TETRA TECH

July 29, 2019

Mr. Peter Hays
Environmental Protection Specialist
Division of Reclamation, Mining, and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

RE: Response to TZA Water Engineers Report dated April 5, 2018

Dear Mr. Hays:

This letter has been prepared in response to a comment letter prepared by Timothy and Jeanne Iverson dated June 21, 2018.

Comment 1 – The low area in the riverside berm located at the northwest corner of the lake should be uniformly graded to elevation 4686.0 feet which is approximately equal to the pre-mining elevation and is above the 2-Year Flood elevation of 4685.3.

Response: The ground elevation has been restored as close as practical to pre-project grades as required by the DRMS approved reclamation plan. Grades in the northwest have a maximum elevation of approximately 4686.0. Additional fill above this elevation is not allowed without permission from Weld County or FEMA due to the requirements of the National Flood Insurance Program.

Comment 2 – The riverside berm should be protected with riprap on both the riverbank and pit side for the critical section of the berm extending from the inlet spillway approximately 3,200 feet around the riverbend at the northwest corner of the lake. The riprap erosion protection should conform to the typical sections and requirements in the UDFCD Guidelines.

Response: Riverbank protection is used by the UDFCD within district boundaries to stabilize the river location. The location of riverbank protection for UDFCD master planning studies is analyzed and selected for effectiveness in specific locations. This project is not located within the UDFCD district. There is no equivalent master plan along the Cache la Poudre River. All rivers without engineered stabilization will change location and depth over time. This is a risk borne by every landowner near a waterway. Further, there is no contractual requirement between Martin Marietta and the Iverson's' to provide riverbank protection.

Comment 3 – The inlet and outlet spillways should be increased in width to 100 feet as required by the UDFCD Guidelines. Concrete cutoff walls for the spillway should be founded on sheet pile designed in accordance with the UDFCD Drainage Criteria Manual. Riprap erosion protection should meet the requirements of the UDFCD Guidelines and have a granular filter designed in accordance with the UDFCD Drainage Criteria Manual.

Response: The spillways are designed in accordance with UDFCD *Technical Review Guidelines for Gravel Mining Activities.*

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The spillway length in the original design was calculated per the UDFCD Guidelines, then divided in accordance with UDFCD policy to allow both an inlet and outlet to the lake. Due to the sinuous nature of the river around the property, there is a significant elevation change in the river thalweg and bank elevation, where the grades on the east side of the property are lower than the west side. To reduce the risk of uncontrolled overtopping in an undesired location, two spillways were used with an equivalent capacity to approximately 1/3 of the 2-year discharge.

We believe this comment has been made because the landowner has previously claimed that the cutoff walls have settled and cracked. After this claim was made to Martin Marietta, a survey was conducted in October 2017, approximately one-year after construction. The topographic survey showed no significant settling in the top of the cutoff walls when compared to the construction drawings. Further, the *Technical Review Guidelines* have no requirement for use of sheet pile.

Riprap erosion protection was designed in accordance with the UDFCD Guidelines with modifications to the standard configuration. The modifications include a “sacrificial” reservoir of riprap to passively fill in areas where undercutting by the river has occurred. This technique has been used on previous projects and was previously suggested by UDFCD. Riprap was added to the area between the cutoff walls, in excess of UDFCD Guidelines, to protect areas without established vegetation. Previous experience at this site demonstrated that leaving the area unprotected can lead to failure during high flow conditions.

The Cache la Poudre River normally has high flows every year during the snowmelt season, including 2016. In 2016, Tetra Tech and Martin Marietta inspected the spillways during high flows. Along with other subsequent site visits, including one with the DRMS, they function properly and without damage. Therefore, the spillways are performing adequately and are in conformance with applicable standards.

