

**HB 1036 – Water Trading Work Group  
Minutes of  
October 22, 2018, Meeting  
Troutman Sanders Building, Richmond Virginia**

**Work Group members present:**

HRSD, Jamie Mitchell  
King George County, Eric Gregory, Hefty, Wiley & Gore  
Western Tidewater Water Authority, Chris Pomeroy, AquaLaw  
Eastern Shore Groundwater Committee, Britt McMillan, Arcadis  
Mission H2O/Troutman Sanders, Shannon Varner  
Virginia Tech, Kurt Stevenson  
DEQ, Scott Kudlas  
VDH, Office of Drinking Water, Aaron Moses

**Work Group members absent:**

Aqua Virginia  
Newport News Waterworks  
Middle Peninsula PDC  
Virginia Farm Bureau  
Virginia Well Drillers Association  
VDH, Office of Environmental Health Services  
Virginia Economic Development Partnership

**Interested parties attending:**

Juan Silva, VCU Environmental Science major  
David Jurgens, City of Chesapeake  
Whitney Katchmark, HRPDC  
Christopher Gill, Christian & Barton/ Norfolk  
Brandon Bull, DEQ

**HB 1036 overview/ Trading Work Group organizational matters**

- The meeting began at approximately 2:10 with Work Group members and others in attendance introducing themselves.
- Shannon Varner provided an overview of HB 1036 continuing the Trading Work Group efforts, provided an overview of the agenda and related materials, and discussed organizational and procedural matters. It is the intent to work toward consensus and if consensus cannot be reached, that all views be represented in any final report.
- The Work Group nominated and confirmed Shannon Varner as Work Group chair.

## **City of Chesapeake ASR Experience**

- David Jurgens, Director, Department of Public Utilities, City of Chesapeake, provided an overview of the City's experience with injection and banking (slides attached).
- David discussed the need for regulatory stability in the injection process and that there will be limited willingness to invest without a regulatory framework.
- David discussed the history of Chesapeake's groundwater withdrawal permit and the changes made by DEQ regarding the volume of injected groundwater that would be available for withdraw. Originally, 100 percent of groundwater injected by Chesapeake was available for withdraw, currently Chesapeake is permitted to use 3 years' worth of storage for withdraw. That equates to a loss to the City of 2.5 billion gallons of water.
- David also noted that the City is considering whether to continue injection or not, noting that the limited allowed withdrawal may not justify the expense of permitting and maintaining the system.
- David discussed Chesapeake's needs for banking and that a short-term program would be insufficient for Chesapeake since its needs are mostly driven by episodic droughts.

## **Trading Work Group Discussion on Needs, Goals, and Concerns**

- Based on David's presentation, the group had a general discussion of the needs for banking and the current technical limitations to developing a trading framework.
- The group discussed the need for banking in the EVGWMA to promote economic development.
- The group discussed with DEQ what it means to be in compliance as it relates to degradation in head pressure and how a trading program in gallons could be matched up with pressure.
- DEQ noted that the regulatory program is based on head, not volume.
- The group discussed an example of an injection to facilitate a withdraw some distance away. DEQ has conducted modeling that indicates that a 10 million gallon per day (mgd) injection in James City County could allow for a 2.5 mgd withdrawal in West Point after 5-7 years of injection. Increased withdrawals may be available following a longer injection period.
- This example led to a discussion of the model capabilities and how to account for the impact existing permitted withdrawals, proposed withdrawals and unpermitted withdrawals may have on two parties seeking to trade (i.e., the two parties being in this example - one party injecting in James City County and the second party wishing to gain the benefit of that injection through a withdraw in West Point). Current modeling methodology would look at modeled head and make decisions on a permit amendment or new permit request based on the head including the injected water.
- The discussion continued regarding the ability of the current model to segregate or "wall off" injected water so that the head impact of a permitted withdrawal or potential new withdrawal could be determined with and without the influence of the injected water. This could be a potential mechanism to allow those who inject water to trade with those wishing to obtain the benefit of the injected water.

