0034

Outgoing - C/007/005 - AM016 E_mjsElelake.doc
Attachment A → E_mjsElelakeA.doc
Attachment B → E_mjsElelakeB.doc

From: Mike Suflita
To: "Darce.Guymon@pacificorp.com".MAIL.MNET
Date: 8/30/01 6:46PM
Subject: Electric Lake and Skyline Mine Flooding

Darce,

Attached is the file I created to analyze the data you sent. Also attached is the one electronic file you sent which I used to derive data for my file. Note that the file you faxed me was used to plot the date, water surface elevation (colm 5) and outflow (colm 8). I had to enter all three by hand.

Chart 1 was created first, which showed an increase in slope after Skyline Mine started flooding. That's what prompted further analysis. The lake capacity vs elevation curve suggests no issues there. Chart 5 compares date vs both lake level and outflow. I don't see any correlation between the two curves before or after the mine flooding. I looked for a delay between days on the two curves and still saw no correlation. **As far as I'm concerned, it does NOT appear that water from Electric Lake is draining into Skylline Mine.** This, of course, is good news! Perhaps you will want to do some other analysis, or maybe you'll see something I do not. I'd encourage you to look at the data critically. Different eyes see different things, and I've been staring at these data sets too long.

For your info, the lake's water surface elevataion on 8/16 was 8543. The flooding began at 5:30am on 8/16. The mine flooding inflow elevation is 8043, a difference of 500 feet below the lake. Also, the edge of the lake is over 2,300 feet west of the mine flood inflow location. For comparison, the Mining and Reclamation Plan shows a groundwater Potentiometric Head of 521 feet at the mine flooding location. The folks at Skyline believe the water is coming from groundwater. This is based on past experiences with other water inflows to the mine. The attached analysis suggest that is the case.

Skyline will be mining one longwall panel closer to Electric Lake in their current permit area, and they're intending to mine west of the lake in the Flat Canyon tract. As such, I figured it would be well to keep this analysis for possible future use. You may want to do that too.

Thanks very much, Darce, for your help in providing the data. This could not have been done without it. I do not plan any future action on the matter.

