



STATE OF
COLORADO

Ebert - DNR, Jared <jared.ebert@state.co.us>

Loveland Ready Mix (LRM) Permit Application # M-2017-036: No LaPorte Gravel Corp. Comments - Adequacy Review 3

ROBERT N HAVIS <rhavis@msn.com>

Thu, Mar 1, 2018 at 3:44 PM

To: "Ebert - DNR, Jared" <jared.ebert@state.co.us>

Dear Mr. Ebert:

Please find, attached (file – NLGAdeq3.docx), comments on the Loveland Ready Mix (LRM), permit application No. M-2017-036, responses to the Colorado Division of Reclamation Mining and Safety Adequacy Review of the LRM permit application. These comments are provided by the No LaPorte Gravel Corporation (NLG). The comments provided by NLG are listed in this email.

The DRMS should deny the LRM permit to protect the property, health and well being of the property owners threatened with flooding caused by ground water mounding in the neighborhood to the west of the project.

The neighborhood properties to the west of the project are very sensitive to the effects of ground water mounding predicated to be caused by the LRM project (see 37b). LRM predicts 2 feet of ground water mounding in these neighborhood, a predication with a high degree of uncertainty. Ground water has been observed to form springs flowing on the ground surface. In the neighborhood during certain times in the irrigation season and under wet meteorological conditions. Most of the residences have crawl spaces with **ground water elevations about 4 feet below surface**. The following is a list of potential infrastructure and health risks to the LaPorte community that would be caused by the ground water mounding from the proposed LRM project.

1. Flooding and wetting of crawl spaces. Remediation by sump pumps is not acceptable, it is an incomplete solution, additional maintenance and annoyance. Wetting of the crawl space will still occur, leading to **mold and fungus growth, deterioration of utilities**, and other damage.
2. High ground water causes infiltration into the sewer system which is largely composed of older clay sewer pipes, risking **sewer backup in homes**.
3. High ground water risks damage and **failure of older septic systems**, floating of septic tanks, sewer backups into homes.

LRM did not address 39a and 40a regarding pit water quality since the responses on January 2, 2018. Please see the following reference for an analysis of potential pit-water quality issues.

HAVIS Engineering January 2018. Potential Water Quality Issues from Cretaceous Pierre Shale in the Proposed Loveland Ready Mix Knox Pit, Larimer County Colorado. Submitted to the Colorado DRMS as Comment on permit application No. Permit Application # M-2017-036

NLG comments are prepended by 10 bolded asterisks (*****) below and in the attached document.

*******NLG Comment on Response 12b – Please see wild life observations, below, below by Jayme Tilley and Terry Waters**

Wildlife Observations by

Jayme Tilley (residential property adjacent to project west boundary).

Birds observed feeding/ using LRM field:

American Kestrel

Northern Harrier

Red-tailed Hawk

Ferruginous Hawk

Grasshopper Sparrow

House Sparrow

Western Meadowlark

Red-winged Blackbird

Common Grackle

Mourning Dove

Turkey Vulture

Great Horned Owl

Canada Goose

Deer, Coyotes, bears, and foxes also use this field. Raccoons use the Taylor and Ditch. Also the field is an important pack territory for coyotes. They congregate in number to feed and call.

Subterranean wildlife use and herbivory are important components of range habitats.

Although the field appears to be mostly homogenous Smooth Brome, there is enough habitat diversity on the parcel to support diverse insect and rodent populations and distinct wildlife uses. For example, the southern half of the field is dry and predominately Smooth Brome that is mowed somewhat regularly (1-2x/ year). The southwest corner of the field receives heavy cattle use and is fertilized accordingly. The northern half of the field has more vegetative diversity that includes a number of forbs as well as cheatgrass and alfalfa. The northwest corner of the field is much wetter than the rest of the field and supports thick grass bunches and horsetail species, and possibly additional wet meadow plant species. Standing water occurs in this portion of the field for most of the spring months and the entire irrigation season (irrigation runoff from Hawkeye ranch property). NOTE: The LRM parcel is NOT irrigated; laterals from Little Cache La Poudre Ditch have not been in use for many years. A number of soil and rock outcroppings exist on the field apparently caused by plows or other heavy equipment, and these areas have visible burrows of varying sizes. The Little Cache La Poudre Ditch and its service road each provide linear edges of various woody and wetland plants. The

