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August 21st, 2012

Kate Pickford
Environmental Protection Specialist
CO Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

RE: Old Castle SW Group, Inc.dba Four Corners Materials, File No. M-2011-028
Animas Glacier Gravel (AGG), 112(c) Permit Application –
Second adequacy Review

Dear Ms. Pickford,

This letter is in response to Tim Cazier's August 1st, 2012 memorandum concerning the Animas Glacier Gravel Pit. We have included the original comments within the letter for your information. If you have any subsequent comments please feel free to let us know.

1. Section III. Hydrologic Data:
    a. The peak flows for Basins #1 through #7 listed in Section III do not match those presented in the third summary table in Appendix B (Figure 3), labeled "Graphical Peak Discharge Method TR-55". Which set of values are correct? Please revise as appropriate.

    *Response: The peak flows have been updated to reflect the correct amounts.*

2. Section IV. Culvert Design:
    a. The design flows for Design Points A through G listed in Section IV do not match those presented in the design point summary table in Appendix C (Figure 1). Which set of values are correct? Please revise as appropriate.

    *Response: The design flows have been updated to reflect the correct amounts.*

3. Section V. Basin Creek:

    a. The 6th paragraph begins discussion on the time to dewater the retention pond. The pond must be dewatered in 72 hours. If evaporation and infiltration do not achieve this, the dewater plan must be altered. Please describe how the pond will be emptied in 72 hours.

    *Response: Pending more analysis.*

    b. Individual swales – the paragraph above Table -2 indicates all swales will be 24 inches deep. Design flow velocities above five feet per second (5 fps) will require armor protection. Russell Engineering submitted riprap calculations to the DRMS engineering staff for review on July 31, 2012. The riprap will necessitate a higher Manning's n for design (typically 0.035 for stability and 0.040 for capacity). This additional roughness will increase the flow depth and likely require a deeper swale where riprap is used. Freeboard should be one foot or one velocity head ($V^2/2g$), whichever is greater. Please revise the channel designs to meet those criteria.

    *Response: Pending more analysis.*

    c. Overflow weir – the overflow weir requirements state indicate it will be armored with "D9-50 riprap". The DRMS believes this to be a typographical error. Please clarify how the weir will be armored and provide riprap calculations.

    *Response: Pending more analysis.*

4. Appendix B, Figure 2:

    a. The times of concentration for the Historic Basin and Basin #1 appear excessively large. Please provide justification for using a Manning's n of 0.20 in the Open Channel Flow ($t_2$) Column.

    *Response: It appears this Manning's number was a typo, it has been revised to 0.08, see next comment for justification.*

b. Similarly, please provide justification for using a Manning's n of 0.08 in the Open Channel Flow ($t_2$) Column (Basins #2 through #8) and in the Open Channel Flow ($t_3$) Column (Historic Basin and Basin #1)

*Response: It is my opinion that the natural of the channels found in most of this terrain will consist of heavily vegetated existing channels, arroyos, and drainages that will generate Manning's numbers much higher than common grass lined channels. Below is a link to a table for your reference, which has multiple examples of high Manning's numbers. I would compare our situation most closely to heading 4. Excavated of Dredge Channels, sub-heading e. Channels not maintained, weeds, and brush uncut, sub-sub-heading 2. clean bottom, brush on side, which has a maximum Manning's n of 0.08. I think this is an accurate representation of the existing and proposed site, and I certainly don't think we've underestimated our Tc's. If you want to discuss this issue future please let me know.*

http://www.fsl.orst.edu/geowater/FX3/help/8_Hydraulic_Reference/Mannings_n_Tables.htm

5. Appendix C – Culvert calculations:

   a. A Manning's n of 0.024 is typically used for corrugated steel/metal pipe. Please provide justification for using a Manning's n of 0.022 or resubmit the analyses with n = 0.024. *Note: The DRMS engineering staff is aware there may be no difference in results as the culverts are as designed under inlet control. However, a higher Manning's n may result in barrel/outlet control due to the fixed tailwater depth.*

   *Response: The Manning's n of all culverts have been updated to 0.024.*

   b. There is an error on the input for Design Point D. The road elevation is 100 feet higher than presented in Appendix C, Figure 1. – Design Point Summary Table.

   *Response: This typo has been corrected.*

If you have questions or need additional information on any issue, please let us know.
Sincerely,

Steve Winters, P.E.
Russell Engineering, Inc.
Attachments: Engineering Plans & , Drainage Study, updated 07/31/2012