2022 Annual Report

COLORADO
Division of Water Resources
Department of Natural Resources

Sheriff Reservoir, photo by Brian Romig

From the State Engineer

In 2022, I was reminded more than ever about the role the Division of Water Resources plays in ensuring that our Colorado water users can get the maximum beneficial use of their water right while not injuring others. This is such a well-worn phrase that it sounds unnecessary to say it out loud. But it is the heart and soul of what we do at the Division of Water Resources. I often substitute the term “best, most effective beneficial use” for “maximum beneficial use” to emphasize the fact that Coloradans need to be smart about how we use water so that Colorado can benefit to the greatest extent through the use of this natural resource. I'm also reminded of the fact that “injury” is such an important term because it reflects not just impact, but specifically, an impact to someone that is materially deprived of water to which they are legally entitled.

The importance of this is becoming increasingly evident due to the fact that we at the Division of Water Resources need to direct our attention toward evolving water law in Colorado more than ever. Colorado needs to adhere to our constitutional and statutory tenets, and at the same time consider how evolving water law attempts to address changing water needs and advance the way we perform water administration.

As I've addressed different groups in recent years, it’s relevant for me to talk about how water administration is asked to evolve according to changing water needs in Colorado. I've called that the nexus of water administration and water policy. I remind people that in Colorado we administer water rights according to the law, and when policy conflicts with that, we need the law to evolve by incorporating policy into the law. We do not have the authority at the Division of Water Resources to incorporate new concepts into our administration if those new concepts conflict with the law. If we do, the water users and the courts would quickly remind us of our role. I'm proud of the staff of the Division of Water Resources and how all of you do your job well to ensure that we administer water rights in a fair and equitable manner according to the law.

I note that many of the things we regard as fundamental aspects of current water law may have at one time been considered water policy that conflicted with proper water administration, requiring advances to allow the maximum beneficial use of water in Colorado. Before Colorado became a state, our territorial law defined *prior appropriation* as the way to administer water rights. “First in time, first in right,” was intended to address a competitive demand for water in a geographic area where agriculture, mining, and municipal use was developing in a desert climate. That may have been Colorado’s first policy decision that was incorporated into law.

Continued next page

State Engineer continued

Next, consider for example the fact that over 130 years ago, a party proposed to change the use of their water right to a new beneficial use while retaining its original priority. At the time, some may have argued that putting the water right to a new beneficial use would require a new appropriation, with a more junior date. To allow otherwise may have facilitated speculation. But the Supreme Court ruled that such a change could be made, retaining the original priority date, as long as there was an "absence of injurious consequences." This may have been an early example of incorporating policy into law.

Later, as Colorado struggled with administration of groundwater in the early part of the 20th century, we finally incorporated groundwater use into our surface water administration in 1965 and 1969. The outcome could have been that junior groundwater rights could not divert since they could not ensure their delayed impacts would not injure senior surface rights in an over-appropriated basin. Conceivably, that could have ended groundwater diversions. However, the General Assembly found a mechanism, the Plan for Augmentation, to allow groundwater diversions. The Plan for Augmentation is another example of how water policy was put into law, and we now regard it as fundamental to what we do. There are certainly many other examples of how policy initiatives became part of our fundamental law along the way.

With persistent drought that is becoming the norm, along with increasing types of demands for water, I know that Colorado will continue its efforts to advance its body of water law to meet these difficulties. At the Division of Water Resources, we can lend our skills and abilities to this statewide effort by, first and foremost, fulfilling our role as good, reliable water administrators that can inform the public of the criticality of good water administration. In that role, we can be the experts that advise those that wish to advance Colorado's efforts to use water differently as they try to put water policy into law. Playing this challenging, dual role is one of the many things we at the Division of Water Resources do so well.

Kevin Rein
State Engineer, Executive Director

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Upper Urad Dam Emergency Spillway, photo by Jim Kirch

Our mission:

The Division of Water Resources will administer the waters of the State to maximize lawful beneficial use, ensure that dams and water wells are properly constructed and safe, and provide information about water resources to the public.

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Our Programs

- Water Administration
- Dam Safety
- Hydrographic & Satellite Monitoring
- Hydrogeological Services
- Interstate Compacts
- Modeling & Decision Support Systems
- Water Supply
- Water Information & Data

