



COLORADO OPERATIONS

Henderson Mine and Mill
P.O. Box 68
Empire, CO 80438
Phone (303) 569-3221
Fax (303) 569-2830

November 11, 2020

Sent Via Email and UPS#: 1Z804641NT98366007

Mr. Peter Hays
Division of Reclamation Mining and Safety
1313 Sherman St., Rm. 215
Denver, CO 80203

RE: Climax Molybdenum Company, Henderson Mill, Permit No. M-1977-342, Technical Revision 30, Mill-EPF 1.5 – Seep Water Collection and Return System Improvements Closeout Documentation

Dear Mr. Hays:

Technical Revision (TR) No. 30 to the Henderson Mine Permit No. M-1977-342 was approved by the Division of Reclamation, Mining, and Safety on October 1, 2018. This TR was for the Seep Water Collection and Return System Improvements that took place towards the end of 2018 and which were completed in the fall of 2019. As required, Henderson is submitting the attached as-built drawings and engineering certification for this project.

Both the as-built drawings and the engineering certification have been stamped, signed, and dated by Trevor E. Mugele, a professional engineer working for W. W. Wheeler and Associates, Inc. who designed and oversaw the construction.

If you need any additional information to complete your review of this request, please contact Miguel Hamarat at mhamarat@fmi.com or 720-942-3255.

Regards,

Aaron Hilshorst
Manager, Land & Water Resources
Colorado
Climax Molybdenum Company

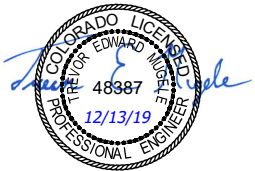
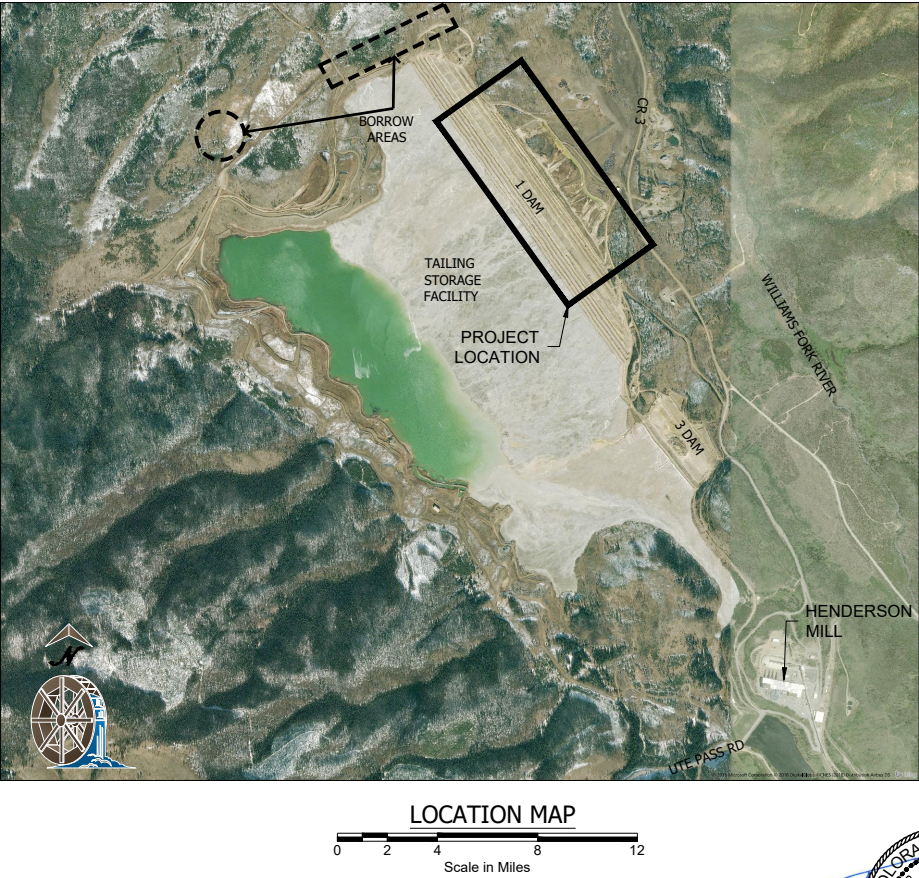
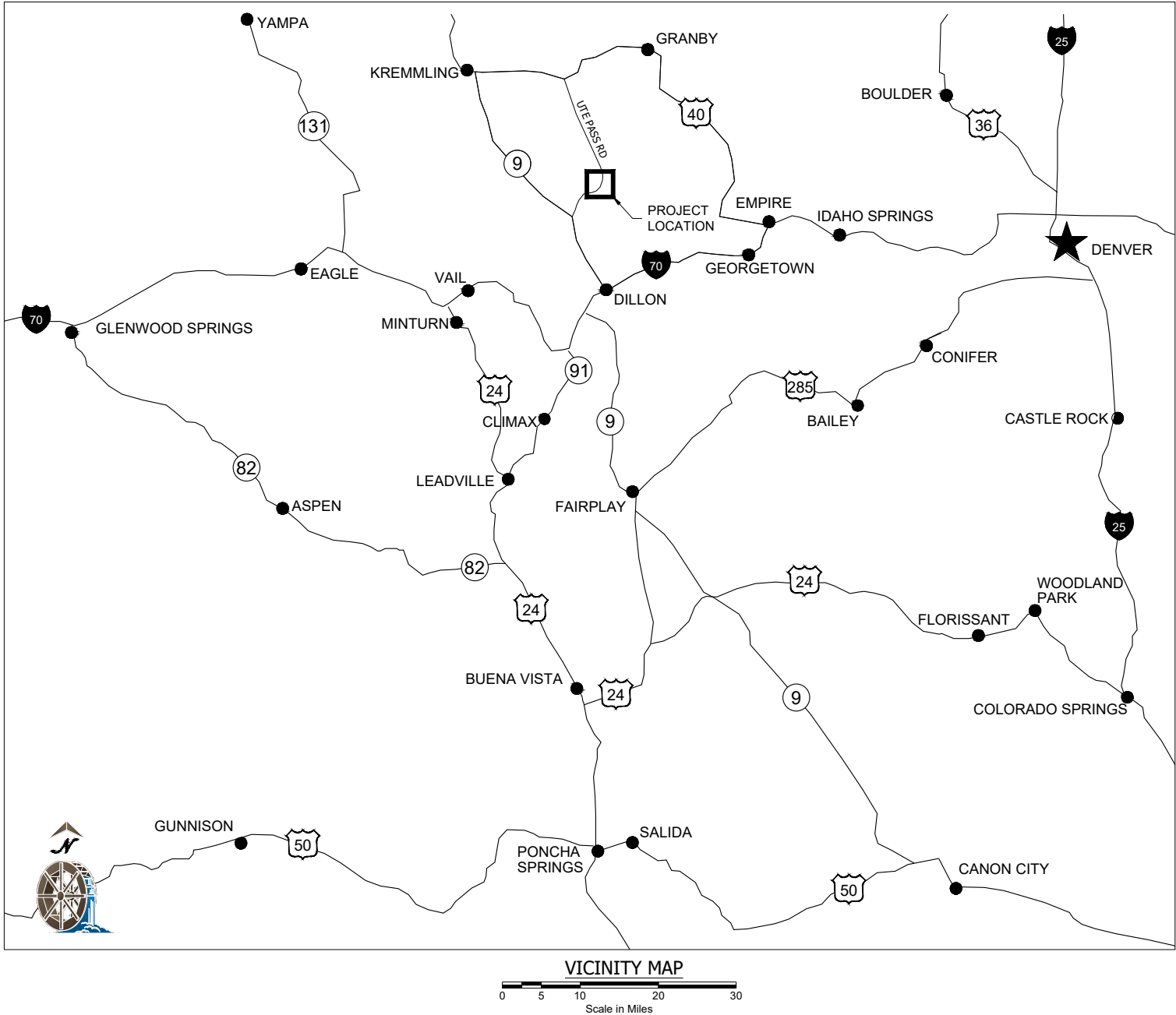
Attachments:

- Seep Water Collection and Return System Improvement As-Build Drawings
- Seep Water Collection and Return System Improvements Engineering Certification Statement

cc: M. Hamarat, Climax

SEEPWATER DETENTION BERM ROAD RAISE
HENDERSON MILL
PARSHALL, CO

DRAWING INDEX	
DRAWING NO.	DRAWING TITLE
G1	COVER SHEET, DRAWING INDEX, AND LOCATION MAPS
G2	SEEPWATER DETENTION BERM - GENERAL ARRANGEMENT - SITE PLAN
C1	ROAD RAISE - PLAN & PROFILE - STA. 0+00 TO 9+00
C2	ROAD RAISE - PLAN & PROFILE - STA. 9+00 TO 18+00
C3	ROAD RAISE - PLAN & PROFILE - STA. 228+00 TO 234+00
C4	ROAD RAISE - FEEDER CANAL CROSSINGS - PLAN VIEWS
C5	ROAD RAISE - TYPICAL SECTIONS & DETAILS
C6	ROAD RAISE - SPECIFICATIONS & MATERIALS



R:\13001\13331\13331.01\13331.01.13 - BERM - Road Raise\DRAWINGS\RD\Sheet\13331.01.13-001 - 12-13-19 10:51:19 AM Scott XREFS: climax24x36; T:\Mugale PE Stamp TEM Spt Climax 4C;

NO.	DATE	MADE BY	CHK. BY	REMARKS
1	05/18	TEM	SMM	30% DESIGN REVIEW
2	07/18	TEM	SMM	90% DESIGN REVIEW
3	08/18	TEM	SMM	ISSUED FOR CONSTRUCTION
4	12/19	SAA	TEM	RECORD DRAWING

"This drawing together with any and all additions, corrections, changes and alterations thereof is the property of Climax Molybdenum Company and is furnished on the express condition that it shall not be reproduced, copied, lent, or disposed of directly or indirectly, nor used for any other purpose than for which it is specifically furnished without the prior written consent of said Climax Molybdenum Company."

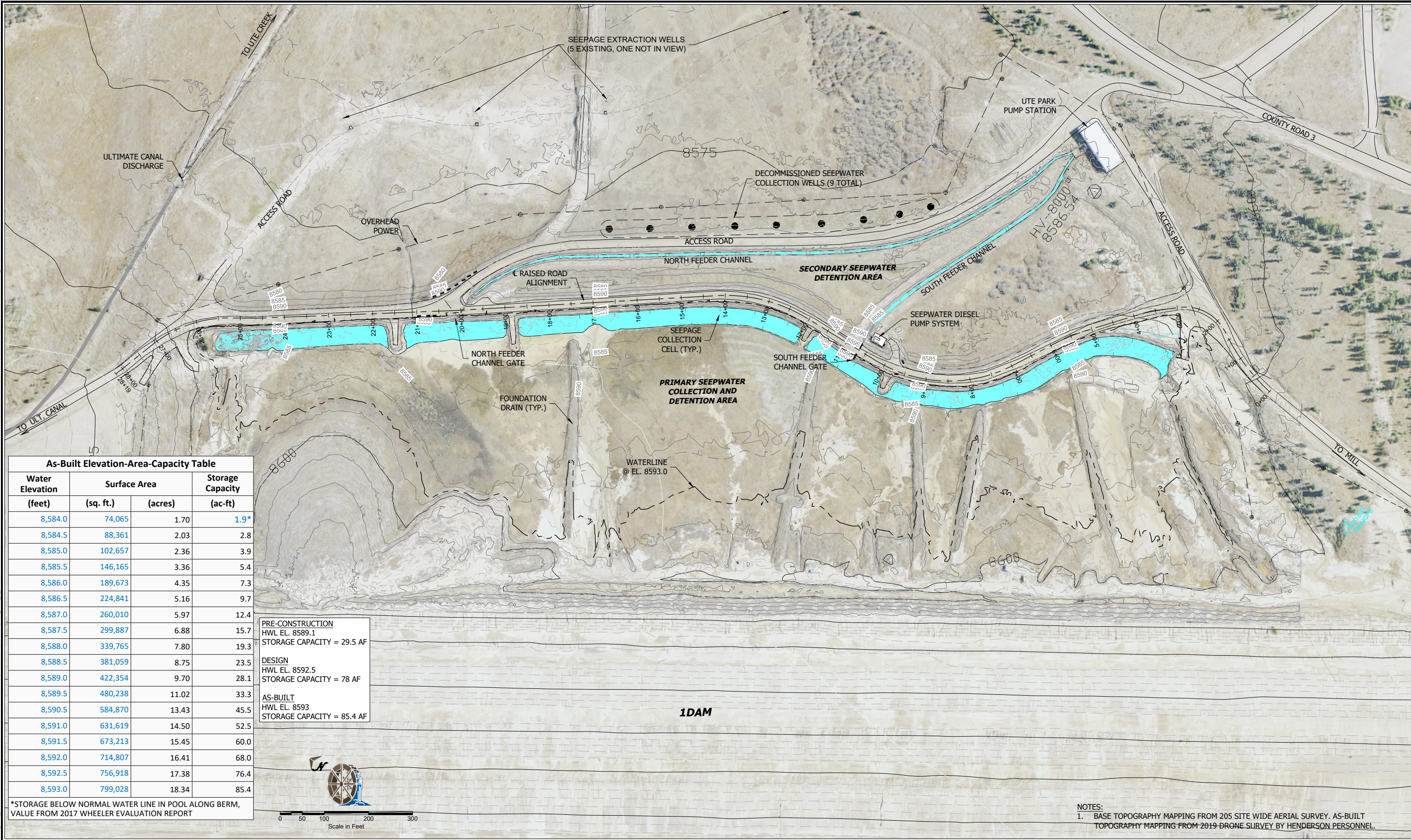
DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC.
Water Resources Engineers

