

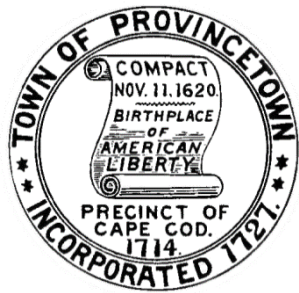
**TOWN OF PROVINCETOWN  
DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

Town of Provincetown & Truro, Massachusetts  
Select Board Joint Meeting  
Monday, October 24th, 2022



## Water System Update





**TOWN OF PROVINCETOWN  
DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

## **TOPIC OUTLINE**

- Department Overview
- Drought Declaration and Current Conditions
- Pumping Trends – 2022
- Current & Future Projects
- Future Growth & Expansion - Water Demand Forecasting



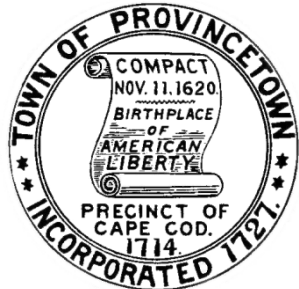


## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### PROVINCETOWN WATER DEPARTMENT: “AT A GLANCE.”

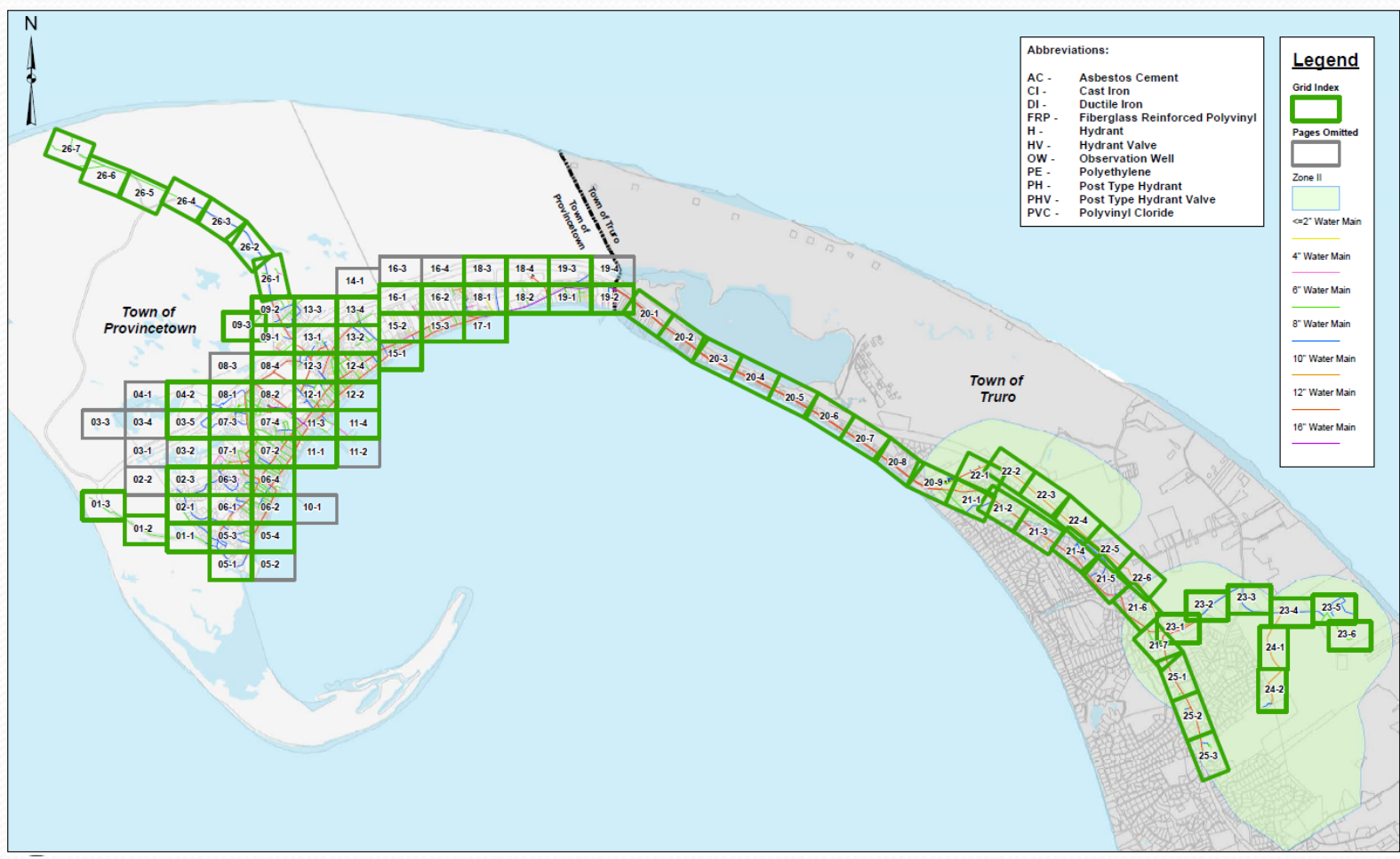
- “The Town of Provincetown Water Department operates and maintains a total of three groundwater sources located within the Town of Truro: the Knowles Crossing Wellfield consisting of three gravel packed wells, the Paul Daley Wellfield consisting of six active gravel packed wells, and the North Union Field Well Site consisting of two gravel packed wells.
- Two water treatment facilities; a 1.2 MGD membrane filtration facility and a .734 MGD corrosion control facility.
- The water distribution system consists of approximately forty-five (45) miles of water mains;
- One booster pump station
- Two (2) water storage tanks totaling 6.4 millions gallons;
- Two hundred ninety-one (291) fire hydrants;
- Nine Hundred Sixty (960) gate valves;
- Four thousand seventy-four (4,074) service accounts.