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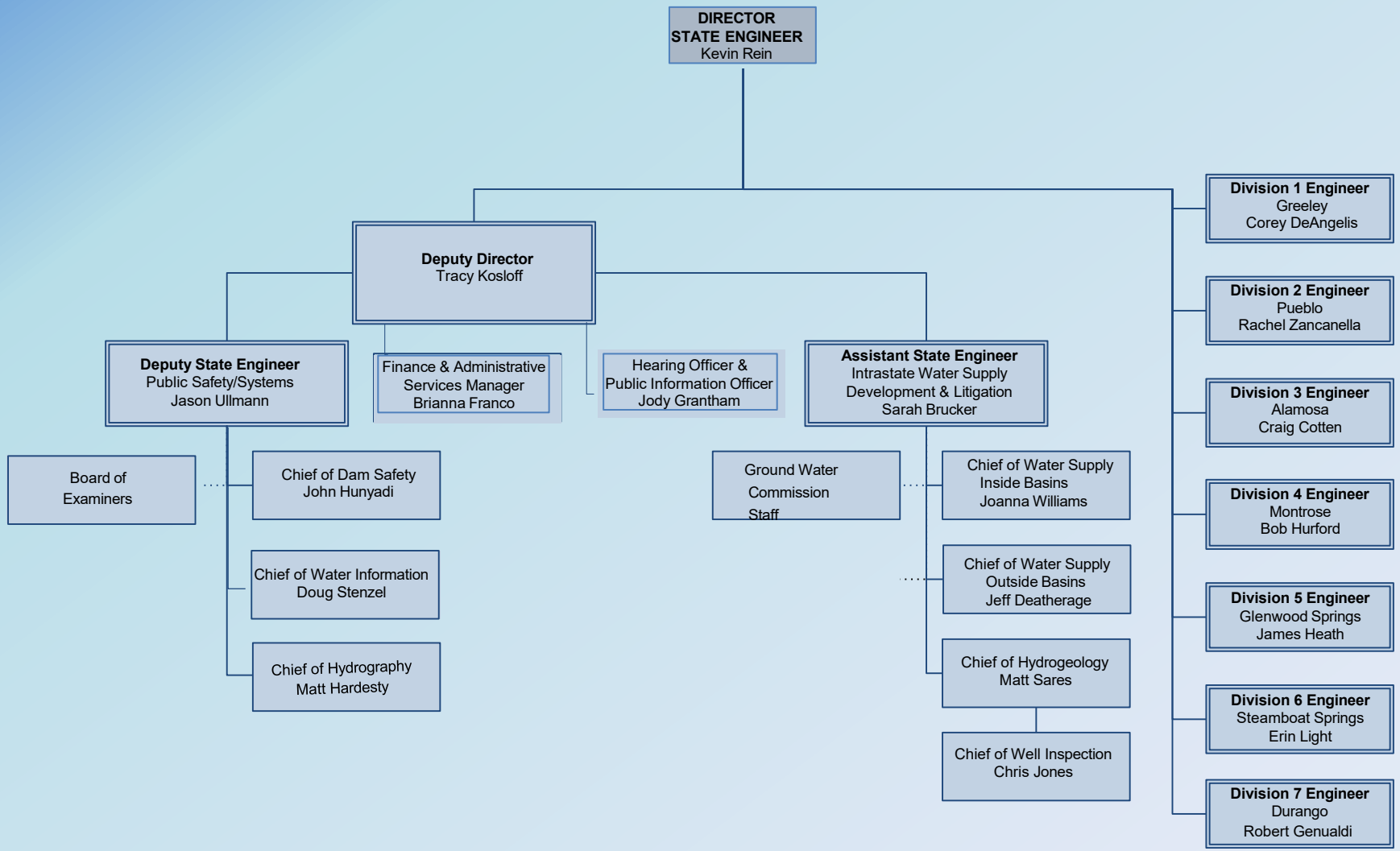
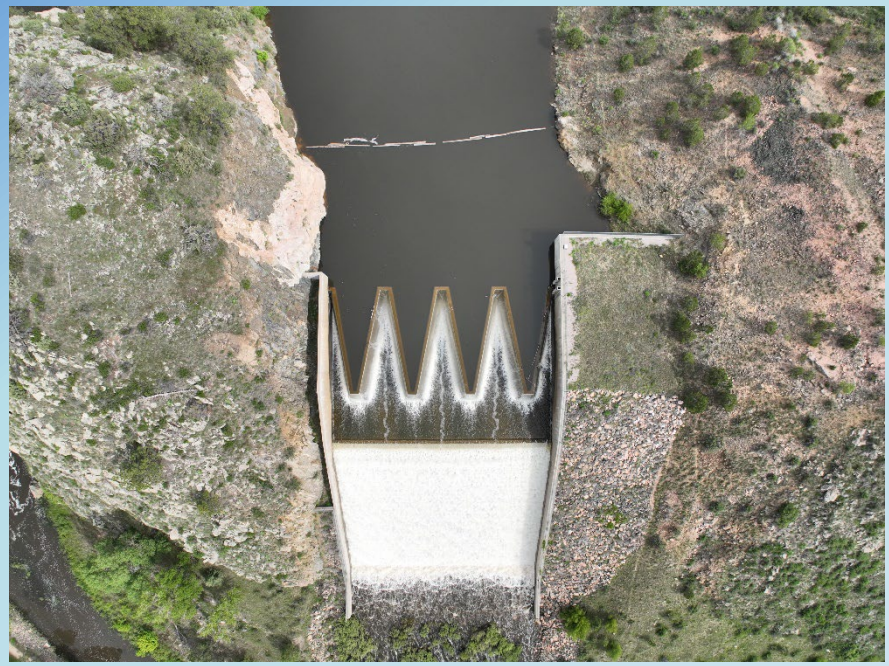
COLORADO DIVISION OF WATER RESOURCES
ORGANIZATIONAL CHART



August 2023

Colorado's Inventory of Dams by the numbers, 2023



Seaman Reservoir Spillway, Photo by David Bridge

High Hazard – ***457***

- Lives At Risk – 2.1 million, 36% of Coloradans
- Oldest – 1863. Newest 2022. Average 1945.
- 30 Restricted High Hazard Dams

Significant Hazard – ***275***

- 16 Restricted Significant

Low Hazard – ***1,958***

- 76 Restricted low

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Safe Storage Determination Activities

Inspection Performance
Calendar Year 2022

Risk Based Prioritization

- ***Focused*** effort on High & Significant Hazard Dams
- Dam Safety Mission Focus to Prioritize Public Safety
- ***571*** *Inspections Completed to Assess Safe Storage Conditions*

Dam Safety Inspection Completion Percentage for Number Due	Percentage
High Hazard	100%
Significant Hazard	100%
Low Hazard	35%

Dam Safety Percentage of Complete Emergency Action Plans with Inundation Maps	Percentage
High Hazard	99% (Up from 96% in 2022)
Significant Hazard	73% (Up from 68% in 2022)

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Hydrographic & Satellite Monitoring Program

Gibralter Ditch new headgate, photo by Brian Romig

Division							
1	2	3	4	5	6	7	Grand Total
1675	508	1295	98	109	50	163	3898

Streamflow Measurements by Water Division

•Hydrographic staff maintained and operated 700 sites including streamgages, gage infrastructure, and satellite monitoring equipment.

•Hydrographic staff published 205 final streamflow records.

•Hydrographers and water commissioners made 3,898 gage visits and discharge measurements in Water Year 2022.

• The Satellite-linked Monitoring System (SMS) continues to provide real-time streamflow and storage data from gaging stations across the State of Colorado.

•Implementation of the Aquarius software package for management of streamflow record calculations and review has begun. This Sofwater-as-a-Service will replace the in-house developed Colorado Hydrologic Management System (CoHMS) and should significantly improve DWR streamflow record production quality and efficiency.

•Expanded use of Acoustic Current Doppler Profilers (ADCP's) for more accurate, efficient and safe discharge measurements continues. DWR has almost completely replaced current meters with hydroacoustics (i.e. Flowtracker 2) for wading measurements.

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Hydrogeology Section Stats

The 2022 Numbers

Staff assistance:

- Aquifer determinations ► **843** (+10%)
  - top/base, saturated ft, hydraulic properties, lag depletions, return flow, etc
- Recharge pond reviews (HB-1013) ► **3** apps (-2)

Board of Examiners Support:

- Variances to Well Construction Rules ► **126** (+13%)

Groundwater Monitoring Program: ► **1351** (+15%)

- 6 Des. Basins, S. Platte, Denver Basin, West Slope, North Park (564 by DWR)

Permit Condition Amendments: ► **247** (+6%)

- Geophysical log waivers (210), aquifer depth (37)

Hydrogeology Section Stats

The 2021 Numbers (cont.)

