



**WESTERN RESOURCE
ADVOCATES**

March 16, 2011

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**BEFORE THE EXECUTIVE DIRECTOR
UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY**

In Re: PR Spring Tar Sands Project	:	REQUEST FOR
February 15, 2011 Ground Water	:	AGENCY ACTION/PETITION
Discharge Permit-by-Rule	:	TO INTERVENE ¹
	:	

Pursuant to Utah Admin. Code R317-9-3 and Utah Code Ann. § 63G-4-201(3), as well as R317-9-6 and § 63G-4-207, Living Rivers respectfully submits this Request for Agency Action/Petition to Intervene to the Executive Director of the Utah Department of Environmental Quality (Executive Director) and to the Executive Secretary of the Water Quality Board (Executive Secretary).² As specified below, through this request, Living Rivers seeks fulfillment of the obligation of the Division of Water Quality and the Executive Secretary of the Water Quality Board (collectively DWQ) to protect the

¹ Living Rivers hereby submits this Request for Agency Action/Petition to Intervene to the Executive Director of the Utah Department of Environmental Quality pursuant to Utah Admin. Code R317-9-3 and Utah Code Ann. § 63G-4-201(3), as well as R317-9-6 and § 63G-4-207. In doing so, however, Living Rivers does **not** concede that, under the Division of Water Quality regulations, it must submit a petition to intervene in its own request for agency action. *See, e.g.* Utah Admin. Code R317-9-6(1)(d); Utah Code Ann. § 63G-4-103(1)(f).

² The relevant regulations are confusing with regard to whom to serve with this Request for Agency Action/Petition to Intervene. *See* Utah Admin. Code R317-9-1(2); *but see* Utah Admin. Code R317-9-3(1)(a) & (b) (other than “[i]nitial orders denying or revoking a permit” other initial orders “may be contested by filing a Request for Agency Action to the Executive Secretary[.]” As a precaution, Living Rivers serves both the Executive Director and the Executive Secretary in this matter.

beneficial uses and water quality of ground water resources in the area of the PR Spring mine in compliance with the Clean Water Act and Utah's Water Quality Act. Living Rivers also respectfully requests a hearing on the issues raised and relief requested in this Request for Agency Action.

Statement of Service

This Request for Agency Action/Petition to Intervene was **emailed** on March 16, 2011, and hand-delivered on March 17, 2011 to:

Amanda Smith
Executive Director
Utah Department of Environmental Quality
195 North 1950 West, 4th Floor
Salt Lake City, UT 84114-4414

Walt Baker
Executive Secretary
Utah Water Quality Board
288 North 1460 West
Salt Lake City, Utah 84116;

and a copy mailed, via first class mail, on March 17, 2011 to:

Mr. Barclay Cuthbert
Earth Energy Resources, Inc.
Suite # 950
633-6 Avenue SW
Calgary, AB T2P 2Y5 Canada

Agency Reference Number

This matter concerns the Ground Water Discharge Permit-by-Rule, issued by DWQ on February 15, 2011 to Earth Energy Resources (EER) for the PR Spring Tar Sands mine.

Date of Email/Hand Delivery

Living Rivers emailed this Request for Agency Action/Petition to Intervene to the Executive Director of the Department of Environmental Quality and the Executive Secretary of the Water Quality Board on March 16, 2011, and hand delivered this Request for Agency Action/Petition to Intervene to the Executive Director of the Department of Environmental Quality and the Executive Secretary of the Water Quality Board on March 17, 2011.

Statement of Legal Authority and Jurisdiction

Living Rivers makes its Request for Agency Action pursuant to Utah Admin. Code R317-9-3(1) and Utah Code Ann. § 63G-4-201(3). Utah Code Ann. § 63G-4-201(3) provides that, where agency rules permit persons other than the agency to initiate adjudicative proceeding, these persons may do so according to the established format. DWQ rules R317-9-3(1) and (2) confirm that persons other than DWQ may contest initial orders by filing a written Request for Agency Action with the Executive Director and the Executive Secretary of the Water Quality Board. Utah Admin. Code R317-9-2(1), in turn, clarifies that “[i]nitial orders and notices of violation include, but are not limited to, initial proceedings regarding (a) approval, denial, termination, modification, revocation, reissuance or renewal of permits, plans, or approval orders” and “(e) requests for variances, exemptions, and other approvals.” The Ground Water Discharge Permit-by-Rule, issued by DWQ on February 15, 2011 to EER for the PR Spring Tar Sands mine is an initial order pursuant to R317-9-2(1).

Living Rivers is a proper party to this matter pursuant to Utah Admin. Code R317-9-6(1)(d) because it is a “person with standing who brings a Request for Agency Action as authorized by the Utah Administrative Procedures Act and [DWQ] rules.” Because DWQ has argued in other proceedings that a person who files a Request for Agency Action is not automatically a party to its own adjudication, Living Rivers also submits this Petition to Intervene pursuant to Utah Admin. Code R317-9-6(1)(c) and Utah Code Ann. § 63G-4-207. Intervention should be granted because Living Rivers’ legal interests may be substantially affected by this proceeding, and because the interests of justice and the orderly and prompt conduct of the adjudicative proceeding will not be materially impaired by allowing the intervention. To deny Living Rivers the opportunity to intervene in this action would be a violation of Living Rivers’ constitutional rights and the Clean Water Act.

It is Living Rivers’ position that, at the most fundamental level, Living Rivers is not required to intervene, or file a petition to intervene, because Living Rivers is, by definition, already a party in its own request for agency action. Further, the insertion of a discretionary intervention process in an administrative challenge to a state-approved permit improperly restricts the opportunity for judicial review of the final permit in state court, in violation of federal law. So long as a party has standing (which Living Rivers does), the state cannot deny intervention without being in violation of the minimum requirements for federally-authorized State permitting programs under Section 402 of the Clean Water Act. EPA regulations explicitly require that a state-administered program under the CWA comply with provisions found in 40 C.F.R. Part 123 and provide access to state courts “sufficient to provide for, encourage, and assist public participation in the permitting process.” 40 C.F.R. § 123.30. Because a state may not narrowly restrict the class of persons who may challenge the approval of a state-issued permit, *id.*, the implied discretion invoked by the state to either grant or deny intervention in these matters is in clear violation of federal law.

However, in an excess of caution, Living Rivers notes that each of the elements required by Utah Code Ann. § 63G-4-207 are included in this document. Those include: 1) identifying the name of the proceeding and any other file or reference number; 2) a statement demonstrating that the Living Rivers has legal rights or interests that are substantially affected or qualifies as an intervenor under any provision of law³; and 3) a statement of relief.