3700 S. INCA STREET
ENGLEWOOD, CO 80110-3405
303-761-4130
FAX 303-761-2802

SEEPWATER DETENTION BERM	Climax Molybdenum Henderson Mill Parshall, CO		
ROAD RAISE	MADE BY TEM	03/18	PROJECT NUMBER 1333.01.13
COVER SHEET, DRAWING LIST	CHECKED BY SMM	03/18	DRAWING NO.
AND LOCATION MAPS	ACCEPTED BY ...		G1



As-Built Elevation-Area-Capacity Table			
Water Elevation (feet)	Surface Area (sq. ft.) (acres)		Storage Capacity (ac-ft)
8,584.0	74,065	1.70	1.9*
8,584.5	88,361	2.03	2.8
8,585.0	102,657	2.36	3.9
8,585.5	146,165	3.36	5.4
8,586.0	189,673	4.35	7.3
8,586.5	224,841	5.16	9.7
8,587.0	260,010	5.97	12.4
8,587.5	299,887	6.88	15.7
8,588.0	339,765	7.80	19.3
8,588.5	381,059	8.75	23.5
8,589.0	422,354	9.70	28.1
8,589.5	480,238	11.02	33.3
8,590.5	584,870	13.43	45.5
8,591.0	631,619	14.50	52.5
8,591.5	673,213	15.45	60.0
8,592.0	714,807	16.41	68.0
8,592.5	756,918	17.38	76.4
8,593.0	799,028	18.34	85.4

*STORAGE BELOW NORMAL WATER LINE IN POOL ALONG BERM, VALUE FROM 2017 WHEELER EVALUATION REPORT

PRE-CONSTRUCTION
HWL EL. 8589.1
STORAGE CAPACITY = 29.5 AF

DESIGN
HWL EL. 8592.5
STORAGE CAPACITY = 78 AF

AS-BUILT
HWL EL. 8593
STORAGE CAPACITY = 85.4 AF

NOTES:
1. BASE TOPOGRAPHY MAPPING FROM 205 SITE WIDE AERIAL SURVEY. AS-BUILT TOPOGRAPHY MAPPING FROM 2019 DRONE SURVEY BY HENDERSON PERSONNEL.

REVISIONS

NO.	DATE	MADE BY	CHK. BY	REMARKS
1	05/18	TEM	SMM	30% DESIGN REVIEW
2	07/18	TEM	SMM	90% DESIGN REVIEW
3	08/18	TEM	SMM	ISSUED FOR CONSTRUCTION
4	12/19	SAA	TEM	RECORD DRAWING

"This drawing together with any and all additions, corrections, changes and alterations thereof is the property of Climax Molybdenum Company and is furnished on the express condition that it shall not be reproduced, copied, lent, or disposed of directly or indirectly, nor used for any other purpose than for which it is specifically furnished without the prior written consent of said Climax Molybdenum Company."

REFERENCE DWGS

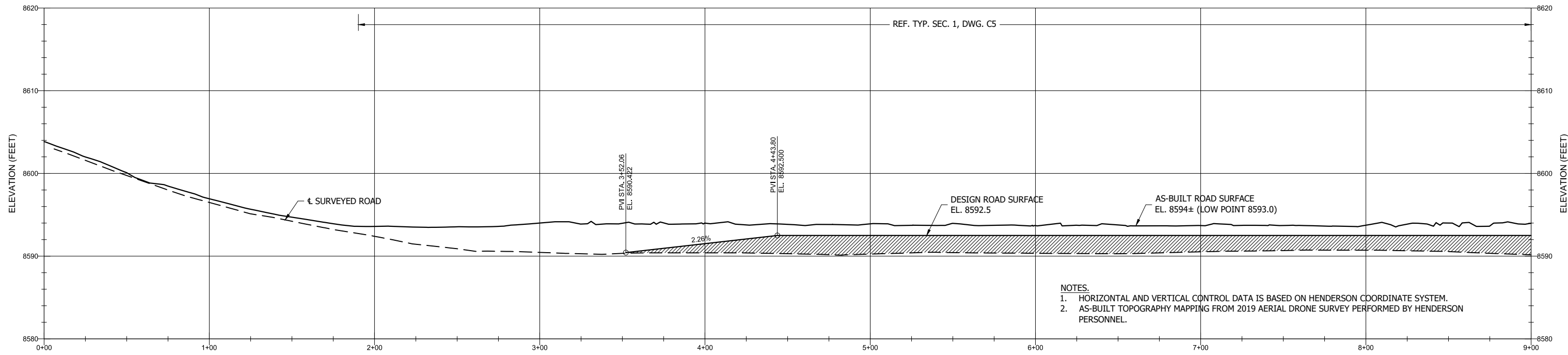
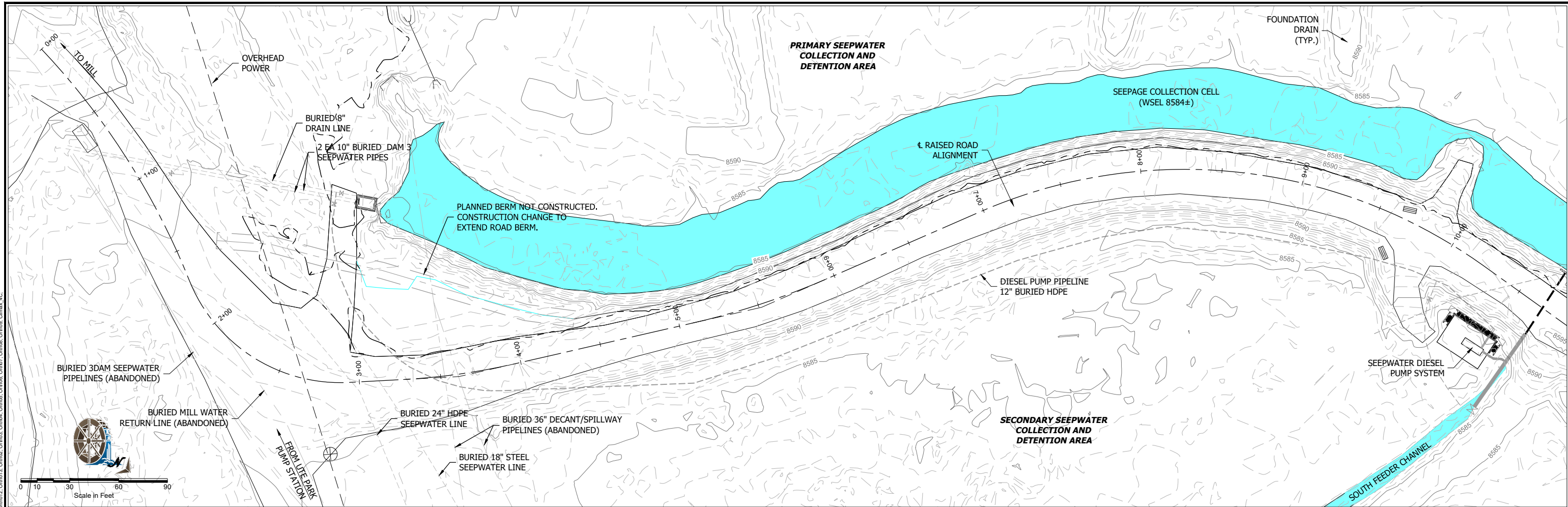
DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company



