February 2019 Storm Challenges

WATER, WASTEWATER, HYDRO, AND RECREATION DIVISIONS
Summary

- February 2019 presented significant challenges
  - Staff across the District responded by shifting duties
- Record or near record rain and snow totals across much of the region
- Water supply index increased from 90% to 150% of normal
  - Staff estimates 35,000AF of snow above Caples Lake
  - Jenkinson and Weber Reservoirs have both spilled
  - Remaining Project 184 reservoirs expected to fill
California Snow Water Content, February 28, 2019, Percent of April 1 Average

North
- Percent of Average for this Date: 152%
- 1982-1983 (max)
- 2016-2017
- 2017-2018
- Average
- 1976-1977
- 2014-2015 (min)

Central
- Percent of Average for this Date: 156%
- 1982-1983 (max)
- 2016-2017
- 2017-2018
- Average
- 1976-1977
- 2014-2015 (min)

South
- Percent of Average for this Date: 147%
- 1982-1983 (max)
- 2016-2017
- 2017-2018
- Average
- 1976-1977
- 2014-2015 (min)

Statewide Percent of April 1: 133%
Statewide Percent of Average for Date: 153%

Source: DWR
Snow Pack Comparison

Feb. 15, 2018

Feb. 11, 2019
Outlook and Diligence

- 2019 looking favorable for both water supply and power generation following storm recovery
- Continued caution for potential additional damage
  - Saturated soil conditions causing tree falls/ landslides
  - “Pineapple Express” that rapidly melts accumulated snow/potentially create flooding conditions
  - Potential for warm spring resulting in an early runoff
Effects of Recent Storms

- Low snow levels produced significant challenges
  - Conditions not seen in a generation
- Heavy precipitation “atmospheric river” events have created saturated soil conditions
  - Potential for landslides
- Staff have been monitoring repairs and stabilization efforts following 2017 storms
- Long days and nights keeping facilities operational
  - Ongoing focus on District’s Guiding Principle of 100% Safety
Drinking Water Challenges

- Excessive back to back snow accumulations
- Widespread extended power outages
- Snow management space and equipment
- Chemical delivery timing
- Regulatory monitoring obligations
- Field service request volume
- Water line and monitoring facilities freeze damage
- Facility accessibility due to snow and traffic
Reservoir A WTP

Snow Management
Reservoir A WTP

Safety and security
Reservoir 1 WTP

Facility maintenance and snow clearing
Strawberry WTP

Chemical Management and snow clearing
Loss of Power

Installation and operation of backup generators
Wastewater Division
Wastewater Challenges

- Power outages to sewage lift stations
- Inflow and infiltration concerns
- Accessibility – road washouts, snow/ice, flooding
- Facility flooding
- Stormwater capacity management
- Regulatory requirements
  - Pond freeboard
  - Emergency storage
  - Identifying monitoring locations
DCWWTP Sludge Hauling Access Road
CHWWTP Hauling and Spraying
Gold Ridge Forest Monitoring
El Dorado Lift Station Pond Management
Floodwater Isolation
Hydroelectric Division
Hydro Summary

- Over 100 trees in El Dorado Canal
- Tree damage to 5 separate wood flumes
- Pacific Tunnel blocked with trees/ice
- Damage required extended shutdown of Canal
- Extensive staff support from across the District
  - Shoveling miles of walkways for patrolling
  - Plowing access roads to the canal and powerhouse
  - Debris removal and flume reconstruction
- Widespread extended power outages
  - Constant refilling of generators in challenging conditions
  - Multiple instances of T1 & phone lines down
- Similar debris challenges to lower ditches
Camp 5 Yard
Tons of Ice and Debris

Heavy Equipment And Labor for Removal
Flume Repairs
Flume Section/Walkway Replacement
Pacific House Tunnel

Full of snow & debris
Penstock
PG&E Transmission Line
Hydro Staffing Chart

- Other Divisions
- Addtl Hydro
- Hydro Const
Recreation Division
Recreation Challenges

- Main hazard trees down across the park require cleanup prior to summer season
- Significant snow required plowing
- Day use areas closed for 9 days
- Camping reservations cancelled for a month
- Main access road damage requires repair before summer season
- Staging areas provided to PG&E for power restoration
Main Park Access Road
Park Facility Damage
Main Park Access Road Damage
PG&E Helipad at Main Boat Launch
Excessive Snow Required Park Closure
Reopening Day
February 2019 Storms Recap

- Significant challenges but fortunately no major facility damage
- 2,400 hours of overtime and shift of regular duties
- Worked safely with no significant safety issues
- Extra vigilance from staff to operate treatment facilities strategically
- Cleanup and repairs will extend into summer
  - Water and wastewater facilities remain operational
  - Project 184 power generation has been restored
Questions?

This is getting ridiculous!