Well Inspection Program

- Inspections ► **1467** (+24%)
- Complaints/Violations ► **25** (+67%)
- Hearings ► **1** (-67%)

Nontributary Initial Determinations (in process & completed)

- Water Court, Policy 2010-4, Produced Water ► **3** (0%)
  - +2 in preliminary discussion with Hydrogeo

COGCC UIC Review ► **3** (+2)

Rulemaking – Nontributary Groundwater Rules ► still on hold
- Well Construction Rules ► 2022-23

Michigan Ditch at Cameron Pass, photo by Corey Deangelis

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Interstate Compacts

Republican River

- Compact Use Rules in effect
  - Dry-up in South Republican area assistance
  - Enforcement of overpumping in progress
- Well Measurement Rules administration

Colorado River

- Drought
  - Slight relief during 2022-23 winter
  - Inflows and lake levels rise
  - Colorado creates drought task force
  - Negotiations continue
- Measurement rules filed in Water Court, Division 6

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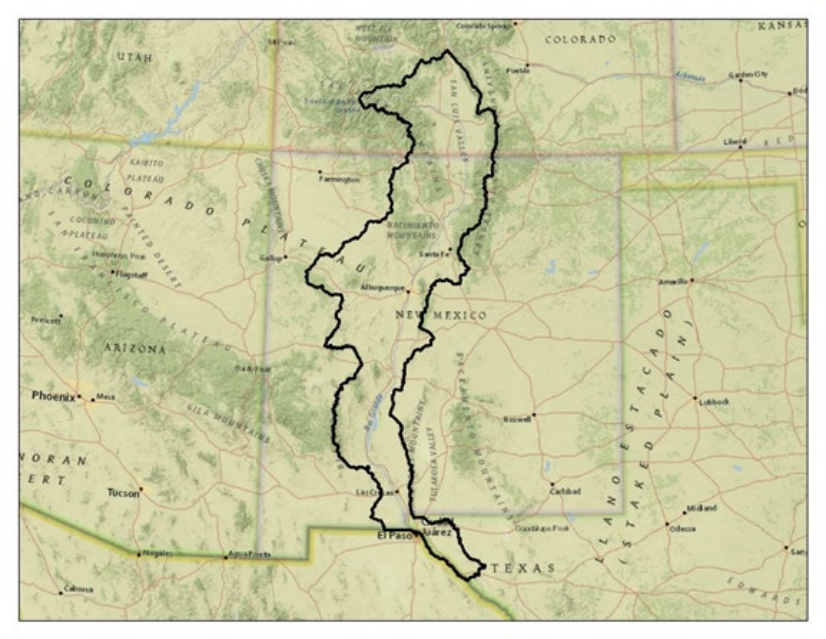
Interstate Compacts

- Rio Grande Compact
  - Litigation TX V NM & CO Original 141 (Ground water depletions) continues
    - Trial continued
    - Pending agreement before the Judge
- South Platte
  - Nebraska adopts Perkins County Canal Project Act, setting aside $574.5 million to build canal
- Federal
  - Waters of the United States revisions published January 2023, and in effect as of March 20, 2023, but not operative
  - Litigation continues



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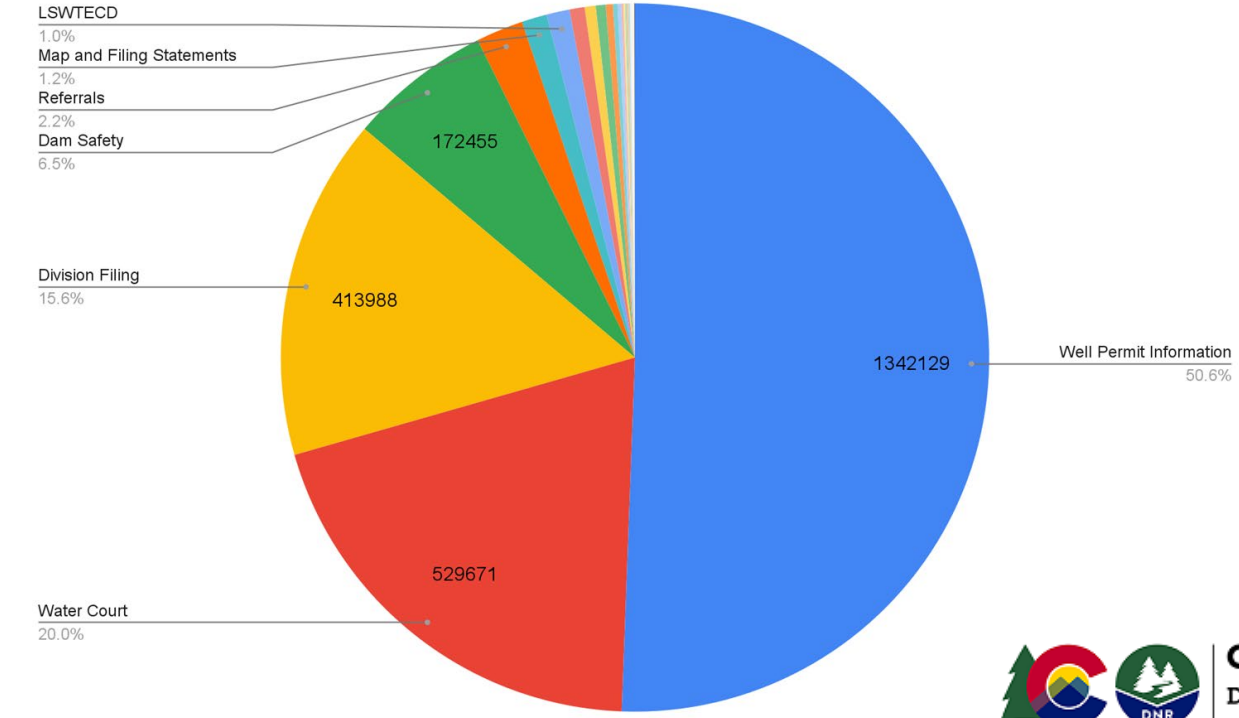
Seaman Reservoir Spillway,
photo by Brianna Krauser

Laserfiche Files Loaded 2022

	Total New Docs Added	Uploaded w/ HBDMC	Records
2022	89,939	58,063	31,876
2021	95,121	62,437	32,684
2020	99,998	45,960	54,038



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GIS 2022 Highlights

Irrigated Lands
- Republican, Rio Grande, Jackson County

RGDSS Revisions
- Continuing Well Research
- Irrigated Lands Updates
- Recharge Locations
- Canal Leakage

Statewide Canal Layer
- More data has been published…
- Div3 701 Individual Canals Delineated
- Dist47 450 Individual Canals Delineated

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Modeling 2022-23 Projects

RGDSS - Finalize Phase 7 Updates and potentially develop new response functions

ArkDSS - Complete ArkDSS STATEMOD model and develop Trinidad Reservoir Scenario

Colors of Water - Finalize Lower Arkansas River calibrations and scenario planner to design planned releases and exchanges; integrate Statewide ET dataset into Hydrobase for evaporation

Div2 HI Model - Continue development of tool to use provisionally published records in Hydrobase to directly build datasets

