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WATER & POWER ASSOCIATES, INC.

NEWSLETTER

For a Sustainable Los Angeles



Owens Valley Operations in the Summer of 2023

By Jerry Gewe

In April, LADWP reported the eastern Sierra April snowpack was 301 percent of normal, the highest amount recorded in the almost 100 years that LADWP has been taking snowpack measurements. This was over 35% higher than the prior highest level in 1969.

There was concern that substantial damage would be done to the Los Angeles Aqueduct (LAA) facilities as well as dust control facilities in the Owens Lakebed. However, the cool spring allowed for part of the snow pack to sink into the ground and another portion go from ice to vapor (sublimation) and a portion evaporating without creating runoff.

As a result of this cool spring, the runoff through August was 660,000 acre-feet (AF) vs the forecast of 730,000 AF, which was manageable, although substantial effort was required to minimize damage to LADWP facilities and other governmental and private properties. While major damage to facilities was avoided, 30 diversion structures and 60 measuring stations were severely damaged or destroyed. The annual runoff is now projected to be 845,000 AF vs the 943,000 AF initially forecast.

One major concern occurred in a canal section of the LAA, where a portion of the wall collapsed into the aqueduct, but fortunately the non-structural concrete, that was placed to allow the construction of the structural wall, was solid enough to allow the section of wall to be replaced and avoid serious damage to the facility and surrounding area.



In order to protect Tinemaha Reservoir, located below Bishop, siphons were installed to allow 1,800 cubic feet per second of water (This is more than twice the capacity of the aqueduct system) to by-pass the dam, avoiding severe damage to the dam. The water then traveled down the Owens River and ended up in Owens Lake.

In April, the brine pool in the lake contained about 7,500 AF of water. It was projected that about 180,000 AF of additional water would enter the lake and severely damage the extensive dust control facilities at an estimated cost of up to \$500 million. LADWP was able to get an Emergency Declaration from the Mayor and approved by the LA City Council to procure services to protect this investment on an expedited basis. The authorization was for \$52.5 million. As of the end of July \$26.9 million has been invoiced. Most of the work is completed.

(Continued on page 3)

Editor's Column

I believe that you will find this issue of the Water & Power Associates Newsletter both interesting and informative.

We start off with an article presenting information on how the runoff from the highest recorded snowpack was handled. Learn about the actions that LADWP staff took to minimize damage to the Los Angeles Aqueduct facilities and to the dust control measures controlling the emissions from Owens Lake. These actions resulted in saving hundreds of millions of dollars for the ratepayers of Los Angeles.

We present the second article on the "Intermountain Project Renewed" reporting on how it is progressing and the role it will play in meeting Los Angeles' future energy needs. This project will play a key role in allowing Los Angeles to meet the California clean energy goals, support the ability to import power from solar and wind facilities in the northwest, and act as an energy hub for renewable resources.



Learn how a "White Elephant Facility" turned into a major money maker for Los Angeles.

Another major issue that will greatly expand the economical uses of recycled water and improve water supply reliability in the decades to come is "Direct Potable Reuse of Treated Wastewater". Read about the proposed regulations that have been issued by the California Department of Public Health and all of the safeguards that will be required for this use.

Also read about some of the interesting presentations that have been made to our Board of Directors at their Monthly Meetings. These meetings are open to all members. A schedule of future meetings is included on page 20.

All members are encouraged to save the date of Saturday, February 10, 2024, for the WPA Annual Meeting to be held at the JFB beginning at 10 a.m. Marty Adams, the current General Manager, who is scheduled to retire in early 2024, will be present to inform us on "what he sees in the future for LADWP."

If you are not already members, I would urge you to join the Associates in supporting sound water and energy policies, as well as safeguarding the history of the role that the development of water and electricity supplies have played in the creation of Los Angeles.

Enjoy!

Jerry Gewe, Editor



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Owens Valley Operations, Continued from Page 1



As a result of the cool summer and the Department's extensive activities to control the runoff, for the period of March through August, only an estimated 125,000 AF of runoff has made its way into Owens Lake. This is substantially less

than the original projection of 180,000 AF. This inflow has resulted in a lake elevation increase of 3.5 feet versus the 7 feet originally projected. The area of the brine pool currently stands at 22,000 acres, substantially less than projected. Damage to the dust control facilities has been relatively moderate.

LADWP will closely monitor the weather conditions into next year and make adjustments in operations, as necessary, to deal with another wet winter. It has been forecast that next year will bring another El Nino which often, although not always, results in well above normal precipitation.

IPP Renewed Project, Part 2

By Saif Mogri

The Intermountain Power Project (Project), located in Central Utah, features electricity generating resources and two major transmission systems. Owned by the Intermountain Power Agency – which is comprised of 23 Utah municipalities – the project participants also include rural electric cooperatives serving portions of five states and six large municipal power systems in Southern California. Los Angeles Department of Water and Power holds the largest entitlement share for electricity produced by the project and also serves as operating agent and project manager for the IPP Renewed initiative now under construction.

Beginning in 2006 it became clear that the Renewal Power Sales Contract that was offered to the Purchasers was not going to meet changes in California environmental laws. Specifically, Senate Bill 1368, which was signed into law by the California governor in September 2006, together with Assembly Bill 32 which provided a framework to reduce greenhouse gases. With these changes in law, it became clear that the California Purchasers would not be able to participate in a coal project without substantial environmental controls, which were not found to be technically or economically feasible.