Statement of Relief and Action

By this request, Living Rivers asks the Executive Director and the Executive Secretary to vacate and remand the February 15, 2011 Permit-by-Rule determination for the PR Spring mine and order DWQ to:

- (1) find that the PR Spring mine does not qualify for Permit-by-Rule status under Utah Admin. Code R317-6-6.2(A)(25);
- (2) require EER to submit an application pursuant to the provisions outlined in Utah Admin. Code R317-6-6.3;
- (3) review that application and issue a permit pursuant to R317-6-6.1 and R317-6-6.3 to 6.18.

In the event that the Executive Director, Executive Secretary or the Water Quality Board does not take final action on this matter before approval of the PR Spring mine by the Board of Oil, Gas and Mining, Living Rivers intends to request a stay of the Permit-by-Rule determination pursuant to Utah Admin. Code R317-9-10(2) until a final decision can be made.

Statement of Standing

Living Rivers brings this action on its own behalf as well as on behalf of its members – aggrieved parties who have protested approval of the PR Spring mine in other administrative actions before other State agencies. Living Rivers members use the biological, recreational, cultural/historic, aesthetic, water, air, and other environmental resources located on and adjacent to the Tavaputs Plateau area to stargaze, hike, hunt, camp, and sightsee, including the exact area proposed for development of the mine. They view the wildlife, plant communities and archeological sites there and enjoy the unique solitude of these undeveloped lands. Members of Living Rivers have enjoyed and hope to continue to enjoy the resources of the Tavaputs Plateau area, including the exact area proposed for development of the mine. DWQ’s decision to issue a permit-by-rule for the PR Spring mine is unlawful. DWQ’s arbitrary and capricious determination that the mine will have a *de minimis* actual or potential effect on ground water quality will directly and adversely affect these resources and the interests of members of Living Rivers. DWQ’s Permit-by-Rule determination will allow the placement of contaminated mining waste into the mining pit and into waste dumps in a way that will negatively impact ground water quality in the area of the mine, thus jeopardizing the ability of Living Rivers and its members to continue to use and enjoy the resources of the Tavaputs Plateau area. Each

³ Living Rivers achieves this by demonstrating that it has standing under applicable Utah case law.

of the effected members of Living Rivers relies upon Living Rivers, as an organization, to bring actions such as this one to protect the members' potentially effected interests.

The declaration of John Weisheit is attached to this Request for Agency Action/Petition to Intervene in order to establish the basis for the facts that confirm Living Rivers has standing under Utah law to pursue this appeal. *See Utah Chapter of the Sierra Club v. Utah Air Quality Board*, 2006 UT ¶ 73, 148 P.3d 975; *Utah Chapter of the Sierra Club v. Utah Air Quality Board*, 2006 UT ¶ 74, 148 P.3d 960.

Background

Overview

EER has held experimental leases in the PR Spring area since 2005. Since that time, the company has tinkered with a chemical extraction process for removing the bitumen from the tar sands called the Ophus process.⁴ This process purports to use a very condensed form of oil extracted from citrus peels as a reagent to remove bitumen from tar sands. This oil, known as d-Limonene, is quite potent. In very small concentrations it is used to add scent to cosmetics and food. At higher concentrations it is used as an insecticide. At near full strength, it is used to degrease parts and tools. D-Limonene, however, should not be released into the environment, particularly not in the quantities or concentrations associated with mining operations. Warnings associated with this substance note that it is “[v]ery toxic to aquatic organisms” and caution that the user should “[a]void release to the environment.” Additionally, the petrochemicals found in tar sands are highly carcinogenic when released into the environment. While these chemicals are fairly stable under natural conditions, residual d-Limonene will make petrochemicals remaining in the tailings 1,000 times more mobile than in their original state.

EER proposes to process mined tar sands with a mixture of d-Limonene and water; however the exact concentration of the d-Limonene has not been disclosed to the public. Once the bitumen is extracted, the processed sand tailings – 80% coarse sand, 20% fine sand and clay – will be placed, without treatment, back into the mine pit and onto 70 acres worth of waste dumps. The waste dumps are necessary because the disturbed mine material will increase in bulk by a factor of 30%. The exact ratio of placement of the tailings in the dumps versus the pit is unclear, but estimations suggest that from 1.2 million to 2.5 million cubic yards of wastes will be placed in dumps.

Although the company describes the tailings as “damp-dry,” the tailings will actually contain between 10-20% moisture by weight, in the form of some combination of water, process chemical (d-Limonene) and residual petrochemicals. The damp-dry characterization is inaccurate, and the processed sands will be at or near field capacity – the point at which water will drain from the material due to gravity. Additionally, the

⁴ Kevin Ophus is the Director and Chief Technology Officer at Earth Energy Resources and is the inventor of the Ophus process.

company's statements that there is insufficient precipitation in the area to further saturate the tailings are incorrect. The 12 inches of average annual precipitation is ample enough to further mobilize the residual process chemical and petrochemicals into ground water in the area. In short, conditions are such that the residual process chemical and petrochemicals will contaminate the local aquifers which feed the area's seeps and springs, thus poisoning the surface water supply upon which local wildlife depends.

Procedural Background

The ground water section at DWQ was first contacted by EER regarding the PR Spring mine in October 2005. At that time, DWQ noted that, due to the complete lack of information, the agency was obligated to assume that EER's submission represented "a worst-case scenario" that required the company to isolate the tailings from precipitation to prevent ground or surface water contamination. However, DWQ noted that if EER would provide "[a]dditional information on the composition of the leachate from the tailings, disposal site conditions or proposed containment technology for tailings disposal" that information could justify less stringent requirements.

In December 2005, DWQ corresponded with EER regarding a pilot project at the PR Spring site. DWQ referenced tailings tests conducted by American West Analytical Laboratories (AWAL), which, DWQ claimed, showed non-detectable levels of Total Recoverable Petroleum Hydrocarbons (TRPH) and metals except barium in the resulting leachate. The record is devoid of these test results, any analysis performed by DWQ or any support for DWQ's assessment. DWQ concluded that "for a pilot project of this scale, disposal of the tailings according to procedures . . . should not result in contamination of ground or surface water." The agency also informed EER that should it expand the pilot project or "go into production, more extensive testing of leachate from the tailings would be necessary for . . . [DWQ] to determine an appropriate regulatory action[.]".

In early 2007, DWQ was again contacted by EER, and via a series of emails and letters DWQ suggested that EER undertake certain tests on the tailings. Among other tests, the agency specifically asked for a determination of the amount of total dissolved solids (TDS – or salinity) in the tailings. After back and forth communication between EER and AWAL, these tests were eventually performed in August 2007. The results of these tests are highly suspect because of testing protocols violations and inadequate detection limits.

