Continued Concerns Surrounding DEC Application ID#0-9999-00075/00001 (Cargill Mine Shaft #4)

May 1st 2017
2:30PM – 4:00 PM

Photo: Bill Hecht
• Thank you
• Introductions
  • Dale Baker
  • Cait Darfler
  • Deborah Dawson
  • John Dennis
  • Brian Eden
  • Dooley Kiefer
  • Raymond Vaughan

Photo: Bill Hecht
Subsurface technical team:

• John K. Warren: eminent evaporite geologist
• Raymond Vaughan: geologist
• Cait Darfler: geologist
• John Mason: geologist
• Andrew Michalski: hydrogeologist
• Angus Ferguson: geophysicist
How did we get here?

Photos: Bill Hecht
Economics

- The land area of the **Cayuga Lake Watershed** includes six counties and 45 municipalities (cities, towns, and villages), and is home to 133,942 people, according to 2010 U.S. Census data.

- $1.076 billion waterfront property assessment values of 2,804 waterfront parcels in Tompkins, Cayuga, and Seneca counties.

- $156 million in 2009 from visitor spending and supporting more than 2,300 jobs in Tompkins County alone.
  - According to a study conducted for the Tompkins County Visitors Bureau in 2009, Tompkins County recording more than 840,000 visitors.

- Along with world-renown educational institutions, the top motivators listed by visitors were directly or quite closely related to Cayuga Lake and its network of waterbodies.

- $863 million in tourism related labor income and $1.44 billion including indirect and induced impacts in the Finger Lakes.
  - According to a 2015 study, tourism in the Finger Lakes generated. *(The Economic Impact of Tourism in New York 2015 Calendar Year, Finger Lakes Focus. 2015. Tourism Economics, an Oxford Economics Company).*
Cayuga Lake Supports

• Water supply for 30,000 homes and businesses in the Towns of Dryden, Ithaca, and Lansing and the Villages of Cayuga Heights and Lansing from Bolton Point Municipal Water System

• flourishing local products and markets industries
  • wine
  • beer
  • ciders
  • liquors
  • cheeses
  • specialty crops
  • honey
  • maple syrup, etc.

• massive recreational boating and fishing industry
• seven state parks and numerous county/town parks.
Visibility of Proposed Cargill Shaft: Leaf-off Season

Data sources: ESRI, NYS GIS Clearinghouse, MRLC.gov
Map created by Karen Edelstein.
Updated: 28 April 2017
Unconsolidated Sediment

Cayuga Lake

High-Permeability Bedrock (Valley Fill Aquifer)

Devonian Sedimentary Strata

Bedrock Aquacle (includes Salina Group salts)

Marcellus Fm (top 1300’ bgs) *Gas Bearing
Onondaga Fm (top 1430’ bgs) *Gas Bearing
Oriskany Fm (top 1485’ bgs) *Gas Bearing

Adapted from Sear Brown (2000)
(Warren, 2016)

(a) Pilot drilling.  
(b) Back reaming.
Figure 3-9. Corehole #18 Response to Pumping (Displacement Versus Time).
How can Stabilized water level in CH-18 be 100 ft lower than the Cayuga Lake Level?

Figure 13. Influent stream [or lake] loses water to the aquifer

Adapted from Johnson, *Ground Water and Wells*, pp. 22 and 119.
Proposed disposal of shaft 4 leakage

4” Plexco Line – Butt Fused Connections

30’ of elevation drop across total run

14,000’ of pipe
RESPEC: “salt dissolution is visible and pillars are being undercut”
Cargill: re Shaft 4: “We will fully saturate leakage water.”
Unconsolidated Sediment

Cayuga Lake

Devonian Sedimentary Strata

High-Permeability Bedrock (Valley Fill Aquifer)

Bedrock Aquaclude (includes Salina Group salts)

West

Cayuga Lake

Unconsolidated Sediment

Devonian Sedimentary Strata

High-Permeability Bedrock (Valley Fill Aquifer)

Bedrock Aquaclude (includes Salina Group salts)

Corehole 18

Marcellus Fm (top 1300' bgs) *Gas Bearing

Onondaga Fm (top 1430' bgs) *Gas Bearing

Oriskany Fm (top 1485' bgs) *Gas Bearing

Adapted from Sear Brown (2000)
Methane Release Risks

- 4.85 million cubic feet of natural gas during reaming/grouting
- Burp or sustained?
- Corehole 17 in 1977
- Cargill: no GHG emissions to NYS or EPA
- Guns of Seneca Lake, *Science*, 1934
Spectra Well Survey vs DEC Water Well Database

- Spectra: 10 drilled wells
- DEC: Town of Lansing 32 wells
- Spectra aver. depth to water table:
  - 16.8’ (Cargill 16.9’) n=9
- DEC database:
  - 22’ n=22
- study average yield (gpm):
  - 29.2 (9.5-60) n=3
- Town of Lansing average yield (gpm):
  - 8.2 (0-30) n=31
- The Campbell beach well
Withheld Data

• RESPEC. July 2013. Expected subsidence over Cayuga Mine Amended Area, Topical Report RSI-2361.

