STATE OF COLORADO

Cazier - DNR, Tim <tim.cazier@state.co.us>

Fwd: First bentonite notes ready to be sent to DRMS

1 message

Carter, Stephanie <sscarter@blm.gov> Fri, Dec 9, 2016 at 1:03 PM
To: "Cazier - DNR, Tim" <tim.cazier@state.co.us>

Tim,

William was back out onsite after we had the operator cut the swale a little deeper. Attached are the notes.

Basically, we want to take a look at it in the spring to see how the slope weathers, as it may be best to not alter it too much from the top to force more of a 3:1 slope. Plus, we need to monitor the reveg.

Let me know if you have any questions,

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2 attachments

Reclamation Notes on 11292016 Site Visit.pdf
2818K

Surrounding Structural Geology.pdf
507K

11/29/2016 Reclamation Notes

Remaining Stockpiles (Product and Topsoil)

- Stockpiles of product still remain at the lower stockpile area.
    - The operator has indicated that they are trying to sell the rest of this material.

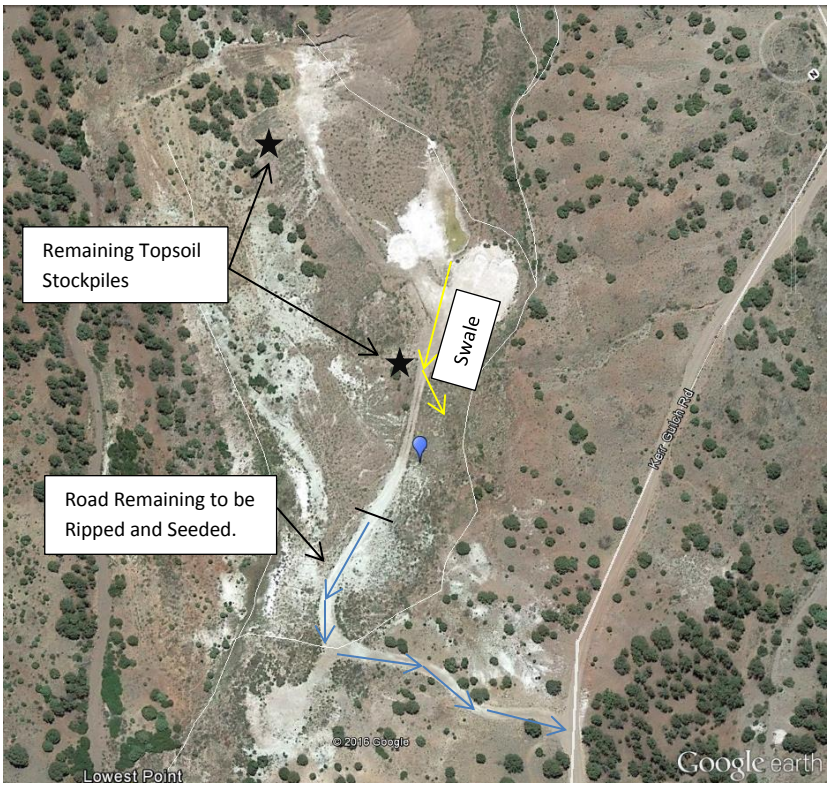
- Two stockpiles of soil were observed along the former route to the highwall from the staging area. The stockpiled material should be used in the ongoing reclamation efforts (this material could be used for the area where the product piles are currently being stored), so that there are no stockpiles remaining on the site.

Topsoil stockpile adjacent to the swale, near the former staging area.

Topsoil stockpile on the floor below the former highwall.