Sincerely,

TETRA TECH

Jeffrey A. Butson
Project Engineer

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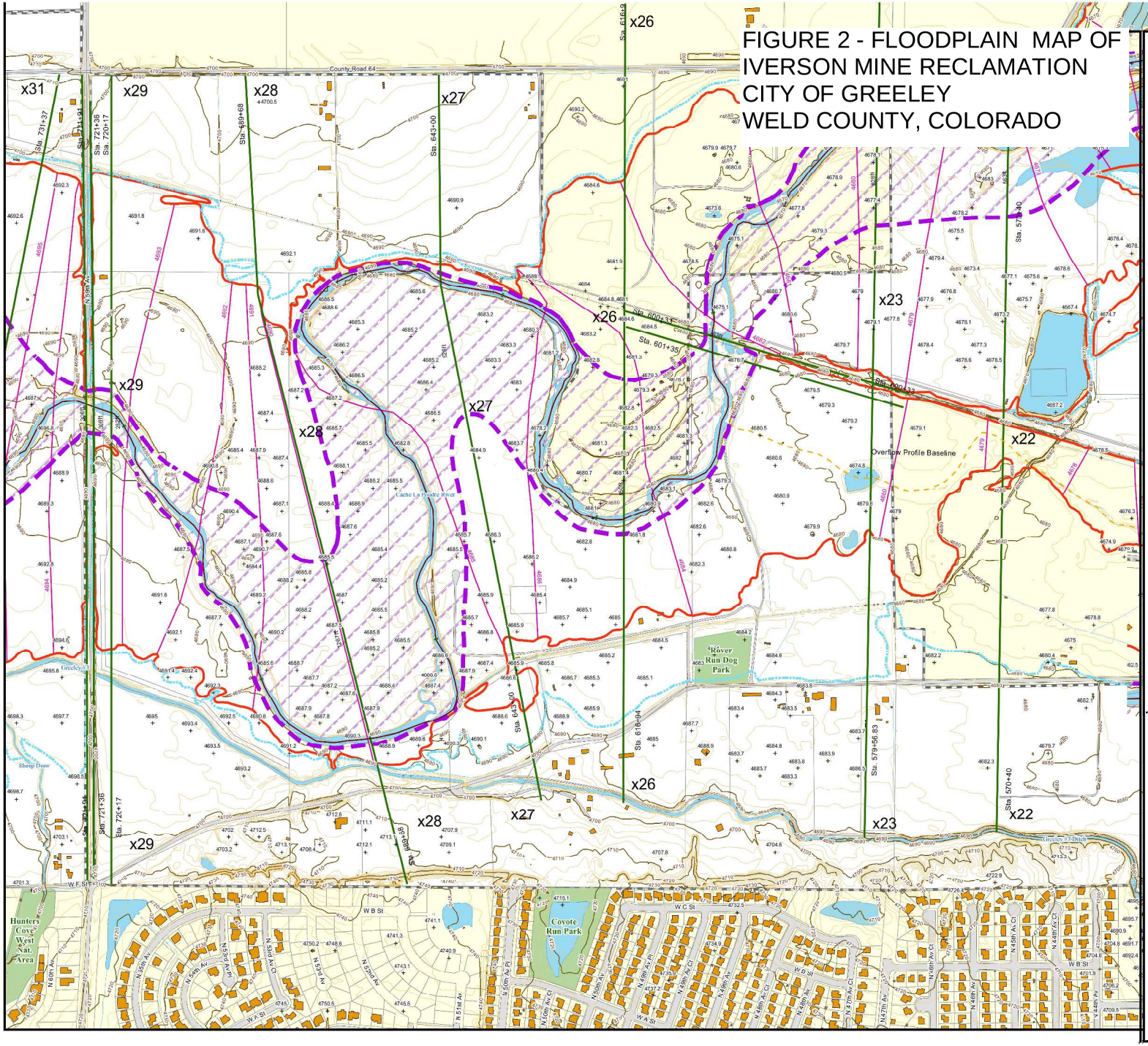

FIGURE 2 - FLOODPLAIN MAP OF IVERSON MINE RECLAMATION
CITY OF GREELEY
WELD COUNTY, COLORADO

Flood Plain Information Study
Cache La Poudre River

City of Greeley &
Weld County, Colorado
November 1999 - Updated July 2003
Adopted by Greeley City Council
August 2003
Annotated Oct. 2006

Legend

- Spot Elevations (4600)
- River Center Line
- Overflow Profile Basline
- Cross Section Locations
- Water Surface Elevations
- 1995 NGVD29 Topography
- 2 ft. contour
- 10 ft. contour
- 2003 Army Corps Floodway
- Railroad
- 2003 Army Corp 100 Year Flood Plain
- 2003 Army Corps 500 Year Flood Plain
- 2003 Army Corps Floodway
- Hydrography
- Water Bodies
- All Primary Schools
- Colleges & Universities
- Park Lands
- Road
- Bridge
- Garden City
- City of Greeley

Map Page 4

Flood Data Pending FEMA Approval

City of Greeley

Last Updated: 10/31/06
By: The GIS Program, 9787
File Name: pdrflood06-01.mxd
Scale: 1" = 500'

0 250 500 1,000
Feet

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