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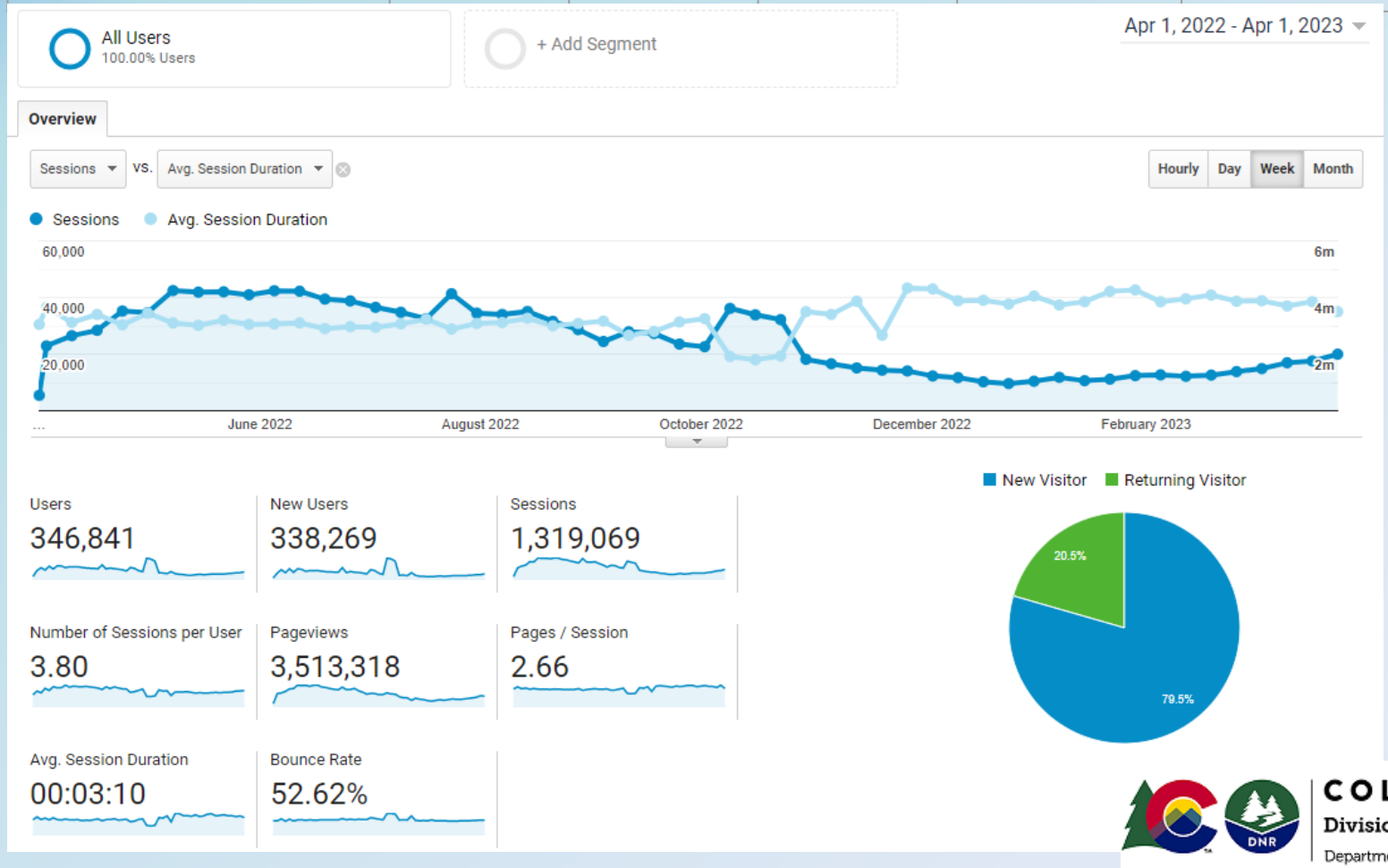
CDSS Online Analytics (Comparison)

dwr.state.co.us

Time Step (12 mo.)	Users	New Users	Sessions	Page Views	Session Duration
April 1, 2022 - April 1, 2023	346,841	338,269	1,319,069	3,513,318	3:20
April 1, 2021 - April 1, 2022	272,000	263,080	1,215,861	3,521,560	3:27



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Water Supply Branch

- Analyzed and approved 166 general Substitute Water Supply Plans (SWSPs) and 88 SWSPs for gravel pits
- Reviewed, analyzed, and provided 645 (up from 542 in 2021) comments to Colorado counties regarding the water supply for proposed subdivisions and other land use actions
- Received and acted on 8,480 well permit applications and processed 1,162 Monitoring Hole Notices, 5,968 Changes in Ownership/address, 4,396 Well Construction and Test Reports, and 4,293 Pump Installation Reports
- Issued thirteen (3) final permits, 178 determinations of water rights, 13 change application approvals and eight (8) replacement plans in designated basins.

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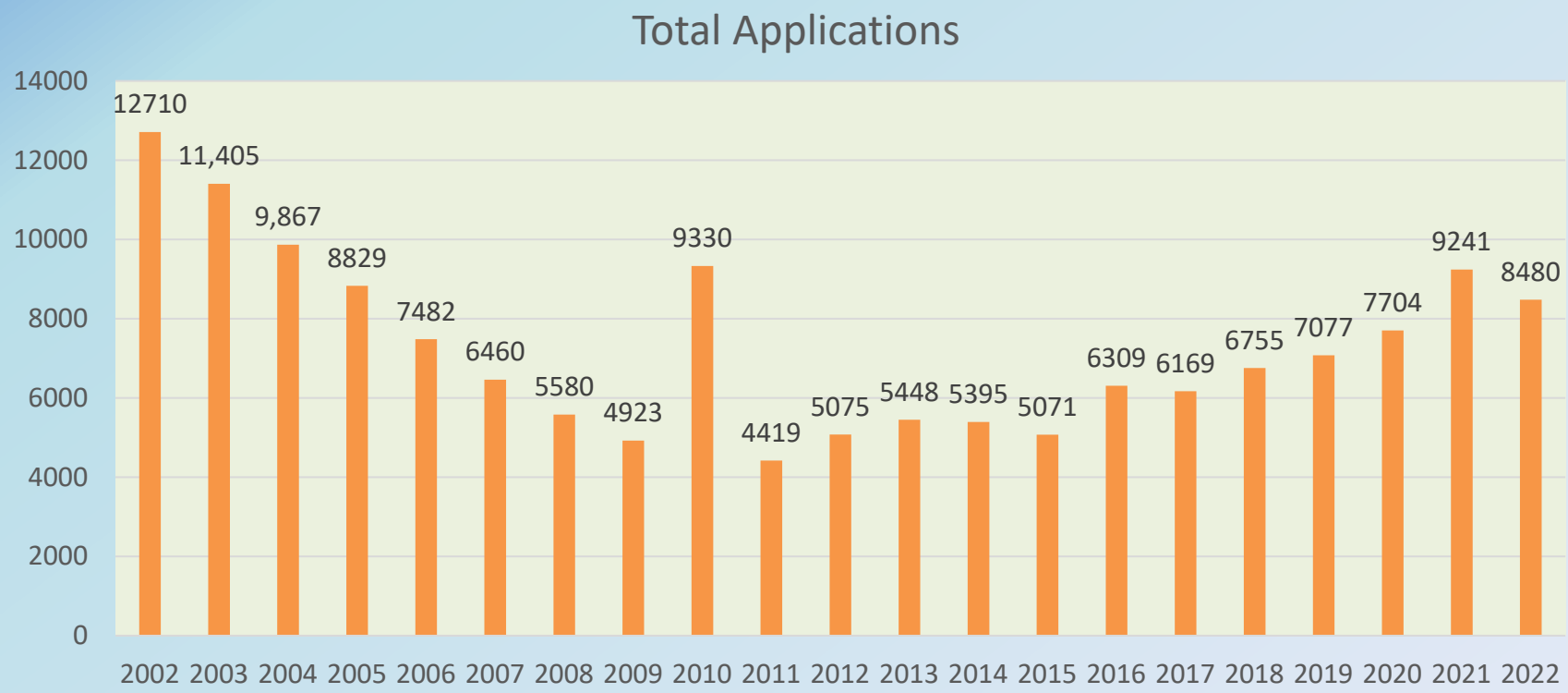
Well Permit Activity