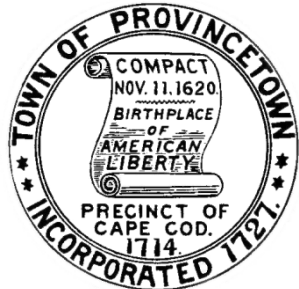


# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## PROVINCETOWN WATER DEPARTMENT: “AT A GLANCE.”

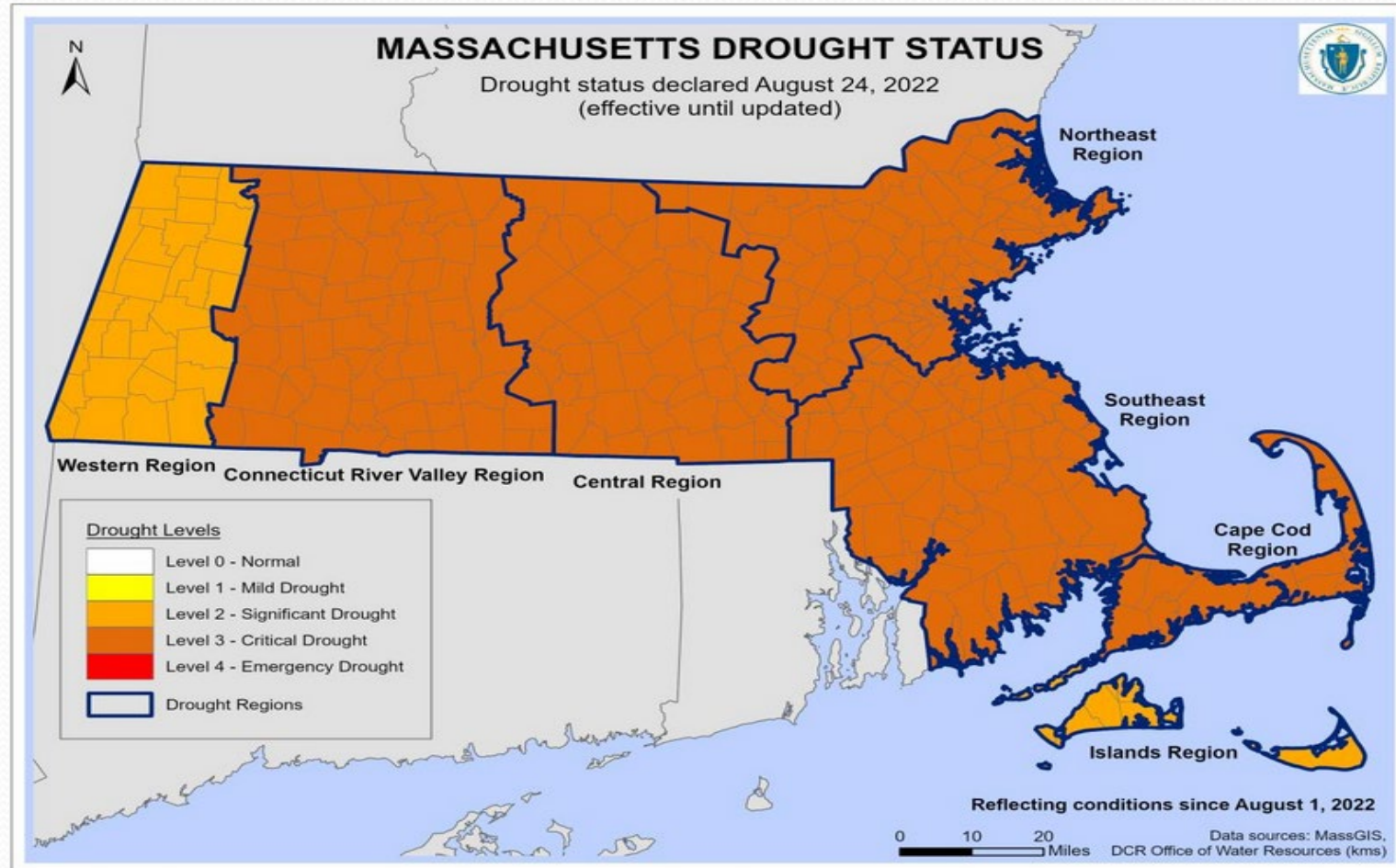






## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### Level 3 – Critical Drought Declaration





**TOWN OF PROVINCETOWN  
DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

## **Level 3 – Critical Drought Declaration**

With the risk of wildland fires increasing due to below average precipitation across the state, Energy and Environmental Affairs (EEA) Secretary Beth Card today declared that the **Cape Cod Region** will join the Connecticut River Valley, Southeast, Northeast, and Central