



— BUREAU OF —
RECLAMATION

Spring 2022
Issue 255

Water Operations and Maintenance Bulletin

Hazardous Materials and Innovations

Contents

- 1 Editor's Note
- 1 Around O&M
- 2 Flatiron Powerplant Asbestos Abatement
- 5 Don't Eat the Lead Paint: Safely Inspecting, Removing, and Replacing Protective Coating Systems
- 8 Used Oil: What to Do?
- 10 Airborne Snow Observatory: Water Supply Forecasting Moves Forward
- 12 Leavenworth National Fish Hatchery Pilot Circular Tank Project
- 14 Q&A: Commissioner Camille Touton
- 18 Updates & Due Dates

Bulletin Mission Statement

This *Water Operations and Maintenance Bulletin* is published quarterly through the Asset Management Division of the Dam Safety and Infrastructure Directorate. It serves as a medium to connect personnel who operate and maintain Bureau of Reclamation water supply systems.

Bulletin History

The *Water Operations and Maintenance Bulletin* has been published quarterly since 1952. Past issues may be read and downloaded at [Water Operations and Maintenance Bulletins](#), where you can also search the entire bulletin database by subject.

Contact

We welcome suggestions for future issue topics, contributing authors, and comments on the *Bulletin*. Please direct all inquiries to drowateroandm@usbr.gov.

Cover photo: Overlooking Monticello Dam on a spring day (Anthony Southwood).

Editor's Note

The third sentence of December's *Bulletin* began "After another busy and destructive wildfire season ..." Three weeks after the Wildland Fire Management special issue published, the Marshall Fire roared through Superior and Louisville, Colorado. Several of us at Reclamation were evacuated and experienced irreparable losses. We want to extend our heartfelt sympathies to those impacted and offer our community's support as you begin to rebuild. Reclamation must continue to prepare to address changing climate extremes to fulfill our mission and help protect the American people.

Special thanks to the Materials and Corrosion Laboratory in Reclamation's Technical Service Center for contributing three articles for this issue: "Flatiron Powerplant Asbestos Abatement," "Don't Eat the Lead Paint: Safely Inspecting, Removing, and Replacing Protective Coating Systems," and "Used Oil: What to Do?" We are also excited to share contributions from the California-Great Basin and Columbia-Pacific Northwest Regions, respectively, with Todd Plain's "Airborne Snow Observatory: Water Supply Forecasting Moves Forward" and Dan Church's "Leavenworth National Fish Hatchery Pilot Circular Tank Project."

For this issue's Q&A, we had a special guest: Bureau of Reclamation Commissioner Camille Touton. Commissioner Touton graciously shared her time with us on the one-year anniversary of her appointment to the Department of the Interior's Biden-Harris Leadership Team. Please read on to learn more about her career prior to becoming Commissioner, how she measures big picture results, and the importance of investing in Reclamation's human capital. Enjoy!

Darion Mayhorn, P.E.

Supervisor, Operations and Maintenance
Asset Management Division

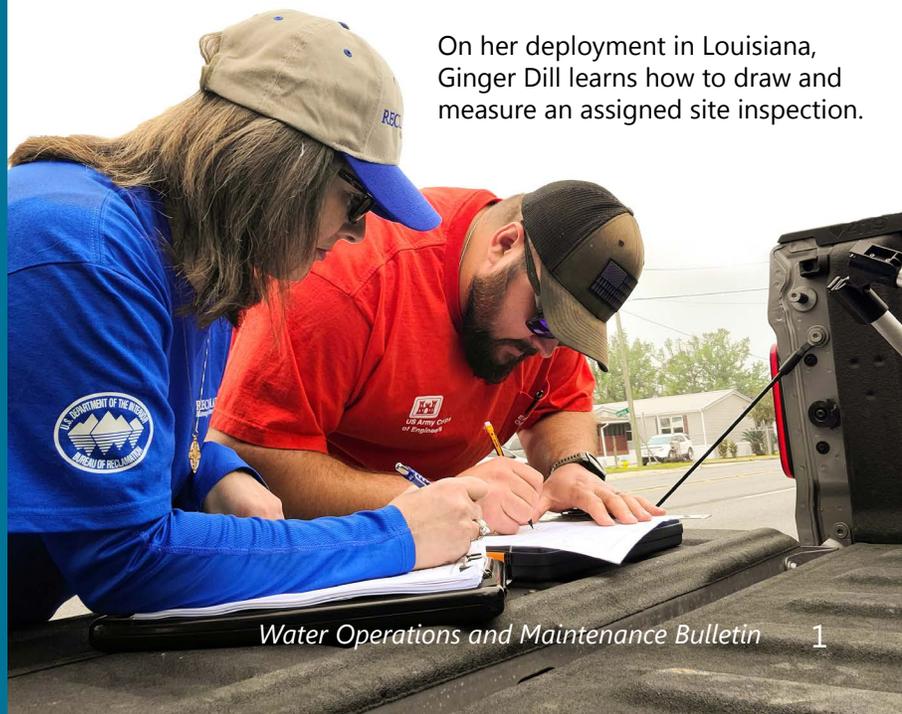
Andrew Daigle, Ph.D.

Writer-Editor
Dam Safety and Infrastructure

Around O&M

- **Water Management Workshop, February 22-24, 2022**
 - The virtual workshop featured six sessions over three days. Session topics included water operations and maintenance (O&M), climate change, WaterSMART funding opportunities, the Enterprise Asset Registry, transferred works outreach, major rehabilitation and replacement, and a case study on the Colorado River Basin. Featured labs included Materials and Corrosion, Hydraulics, Unmanned Aerial System (UAS), Geotechnical, and Concrete Materials and Mixes.
 - 145 people registered, representing 51 water districts and 16 area offices. 70% of those who completed the workshop survey were engineers or in a management/supervisor role.
 - Attendees were most interested in the Hydraulics lab, the Colorado River Basin study, UAS, Water O&M, and the Asset Registry.
 - Suggested future topics include irrigation, dealing with public/management/Reclamation resources, canal lining construction and repair, and pest management.
- **The Bipartisan Infrastructure Law** represents a once-in-a-generation opportunity to improve our infrastructure and advance our mission. To learn more about the Law's implementation and opportunities for stakeholder engagement, please visit: <https://www.usbr.gov/bil/>.
- **Dam Safety and Infrastructure's Ginger Dill and Jackie Horn** went on a deployment for the Louisiana Relief Effort in December. Thank you, Ginger and Jackie, for your service.