small dry lateral ditch in the south portion of the field supports a number of cottonwood and other trees and taller grasses and is also a heavily used corridor for coyotes and foxes. The western side and a portion of the "peninsula" of farm properties include a number of fruit and berry trees. This lot and the Hawkeye lot together are an important pathway for mammals to move between the lower Poudre River corridor and the mountains via Poudre Canyon. Together all these characteristics describe a vibrant and diverse rangeland community that must be studied and protected.

Comments from Observations by Terry Waters, (residential property in neighborhood adjoining LRM property on west side)

4. Table 3, Sensitive Plants and Animals, is missing birds that were identified in the [City of Fort Collins Checklist of Local Birds](#). I have seen from my yard (within 500 feet from proposed site) Ferruginous hawks, Peregrine Falcons, and Bald Eagles (juvenile and adult). I have seen these birds on the ditch willows that are within 200 feet of the site, and photographed a falcon eating a pigeon in our front yard.

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Section 10.2.3, Raptor Nest sites, states "No raptor nests exists within the project area due to close

proximity of suitable trees to the adjacent road activity and existing industrial activity in the surrounding areas." Please note that the proposed site is not in an industrial area. It is beside quiet residential areas that have a large quantity of wildlife (e.g., deer) and birds. Bird watching and identifying birds is one of the top recreational activities in Laporte due to the large variety of birds that can be seen and heard singing in Laporte's rural environment. There are numerous suitable trees for raptor nests (e.g., over 80 feet tall) to the west of the site and to the south of site (especially along the Cache La Poudre river). I know of at least one raptor nest that exists within a ½ mile radius of the project area (note: I am not a trained ornithologist).

Requested Action: The applicant should hire a trained ornithologist to identify raptor nests within a ½ mile radius of project.

6. Section 10.2.4, Winter Night Roost, states "Due to the absence of raptors nests in the project area, it

is unlikely this project would be impacted by adjacent wintertime night roosts" implies that the writer is more concerned about the raptor nests impacting the project, rather than the project impacting the nests. Please note that the wintertime night roosts will be impacted by the

project's noise and light. Laporte is very quiet at night and has very few light sources. The applicant then states that "This facility is unlikely to be in operation during night time hours, during the winter months" which is also incorrect. The noise from the Natural Gas Compressors (76.2 dBA) at the proposed batch plant will operate throughout the night and lighting from the proposed batch plant will occur during all months of the year.

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7. Section 10.4, Effects on Existing Wildlife, states "Potential impacts to wildlife from the proposed mine

are expected to be minimal due to the preexisting disturbed nature of the project area". What preexisting nature of the project area – it is currently grazing for cattle and farm land both of which are attractive and readily support wildlife. What happens if mining occurs at Timberline Resources and Knox Pit occur at the same time? Where would wildlife go that is undisturbed? Might the wildlife attempt to cross 54G or the 287 bypass and endangering both the animals and

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Requested Action: The reclamation plan should contain the same as what the applicant originally

proposed in their Sketch Plan "the landform will be reclaimed to natural agricultural conditions, with the former pit areas reclaimed for water storage, lakes or enhanced wetlands. The presence of these reclaimed features will create open space that will preserve a more rural character, helping to maintain a sense of separation between the LaPorte community and the urban density of Fort Collins."

RULE 6.4.5 EXHIBIT E – RECLAMATION PLAN

*******NLG Comment 6.4.5**

Comments from Daniel Milchunas (grassland ecologist).

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*****NLG Comment on Response 35a

page 2 of the 'Drainage Report of LRM' it says " Little Cache la Poudre Ditch is expected to accept stormwater...from within the Ditch's on-site easement.

1. How wide is the easement? Might enough tainted dust (heavy metals) fall in that easement and then be carried by runoff to the ditch to pose a threat to downstream use of the irrigation water or Terry Lake?
2. If stormwater is leaving the LRM property through the Little Cache La Poudre Ditch isn't a NPDES stormwater discharge permit required for that discharge?