Mike

Michael Suflita
nrogm.msuflita@state.ut.us

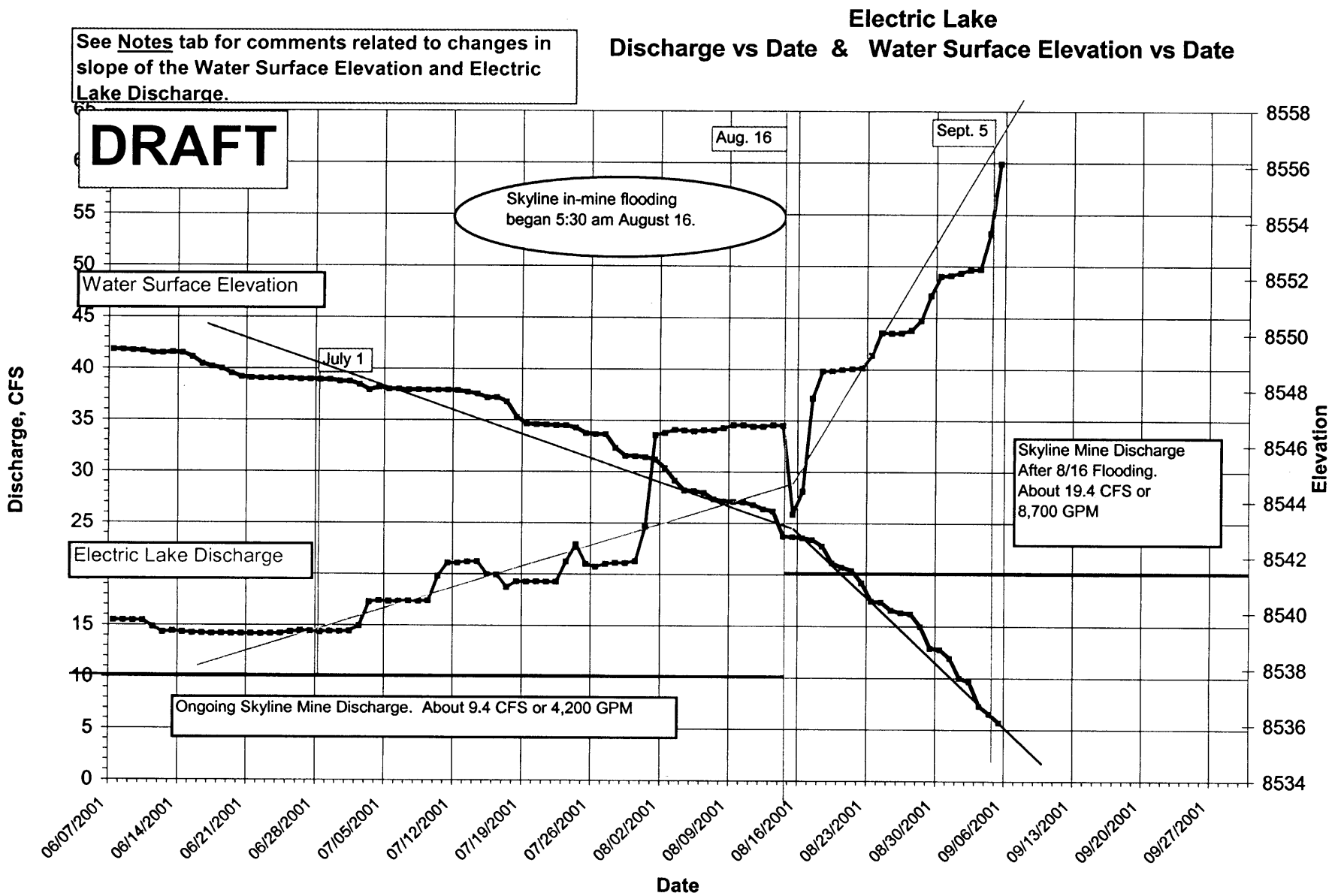
>>> "Guymon, Darce" <Darce.Guymon@pacificorp.com> 08/29/01 09:55AM >>>

Mike, I thought rather than wait for me to sort out just what you need,
I'll forward this whole file and tell you how to discern the part you need.
Open the Electric Lake spread sheet, then across the bottom of the page
you'll see a sheet for capacity table. That is drawn from the curve. In
the info I faxed yesterday or whenever it was column #8 is a 24-hr average
cfs outflow. Multiply by 1.98 to get AF/day. Please let me know if this
does not suffice. Leave a phone mail and I will get back to you tomorrow.
Thank you. I will appreciate a copy of your findings. Darce
> -----Original Message-----
> From: Sinquefield, Chester
> Sent: Tuesday, August 07, 2001 10:26 AM
> To: Darce Guymon; Leland Matheson; Louis N. Berg
> Subject: Huntington Canyon Reports for August 2001

> <<Electric Lake 2000-2001.xls>> <<Bel01JUL.xls>> <<divJul.xls>>
> <<HTN01JUL.xls>>
>