Regions as a **LEVEL 3 – CRITICAL DROUGHT**. From August 1, 2022, to August 22, 2022, rainfall ranged mostly between 0.5 inch to 1 inch across the state, with a few localized higher and lower totals. Precipitation numbers are trending below average for the month of August. The Cape Cod, Islands, and Western Regions of the state were most impacted by the lack of precipitation. Additionally, since the onset of the drought, regions are experiencing between a four and ten inch deficit in precipitation.

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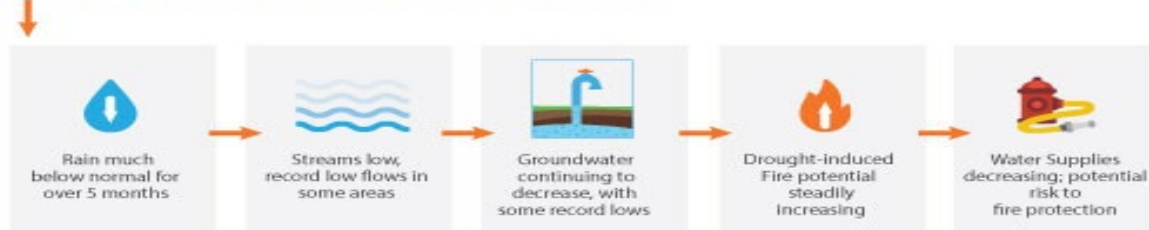


## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### Level 3 – Critical Drought Declaration