W. W. WHEELER & ASSOCIATES, INC.
Water Resources Engineers
3700 S. INCA STREET
ENGLEWOOD, CO 80110-3405
303-761-4130
FAX 303-761-2802

SEEPWATER DETENTION BERM		Climax Molybdenum Henderson Mill Parshall, CO	
ROAD RAISE		MADE BY TEM	03/18
GENERAL ARRANGEMENT		CHECKED BY SMM	03/18
SITE PLAN		ACCEPTED BY ...	

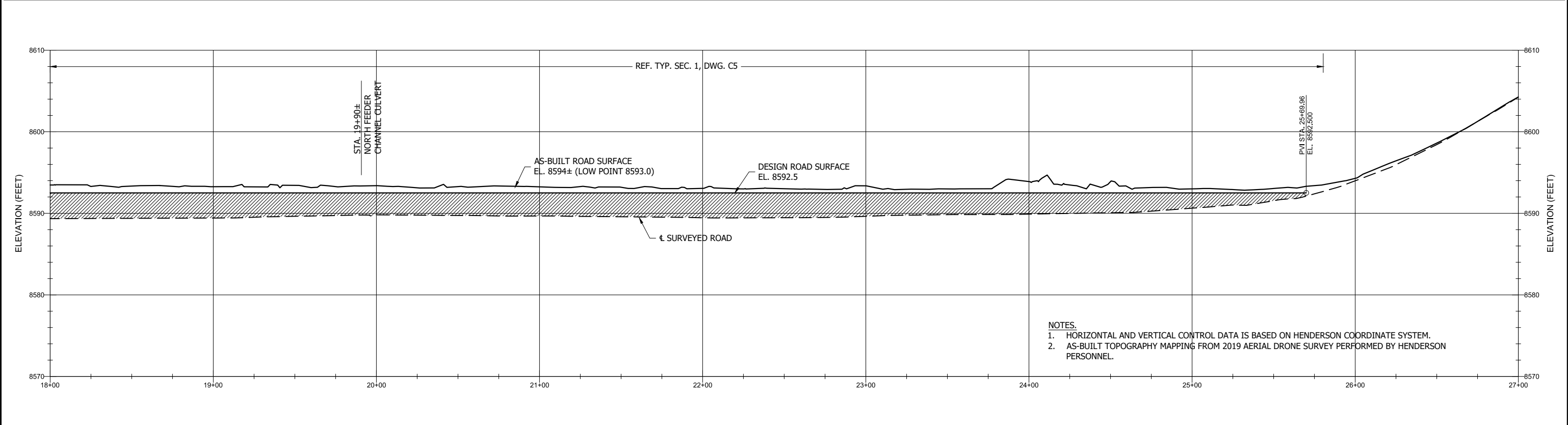
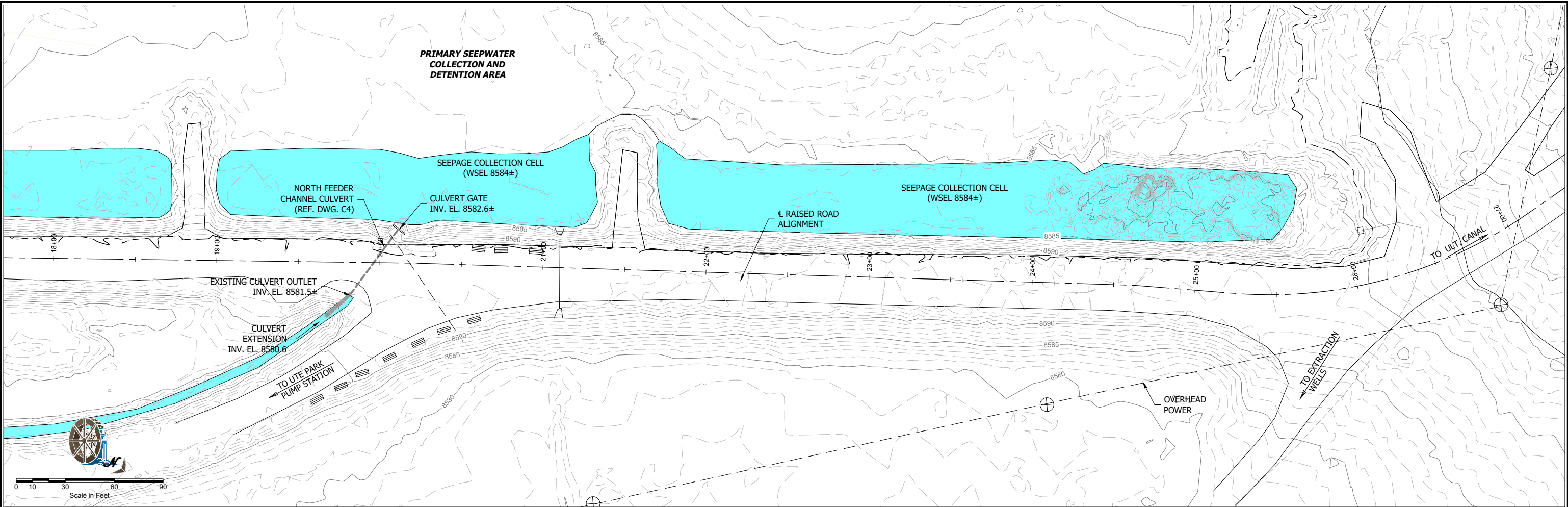
PROJECT NUMBER
1333.01.13
DRAWING NO.
G2