*****NLG Comment on Response to 37a: The response is inadequate. If wells are less than 10 feet and have 5 feet of saturated thickness, then when the well drawdown reaches the LRM trigger of 5 feet the well will be dry and unusable. How long must neighbors be inconvenienced by dry wells before LRM corrects the problem? Also, the comment points out the proximity of bedrock. Deepening to achieve an adequate saturated thickness will likely be impractical. LRM is

responsible for compensating well owners for the additional pumping costs required in deeper wells if deepening would remediate well drawdown problems.

******* NLG Comment on Response to 37b**

The Modflow simulations of flow around the pit walls (e.g. Figure 21) shows a tendency towards ground water mounding in the neighborhoods to the west of the project, as would be expected. There are many unknowns in the design, construction and performance of the drain system. Among the unknowns is the long-term hydrology of the area. The current ground water flow regime represents abnormally dry conditions in the LaPorte area. How will the drain system work if in the future there are successive years of abnormally high rainfall? Would LRM be around in 50 or 100 years or more to try to fix the ground water flow when variations in precipitation cause a failure of the drain system? Was sensitivity analysis performed on ground water flow rates? If the pit lining system was allowed to be constructed, the ground water flow around the pits would need to be reliable in perpetuity without maintenance. The proposed design does not appear reliable and has significant uncertainty about performance. Remediation to address failure of the ground water flow plan, as described in section 7.1.3 of the 2nd Ground Water Report is not acceptable as a long-term plan. LRM proposed building a second drain system as remediation. If the original drain system fails to work how certain can the public be that a second drain system will work?

The neighborhood properties to the west of the project are very sensitive to the effects of ground water mounding predicated to be caused by the LRM project. LRM predicts 2 feet of ground water mounding in these neighborhood, a predication with a very high degree of uncertainty. Ground water has been observed to form springs flowing on the ground surface during certain times in the irrigation season and under wet meteorological conditions. Most of the residences have crawl spaces with **ground water elevations about 4 feet below surface**. The following is a list of potential infrastructure and health risks to the LaPorte community caused by the ground water mounding from the proposed LRM project.

4. Flooding and wetting of crawl spaces. Remediation by sump pumps is not acceptable, it is an incomplete solution, additional maintenance and annoyance. Wetting of the crawl space will still occur, leading to **mold and fungus growth, deterioration of utilities**, and other damage.
5. High ground water causes infiltration into the sewer system which is largely composed of older clay sewer pipes, risking **sewer backup in homes**.
6. High ground water risks damage and **failure of older septic systems**, floating of septic tanks, sewer backups into homes.

*******Comment on Response to 39a:** The above is the same response that LRM gave to this comment in the January 2, 2018 Response to DRMS Adequacy review. NLG offers the same comment as offered to the January 2018 response with an additional paragraph following.

If there are not widespread water quality issues in gravel mines exposing Pierre Shale, what are the concentrations of arsenic, lead, selenium and uranium associated with the pit water in these mines? How does LRM propose to key the pit liner into the Pierre Shale without disturbing the shale and exposing ambient ground water and pit water to toxins in the shale? Pit water would also likely be contaminated during the excavation of the bedrock key. Contaminated pit water will be pumped into the water management pond which discharges to ground water and likely exceed National Drinking Water Quality Standards for arsenic, lead, selenium and uranium. The water management pond is used for dust suppression. Contaminated water from the pond will be spread throughout the site and entrained in the fugitive dust. LRM has taken samples and measured the Pierre Shale for selenium. However, the sampling plan, as designed provided no new information. One would not expect that the surface of the weathered shale, that has been in contact with ground water for thousands of years, would contain appreciable concentrations of mobile contaminants. The LRM samples of the Pierre Shale surface in contact with alluvium confirmed this presumption. LRM discovered that well sampling showed low levels of Selenium. This would also be expected since the well water was in contact with a relatively small area of shale (the inside of the well

