

Outgoing - C:\007\005 - AMOIG E - mjsEteLake(2).doc

Attachment A → E - mjsEteLakeA.doc

B → E - mjsEteLakeB.doc

C → E - mjsEteLake(2)C.doc

0037

From: Mike Suflita
To: Chris Hansen; Darce guymon
Date: 9/10/01 1:10PM
Subject: Electric Lake Analysis

Gentlemen,

Attached is a Word document and an Excell file ElecLkLv that summarize my analysis so far. More work IS needed as the results are NOT conclusive. The Word document provides details of what to do and how to continue the analysis. The Electric Lake 2000-2001 file contains data needed for continued analysis. All of the work is marked DRAFT since the work is not complete and subject to revision.

I've been working on the Skyline flooding in one capacity or another for almost 3 weeks and my other assignments have really stacked up. Since the Division has obligations to other mines, I've got to stop work on this analysis and get some of their work done. I'd ask, suggest, and encourage both of you to continue the analysis as described in the Word document and in any other way you see is appropriate. I think both your organizations have significant interests in the outcome. Since the flooding has been going on for 3 ½ weeks now, it seems that the analysis should continue soon.

Thank you both for your help and cooperation in getting this far. I look forward to that continuing. Please keep me aware of your work.

Mike

Michael Suflita
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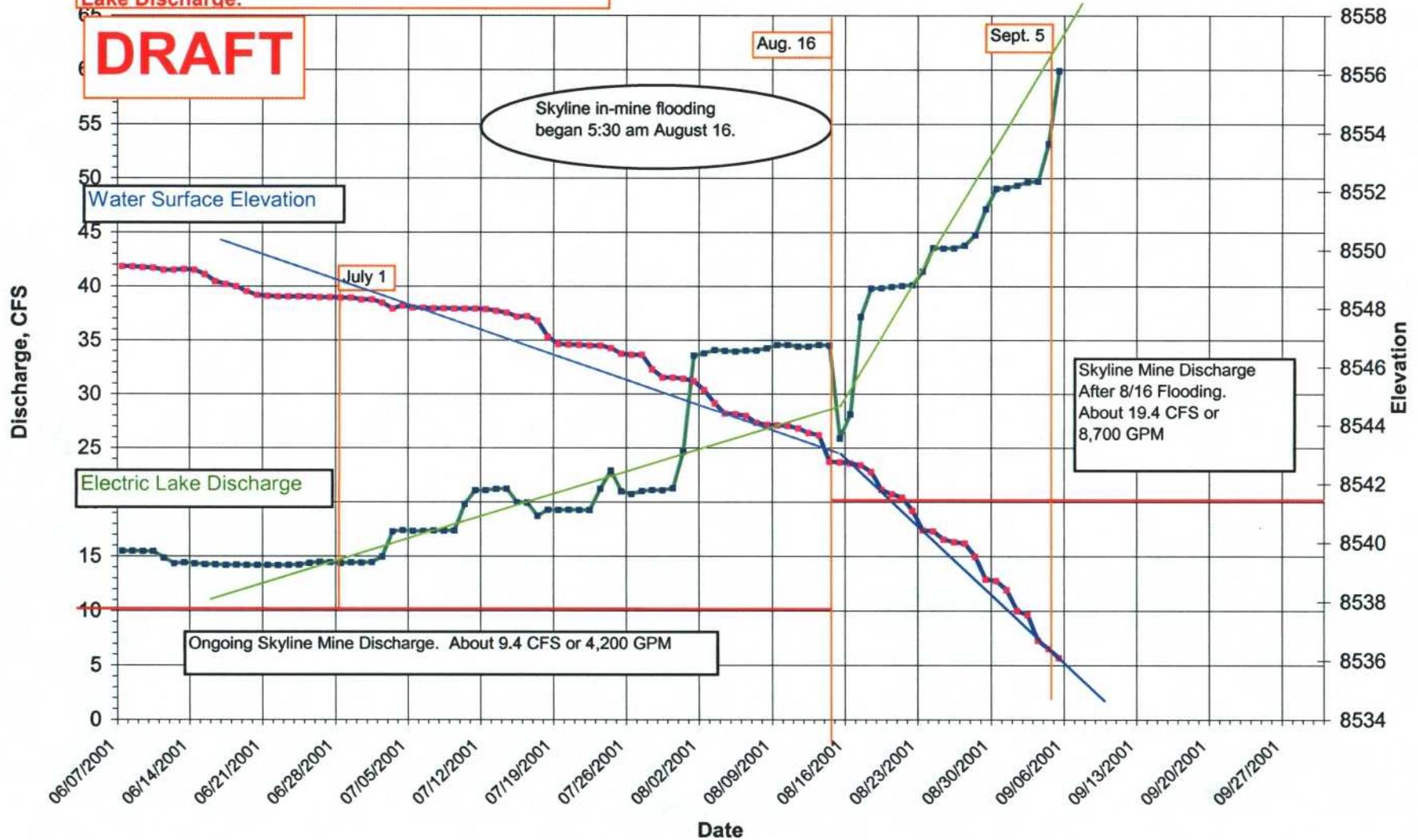
CC: Daron Haddock

