

In the Matter of the Application, CAYUGA LAKE ENVIRONMENTAL ACTION NOW (CLEAN), an Unincorporated Association by President JOHN V. DENNIS, and LOUISE BUCK, BURKE CARSON, JOHN V. DENNIS, WILLIAM HECHT, HILARY LAMBERT, ELIZABETH and ROBERT THOMAS, and KEN ZESERSON

Petitioners,

**REPLY
AFFIRMATION OF
JOHN K. WARREN**

For a Judgment Pursuant to Article 78 of the New York Civil Practice Laws and Rules
vs.

Index No. 2021-0422

THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, and CARGILL INCORPORATED

Respondents.

Adelaide,
State of South Australia, Australia, ss.:

I, JOHN K. WARREN, hereby affirm under the penalties of perjury of the State of New York:

1. I am an evaporite geologist with a Ph.D. in Geology from Flinders University School of Earth Sciences. Evaporite geology, my area of expertise, deals with deposits of salt, gypsum, etc., and the many related practices and technologies involved in salt mining, gypsum mining, etc. In my work and writing, I understand and follow the accepted methodology of evaporite geology. I am the author of four books on evaporite and carbonate geosystems. The first edition

of my most recent evaporite book was chosen by the American University Association of University Librarians as one of the “Outstanding Academic Titles for 2006.” My fourth book, *Evaporites: a Geological Compendium*, was published by Springer in late 2016. This is an updated and expanded version of the previous book and is now an all-color edition that is more than 1800 pages in length. My CV is already on file with the Court (a shorter online version can be accessed at <https://www.saltworkconsultants.com/johns-resume>).

2. I have reviewed the 2019 mine permit, the DEC Notice of Intent, the 2021 modified mine permit, and maps prepared by or for Cargill showing two different versions of the Frontenac Point Anomaly (FPA), and now submit this Reply Affirmation. One map of the FPA shows it as a linear feature; the other map shows it as an oval. I will refer to them herein as the linear-FPA and the oval-FPA, respectively.

3. One of the maps showing the linear-FPA is from slide 7 of a presentation by Cargill consultant RESPEC, which is attached as Exhibit A. Upon information and belief, the presentation was very recently released (on Sept. 1, 2021) to CLEAN under New York’s Freedom of Information Law. This linear-FPA map is the same as the linear-FPA map attached to Raymond C. Vaughan’s affidavit in his Exhibits B and C (NYSCEF document 7) but provides clearer context and provenance for the map, showing that it was created by RESPEC, the well-respected company that has served as a consultant to Cargill.

4. My review of some of the relevant opinions filed in this case by each Respondent relevant to my area of expertise shows that they make no reference to the two competing

versions of the FPA (linear-FPA and oval-FPA). I find this an odd and troubling omission, given the central role that the two different versions of the FPA play in this case.

5. The FPA matters because it is a fault, and because faults pose a well-known risk to subsurface mines. Upon information and belief, these points are undisputed. The risk to a mine's global stability depends, of course, on how close the fault is to the mine, and it is therefore crucial that the location of any nearby fault be accurately determined so that mining can be kept at a prudently safe distance. Risk to "global stability" refers here to the risk of sudden or catastrophic mine collapse. The risk to a mine's global stability also depends on whether a fault is active, but this can be an elusive criterion because the ongoing shifting (primarily sagging or subsidence) of bedrock around and into a mine cavity tends to reactivate old faults. Thus, the key point here is that the location of any nearby fault must be accurately determined so that mining can be kept at a prudently safe distance.

6. Here is where the difference between the linear-FPA and oval-FPA becomes critically important. Faults such as the FPA are typically linear features, not ovals. An oval drawn around a fault zone may be a protective representation of a linear fault as long as the oval includes the known extent of the fault. But if the known extent of the fault extends well beyond the length of the oval, it doesn't serve the purpose of accurately representing the fault so that mining can be kept at a prudently safe distance. That's the issue in this case, where the oval-FPA has been adopted as a protective standard yet the linear-FPA is about 4 times as long as the oval-FPA. If the linear-FPA is an accurate representation of the fault – and no evidence has been presented to the contrary – then mining is not being kept at a safe distance from the fault, putting at risk both the mine's global stability and the lives of Cargill's miners.

7. The issue arises in the 2021 modified mine permit (cayugasmfinaldim), which is a modification of the 2019 mine permit (cayugasmp permit) in accordance with the Notice of Intent (cayugasmnoi). All of these documents are found on the New York State Department of Environmental Conservation (DEC) website at <https://www.dec.ny.gov/permits/89419.html>, where the 2019 permit has now been superseded but is called the “Current” Mined Land Reclamation Permit.

8. The 2019 mine permit required Cargill to conduct further investigations of the “disturbed salt zone” prior to mining in that area. This is/was a reasonable precaution while the location, extent, and geologic details of the “disturbed salt zone” were being worked out. The term “disturbed salt zone” served as a reasonable geologic description or working definition during the period when the location, extent, and other details remained under investigation. At some point during this period, I understand that the term “Frontenac Point Anomaly” started to be applied to the disturbed salt zone, and also that DEC and Cargill’s consultant RESPEC had become aware of the conflicting definitions of the linear-FPA and oval-FPA. See affidavit of Raymond C. Vaughan (NYSCEF document 7) and my own Exhibit B attached hereto.