*******NLG additional paragraph on Response to 39a.** LRM conducted several grab samples of the surface of the Pierre Shale, but this is not a conclusive study. Areas of the surface can be isolated from ground water flow, covered by material, preventing leaching by ground water. Excavation of the key into the Pierre Shale liner, and mechanical erosion by equipment has potential to expose significant toxins to ground water (see HAVIS Engineering, January 2018). **LRM has once again failed to respond to these issues.**

HAVIS Engineering January 2018. Potential Water Quality Issues from Cretaceous Pierre Shale in the Proposed Loveland Ready Mix Knox Pit, Larimer County Colorado. Submitted to the Colorado DRMS as comment on Permit Application # M-2017-036

*******NLG comments on 39b and 40a** – The ground water sampling locations are inadequate. There is no up-gradient sampling station. Three sampling wells are located on the property and only one sampling well is down gradient. The down-gradient well, MW-19 is in the shadow of the pit structure and not likely to experience significant contaminant transport.

*******NLG Comment on 40a.** LRM Response to 40a is absent, there is no Section 5.5.3 of the revised groundwater report. Please see HAVIS (2018), for a technical analysis of the potential for ground water contamination through mechanical erosion of the Pierre Shale.

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NLGAdeq3.docx
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NO LAPORTE GRAVEL.ORG

nolaportegravel@gmail.com

March 1, 2018

By email: jared.ebert@state.co.us -

Jared Ebert

Colorado Division of Reclamation, Mining and Safety

1313 Sherman Street

Denver, Colorado 80303

Re: Loveland Ready Mix (LRM) Permit Application # M-2017-036 – Comments on Response to Adequacy Review 3

Dear Mr. Ebert:

No LaPorte Gravel Corp and the undersigned individuals submit the following comments on the LRM response to the Colorado Division of Reclamation Mining and Safety (DRMS) Adequacy Review No. 3.

Thank You

Robert N. Havis, PhD, PE for

No LaPorte Gravel Corporation

Board Members; Patty McElwaine, Co-President | Jayme Tilley, Co-President | Pete Waack, Legal Liaison | Leah Salmans, Treasurer
Amy Maddox, Secretary | Robert Havis, Advising Member/Engineer | Tess Reyes, Advising Member/ Nurse | Erica Daniell, Advising
Member/ Schools | Linda Sawyers, Advising Member | Ruth Wallick, Advising Member | Susan Barbour, Advising Member

No Laporte Gravel P.O. Box 523 Laporte, CO 80535 970/490-1776

Comment 12b

The Division is currently consulting with Colorado Parks and Wildlife regarding the proposed plan submitted. If any additional adequacy items pertaining to this issue are identified they will be forwarded to LRM as soon as possible.

Response 12b

LRM welcomes comments from the Colorado Parks and Wildlife.

An additional Avian Nest Survey Report has been prepared to support the current plan to monitor site for raptor nests and to prepare for yearly surveys. A copy of this report is included as Attachment 1.

*******NLG Comment on Response 12b – Please see wild life observations, below, below by Jayme Tilley and Terry Waters**

Wildlife Observations by
Jayme Tilley (residential property adjacent to project west boundary).

Birds observed feeding/ using LRM field:

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2x/ year). The southwest corner of the field receives heavy cattle use and is fertilized accordingly. The northern half of the field has more vegetative diversity that includes a number of forbs as well as cheatgrass and alfalfa. The northwest corner of the field is much wetter than the rest of the field and supports thick grass bunches and horsetail species, and possibly additional wet meadow plant species. Standing water occurs in this portion of the field for most of the spring months and the entire irrigation season (irrigation runoff from Hawkeye ranch property). NOTE: The LRM parcel is NOT irrigated; laterals from Little Cache La Poudre Ditch have not been in use for many years. A number of soil and rock outcroppings exist on the field apparently caused by plows or other heavy equipment, and these areas have visible burrows of varying sizes. The Little Cache La Poudre Ditch and its service road each provide linear edges of various woody and wetland plants. The small dry lateral ditch in the south portion of the field supports a number of cottonwood and other trees and taller grasses and is also a heavily used corridor for coyotes and foxes. The western side and a portion of the "peninsula" of farm properties include a number of fruit and berry trees. This lot and the Hawkeye lot together are an important pathway for mammals to move between the lower Poudre River corridor and the mountains via Poudre Canyon. Together all these characteristics describe a vibrant and diverse rangeland community that must be studied and protected.