Beginning in 2009, a group from the Project, consisting of Purchasers and staff from the Operating Agent and IPA, began a strategic planning process. The objective of this process was to allow California Purchasers a means by which to continue in a project at the IPP site and studies were underway to evaluate different generation technologies compliant with California law. In 2010, a solution based on gas-fired generation technology became generally accepted by the Purchaser's representatives that gave birth to the IPP Renewed Project.



IPP Switchyard Expansion

This transformational project, called IPP Renewed, includes the retirement of the existing 1,800 MW coal-fueled units; installation of new natural gas-fueled electricity generating units capable of utilizing hydrogen for 840 megawatts net generation output; modernization of IPP's Southern Transmission System (STS) linking IPP to Southern California; and the development of hydrogen production and long-term storage capabilities. The new natural gas generating units will be designed to utilize 30 percent hydrogen fuel by volume at start-up in 2025, transitioning to 100 percent hydrogen fuel by 2045 as technology becomes viable.

In March 2020, the IPP Coordinating Committee approved the award of the two combined cycle natural gas fired generators with the capability of using a fuel blend of 30 percent hydrogen mixed with natural gas to Mitsubishi. Site Preparation was awarded to Granite Construction Inc. MJ Electric was awarded the contract for the expansion of the switchyard; the generation installation was awarded to The Industrial Company (TIC), and Synchronous Condensers to Siemens Energy, Inc. and Sturgeon Electric Company, Inc., and Kern River was awarded the Gas Pipeline Project. The Converter Station project was awarded to the Hitachi Energy and Phoenix Group Consortium.

Permitting and project design activities commenced in 2018, and the design of key facilities are well underway. In 2022, site preparation was completed, and construction activities began. The work on IPP Units 3 and 4 is well underway with the mass excavation and grading of the power block, trenching and installation of buried piping and cables, and installation of the generation equipment. Construction began on the Switchyard Expansion project and has completed installation of the equipment required to provide construction power to the Advanced Clean Energy Storage (ACES), Hydrogen project. They began work to expand the AC Relay House structure and began grading work to expand the 345 kV switchyard. The new electricity generating units are on track to begin commercial operation by July 2025.

By the end of 2022, work on IPP Units 3 and 4 began to really ramp up, including excavations for the foundations. As of April 2023, all the Heat Generating Recovery Steam Generators (HRSG) equipment has arrived via train to the construction site. The Mitsubishi equipment started acceptance testing and assembly with shipment scheduled to start early summer 2023.



IPP Gas Generator Site November 2022

The weather was a challenge as the 2022/2023 winter was the wettest winter on record. However, progress was made as IPP Renewed construction began above ground work. Erection began of the Unit 3 and Unit 4 HRSG structures.

The expansion of the 345 kV switchyard will add five new bays and 10 positions. This will allow the new gas generators to be connected, while the second generator will connect to the existing switchyard. Converters and filters for the STS Renewal Project and renewable projects will also connect to the new switchyard. .

There are several solar interconnection requests to connect to the IPP switchyard. All the interconnection requests total approximately 3000-4000 MW. Most of the solar interconnections also provide for a battery in parallel. There is one wind energy transmission interconnection request for 1500 MW. This interconnection would bring wind generation from Wyoming.



IPP Gas Generator Site June 2023

As can be seen from the above-mentioned projects, the IPP switchyard in Delta, Utah has the potential to expand its presence as an energy hub for renewable resources. As a renewable energy hub, it is foreseeable that IPP may become carbon free by the year 2045.

Castaic: White Elephant to Envy of the Western Interconnection

By William Barlak

On September 13, twelve members of the Water & Power Associates took a field trip to Castaic Power plant. Following is a summary of what was learned.

Not long after it opened in 1973, Castaic Power Plant was being derided as a “white elephant”, i.e., something that its owner cannot sell, but whose maintenance cannot be justified by its lack of usefulness. But now, some 50 years later, Castaic has become the envy of energy markets in California and the West.

In cooperation with the California Department of Water Resources, Castaic was built as a pumped-storage hydroelectric generating station. With an upper reservoir at Pyramid Lake and lower reservoir at Elderberry Reservoir (feeding Castaic Lake) connected by the 72-mile Angeles Tunnel, it was intended to work in tandem with DWP’s proposed Malibu Nuclear Generating Station planned at Corral Canyon a few miles west of the Malibu pier.

Although DWP’s electric customer demand varies during the day with high demand during the day and lower demand at night, a nuclear power plant is designed to run most safely and efficiently at a constant output. It cannot be “dispatched” to meet the changing demand, but is rather a “base load” resource.

During the night, when the constant output from the nuclear plant is greater than total customer demand, some of the nuclear output would be used at Castaic to pump water from Elderberry to Pyramid. Then the next day, when customer demand exceeded nuclear output, water would flow down the hill from Pyramid through the same turbines used as pumps the night before, generating energy to help meet customer demand. Castaic therefore operates as a “water battery” to be charged and discharged daily.

Castaic construction began in 1966, but plans for Malibu Nuclear were abandoned in 1970 due to local environmental resistance. Then, when the San Joaquin Nuclear Project (a DWP-led effort to build the world’s largest nuclear generating station near Wasco) was soundly rejected by Kern County voters in 1978, Castaic was thought by some to have achieved “white elephant” status.

Things began to change for Castaic in the 1980’s. On December 22, 1982, high winds in Northern California toppled transmission towers causing a major power disturbance to ripple through the West Coast. PG&E, SCE, and SDG&E all lost major portion of their customers, but under-frequency relay protection isolated DWP, and Castaic helped stabilize DWP’s grid due to its ability to bring online about 1,000 MW within minutes.