ElectkLv.x15

Electric Lake Discharge vs Date & Water Surface Elevation vs Date

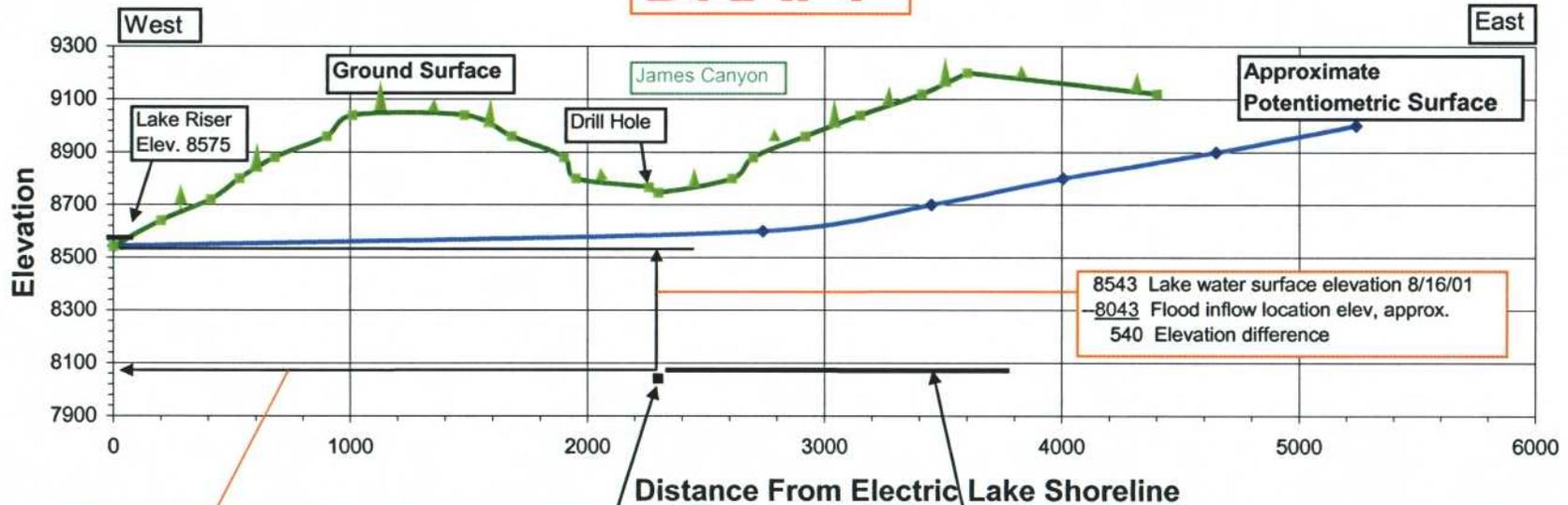
See Notes tab for comments related to changes in slope of the Water Surface Elevation and Electric Lake Discharge.

DRAFT



Ground Surface & Potentiometric Surface Along Cross-Section From Electric Lake to Drill Hole in James Canyon

DRAFT



1. Horizontal & Vertical Scales approximately the same.
2. Ground Surface & Potentiometric Surface scaled from Dwg. 2.3.4-2 of Skyline Mining & Reclamation Plan.

1. Skyline Mine has encountered underground water at several places and at several times. Further, these flows often change over time. Sometimes the pumping rate is the same as the inflow rate and sometimes pumping is greater than the inflow rate and the water level goes down. Sometimes the pumping rates are measured and other times they are not. The result of all this is it's difficult to accurately quantify water inflow rates to the mine.