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Comment 35a

Is the Little Cache La Poudre Ditch that passes through the site lined? If not, how will LRM prevent losses from the ditch during dewatering? If there is a potential for losses to occur from the ditch, how will LRM monitor the inflow and outflow of the ditch to measure these losses? Please provide a monitoring plan and either a mitigation plan or loss prevention plan

Response 35a

The Little Cache Ditch is not lined through the site. However, the ditch company performed a leakage analysis (measuring inflow and outflow up and down gradient of the site) recently, and they have indicated that the ditch leaks very little through this section, indicating that natural siltation has likely sealed up the ditch. The Taylor and Gill ditch is sealed on the west side of the site as it is conveyed through concrete sewer pipe.

LRM is in contact with both the Little Cache and Taylor and Gill ditch companies. Agreements have been signed to commit LRM to providing mitigation should ditch losses become excessive (Attachments 10 and 11).

The ditches were simulated in the groundwater model. Mine dewatering was projected to increase ditch losses by a few percent for the Little Cache and Taylor and Gill, respectively, during mining. After mining, ditch losses are expected to decrease due to lining of the pits. The results section of the groundwater modeling report provides estimates on the increased

*******NLG Comment on Response 35a**

page 2 of the 'Drainage Report of LRM' it says " Little Cache la Poudre Ditch is expected to accept stormwater...from within the Ditch's on-site easement.

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1. How wide is the easement? Might enough tainted dust (heavy metals) fall in that easement and then be carried by runoff to the ditch to pose a threat to downstream use of the irrigation water or Terry Lake?
2. If stormwater is leaving the LRM property through the Little Cache La Poudre Ditch isn't a NPDES stormwater discharge permit required for that discharge?

Comment 37a

Please submit a groundwater monitoring and impact mitigation plan to DRMS for approval. This plan should include: all historic water level data available for the site wells and immediately surrounding area if available, monthly monitoring of water levels at all existing wells if possible, trigger levels for each well based on historic high and low water levels for that well, proposed reporting and mitigation plan when groundwater levels deviate beyond proposed trigger levels to minimize any impact to groundwater levels and especially off-site impacts. Section 9.1 states LRM may mitigate adverse effects to existing wells by supplementing water supplies or deepening wells. Due to the approximately 1,900 feet of Pierre Shale bedrock underlying the area at a depth of 12-30 feet below ground surface (bgs), deepening the existing wells is unlikely to be a successful mitigation solution.

Response 37a

Please see Section 7 of the revised groundwater report. Note that deepening of neighbors' wells is a viable solution as most wells are shallow (less than 10 feet deep with approximately 5 feet of saturated thickness). The majority use of the wells is for domestic lawn and gardening at pumping rates less than 20 gpm. Well drawdown required in this aquifer to achieve 20 gpm is less than 1 foot. Thus, deepening of wells is a viable mitigation strategy, assuming that the wells are legally permitted.

*******NLG Comment on Response to 37a:** The response is inadequate. If wells are less than 10 feet and have 5 feet of saturated thickness, then when the well drawdown reaches the LRM trigger of 5 feet the well will be dry and unusable. How long must neighbors be inconvenienced by dry wells before LRM corrects the problem? Also, the comment points out the proximity of bedrock. Deepening to achieve an adequate saturated thickness will likely be impractical. LRM is responsible for compensating well owners for the additional pumping costs required in deeper wells if deepening would remediate well drawdown problems.