On her deployment in Louisiana, Ginger Dill learns how to draw and measure an assigned site inspection.



Flatiron Powerplant Asbestos Abatement

Kevin Kelly, Ph.D.

Research Chemist, Materials and Corrosion Laboratory, Technical Service Center

Brad VanOtterloo, P.E.

Structural Engineer, Plant Structures, Technical Service Center

Asbestos is a naturally occurring mineral that is still used widely in Bureau of Reclamation (Reclamation) facilities for its high tensile strength and its resistance to chemicals, electricity, and heat. Some of the materials containing asbestos in Reclamation facilities include asbestos cement (transite); cable tray liners; ceiling and floor tiles; coatings; drywall; electrical system insulation components such as wiring covering, blocks, and partition boards; fireproof doors; pipe joint packings; roofing construction materials; thermal system insulation; sealants; and window glazing.



Closeup view of cables sitting on top of transite cable tray liners. Note accumulation of dust on cables.

A key consideration in assessing the conditions of asbestos-containing materials (ACMs) is friability. Friability is the tendency of an ACM to break down. ACMs become friable due to deterioration of the material caused by age, air erosion, mechanical vibrations, and weathering. When ACMs are damaged or disturbed, fibers may be released into the air that can then be inhaled. According to the Occupational Safety and Health Administration (OSHA), exposure to asbestos is known to lead to an increased risk of asbestosis, lung cancer, and mesothelioma. Symptoms of these diseases often do not appear for 20 to 30 years after the first exposure to asbestos. For these reasons, OSHA has established general industry and construction safety standards for asbestos. Although asbestos is not fully banned in the United States, environmental regulations starting in the 1970s and increased consumer awareness have caused manufacturers to produce safer asbestos alternatives. Environmental standards and regulations for asbestos in the United States were promulgated under the National Emission Standards for Hazardous Air Pollutants (NESHAP), Asbestos Hazard Emergency Response Act (AHERA), Asbestos School Hazard Abatement Reauthorization Act (ASHARA), and the Toxic Substance Control Act (TSCA).

ACMs are often not easily identifiable. The Technical Service Center (TSC) provides certified asbestos professionals to carry out facility surveys to identify and confirm the presence of ACMs. When asbestos abatement is required, the TSC also provides knowledgeable project managers who can lead construction specification teams for the abatement of ACMs, cleanup of asbestos contamination, and specify replacement materials compatible with existing equipment in the facility.



View of the cable tunnel looking towards Flatiron Powerplant.

Flatiron Powerplant (Flatiron) began operations in 1954 and is located near Loveland, Colorado. It is one of 15 interconnected Reclamation power plants in the Western Division of the Missouri River Basin operated by the Western Area Power Administration. The TSC recently performed an asbestos facility survey and provided a construction specification package for an asbestos abatement solicitation for Flatiron. Concerns were raised by Flatiron personnel on the age and condition of existing cable tray liners (transite) in the tunnel where high voltage cables are routed from hydroelectric generators to the switchyard. Hazardous materials testing performed by the TSC confirmed the cable tray liners contained asbestos. Air and dust sampling within the tunnel confirmed surfaces were contaminated with asbestos, which is a clear indicator of friable ACMs releasing airborne asbestos fibers. Cooling water pipes within the Unit 1 and Unit 3 air housings were also found to be wrapped with asbestos tape.

Principle components of the asbestos abatement solicitation for Flatiron include removing the existing electrical cable tray liners and asbestos dust contamination from all surfaces within the tunnel, installing new electrical cable tray liners in the tunnel, and removing existing asbestos pipe insulation and installing new pipe insulation on water cooling pipes within the Unit 1 and Unit 3 air housings for the hydroelectric generators.

All work was performed in accordance with Federal, state, and local regulations, and as specified in the TSC construction specification package used for the solicitation. The power plant was first placed on a

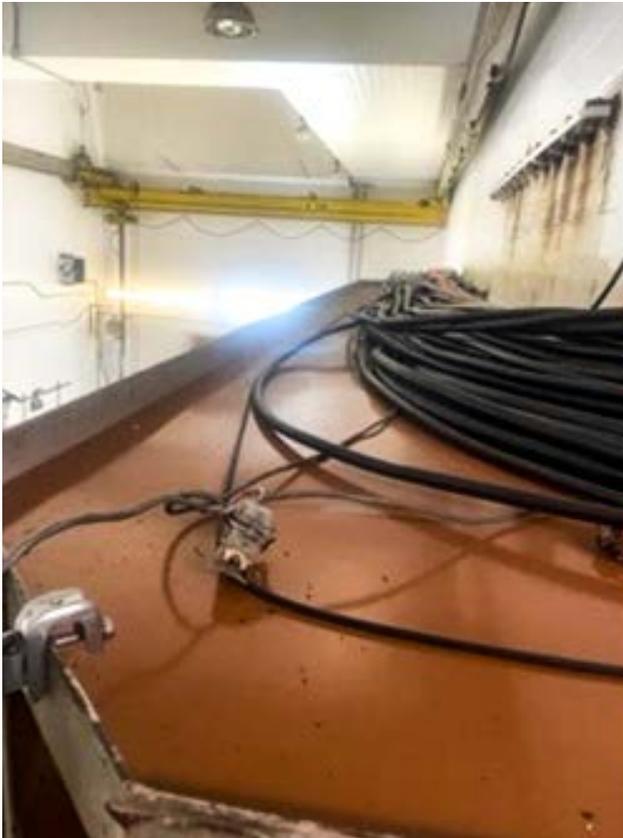


Cooling water pipes wrapped with asbestos tape within Unit 3 generator air housing.