When Intermountain Power Project came online in the mid-80’s, Castaic was able to fulfill its original purpose, pumping during the night with excess IPP output, and then generating during the day to help meet peak demand.

Moreover, Castaic is the most versatile asset DWP has. In addition to its daily pump/generate cycle, it can also be used as a synchronous condenser (capacitor) when its turbines are intentionally “motored” in air. This enables the generators to provide voltage and reactive power support to the DWP grid while consuming only 3 MW in each in each condensing generator. It provides capacity and energy reserves (required by NERC Reliability Standards) that can be accessed in minutes. For example, Castaic can generate 1,200 MW for ten hours in an emergency, provided all Castaic main units are available, and upper and lower reservoir levels permit it.

Castaic also provides “black start” capability for the DWP grid. During a complete blackout, all station service loads (power to supply critical station loads) are lost at all stations. Castaic generators can start in the complete absence of external power, and can energize transmission lines from its switchyard all the way to Haynes and Scattergood Generating Stations to provide start-up power for conventional generating units at those stations. As transmission is energized in the “cranking paths” from Castaic to Haynes and Scattergood, critical loads can also be picked up at Receiving Stations along the way, which increases local grid dynamic stability, and decreases the time required for full grid restoration.

With the increased penetration of renewable resources into the western US energy markets, Castaic has become the envy of the Western Interconnection. In order to reach state mandated renewable energy targets, California utilities have had to overbuild solar capacity in order to maximize solar production during the day. But there is only so much daily demand in the state.



Water and Power Associates Field Trip
Castaic Pumped Storage Hydroelectric Plant
September 13, 2023

When total supply is greater than demand, solar output must be curtailed or be given away to energy buyers in neighboring states. This is where Castaic becomes very valuable.

Unlike in the past when Castaic would pump energy during the night and generate during the day, now the opposite is true. When there is too much solar production during the day, energy markets in the west purchase Castaic's pumping ability to store the excess solar energy. Then, when the solar production goes away at night, the markets can utilize Castaic generation to help meet the evening demand.

LADWP's participation in the California Independent System Operator's Energy Imbalance Market (EIM) has greatly increased Castaic's usage as an energy storage resource. While Castaic's monthly pump energy averaged about 14,000 MWH before LADWP began participation in EIM, after joining EIM, Castaic average monthly pump energy has increased to 46,000 MWH. According to the ISO, since joining EIM on April 1, 2021, LADWP has realized a net benefit of \$163,000,000 much of which can be attributed to Castaic's energy storage capability.

So, since beginning operations 50 years ago, Castaic is now operating in a way its original planners and designers could not have imagined. From its role as pumped storage facility for a nuclear power plant that was never realized, to its current role as a "water battery" to facilitate integration of renewable resources in the West, Castaic has come a long way from its "white elephant" days.

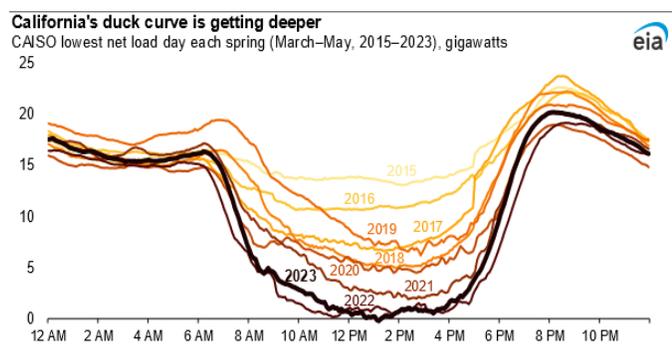
California Grid Reaches 5,600 MW of Battery Storage Capacity - Over a 10-Fold Increase Since 2020

By William Glauz

In July, the California Independent System Operator (ISO) announced that the grid has reached 5,600 megawatts (MW) of battery storage capacity online and fully integrated, a major milestone towards the state's 100% clean electric goal and overall ability to meet consumers' needs. This is up from only 500 MW of battery storage capacity in 2020.

With one megawatt of electricity providing roughly enough power to meet the demand of 750 homes, 5,600 MW of battery capacity can provide enough electricity to power 4.2 million homes for up to four hours before the batteries need to be recharged.

The batteries being added to the grid are charged during the day, when solar power is abundant, and dispatched primarily in the evening hours when demand is still high and the sun is setting and solar capacity diminishing to level out the "duck curve". Batteries are also increasingly being paired with new or existing solar resources at the same location because such facilities can provide greater operational efficiency and flexibility.



Last summer, when record heat and demand put California's electric grid under an unprecedented amount of strain, batteries played an important role in maintaining reliability during the critical evening hours when solar is not available. 5,000 MW of storage can serve roughly ten percent of the State's load during the most stressful conditions on the grid and it can often provide greater than ten percent of load during peak periods.

This development also follows the Governor's updated Building the Electricity Grid of the Future: California's Clean Energy Transition Plan for how California will reach our goal of 100% clean electricity by 2045 while keeping costs affordable and maximizing our energy supply through this transition:

- California will have to build 148,000 MW of new clean power by 2045.
- California has already built out 35,000 MW of clean electricity capacity for the grid
- The latest data from the California Energy Commission shows that in 2021, 59% of the state's energy came from renewable and zero-carbon resources.

