

# Lake 4, West Lake and A-Frame Dam Rehabilitation Project

## Weekly Construction Update Report

4/20/2020 to 4/24/2020

**Date:** 4/30/2020

**Location:** Boulder County Open Space west of Hygiene, CO

**Project Owners:** Boulder County and St. Vrain & Left Hand Water Conservancy District

### Design Engineers:

Lake 4 - Engineering Analytics (EA)

West Lake and A-Frame - Applegate Group (AG);

Lake 4 Outlet Pipeline - Deere & Ault (DA)

### Construction Contractors:

Kirkland Construction (Prime Contractor)

Lobato Construction (Sub-contractor)

**Weather & Site Conditions:** Dry and mild/warm weather. Muddy conditions limited Kirkland's work on Monday 4/20.

**Update by:** Obadiah Broughton, Boulder County

### Work in Progress/Completed

1. Lake 4 Dam – started and made significant progress on the installation of formworks and rebar at outlet tower #1. Anticipate placing ~43 CY of concrete in tower #1 on Monday April 27th.
2. Lake 4 sediment removal area - continued ripping, crushing, and stockpiling of claystone to use as ¾" minus embankment fill. Cleared and ripped an area to be used as ripped (non-crushed) claystone fill. Cleared and prepped an additional area to used for ripping, crushing and stockpiling.
3. West Lake Dam - stripped the formworks from the Foothills Outlet Ditch and Clough and True Ditch inverted siphon inlet and outlet structures. Finished the concrete surfaces and installed trash racks on the structures.
4. West Lake Dam - completed concrete finishing and backfill around the Foothills Outlet Ditch and Clough and True Ditch inverted siphon inlet and outlet structures. Began installing riprap bedding and riprap at the inlets and outlets of the siphon structures. Rebuilt the ditch cross section upstream of the siphon inlet. Performed inspections on ADS siphon pipes and completed punch-list on pipes after inspection Foothills Outlet Ditch and siphon was cleared to run water on April 25<sup>th</sup>.
5. West Lake Dam - rebuilt the South Branch ditch profile from crossing structure through Foothills Outlet Ditch overflow and work area. Placed riprap in the overflow from the structure to the ditch edge.



4/21: West Lake Dam - Placing clay around 60" pipe at headwall and 3" minus backfill in other areas at the Foothills Outlet Ditch inlet structure.

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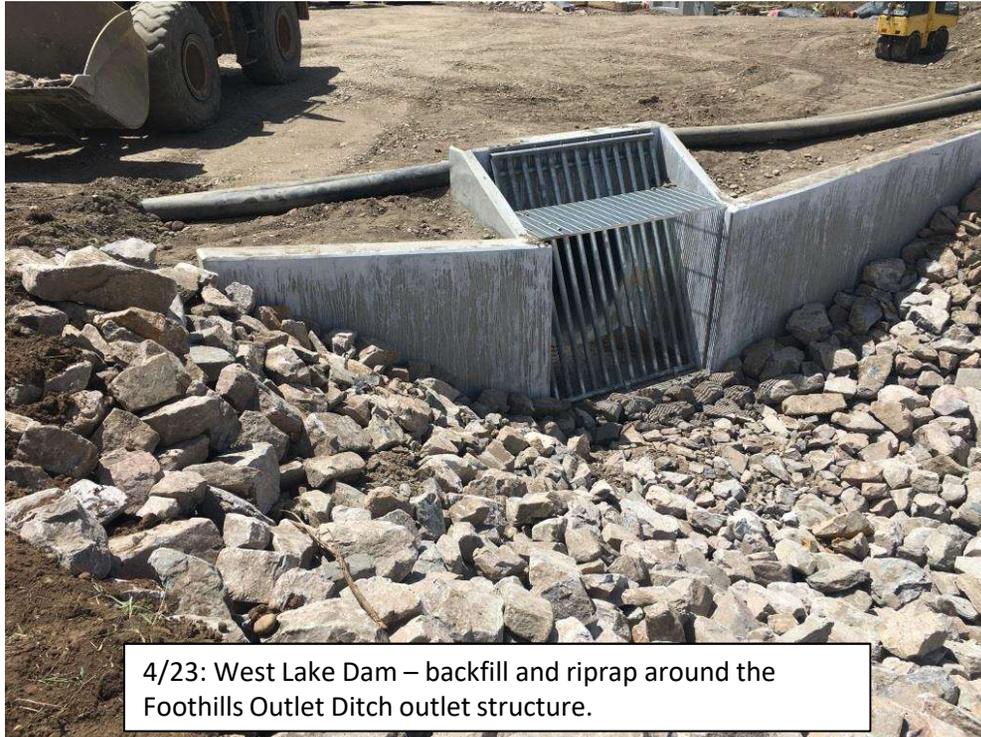
## Weekly Construction Update Report

### Work in Progress/Completed *(cont.)*

6. West Lake Dam - continued upstream embankment reconstruction and work on final grades for the dam embankment. Continued placement of upstream embankment protection; riprap bedding and riprap. Finished sand filter diaphragm placement and backfill around outlet encasement. Installed slide gates in the West Lake outlet tower.
7. West Lake Dam – restarted excavation on downstream side of West Lake Dam. Started to place cut material as backfill to rebuild the Clough and True Ditch and the southern shore line/bank of A-Frame Pond.
8. Kirkland took delivery of approximately 2052 tons of Type H riprap and 580 tons of Type M riprap and staged near Lake 4/Lake 3 embankment.
9. As necessary to facilitate the work dewatering operations occurred to remove nuisance water in work areas, Lake 3, Lake 4, West Lake and A-Frame Pond.