#### What does this mean?



#### What you can do!



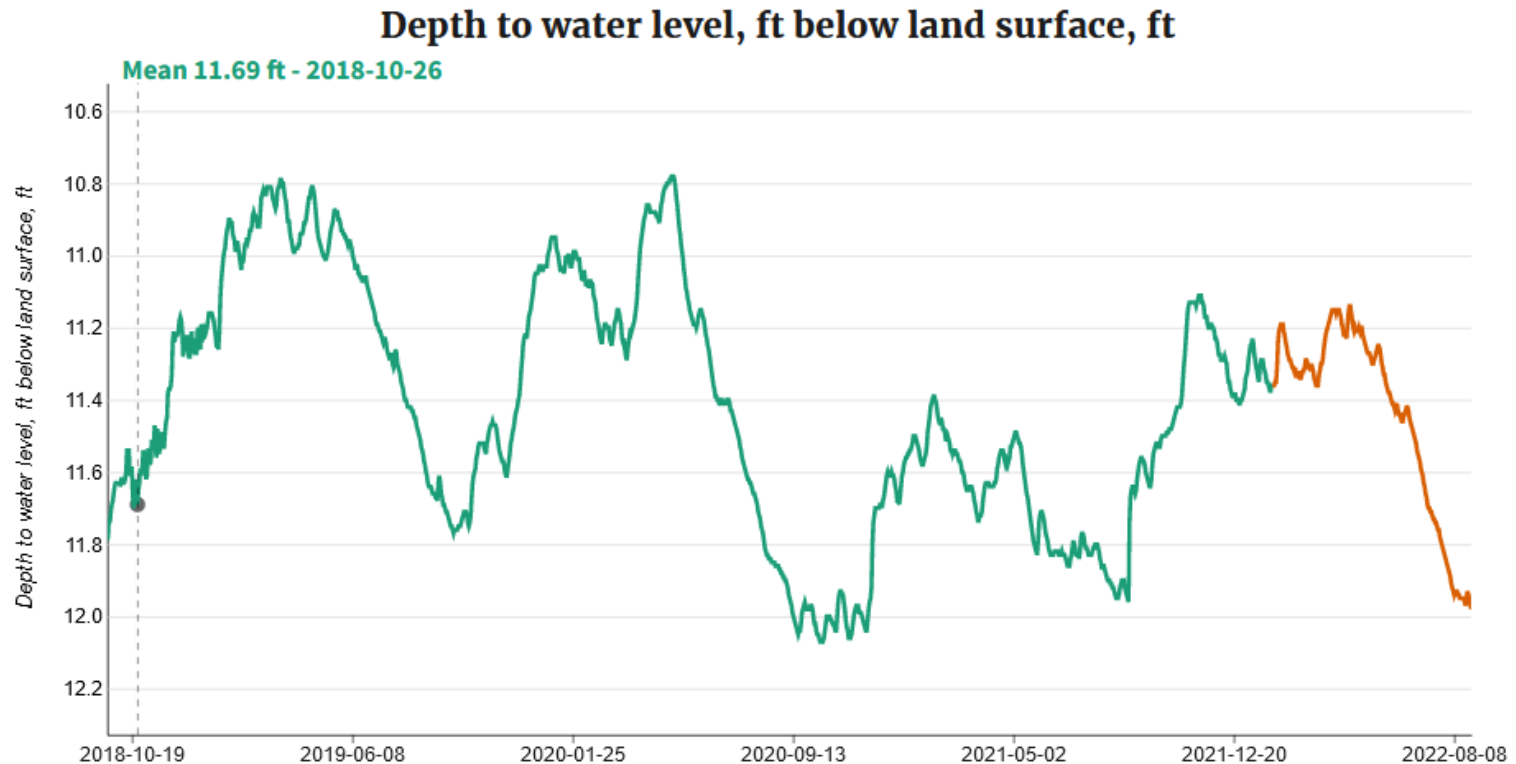
Learn more at [www.mass.gov/ma-drought-management](http://www.mass.gov/ma-drought-management)





## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### Level 3 – Critical Drought Declaration







## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### Level 3 – Critical Drought Declaration

Depth to water level, ft below land surface, ft

Mean 11.78 ft - 2014-11-16



7-year trend



**TOWN OF PROVINCETOWN  
DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

## **Level 3 – Critical Drought Declaration**

- Provincetown Water Dept. initiates non-essential water use restrictions on a seasonal basis in order to limit overall demand on the system and maintain our withdrawal permit.
  - Normally, restrictions begin June 1<sup>st</sup> and run until Oct. 1<sup>st</sup>
  - Per MassDEP permit, if USGS monitoring well assigned to us hits trigger levels for 30 consecutive days beginning in March AND a drought advisory of higher is declared by the task force, restrictions could begin May 1<sup>st</sup>.
-





## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

# Level 3 – Critical Drought Declaration

### WHAT ARE ESSENTIAL OUTDOOR USES?

Essential uses, as defined by MassDEP, are required for: 1) health and safety; 2) by regulation; c) for the production of food and fiber; 3) for the maintenance of livestock; 4) to meet the core functions of a business

### NON-ESSENTIAL USES ARE THOSE OTHER THAN ESSENTIAL!

#### Information for Private Well Owners

During a drought, wells and reservoirs can drop to low levels because there is less water to draw from the ground. Your water supply will be affected if the drought continues.