Update on Lake Mead and the Colorado River

By Robert Yoshimura

In the last two years or so, a total of 13 articles have appeared in this newsletter regarding the impact of the twenty-three-year drought on the water stored in Lake Mead. All those articles expressed dire concerns about the future ability of the Colorado River to continue delivering a reliable source of water to Southern California (as well as Nevada and Arizona). Since 1999, when Lake Mead's water level stood at 1,215', it has steadily declined and reached a low point in July of 2022 at 1,040'. At that elevation, Lake Mead was technically 10 feet below a Level 2 shortage condition that would have triggered a combined 250,000 acre-foot (AF) cut in deliveries to Arizona and Nevada under the 2007 Interim Shortage Guidelines. Had Lake Mead remained below 1,045' in elevation throughout the rest of the year, it would have also triggered the first-ever cuts in deliveries to California totaling 200,000 AF for calendar year 2023.



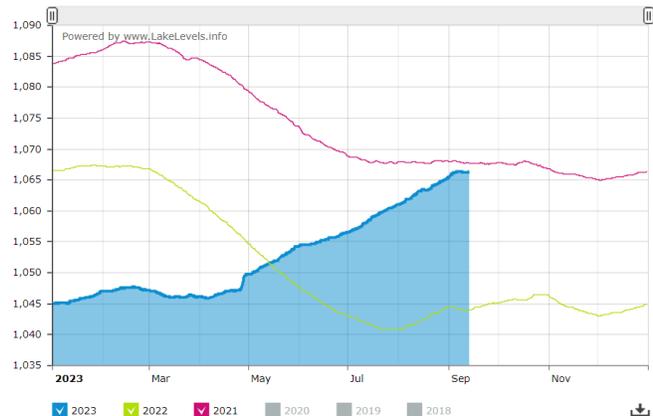
However, for the first time since the drought began, the monsoon storms of 2022, the record atmospheric river storms of early 2023, and Hurricane Hilary, have provided a glimmer of hope that the drought may be easing. Lake Mead began the year at 1,044' and had risen to 1,050' by May. In early August, the US Bureau of Reclamation (USBR) updated its end-of-year prediction to 1,068'. By late August, the Lake rose another 13+ feet and reached 1,063.5' prior to the arrival of Hilary. Since then, the Lake has

risen another 3 feet and now stands at 1,066.51' as of September 18. That rise in elevation is likely the result of rainfall and runoff from Hilary, significantly reduced agricultural demand in the southwest due to the heavy rainfall provided by the storm, and increased releases from upstream Lake Powell during this period.

In the graph on the next page, provided by Lake Levels.com, the trend in water elevations in Lake Mead in the years 2021, 2022, and 2023 are shown. The years 2021 and 2022 display the typical pattern whereby lake levels decline significantly from early spring until the end of summer. The year 2023, however, contradicts that pattern by rising during the period when it normally declines, because of the record snowmelt of the past spring. It will also be only the third time since the drought began that Lake Mead will end the year at a higher elevation than it began the year.

So, can we stop worrying about the drought? No, say the experts. The water-supply windfall from this year's storms will likely only buy us one year. Earlier this year, the lower basin states of California, Nevada, and Arizona voluntarily agreed to cut a total of one million acre-feet of combined deliveries from the river over the next three years (when the 2007 Interim Guidelines expire in 2026). However, since 1999, the average flow of the Colorado River has been 12.5 million AF per year. That represents a full four million AF shortfall from the 16.5 million AF of water annually allocated to the seven user states. Thus, a one million AF per year cut will not suffice to sustain the elevation of the Lake.

USBR believes that the most likely outcome in the next year is a return to recent patterns and a resumption of the decline in Lake Mead's water level. The USBR and the seven states that use Colorado River water soon will begin negotiations to develop permanent guidelines for operating the river beyond 2026, likely including revised allocations to each user state to maintain usage below the anticipated future flow of the river. The seven affected states are: Wyoming, Colorado, Utah, and New Mexico (Upper Basin), and California, Nevada, and Arizona (Lower Basin).



As the seven states gear up for those negotiations, a number of environmental groups are also preparing to influence the decisions from those talks. A long-standing proposal to eliminate Lake Powell has reemerged and is now gaining traction with agricultural users in California and one Clark County Nevada Supervisor as well. A major benefit of the proposal is the elimination of an estimated 360,000 AF per year of evaporative losses from the huge surface area of Lake Powell, at the expense of the loss of hydroelectric power generation from Glen Canyon Dam. The 360,000 AF of losses is greater than the state of Nevada's total allocation of Colorado River water of 300,000 AF. As these negotiations unfold, we will continue to monitor them and report back to our membership when appropriate.

California Releases Proposed Regulations for Direct Potable Reuse of Treated Wastewater

By Robert Yoshimura

As a freshman engineering student at UCLA in the fall of 1963, I recall taking a tour of an "advanced sewage treatment demonstration plant" located on the roof of one of the engineering buildings on campus. The graduate Teaching Assistant who hosted the tour described each of the three treatment stages (primary, secondary, and tertiary) in some detail and proclaimed that the final effluent from the plant was suitable to drink. He then proved his point by scooping up a mason jar full of treated effluent and drinking it right before our eyes! I don't know if that Teaching Assistant is still alive today, but if so, he should be overjoyed by the California



Department of Water Resources recent announcement finally proposing regulations for the direct potable reuse of treated wastewater.

Those proposed regulations were released on July 21, 2023, nearly 60 years after my tour of the demonstration plant that first piqued my interest in water reuse. The Teaching Assistant would likely be shocked at the number and complexity of required treatment steps following the tertiary treatment provided by the rooftop demonstration plant at UCLA. The water industry has been

urging the regulators to formulate and adopt regulations for DPR for many years. The regulators, on the other hand have been reluctant and rightfully so. While the technology to treat wastewater to meet drinking water standards has been available for nearly 30 years, lingering doubt about the uncertainties of treatment efficacy and fear of the unknown contaminants in wastewater have prevented regulators from giving the go-ahead.

