

**Hannah Elliott**



**From:** jim newton <newtonjim@hotmail.com>  
**Sent:** Monday, November 15, 2021 3:58 PM  
**To:** Hannah Elliott; Plan  
**Subject:** CROOK COUNTY COURT HEARING RECORD NUMBER 217-21-000436-PLNG; CGE Review of Knife River Submittals  
**Attachments:** 11-15-2021 CGE - KR Review Memorandum Crook Co File 217-21-000436-PLNG.pdf

To Whom it may concern:

Enclosed is a memorandum prepared by Cascade Geoengineering, LLC in response to the proposed mine expansion of the Knife River Site included in CROOK COUNTY COURT HEARING RECORD NUMBER 217-21-000436-PLNG.

Please admit this memorandum and review into the county record for review.

If you have any questions regarding this submittal, please contact me at your earliest convenience, my contact information is shown below.

Best,  
~Jim

Jim Newton, PE, RG, CWRE  
Principal - Engineer-Geologist  
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**CROOK COUNTY**  
**NOV 15 2021**  
**PLANNING DEPT**

# Memorandum



**CASCADE**  
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November 15, 2021

**CROOK COUNTY**  
**NOV 15 2021**  
**PLANNING DEPT**

**TO:**

Crook County  
Community Development Department  
Planning Division  
300 NE 3<sup>rd</sup> Street, Room 12  
Prineville, Oregon 97754

**FROM:**

Jim Newton, P.E., R.G., C.W.R.E.

**RE: CROOK COUNTY COURT HEARING RECORD NUMBER 217-21-000436-PLNG; REVIEW OF STANTEC CONSULTING SERVICES INC. REPORT, "WOODWARD/VANIER AGGREGATE MINE HYDROGEOLOGIC CHARACTERIZATION", DATED MARCH 2021. SITE LOCATED NEAR PRINEVILLE, OREGON**

Dear Crook County Community Planning Department:

This memorandum has been prepared by Cascade Geoengineering, LLC (CGE) on behalf of Richard Zimmerlee (resident and lease property farm tenant of the Vanier property located at 6487 NW Lamonta Road), and provides a review of a portion of the Knife River Corporation-Northwest (KR) Crook County Condition Use Application file number 217-21-000436-PLNG (Application), specifically, the "Woodward/Vanier Aggregate Mine Hydrogeologic Characterization" report prepared by Stantec Consulting Services Inc. (Stantec), dated March 2021, that is included in the file 217-21-000436-PLNG submittal, and the Exhibit 33 rebuttal letter from Stantec dated September 8, 2021. The review contained within this memorandum was completed and prepared by Jim Newton of CGE, an Oregon registered professional geologist (RG), Oregon registered professional engineer (PE) and Oregon certified water right examiner (CWRE).

## INTRODUCTION

The review of the Stantec Consulting Services Inc. (Stantec) report (noted as “Wenck, now part of Stantec”, “Stantec Consulting Services Inc.” on the March 2021 report) and Stantec rebuttal letter dated September 8, 2021 was requested of CGE by Mr. Zimmerlee based on his concern over potential groundwater conditions of the active mine site and areas that have been reclaimed and the continued ability to farm these areas, as Mr. Zimmerlee is currently leasing the Vanier lands included in the KR Application, and has leased the reclaimed portions of the existing Woodward portion of the active KR mine site. Mr. Zimmerlee is concerned that during active mining of the Vanier property, groundwater conditions may change in ways that affect the ability to continue to farm portions of the undisturbed Vanier lands, and, upon reclamation of the post-mined Vanier lands also. These concerns have been expressed to the County by Mr. Zimmerlee and included in documents contained with the KR Application as Exhibit 31a and 31b dated September 1, 2021.