Specifically, the record shows that: 1) volatile and semi-volatile organic analyses were compromised by air space in sampling jars, holding times for getting samples to the lab were exceeded, and holding times at the lab were exceeded; 2) reporting limits for volatiles and semi-volatiles were generally above the applicable ground water standard; 3) certain metal analyses could not be compared against DWQ standards because the reporting limits for the tests exceeded the standard of comparison; and, 4) the analysis for TDS requested by DWQ could not be used because the test was run using inappropriate methods. As a result, EER admits that: 1) with regard to volatile and semi-volatile

organics (of which d-Limonene is one) “it is possible that greater concentrations than those measured by the lab were actually present in the samples;” 2) that concentrations of arsenic, cadmium, mercury and selenium could be greater than the ground water quality standards for those compounds; 3) although TDS is “a concern” for ground water, and ground water in Utah is classified and protected based on TDS levels, “site-specific TDS data for ground water underlying the project area are not available,” and “[t]he expected TDS of leachate that might develop from the processed oil sands is not known.”

Test results also revealed that levels of oil and grease in the unprocessed ore and processed fines “are outside the method limits” and that levels of TRPH⁵ in the processed fines were also outside method limits. EER reported that the “absence of volatile or semi-volatile constituents in the processed material indicates that organic compounds in the residual material are likely to be no more mobile than the *in situ* tar sands themselves.” EER then compared the levels of oil and grease and TRPH to clean up standards for petroleum contaminated soils at underground storage tank sites and argued that, although the levels of oil and grease in the processed fines were three times the “Tier 1 Screening Criteria” and the levels of TRPH were 95% of the Tier 1 criteria, the petrochemical contaminants in the processed ore presented no concern.

Despite high concentrations of oil, grease and TRPH in the tailings and while relying on flawed test results and inaccurate descriptions of both the extraction process and ground water resources in the area of the mine, on February 22, 2008, EER submitted a Groundwater Discharge Permit by Rule Demonstration (Demonstration) to DWQ requesting that the agency deem the PR Spring mine and tailings piles subject to the permit by rule provisions of Utah Admin. Code R317-6-6.2. Along with the Demonstration document, EER submitted the 2007 test results and two Material Safety Data Sheets (MSDS)⁶ for the chemicals it planned to use in the extraction process. Seven workdays later, on March 4, 2008, DWQ issued a permit-by-rule determination under Utah Admin. Code Rule 317-6-6.2(A)(25), stating that it had considered the information submitted by EER and that the operation “should have a *de minimis* potential effect on ground water quality.” There was no public notice or opportunity for public comment associated with either the EER Demonstration or the March 4, 2008 DWQ permit-by-rule determination. In its determination letter, DWQ stated that “if any [of the factors noted in the Demonstration] change because of changes in your operation or from additional knowledge of site conditions, this permit-by-rule determination may not apply and you should inform the DWQ of the changes.”

In support of its *de minimis* determination, DWQ cited four factors: 1) its examination of the MSDS sheets submitted by EER; 2) the operation’s closed process; 3) the fact that the tailings will not be “free-draining,” and will only contain “trace” amounts

⁵ TRPH is a shorthand notation for a collection of hydrocarbon compounds that are associated with petroleum.

⁶ MSDS sheets are required by OSHA to be present in order to inform workers of the characteristics and correct safety handling requirements of chemicals used in the workplace.

of the reagent⁷; and, 4) the vertical separation between the mine and the nearest large aquifer.

During the Living Rivers appeal process before the Division of Oil, Gas & Mining (DOG M), the agency approving the mine and the agency with which DWQ coordinated its *de minimis* determination, Living Rivers pointed out to DOGM that the approved operations plan had changed substantially since DWQ's 2008 determination, and that DWQ's assessment was obsolete. Based on this, DOGM suggested to EER that it update DWQ on these modifications, and request a determination from DWQ whether the mine still qualified for permit-by-rule status. On February 8, 2011, EER sent a letter to DWQ outlining the modifications it had made to the process since 2008 and asked DWQ to "confirm that the Ground Water Discharge Permit-By-Rule status granted on March 4, 2008 remains valid and in effect." In its letter, EER cited four modifications that it had made since the initial determination: 1) removal of the stabilizer compound from the cleaning emulsion; 2) changes in the de-watering process; 3) increases in the size of the waste dumps; and, 4) disposal of the tailings outside of the pit in the waste dumps. EER claimed that none of these "improvements" affected the factors that DWQ used in its 2008 PBR determination.

On February 15, 2011, DWQ responded to EER's request stating that "the proposed changes to the mining and bitumen extraction project do not change the March 4, 2008 permit-by-rule determination for having a *de minimis* potential effect on ground water quality and the project still qualifies for permit-by-rule under UAC R317-6-6.2.A(25)." DWQ's February 15, 2011 response to EER constitutes a final agency action, as well as an agency action pursuant to the Utah Administrative Procedures Act, including Utah Code Ann. §§ 63G-4-102(1)(a), 63G-4-102(2)(k), and 63G-4-401(1) and is an initial order pursuant to Utah Admin. Code R317-9, including R317-9-2(1). In any case, DWQ was required by Utah Admin. Code R317-6-6, including R317-6-6.2 and R317-6-6.2.(A)(25), to undertake an agency action to review the modifications to the PR Spring mining and bitumen extraction processes and operations. That agency action was required to determine and ensure compliance with DWQ's ground water protection regulations and to assess whether the PR Spring mining processes and operations, as actually proposed, would have a *de minimis* actual or potential effect on ground water quality.

Legal Background

R317-6 Ground Water Quality Protection

All persons that operate a facility that would either discharge or would probably result in a discharge of pollutants that would move directly or indirectly into ground

⁷ As noted within this document, "reagent" refers to some mixture of Orange Terpene or d-Limonene with other chemicals to compose the process chemicals used to separate the bitumen from the tar sands. EER has not revealed the exact composition of the process chemicals.

water from mining operations are required to obtain a Ground Water Discharge Permit under the provisions of R317-6-6.2. *See* R317-6-6.1(A). Certain facilities, however, may be permitted by rule and would thus be exempt from obtaining an individual discharge permit under R317-6-6.1. In the Demonstration, EER cited two regulatory exceptions – R317-6-6.2(A)(1) and R317-6-6.2(A)(25)⁸ – as qualifying it for permit-by-rule status. The applicable regulatory provisions are:

R317-6-6.2. A. Except as provided in R317-6-6.2(C), the following facilities are considered to be permitted by rule: . . .

1. facilities with effluent or leachate which has been demonstrated to the satisfaction of the Executive Secretary to conform and will not deviate from the applicable class TDS limits, ground water quality standards, protection levels or other permit limits and which does not contain any contamination that may present a threat to human health, the environment or its potential beneficial uses of the ground water. . . .;

25. facilities and modifications thereto which the Executive Secretary determines after a review of the application will have a de minimis actual or potential effect on ground water quality.