Part of the reason for the reluctance is the technology available for testing water in the laboratory. Sixty years ago, laboratory techniques were barely capable of detecting contaminants down to the parts per million level. Today, advanced tools are available that can detect contaminants down to a few parts per billion, and in some cases, parts per trillion. Such tools can now provide the regulators with confidence regarding the effectiveness of treatment.

The proposed regulations focus on several factors:

- Assuring that the source wastewater is treated to meet all current regulations for discharge to waterways or the ocean.
- Treatment processes and techniques to remove pathogens by a sufficient amount to assure confidence in the safety of the water.
- Treatment processes and techniques to remove chemicals by a sufficient amount to assure confidence in the safety of the water.
- Validation of the efficacy of the treatment processes used.
- Compliance monitoring programs that stipulate the method and frequency of water sampling and testing above and beyond the current requirements for testing under the Safe Drinking Water regulations.

The specific requirements for pathogen control reflect the concerns of the regulators regarding disease-causing microorganisms and require a multi-barrier approach to treatment. The proposed regulations stipulate at least a 20 log (99.9999999999999999999999999999%) removal of enteric viruses, a 14 log (99.9999999999999999999999999999%) removal of Giardia Lamblia cysts, and a 15 log (99.9999999999999999999999999999%) removal of Cryptosporidium oocysts. By comparison, current regulations for pathogen control applying to drinking water from surface water sources range from 3 to 6 log removals of these microorganisms. Furthermore, the proposed regulations require the application of at least four treatment processes, none of which can be credited with more than 6 log removal of any of the three stipulated microorganisms. Additionally, at least three treatment mechanisms must be used, including a membrane physical removal mechanism, a chemical inactivation mechanism, and a UV inactivation mechanism.

For chemical contaminant control, the proposed regulations stipulate a treatment train that incorporates at least three separate treatment processes and three diverse treatment mechanisms that must include:

- Ozonation followed by biologically activated carbon (Ozone/BAC) – this step may be omitted if the influent contains less than 10% wastewater
- Reverse osmosis membrane
- An advanced oxidation process

The elements of the required treatment train must also provide for one log (90%) removal of certain stipulated chemical substances.

It should be noted that a treatment train consisting of ozonation/BAC, reverse osmosis, and UV inactivation will meet the treatment mechanism requirements for chemical contaminant removal, but falls short of the four processes needed for pathogen removal. Thus, one additional process consisting of one of the three mechanisms stipulated must be added.

The review and comment period for these proposed regulations will end with a public hearing to be called by the Water Resources Control Board later this year with a goal of finalizing the regulations by year's end.

CPUC Proposes New Rules for Solar Net Metering

By William Glauz

In December 2022, the California Public Utilities Commission (CPUC) issued a decision allowing customers to continue to consume electricity produced by their solar equipment, but any excess electricity produced that is delivered to the utility grid would receive a credit that would be valued as the avoided energy costs for the utility, averaging about 25% of the retail delivered electricity price. This was to assure that the utility could recover its costs for infrastructure to deliver electricity. This policy also encourages solar customers to install battery systems to reduce exported electricity.

On August 4, 2023, the CPUC followed up with new proposed rules that address solar installations for multifamily housing, farms and schools that use virtual net energy metering and net energy metering aggregation to determine their savings from installing solar. This proposed rule would essentially require all multi-metered properties which install solar to sell their entire electricity generation to the local utility at the reduced avoided energy cost and not the fully delivered retail cost. This rule would not allow any of the solar electricity produced on-site to be directly used on-site and reduce the customer's electricity consumption and bill.



This proposed rule is scheduled to be voted on by the CPUC by the end of September. Many solar, environmental, school, affordable housing and renters' rights organizations and local elected officials oppose this rule claiming it will make it nearly impossible for these customers to benefit from rooftop solar and battery storage.

Overcoming Obstacles: Los Angeles Developers and the DWP's Path to Progress

By Jack Feldman

An editorial published in the LA Times on August 28, 2023, explores the obstacles faced by developers in Los Angeles as they strive to build residential and commercial projects. The article highlights the critical need for systemic improvements within the Los Angeles Department of Water and Power (DWP) to tackle these challenges.

The DWP's bureaucratic procedures have led to high costs and significant delays in obtaining permits and electrical connections, discouraging investment in the city, particularly in the housing sector. This challenge is exacerbated by various city departments contributing to the overall red tape.



The DWP has recently introduced two policies to address these issues. The first, Project Powerhouse, aims to expedite approvals for homeless and 100% affordable housing developments, streamlining the process by engaging with developers early and prioritizing their projects. This initiative has reduced approval timelines from years to months.

Additionally, the DWP is changing its approach to charging developers for electric infrastructure in the public right of way. The previous practice of charging developers the full cost of extending

power lines deterred some from building in the city and negatively impacted electric vehicle charging station development. The new policy spreads the cost more evenly among users, making it fairer and less burdensome.

For affordable and homeless housing developments, DWP will cover the cost of line extensions in the public right of way, making these projects more feasible and timelier. These changes are seen as a recognition that the DWP has posed challenges to addressing homelessness and affordable housing issues. The aim is to expedite approvals for all commercial projects, promoting economic development and job creation while making the DWP a supportive partner rather than an obstacle to investment.

Sites Reservoir

Will Methane Generation from the Reservoir Derail its Approval?