Jim Newton of CGE was contacted by Mr. Zimmerlee on October 28, 2021 to discuss concerns regarding the proposed KR Application to mine the Vanier property that he currently leases to farm fodder crops. Mr. Newton disclosed that he had previously worked with neighbors of the KR active mine site prior to the Woodward mine site being permitted in approximately 2015, as concerns over groundwater impacts to the shallow aquifer that supplied domestic water to neighboring properties was a concern at that time. Mr. Newton provided a cursory review of the Stantec report noting some concern over the report preparation, methodology and conclusions included in the report, and subsequently coordinated a brief site visit with Mr. Zimmerlee on Monday November 8, 2021. The November 8 site visit allowed Mr. Newton to peruse the adjacent area around active the KR mine site, observe general existing site conditions of the area surrounding the KR mine site and discuss with Mr. Zimmerlee concerns related to continued farming adjacent to the potentially expanded mining operations. Further, Mr. Zimmerlee and Newton met with Mr. and Mrs. Adam and Karen Mikulski to discuss their concerns related generally to living across the street from the KR mine site on the southside of NW Stahancyk Lane.

### **Review of Stantec Hydrogeologic Characterization Report dated March 2021**

CGE conducted a review of the March 2021 Stantec Hydrogeologic report and noted several deficiencies in the report that include:

- Failure to follow Oregon State Board of Geologist Examiners Hydrogeologic Report Guideline, Second Edition, dated May 30, 2014, including the requirement the report be stamped and signed by an Oregon registered professional geologist, *“The registrant’s seal (stamp) and signature can be placed either on the title page, a separate signature page, or another location, which indicates that the registrant is responsible for the entire contents of the report.”*.
  - As there is no mention of whom prepared or takes responsibility for the report, other than Stantec of Fort Collins, Colorado, this likely constitutes a violation of Oregon Revised Statutes (ORS) 672.525 ‘Geologist registration; public practice of geology’, nor does it appear that Stantec would qualify under an exemption in ORS 672.535 ‘Exemptions from

ORS 672.505 to 672.705'-generally refers to exemptions for employees of the United States of America (employed by a U.S. federal agency), or as a geologic teaching professional; or ORS 672.545 'Practice of geology by proprietorship, partnership or corporation; employment of nonregistered geologist; practice by other professionals; practice by nonresident.'

- Specifically, ORS 672.525 states,

*“(8) A person shall be construed to publicly practice or offer to publicly practice geology if the person:*

*(a) Publicly practices any branch of the profession of geology;*

*(b) By verbal claim, sign, advertisement, letterhead or card, or in any other way, purports to be a registered geologist, or through the use of some other title implies that the person is a registered geologist or that the person is registered under ORS 672.505 to 672.705; or*

*(c) Offers to provide any geological services or work recognized as the public practice of geology for a fee or other compensation.”* Source: [https://www.oregonlegislature.gov/bills\\_laws/ors/ors672.html](https://www.oregonlegislature.gov/bills_laws/ors/ors672.html)

- Contradictions made in Section 3.0 in the Stantec March 2021 Report noted that, *“Wenck [the Stantec report refers to themselves as Wenck] prepared a water table map. Wenck prepared this map by plotting groundwater elevations measured at nearby shallow wells drilled or screened to a maximum depth of 40 feet.”*. Further language in the Stantec Report noted, *“Only water level measurements recorded between June and October were considered in part to reduce error caused by seasonal fluctuations in the water table and an abundant amount of available data recorded during these months.”*
  - It is interesting that the Stantec report only included water level data recorded between June and October to develop the water table map, when the test borings and well tests conducted in the Stantec report were installed, recorded and conducted between January and March of 2021.
  - Stantec could have been more diligent to obtain current water level data from wells that includes the actual well locations, ground surface elevations, and use this data to prepare a current water table map that is from the same timeframe and likely more reflective of the actual groundwater flow regime in the identified project area.
- In Sections 4.0, 5.0, 6.0, and 7.0, Stantec describes generally the *how* and *why* the geologic borings and pump testing of the borings were conducted, however, there is insufficient data provided to determine the design of the completed borings into test wells (Oregon Water Resource Department well logs were filed as monitoring wells for all three of the Stantec/Yellow Jacket drilling wells), nor that the completion methods and materials were conducive to allow for adequate or accurate pump testing of each installed well boring.