Road Reclamation

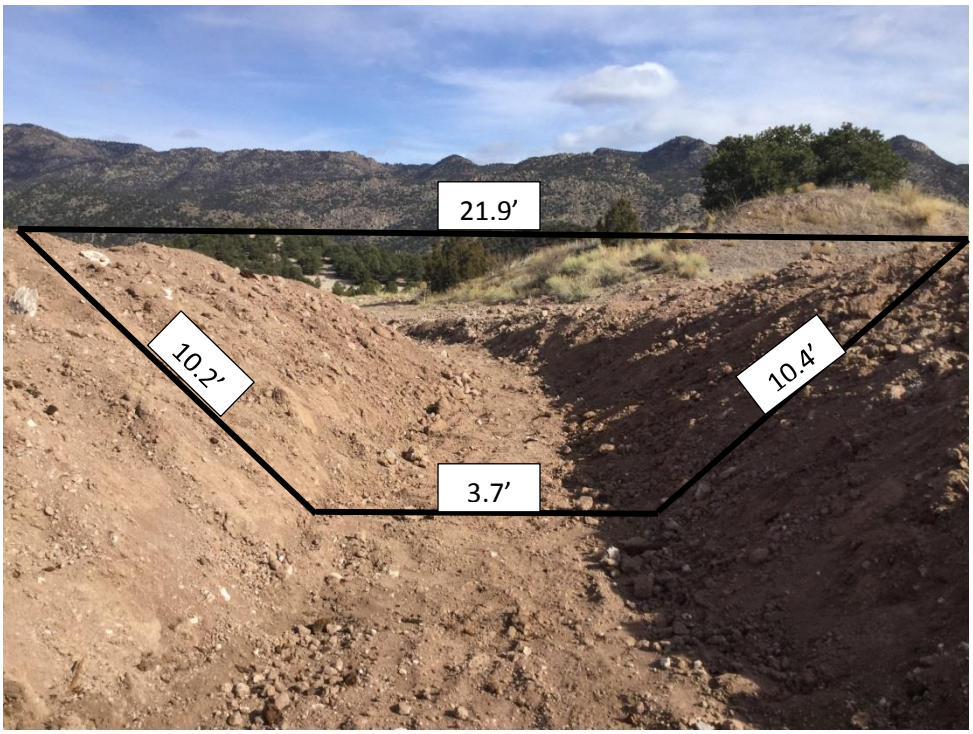
- Part of the Access Road has been graded, extending from the former staging area and stopping before the lower stockpile area.
    - The remainder of the access road will need to be ripped and seeded for final reclamation.



Swale

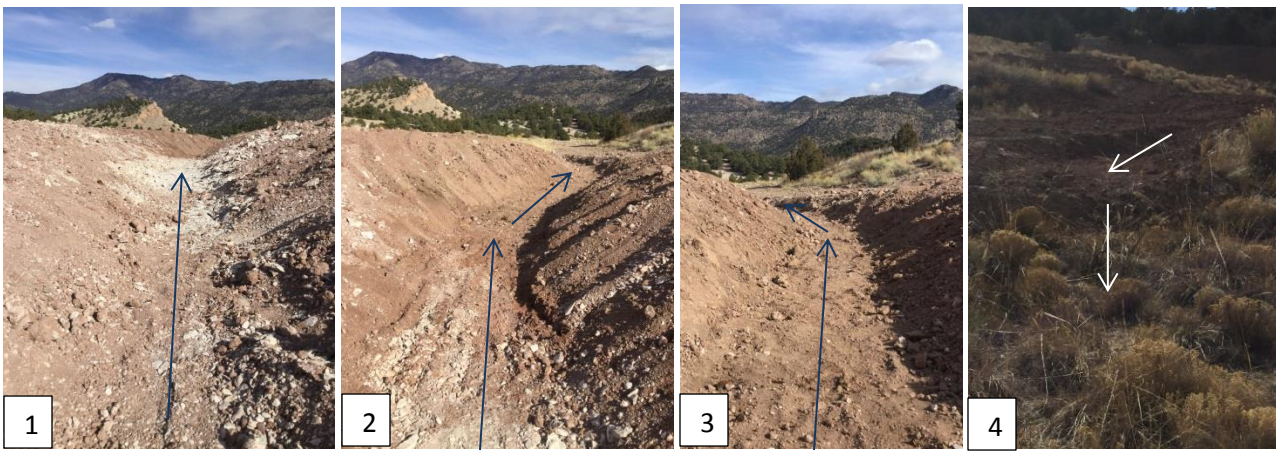
- The existing swale has been cut deeper to facilitate the site's drainage.