- The group discussed the potential to break down the EVGWMA into regions to simplify trading and account for the impact of injections spatially within the aquifer.
- The group noted that injections in certain areas have less of an impact on the aquifer than injections in other areas, making it challenging to ascribe the same value to all injections.
- The group agreed that it would look at simple scenarios (injection and withdrawal in the general vicinity) and then more complex scenarios in future discussions.

#### **Discussion on additional analysis and information needs helpful to the Work Group**

- Kurt Stephenson led a discussion on identifying gaps in existing information and analysis that, if addressed, could be beneficial to the work group in better understanding how to build a trading program.
- Kurt discussed spatial (the distance from an injection point withdrawal may be appropriate) and temporal (the period of time after injection withdrawals may be appropriate) issues and recognized a need to conduct research into how, or if, other states have approached these issues.
- Kurt committed to researching other state's programs including programs where a compensation structure exists and how an injector preserves the benefits of their injection in the program.
- The group discussed the benefit of learning more about current model capabilities and the James City to West Point model run. DEQ agreed to discuss with its contractor whether a presentation could be made to assist with this request.

#### **Discussion of next steps**

- The Work Group discussed options for how frequently the group should meet based on a Final Report due July 1, 2020.
- The meeting adjourned at approximately 4:50.



# City of Chesapeake Aquifer Storage Experience



22 October 2018

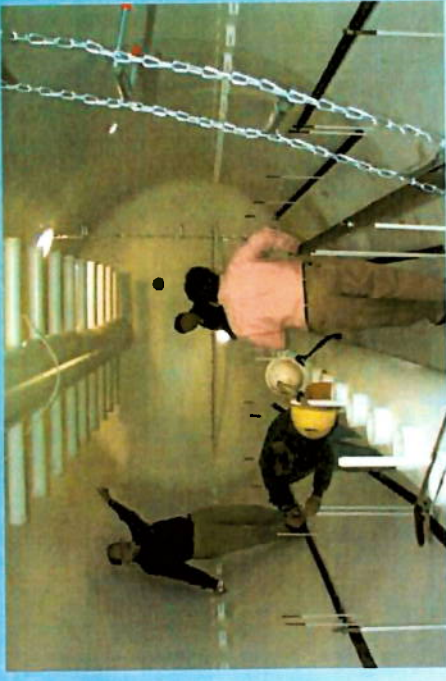
**Chesapeake**  
VIRGINIA





## Aquifer Storage and Recovery

- ASR Benefits Aquifer
- Storage Benefits Chesapeake
- Permit Issues with DEQ





## Groundwater Permit History

- 1991 Permit 100% of All Groundwater Injected
- 2003 Permit 100% of All Groundwater Injected
- 2017 Permit 3 Year's Worth of Storage
  - Retained Rights to  $\approx$  750 MG of storage
  - Lost Access to  $\approx$  2,400 MG of storage



# COMMONWEALTH of VIRGINIA

## PERMIT

### TO WITHDRAW OR ENLARGE WITHDRAWAL OF GROUNDWATER (FOR USE IN GROUNDWATER MANAGEMENT AREAS)



Pursuant to the authority granted by Sections 62.1-44.100 and 62.1-44.93, Chapter 3.4, Title 62.1 of the GROUNDWATER ACT OF 1973, as amended, the STATE WATER CONTROL BOARD hereby grants this PERMIT to

Name City of Chesapeake, Department of Public Utilities  
Address Deep Creek Ground Storage Tank Site  
P. O. Box 15225  
Chesapeake, Virginia 23320

effective 9/23/91 (date), in order to acquire or enlarge a use of ground water, to the extent and manner described below:

existing use authorized by State Water Control Board PERMIT or CERTIFICATE is zero (0) gallons per day; acquired or enlarged use authorized under this PERMIT shall be no greater than amount of water stored gallons of ground water per day, with the following conditions and/or restrictions: See attached conditions and limitations

for a grand total use not to exceed the gallons of ground water stored stored in the aquifer.