Any water conservation efforts you make can have a great benefit on your own water supply, and the community's water supply. If you follow town restrictions and conserve water appropriately, you will help your community to have enough water for fire protection (the likelihood of fires increases as conditions get dry), public health and safety, and the environment. To help, you can:

- Be mindful of the amount of water you use
- 
- Follow the same water restrictions that your city or town is following

Remember, even if you have your own well, it almost always still comes from the same source as the public water supply, as long as you are in the same river basin. Water conservation measures are critical and should be started early. Reducing your water use can save water for the future!

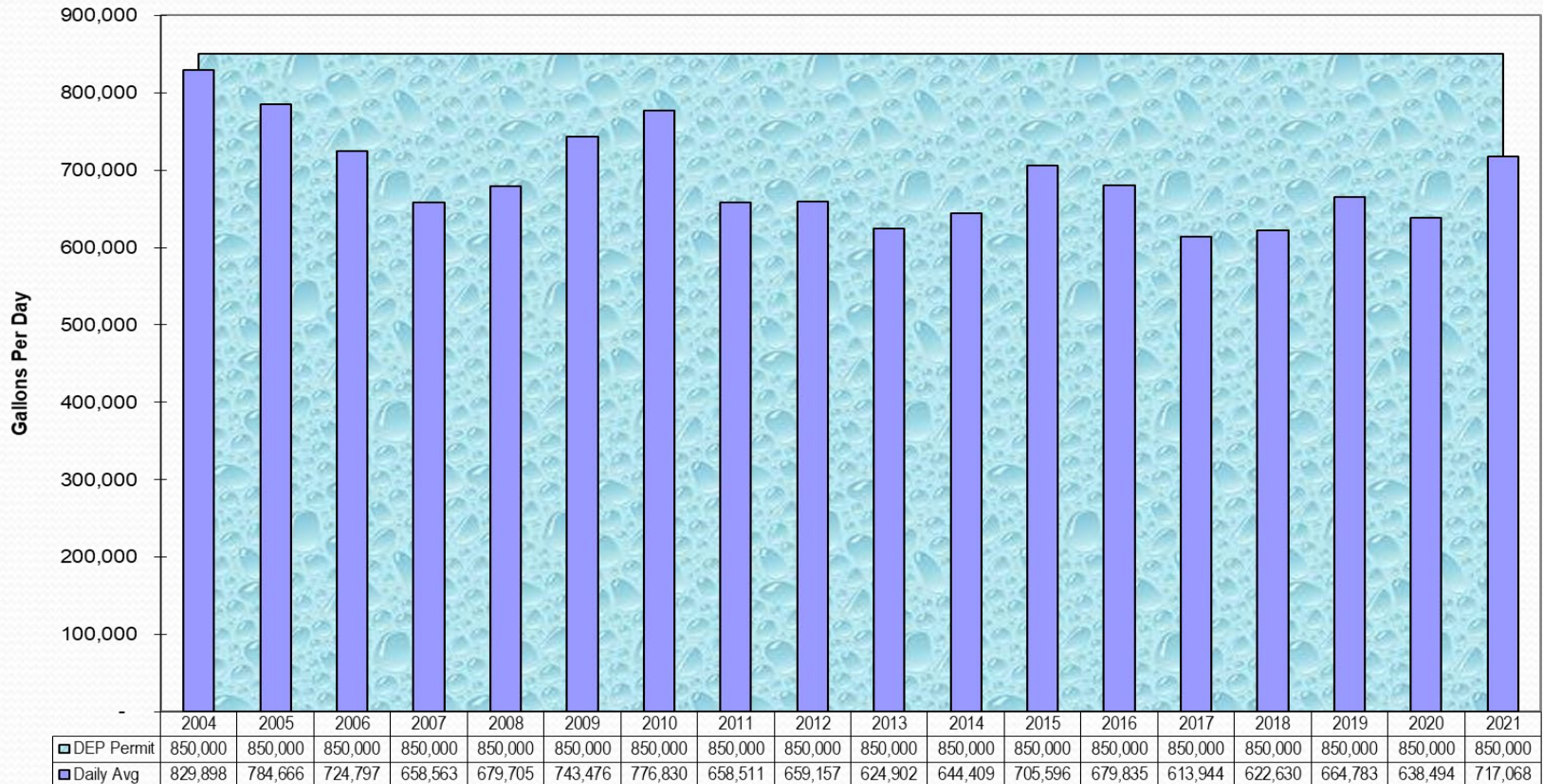
You can get more information about your well from your local Board of Health.



# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## Water Withdrawals & Production

**Provincetown Water System  
Average Daily Water Withdrawal 2004-2021**



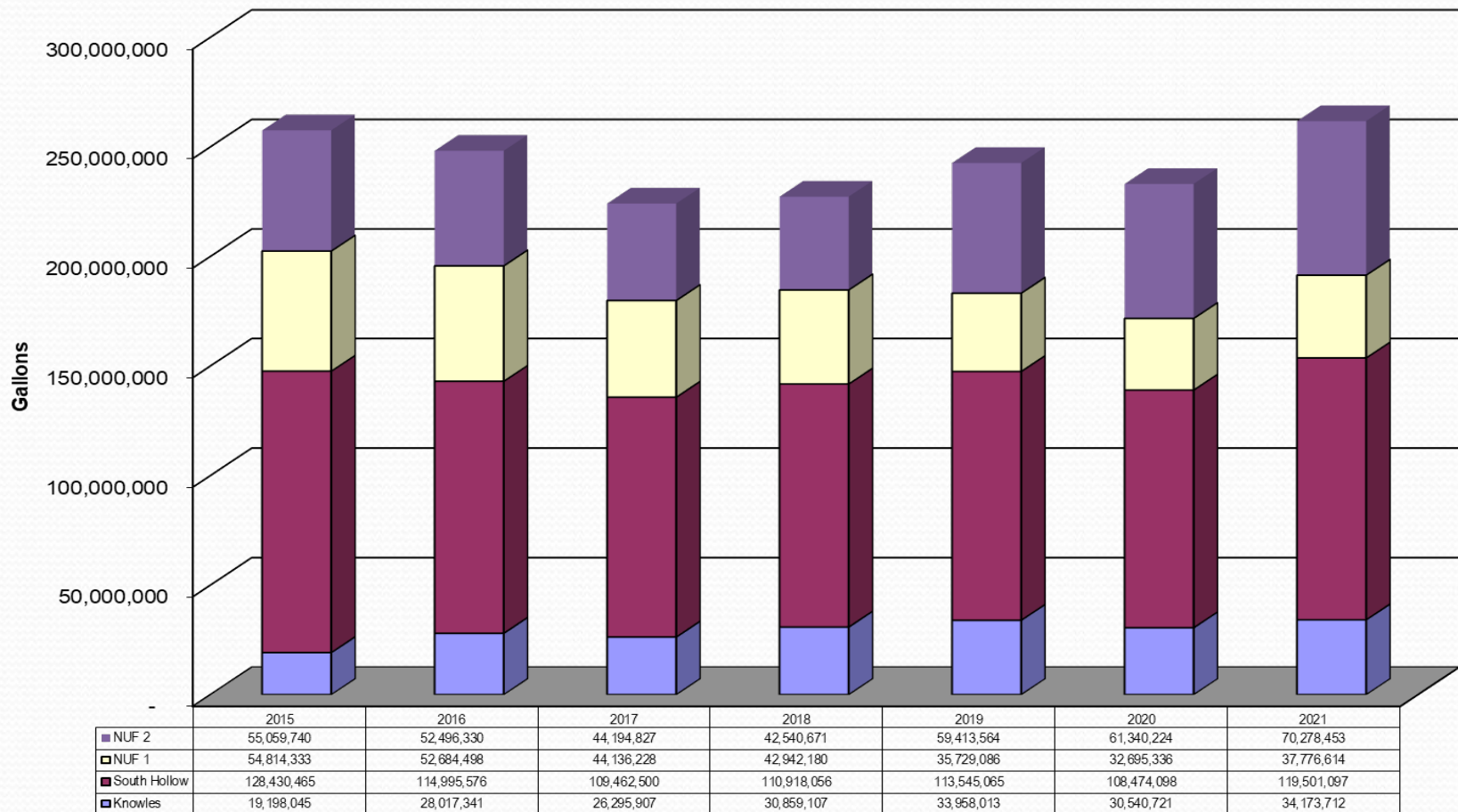


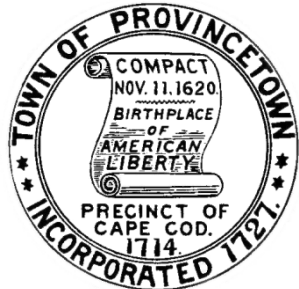


# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## Water Withdrawals & Production