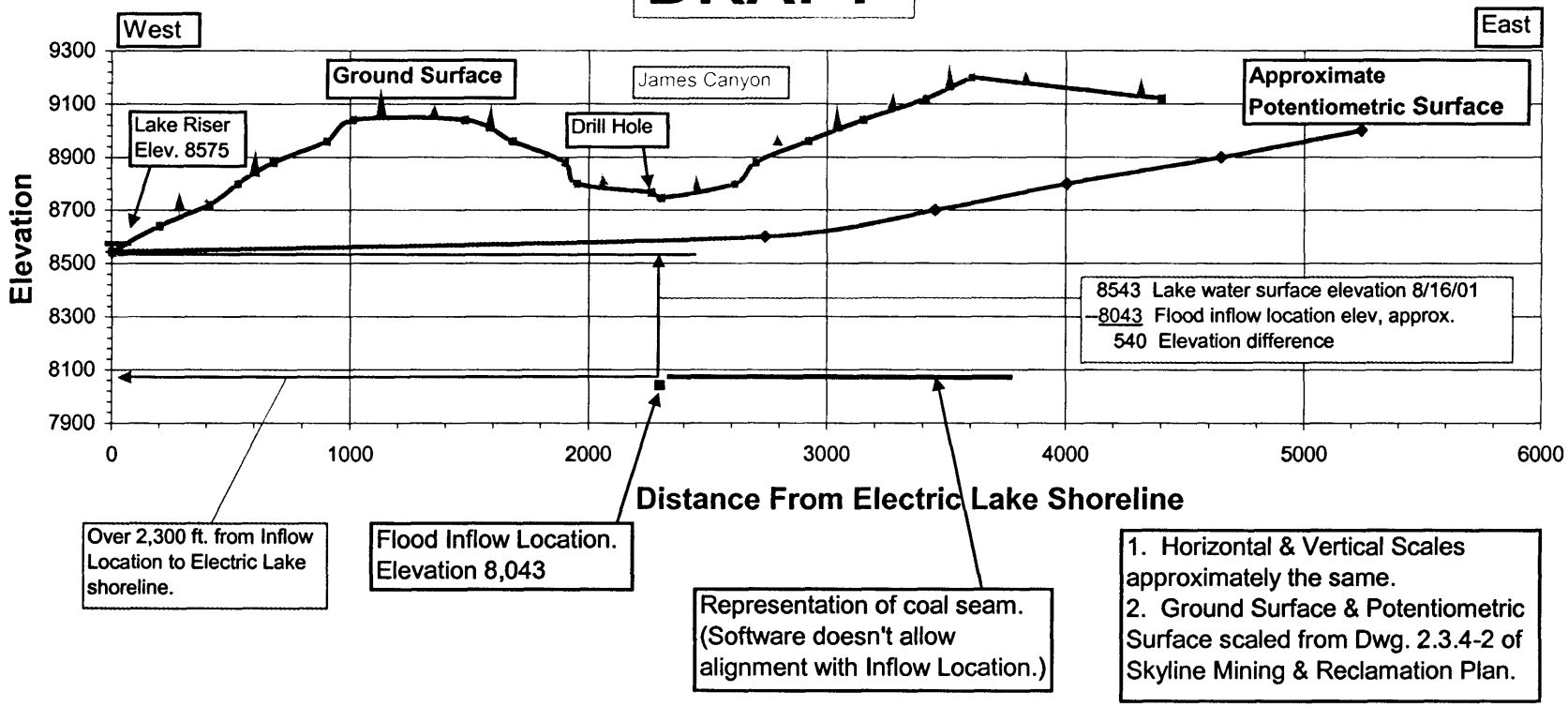
CC: Daron Haddock; Mary Ann Wright

ElecLkLv.xls



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 basicly 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