By Robert Yoshimura

Sites Reservoir is a proposed Off-Line Storage Facility on the Sacramento River north of Sacramento that is intended to collect excess storm runoff from wet-year storms for use in subsequent dry years. It will also incorporate a pumped-storage hydroelectric power facility that will enable renewable energy to be stored when it is generated during low-demand periods for use during high-demand periods. As such, it is a critical facility for water supply sustainability and for managing the sporadic and intermittent nature of solar and wind energy. The reservoir is to be designed and constructed by the Sites Reservoir Authority (a joint powers agency) pursuant to Proposition 1 (the water bond issue) passed in 2014.



However, a new study performed by the environmental organizations Friends of the River (FOR) and Tell the Dam Truth (TTDT) and funded by outdoor equipment retailer Patagonia reveals a number of undesirable impacts of the reservoir related to methane production. The study was performed using a new modeling tool (All Res Modeling Tool) that considers broader impacts and covers a cradle-to-grave timespan of more than 100 years. It is a comprehensive approach that includes construction, operation, off-site

impacts, and decommissioning. The study estimates the annual methane generation from the reservoir and converts it into an equivalent amount of carbon dioxide to determine the reservoir's relative impact on climate change.

Methane gas is a product of the decomposition of organic matter such as algae and aquatic plants under anoxic conditions (the absence of oxygen). Anoxic conditions occur commonly at the bottom of deep reservoirs where water stagnates due to lack of circulation. When released into the atmosphere, methane is a greenhouse gas (GHG) that has 80 times the effect of carbon dioxide in trapping heat in the atmosphere.

Emissions pathways for methane, carbon dioxide, and nitrous oxide assessed in the TTDT/FOR report include:

- Reservoir surface transfer of gasses into the atmosphere,
- Exposed banks producing greenhouse gas emissions due to plant decomposition resulting from the exposure/inundation cycle occurring at the shoreline,
- Off gassing of methane from reservoir water as it passes through the turbines. The report claims that this is a particularly significant source especially if the water is drawn from the reservoir below the thermocline where anoxic conditions persist,
- Land use changes under the reservoir which, because of its inundation loses the ability of plants to uptake carbon dioxide, and the decomposition of the inundated plants which releases carbon dioxide to the atmosphere,
- Land use changes away from the reservoir to replace uses that were inundated (the authors admit this is minor),

- Downstream effects – the presence of the reservoir reduces flow in the river and results in the drying of wetlands areas causing decomposition of plants that once grew there.

Using the tools described above, the study findings show that Sites Reservoir will produce 36.2 million metric tons of carbon dioxide equivalent (CO₂e) over its 100-year lifespan, or 362,000 metric tons of CO₂e per year. This amount of CO₂e is equivalent to putting more than 80,000 additional gasoline-fueled cars on the road. This conclusion is significantly worse than the GHG estimates provided in the project's environmental documents, which also state the goal of the project is to achieve carbon neutrality. The methods used by the Sites Reservoir Authority to estimate GHG production are approved by the Intergovernmental Panel on Climate Control (IPCC), of the United Nations. The All Res tool used by the TTDT/FOR is not.

The report has been submitted to the State Water Resources Control Board for their consideration in deciding on permitting and funding the project. In its submittal to the Board, the authors stated "We strongly encourage decision-makers and public agencies to consider the GHG emissions caused by the proposed Sites Reservoir project in any ongoing or future permitting and funding decisions."

While the findings of this report are alarming, it is important to note that the organizations who performed the study and provided its source of funding are environmental advocates who are opposed to the construction of new dams and support efforts to remove existing dams from rivers and streams elsewhere in the country.

The report ignores the value of the pumped-storage component of the project (which will eliminate an equivalent amount of on-demand generation capacity and thus reduce GHG emissions) and dismisses the energy generation capability of the project because of its small size (46 gW/year). It also points out that the energy required to pump water into Sites Reservoir is greater than the energy generated by the turbines as water is released. While this is true, it misses the point that a pumped-storage facility *stores* energy much like a battery and is necessary to make solar and wind energy viable. They also take the GHG emissions of the entire project and attribute them solely to the pumped-storage facility, then compare those emissions against other forms of energy generation such as coal, gas, and nuclear. Of course, the Sites project stacks up unfavorably with the other generation facilities because the energy generation component is burdened by the GHG emissions of the entire Sites project.

There is no mention in the report about commonly used methods such as the application of copper sulfate or hypochlorite to suppress the growth of algae and plants, nor of the routine maintenance applied to reservoirs to control plant growth at the shoreline (as pointed out in the DEIR). There is no mention of the uptake of carbon dioxide by algae that may grow in the reservoir that will balance emissions from those algae as it decomposes. Nor is there a discussion of the ability to selectively withdraw water from varying depths to optimize the quality of water delivered to the turbines. Such omissions cast doubt on the credibility of the study.

The report is now in the hands of the authorizing regulatory agency, and we will follow up on the outcome of their decision.

Mystery History Question

Presented by Jack Feldman



This June 24, 1965 photo shows the opening ceremony for DWP's General Office Building located at 111 N. Hope Street in downtown Los Angeles.

As part of the ceremony the eight fountains outside the building were turned on by granddaughters of the two men who were DWP's first Chief Engineers.

Name DWP's first two Chief Engineers?

_____ & _____

Answers on page 19, or Click [HERE](#) or visit the

https://waterandpower.org/museum/Construction_of_the_GOB.html#Opening_Ceremony



GUEST SPEAKERS

Summaries by Robert Yoshimura

GUESTS OF THE MONTH
JULY 2023

Timothy Ushijima and Andrew Han, both from LADWP's Water Resources Division provided updates on the status of Owens Valley runoff, and the Department's efforts to obtain outside grants and loans for its capital program.