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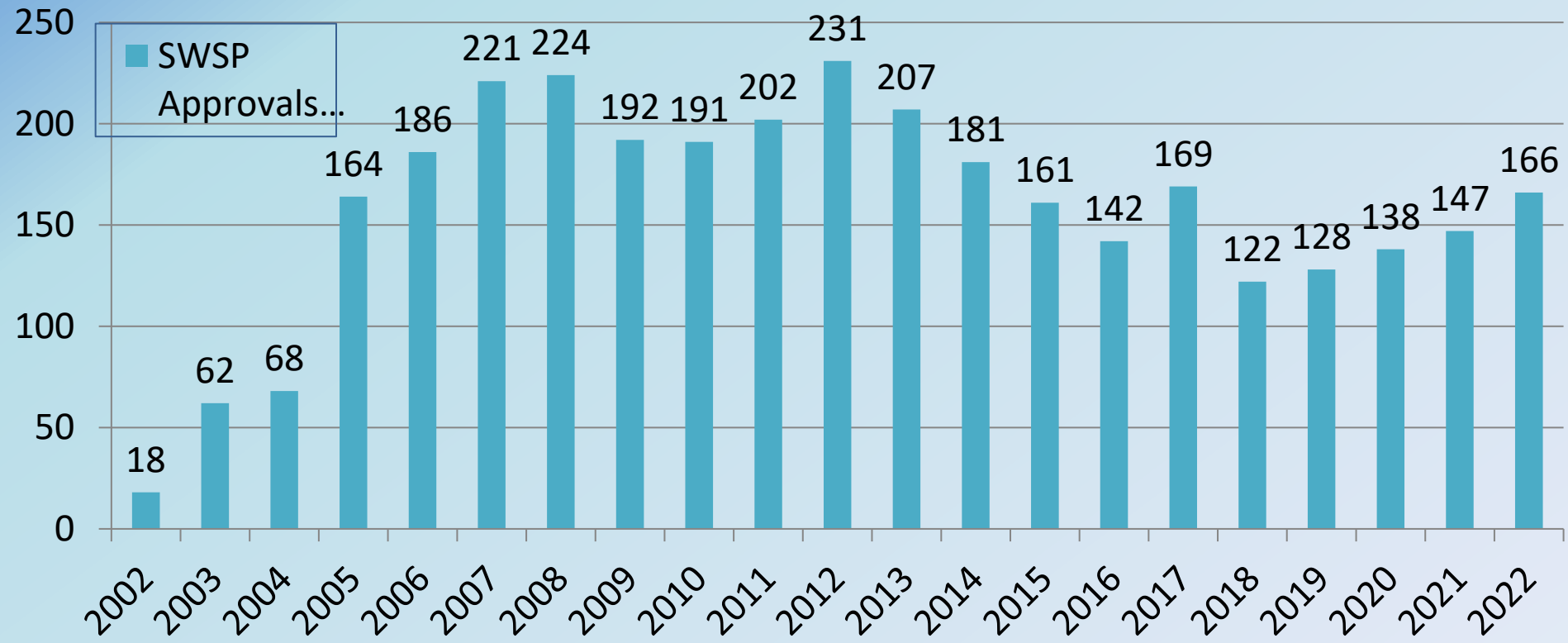
SWSP Activity



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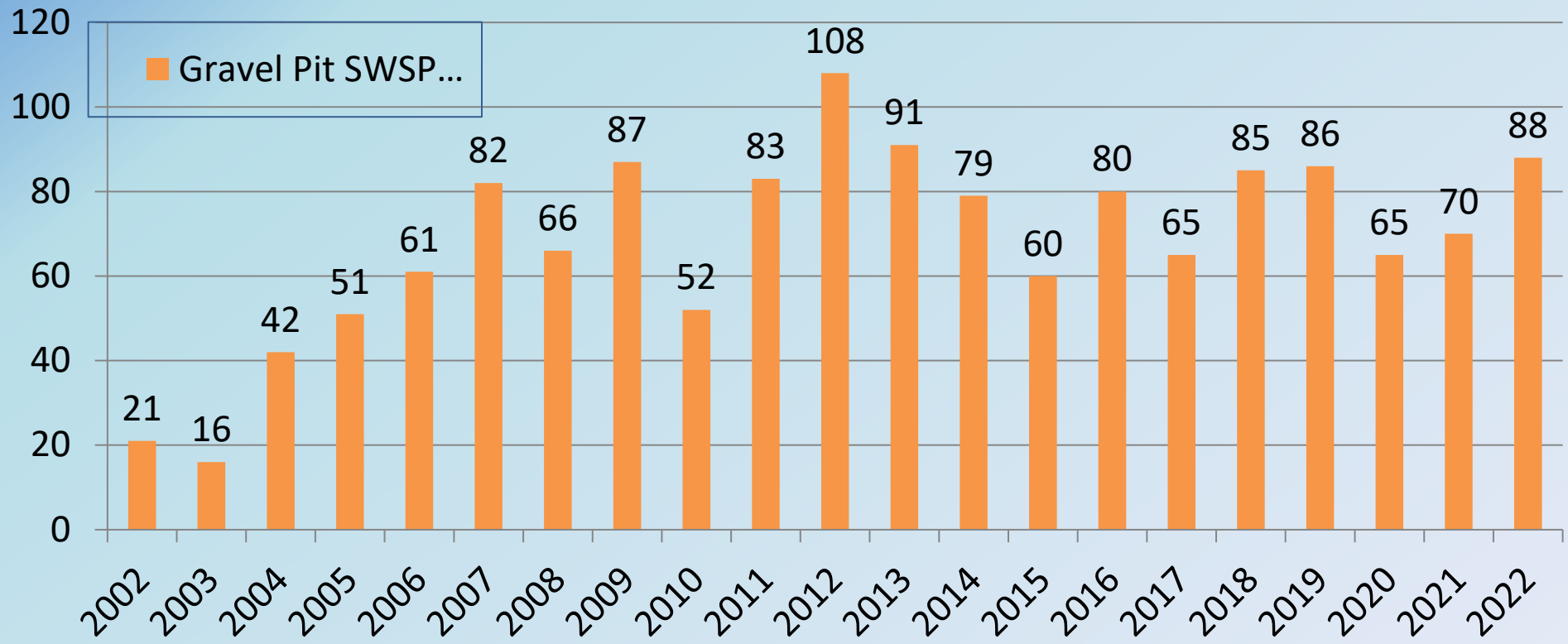
Gravel Pit SWSP Activity