three-week outage. Since the secondary 13.8 kilovolt cables also had to be cleaned during the abatement, power was back fed to the power plant through an alternate feed to maintain needed equipment during the outage. Prior to the start of abatement at Flatiron, the required Asbestos Hazard Abatement Plan was submitted by the contractor and reviewed by Reclamation for approval. During abatement and decontamination, a negative pressure containment system equipped with High Efficiency Filtered Air (HEPA) vacuums was fully in place and air outside of the containment system was monitored continuously. All surfaces within the cable tunnel were cleaned free of asbestos dust, including the floor, ceiling, walls, high voltage cables and bushings, cable tray and electrical conduits, and cable tray frames and brackets within and outside of the tunnel. Due to sensitive electrical equipment, only amended water (water to which surfactant (wetting agent) has been added to improve surface penetration) was used to minimize the airborne release of asbestos dust without contact with electrical load-bearing components.

Asbestos waste was double-bagged using 6 mil poly asbestos disposal bags, gooseneck tied, and sealed with duct tape. The outside of each bag was wiped clean prior to removal from the containment system. Waste characterization, handling, transport, and disposal were tracked using a hazardous waste manifest. In accordance with Environmental Protection Agency (EPA) guidelines, both the contractor removing the hazardous waste and the owner of the facility (Reclamation) are jointly and severally liable for compliance with the hazardous waste generation regulations. When the work was completed, clearance

air and surface testing for asbestos was performed to confirm levels were below acceptance criteria in accordance with the approved Asbestos Hazard Abatement Plan and prior to Flatiron personnel returning the power plant to operation.



Close-up view of one of the new Micarta replacement tray liners.

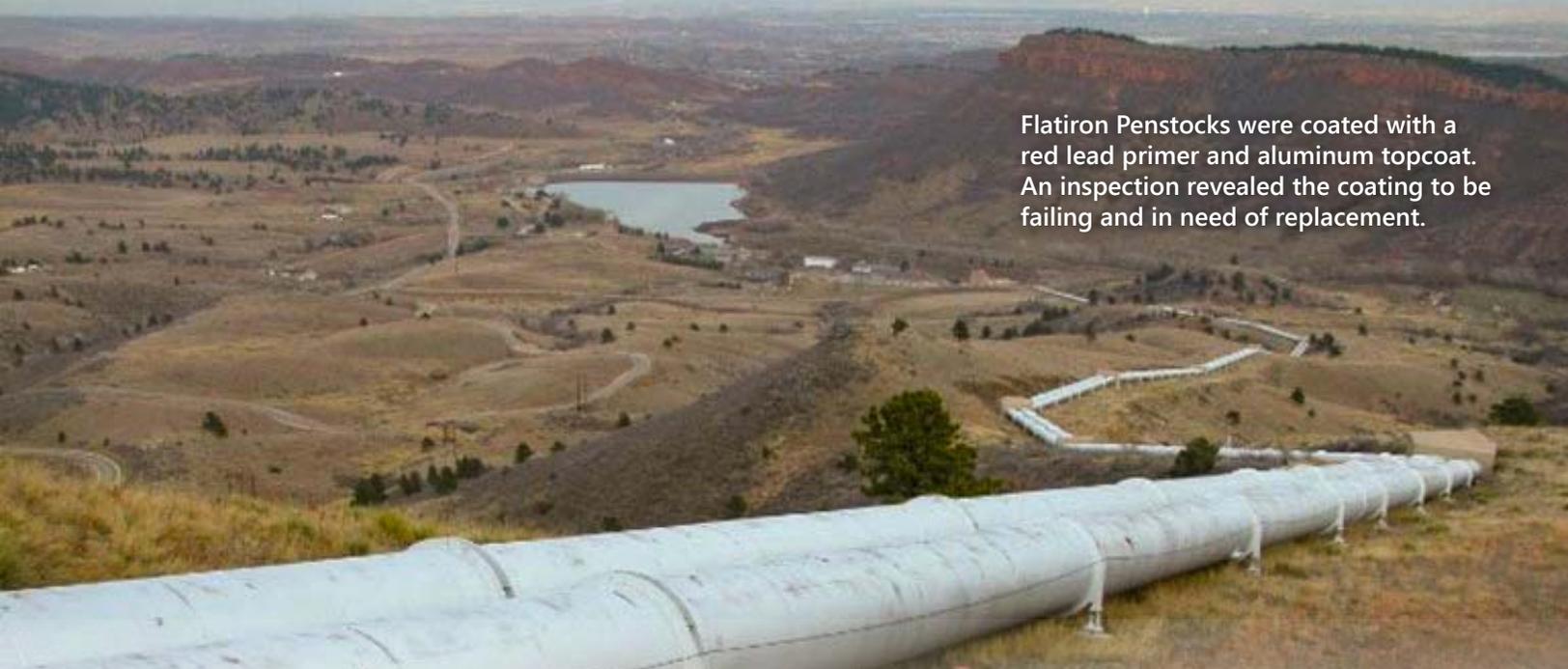
The TSC also researched and specified requirements for suitable replacement cable tray liners with the necessary sizing, flexural strength, breakdown voltage, electric strength, and arc resistance. These requirements were specified by the TSC to ensure replacement cable tray liners would be suitable for the existing equipment in Flatiron. Much of the requirement criteria may be compared with the manufacturer's specification sheets; however, some characteristics must be verified before a candidate material is found to be acceptable. As an example, one of the candidate materials proposed as replacement cable tray liners was a phenolic paper sheet (NP 610 X) produced by Norplex Micarta (Micarta) that exhibits good high voltage electrical insulation and tensile, flexural, and compressive strength. The Micarta NP 610 X cable tray liner was analyzed by the TSC as a replacement for the existing asbestos cable tray liners using the following procedures.