- Further, upon review of the Stantec pump test data and analysis there is little consistency to follow pump testing guidelines past the initial step-drawdown testing (step-drawdown testing is conducted at incremental pumping rates in an effort to determine the likely flow rate to conduct a longer-term constant rate pump test).
  - Conducting a constant rate pump test requires water levels to be recorded at prescribed intervals that vary depending on the timeframe during such a test, with the flow rate of the well to be maintained at a constant flow rate (or near constant flow rate with minimal fluctuation in flow rate). Based on the reported data in the Stantec report the flow rate varied during pump testing of the installed wells between around 2.5 to 1.7 gallons per minute, which constitutes a roughly 30% deviation in pump rate, which explains the poor initial water level data that was not used in the calculations of aquifer parameters-the initial 10 minutes of a well test typically provide the most accurate and detailed data to conduct calculations on aquifer parameters.
  - Further, data collected during the latter portions of the pump testing well WW-1A and the WW-1A Re-Test past minutes 300 and minutes 150 minutes demonstrate a change in the slope of the drawdown during the pumping portion of the well testing. This change in slope is commonly referred to as a secondary response, indicating the aquifer is demonstrating a change in parameters that may be attributed to a boundary condition, or other change in aquifer's ability to transmit water towards the pumping well. This data does not appear to be considered by Stantec in their aquifer evaluations or calculations, nor is this data reflected in the discussions of Sections 4.0 through the end of the report.
- Section 8.0 of the Stantec Report attempts to describe a review and analysis of 'Water Rights Impact Analysis', however, this section refers to the potential for the KR site to impact surrounding water users of the 'shallow' aquifer system (wells completed at depths 40-feet or shallower, the maximum anticipated depth the KR mining may have a potential impact to groundwater). This Section 8.0 may be more accurately described as attempting to assess the impacts to shallow groundwater users, as the Stantec Report attempts to locate wells completed in the shallow aquifer system, not areas where water rights issued by the OWRD are issued. Water rights in Oregon prescribe generally the type of water right (e.g., permit application, permit, certificate), the use of water (e.g. irrigation, municipal), location of the water to be used ('Place of Use', or POU), the source of water (i.e. surface water, or groundwater) as in the 'Point of Diversion' (POD) for surface water, or 'Point of Appropriation' (POA) for groundwater, and a priority date (the date generally recognized as either first requested from the OWRD, or historically the timeframe when water was first used by a water user). The Stantec report references none of these, nor the assigned OWRD water right application/permit/certificate number, POU, POA/POD, type (e.g., irrigation), etc.
- Section 9.0 of the Stantec Report relies upon the derelict, inaccurate, or failed aquifer testing and analysis and water right review included in the Stantec Report, noting that, "In conclusion, dewatering of the mine cells at the Vanier property can be accomplished with minimal impact to nearby water rights. The use of recharge trenches is a proven method, and the installation of

observation wells will minimize and/or eliminate the negative impacts from dewatering.” This statement from Stantec appears to be unsupported by the data and analysis included in their report, further emphasizing potential for concern by surrounding landowners.

- Section 10.0 of the Stantec Report notes that “The final ground surface will be close to the recovery elevation of the groundwater and should be acceptable for growing hay and similar forage crops.” This statement seems to present and support the concerns expressed by Mr. Zimmerlee during the November 8, 2021 site visit that shallow groundwater (groundwater within 2-feet or less of the ground surface) has a significant effect on the ability to farm the grounds after reclamation. This concern may further be supported by the exposure of such shallow groundwater to farming practices that involve the inclusion of fertilizers, both chemical or organic fertilizers, that could become a contaminate source for groundwater that is otherwise currently a potable water source.
  - The Stantec report does not appear to account for such concerns related to increasing groundwater elevations to nearly ground surface, and resultant potential impacts that may have to both nearby groundwater users, or downstream groundwater users, or potential discharge of now mobilized groundwater contaminants that could discharge to surface water via springs or seeps.