2. Pumping rates, as in water pumped out of the mine, should be considered to be only approximations of the inflow rate, as in water flowing into the mine.

3

The shape of the Water Surface Elevation & the Electric Lake Discharge curves suggested comparing the change in slopes of both curves before and after August 16. This is to compare whether and how much both curves change before and after the flooding began in Skyline Mine. The July 1 date was selected to start the study since both curves were basically flat before that time. They both began changing after that date.

4. The slope of the Water Surface Elevation between 7/1 and 8/16, 46 days, is 0.12 foot per day. The slope of that same curve between 8/16 and 9/5, 20 days, is 0.33 foot per day, which is an increase of 175% in slope. $(0.33 - 0.12) / 0.12 = 1.75$

5. The slope of the Discharge curve between 7/1 and 8/16, 46 days, is 0.30 cfs per day. The slope of that same curve between 8/16 and 9/5, 20 days, is 1.59 cfs per day, which is an increase of 430% in slope. $(1.59 - 0.30) / 0.30 = 4.30$

6. The rate at which Electric Lake water surface elevation went down increased 175% at the same time the rate at which water was being discharged from Electric Lake went up 430%. During the same time intervals the pumping from Skyline Mne increased from an ongoing rate of 9.4 cfs (4,200 gpm) to 19.4 cfs (8,700 gpm). It's difficult to see from the three curves, or from the above analysis any relationship between the mine flooding and the increase in the rate of water surface decrease.

7. A similar analysis was done for the same dates in the preceding year, 2000. That showed the slope of the Water Surface Elevation curve between 7/1 and 8/16 was 0.20 foot per day. The slope of that same curve between 8/16 and 9/5 was 0.33 foot per day. Coincidentally, that's exactly the same as in 2001. The slope of the Discharge curve between 7/1 and 8/16 was 0.86 cfs per day. That same slope was - 0.19 cfs per day. The negative sign means the slope of the curve was negative for that period. Thus we see, in 2000, the rate of Water Surface Elevation increased 63% in spite of the rate of Discharge DECREASING by 122%. While these are interesting year-to-year comparisons, they do not seem to provide any insight into whether Skyline Mine's flooding has affected the normal decline in water surface elevation that's typical during July, August, and September.

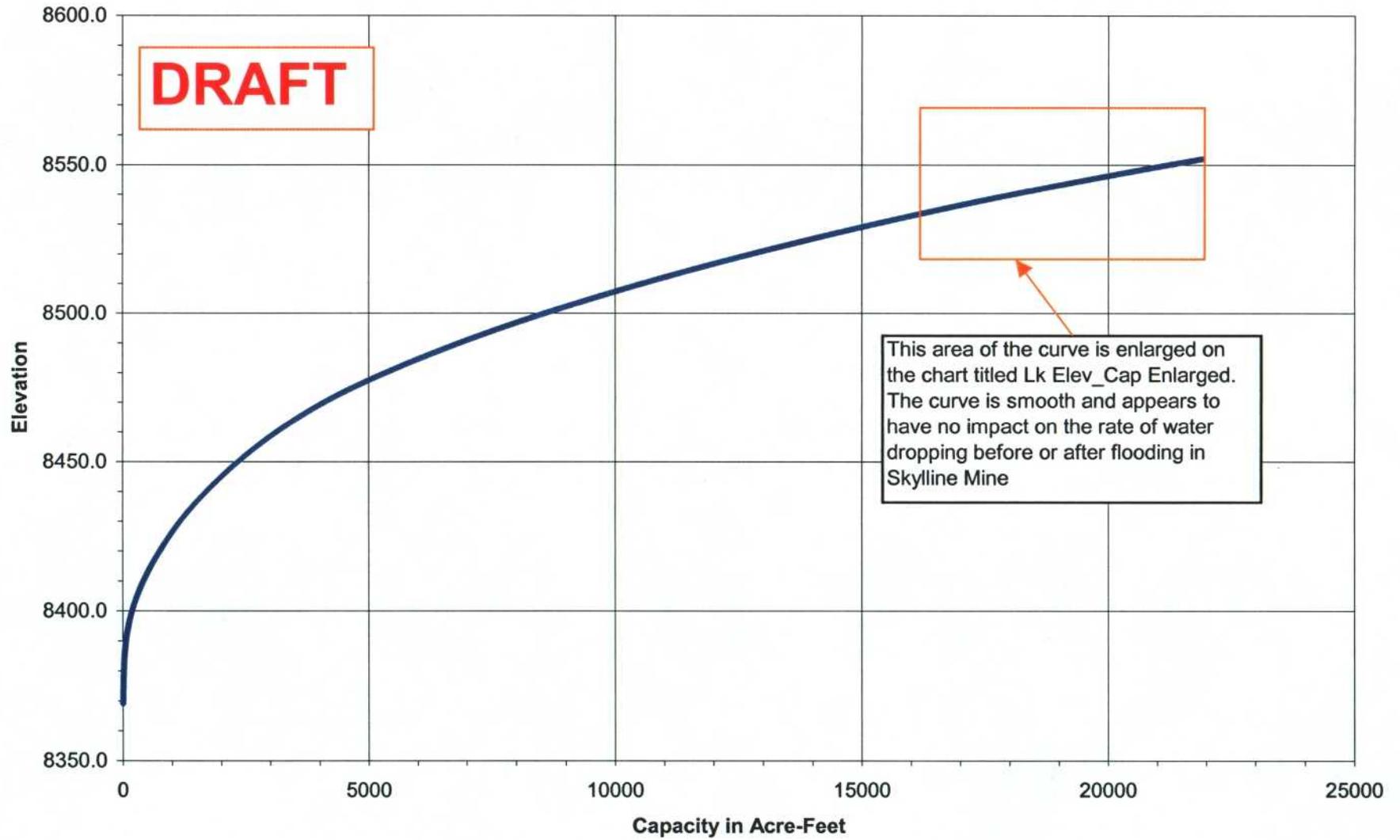
The 2000 data was only available in hardcopy, so the actual curves were not plotted.