- The bending moment across an assumed length of the existing cable tray liners was calculated, using a known clear span between cable tray liner supports and an assumed uniformly distributed load of cabling between cable tray supports.
- The section modulus of the replacement cable tray liner was then calculated for an assumed thickness of the liner, and a maximum bending stress at the surface of the liner was determined using the bending moment and the section modulus.
- Finally, the stated flexural strength of the replacement cable tray liner was compared against the maximum bending stress in each principal direction to ensure adequate flexural capacity of the liner.



View of cable trays and their new replacement cable tray liners entering the cable tunnel.

Reclamation facilities, especially power plants, have had a long history of utilizing ACMs. A facility asbestos survey may be required to identify existing ACMs and their current conditions. As noted, there is a wide array of asbestos products found in these facilities beyond cable tray liners. While the example presented above primarily concerns transite cable tray liners, asbestos abatement work can be adapted to different equipment and facility conditions involving ACMs.



Flatiron Penstocks were coated with a red lead primer and aluminum topcoat. An inspection revealed the coating to be failing and in need of replacement.

Don't Eat the Lead Paint: Safely Inspecting, Removing, and Replacing Protective Coating Systems

Stephanie Prochaska

Materials Engineer, Materials and Corrosion Laboratory, Technical Service Center

Protective coating systems are found on almost all steel infrastructure across the Bureau of Reclamation (Reclamation). These coatings protect critical equipment like outlet works, gates, pipelines, and other features from corrosion. Corrosion, or rust, is a naturally occurring process capable of damaging or rendering Reclamation's critical infrastructure inoperative; if left unchecked, corrosion can cause failures requiring outages to fix or replace equipment. To ensure sufficient protection, coating systems must be periodically inspected. When they've reached the end of their service life or otherwise show signs of degradation, they must be repaired or replaced. While replacing a coating system is less cost- and time-intensive than replacing a corroded piece of equipment, recoating infrastructure comes with its own set of challenges and necessary considerations. This article outlines considerations relating to hazardous materials that must be taken into account to ensure a successful and safe recoating job.

The majority of Reclamation facilities were built in the early to mid-1900s and many facilities still have infrastructure coated with the originally

applied systems. These historic coating systems can provide lengthy service lives but are typically no longer used in modern recoating projects because they can contain toxic metals like lead, dangerous chemical compounds, and other hazardous materials. Therefore, when the time comes to repair or replace coating systems, great care must be taken to mitigate exposure to or release of any hazardous constituents. It is important to note that it is not just coating systems that contain hazardous materials. Construction materials such as drywall, insulation, wiring, and roofing, which can be disturbed or replaced during facility refurbishment, may also contain hazards like asbestos. While this article's focus is only on coating systems, similar considerations should be made for other materials. Please contact the Technical Service Center's (TSC) Materials and Corrosion Laboratory (MCL) with any questions regarding hazardous material testing and mitigation before starting any construction activities.

Most coating system problems are identified through routine inspections. Routine inspections are critical to ensure the optimal health and efficiency of



A close-up of the exterior of the penstock coating system shows the failure of the aluminum topcoat exposing the red lead primer.

Reclamation's structures and to avoid unexpected failures. MCL staff hold internationally recognized certifications to perform coating inspections and travel throughout Reclamation to monitor coating system conditions. In 2009, the TSC initiated a project to replace over 200,000 square feet of the exterior coating system on the Flatiron Penstocks located at Flatiron Dam, approximately 12 miles west of Loveland, Colorado. This work was spurred by a routine inspection of the penstocks' coating systems that found the coating failing and in need of replacement.

Constructed in 1937, the exteriors of the Flatiron Penstocks were originally coated with a red lead primer and aluminum topcoat system. While the coating's distinctive red color was a giveaway that it contained lead, and construction records and documents confirmed the presence of lead in the primer, hazardous materials sampling was still performed to identify all the potential hazardous constituents. It is critical to perform hazardous materials sampling on any coatings that are to be removed in case documentation is incorrect or unavailable. Additionally, many coating systems look alike and can be easily confused. Knowing exactly what hazards are present and properly removing and disposing of them is imperative to protecting worker safety and health and for maintaining regulatory compliance.

For coatings, hazardous materials sampling involves removing coating samples from the equipment. For coating sample collection, the coating is scraped off down to the substrate using tools such as a paint scraper, chisel, heat gun, small drywall knife, or needle scaler. For metals and chemical compound sampling, approximately 30 grams (each) of coating are required for analysis. For asbestos sampling, just a few grams are needed as long as the sample is representative of all coating layers. Samples are carefully documented and sent to external laboratories for evaluation.

Once the hazardous materials results are ready and potential hazards identified, plans can be made for removal, containment, and disposal of the coating system. These methods can vary greatly depending on if hazardous materials are found and which are present. At the Flatiron Penstocks, red lead was confirmed to be present along with toxic levels of other regulated metals. Therefore, during the coating removal, workers were required to wear special protective equipment and carry monitors that tracked particulate levels in the air. A containment was constructed around the area where coating was being removed to ensure that all the coating, along with the abrasive blast media used to remove the coating, was collected and contained.

