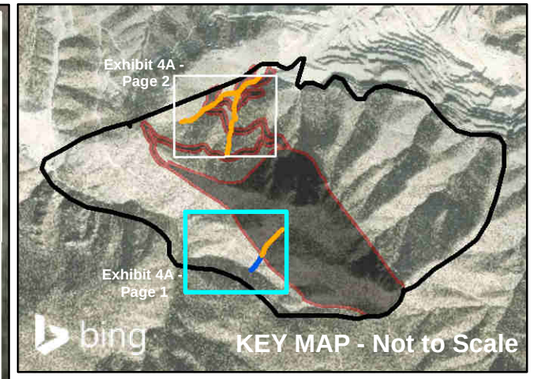

PHOTO	LATITUDE	LONGITUDE
1	34.337918	-116.858864
2	34.337926	-116.858862
3	34.337853	-116.858968
4	34.337712	-116.859164
5	34.337512	-116.859271
6	34.337219	-116.859910
7	34.337087	-116.859916
8	34.336747	-116.860049
9	34.336745	-116.860062
10	34.336407	-116.860229
11	34.336176	-116.860497
12	34.335948	-116.860799
13	34.336430	-116.862185
14	34.336550	-116.864512

Study Area

Project Footprint

Avoided CDFW Non-riparian Streambed

Impacted CDFW Non-riparian Streambed

Photo Location

0 75 150 300

Feet

1 inch = 150 feet

N

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Photo Location Map

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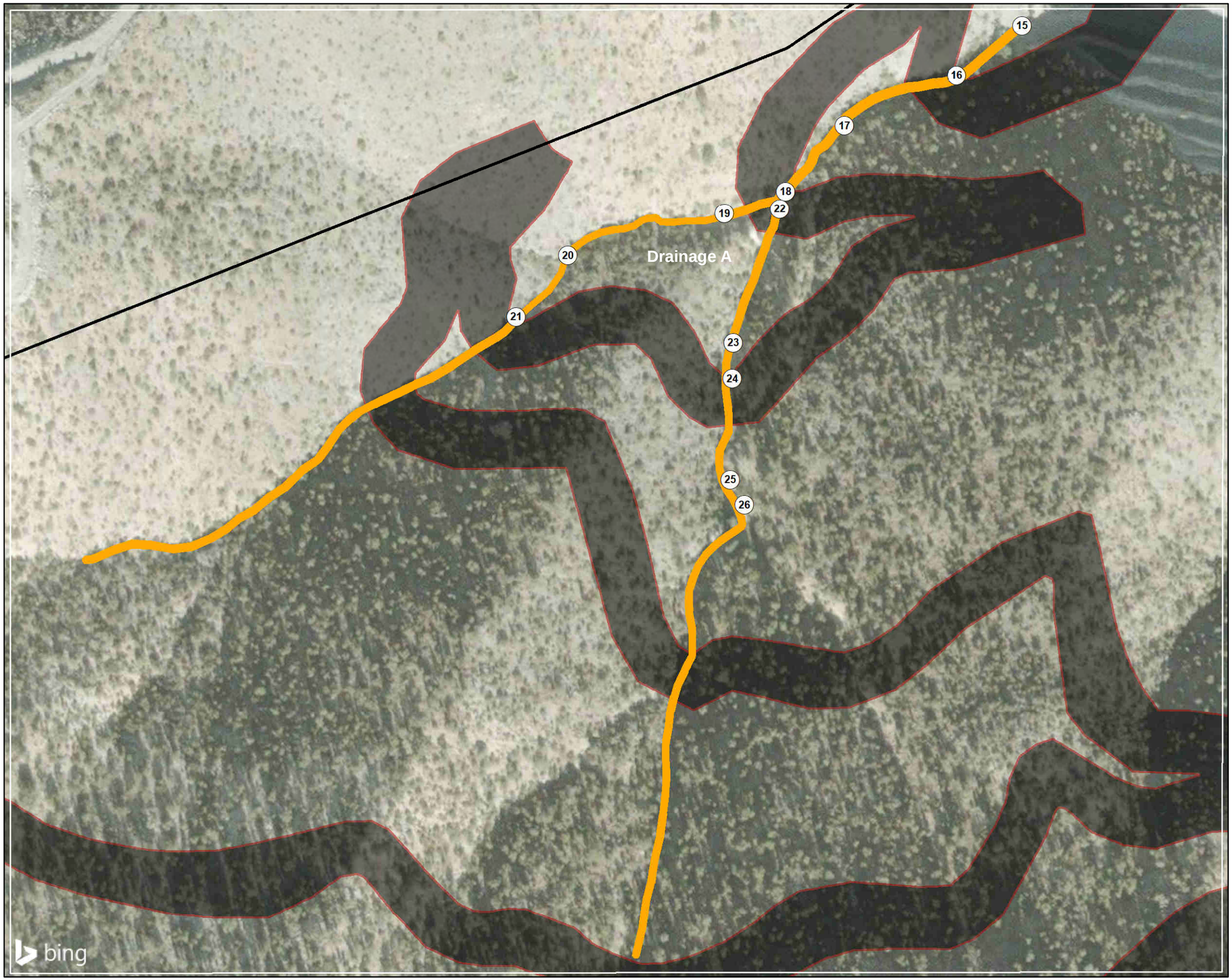
Exhibit 4A Page 1

X:\0363-THE REST\0551-05CUSH\551-5_GIS\DelineationGIS\551-5 PhotoLocationMapSouth.mxd