- NOTES:
1. HORIZONTAL AND VERTICAL CONTROL DATA IS BASED ON HENDERSON COORDINATE SYSTEM.
 2. AS-BUILT TOPOGRAPHY MAPPING FROM 2019 AERIAL DRONE SURVEY PERFORMED BY HENDERSON PERSONNEL.

REVISIONS	NO.	DATE	MADE BY	CHKD. BY	REMARKS	REFERENCE DWGS	DRAWING NO.	REFERENCE	<div><div>Climax Molybdenum A Freeport-McMoRan Company</div><div>W. W. WHEELER & ASSOCIATES, INC. Water Resources Engineers</div></div>	SEEPWATER DETENTION BERM ROAD RAISE PLAN & PROFILE STA. 0+00 TO 9+00			Climax Molybdenum Henderson Mill Parshall, CO MADE BY TEM 03/18 CHECKED BY SMM 03/18 ACCEPTED BY ... PROJECT NUMBER 1333.01.13 DRAWING NO. C1		
	05/18	TEM	SMM		30% DESIGN REVIEW										
	07/18	TEM	SMM		90% DESIGN REVIEW										
	08/18	TEM	SMM		ISSUED FOR CONSTRUCTION										
	12/19	SAA	TEM		RECORD DRAWING										
"This drawing together with any and all additions, corrections, changes and alterations thereof is the property of Climax Molybdenum Company and is furnished on the express condition that it shall not be reproduced, copied, lent, or disposed of directly or indirectly, nor used for any other purpose than for which it is specifically furnished without the prior written consent of said Climax Molybdenum Company."															