When suspect hazardous materials may be present but the identification and quantity are unknown, the hazardous waste stream generated must undergo a toxicity characteristic leaching procedure (TCLP) to simulate leaching of the waste stream in a landfill. Depending on the hazardous materials present and whether individual target analytes exceed the TCLP toxicity characteristic thresholds, waste may be sent to a solid waste landfill, a hazardous waste landfill, a disposal facility specifically designed for one or more types of hazardous materials, or another location. In some cases, further treatment of the hazardous waste stream is required prior to disposal. Since it contained lead and other heavy metals, the Flatiron Penstock waste was sent to a dangerous waste landfill for disposal. MCL hazardous materials specialists can assist in determining the correct disposal methods for generated wastes.

Once the old coating system is removed and properly disposed of, the metal substrate can be cleaned and prepared to receive the new coating system. Surface preparation is the most important part of a coatings job and, if done improperly, can greatly reduce the service life of the new coating. MCL coatings specialists can assist with planning the best methods

for surface preparation. In addition, they can help select a new coating to apply to the cleaned surface. Choosing the right coating should be discussed with experienced personnel. Coating selection is highly dependent on multiple factors, including feature type, feature service condition/environmental conditions, sediment loading, and local regulations, among other factors. The exteriors of the Flatiron Penstocks were recoated with a zinc-epoxy-polyurethane system that provides good protection in atmospheric conditions.

Regularly inspecting and maintaining Reclamation's coating systems is important for continued and optimal operations and critical for avoiding catastrophic failures. While these tasks may seem daunting with the many important considerations, MCL staff are available to assist and/or guide facility owners through the entire process. Together, we can ensure the longevity and safety of Reclamation's infrastructure.



Section of Flatiron Penstocks during recoating. A containment is seen on the top of the work area adjacent to newly applied coatings.

Used Oil...What to Do?

Lise Pederson, P.E., CHMM

Chemical Engineer, Materials and Corrosion Laboratory, Technical Service Center

Brianna Herner

Environmental Scientist, Materials and Corrosion Laboratory, Technical Service Center

The Bureau of Reclamation (Reclamation) uses oil in various functions at its facilities. The two major oil functions at Reclamation are mechanical (as hydraulic oil) and electrical. Mechanical equipment that uses oil includes turbine speed governors, crane hoists, elevators, gate actuators, and hydraulic presses. Generally speaking, anything that uses hydraulics is likely using oil as the fluid.

Electrical equipment that uses oil includes transformers, transformer bushings, breakers, electrical equipment insulation (e.g., capacitors), and more.



Mechanical governor.

So, what do you do when oil at a facility needs to be disposed and you don't have a local service that takes care of this for you? Dump it down the drain? No! You don't want to contaminate the precious water supply that Reclamation works to protect.

You need to test the oil. But how?

A simple way is to purchase a Used Oil test kit. Several firms (AMSOIL, DEXOIL) make them, and they're very simple to use. This is a good alternative to laboratory testing for hydraulic oil. We've found that hydraulic oil typically fails Used Oil testing, usually for metals. Oil filtering systems do work most of the time at filtering out metals but also likely filter out nothing else. Remember to clean those filters too!

If the oil passes the Used Oil specification, it can be recycled as used oil or burned for energy recovery. If it doesn't, it will either be a Hazardous Waste or fall into one of the polychlorinated biphenyls (PCB) categories.



Generator Step-up Transformer.

Oil used in electrical systems such as from breakers and transformers has a different issue. This oil is tested on a regular basis, which is good, but it also may have PCBs, which is bad. Even if the high-concentration PCB oil is drained out of a component, PCBs may still leach out, making a non-PCB oil into a PCB-containing oil. This is something to watch for.

Note that state regulations take precedence over Federal regulations. This means, for example, that even if an oil passes the criteria under Federal regulations, check the state's regulations next. As an example, California and Washington have lower limits for PCBs than Federal regulations, so those blue PCB-free stickers aren't necessarily accurate.



PCB-Free Sticker.

Interested in more details about state and Federal regulations and how they apply?

The Environmental Protection Agency's (EPA) Used Oil Specifications (40 CFR Section 279.11, Table 1) provides allowable levels of certain constituents and properties of used oil that determine whether or not

the oil is regulated under 40 CFR Part 279, Standards for the Management of Used Oil. These constituents and properties are arsenic, cadmium, chromium, lead, flash point, and total halogens.

If oil is below the allowable levels in 40 CFR Section 279.11, Table 1 (see below), and does not exceed the allowable limit of PCBs under 40 CFR 761.20(e), it can be burned for energy recovery or recycled. However, if the oil exceeds the allowable limits in this table and contains an allowable level of PCBs, it may be regulated as hazardous waste under 40 CFR Part 261.24, Toxicity characteristic. Used oil containing PCBs falls under 40 CFR 761.20(e), which is the PCB regulation.

Domestic PCB production was banned in 1979 under the Toxic Substances Control Act (TSCA); however, many of Reclamation's electrical facilities and equipment predate this regulation. Even if PCB-containing oil has been replaced with PCB-free oil in equipment, PCBs can leach into the metal containers and back into the oil, thus contaminating the new oil. PCBs are regulated under 40 CFR Part 761,

Constituent/property	Allowable level
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Flashpoint	100 °F minimum
Total halogens	1,000 ppm / 4,000 ppm max.
PCBs	< 2 ppm, 2 – 49 ppm, >= 50 ppm

Table 1. 40 CFR Part 279.11.

Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions, which is part of the TSCA (40 CFR Subchapter R). Under this regulation, PCB-contaminated oil may be required to be disposed at an EPA-approved incinerator.

After checking the Federal regulations, it's time to review the state regulations. As we noted above, state regulations take precedence over Federal regulations and will be stricter. For example, Washington and California regulate PCBs in electrical system oil lower than the Federal standard. In these cases, that oil becomes a state-regulated hazardous waste and must be disposed following the state's regulations.

What We've Found in Testing Hydraulic Oil

Mechanical hydraulic system oil often fails the Used Oil Specifications for the allowable levels for metals unless it has been filtered, either by an inline system or removed, filtered, and re-added. Other contaminants we have found include halogenated solvents or degreasers like Trichloroethylene (TCE) and Perchloroethylene (PCE), which may fail under halogens and might be found in workshops.