- Inverted trapezoidal cross-section notes (refer to figure):
  - 3.7' (base) x 10.2' (left diagonal) x 10.4' (right diagonal) x 21.9' (top)



  - Approximate Area of Trapezoid = 61.76 ft^2
  - Approximate volume of material removed for swale = 61.76 ft^2 x 160 ft (ground length) = 9,881.6 ft^3 of material. The real number will be less than this because this assumes a constant depth (swale-bank top).

- In order for the water to drain through the swale's length, it appears that it will need to overtop 1.21 feet of vertical increase in the swale channel. It should be noted that this vertical increase is located at the beginning of the swale.

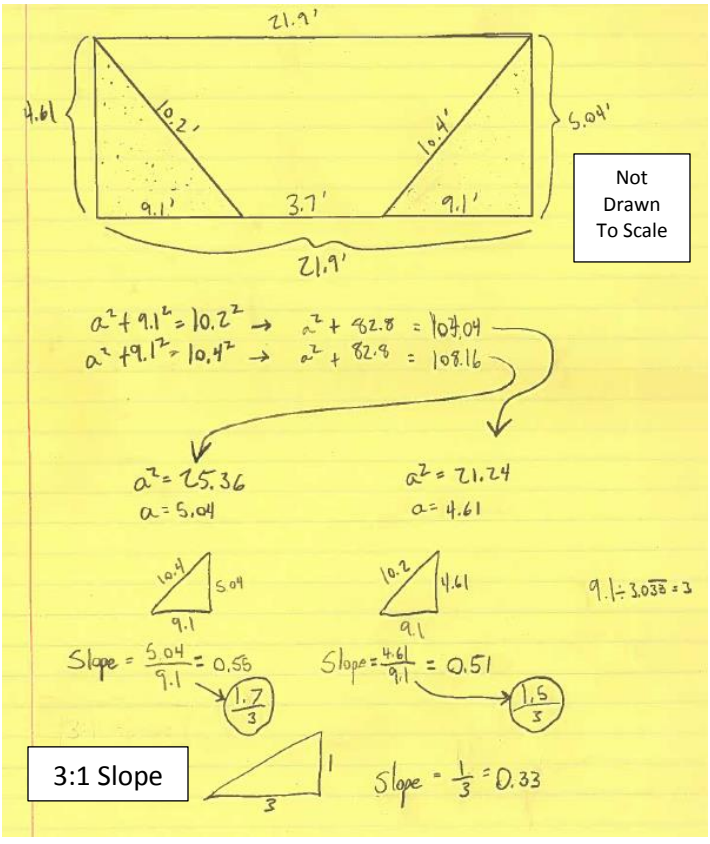


- The above photos show the sequence that water would take through the swale after overtopping the vertical increase of 1.21 feet at the beginning of the swale's channel. Photo 4 shows where the swale terminates into the pre-existing drainage basin.

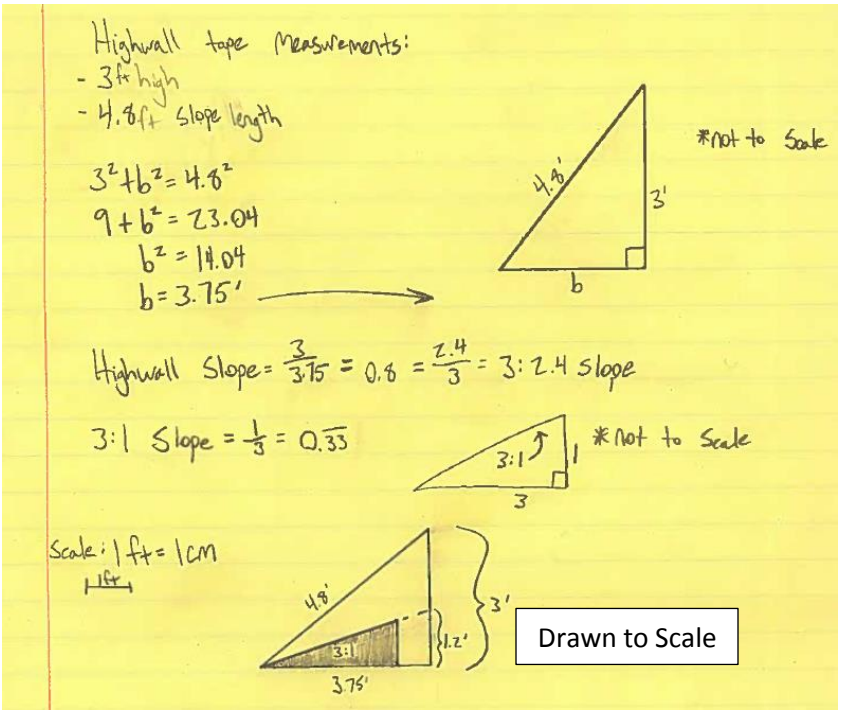
- The above photos show where drainage channels have been cut through the check dams below the swale. They are shown in sequential order as you travel down the drainage path.