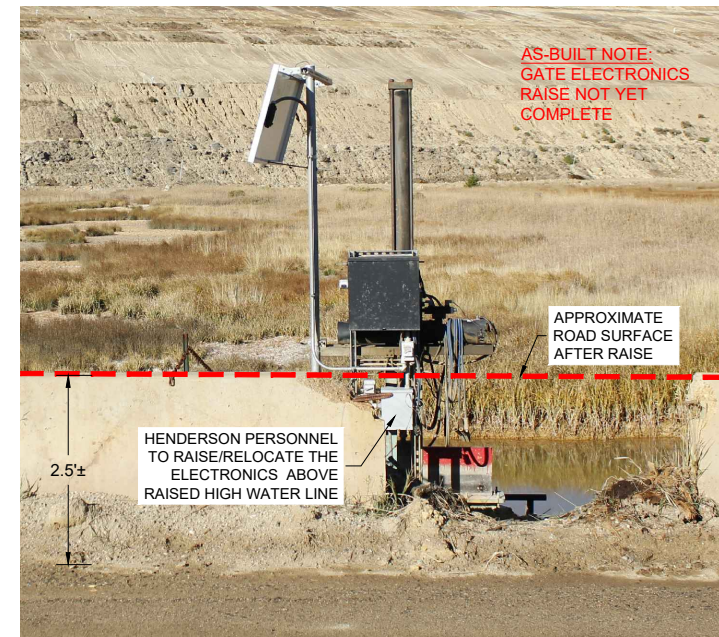
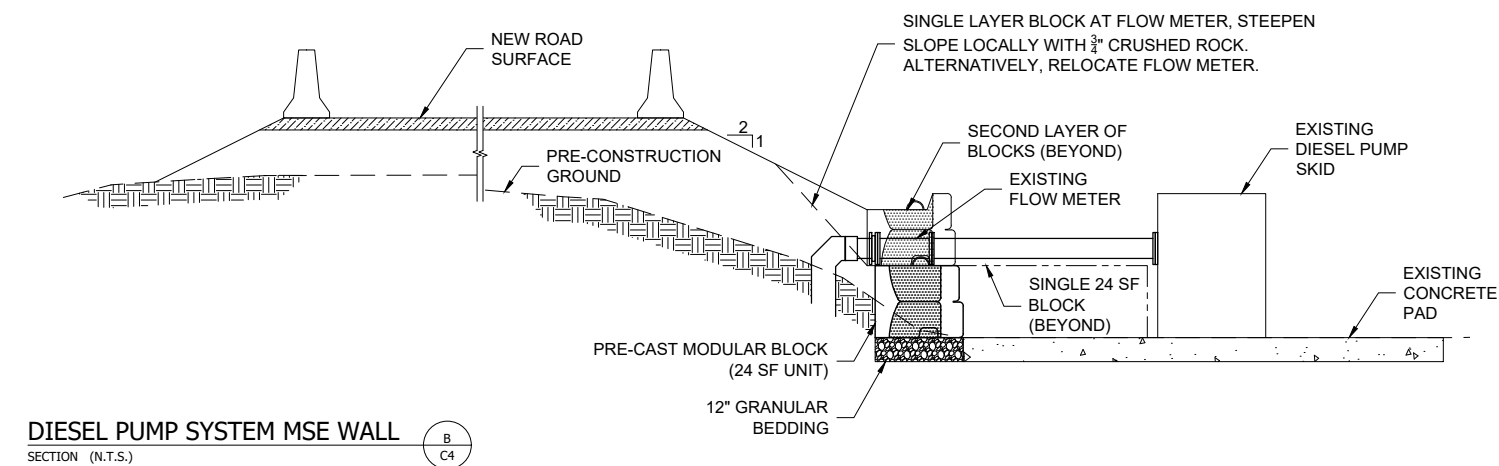
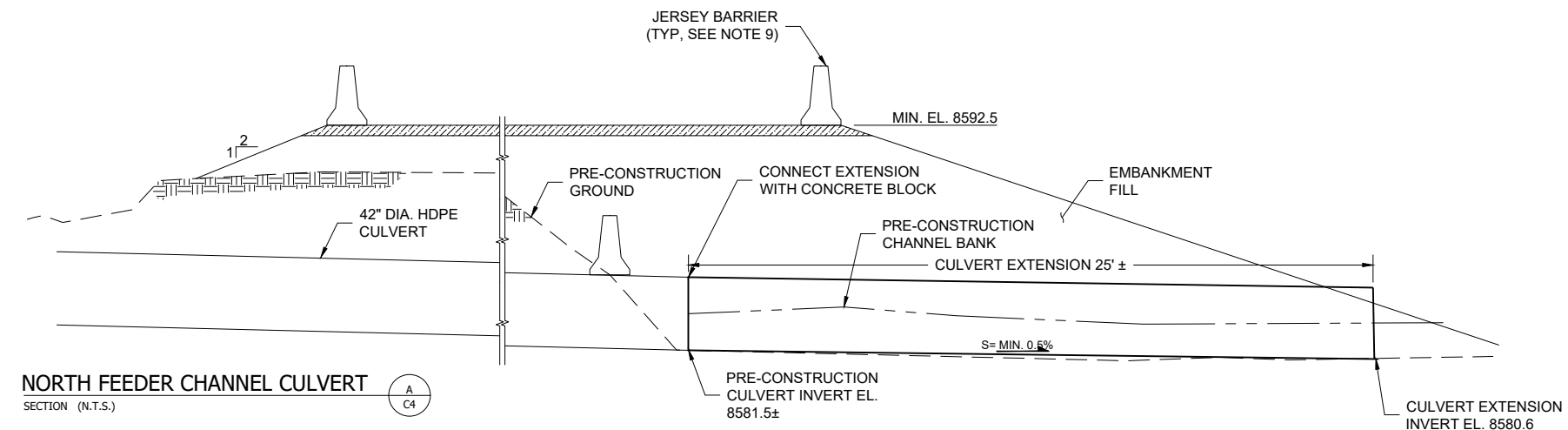
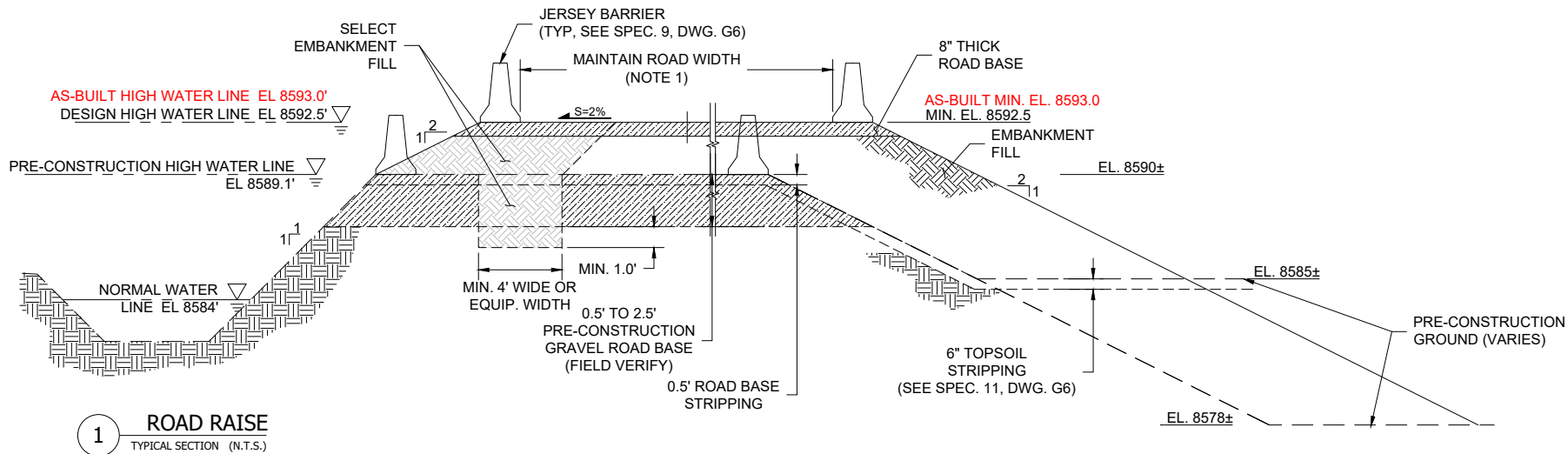
R:\13001\1333\1333_01\1333.01.13_Berm_Road_Raise\Drawings\RD\SheetFiles\13330113-002_12-13-19_03-19pm_Sort_XREFS.ctb: 2015 Site Map: Climax24x36 Ortho: 10: Ortho: 12: Ortho: 13: Ortho: 2: Ortho: 3: Ortho: 4: Ortho: 5: Ortho: 6: Ortho: 7: Ortho: 8: Climax 4C:



- NOTES.
- HORIZONTAL AND VERTICAL CONTROL DATA IS BASED ON HENDERSON COORDINATE SYSTEM.
 - AS-BUILT TOPOGRAPHY MAPPING FROM 2019 AERIAL DRONE SURVEY PERFORMED BY HENDERSON PERSONNEL.

REVISIONS	NO.	DATE	MADE BY	CHKD. BY	REMARKS	REFERENCE DWGS	DRAWING NO.	REFERENCE	 A Freeport-McMoRan Company	 W. W. WHEELER & ASSOCIATES, INC. Water Resources Engineers	3700 S. INCA STREET ENGLEWOOD, CO 80110-3405 303-761-4130 FAX 303-761-2802	SEEPWATER DETENTION BERM			Climax Molybdenum Henderson Mill Parshall, CO		
	05/18	TEM	SMM		30% DESIGN REVIEW							ROAD RAISE			MADE BY TEM	03/18	PROJECT NUMBER 1333.01.13
	07/18	TEM	SMM		90% DESIGN REVIEW							PLAN & PROFILE			CHECKED BY SMM	03/18	DRAWING NO.
	08/18	TEM	SMM		ISSUED FOR CONSTRUCTION							STA. 18+00 TO END			ACCEPTED BY ...		C3
	12/19	SAA	TEM		RECORD DRAWING												

"This drawing together with any and all additions, corrections, changes and alterations thereof is the property of Climax Molybdenum Company and is furnished on the express condition that it shall not be reproduced, copied, lent, or disposed of directly or indirectly, nor used for any other purpose than for which it is specifically furnished without the prior written consent of said Climax Molybdenum Company."