9/23/91

Withdraw the gallons of groundwater stored in the aquifer.

A. This permit allows the City of Chesapeake to withdraw up to the total volume the City has stored in the aquifer at the Deep Creek Ground Storage site. The only additional pumpage allowed would be test pumping necessary for the design of the ASR well as described in the July 9, 1991 application.



COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
PERMIT

GROUNDWATER WITHDRAWAL PERMIT  
FOR USE IN GROUND WATER MANAGEMENT AREAS

Permit Number: GW00143900  
Effective Date: November 1, 2003  
Expiration Date: October 31, 2013

Pursuant to Section 62.1-256 of the Ground Water Management Act of 1992 (Chapter 25, Title 62.1 of the Code of Virginia) and the Ground Water Withdrawal Regulation (9 VAC 25-610.10 et seq.), the STATE WATER CONTROL BOARD hereby authorizes:

Permittee: City of Chesapeake  
Dept of Public Utilities  
Address: P O Box 15225  
Chesapeake, Virginia 23024  
Facility: Northwest River Water Supply System

To withdraw and use ground water in accordance with this permit and the application received December 22, 2000 and subsequently amended.

The permitted withdrawal will supplement the raw water supply of the Northwest River Water Treatment Plant, provide chloride mitigation at the treatment plant and satisfy requirements of the Safe Drinking Water Act. Finished water from the treatment plant will be distributed as a public water supply to the City of Chesapeake and stored for future distribution as injected water in the Western Branch Aquifer Storage and Recovery well. Other beneficial uses are not authorized by this permit.

**November 1, 2003**

**And stored for future distribution as injected water in the . . . ASR well.**



**July 21, 2017**



COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
**PERMIT**

TO WITHDRAW GROUNDWATER IN THE  
EASTERN VIRGINIA GROUNDWATER MANAGEMENT AREA

**Permit Number: GW0043901**

**Effective Date: July 21, 2017**

**Expiration Date: July 20, 2027**

Pursuant to Section 62.1-256 of the Ground Water Management Act of 1992 (Chapter 25, Title 62.1 of the Code of Virginia) and the Groundwater Withdrawal Regulations (Regulations) (9VAC25-610-10 *et seq.*), the State Water Control Board (Board) hereby authorizes the Permittee to withdraw and use groundwater in accordance with this permit.