Slopes

- Some reclaimed slopes exceed CDRMS' maximum slope of 3:1; however, the material is loose in these areas and will likely fill in towards the respective toe of each slope, making the slopes more gradual.
    - As we will have to wait for the growing season on the site's revegetation, it might be sufficient to monitor these slopes over the coming months.
- Swale side slopes are adequate (3 : 1.6).



- The Highwall Slope at its steepest angle is $\leq$ 2 x greater the CDRMS 3:1 slope standard. Refer to the scaled triangle at the base of the figure, which compares a 3:1 slope (shaded) and the current slope of the highwall.



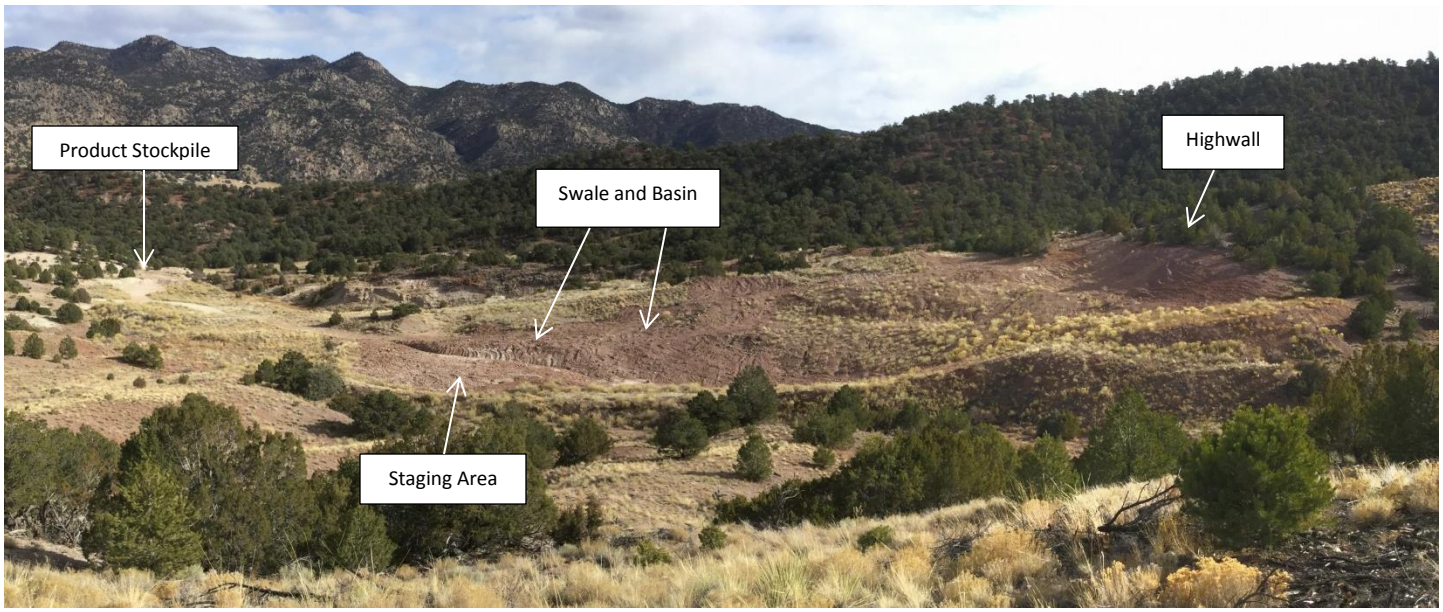
*Note the drawn diagram's slope and pictured slope are sub-parallel, suggesting that the **average** highwall slope is not as steep as the drawn diagram (in between a 2:1 and 3:1). The grey shaded polygon represents the approximate increase in area that would be required to bring the slope to a 3:1 ratio, per the CDRMS