Reclamation's Technical Service Center (TSC) Materials and Corrosion Lab personnel can help you with the process of handling used oil, including sampling, sending to a lab, and determining a disposal plan. Please reach out to Lise Pederson (LPederson@usbr.gov), Kevin Kelly (KKelly@usbr.gov), or Brianna Herner (BHerner@usbr.gov) with questions.

Airborne Snow Observatory: Water Supply Forecasting Moves Forward

Todd Plain

Public Affairs Specialist, California-Great Basin Region

As snow continues to pile up in the Sierra Nevada at the start of 2022, local and Federal water managers alike eagerly anticipate data from [snow surveys](#) to find out how much snow is on the ground, the water content of the snow, and exactly where it has fallen.

Estimating snowpack plays an important role in forecasting water supplies. Snow in mountain watersheds, like the Truckee-Carson River Basin, acts as a natural reservoir holding on to the frozen water that will gradually melt and run downhill as the season progresses.

“Snow surveys and the forecasts that come from that allows us to operate much more efficiently. When you know how much water is coming, the water users can plan better,” said Chad Blanchard, U.S. District Court Water Master for the Truckee Basin. “We can maximize storage and not over-release ahead of time or not under-release and have issues with flooding. So, definitely critical to operations of not only Lake Tahoe but the other reservoirs in the system.”



The Airborne Snow Observatory makes a stop at Truckee Tahoe Airport in Nevada County, California (Kelly Grow/DWR).

With changes to climate and increasing water demands due to population growth, accurately mapping where the snow has fallen is becoming

increasingly important to best determine water allocations for myriad needs and obligations throughout the year.

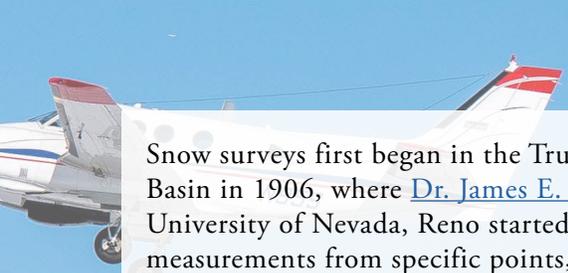
Arguably, one of the best and easiest ways to map snowfall is from a plane.

This brings us to the [Truckee Tahoe Airport](#) on December 10, 2021, where the Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) are teaming up on a new project: to gather high altitude National Aeronautics and Space Administration (NASA)-inspired imagery they hope will accurately detail snow location and depth within the basin.



Technology onboard the Airborne Snow Observatory while at Truckee Tahoe Airport (Kelly Grow/DWR).

“Today we’re out here to collect some new snow data that we have never been able to collect before; the plane behind me collects high resolution information about snow depth across the entire watershed rather than single-point estimates like we’ve done in the past,” said Dr. Scott Fennema, a Reclamation hydrologist from nearby [Lahontan Basin Area Office](#) in Carson City, Nevada. “This will tell us information about snowpack in areas of the basin we never look at.”



Snow surveys first began in the Truckee-Carson River Basin in 1906, where [Dr. James E. Church](#) from the University of Nevada, Reno started collecting snow measurements from specific points, and those points are still being used to this day. So, it's only fitting that the birthplace of snow surveys is also the start of a new aerial snow survey project with Reclamation and DWR leading the way.

“We’ve been measuring snow the same way with snow tubes since the early 1900s, and a lot of the technologies have changed since then,” said Sean de Guzman, DWR Snow Surveys and Water Supply Forecasting Section Manager. “Some of the new emerging technologies that we’ve explored is the Airborne Snow Observatory where they’re able to determine how much snow is on the ground by airplane.”



Airborne Snow Observatory surveying unit protrudes out of exposed bay in the plane's hull (Todd Plain/Reclamation).

The Airborne Snow Observatory is outfitted with scanning Light Detection and Ranging (LiDAR) and an imaging spectrometer. This technology allows the propeller plane to efficiently survey vast areas and previously inaccessible terrain from an elevation of 23,000 feet. The Airborne Snow Observatory measures snow depth within 2.5 inches.



Close-up of the surveying unit's downward-aimed face (Todd Plain/Reclamation).

“When you think how large a watershed is and even if you’re measuring maybe 10 sites in a large watershed, you’re not covering the whole thing,” said David Rizzardo, a DWR hydrology manager. “Now, we can fly over and get data every three square meters in that watershed and tell us very precisely what’s going on in the snowpack more so than we’ve ever known before.”

The [airborne snow data](#) will assist in real world decisions, including improving operations for protecting threatened and endangered fish species, assisting farmers’ investments into which crops to plant in dry versus wet years, improving flood management decisions, and optimizing hydropower generation.

“This project is a complete and total partnership between us at the Bureau of Reclamation and the California Department of Water Resources,” added Fennema. “We’re partnering from the start to the end of going through and collecting this data and taking that data and trying to turn it into a river forecast for the Truckee and Carson Rivers. It’s a great partnership, and we’re hoping it will grow into the future so we can use this information to better inform river operations.”



The Airborne Snow Observatory flying above Truckee Tahoe Airport (Kelly Grow/DWR).

-- Special thanks to the other snow survey partners: Natural Resources Conservation Service, U.S. Geological Survey, NASA, National Oceanic and Atmospheric Administration, and U.S. Army Corps of Engineers.

Leavenworth National Fish Hatchery Pilot Circular Tank Project

Dan Church

Project Management Specialist, Technical Projects, Columbia Cascades Area Office

The Leavenworth Fisheries Complex consists of the Leavenworth, Entiat, and Winthrop National Fish Hatcheries and the Mid-Columbia Fish & Wildlife Conservation Office. The hatcheries were built as mitigation for the impact of construction, operations, and maintenance of Grand Coulee Dam on fisheries resources in the Columbia River and its tributaries. Leavenworth National Fish Hatchery (LNFH) construction started in 1939 for propagating and helping restore native salmon runs in the Columbia River system.