[Type here]

Comment 37b

The following items will need to be addressed regarding the proposed monitoring and mitigation plan included with the groundwater report submitted:

- i. Section 7.0 states the groundwater model will be updated and verified as more data is collected. Please commit to updating the model with all available monitoring data annually and submitting the results, and monitoring data, with the annual report.
- ii. Section 7.1 states that groundwater depth/level data will be collected monthly for 1 year, dropping to quarterly thereafter until active operations are completed. Given the concerns for impacts to surrounding structures/wells, and the usefulness of the data for the groundwater model calibration/verification, please commit to maintain the monthly groundwater level monitoring for the life of the permit.
- iii. Section 7.1.4 also states that, with well owner's permission, they will monitor levels in the identified nearby private wells semi-annually. For the same reasons listed above, this data should be collected quarterly if possible. For clarity, please specify which of the neighbor's wells will be monitored.
- iv. Section 7.1.6 states that LRM proposes a drawdown trigger level of 5 feet to trigger additional monitoring and possible mitigation if required. This seems reasonable. However, please clearly define the baseline elevations for each well that will be used to determine what the drawdown level in that area is. These baseline elevations should take into account the seasonal variations of the well levels.
- v. No trigger level for groundwater mounding was proposed in Section 7.1.6 of the groundwater study, however sections 3.3 and 5.1 of the groundwater study indicates that a trigger level of 2 feet above baseline would be appropriate. Similar to the item above, please clearly define the baseline elevations for each

well that will be used to determine what the mounding level in that area is. These baseline elevations should take into account the seasonal variations of the well levels.

Response 37b

- i. LRM commits to updating the groundwater model with all available monitoring data annually and submitting the results, and monitoring data, with the annual report.
- ii. LRM commits to maintain monthly groundwater level monitoring for the life of the permit.
- iii. LRM will, with owner's permission, monitor water levels in the identified nearby private wells quarterly, if possible. The private wells that have been monitored to date and will continue to be contacted for future monitoring are:

NAME	ADDRESS
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[Type here]

M. Morgan	2532 W County Rd 54G
D. Hildred	2403 Brookhill Rd
R. Wallick	3000 N Overland Trl.
T. Waters & D. Little	3200 Tharp DR
H. Still	2801 W County Rd 54G
J. West	2812 W County Rd 54G
C. Cherry	2816 W County Rd 54G
E. Stoner	2301 Eddy Ln
J. Maxwell	2816 Gardner Pl
D. Chavez	2919 Farview Dr.
M. Amey	2903 Farview Dr
J. Sincavage	2813 Farview Dr
D.Brown	2400 W County Road 54G
P. Brobst	3010 N Overland Trl
J. Komer	2817 County Rd 54G
L. Sutherland	2725 Farview Dr
E. Watt	2626 N Overland Trl
S. Gomez	3205 Wilson Ct
Cindi Lee	3220 Sunrise Dr.

- iv. See v below
- v. Monitoring wells may be used to detect drawdown and mounding during different phases of the project. The baseline elevation for each monitoring well is listed in the table below. The elevations take into account the seasonal variations.

Well	Dry Season Baseline Elevation ft.	Wet Season Baseline Elevation ft.
MW-01	5044.6	5048.1
MW-02	5048.2	5051.3
MW-03	5051.6	5055.8
MW-04	5047.7	5051.4
MW-05	5052.4	5056.1
MW-06	5052.4	5057.6
MW-07	5047.6	5051.2
MW-08	5052.6	5056.2
MW-09	5052.9	5054.8

[Type here]

MW-10	5044.1	5046.3
MW-11	5044.2	5045.8
MW-12	5041.1	5045.2
MW-13	5042.6	5046.6
M-14	5043.7	5047.2

***** NLG Comment on Response to 37b

The Modflow simulations of flow around the pit walls (e.g. Figure 21) shows a tendency towards ground water mounding in the neighborhoods to the west of the project, as would be expected. There are many unknowns in the design, construction and performance of the drain system. Among the unknowns is the long-term hydrology of the area. The current ground water flow regime represents abnormally dry conditions in the LaPorte area. How will the drain system work if in the future there are successive years of abnormally high rainfall? Would LRM be around in 50 or 100 years or more to try to fix the ground water flow when variations in precipitation cause a failure of the drain system? Was sensitivity analysis performed on ground water flow rates? If the pit lining system was allowed to be constructed, the ground water flow around the pits would need to be reliable in perpetuity without maintenance. The proposed design does not appear reliable and has significant uncertainty about performance. Remediation to address failure of the ground water flow plan, as described in section 7.1.3 of the 2nd Ground Water Report is not acceptable as a long-term plan. LRM proposed building a second drain system as remediation. If the original drain system fails to work how certain can the public be that a second drain system will work?