R317-6-6.2(C). The submission of an application for a ground water discharge permit may be required by the Executive Secretary for any discharge permitted by rule under R317-6-6.2 if it is determined that the discharge may be causing or is likely to cause increases above the ground water quality standards or applicable class TDS limits under R317-6-3 or otherwise is interfering or may interfere with probably future beneficial use of the ground water.

DWQ regulations also define the following classes of ground water resources: Class IA – Pristine (TDS < 500 mg/l & no contaminants exceeding standards); Class IB – Irreplaceable (community drinking water); Class IC – Ecologically Important (source of ground water discharge important to continued existence of wildlife habitat); Class II – Drinking Water Quality; Class III – Limited Use (high TDS or contaminated); Class IV – Saline (extremely high TDS). Although there is nothing in the record formally designating the ground water resources at the PR Spring site, the post-mining use of the area is designated as wildlife habitat, and therefore the seeps and springs affected by the PR Spring mine are properly classified as Class IC – Ecologically Important.

R317-6-4 outlines the ground water class protections for Class IC as “protected as a source of water for potentially affected wildlife habitat. Limits on increases of total dissolved solids and organic and inorganic chemical compounds will be determined in order to meet applicable surface water standards.”

⁸ DWQ only qualified EER under the R317-6-6.2(A)(25) provision.

Causes of Action

Because it is not supported by evidence in the record or otherwise, DWQ's permit by rule decision is arbitrary, capricious, contrary to agency rule, not supported by substantial evidence and constitutes an erroneous interpretation or application or is otherwise a violation of the law.

Specifically, it was arbitrary and capricious or otherwise erroneous for DWQ to conclude that the reagent used for bitumen extraction is generally non-toxic. This is because: 1) the tests that were performed on the tailings were not sufficient to determine whether those tailings were non-toxic; 2) the record clearly notes that the tests that were performed were flawed in a number of ways, due to improper handling of the material and processing of the tests; 3) these breaches in testing protocol invalidated a number of the test results; 4) the MSDS submitted by EER showed that the reagent is toxic or potentially toxic; 5) the MSDS submitted by EER were insufficient to determine the toxicity of the reagent; 6) DWQ lacked the expertise to determine the toxicity of the reagent; 7) the levels of oil and grease, TRPH and other petrochemicals in the processed tailings, particularly in the presence of residual reagent, demonstrated toxicity or potential toxicity; 8) the reliance on underground storage tank criteria in the context of the permit by rule determination was inappropriate; and, 9) as a result of these deficiencies the permit by rule determination and the findings that support it are invalid.

In addition, it was arbitrary and capricious or otherwise erroneous for DWQ to conclude that the tailings will not be free-draining, or that the tailings contain "trace" amounts of the reagent. This is because: 1) the percentage of moisture contained within the tailings indicates that the tailings are at or near field capacity, and that they will be free-draining upon being placed in the pit or waste dumps; 2) the record does not support and indeed contradicts DWQ's assertion that there will be a "trace" amount of reagent left in the tailings; and, 3) a proper analysis of the record shows that there is a sufficient quantity of the reagent in the tailings and sufficient precipitation to allow the reagent and the petrochemicals mobilized by the reagent to migrate or to have the potential to migrate to and to contaminate the ground water system. Moreover, DWQ improperly ignored the levels of petrochemicals in the tailings and wrongly disregarded the interaction between the residual reagent and the petrochemicals disposed of in the processed ores.

Likewise, it was arbitrary and capricious and otherwise erroneous for DWQ to conclude that neither regional nor local aquifers would be impacted by the PR Spring mining operation. This is because: 1) there are local aquifers in the area of the PR Spring mining operation; 2) the analyses performed by EER to determine the ground water resources in the area of the mine were insufficient to determine the impact to the local aquifers that feed the seeps and springs in the area of the mine; 3) the statements made by EER in the Demonstration directly contradict information in the record concerning possible impacts to those seeps and springs; 4) local aquifers will or could, in fact, become contaminated by leachate from the tailings; 5) the post-mining use of the area is designated as wildlife habitat; 6) ground water discharges in the area of the mine are properly classified as Class IC – Ecologically Important; and, 7) that these water sources

required protection “as a source of water for potentially affected wildlife habitat” pursuant to R317-6-4.4.

Finally, it was arbitrary and capricious and otherwise erroneous for DWQ to rely on the EER Demonstration for the purposes of making its R317-6-6.2(A)(25) Determination. R317-6-6.2(A)(25) requires the Executive Secretary to review “the application” in order to determine whether the proposed facility or modifications to the facility would have a *de minimis* actual or potential effect on ground water quality. As used in this rule, “the application” refers to a R317-6-6.3 application or something substantially similar. In any case, only with the information required by R317-6-6.3 can the Executive Secretary adequately make a *de minimis* determination and otherwise comply with R317-6-6 and R317-6-6.2(A)(25).

Because it is not supported by evidence in the record or otherwise, DWQ’s permit by rule decision is arbitrary, capricious, contrary to agency rule and not supported by substantial evidence and constitutes an erroneous interpretation or application or is otherwise a violation of the law.

1. DWQ Has No Basis for its Assertion that the Reagent and the Petrochemicals Contained in the Tailings are Non-Toxic and Have No Potential to Effect Ground Water.

DWQ has no basis for its permitting determination that the reagent used in the bitumen extraction is generally non-toxic. First, DWQ should have, but did not, require the appropriate regime of leachate testing to determine the toxicity of the reagent used by EER at the PR Spring mine. Second, even if the tests that EER conducted on the tailings were appropriate, multiple protocol violations invalidated those test results, a number of the testing thresholds exceeded applicable ground water quality standards, and test results for TDS levels were not considered relevant. As a result, these tests could not serve as a basis for the DWQ permit by rule determination. Third, the MSDS submitted by EER showed that the reagent is toxic or potentially toxic and, at a minimum, triggered the need for further investigation and underscored that this limited information was insufficient to establish the toxicity of the reagent. Fourth, DWQ improperly ignored or discounted test results showing significant levels of oil and grease, TRPH and other petrochemicals in the processed tailings and failed to consider the impact of the residual reagent on these petrochemicals for the purposes of determining impacts from the mining process and operations on ground water. Because of these deficiencies, the February 15, 2011 determination that the reagent used in the bitumen extraction and the resulting leachate would have a *de minimis* impact on ground water quality were arbitrary and capricious and not supported by the record.