**Water Pumpage: Total Withdrawals by Source 2015-2021**

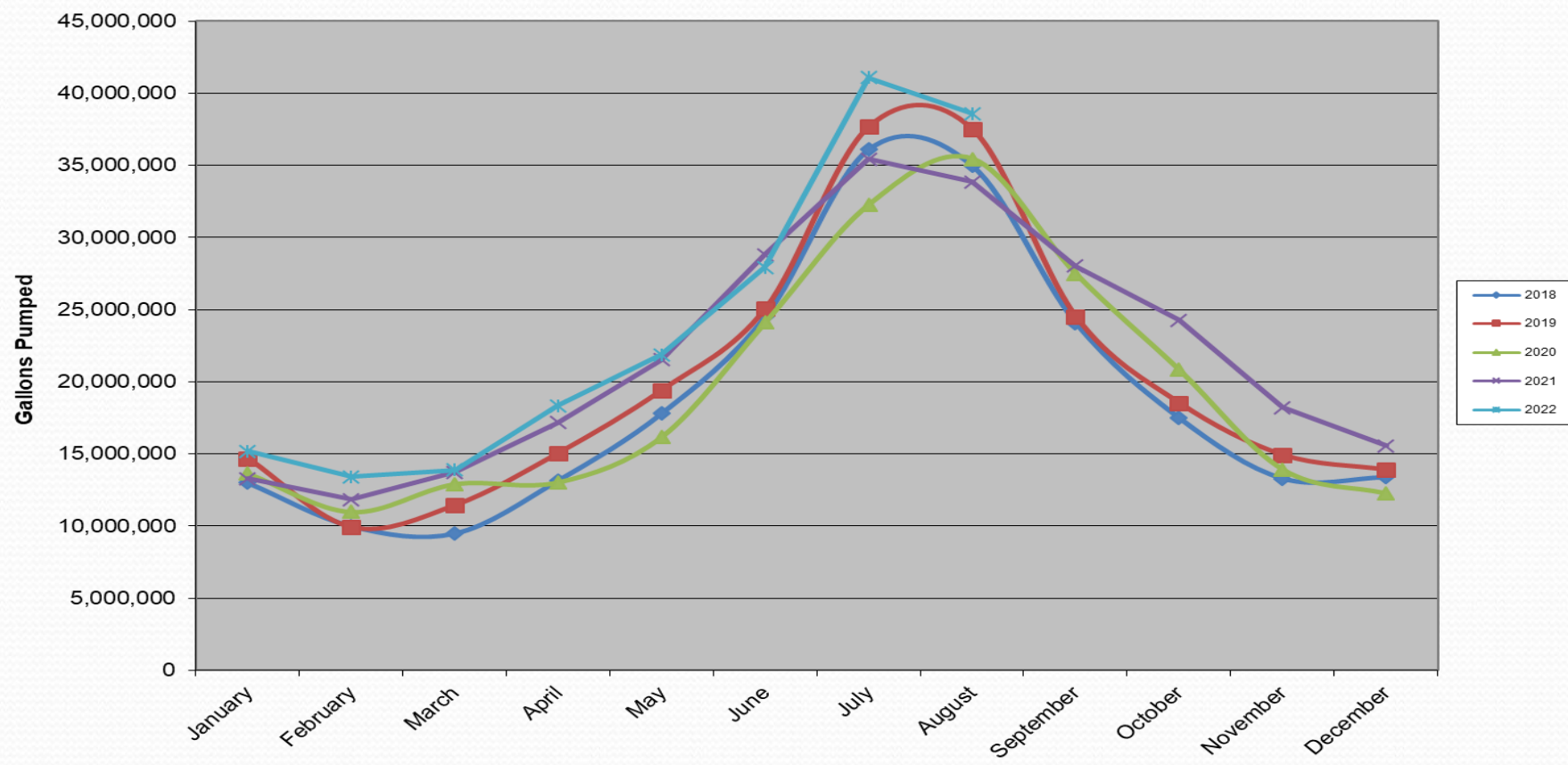




# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## Water Withdrawals & Production