Permittee City of Chesapeake Department of Public Utilities

Facility Northwest River Water Supply System

**From July 21, 2014  
through the current  
permit term**

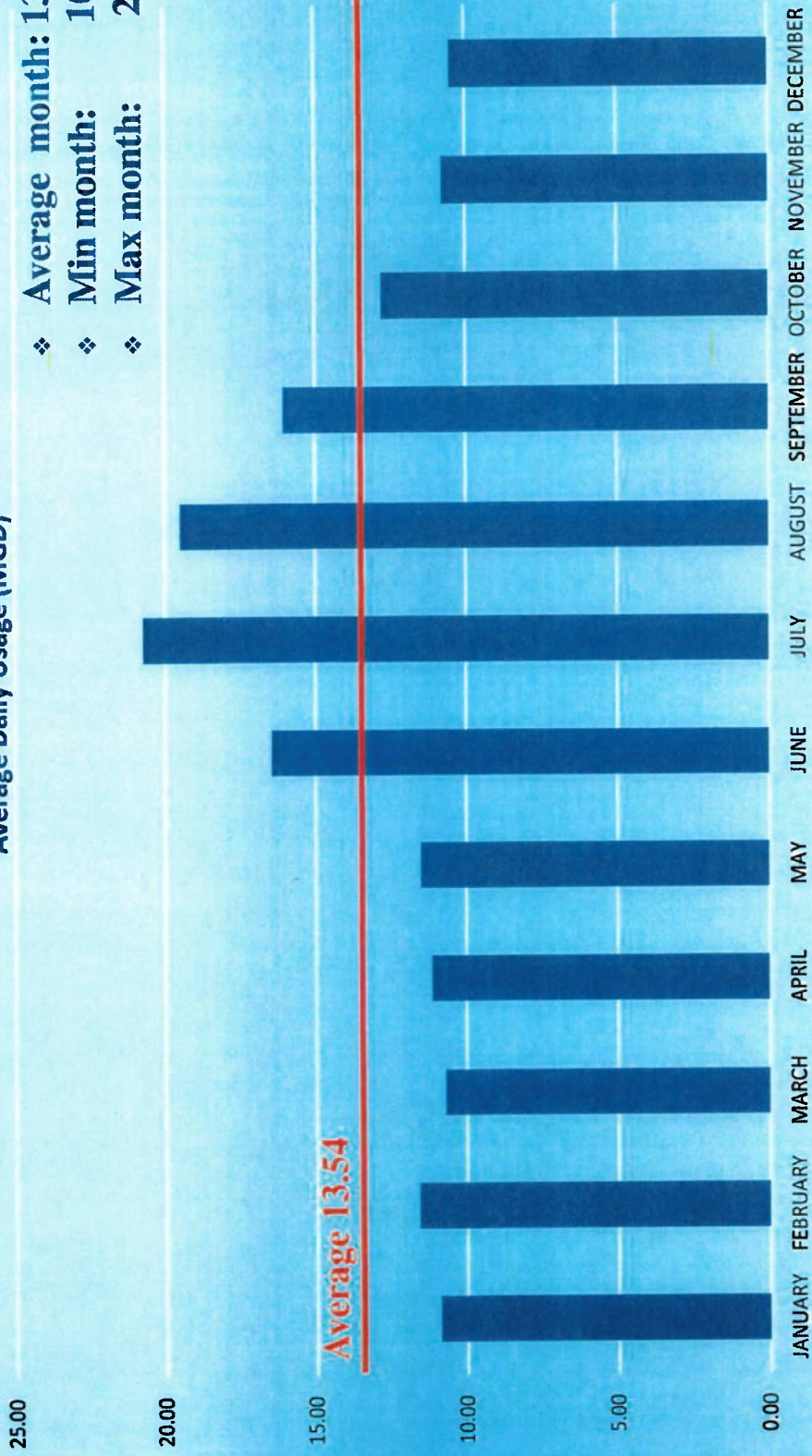
**D. Aquifer Storage and Recovery**

1. In addition to any other withdrawal limits provided, the permittee may withdraw up to 3,000,000 gallons per day from the Western Branch Well Field from the cumulative volume stored in the aquifer at the site. For all intents and purposes of this permit, the cumulative volume stored shall be defined as the total volume injected into the WB+ ASR Well (DEQ Well Number 234-00208) from July 21, 2014 through the current permit term minus the total volume withdrawn from the injected volume during the same time period. The Western Branch Well Field is defined as Wells WB 1 (DEQ Well Number 234-00188), WB 3 (DEQ Well Number 234-00200), and the WB + ASR Well (DEQ Well Number 234-00208).

# Seasonal Banking

Average Daily Usage (MGD)