The neighborhood properties to the west of the project are very sensitive to the effects of ground water mounding predicated to be caused by the LRM project. LRM predicts 2 feet of ground water mounding in these neighborhood, a predication with a very high degree of uncertainty. Ground water has been observed to form springs flowing on the ground surface during certain times in the irrigation season and under wet meteorological conditions. Most of the residences have crawl spaces with **ground water elevations about 4 feet below surface**. The following is a list of potential infrastructure and health risks to the LaPorte community caused by the ground water mounding from the proposed LRM project.

- 1) Flooding and wetting of crawl spaces. Remediation by sump pumps is not acceptable, it is an incomplete solution, additional maintenance and annoyance. Wetting of the crawl space will still occur, leading to **mold and fungus growth, deterioration of utilities**, and other damage.
- 2) High ground water causes infiltration into the sewer system which is largely composed of older clay sewer pipes, risking **sewer backup in homes**.
- 3) High ground water risks damage and **failure of older septic systems**, floating of septic tanks, sewer backups into homes.

[Type here]

Comment 39a

Section 7.3.2 of the application claims that “ground water quality is not anticipated to be an issue.” Exhibit G cites a groundwater study (Telesto, 2017b) that was not submitted with the application. Has LRM analyzed the baseline groundwater quality? If so, please provide this data. Please provide a prediction of the probably hydrologic impacts to the groundwater quality from excavating the alluvial material and exposing the Pierre Shale.

Response 39a

The statement that “ground water quality is not anticipated to be an issue” comes from three fundamental pieces information:

- Nearly every gravel pit on the Poudre River has exposed the Pierre Shale and there are not wide-spread water quality issues associated these activities
- Constituent mobility requires two principal components:
 - Source chemistry
 - Water movement
- LRM commits to monitoring and managing its water to limit the potential for water quality issues

While the Pierre Shale is documented to have source constituents available, it is also well documented that it is highly impermeable. On site, the Pierre Shale drilled dry, meaning there is no water present. Thus, the only mechanism to move source constituents from the Pierre into contact water is through molecular diffusion, which is a slow process.

Recently, LRM collected samples of the Pierre Shale at the contact with the alluvium and subjected the samples to the synthetic precipitation leach procedure (SPLP) testing. One of 5 samples resulted in detectable selenium. Three groundwater quality samples were taken from monitoring wells MW-06, MW-13, and MW-02. MW-06 showed detectable levels of selenium below the drinking water standard. The sample from MW-06 contained sedimentation (i.e., the well has not completely developed), thus it is most likely that the detected selenium was part of the solid matrix. LRM will sample MW-06 again and filter the sample to corroborate this supposition. These data corroborate the potential for the Pierre Shale to contain selenium, and on the whole, show that ground water quality is not significantly impacted by the Pierre Shale. LRM’s water management activities keep the groundwater system outside of the mining area in tact with respect to water contacting the Pierre Shale. Inside the mining area, no water that is in direct contact with the shale is proposed to leave the site. Thus, no water quality issues are anticipated. Regardless, LRM commits to monitoring its water quality in the water management pond and respond accordingly should discharges be an issue.

[Type here]

*******Comment on Response to 39a:** The above is the same response that LRM gave to this comment in the January 2, 2018 Response to DRMS Adequacy review. NLG offers the same comment as offered to the January 2018 response with an additional paragraph following.