Revegetation

- The operator has spread some seed, but intends to spread more.
- Several saplings (flagged and circled in blue) have been planted since the previous site visit, and they are marked by the rock rings which surround them.

Visual Resource

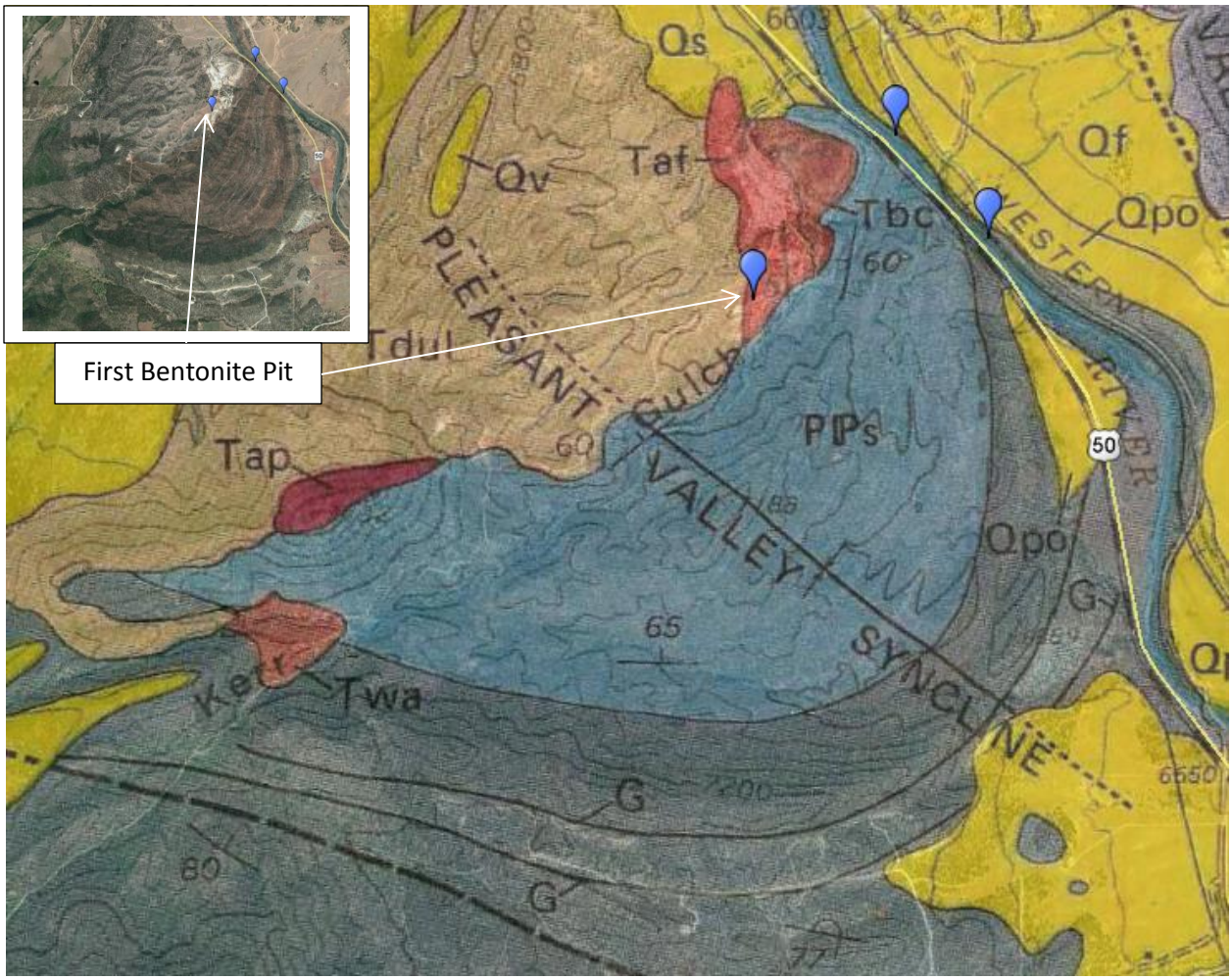
- From a visual standpoint, the grading and re-contouring efforts appear to have been successful. From Kerr Gulch Rd., the previous disturbances appear to be well blended with the surrounding topography (see photo below).