Guest Speaker #1: Timothy Ushijima

With the arrival of summer, nearly all the heavy snow accumulation at the remote monitoring stations (snow pillows) have melted off except for Mammoth Pass. The resulting runoff from that snow accumulation for the coming year is anticipated to total 955,000 AF from this April to the end of next March. The anticipated runoff to date was forecasted to be 380,000 AF, however, because of cool weather in late spring and early summer, only 310,000 AF has materialized. Thus, more than 600,000 AF is yet to come. The above runoff numbers are for the entire Owens Valley and excludes the Mono Basin from which no diversions are expected.



The siphons constructed on Tinemaha Dam as reported in the Inyo Register last month are effectively handling overflow without eroding the downstream dam face which is constructed of earth similar to Oroville Dam, the spillway of which suffered disastrous damage due to overflow a few years ago. Consequently, a similar disaster would seem to be mitigated at Tinemaha.

Flooding of Owens Lake was feared because of the heavy runoff, but the less-than-anticipated flows due to early cool weather combined with greater evaporation because the flow arrived later in the year has mitigated those fears. The brine pool is full, but DWP's preparations for flooding such as armoring of berms has been effective in preventing damage to dust control facilities at the lake. Because of those preparations, no further damage is expected from runoff for the rest of the year.

El Nino conditions are predicted to return next year, which generally raises the likelihood of high precipitation. However, that has not been the case historically in the eastern Sierra. Furthermore, two consecutive years of exceptionally wet weather have never occurred. Nevertheless, if such a scenario should play out next year, the consequences would be dangerous and would require extraordinary mitigation measures. Conversely, if next year is dry, we will be in relatively good shape from a water supply perspective because our reservoirs and groundwater basins will contain adequate storage resulting from this year's storms.

The Department has not used cloud seeding since the late '90s but is currently looking into resuming it in the near future.

The Los Angeles Aqueduct is expected to deliver nearly 100% of its capacity (approximately 400,000 AF) this year, and a portion of it will be used to recharge local groundwater basins for future use. Similarly, in Owens Valley, a large amount of aqueduct flow is being diverted for spreading to recharge the groundwater basin. Diversion and spreading are also occurring as far south as Mojave, where the water will benefit the environment there, but will not be recoverable by the Department. Such non-productive spreading is simply part of the strategy to keep water out of Owens Lake where dust control facilities are threatened.

The abundance of Aqueduct deliveries to Los Angeles will severely reduce purchases of water from MWD. The subsequent reduction in revenue is likely to negatively affect MWD's budget for this year.

Guest Speaker #2: Andrew Han

Andrew is currently project manager of the Groundwater Replenishment Program (GRP) and is experienced in seeking and obtaining outside sources of funding for his project. Andrew provided a summary of the Department's overall efforts to obtain grants and loans for its capital program. While those efforts are not specific to Operation NEXT, the funding efforts used thus far will guide the efforts eventually to be used for Operation NEXT.

The Department is tracking both federal and state funding sources for its water infrastructure projects. Its recent focus has been on the United States Bureau of Reclamation's (USBR) Title 16 program which pays 25% of total project cost to qualified programs. For the GRP, which is in the feasibility assessment stage, an application for Title 16 funding is pending the completion of that assessment.

The Department is also actively pursuing loans from the EPA through the Water Infrastructure Finance and Innovation Act, which promises low interest loans to projects of regional and national significance. The Department has applied for and been approved for \$224 million of financing for the GRP project at a rate of one to two percent.

No specific state funding source for water replenishment projects exists, however, California is planning to provide substantial funding out of its general budget to support drought resiliency programs (such as GRP and Operation NEXT). The Department will apply for funding under that program as funds become available. To date, the Department has received a \$15 million grant from the state's Proposition 1 (Water Bond) program that will sustain the GRP project through the design phase. Another source of funding is the MWD Local Resources Program that the Department is pursuing actively.

Pursuing funding of any sort is difficult until the project's details are developed, and regional benefits are defined. Funding for Operation NEXT will follow the targets and processes described above once more details are known.

GUESTS OF THE MONTH AUGUST 2023

Simon Zewdu, Assistant General Manager – Power, Gregory Reed, Assistant General Manager of Diversity, Equity, and Inclusion, and Denis Obiang, Manager of Transmission Planning provided a presentation on the emergence of equity issues and how DWP is planning to deal with them.

Simon Zewdu opened the presentation with a description of how equity issues became prominent during the early planning phase of the LA 100 study. For the last two years, DWP has been working with the National Renewable Energy Laboratory to develop a plan for conversion of the City's energy portfolio to 100% renewable energy. Public outreach related to the LA 100 Study revealed enthusiasm for renewable energy, but also significant concern for both its cost and potential financial implications on ratepayers, and equity in implementation of the program. Participants were particularly concerned about accessibility to the program's benefits for all ratepayers. Because 47% of the City's population is designated "disadvantaged", the public concerns about the costs and benefits of the program have become a focal point for program development in the remainder of the planning process. (Disadvantaged communities are defined by CalEPA under SB 535, a bill intended to assure equity in climate investments.)



As a result of the public's equity concerns, DWP began working with UCLA in addition to NREL to develop a foundational equity strategy. DWP added a community steering committee to work with UCLA, NREL, and DWP staff for the purpose of studying the level of equity in recent DWP projects and to define specific equity targets moving forward. The study considered DWP expenditures as part of its incentive programs for renewable

energy over the last twenty years to determine to whom and to which communities those expenditures were allocated, and how they affected the disadvantaged communities in the city. The study will conclude in September and a final report will be published in October.

