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Steve Styler
Waddingham & Associates
362 West Main Street
Delta, UT 84624

Dear Mr. Styler:

You have asked us to evaluate the water resources of the Hansel Valley in Box Elder County in connection with a proposed Municipal Solid Waste site (SITE). The SITE is proposed to be located just northeast of the freeway in the northern portion of the valley. We have reviewed literature, consulted with State regulators, toured the valley and observed the proposed waste facility SITE. We can have prepared for you a hydrogeologic study when needed.

We have already been able to reach certain conclusions that we would like to share with you at this time. Box Elder County adopted criteria for locating a site for waste disposal on July 6, 2011. The title of the action we referred to is "3-8-030.2. Creation and location." This ordinance lists three criteria. The first one would eliminate a site approval if there was any existing residential dwelling within a mile of the site. We did not locate such a dwelling within that distance when we visited the valley.

The second criteria seems to have two criteria within the short sentence that are somewhat unrelated. The first has to do with the determination that the site is in a primary recharge area for the groundwater of the area. We believe that the SITE is in a principal or primary recharge area for this valley. The SITE is proposed to be located in a natural depression. This valley experiences from time to time torrential summer rain events. Some of these events result in the filling of a part or all of the SITE with runoff water and there is created a SITE lake (LAKE). This LAKE, when overfilled, spills out of two low areas and there are reports of significant flows from the over-topping of the LAKE discharging under the freeway. Residual water in the LAKE is reported to seep into the ground over a relative short period of time. This makes the site of the LAKE a recharge area for the groundwater resources of the area. From topographic maps, we roughly estimate the capacity of the LAKE to be about 4400 acre-feet. The SITE is farmed, and when we visited the SITE, we saw evidence of water flowing recently down a draw and into the SITE as a result of this summer's heavy rains. There was wheat growing in the SITE and we were not able to determine if this summer any water had ponded to create the beginnings of the LAKE.

Hansel Valley is surrounded by moderately high mountains and we believe winter snow pack is not significant and recharge to the groundwater reservoir from the snow pack is limited. It is our belief that summer torrential rain events provide an important amount of recharge to the groundwater of the area. In the area of the SITE, it appears that the area is underlain by fractured lava flows, including the area under the LAKE, and hence, recharge to the aquifer from storm events is easily accomplished.

The second portion of criteria 2 refers to "groundwater classified as 1B." It is our current conclusion that the County intended to refer to "irreplaceable" groundwater. The groundwater of Hansel Valley is clearly irreplaceable and if it were contaminated it would preclude the use of the groundwater for domestic purposes. The contaminated water would be irreplaceable. This second provision of criteria 2 seems to be closely related to criteria 3.

The third criteria asks if the location of the SITE is over a sole source aquifer. We conclude that this question is clearly answered in the affirmative. The groundwater aquifer in the northern portion of Hansel Valley including the SITE area is of good quality and is the only source of water for the area. If it is the only source, it seems that the conclusion is that it is the sole source. Importing water from other areas to replace contaminated groundwater does not seem feasible. This belief was validated when we learned that if the Bear River Water Conservancy District were to be asked to serve the valley with municipal water at some future date, the District has concluded that the only viable source would be the groundwater of Hansel Valley.

This concludes a summary of our findings thus far. Please contact us if there are any current additional questions.

Sincerely,

Jack A. Barnett

Jack A. Barnett, P.G.