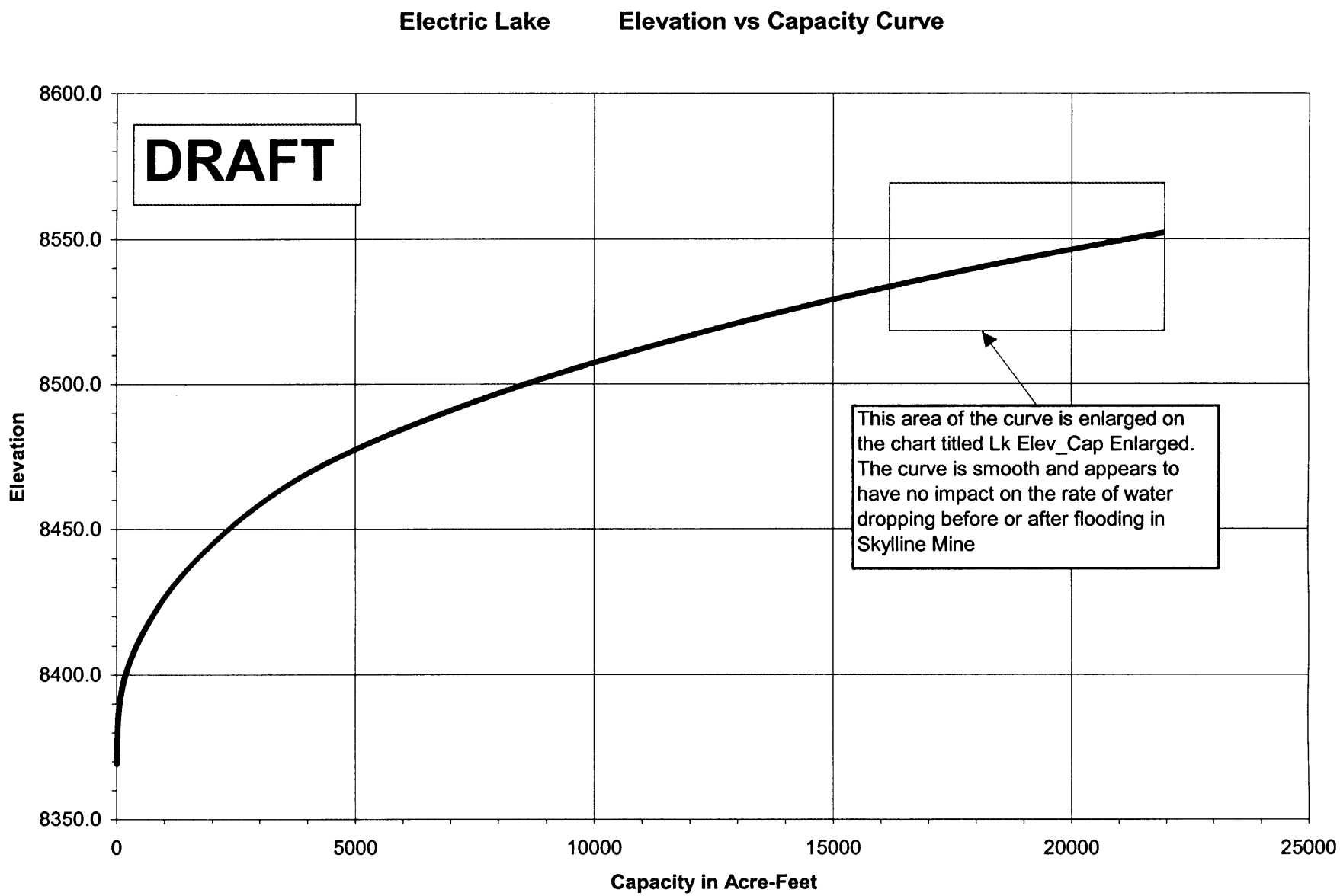
5. The slope of the Discharge curve between 7/1 and 8/16, 46 days, is 0.30 cfs per day. The slope of that same curve between 8/16 and 9/5, 20 days, is 1.59 cfs per day, which is an increase of 430% in slope. (1.59 - 0.30) / 0.30 = 4.30

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.