Simon introduced Greg Reed, who described the disparity between disadvantaged communities and other communities in terms of electric vehicle (EV) ownership and use and the number of charging stations in those communities. People in disadvantaged communities are not able to take advantage of EVs and the subsidies provided to them for their purchase and operation.

Another disparity exists in the number of rooftop solar installations which are rare in disadvantaged communities. Those communities thus do not benefit from subsidies for purchase of solar panels nor the reduced energy costs resulting from solar energy generation. Furthermore, the net metering program which pays homeowners for the export of excess solar energy produced by them results in further disparities in costs borne by the other ratepayers. To date, the combination of reduced revenues, incentives paid out to rooftop solar owners, and the payments to solar owners for excess energy amounts to approximately \$1 billion total. Those costs are thus shifted from solar panel owners who pay very little in electric bills to those who don't have solar panels and are now burdened with higher rates because of the solar panels incentive program. Also, as solar panel ownership grows, the shrinking remainder of the ratepayers are left to pay the costs of operation and maintenance, which will ultimately result in higher rates yet.

In light of these disparities, the role of the office of Diversity, Equity, and Inclusion in the planning for DWP's conversion to 100% renewable energy will be to assure that the nearly \$80 billion investment in infrastructure will yield equitable benefits to those who pay for it. Public outreach to gain the input of all communities will be expanded to assure that the underserved are heard. Planning activities will focus on rate structures to alleviate the disparities described above while managing the constraints imposed by the 2008 rate ordinance, which limits DWP's flexibility in restructuring rates. Consideration will also be given to reducing the DWP's City Transfer fee, possibly through a future ballot measure.

At this point, Simon turned the meeting over to Denis Obiang, who provided more details of the Equity Strategy Study mentioned earlier by Simon. The study is the foundation for moving forward with equity issues associated with the transition to renewable energy. It is the first such study in the USA and is closely watched by other utilities who anticipate facing the same issues. The equity strategy resulting from the study will significantly change the traditional planning process for energy projects by introducing equity needs as determined by public input. In addition to optimizing the technical and economic factors of a project, the equity strategy will impose fairness to all stakeholders as another primary goal. Consequently, how to accomplish such fairness will become a key element of the planning process.

The study began with an assessment of how equity was (or was not) incorporated into past energy projects. Then a determination of how to appropriately engage the public was made to assure a fair representation of their concerns. One issue to be addressed will be to ensure the

input of the business community as well as the underserved communities on the steering committee. DWP wants all customers to have equal access to the distribution resources produced by the expenditure needed, which will require procedural justice in the planning process. Initial meetings with the steering committee revealed the primary concerns of the public:

The number one concern was affordability and rate equity to assure that no unfair burdens are imposed on the disadvantaged as current programs tend to do (see discussion of disparities as described by Greg Reed above).

Other concerns were:

Fair access to distribution resources such as charging stations and rooftop solar incentive programs;

Assurance of the health and safety of communities resulting from pollution-producing facilities (e.g., power plants) and transportation (heavy commercial vehicles produce more than half of the pollution from vehicles), which currently affect disadvantaged communities disproportionately;

Job creation equity – since the investment in the needed infrastructure and its subsequent operation will produce new jobs, assure that those jobs can benefit all communities equally.

Future planning efforts will take these public concerns into consideration and DWP will co-design programs with the affected communities that eliminate the real and potential inequities that have been discussed to date. DWP is aware of the difficulty of developing such programs that achieve the equity goals while avoiding unintended consequences that may arise. One example is the proposed energy efficiency program that will provide rebates for customers to replace gas stoves with electric. One result would be a higher cost to the consumer of such a change because gas is cheaper than electricity and a means of working around such costs is imperative.

Measurable metrics (such as the percentage of customers who can participate in solar incentive programs) will be developed and applied to monitor the success of these programs. DWP plans to work side-by-side with the affected communities to develop such metrics, and understands that this will be a challenging task. Other utilities are excited about DWP's efforts in this area because it will be the first attempt to incorporate equity strategies in planning for the renewable energy transition.

DWP will roll out such programs beginning with those that are easiest to implement. An example would be the energy efficiency program described above to exchange gas stoves for electric. Once the program is fully developed, it will be relatively easy to explain to the public. More complex programs will be prioritized for development later and rolled out, beginning with the easiest ones first. Neighborhood Councils will ultimately be brought into the process with the hope that they can become ambassadors for these programs.



Mystery History Answers

William Mulholland and Ezra Scattergood

More information at:

https://waterandpower.org/museum/Mystery_History.html or Click [HERE](#).

SAVE THE DATE

2023 CALENDAR

GUEST OF THE MONTH

Meetings in Person
Room 1471, JFB and Via
Zoom, Check your WPA
Emails for the Zoom Link



MATTHEW HALE DIRECTOR OF LEGISLATIVE AND GOVT AFFAIRS, LADWP	OCTOBER 11, 2023 How to Support Sound Water and Energy Policies
MWD REPRESENTATIVE	NOVEMBER 8, 2023 Status of Colorado River Negotiations and Supply Reliability for Northern MWD Agencies
DR. FRED PICKEL RATEPAYER ADVOCATE CITY OF LOS ANGELES	DECEMBER 13, 2023 Lessons Learned from 10 Yrs as Ratepayer Advocate
	JANUARY 10, 2024 To Be Determined

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