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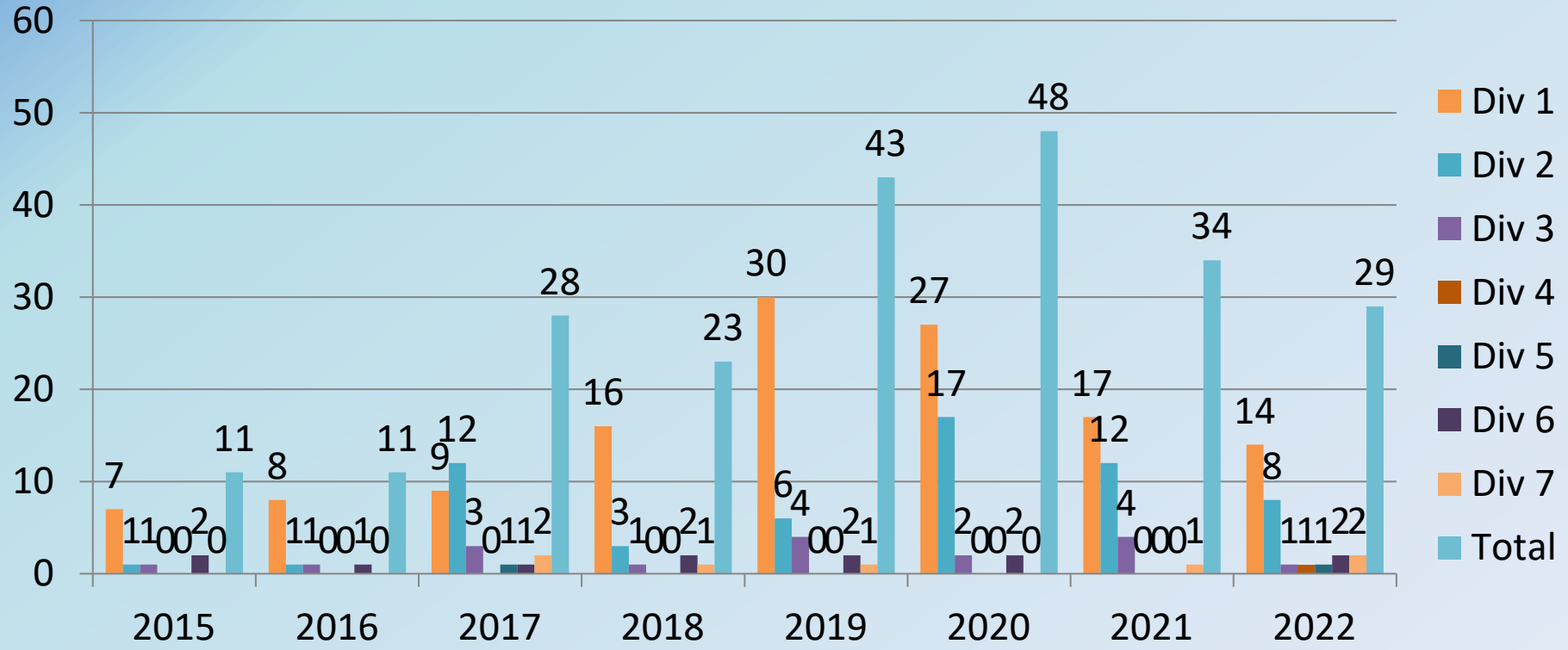
Resume Review –Statements of Opposition



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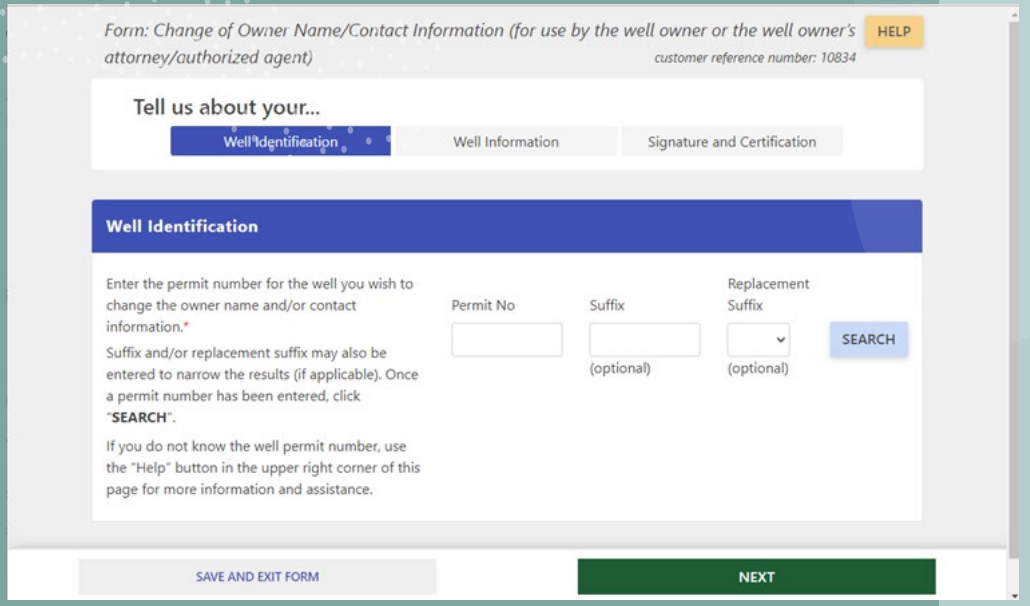
Water Supply Activities - eForms

Launched the eForms for Change of Owner Name for well permits on August 1, 2022. DWR stopped accepting the PDF version of this form (GWS-11) on October 1.



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South Platte River Basin Water Division 1

- There were a total of 165 days South Platte Compact Call during water year 2022, a significant increase in comparison to the 65 days of call during 2021.

- The South Platte Well Team continued its work with approximately 6,500 wells that fall within the scope of the South Platte Measurement Rules. The Team processed approximately 18,400 meter readings and published diversion records for 1,700 wells. The Team also conducted 52 installed flow meter verification field tests, processing 549 submitted measurement tests into DWR's database. Field inventory of approximately 730 wells and inspection for compliance of 308 wells filed as inactive in accordance with the Measurement Rules were also conducted. The well team certified 1 new well meter testers and recertified 14 certified well meter testers.