LNFH is located on Icicle Creek approximately three miles south of the city of Leavenworth, Washington. The hatcheries and associated facilities were constructed by the Bureau of Reclamation (Reclamation), but the facilities are now owned and operated by the U.S. Fish and Wildlife Service (USFWS) and funded by Reclamation and the Bonneville Power Administration.

USFWS rears spring Chinook salmon using intensive fish culture methods at LNFH and has been working on methods to reduce surface water withdraws and improve effluent discharge while producing healthy fish. Reclamation started addressing these issues in

2013 and completed the 65 percent engineering designs for a partial recirculating aquaculture system (PRAS) using circular tanks. The project stalled but was restarted in 2019 with a pilot circular tank project design from McMillen Jacobs Associates. Construction began in 2020 and was substantially completed in December 2021.



Building entrance to the Pilot Circular Tank Project.



Leavenworth National Fish Hatchery.

The Pilot consists of two PRAS systems that each have two circular tanks (four tanks total). It is a modular design with the ability to add additional modules to increase production capabilities using this technology. Following construction, a monitoring and evaluation study for fish performance will occur. If the study proves the expected results and funding becomes available, further buildout can be pursued. Effluent treatment to manage phosphorus discharge to Icicle Creek is a key component in the design as well.

This project demonstrates Reclamation's ability to work together to solve difficult problems. Close partnerships between the area office, regional office, Technical Service Center, USFWS, and our tribal partners were instrumental in its construction.



Partial recirculating aquaculture system's circular tanks.

Q&A

Camille Touton

Commissioner, Bureau of Reclamation

Camille Touton was sworn in as Commissioner of the Bureau of Reclamation on December 15, 2021. About five weeks later, on the one-year anniversary of her being named to the Biden-Harris Leadership Team, she graciously sat down with us. Here she discusses the many roles she has held in water management, the immediate challenges she confronted as Deputy Commissioner, and how improved data helps Reclamation operate and maintain its systems and continue to advance its mission.

You're from Nevada. Can you tell us about growing up there and how that impacted your career path?

I'm a military brat. We moved to Nevada when my dad was stationed at Nellis Air Force Base in Las Vegas. Immediately, part of the landscape is the Bureau of Reclamation with Hoover Dam and Lake Mead. Going out to Lake Mead to be on the water. Going on field trips as a schoolkid to Hoover Dam. And it really did influence me in ways growing up, but also with what I wanted to be and wanted to study. I went into engineering at the University of Nevada, Las Vegas. I spent my time working at the Southern Nevada Water Authority while I was going to school. So very much connected to the dynamics of water management from a local perspective, but also Southern Nevada's work with the LCB Region. It was always a goal of mine to be a part of this organization. And I'm humbled to be able to lead it.

What different roles have you held since joining the public service?

I started on the Hill working for my home senator, who at the time was Senator Reid. I had previously worked for a consulting firm in Nevada designing a golf course, the water portion of the course. I was asking questions like: "Why are we using the water? Who makes those decisions?" I had a great project manager who said, "Those are great questions. Those aren't the questions that we answer. My answer is 'Where is the best pressure? How can you build efficiencies?'" That made me want to pursue the policy side of the questions. So, I went to Senator Reid's office to go find those out.



Camille Touton, Commissioner, Bureau of Reclamation.

I moved to the House Natural Resources Committee. I worked on the Claims Resolution Act, which is a finalization of claims for the Taos and the White Mountain Apache along with the Aamodt litigation Pueblos and Crow Tribe, and which allowed for the creation of the Reclamation Settlements Fund. I also worked on omnibus legislation that had 10 or so Title XVI projects, when we were authorizing them one-by-one. I got to know the organization based on the laws that govern this organization.

It's been fascinating to be on the other side now, having to implement those things that Congress authorized. The Klamath Basin Drought Relief Act Fund. I worked on that in 2018. Never thought I would be the person to fund it. It was a pool of funding that we absolutely needed this year. That's what is fascinating: being able to build on that work and partnerships with our stakeholders with Reclamation and then implement those laws in ways that help us all.

Can you tell us more about specific tasks you've taken on within Reclamation?

When we work with irrigation districts, they'll talk about their board. My board is Congress. And we answer to the American people. When I sat as staff for the authorizing committees and the members of Congress and senators, my job was to understand how they were implementing the laws that were authorized, but also what was missing. What were things in their authorities that they absolutely needed to be able to do to carry out the mission?

Then I had 2.5 years where I worked in the Water and Science hallway for another different perspective. Being an advocate for Reclamation within the Department, across the Federal Government, and for Congress. But also not within that organization – sort of one step removed. Now, I am the lead advocate for Reclamation internally, externally, and wherever else they need me.

What have been the biggest takeaways for you after one year on the Department of the Interior's Biden-Harris Leadership Team?

We walked into a terrible hydrology. There was really no time for niceties. Within the California-Great Basin Region we have the Klamath Project. First zero percent allocation since 1908. That was tough. The Central Valley Project recently losing 800,000 acre-feet in inflow into our system on top of already poor 2021-2022 hydrology.

The same thing with the Colorado River. 1.5 million acre-feet between April 1st and May 15th. I knew a lot of people with the organization, but there's others who didn't know me. We had to look at each other and say we've got to do it. We've got to trust each other.

I'm grateful for the pros we have. Starting with the leadership team here in Reclamation. David Palumbo. Grayford Payne, the directors. But really it goes down to the area managers, the supervisors. Everybody just picked it up. And that on top of the uncertainty of the global pandemic. People being personally impacted. I walk into 2022 eyes wide open, recognizing that it could be just as hard, but feeling a little more comfortable because 2021 was one of those years where we needed to show up and do it. I'm excited to do some proactive good things instead of just reacting in the moment.