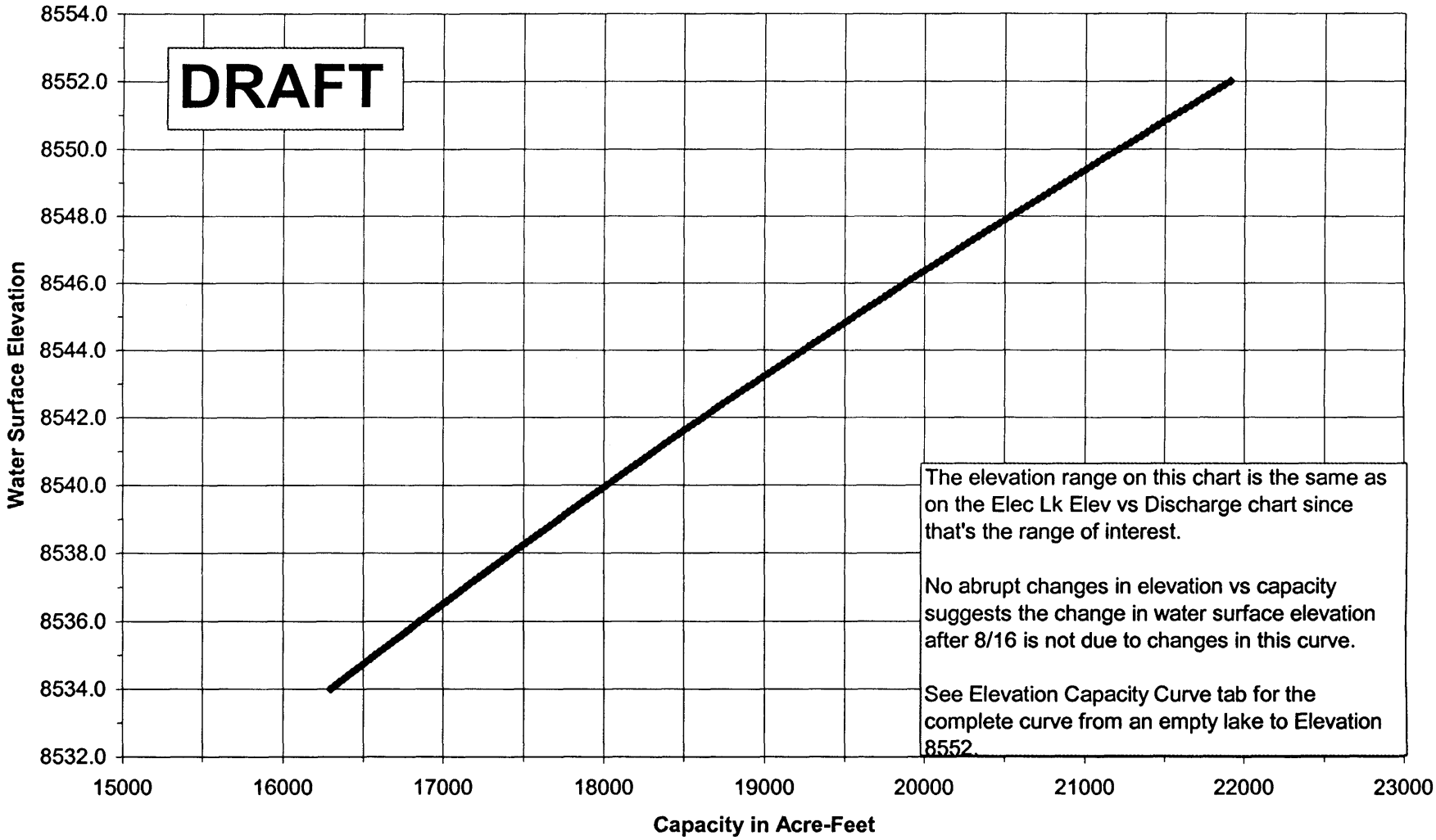
7. A similar analysis was done for the same dates in the preceding year, 2000. That showed the slope of the Water Surface Elevation curve between 7/1 and 8/16 was 0.20 foot per day. The slope of that same curve between 8/16 and 9/5 was 0.33 foot per day. Coincidently, that's exactly the same as in 2001. 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 interestigng 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 definative 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
DRAFT
8600.0
8550.0
8500.0
8450.0
8400.0
8350.0
Elevation
0
5000
10000
15000
20000
25000
Capacity in Acre-Feet
This area of the curve is enlarged on the chart titled Lk Elev_Cap Enlarged. The curve is smooth and appears to have no impact on the rate of water dropping before or after flooding in Skylline Mine

Electric Lake Elevation vs Capacity Curve
for Elevation 8534 to 8552



The elevation range on this chart is the same as on the Elec Lk Elev vs Discharge chart since that's the range of interest.

No abrupt changes in elevation vs capacity suggests the change in water surface elevation after 8/16 is not due to changes in this curve.

See Elevation Capacity Curve tab for the complete curve from an empty lake to Elevation 8552.

Utah Power & Light Company
Reservoir Level Records
Electric Lake 2000 - 2001
Daily Average Stage (ft.)