A. DWQ did not require EER to conduct the proper testing regime to determine toxicity.

The tests conducted by EER under the direction of DWQ were not sufficient to determine the toxicity of the leachate generated by the reagent used to extract bitumen from the tar sands at the PR Spring mine, or the residual petrochemicals mobilized by the reagent. The TCLP/SPLP tests conducted by EER, and accepted by DWQ, do not predict leachates that form in the field. Rather, those tests can only be used to determine whether a waste is “hazardous by characteristic” under Subtitle C or D of RCRA.

B. The testing that was conducted was fatally flawed.

DWQ was fully aware of the violations of testing protocols and the lack of adequate analysis in the tests conducted by EER on the tailings material from the PR Spring Mine. The Groundwater Discharge Permit by Rule Demonstration submitted to DWQ by JBR on EER’s behalf on February 22, 2008, outlined those shortfalls and violations. Specifically, the Demonstration stated that: 1) volatile and semi-volatile organic analyses were compromised by air space in sampling jars, holding times getting the samples to the lab were exceeded, and holding times at the lab were exceeded; 2) reporting limits for volatiles and semi-volatiles were generally above the applicable ground water standard; 3) certain metal analyses could not be compared against DWQ standards because the reporting limits for the tests exceeded the standard of comparison; and, 4) the analysis for TDS requested by DWQ could not be used because the test was run using inappropriate methods.

Because of these deficiencies, the Demonstration notes that: 1) “it is possible that greater concentrations than those measured by the lab were actually present in the samples;” 2) that concentrations of arsenic, cadmium, mercury and selenium could be greater than the ground water quality standards for those compounds; 3) that although TDS is “a concern” for ground water, and that ground water in Utah is classified and protected based on TDS levels, “site-specific TDS data for ground water underlying the project area are not available,” and “[t]he expected TDS of leachate that might develop from the processed oil sands is not known.”

C. DWQ’s determination that the reagent in the tailings was non-toxic was arbitrary and capricious.

Prior to making a determination that the reagent in the tailings and the resulting leachate were “generally non-toxic” and would have a *de minimis* actual or potential effect on ground water, DWQ was required to demand that EER conduct an appropriate testing regime. The limitations of the TCLP/SPLP tests have been acknowledged by the U.S Environmental Protection Agency since the early 1990s. In order to properly assess the leachate from the PR Spring mine, DWQ was required to following a six-step or substantially similar assessment, including: (1) bulk analysis of waste materials involved; (2) a mineralogical analysis of the waste materials; (3) analyze the process water that is contained in the processed tar sands; (4) a leachate test that will stimulate field

conditions; (5) analysis of any leachate coming into contact with receiving waters (surface and ground water); (6) computer simulations of the effects of time dependent changes in the waste.

Although it discounts its own data, EER's analysis shows that the processed tailings have TDS concentrations of 300 to 6,100 mg/kg, which is 24-254 times the TDS concentration of unprocessed tar sands. While EER declares that these results are not considered relevant for the estimation of TDS because they were derived from a non-standard method, the company does not provide an explanation why results are not relevant. Moreover, EER does not provide any other test results or relevant analytical data to ascertain TDS concentrations in the tailings.

Living Rivers does not believe these tests were sufficient in scope. But, assuming *arguendo* that they were, the initial tests were meaningless, because, *inter alia*, proper testing protocols and procedures were not followed and the detection limits of the tests were not sufficiently rigorous. Moreover, the tests did not reflect changes to the processed tailings that would result from EER's modification to its mining process and operations. DWQ, therefore, failed to ensure that the initial testing was done properly and failed to require EER to submit tailings from the new process for testing prior to issuing its February 15, 2011 *de minimis* permitting determination. Because of the violations of testing protocols, the inadequate detection limits applied to volatile and non-volatile organics and a number of metals, and the deficiencies in the TDS test analysis, the test results were insufficient to show that the amounts of either TDS or organic and inorganic chemical compounds contained within the tailings would have *de minimis* actual or potential effects on ground water quality.

D. The MSDS Showed the Reagent is Potentially Toxic and Signaled the Need for Additional Research.

The MSDS submitted by EER showed that the reagent is toxic or potentially toxic and, at a minimum, triggered the need for further investigation and underscored that this limited information was insufficient to establish the toxicity of the reagent.

In 2011, in support of its permit by rule request, EER provided DWQ with an MSDS⁹ from each of two corporations, Florachem and Frutech International. EER did not indicate whether it would utilize either or both compounds and, if so, in what proportions. These sheets purported to reveal the chemical properties of the reagent and to indicate the toxicity of the compounds. The Frutech MSDS is dated March 5, 1997, almost 14 years ago. The Florachem MSDS is dated as revised in August 2001, more than 9 years ago. The Florachem product lists, as its ingredient, a single chemical, d-Limonene (CAS # 5989-27-5). The Frutech product is called "orange terpenes" (CAS # 8028-48-6). A chemical analysis included with the MSDS of one lot of orange terpenes, shipped in 2005, listed analyses for 8 chemicals. These chemicals, reported as a

⁹ In the United States, the company selling or manufacturing the substance provides the MSDS. It may be authored by the company or by a person retained by the company.

percentage, are d-limonene (96.332), myrcene (1.984), alpha-pinene (0.569), sabinene (0.277), octanal (0.270), Linalool (0.169), beta-pinene (0.020) and Decanal (0.000). The total percent concentration of these 8 compounds is 99.621%, indicating one or more trace compounds were not reported.

The information on the MSDSs indicates that the reagent is potentially toxic. For example, the MSDS indicates that reagent chemicals are a marine pollutant that should not be allowed to enter a municipal sewage system. Regarding the compounds, the MSDS sheets also warn: “Do not discharge into surface waters. May be toxic to aquatic organisms.” The MSDS sheets indicate that biodegradability for the compounds and the potential for bioaccumulation of the compounds have not been determined. Moreover, the data on these sheets are inconsistent. For example, one sheet states that the vapor density of the compounds relative to air (air = 1, unitless) is 0.0123 at 20 Celsius. The vapor density reported by Florachem is greater than 1, relative to air. This is more than 80 times the density reported by Frutech. These values are clearly inconsistent and yet provide critical information for determining whether the chemicals, in a gaseous state, will rise or sink in air.

The MSDS sheets do not provide a complete and accurate description of either of the two materials described in the documents. The relevant information on the MSDS is limited and often qualitative, rather than quantitative. Effects of exposure are discussed only in terms of human exposure. The MSDS sheets do not address non-human carcinogenicity, non-human toxicity, fate in the environment, biodegradability, abiotic degradation, or bioconcentration. Further, none of the analyses in the materials submitted to DWQ – either the Notice of Intent or the Demonstration – convey the uniqueness of the proposal to allow these materials to be released in the environment of the mine site or the potential risks of doing so.