At your swearing in, Secretary Haaland mentioned how your water management experience would be essential to implementing the Bipartisan Infrastructure Law. What are the process and considerations to put such an unprecedented law into action while still meeting Reclamation's mission?

We have a lot that we need to accomplish in our day-to-day jobs. I see the Bipartisan Infrastructure Law as a complement to those efforts, including from the human capital perspective. One of the challenges, whether it's safety of dams, rural water, Title XVI



Commissioner Touton at her nomination hearing.



Commissioner Touton at her ceremonial swearing in by Secretary of the Interior Deb Haaland.

water recycling, is we've always had the ability to do more, but never had the resources to do it. And so now we have what's essentially equivalent to an additional year's appropriations to do that work, for five straight years. You can't talk about investment in infrastructure without investment in human capital to build the resiliency we need in the future. Part of it is having people say, "I want to work here. I see myself in this organization." The Infrastructure Law does allow us that flexibility to look at our human capital capacity and hire up. That is a huge priority for me.

Operations and maintenance have increased efforts to manage what we own, for instance, with the Enterprise Asset Registry and CARMA. What do you see as the benefits of improved asset inventory?

The biggest portion of our funding for the Bipartisan Infrastructure Law is \$3 billion for Aging Infrastructure. There is a constant question: What is the state of our fleet? And how are we managing that? Step one is understanding holistically what it is we own, where it is, and the condition it's currently in. To the extent that we have that transparency internally, it helps us to be more accountable internally but also externally. And it's a big step because we're geographically diverse with our infrastructure.

With advanced asset management systems, we can obtain more consistent data. How can Reclamation support this standardization bureau-wide?

With anything that's new, the challenge is process engagement and general policy. On this issue of standardization of data, there's consensus that it's a good thing. But if it isn't a ground-up sort of thing, it's harder to get buy in. It doesn't matter what good policy you have if people don't like the process.

When I was working in the Obama Administration, I worked on open water data. That was being able to take our data from facilities, plug it in, and have it be machine readable and compatible, so that it can talk to USGS data. Someone could take that data set and eventually come out with information, not just data sets. A good example is the Hydropower Institute in the Northwest. They're taking data at facilities and running it through a program to show when cavitation is happening because the most expensive part of hydropower outages are unplanned outages. If you can see that data set happening already, then you can know "I need to pull Unit 1 down now, repair it," versus "it's failing" and having no backup plan.

Engagement is key. There are differences in data quality. There are differences in how it's collected. But the bottom line is "here's where we want to get to, and we can help you with that."

With challenges as big as drought and climate change, how do you measure results, especially early in an administration?

What's often difficult about our jobs is our success is quiet. Think about infrastructure. We define success by how many pipes we put in the ground. How much concrete we place. A lot of that is unseen, but the benefits are realized. It's projects like the Navajo-Gallup Project and delivering water for the first time to communities that have never been served water in their homes. A lot of the challenges we have as an organization are the resources we provide the American people are expected.

This administration will have invested with the WIIN Act and our initial Bipartisan Infrastructure Law FY 2022 spend plan \$245 million for Title XVI water recycling, almost half a billion dollars in new storage, and the dam safety money that we have in the Infrastructure Law. These are significant investments moving the ball forward. Our partnerships – that's another way that I've measured success. There are partners who don't agree with some of the decisions I made, but they're still talking to me. And they'll still hear from me when those decisions are made and why. And, finally, it's the workforce. Defining success means when you talk about Hoover Dam, you're not just talking about the facility. You're talking about hundreds of people. Those things don't run themselves. And how do you set up the next generation of leaders for Reclamation who believe in this mission and can move it forward in a changing climate?

Your children were at your swearing in. How do you describe your work to them?

They are very young, so they don't quite understand it. I tell them that Mom helps to lead the organization that brings water to Grandma's house. That's a simplistic way of talking about our mission, but it boils down to what we do.

And they think I Zoom and talk to my friends all day. I caught my daughter saying, "Mom has anxiety when people waste water." She's not wrong. They hear the things you say.

What is something that readers might be surprised to learn about you?

I love fun facts. I love to use numbers in context. That comes from being able to relate our mission to other people. 800,000 acre-feet lost in the CVP in water year 2021 means nothing unless you say, "And by the way, that's almost a full capacity of Folsom." That's not just my professional life; I do it in my personal life. My friends will fun fact me all the time.

On my down time, it's with my children. And this is embarrassing, but I love to watch reality TV and HGTV. It gets my head reset. I think for everyone, you have to find places where you can sort of separate. For me right now, that's watching home remodeling, reading *Harry Potter*, and fun facts.



Commissioner Touton delivers an address from the studio.

Updates & Due Dates

2022 Review of Operations and Maintenance (RO&M) Workshop

The RO&M Workshop is a three-day seminar tailored to Bureau of Reclamation (Reclamation) operations and maintenance personnel and inspectors. Participants will bolster the skills and knowledge used to operate and assess Reclamation infrastructure ranging from dams to associated facilities of any type. This will be accomplished by presenting a mix of content including technical information, policy and procedures, best practices, and case histories.

What's New?

The 2022 RO&M Workshop is scheduled to be held virtually over Microsoft Teams from Tuesday, May 3, through Thursday, May 5, 2022.

Presentations Include

- Tunnel inspection
- Corrosion and Coatings and Cathodic protection training
- Round table discussion
- Concrete Repair Techniques
- Durango Pumping Plant major modification case history

Registration

If you have not registered, please visit “Find Learning” on DOI Talent and search for “Review of Operations and Maintenance Workshop” to locate and sign up for the seminar. There is no cost to attend. Registration closes Tuesday, April 12, 2022.