(3)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	242.40	241.30	240.24	238.98	237.60	236.20	234.91	237.67	249.30	248.47	0.00	0.00	1
2	242.40	241.30	240.10	239.33	237.53	236.08	234.96	238.38	249.38	248.38	0.00	0.00	2
3	242.40	241.30	240.10	238.74	237.35	236.14	235.08	238.81	249.40	248.29	0.00	0.00	3
4	242.40	240.50	240.09	238.73	237.37	236.12	235.05	239.08	249.49	248.23	0.00	0.00	4
5	242.40	241.20	240.08	238.73	237.31	235.98	234.99	239.26	249.48	248.08	0.00	0.00	5
6	242.40	240.80	240.03	238.71	237.00	235.90	235.01	239.54	249.44	248.06	0.00	0.00	6
7	242.40	240.90	240.01	238.71	237.27	235.83	235.05	239.77	249.41	248.04	0.00	0.00	7
8	242.30	240.40	240.01	238.70	237.29	235.81	235.17	239.96	249.42	247.96	0.00	0.00	8
9	241.70	240.40	240.00	238.63	236.90	235.67	235.10	240.43	249.38	247.96	0.00	0.00	9
10	241.90	240.70	240.00	238.63	236.45	235.68	235.04	241.04	249.38	247.90	0.00	0.00	10
11	242.30	240.40	240.02	238.42	236.84	235.74	235.08	241.66	249.34	247.78	0.00	0.00	11
12	242.30	240.40	239.98	238.42	236.96	235.75	235.11	242.29	249.39	247.66	0.00	0.00	12
13	241.70	240.40	240.00	238.63	236.79	235.60	235.02	242.94	249.40	247.63	0.00	0.00	13
14	241.70	240.40	240.00	238.42	236.68	235.59	234.97	243.44	249.33	247.49	0.00	0.00	14
15	241.70	240.40	239.98	238.41	236.41	235.49	234.94	244.02	249.25	247.40	0.00	0.00	15
16	241.70	241.20	240.00	238.41	236.42	235.40	234.88	244.61	249.21	247.32	0.00	0.00	16
17	241.70	241.30	239.97	238.56	236.41	235.47	234.92	245.38	249.19	247.22	0.00	0.00	17
18	241.60	241.00	239.99	238.40	236.34	235.42	234.94	246.01	249.15	247.13	0.00	0.00	18
19	241.60	240.70	239.97	238.39	236.31	235.31	235.02	246.50	249.10	247.02	0.00	0.00	19
20	241.50	240.50	239.90	238.31	236.30	235.21	235.21	246.97	249.06	246.93	0.00	0.00	20
21	241.40	240.40	239.90	238.34	236.31	235.19	235.32	247.42	248.99	246.81	0.00	0.00	21
22	241.40	240.40	239.87	237.69	236.21	235.16	235.46	247.70	248.90	246.69	0.00	0.00	22
23	241.40	240.40	239.91	238.26	236.08	235.16	235.47	247.95	248.89	246.59	0.00	0.00	23
24	241.50	240.40	239.68	237.69	236.18	235.13	235.42	248.19	248.86	246.43	0.00	0.00	24
25	241.30	240.40	239.83	237.79	236.11	235.09	235.49	248.44	248.76	246.40	0.00	0.00	25
26	241.40	240.30	239.87	237.69	236.11	235.10	235.66	248.61	248.82	246.32	0.00	0.00	26
27	241.30	240.30	239.68	237.61	236.08	235.13	235.95	248.81	248.71	246.14	0.00	0.00	27
28	241.30	240.30	239.66	237.66	236.03	235.07	236.24	249.01	248.58	246.00	0.00	0.00	28
29	241.30	240.20	239.44	237.65		235.08	236.77	249.11	248.57	245.81	0.00	0.00	29
30	241.30	240.59	239.13	237.60		235.08	237.20	249.25	248.48	245.72	0.00	0.00	30
31	241.30		239.29	237.66		235.02		249.28		245.60	0.00		31

ELECTRIC LAKE STATISTICS

	Monthly												Year
Daily Mean	241.79	240.64	239.89	238.32	236.67	235.50	235.31	244.24	249.14	247.21	0.00	0.00	[illegible]
Daily Min	241.30	240.20	239.13	237.60	236.03	235.02	234.88	237.67	248.48	245.60	0.00	0.00	0.00
Daily Max	242.40	241.30	240.24	239.33	237.60	236.20	237.20	249.28	249.49	248.47	0.00	0.00	249.49
Change	-1	-1	-1	-1	-2	-1	2	12	-1	-3	0	0	3
Total	7,495	7,219	7,437	7,388	6,627	7,301	7,059	7,572	7,474	7,663	0	0	[illegible]

Notes:

Unpublished Records
Subject to Change