9. In my experience as a consultant to evaporite mining companies, I understand the need for mines and other regulated entities to pay close attention to the terms of a permit, and, by the same token, the need for permit language to say what it means. Based on my experience and my review of the foregoing documents, *the 2019 mine permit terms* (prohibiting mining in the area of the disturbed salt zone until further investigation is done) *make no distinction between the linear-FPA and the oval-FPA*. A mining company operating under such a permit, if aware of these conflicting definitions of the disturbed salt zone, would be ill-advised to ignore one

definition in favor of the other. Further investigation will typically provide an avenue for resolving the conflicting definitions, i.e., finding which definition is supported by the evidence, and it's generally in the best interest of all parties to seek such resolution. But unless and until investigation is done, resolution is reached, and the permit terms are modified, the existing permit language appears to allow mining in an area of the FPA where it should not be allowed.

10. It should be noted that the 2019 permit cites a mining plan to which strict conformance is required (“Mining Plan Renewal titled: ‘Cayuga Mine 5 YR Mine Plan 2017/2018 Fiscal Yr’: prepared by Cargill Deicing Technology: dated August 2017”) and wherein a map shows several ovals with a label FPA + 1000’. While it is evident in retrospect that these map markings show the oval-FPA, I do not find any text in the permit itself that requires or prohibits any activity relating to the FPA or Frontenac Point Anomaly. On the contrary, the 2019 mine permit required Cargill to conduct further investigations of the “disturbed salt zone” prior to mining in that area, thus indicating that investigations had not yet reached resolution as of 2019. Given my obligation to respect permit terms, I would have advised a mining company to insist on clearly stated requirements. In the absence of clarity, I continue to say that the 2019 Cargill mine permit language shows no resolution between the linear-FPA and the oval-FPA, and a mining company would be ill-advised to ignore one definition in favor of the other.

11. The 2021 modified mine permit provides clarity by requiring that “No mining shall occur under the Frontenac Point Anomaly. No mining or mining activities shall be conducted within 1000 feet of the Frontenac Point Anomaly.” The permit cites the same mining plan cited in the 2019 permit, to which strict conformance is required (“Mining Plan Renewal titled:

‘Cayuga Mine 5 YR Mine Plan 2017/2018 Fiscal Yr’: prepared by Cargill Deicing Technology: dated August 2017”) and wherein a map shows several ovals with a label FPA + 1000’. In combination, the map and permit text create a clear prohibition against mining under or near the oval-FPA. What remains unclear is whether investigation has shown the oval-FPA to be a better representation of the disturbed-salt-zone fault – or, alternatively, whether evidence in favor of the linear-FPA has simply been swept aside or suppressed. Upon information and belief, DEC has released no information on how it judged the oval-FPA to be better supported by the evidence than the linear-FPA.

12. CLEAN has asked for my opinion on whether the the 2021 permit modification was a “material” change from the 2019 mine Permit, whether DEC exercised discretion in making this modification, and when DEC judged the oval-FPA to be better supported by the evidence than the linear-FPA. On the first and second points, I find the modification Permit Conditions changes to be “material” in any reasonable sense of the word, and I consider the modification to be discretionary, meaning that DEC exercised its judgment in making the modification. On all three points, my opinion is based partly on the understanding expressed above – that the 2019 Cargill mine permit language shows no resolution between the linear-FPA and the oval-FPA, while the 2021 modified permit adopts the oval-FPA. Agency discretion was clearly needed to weigh the evidence from the required investigations and conclude that the oval-FPA is better supported by the evidence than the linear-FPA. The available information shows that this happened at the time of the 2021 permit modification, but the basis for adopting the oval-FPA over the linear-FPA is not disclosed.

13. Furthermore, since any such exercise of judgment carries some possibility of error, this is a “material” modification due to the serious consequences for global mine stability if the location or extent of the disturbed-salt-area fault has been misjudged. In my professional opinion, to a reasonable degree of scientific certainty in my area of expertise, DEC in issuing the modification did not exercise scientifically sound judgment based on the fact that evidence is still not fully developed. The modification issuance was premature and (a) should have awaited full performance of Condition 10 of the modification requiring “Further Investigations” called for therein, and (b) should have awaited the subsequent performance of Condition 8 that requires providing permanent markers for the permit area, and (c) in furtherance of Cargill performing Condition 8, should have ensured that Condition 9 could be implemented based on the DEC carefully identifying and delineating what the Frontenac Point Anomaly area actually is. Once the FPA area has been identified and delineated by DEC, only then can the DEC declare and rule that as the area where no mining should be allowed. The modification process and determination of the appropriate permit area are “material” because they have serious consequences for global mine stability if the location or extent of the disturbed-salt-area fault has been misjudged.

14. Upon information and belief, DEC has released no information on how it judged the oval-FPA to be better supported by the evidence than the linear-FPA.

This affirmation is based on information available to me at this time. Should additional information become available, I reserve the right to determine the impact, if any, of the new information on my opinions and conclusions and to modify or supplement this affirmation if necessary.

John K Warren
SaltWork Consultants Pty Ltd
Kingston Park, Australia 5049
Tel: +614 1165 1508
jkwarren@saltworkconsultants.com