If there are not widespread water quality issues in gravel mines exposing Pierre Shale, what are the concentrations of arsenic, lead, selenium and uranium associated with the pit water in these mines? How does LRM propose to key the pit liner into the Pierre Shale without disturbing the shale and exposing ambient ground water and pit water to toxins in the shale? Pit water would also likely be contaminated during the excavation of the bedrock key. Contaminated pit water will be pumped into the water management pond which discharges to ground water and likely exceed National Drinking Water Quality Standards for arsenic, lead, selenium and uranium. The water management pond is used for dust suppression. Contaminated water from the pond will be spread throughout the site and entrained in the fugitive dust. LRM has taken samples and measured the Pierre Shale for selenium. However, the sampling plan, as designed provided no new information. One would not expect that the surface of the weathered shale, that has been in contact with ground water for thousands of years, would contain appreciable concentrations of mobile contaminants. The LRM samples of the Pierre Shale surface in contact with alluvium confirmed this presumption. LRM discovered that well sampling showed low levels of Selenium. This would also be expected since the well water was in contact with a relatively small area of shale (the inside of the well

*******NLG additional paragraph on Response to 39a.** LRM conducted several grab samples of the surface of the Pierre Shale, but this is not a conclusive study. Areas of the surface can be isolated from ground water flow, covered by material, preventing leaching by ground water. Excavation of the key into the Pierre Shale liner, and mechanical erosion by equipment has potential to expose significant toxins to ground water (see HAVIS Engineering, January 2018). **LRM has once again failed to respond to these issues.**

HAVIS Engineering January 2018. Potential Water Quality Issues from Cretaceous Pierre Shale in the Proposed Loveland Ready Mix Knox Pit, Larimer County Colorado. Submitted to the Colorado DRMS as comment on Permit Application # M-2017-036

Comment 39b

The groundwater quality data provided and proposed groundwater quality monitoring program are insufficient. The applicant will need to submit a groundwater quality monitoring plan and data sufficient to demonstrate that the site will be in compliance with CDPHE Water Quality Control Commission (WQCC) Regulation 41 - Basic Standards for Groundwater during the life of the mine and during reclamation. In accordance with Rule 3.1.7(7)(b), the submitted plan should be revised to include at least:

[Type here]

- i. *Proposed groundwater sampling locations and frequency, including up-gradient background location(s) and points of compliance. Quarterly water quality sampling would be sufficient. Please include sampling of the water in the water management pond during operations as it will directly recharge groundwater in the vicinity.*
- ii. *Please include a description of the method of monitoring well completion.*
- iii. *Sampling protocol(s) and analytical methods/detection levels, and quality control and quality assurance methods.*
- iv. *Appropriate analyte list. At a minimum the full Reg. 41 Table 1 Inorganic Analytes list should be collected for establishing background levels and used for regular monitoring parameters. Asbestos may be eliminated, however, TDS, pH, and iron should be included.*
- v. *Please commit to submitting the results of water monitoring sampling during the mining operation and reclamation to the Division with the annual report each year.*
- vi. *Please specifically state the formation, aquifers or strata to be sampled.*
- vii. *Baseline Water Quality Data. Please provide baseline water quality data to document the pre-mining water quality based on the analyte list noted above. The applicant will need to collect at a minimum five quarters of water quality data prior to exposing groundwater and/or initiating dewatering operations. The Division may consider conditionally approving the application with a commitment from the Applicant that they will collect and submit the baseline water quality data prior to exposing groundwater and/or initiating dewatering operations.*

Response 39b

The attached Groundwater Sampling and Analysis Plan (Attachment 3) addresses the comments above.

*******NLG comments on 39b and 40a** – The ground water sampling locations are inadequate. There is no up-gradient sampling station. Three sampling wells are located on the property and only one sampling well is down gradient. The down-gradient well, MW-19 is in the shadow of the pit structure and not likely to experience significant contaminant transport.

Comment 40a

Regarding the item discussed above, please provide a rational and any applicable data to substantiate the claim that groundwater quality will not be an issue.

Response 40a

See previous response and section 5.5.3 of the revised groundwater report.

[Type here]

*******NLG Comment on 40a.** LRM Response to 40a is absent, there is no Section 5.5.3 of the revised groundwater report. Please see HAVIS (2018), for a technical analysis of the potential for ground water contamination through mechanical erosion of the Pierre Shale.

HAVIS Engineering January 2018. Potential Water Quality Issues from Cretaceous Pierre Shale in the Proposed Loveland Ready Mix Knox Pit, Larimer County Colorado. Submitted to the Colorado DRMS as Comment on permit application No. Permit Application # M-2017-036

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