8. The overall conclusion of this analysis, both review of curves and slope analysis, appears to be that there's no definitive evidence one way or the other. That is, there's no evidence to suggest or conclude that Skyline Mine flooding IS or IS NOT affecting the rate at which the water surface of Electric Lake declines. As of 9/10/01.

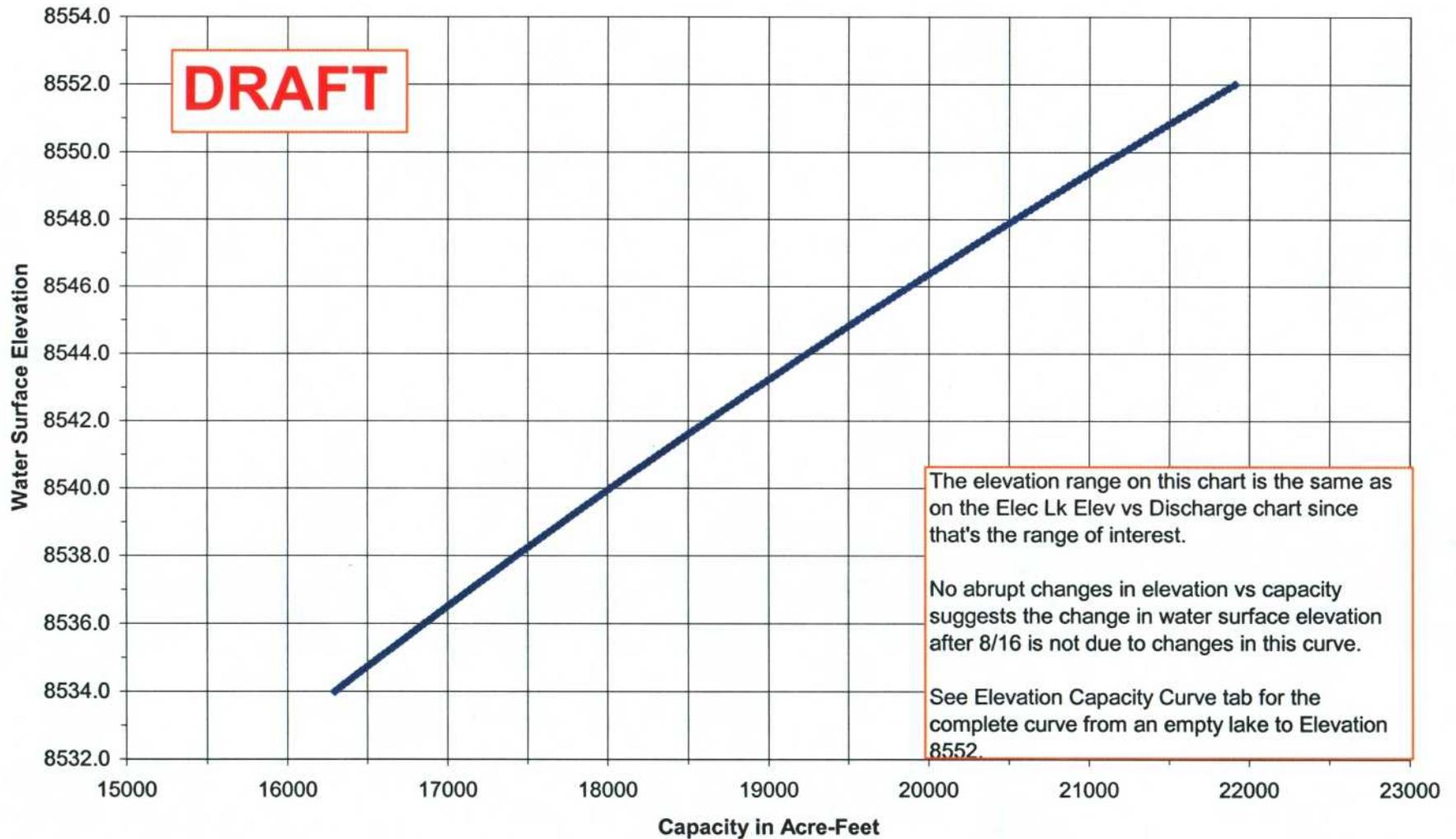
9. On 2/27/02 Darcy Guymon, of UP&L informed me Electric Lake capacity at the spillway elevation of 8575 is 31,264 Acre-Feet. They also consider the lake to have an active storage, not including dead storage, of 30,000 Acre-Feet.