**Review of the September 8, 2021 Rebuttal letter Stantec, authored by Mark Stacy, RG, and Christopher Lidstone.**

The review of the September 8, 2021 rebuttal letter provided by Mark Stacy, RG (the letter was stamped and certified by Mr. Stacy, an Oregon registered geologist) and Christopher Lidstone, both of Stantec, provided essentially a direct response to information from Mr. Zimmerlee with nearly word-for-word phrasing of the process, conclusions and proposed mitigative efforts recommended by the Stantec Report dated March 2021. This September 8, 2021 letter did include a statement that, “...will ensure groundwater availability to neighboring wells and springs:...” and a “Groundwater Guarantee” by KR that there will be monitoring and continued availability of groundwater to all nearby shallow groundwater users. The following statement is directly quoted from the September 8, 2021 Stantec rebuttal letter:

*“In summary, Stantec anticipates there will be no impact to groundwater quantity or quality from Knife River’s operation during or following the completion of mining and reclamation. This expectation is based on the following: (1) during mining, groundwater pulled from the shallow aquifer of a mined cell will be placed into a downgradient recharge trench; this will ensure groundwater availability to neighboring wells and springs; (2) groundwater quality will be monitored for mining related impacts; and (3) the natural filtering characteristics of the un-mined gravels will provide additional protection to all users. Following the completion of mining, groundwater movement may exhibit local changes in the area where sand and gravel was removed, but local area shallow water wells will not be affected. Knife River has proposed a practical and transparent monitoring program to ensure that no impact will occur. Furthermore, Knife River is also offering a “Groundwater Guarantee” so that neighboring residents can continue to operate their homes and businesses without interruption.”*

Although CGE does hope that KR does, in fact, conduct mining practices on the proposed site in a manner that will reduce the potential for impacts to both groundwater availability and groundwater quality, Mr. Stacy does not appear to support these conclusions with new data that may suggest additional reassurances beyond the flawed March 2021 Stantec Report.

## **CONCLUSIONS**

Based a review of the March 2021 Stantec Report, the above referenced report deficiencies, including but not limited to, the lack of adherence to the responsibility to the professional practice of geology, application of sound geologic analysis and supporting data, it is the opinion of CGE that the March 2021 Stantec Report be deemed suspect and not relied upon by the County to provide a determination of adequate review of potential groundwater impacts to the proposed KR mining expansion/Vanier area, or the area immediately surrounding the proposed KR mining expansion/Vanier area. Further, Stantec extrapolated pump test data from a very isolated location on the existing KR site to a large area across the Vanier site that does not provide a reasonable approach to estimate such critical mining conditions or strategies that may alleviate groundwater conditions in suitable manner.

## **RECOMMENDATIONS**

Considering the likelihood that KR will continue to pursue permitting of the expansion/Vanier area, CGE would like to offer recommendations that may provide additional basis for geologic and hydrogeologic investigations that may assist the applicant to address concerns by Mr. Zimmerlee and potentially other nearby landowners:

- If KR or Stantec is to conduct additional analysis on potential groundwater impacts to the proposed KR mining expansion/Vanier area, it would be recommended the investigative and evaluation work be conducted under the direction of an Oregon registered professional geologist that will certify such work and follow Oregon guidelines as presented by the Oregon State Board of Geologist Examiners.
- Install exploratory borings and wells within the actual proposed expansion/Vanier mining area, this will allow the evaluation of actual materials to be mined, and the aquifer to be impacted by mining to be evaluated.
- Engage with concerned neighboring residents/landowners in a manner that is proactive to address concerns directly and provide an avenue for neighbors to both voice concerns and develop mining and reclamation strategies that addresses these concerns.

**CLOSURE**

If you have questions regarding this memorandum, please feel free to contact me at your convenience. I can be reached by email at [newtonjim@hotmail.com](mailto:newtonjim@hotmail.com), or by telephone at 360-907-4162.

Sincerely,



Expires 5/1/2022

Jim Newton, PE, RG, CWRE  
Principal – Engineer-Geologist  
Cascade Geoen지니어ing, LLC