• RESPEC (2013). Cargill de-icing technology Lansing Mine, Corehole #18
  • Stratigraphic Test Hole, Installation and data collection.
    • SONIC FILES MISSING
    • CORE PHOTOS TOO LOW RESOLUTION

• Cargill response to DEC's Dec. 15, 2015 request for 11 items of information under NOIA

• Bay Geophysical 2016 Seismic Study due January 2017
## Withheld Data

Table 1. Summary of Confidentiality Determinations (FOIL W017769-020517) – Cargill 18 Stratigraphic Well Logs

<table>
<thead>
<tr>
<th>Item</th>
<th>Record Description</th>
<th>File Name</th>
<th>Department Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Weatherford Mechanical Rock Properties Log, Pass 1, 5/15/2013</td>
<td>3531401_Cargill_18_Pass_One-Rock_Properties 0-580ft.pdf</td>
<td>Confidential Status Granted 1</td>
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<tr>
<td>2</td>
<td>Weatherford Compact Monopole/CrossDipole Semblance Log, Pass 1, 5/15/2013</td>
<td>3531401_Cargill_18_Pass-One_CXD_Semblance 0-580ft.pdf</td>
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<td>3</td>
<td>Weatherford Cross Dipole Anisotropy Log, Pass 1, 5/15/2013</td>
<td>3531401-Cargill_18_Pass-One_Anisotropy 0-580 ft.pdf</td>
<td>Confidential Status Granted 1</td>
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<tr>
<td>4</td>
<td>Data File: Weatherford Monopole-Dipole Array Semblance Log, Run 2, 5/15/2013</td>
<td>Cargill 18_Run_2_Triple_3531401_Main_Pass_MD 0-580ft.las</td>
<td>Confidential Status Granted 1</td>
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<tr>
<td>5</td>
<td>Weatherford Mechanical Rock Properties Log, Pass 2, 5/22/2013</td>
<td>3531404_Cargill_Inc_Cargill_18_CXD_Rock_Mechanics_Pass_2.tiff</td>
<td>Confidential Status Granted 1</td>
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<td>6</td>
<td>Data File: Weatherford Mechanical Rock Properties Log, Pass 2, 5/22/2013</td>
<td>3531404_Cargill 18_CXD_SEMBLANCE_PASS 2 580-1550 ft.las</td>
<td>Confidential Status Granted 1</td>
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<td>7</td>
<td>Weatherford Monopole - Dipole Array Semblance Log, Run 2, 8/20/2013</td>
<td>Cargill 18_Run_5_Triple_3540548 CXD Semblance Run 2 1550-2480ft.pdf</td>
<td>Confidential Status Granted 1</td>
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<td>8</td>
<td>Data File: Weatherford Monopole-Dipole Array Semblance Log, Run 2, 8/20/2013</td>
<td>Cargill hole 18_Run_5_Triple_3540548 CXD Run 2 1550-2485ft.las</td>
<td>Confidential Status Granted 1</td>
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<td>9</td>
<td>Data File: Weatherford Neutron-Density, Resistivity Log, Main Pass, 8/20/2013</td>
<td>Cargill 18_Run_5_Triple_3540548 Main Pass_MD 1550-2480ft.las</td>
<td>Confidential Status Granted 1</td>
</tr>
</tbody>
</table>

Notes:

1. The Department has granted confidential status based upon the consideration of factors under 6 NYCRR §616.7(c)(2) and will safeguard the record or portion of record in accordance with 6 NYCRR §616.7(b).
Breach of SEQR Process with Improper Permit Segmentation

• Cargill’s 2016 Application to the Tompkins County Industrial Development Agency/Tompkins County Development Corporation, states that Shaft #4 is not a stand-alone project but will enable Cargill’s Cayuga salt mine to expand northward in a manner that would not be possible or feasible without the new Shaft #4.

• Cargill’s statements:
  • “Due to the age of the mine, the underground mine workings are currently over 7 miles from the elevator shafts. Because of the distance, providing fresh ventilation air and safe access to surface in the event of an emergency is becoming increasingly more difficult. A new ventilation and access shaft is required to safely and productively mine the northern reserves....”
  • “The new shaft project is required to ensure long term operations at the Cayuga Mine....”
Thank you