4/21: West Lake Dam – backfilling around the Foothills Outlet Ditch outlet structure.



4/23: West Lake Dam – backfill and riprap around the Foothills Outlet Ditch outlet structure.



4/21: West Lake Dam – preparing for the inspection of the Foothills Outlet Ditch inverted siphon 60" ADS pipe.

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## Weekly Construction Update Report

### Upcoming Work *(One week look ahead. Week of 4/27/2020 to 5/1/2020)*

1. Lake 4 Dam - place concrete in outlet tower #1. Start formwork and rebar installation on outlet tower #2.
2. Lake 4 Dam - excavate Lake 4 emergency spillway cut-off wall to sub-grade. Prep subgrade for inspection and concrete formworks installation.
2. Lake 4 sediment removal area - continue ripping, crushing, and stockpiling of claystone to process it for embankment fill in the Lake 4 sediment removal area. Started ripping claystone to be used as fill on the southern shore line/bank of A-Frame Pond in the West Lake Dam project.
3. West Lake Dam – continue excavation on downstream side of West Lake Dam. Continue place cut material as backfill to rebuild the Clough and True Ditch and the southern shore line/bank of A-Frame pond. Begin hauling and placing ripped claystone from Lake 4 sediment removal area as backfill to rebuild the Clough and True Ditch and the southern shore line/bank of A-Frame Pond.
4. West Lake Dam - continue placement of riprap on upstream embankment. Excavate the siphon outlet drain pipe trench, install the pipe and pour concrete flowable fill CLSM (controlled low strength material) backfill/encasement around the pipe.
5. West Lake Dam - finalize riprap and backfill installation around the Foothills Outlet Ditch inlet structure; install the Clough Private Ditch crossings by installing two 18' CMP culverts. As necessary to facilitate the work dewatering operations occurred to remove nuisance water in work areas, Lake 3, Lake 4, West Lake and A-Frame Pond.

### Additional Notes

1. April 21<sup>st</sup> Weekly construction process meeting was held remotely via a conference call.
2. Project website for additional updates and information:  
<https://www.bouldercounty.org/open-space/management/lake-4-west-lake-a-frame-pond/>



4/24: West Lake Dam – riprap installed around the Foothills Outlet Ditch inlet structure.



4/24: West Lake Dam – looking west from box culvert crossing at the reconstructed South Branch Ditch.



4/23: West Lake Dam – installed riprap on the upstream side of the dam embankment.



4/23: West Lake Dam – fine grading the Foothills Outlet Ditch over flow to the South Branch Ditch.



4/24: West Lake Dam – placing and compacting fill along the southern shore line/bank of A-Frame pond.



4/24: West Lake Dam – riprap placed in the Foothills Outlet Ditch over flow to the South Branch Ditch.



4/22: Lake 4 – clystone/bedrock crushing operation to make  $\frac{3}{4}$ " minus embankment fill in the Lake 4 sediment removal area.



4/21: Lake 4 Dam – looking west, installing formworks at outlet tower #1.



4/22: Lake 4 Dam – formworks and rebar at outlet tower #1.



4/24: Lake 4 Dam – looking east, finishing install of formworks and rebar at outlet tower #1.

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40.17 °N, 105.16 °W

# Longmont, CO Weather History

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[HISTORY](#) (/HISTORY/DAILY/US/CO/LONGMONT/KLMO)

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4-20)