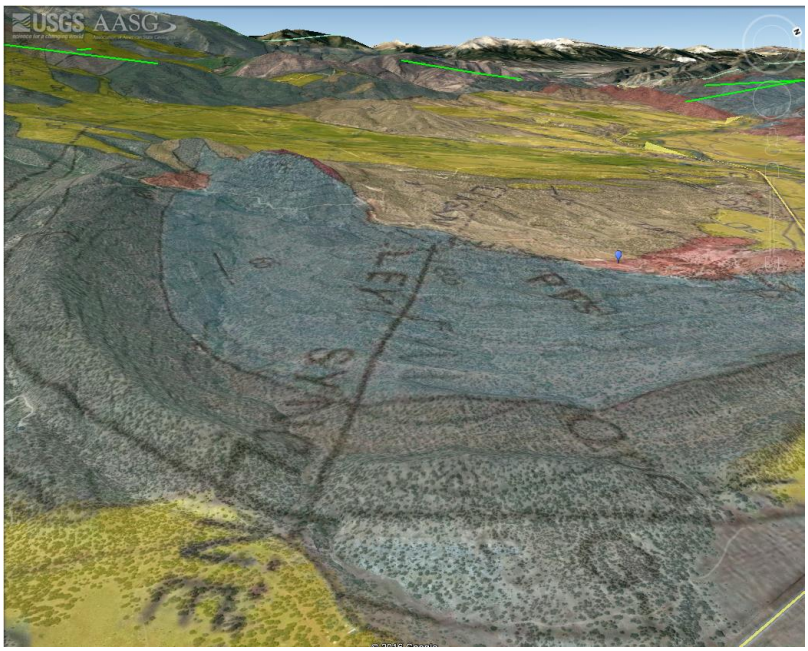


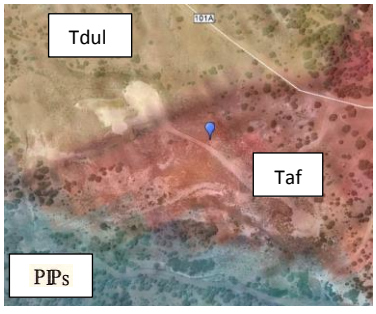
Recommended Actions

- The operator should add a sign stating “Reclamation in Progress, Keep Off”
- After the remaining product piles have been removed, the operator will need to rip the rest of the access road (to Kerr Gulch road intersection) and spread the remaining topsoil (currently stockpiled) over the current product pile storage area. Afterwards, the road and product pile storage area will need to be seeded.
- BLM will monitor the slopes in the Spring of 2017 to see if the winter/spring settling helps to soften the highwall slope to a 3:1.

Surrounding Structural Geology







According to the USGS maps on this page, the First Bentonite pit is located within the pleasant valley syncline. The highwall is shown in occurring in the Dry Union Formation (Tdul - tan), comprised of interlayered clay, silt, sand, and gravel (volcanic fragments). The formation also contains white to gray volcanic ash beds (composed of ash shards). It is likely that the Bentonite being mined at this location stems from one of these ash beds, or the adjacent Ashflow sequence (Taf-red).