Electric Lake

Elevation vs Capacity Curve



Electric Lake Elevation vs Capacity Curve for Elevation 8534 to 8552



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An Analysis of Electric Lake Volume Changes to Determine Whether Flooding in Skyline Mine is Originating From the Lake

September 10, 2001

On August 16, 2001 Skyline Mine began experiencing flooding in panel 10L, in entries 1 & 2. The water is originating from a geologic fault. Shortly thereafter the Division began investigating whether this inflow to the mine might be due to water originating in Electric Lake. Thus far, this investigation has determined, "there's no evidence to suggest or conclude that Skyline Mine flooding IS or IS NOT affecting the rate at which the water surface of Electric Lake declines". Details of this investigation can be found in the Excell spreadsheet H:/Skyline/801Flooding&ElectricLakeAnalysis/ElecLkLv.xls.

While the investigation has not yet shown any definitive results, the results so far indicate the next logical steps to take. Data provided by Mr. Darce Guymon of the PacifiCorp Huntington Plant was used for the analysis. As can be seen in the Excell file, plots were made of Lake Elevation vs Capacity, the ground surface and potentiometric surfaces in the area, and a plot of lake elevation vs date and lake discharge vs date for the same time period. As indicated above, there's no evidence to suggest mine flooding is or is not impacting the lake.

The next logical step is to compare the inflow volumes of the lake to the outflow volumes of the lake. This can be done on a daily basis or accumulating for any number of days. Of course, this would be done for the time period before and after flooding began in the mine. Basically, this would be an "account balance" of the water described as follows.

Total water volume in and out of the lake = Total water volume decrease of the lake.
This needs to be done on a volume basis rather than just flows and various elevations done so far.

For a given time period:

Change in lake volume = volume of lake discharge(out) + volume of evaporation(out) + volume of inflow from Huntington Creek & other streams(in) + volume of rainfall(in).

Since the Division has only limited personnel, and since numerous projects have been put on hold to make the analysis thus far, the Division will NOT be continuing the analysis. It's definitely appropriate to continue with the volume analysis, however, simple workload constraints necessitate the Division delay that to a later date. This document and the associated Excell spreadsheet will be sent to Skyline Mine and to PacifiCorp today, with the suggestion and encouragement that they continue with the volume analysis. They both have interests in these matters.

H:\Skyline\801 Flooding & Electric Lake Analysis\Analys2.doc