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April

20

2020

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Apr 19

Apr 20

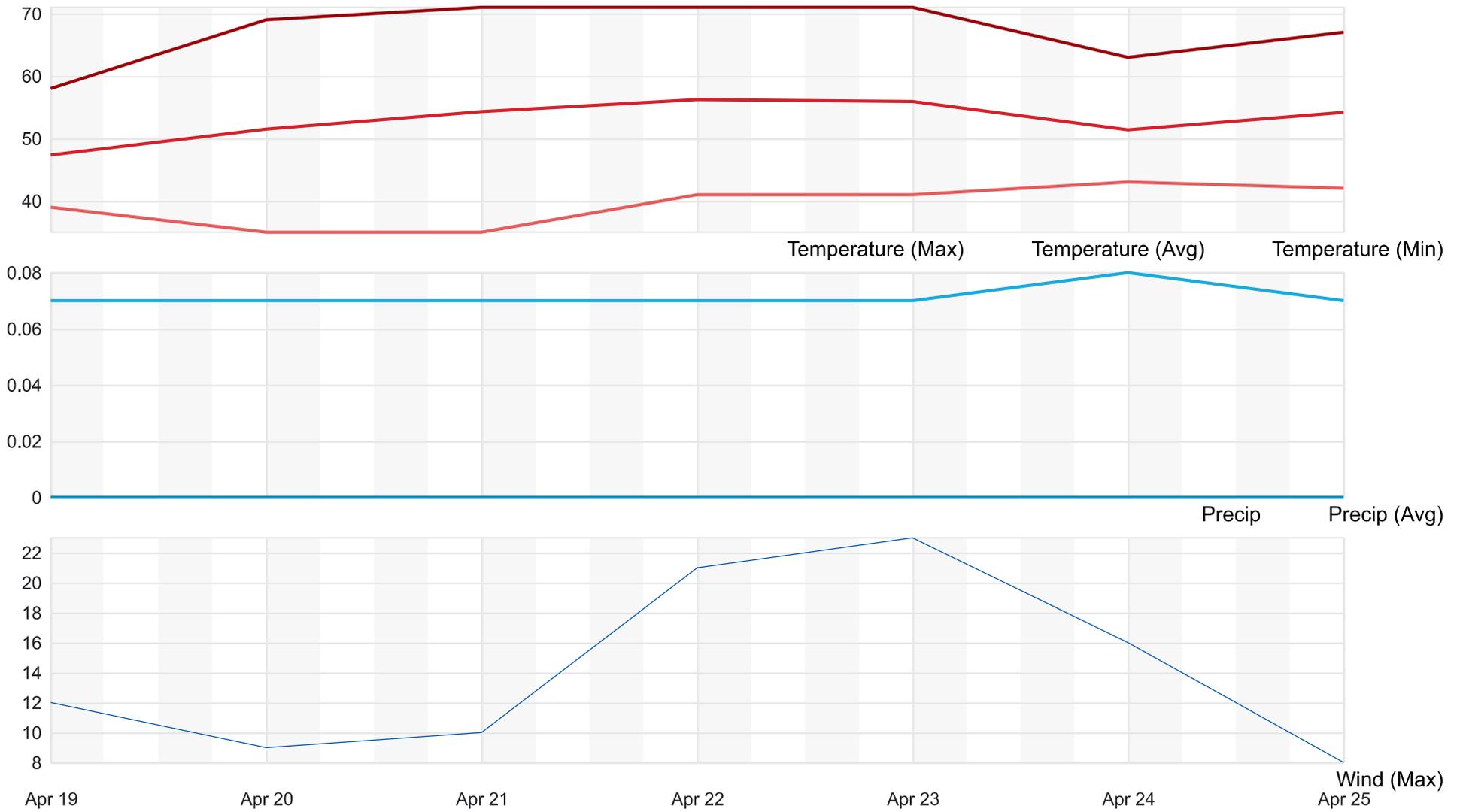
Apr 21

Apr 22

Apr 23

Apr 24

Apr 25



# Summary

Temperature (° F)	Max	Average	Min	▲
Max Temperature	71	67.14	58	

<b>Temperature (° F)</b>	Max	Average	Min	▲
Avg Temperature	56.22	52.98	47.34	
Min Temperature	43	39.43	35	
<b>Dew Point (° F)</b>	Max	Average	Min	▲
Dew Point	41	33	24	
<b>Precipitation (Inches)</b>	Max	Average	Min	Sum ▲
Precipitation	0.00	0.00	0.00	0.00
Snowdepth	0.00	0.00	0.00	0.00
<b>Wind</b>	Max	Average	Min	▲
Wind	23	4.68	0	
Gust Wind	31	1.86	0	
<b>Sea Level Pressure</b>	Max	Average	Min	▲
Sea Level Pressure	25.12	24.82	0	

## Daily Observations

Time	Temperature (° F)	Dew Point (° F)	Humidity (%)	Wind Speed (mph)	Pressure (Hg)	Precipitation (in)
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Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			Pressure (Hg)			Precipitation (in)
Apr	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Total
19	58	47.3	39	39	33.6	30	78	60.3	45	12	4.3	0	24.9	24.9	24.8	0.00
20	69	51.5	35	39	32.5	26	84	53.9	21	9	4.0	0	25.0	24.9	24.9	0.00
21	71	54.3	35	37	32.1	26	79	47.4	21	10	2.9	0	25.0	24.9	24.8	0.00
22	71	56.2	41	36	31.1	24	70	41.0	23	21	6.7	0	24.9	24.9	24.8	0.00
23	71	55.9	41	41	31.7	26	69	43.6	19	23	7.2	0	24.9	24.8	24.7	0.00
24	63	51.4	43	41	35.5	28	82	57.0	28	16	4.8	0	25.1	24.3	0.0	0.00
25	67	54.2	42	41	34.5	26	84	52.5	23	8	2.9	0	25.1	25.1	25.0	0.00

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