- The State Engineer's Republican River Compact Use Rules were approved by the Division One Water Court under Case No. 2019CW3002 on March 4, 2022. The rules allow the state to administer surface water and groundwater wells for compliance with the 1942 Republican River Compact.

- Republican River Well Team assisted the Designated Basins Team in the administration of well permit volume limits by investigating dozens of wells and posting and documenting Orders on 55 wells that exceeded their annual limitation in the 2022 Irrigation Year.

Moffat Tunnel Outlet
Photo by Russel Stroud

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Arkansas River Basin Water Division No. 2

- Water supply conditions in 2022 were below average within the Arkansas River basin and was considered a “Very Dry” year in the year-type calculations used in the basin for the 1950 period forward. 2022 ranked as the sixth worst year in the 73 year period.
- Pueblo Winter Storage…the final report for the period November 15, 2021 through March 14, 2022 showed a system grand total of 92, 219 acre-feet which was 8,551 acre-feet more than was stored in the previous year and 28,559 acre-feet less than the previous 20-year average.
- During 2021 the irrigation well pumping represented in the H-I Model totaled 54,748 acre-feet. For User Groups 1-14 (above John Martin Reservoir Area) the total pumping was 36,980 acre-feet and for User Groups 15-24 (below John Martin Reservoir) the total pumping was 17,768 acre-feet.
- 23 new augmentation plans were decreed during 2022, bringing the total to 785 plans within Div. 2

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Bill Tyner and Lonnie Spady with members of Otero Canal, photo by Rachel Zancanella

The Rio Grande Basin Water Division No. 3

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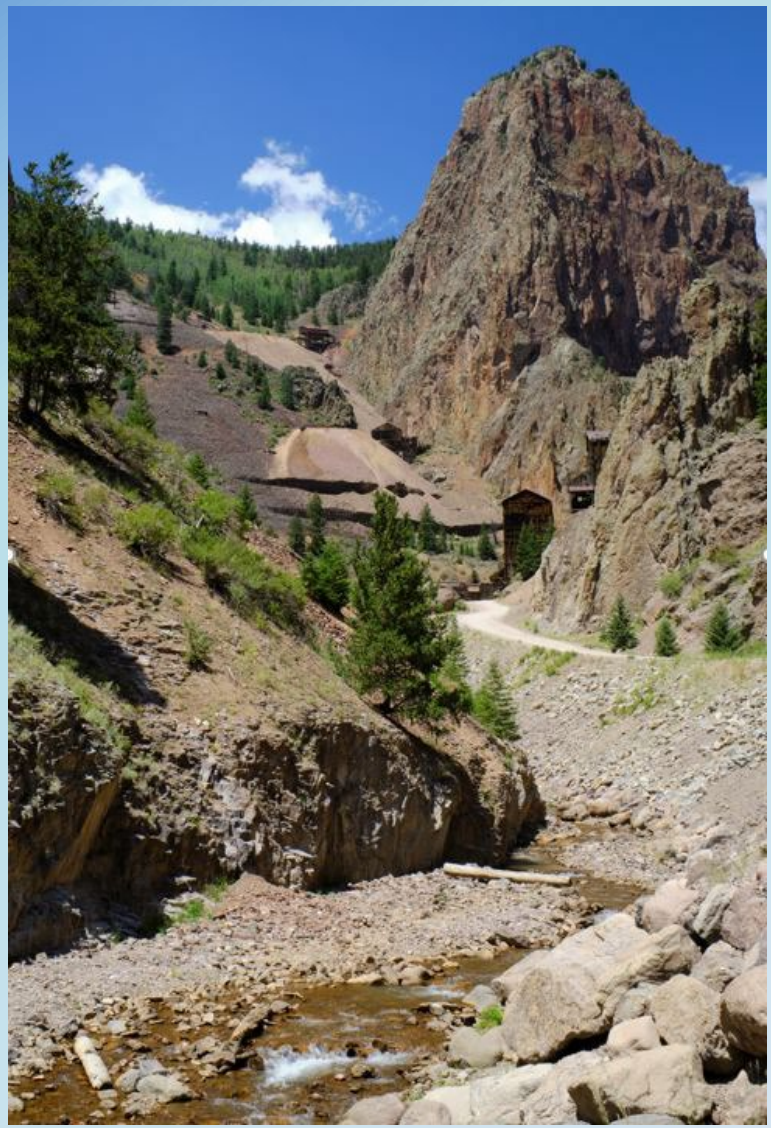

Silver mine above the Town of Creede, photo by Darin Schepp

- In 2022, the unconfined aquifer of the Closed Basin continued its decline. The aquifer lost approximately 50,000 acre-feet and approached the lowest level of storage since the study period began in 1976.
- Water year 2022 saw a near average snowpack that peaked at 101% of average.
- Most rivers and streams had annual streamflows ranging from 60-70% of normal due to winds and very low soil moisture.
- Actual water delivery at the state line was very close to compact obligations, resulting in an end of the year credit of 200 acre-feet for Colorado, compared to the 3,800 acre-feet debit from water year 2021.

The Gunnison River Basin Water Division No. 4

- 2022 snowpack conditions peaked at 100% basin-wide, however low soil moisture conditions resulted in an approximate 60% of average runoff.
- As in 2020, inflow to the Aspinall Unit (Blue Mesa, Morrow Point and Crystal Reservoirs) as of May 15, 2022 was 63% of the 30-year median seasonal average, categorizing the season as a "Moderately Dry" year.
- Water supply conditions continued to suffer on the Grand Mesa
- 296 total permits were issued during 2022 (down from 373 in 2021).

Bob Hurford and Tracy Kosloff at the Montrose and Delta Canal headgate on the Uncompahgre River

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The Colorado River Basin Water Division No. 5

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Colorado River upstream from Utah border, Photo by James Heath

- The 2022 water year began with storage in the basin's major reservoirs at about 166,000 acre-feet less than median and ended with significantly below average storage at about 26,000 acre-feet less than median.
- The 2022 water year ended with gaged flow for the Colorado River near Cameo ranking as the 12th driest year in 89 years of record (up from 2nd in 2021). The flow for the Colorado River near Dotsero ranked as the 13th driest in 81 years of record.
- The Shoshone Power Plant was offline 3 times during 2022 for inspections and repairs with the Shoshone Outage Protocol going into effect. Total calls at the plant were 251 days.
- A Cameo Call did not occur in April as in 2021. The initial call was place on July 30, 2022, and was on and off throughout the remainder of the irrigation season
- Well permitting activity was stead during 2022. 751 applications were received and 729 well permits were approved. Of those, 472 were production wells, 169 were monitoring/observation permits, 85 monitoring hole notices and 3 gravel pits.