In any case, an MSDS is necessarily a synopsis of what is known focused on those characteristics of a chemical that are of importance to the buyer. Because the relevant chemicals – d-Limonene and orange terpenes – are primarily sold to manufacturers of perfumes, scented household products, and food additives, the MSDS sheets focus on dangers associated with work place exposure and work place spills. There are few details associated with environmental risks, presumably because uncontained disposal in the environment in the form of mine waste was not envisioned as the fate for these materials. Another limitation of an MSDS is its vintage. What is known about a chemical can change substantially over the years, making information in an older MSDS quickly obsolete or incomplete.

Based on the limitations and inconsistencies of the MSDS sheets, as well as the statements that disposal of substantial amounts of the reagent into the mine pit and waste piles would harm the environment, DWQ’s *de minimis* permit determination was inappropriate. In addition, the agency was required, at a minimum, to consult with additional sources before arriving at a conclusion concerning the toxicity of the reagent or the impacts of the mining process and operations on ground water. For example, the agency was obligated to review more recent MSDS data for the same chemicals and

investigate the list of chemicals on the Hazardous Substance Data Base (HSDB), a database maintained by the United States National Institutes of Health (NIH).

E. DWQ Failed to Address Adequately the Significant Levels of Oil and Grease and TRPH Found in the Processed Tailings.

DWQ improperly ignored or discounted test results showing significant levels of oil and grease, TRPH and other petrochemicals in the processed tailings. DWQ also failed to consider the impact of the residual reagent on these petrochemicals for the purposes of determining impacts from the mining process and operations on ground water.

Test results revealed that levels of oil and grease in the unprocessed ore and processed fines “are outside the method limits” and that levels of TRPH in the processed fines were also outside method limits. EER reported that the “absence of volatile or semi-volatile constituents in the processed material indicates that organic compounds in the residual material are likely to be no more mobile than the *in situ* tar sands themselves.” EER then compared the levels of oil and grease and TRPH to clean up standards for petroleum contaminated soils at underground storage tank sites and argued that, although the levels of oil and grease in the processed fines were three times the “Tier 1 Screening Criteria” and the levels of TRPH were 95% of the Tier 1 criteria, the petrochemical contaminants in the processed ore presented no concern.

There is nothing in the record to suggest in any way how DWQ assessed these test results. In any case, EER’s comparison of the tailings to the cleanup standards for petroleum contaminated soils at underground storage tank sites is unavailing. First, EER suggests there is an absence of volatile or semi-volatile constituents in the processed tailings. However, the tests that purport to show this did not look for the reagent in the processed tailings and failed to comply with the relevant protocols. Second, the claim that the processed fines, which contain 9,500 mg/kg oil and grease and 30,000 mg/kg TRPH, will be mixed in a ratio of 1:4 with the cleaner processed sands, conflicts with the record. Actually, the record states that the processed sands and fines will be placed in the mine pit and the waste piles together, but does **not**, in any way, claim that any deliberate mixing of these two constituents will take place – much less a mixing sufficient to evenly distribute fines and sands to derive the subsequent concentrations calculated by EER. Third, EER’s analogy to cleanup standards is off the mark. There is nothing in the record to suggest that threshold levels designed for contaminated soils are relevant to making a *de minimis* permit determination relative to tar sands mining. In any case, the types of petroleum mixtures associated with underground storage tanks are significantly different from the tar compounds of concern here. The tar compounds are much less easily biodegraded and much more carcinogenic than the petroleum compounds of concern in the context of storage tanks.

Therefore, based on the inadequate regime of leachate testing required by DWQ, the agency could not reasonably conclude that the reagent was generally non-toxic. EER acknowledged, and DWQ does not dispute, the following flaws in the leachate testing: 1)

improper testing protocols used for the tests that were conducted; 2) inadequate detection limits that were applied to volatile and non-volatile organics and a number of metals; 3) inadequacies for evaluating TDS levels; and, 4) deficiencies in the test analyses. Additionally, the agency could not reasonably conclude that these tests were sufficient to provide data related to the required limits or increase of either TDS or organic/inorganic chemical compounds needed to determine if protection of this Ecologically Important ground water was being accomplished. Moreover, because DWQ did not require testing of the tailings from the new process, its February 15, 2011 *de minimis* determination was arbitrary and capricious. By the same token, DWQ's permit by rule decision is not supported by the record because the MSDS sheets submitted by EER show that the reagent is toxic or potentially toxic, while also establishing that DWQ must consult further resources in order to assess the toxicity of the reagent.¹⁰ Similarly, the levels of oil and grease, TRPH and other petrochemicals in the processed tailings, particularly in the presence of residual reagent, demonstrate toxicity or potential toxicity of the tailings and undermine DWQ's assertion that the reagent is non-toxic.

2. DWQ Has no Basis for its Assertion that the Processed Tailings will not be Free-Draining and that the Tailings will only Contain a Trace of Reagent.

As an integral component of its *de minimis* permit determination, DWQ concluded that the processed tailings will not be free-draining, and that the tailings will only contain a "trace" of reagent. However, there is no basis in the record for either of these assertions.

A. DWQ improperly concluded that the processed tailings will not be free-draining and that, therefore, contaminants will not impact ground water quality.

There is no basis for the DWQ determination that the processed tailings will not be free-draining. This conclusion is contrary to information contained in the record and to EER's own statements. The only information supporting the determination that the processed tailings will not be free-draining comes from unsubstantiated statements by EER. In its Demonstration, EER states that the tailings will be "damp-dry," will contain 10-20 percent moisture and will not release free water while in the stockpile. Based on these contentions, DWQ apparently concludes, without support, that the tailings will not be free-draining.

EER asserts that there is so little water within the tailings that the entrained water will quickly evaporate and will not migrate from the tailings. EER further implies that precipitation in the area of the mine is so limited that all of that water will be lost to evaporation. However, nothing in the record supports these conclusions. In fact, information in the record indicates that the tailings are so waterlogged that they will

¹⁰ To the extent that DWQ argues that only a toxicologist can assess MSDS or other relevant information or that only a toxicologist can determine whether the reagent is toxic or has the potential to effect groundwater, DWQ lacks the expertise to make these determinations.

immediately begin draining. This draining water, in combination with precipitation, will cause either the migration of the leachate into the ground water or the contamination of surface water.

