



Compass Minerals
765 N 10500 W
Ogden, Utah 84404
www.compassminerals.com
801-732-3200

February 20, 2015

Utah Division of Water Quality
Attention: Mr. William Damery
195 North 1950 West
Salt Lake City, Utah 84116

Re: UPRR Compensatory Mitigation and Monitoring Plan and Anti-degradation Review

Dear Mr. Damery:

Provided below are Compass Minerals Ogden, Incorporated's (CMO) comments regarding the Union Pacific Railroad's (UPRR) Compensatory Mitigation and Monitoring Plan and Anti-degradation Review documents posted on Utah DWQ's clearinghouse on the project in January 2015.

- The initial concept of a 180' bridge contemplated in 2012 was associated to a simple model developed to best match pre-culvert closure water and salinity transfer between the North and South Arms of the Great Salt Lake. Subsequent modelling has revealed that the 180' bridge did not meet that objective to replace arm-to-arm transfers water and salt transfers function that was previously provided by the free-flowing east and west culverts; the 180' design created numerous imbalances, all skewed towards higher transfers of salt and water, and therefore did not meet objectives. UPRR subsequently modified its bridge design to a 150' span to meet original project objectives. Nonetheless, the project has evolved, and taken on a hybrid design of including a 180' bridge, with a 150' opening, that will be realized by filling the bridge opening (narrowing the opening) with rock fill. Under Adaptive Management though, the rock fill may be modified to either increase or decrease the span opening, based on assessment of conditions relative to the overall mitigation objectives. It would appear based on modelling, however, that increasing the opening will create imbalances relative to the objective. To that end, based on current modelling, Compass Minerals would not support future modifications that would increase the width of the opening beyond 150 feet.
- CMO has concerns that the proposed rock fill would have a higher hydraulic conductivity than current compacted embankment materials, and therefore, a rock fill used to constrict the opening would have a higher transmissivity than the modelled 150' bridge opening (which would be positioned between in-situ embankment fill). Therefore, it is possible that the effective opening, if the rock fill has a higher transmissivity than in-situ embankment fill, would enable flow volumes higher than modelled volumes of a 150-foot bridge, increasing water and salinity transfers beyond the predicted model. If the rock fill does have a higher transmissivity, the width of the rock fill should be narrowed accordingly to account for this



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difference so the effective water and salt transfer is that same as the modelled 150 bridge with in-situ embankment fills on either side.

- The proposed period of monitoring of 5 years seems inadequate as changes over the large GSL system may take years to develop, and recognizable, significant trends even longer.
- Key ions specific to lake mineral extraction operations, including potassium, sodium, magnesium and sulfate should be sampled and monitored during all sampling events.
- The as-built causeway Opening Geometry Performance Standard with an error range of 10% may create flow conditions that are significantly above or below objectives. The allowable performance standard error factor should be reduced.
- Prior to issuance of any permit, UPPR should respond to Utah State University modelling efforts that found much different water salinity transfers than what had been modelled by the UPPR team. Responses should be made public and subject to additional comment and inquiry.
- Quarterly reports generated by UPPR should be made public.

Please feel free to call me at 913-940-3491 with any questions, or to discuss further.

Sincerely,

A handwritten signature in black ink, appearing to read "J Havasi", is written over a horizontal line.

Joseph Havasi
Director, Natural Resources