The Yampa and White River Basins Water Division No. 6

Gardner Park Reservoir, Photo by Lauren Berrien, Engineering Technician

- In 2022, peak snow water equivalent (SWE) in the Yampa-White-Little Snake basins peaked on April 18 at 17.8 inches; while the median SWE based on the period 1991 through 2020 is 20.2 inches with the median peak occurring on April 8.
- Peak SWE in the Laramie-North Platte basins peaked on April 2 at 20.8 inches; while the median SWE based on the period 1991 through 2020 is 23.3 inches with the median peak occurring on April 23, 2022.
- The Yampa River did not go on call as in 2021. Calls did occur throughout Division 6 during 2022 and the complete list of calls ca be found on the Decision Support System (CDSS) website.
- In irrigation year 2022, 476 well permits, including monitoring/observation wells, were issued. This is a significant increase from previous years due to the designation of the Yampa River in March 2022 as over-appropriated. People who had existing unpermitted wells or uses were allowed to apply for permits untill December 31, 2022.
- Measurement Rule were filed in the Division 6 Water Court on October 28, 2022. Seven protests to the rules were filed and a five-day trial is currently scheduled to begin on February 26, 2024.

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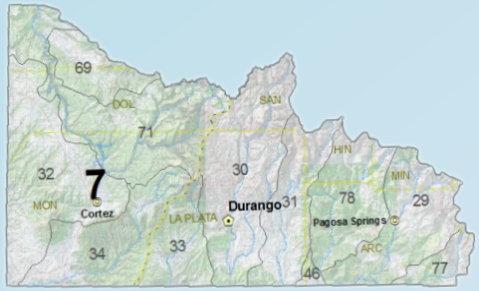
Animas and La-Plata River Basins Water Division No. 7



- As in water year 2021, snowpack in the San Juan and Dolores River Basins during the winter of 2021-2022 (Water Year 2022) was slightly below average. Monsoon rains provided a critical source of water to irrigators and reservoir operators during the year.

- The same monsoon rains allowed for many of the junior water rights to remain in priority, a welcome change from many of the previous years. There were 164 administrative calls placed on 11 different stream systems during the year.

- 313 well permits were issued. Of those, 228 were residential well permits, 45 were general purpose well permits, one permit was a geoexchange system loop, two were for gravel pits, 20 were monitoring holes (notice of intents), 16 monitoring/observation wells, and one rooftop precipitation collection system were issued.

- New Mexico placed a call on March 16 for half the flow as measured at the La Plata River at Hesperus gage, up to a maximum of 100 c.f.s.

- Long Hollow Reservoir, with a capacity of 5,300 a.f. contained 0 a.f. at the start of the water year. It filled to 796 a.f. on March 17 and fell back to 0 a.f. on October 18, 2022.

Monsoon rains South of Hesperus, photo by Shannon Manfredi

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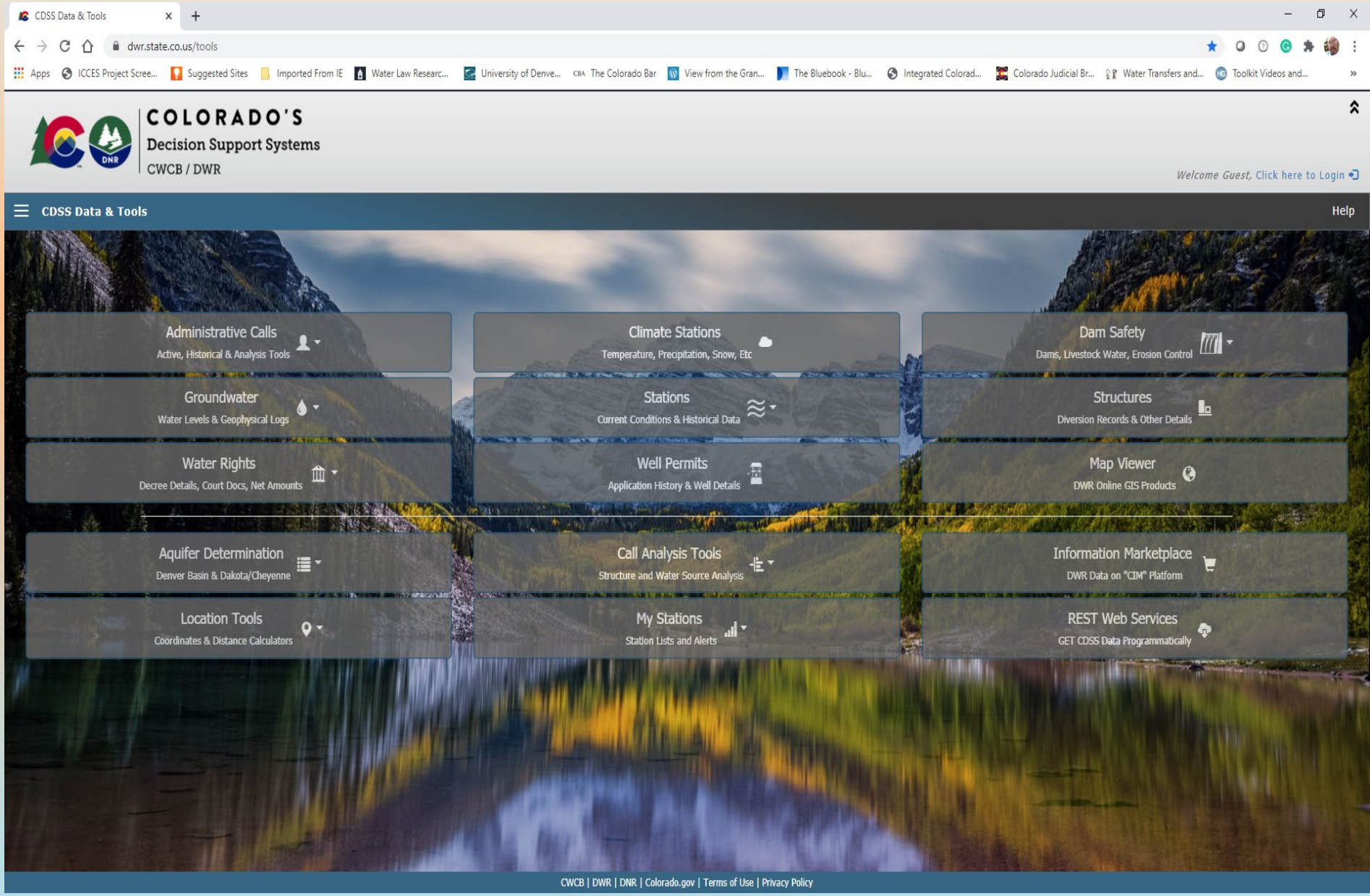
Snake River, Water District 36, Photo by Matt Weisbrod

Colorado's Decision Support Systems Site



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For detailed field office and branch reports please visit imaged documents, Publications and Reports
at: https://dwr.colorado.gov/

Munroe Diversion Structure, photo by David Bridge