DWQ unreasonably accepts the statements in the Demonstration that the processed tailings will be dry and that because of the low rainfall in the area breakthrough of precipitation to the base of the pit is unlikely to occur. Neither of these conclusions is justified. First, sand containing approximately 15% moisture is not dry. It is likely that the material is at or near field capacity, the point where all water that can drain by gravity has done so. This is evidenced both by EER's statement that "[t]he tailings are planned to be moved from the plant site to a handling area where any water draining from the tailings will be captured for recycling," and by the communication from EER to AWAL noting that "[t]he processed sand and processed fines samples contain significant percentages of water (up to 22%) and some separation of the water from the sand matrix typically occurs after the sand or fine samples have sat for a period of time." This information indicates that the water in the tailings is at or near field capacity and that any additional water from precipitation coming into contact with the tailings will result in seepage. Moreover, the qualitative description of damp or damp-dry is inconsistent with the numeric quantification of the water content in the tailings. In fact, evidence in the record related to the ratio of water to rock can only lead to the conclusion that the tailings are free-draining.

Second, even if the tailings were not at or near field capacity, the statement that breakthrough of infiltrating precipitation to the base of the pit waste deposits would not occur is unsupported by data or analysis. There is sufficient precipitation to allow leachate from the tailings to be transported into ground water. The assumption that precipitation in the area is too low for seepage to reach the base of the backfilled pits ignores the fact that precipitation is sufficient to recharge shallow, perched aquifers that contribute flow to the numerous seeps and springs in the area. This alone is a clear demonstration that infiltration of precipitation does occur. Therefore, the presence of numerous seeps and springs in the area confirms that precipitation in the area exceeds evapotranspiration and runoff, and that seepage into the ground does and will occur.

B. DWQ improperly concluded that the processed tailings will only contain a "trace" of the reagent.

There is no basis in the record for DWQ's conclusion that there will only be a "trace" amount of reagent left in the tailings. Nowhere in any of the documentation is the word "trace" used, nor does DWQ quantify what it means by the term "trace."

Nor is there any quantification of the amount of the reagent in the processed tailings. The tests performed on the processed tailings did not look for or determine concentrations or loads of the reagent in the processed tailings. The record makes only vague statements concerning the concentrations or amounts of the reagent that will be disposed of in the environment. Such information is plainly insufficient for the purposes

of making a *de minimis* determination or otherwise ensuring compliance with ground water standards and regulations.

Analysis of the information in the record shows that residual reagent is being deposited in the mine pit and waste dumps in three ways: dissolved in water; as free liquids mixed with the water, and in solid phase partitioned into the residual hydrocarbons in the spent ore. Moreover, the record shows that the reagent partitioned into the residual hydrocarbons in the spent tailings is particularly troublesome because it mobilizes the carcinogenic petrochemicals associated with those hydrocarbons by a factor of 1000 percent. Further, analysis shows that between 450 gallons to 2200 gallons per day of reagent are deposited into the mine and waste dumps.

C. DWQ's determinations that the tailings were not free-draining and only contained a "trace" of reagent were arbitrary and capricious.

DWQ did not conduct a proper analysis of the amount of moisture content of the tailings, or the amount and disposition of precipitation in the area. In the absence of the missing analyses, DWQ improperly concluded that the tailings would be damp-dry, would not be free-draining, and that there was insufficient moisture in the tailings and precipitation in the area to impact ground water resources. Further, because DWQ did not conduct a proper analysis of the amount of reagent that would be contained in the tailings, the agency improperly concluded that only a "trace" amount of this chemical would be present, and it did not account for the possibility that the residual reagent would mobilize residual petrochemicals by a factor of 1000 percent. Additionally, the agency did not account for the possible impact of the residual chemical on ground water resources in the area of the mine. It was therefore arbitrary and capricious for DWQ to conclude that the tailings will not be free-draining, and that they contain "trace" amounts of the reagent.

3. DWQ Has no Basis for its Assertion that Ground Water Resources Will Not be Impacted by the PR Spring Mine.

DWQ has no reasonable basis to conclude that neither regional nor local aquifers will be impacted by the PR Spring mining operation. There was ample evidence in the record to show that local, shallow aquifers exist in the area of the mine, and that those aquifers feed seeps and springs. Based on information outlined above, DWQ's assertion that the mining operations posed no potential threat to ground water is unsustainable. Rather, the record shows that ground water will likely be contaminated by leachate from the tailings, that the post-mining use of the area has been designated as wildlife habitat, that these water sources require protection "as a source of water for potentially affected wildlife habitat" pursuant to R317-6-4.4 and that DWQ has failed its regulatory duties.

A. DWQ knew or should have known that the analysis performed by EER to determine the ground water resources in the area was insufficient.

The record establishes that localized, shallow ground water in the form of isolated perched aquifers exist in the area and that EER had not conducted a sufficient survey of ground water resources for the agency to use to assess possible impacts of the mine. Contrary to its obligation to determine possible impacts to ground water, DWQ did not require EER to undertake a seep and spring survey of the area. The agency did not require EER to provide maps or cross-sections showing the relationship of the location and elevation of the seeps and springs to the perched aquifers cited by EER. These actions are necessary to describe the existing ground water system in order to understand the potential impacts from proposed mining operations.

An examination of the extent of the drilling conducted by EER reveals that while EER drilled 24 holes at the site, the average depth of those holes was only 51 feet and all of the holes were drilled mostly along the eastern edge of the site, rather than throughout the affected area. None of the holes extended down to the maximum lease depth of 500 feet, and none provided information on the presence or absence of ground water that could be impacted. Additionally, there is no information to support the contention that the regional aquifer is 1,500 feet below the ground surface, or that there is no aquifer at a shallower depth. DWQ is obligated to require that drilling of sufficient depth and scope be conducted to confirm the presence or absence of an aquifer that could be impacted.

In order to determine any possible impacts to ground water resources in the area, DWQ is also obligated to require EER to identify and quantify the existing ground water systems. This would involve drilling and the collection of data on the geologic units and the occurrence of water. The drill holes would need to extend to a depth of projected impacts below the mine area. DWQ is required to ensure that data on current discharges from existing points of ground water discharge is collected through surveys of local seeps and springs at varying times of the year. Finally, based on this data, DWQ must demand maps and cross-sections showing the areal extent and gradients of piezometric surfaces of all aquifers. Because DWQ did not require or consider this information before making its *de minimis* permit determination, the agency's action is arbitrary and capricious, fails to assess the quality and location of ground water and fails to determine potential impacts to these resources in a way that is based on the record.

B. DWQ's permitting decision fails to account for the evidence in the record that local aquifers supporting seeps and springs in the area could become contaminated by leachate from the tailings.

The record identifies several seeps and springs in the Main Canyon watershed that support perennial flow for some distance along its main stem. The presence of these seeps and springs confirms that aquifers exist in the area. However, there is no information on the depth, thickness, number or areal extent of these aquifers in the record. In addition, the presence of these aquifers shows that precipitation exceeds

evapotranspiration and runoff, and that seepage into the ground does occur. Therefore, it is possible for leachate to be transported into ground water due to precipitation.