3 GATE MODIFICATIONS
PHOTO (N.T.S.)

- NOTES:
- 35' BERM WIDTH LIMIT IS FOR HAUL ROAD TWO-WAY TRAFFIC, WHICH ONLY APPLIES TO ROAD NORTH OF NORTH FEEDER CHANNEL.

R:\13001\13331\1333_01\1333_01_13_Berm_Road_Raise\Drawings\DRD\Sheet\13330113-003_12-13-19_03:59pm_Sort_XREFS: Climax24x36 Imp_0004: Climax_4C:

NO.	DATE	MADE BY	CHK. BY	REMARKS
1	05/18	TEM	SMM	30% DESIGN REVIEW
2	07/18	TEM	SMM	90% DESIGN REVIEW
3	08/18	TEM	SMM	ISSUED FOR CONSTRUCTION
4	12/19	SAA	TEM	RECORD DRAWING

"This drawing together with any and all additions, corrections, changes and alterations thereof is the property of Climax Molybdenum Company and is furnished on the express condition that it shall not be reproduced, copied, lent, or disposed of directly or indirectly, nor used for any other purpose than for which it is specifically furnished without the prior written consent of said Climax Molybdenum Company."

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC.
Water Resources Engineers

3700 S. INCA STREET
ENGLEWOOD, CO 80110-3405
303-761-4130
FAX 303-761-2802

SEEPWATER DETENTION BERM		Climax Molybdenum Henderson Mill Parshall, CO		
ROAD RAISE		MADE BY TEM	03/18	PROJECT NUMBER 1333.01.13
TYPICAL SECTIONS & DETAILS		CHECKED BY SMM	03/18	DRAWING NO. C5
		ACCEPTED BY ...		

EARTHWORK SPECIFICATIONS:

1. ELEVATIONS AND ROAD WIDTHS ARE BASED ON LIMITED SURVEY DATA AND MAY NOT REFLECT ACTUAL CONDITIONS IN THE FIELD AT ALL LOCATIONS.
2. WET SUBGRADE SURFACES IMMEDIATELY PRIOR TO FILL OR ROADBASE PLACEMENT. THE SUBGRADE SHALL BE PROOF-ROLLED WITH A MINIMUM OF TWO (2) COVERAGES OF APPROVED COMPACTION EQUIPMENT.
3. PRIOR TO PLACING STRUCTURAL BACKFILL ON ROAD SURFACES, SCARIFY THE TOP SIX (6) INCHES OF SUBGRADE MATERIAL.
4. SELECT EMBANKMENT FILL SHALL BE A MIXTURE OF FINES, SAND, AND GRAVEL WITH A MAXIMUM PARTICLE SIZE OF SIX (6) INCHES, A MIN. OF 50% PASSING THE NO. 4 SIEVE, A MIN. OF 15% PASSING THE NO. 200 SIEVE, AND SHALL BE GENERALLY FREE OF PEAT, TWIGS, GRASS, OR LESS THAN THREE (3%) ORGANIC MATERIAL BY WEIGHT. SELECT EMBANKMENT FILL SHALL BE FREE OF DELETERIOUS MATERIALS, DEBRIS, AND TRASH. SELECT EMBANKMENT FILL FILL SHALL BE FURNISHED FROM ON-SITE EXCAVATED MATERIALS. BORROW SOURCES FOR SELECT EMBANKMENT FILL SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEERING DEPARTMENT.
4. EMBANKMENT FILL SHALL BE A MIXTURE OF FINES, SAND, AND GRAVEL WITH A MAXIMUM PARTICLE SIZE OF SIX (6) INCHES, AND SHALL BE GENERALLY FREE OF PEAT, TWIGS, GRASS, OR LESS THAN THREE (3%) ORGANIC MATERIAL BY WEIGHT. SELECT EMBANKMENT FILL SHALL BE FREE OF DELETERIOUS MATERIALS, DEBRIS, AND TRASH. SELECT EMBANKMENT FILL FILL SHALL BE FURNISHED FROM ON-SITE EXCAVATED MATERIALS. BORROW SOURCES FOR SELECT EMBANKMENT FILL SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEERING DEPARTMENT.
5. SELECT EMBANKMENT FILL AND EMBANKMENT FILL SHALL BE PLACED IN HORIZONTAL LIFTS NOT EXCEEDING A THICKNESS OF EIGHT (8) INCHES BEFORE COMPACTION. STRUCTURAL FILL SHALL BE COMPACTED TO A MINIMUM OF NINETY-FIVE PERCENT (95%) OF THE MODIFIED PROCTOR DRY DENSITY IN ACCORDANCE WITH ASTM D1557. IN-PLACE MOISTURE CONTENT OF STRUCTURAL FILL SHALL BE WITHIN TWO PERCENT (2%) OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557.
6. IN-PLACE DENSITY AND MOISTURE TESTS SHALL BE PERFORMED BY AN OWNERS REPRESENTATIVE FOR EVERY 500 CY OF STRUCTURAL FILL OR ONE TEST PER LIFT, WHICHEVER IS MORE FREQUENT. GRADATION ANALYSES FOR IMPORTED MATERIAL SHALL BE SUBMITTED TO THE ENGINEER FOR EVERY 500 CY OF STRUCTURAL FILL.
7. AN APPROVED METHOD SPECIFICATION FOR COMPACTION MAY BE USED IN LIEU OF IN-PLACE DENSITY TESTS. THE METHOD SPECIFICATION WILL BE DEVELOPED BY THE ENGINEER AND BASED ON THE ACTUAL COMPACTION EQUIPMENT TO BE USED BY THE CONTRACTOR. THE ENGINEER RESERVES THE RIGHT TO PERFORM ADDITIONAL DENSITY TESTING AT ANY TIME TO VALIDATE THE USE AND EFFECTIVENESS OF THE APPROVED METHOD SPECIFICATION.
8. ROAD BASE (COURSE) SHALL CONFORM TO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, COLORADO DEPARTMENT OF TRANSPORTATION, 2011 (OR LATEST EDITION), SECTION 703.03: AGGREGATES FOR BASES, CLASS 5 AGGREGATE BASE COURSE, AND SHALL CONSIST OF THE FOLLOWING GRADING REQUIREMENTS:

SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
1½ INCH	100
1 INCH	95-100
NO. 4 (4.75 MM)	30-70
NO. 200 (0.075 MM)	3-15

8. ROAD BASE (COURSE) SHALL BE SPREAD IN SUCH A MANNER AS TO ENSURE A SMOOTH, UNIFORM LAYER AND TO AVOID SEGREGATION. BASE COURSE SHALL BE PLACED IN SIX (6) INCH THICK LOOSE LIFTS AND COMPACTED WITH A MINIMUM OF FOUR (4) COVERAGES OF AN APPROVED VIBRATORY SMOOTH-DRUM COMPACTOR. THERE ARE NO COMPACTION OR MOISTURE DENSITY REQUIREMENTS FOR THE BASE COURSE.
9. REMOVE CONCRETE JERSEY BARRIERS FOR CONSTRUCTION OF RAISE. PLACE ON ROAD SURFACE UPON COMPLETION. REPLACE BARRIERS AS NEEDED. CONCRETE BARRIERS SHALL BE PRECAST TYPE 7.
10. BLUE STAKE PERMITS MUST BE ACQUIRED PER HENDERSON MILL POLICIES PRIOR TO BEGINNING OF WORK.
11. CLEARING OF VEGETATION AND TOPSOIL STRIPPING TO A MIN. DEPTH OF 6 INCHES (6") SHALL OCCUR, WHERE APPLICABLE, PRIOR TO PLACEMENT OF FILL AND BEFORE DEVELOPMENT OF FILL FROM BORROW AREAS. ADJUST STRIPPING DEPTH IF REQUIRED TO REMOVE ALL TOPSOIL. UPON COMPLETION OF THE FILL PLACEMENT, SPREAD TOPSOIL EVENLY ON SLOPES AND RESEED.

PRECAST MODULAR BLOCK SPECIFICATION:








1. BLOCKS SHALL BE 12 SF, NOMINAL 2 FOOT HIGH x 6 FOOT LONG x 2 FOOT DEEP.
2. DIMENSION TOLERANCE SHALL BE +/- 3⁄16" INCH FOR HEIGHT, +/- ½" FOR LENGTH AND +/- 1 INCH FOR WIDTH.
3. CONCRETE FOR BLOCKS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI. ENTRAINED AIR CONTENT SHALL BE BETWEEN 5 AND 7%.
4. REINFORCING SHALL HAVE A MINIMUM YIELD STRENGTH OF 60 KSI. MINIMUM CLEAR COVER TO REINFORCEMENT SHALL BE 1 ½ INCHES.
5. BLOCK SUPPLIED BY PEAK MATERIALS.

ESTIMATED BILL OF MATERIALS

MATERIAL	UNIT OF MEASURE	QTY.
SELECT EMBANKMENT FILL	VOLUME (COMPACTED CY)	2360
EMBANKMENT FILL	VOLUME (COMPACTED CY)	13250
ROAD BASE (COURSE)	VOLUME (COMPACTED CY)	1980
12 SF CONCRETE BLOCKS	COUNT	12
42" DIA. DR 17 HDPE PIPE	LENGTH (FEET)	25
CONCRETE	VOLUME (CY)	6
¾" CRUSHED ROCK	VOLUME (CY)	30

* TABLE NOT UPDATED WITH AS-BUILT QUANTITIES

R:\1300\1333\1333.01\1333.01.13_Berm_Road_Raise\Drawings\DRD\Sheet\13330113-003_12-13-19_03:59pm_Sort.XREFS: Climax24x36.img_0004.Climax_4C.

REVISIONS	NO.	DATE	MADE BY	CHK. BY	REMARKS	<i>"This drawing together with any and all additions, corrections, changes and alterations thereof is the property of Climax Molybdenum Company and is furnished on the express condition that it shall not be reproduced, copied, lent, or disposed of directly or indirectly, nor used for any other purpose than for which it is specifically furnished without the prior written consent of said Climax Molybdenum Company."</i>	REFERENCE DWGS	DRAWING NO.	REFERENCE	<div> A Freeport-McMoRan Company</div> <div><div>3700 S. INCA STREET ENGLEWOOD, CO 80110-3405 303-761-4130 FAX 303-761-2802</div></div>	SEEPWATER DETENTION BERM		Climax Molybdenum Henderson Mill Parshall, CO		
		05/18	TEM	SMM	30% DESIGN REVIEW						ROAD RAISE		MADE BY TEM	03/18	PROJECT NUMBER 1333.01.13
		07/18	TEM	SMM	90% DESIGN REVIEW						SPECIFICATIONS AND MATERIALS		CHECKED BY SMM	03/18	DRAWING NO.
		08/18	TEM	SMM	ISSUED FOR CONSTRUCTION								ACCEPTED BY ...		C6
		12/19	SAA	TEM	RECORD DRAWING										

Environmental Protection Facility Certification

Henderson Mine – Permit No. M-1977-342

Technical Revision 30

Seepwater Detention Berm Road Raise Project

The Seepwater Detention Berm Road Raise Project was approved as Technical Revision No. 30 to Mine Permit No. M-1977-342 on September 19, 2018. This project is located at Climax Molybdenum Company's Henderson Mill in Grand County. The project involved the construction of an embankment raise of the access road berm for the Primary Seepwater Collection and Detention Area (SDA) below 1 Dam. The undersigned was responsible for the design of the seepwater berm road raise.

Henderson Mill personnel have substantially completed the construction of the project. The design earthwork raise was achieved. The 1 Dam Primary SDA volumetric storage capacity increased from 29.5 acre-feet to 85.4 acre-feet, which is greater than the design criteria of 68 acre-feet to detain the 100-year ARI snowmelt. Geometric changes to the road width and length from design to construction were for access and traffic flow considerations and do not affect the design storage capacity or road berm stability. Record Drawings of the project are attached.

Pursuant to Rule 7.3.2, the Professional Engineer that has signed and sealed below certifies that the project was completed in general conformance with the approved design as submitted to the Division of Reclamation, Mining, and Safety. This statement is based in part on information that has been provided by others.



Trevor E. Mugele, P.E.
W. W. Wheeler and Associates, Inc.

December 13, 2019

Date