- ❖ Average month: 13.54 mgd
- ❖ Min month: 10.5 mgd
- ❖ Max month: 21.1 mgd





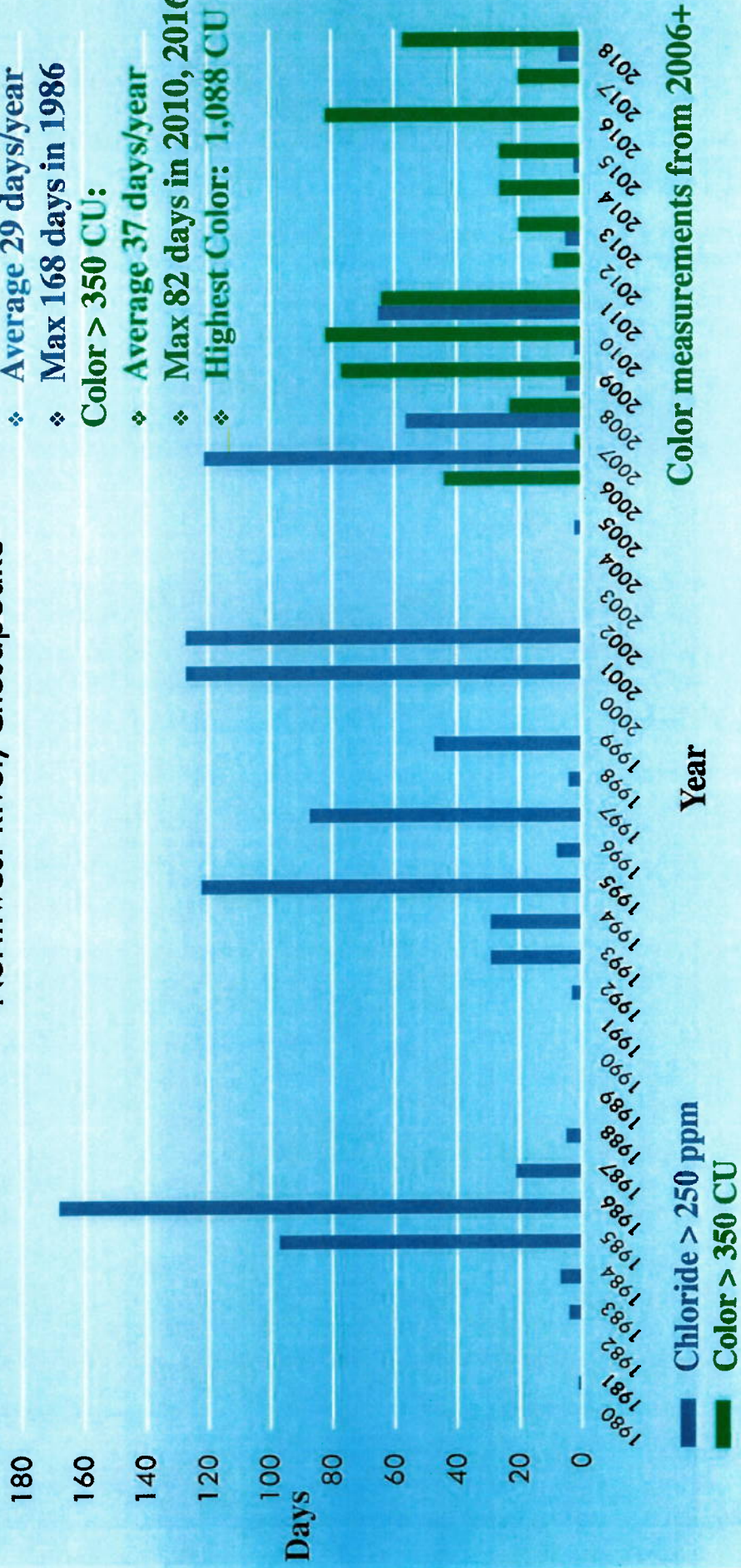
# Long-Term Banking

## Northwest River, Chesapeake

### Northwest River Water Quality

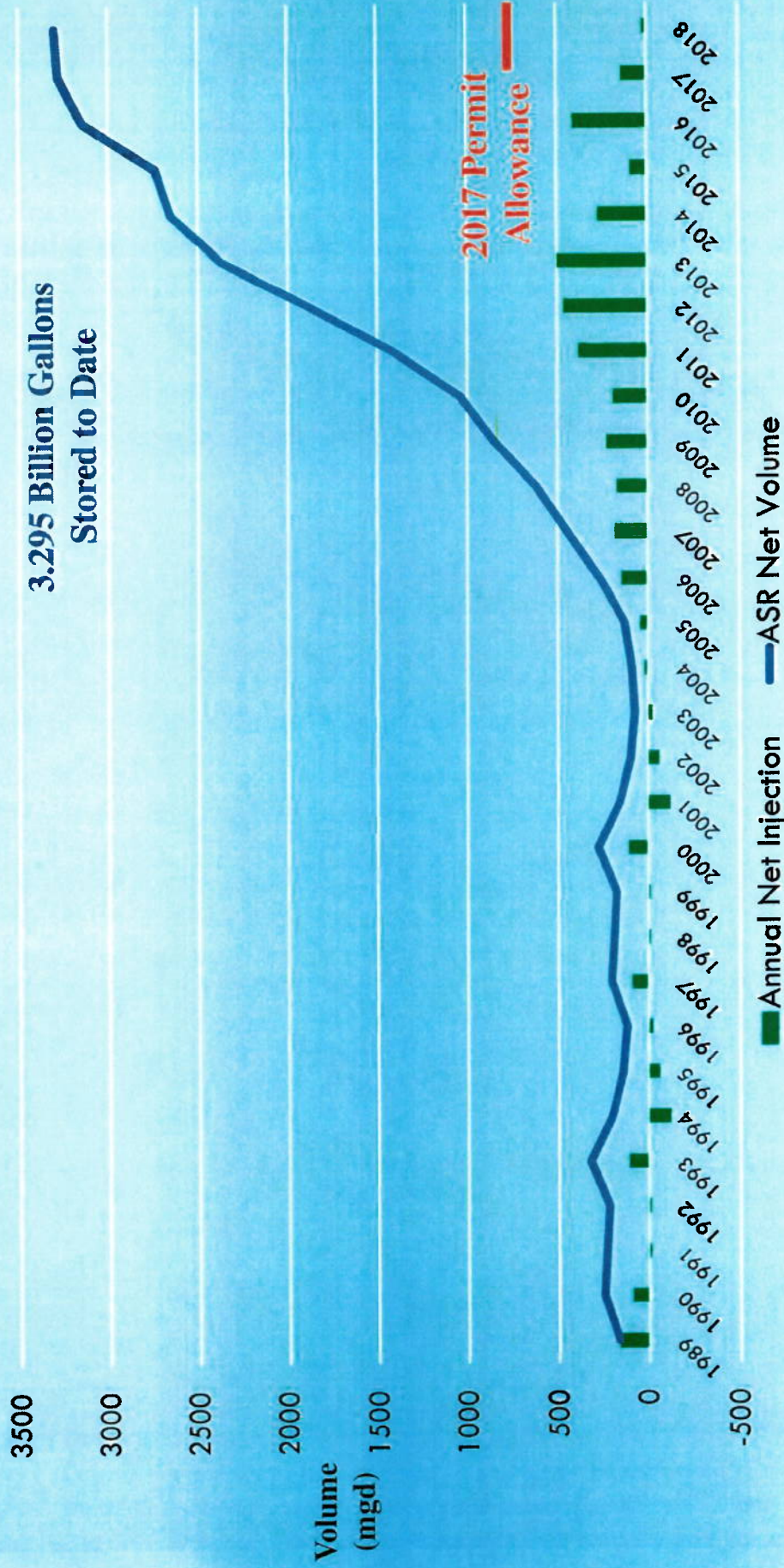
#### Chloride > 250 PPM:

- ❖ Average 29 days/year
  - ❖ Max 168 days in 1986
- #### Color > 350 CU:
- ❖ Average 37 days/year
  - ❖ Max 82 days in 2010, 2016
  - ❖ Highest Color: 1,088 CU





# Aquifer Storage and Recovery



3,295 Billion Gallons  
Stored to Date

2017 Permit  
Allowance



# ASR Injection Aquifer Impact, Water Level