Evidence in the record also shows potential impacts to ground water quality from the leaching of precipitation through the tailings placed in the backfilled pits and the waste dumps. Even though some water is lost to runoff and evaporation, over time, precipitation will percolate through the overburden dumps and tailings and will incorporate residual reagent and petrochemicals from the processing and dissolved solids from these materials.

In order to determine the amount of water that will seep into the ground water from either the waste dumps or the pits, DWQ must require seepage modeling to evaluate material permeability and the hydraulic conditions present in these areas. Only based on this modeling is DWQ in a position to estimate the amount of precipitation that would percolate through the tailings and transport residual chemicals and dissolved solids from these materials. Only with this information can DWQ assess impacts from tailings seepage to ground water, and, where the aquifers discharge as seeps and springs, to surface water.

The assumption that precipitation in the area is too low for seepage to reach the base of the backfilled pits ignores the fact that precipitation is sufficient to recharge shallow, perched aquifers that contribute flow to the numerous seeps and springs in the area. This alone is a clear demonstration that infiltration of precipitation does occur. Additionally, EER reports a bulking factor of 30% for all waste material. This plainly means that the waste material has a higher porosity than undisturbed ground – ground through which precipitation currently moves to recharge aquifers. Thus, the record confirms that precipitation – even at the rate of 12 inches per year – will infiltrate to ground water, especially given that the backfilled material has higher porosity than the in-place material.

In any case, the information in the record does not support DWQ's contention that leachate will not infiltrate into the bedrock underlying the mine pit, or that water will not saturate the backfilled material to the point where it will rise in elevation in the pit until it reaches a layer in the side of the pit with sufficient permeability that water flows into that layer. The record clearly shows that there are numerous shallow perched aquifers which may be impacted by mining, as the layers have sufficient porosity and permeability to recharge the seeps and springs adjacent to the mine. DWQ assumes, without any data or analysis, that migration of water through the pit or through the waste dumps, will not occur. This assumption is in direct conflict with the record, as well as published literature and evidence from the field.

C. It was unreasonable for DWQ to base its 2011 permitting decision on the limited record before the agency.

There is insufficient information in the record to support DWQ's permitting decision. This is particularly true because EER significantly modified its mining process

and operations and first notified DWQ of these changes in 2011. At the same time, much of the analyses before DWQ – inadequate though these analyses were – predated 2008 and dealt with much different processes and operations. For example, the leachate tests reported in the Demonstration came from a process that EER no longer intends to use. At a minimum, DWQ should have required EER to conduct appropriate analytical tests of the leachate that will be generated from the chemical processing that EER now proposes. Also lacking from the record is a quantification of the actual quantity of the reagent that will remain in the processed tailings to be disposed of in the pit and waste dumps. In addition, the record fails to establish the actual volume of tailings that will be disposed of in the waste dumps, along with an analysis of the potential for impacts to ground water quality from leaching of these tailings and the residual processing chemicals. Without this information, DWQ’s permitting decision is unsupported.

In addition, the record does not support DWQ’s contention that waste piles with a footprint of 70 acres containing approximately 1,282,000 to 2,563,000 cubic yards of **processed tailings** would have no impact on ground water. Rather than evaluating the potential impacts of these waste dump tailings on ground water, DWQ dismisses the issue by characterizing EER’s disposal plan as involving “some” tailings. The agency then contends, without support, that its previous determination that leachate from 50 acre overburden/interburden waste piles would not impact ground water applied equally and without analysis to the 70 acre dumps that now contain a huge volume of processed tailings. Such decision making is not supported by the record.

D. DWQ’s assertion that the PR Spring mine will have a *de minimis* actual or potential effect on ground water quality is arbitrary and capricious

DWQ’s assertion that ground water quality will not be impacted by the PR Spring mine is also unsupported because the record contains no description of the existing ground water quality, no description of the water quality of the leachate that will be generated from seepage through the tailings, and no description of the movement of this contaminated ground water into the environment.

In order for DWQ to make a supportable determination that the mining has no potential to impact ground water quality, the agency was obligated to require: 1) collection and analysis of samples to characterize existing water quality from the perched aquifers and from seeps and springs; 2) proper analysis of the tailings to determine the water quality of the expected leachate; and, 3) modeling to determine the volume of water that would be expected to leach through the waste dumps and through the backfilled pits. Only with this information can the agency determine the amount and quality of leachate water and only with this information is DWQ in the position to compare this source of contaminants to existing ground water quality.

The *de minimis* determination is flawed for several additional reasons. First, DWQ based its assessment in part on the assertion that “[t]here are no springs in the Earth Energy leased area and the nearest spring is PR Spring located slightly less than a mile east of the project area[.]” However, the record shows that there are nine water

rights filings for seeps or springs, and four seeps that were identified in the field within EER's lease boundary.

Second, the *de minimis* permit determination is flawed due to a lack of data and analysis. It is impossible to support a *de minimis* determination without data on existing ground water quality and the quality of source water, as well as an accurate characterization of water quality of the seepage through the tailings in the pits and dumps. A complete and accurate analysis of the flow of water through the waste dumps and pits into the underlying and/or adjacent aquifers must also be in the record.

Third, DWQ was required to base its permitting decision on the fact that the post-mining use of the area is wildlife habitat. The agency, therefore, was required to factor into its analysis that the local ground water resource is designated as Class IC – Ecologically Important – and to ensure its protection “as a source of water for potentially affected wildlife habitat.” See R317-6-4.4. Because the agency did not require EER to account for the ground water systems present in the area of the mine or require EER to account for the possible impact of the mining operations on those resources, DWQ improperly concluded the local aquifers would not be impacted by contaminants present in the tailings. As a result, the agency did not properly account for the post-mining use of the area and did not ensure protection of the local ground water discharges pursuant to class IC. As a result, the agency's permitting decision is invalid.

4. DWQ's Reliance on the Demonstration was Erroneous as this Document Contained Insufficient Information on Which to Make a *De Minimis* Determination.

It was arbitrary and capricious and otherwise erroneous for DWQ to rely on the EER Demonstration for the purpose of making its R317-6-6.2(A)(25) permit by rule Determination. R317-6-6.2(A)(25) requires the Executive Secretary to review “the application” in order to determine whether the proposed facility or modifications to the facility would have a *de minimis* actual or potential effect on ground water quality. As used in this rule, “the application” refers to a R317-6-6.3 application or something substantially similar. In any case, only with the information required by R317-6-6.3 can the Executive Secretary adequately make a *de minimis* determination and otherwise comply with R317-6-6 and R317-6-6.2(A)(25).

Dated this 16th day of March, 2011.



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