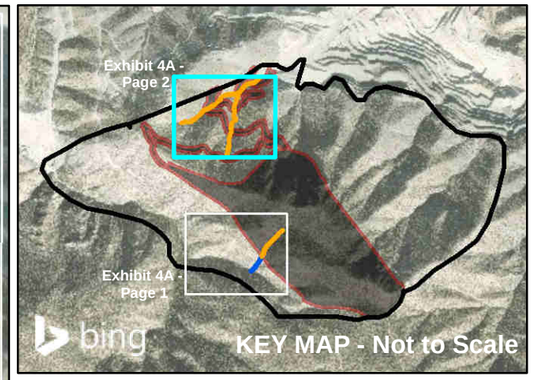


PHOTO	LATITUDE	LONGITUDE
15	34.345638	-116.860217
16	34.345431	-116.860555
17	34.345223	-116.861132
18	34.344946	-116.861436
19	34.344856	-116.861751
20	34.344686	-116.862553
21	34.344428	-116.862822
22	34.344873	-116.861467
23	34.344308	-116.861714
24	34.344157	-116.861719
25	34.343729	-116.861737
26	34.343622	-116.861665

Study Area

Project Footprint

Avoided CDFW Non-riparian Streambed

Impacted CDFW Non-riparian Streambed

Photo Location

0 75 150 300

Feet

1 inch = 150 feet

N

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Photo Location Map

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Exhibit 4A Page 2

X:\0363-THE REST\0551-05CUSH\551-5_GIS\DelineationGIS\551-5 PhotoLocationMapNorth.mxd

Photograph 1: View of uplands adjacent to start of Tributary to Marble Canyon Creek looking downslope. Photograph taken on 11/05/2018.

Photograph 2: Tributary to Marble Canyon Creek looking downstream at start of flow sign. Drainage width averages seven (7) feet in width. Photograph taken on 11/05/2018.

Photograph 3: Upstream reach of Tributary to Marble Canyon Creek looking downstream. Photograph taken on 11/05/2018.

Photograph 4: Tributary to Marble Canyon Creek looking downstream. Drainage width averages nine (9) feet in width. Photograph taken on 11/05/2018.

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Exhibit 4B

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Site Photographs

Photograph 5: Representative landscape view of Tributary to Marble Canyon Creek and adjacent upland areas looking downstream. Note the consistency of vegetation cover in the vicinity. Photograph taken on 11/05/2018.

Photograph 6: Tributary to Marble Canyon Creek middle reach looking downstream. Photograph taken on 11/05/2018 from upland slope.

Photograph 7: Tributary to Marble Canyon Creek middle reach looking downstream. Drainage averages nine (9) feet in width. Photograph taken on 11/05/2018.

Photograph 8: Tributary to Marble Canyon Creek looking downstream. Drainage averages 13 feet in width. Photograph taken on 11/05/2018.

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Exhibit 4B

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Site Photographs

Photograph 9: Additional view of Tributary to Marble Canyon Creek middle reach and adjacent canyon side slopes looking downstream. Drainage averages 13 feet in width. Photograph taken on 11/05/2018.

Photograph 10: Offsite portion of Tributary to Marble Canyon Creek and adjacent canyon side slopes looking downstream. Photograph taken on 11/05/2018.

Photograph 11: Offsite portion of Tributary to Marble Canyon Creek looking downstream. Drainage averages 12 feet in width. Photograph taken on 11/05/2018.

Photograph 12: Offsite portion of Tributary to Marble Canyon Creek looking downstream. Drainage averages 19 feet in width. Photograph taken on 11/05/2018.

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Exhibit 4B

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Site Photographs

Photograph 13: Offsite unmapped portion of Tributary to Marble Canyon Creek looking upstream towards steep rock outcrop. Photograph taken on 11/05/2018.

Photograph 14: Offsite unmapped portion of Tributary to Marble Canyon Creek looking downstream. Drainage averages 27 feet in width. Photograph taken on 11/05/2018.

Photograph 15: View looking towards start of Drainage A looking upstream. Photograph taken on 11/05/2018.

Photograph 16: Drainage A looking upstream. Drainage averages 11 feet in width. Photograph taken on 11/05/2018.

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Exhibit 4B

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Site Photographs

Photograph 17: Drainage A looking upstream. Drainage averages 12 feet in width. Photograph taken on 11/05/2018 from side terrace.

Photograph 18: Drainage A looking upstream towards eastern branch. Photograph taken on 11/05/2018.

Photograph 19: Western branch of Drainage A looking upstream. Drainage averages 10 feet in width. Photograph taken on 11/05/2018.

Photograph 20: Western branch of Drainage A looking upstream. Photograph taken on 11/05/2018.

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Exhibit 4B

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Site Photographs

Photograph 21: Western branch of Drainage A looking upstream. Photograph taken on 11/05/2018 from adjacent uplands.

Photograph 22: Eastern branch of Drainage A looking upstream. Photograph taken on 11/05/2018.

Photograph 23: Eastern branch of Drainage A looking upstream. Photograph taken on 11/05/2018.

Photograph 24: Eastern branch of Drainage A looking upstream. Photograph taken on 11/05/2018.

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Exhibit 4B

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Site Photographs

Photograph 25: Eastern branch of Drainage A looking upstream. Drainage mapped at eight (8) feet in width. Photograph taken on 11/05/2018.

Photograph 26: Eastern branch of Drainage A looking downstream. Photograph taken on 11/05/2018.

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Exhibit 4B

Photograph 27 (unmapped): Eastern branch of Drainage A looking upstream towards headwaters. Drainage mapped at eight (8) feet in width. Photograph taken on 11/05/2018.

Photograph 28 (unmapped): Representative view of canyon slopes adjacent to Drainage A. Photograph taken on 11/05/2018.

CUSHENBURY MINE
SOUTH PIT EXPANSION PROJECT

Site Photographs