Comparison of Water Pumped 2018-2022



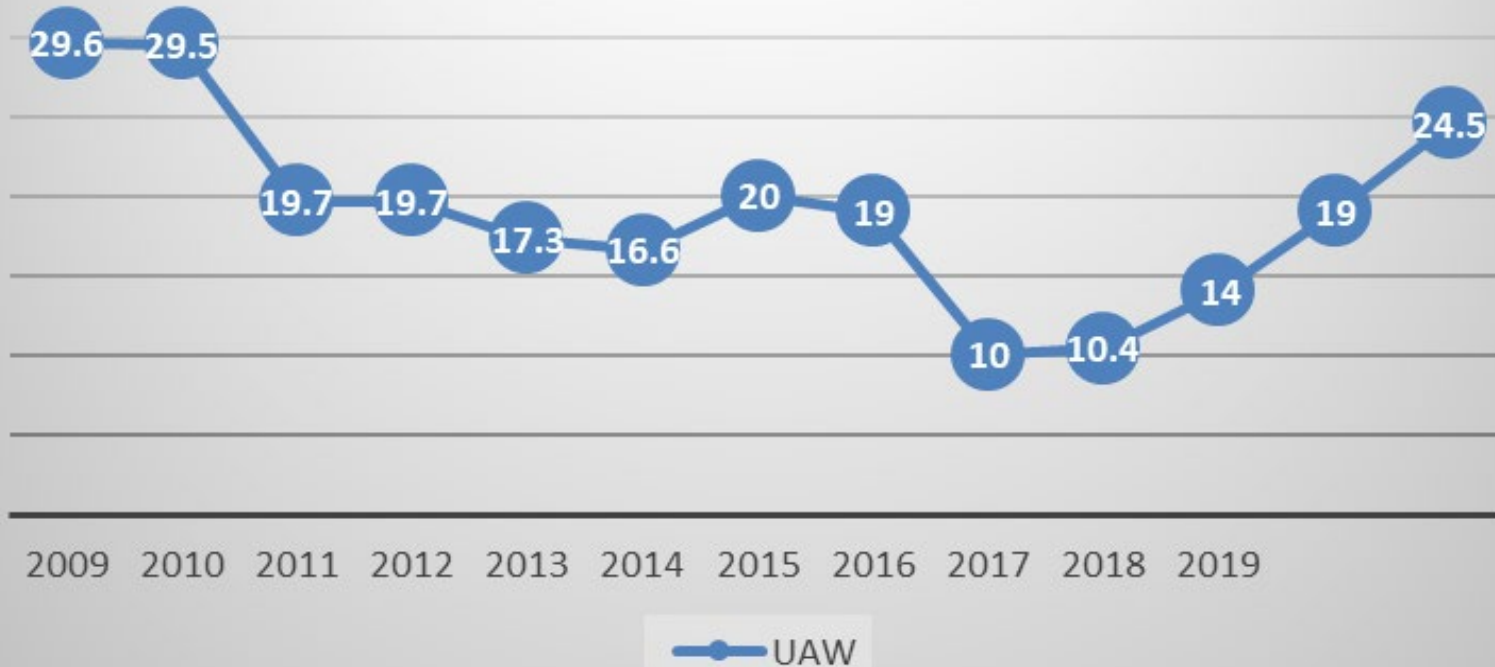




**TOWN OF PROVINCETOWN  
DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

## Water Withdrawals & Production

### UAW





## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### Defining Unaccounted For Water (UAW); and How it is Calculated

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WATER PRODUCED THAT IS LOST PRIOR TO REACHING THE CUSTOMER'S METER

#### WATER PRODUCED

- MINUS Metered Water; and
- MINUS Authorized Unmetered Water (CEMU) (EQUALS) =

#### UNACCOUNTED-FOR-WATER (UAW)

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**TOWN OF PROVINCETOWN  
DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

## **Project Highlights 2022**

- Construction of Knowles Crossing Distribution Storage Building
  - Water Main Improvements Shank Painter Road – Design & USDA Funding Submission
  - Knowles Crossing Wellfield Redevelopment Project
  - Membrane Filter Replacement (2021)
  - Alden Street Service Renewals
-



# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## Knowles Crossing Distribution Garage

### KNOWLES CROSSING WATER DEPARTMENT STORAGE BUILDING



143 SHORE ROAD  
TRURO, MA

FEBRUARY 2020  
95% DESIGN



ENVIRONMENTAL  
PARTNERS

APPLICANT:

DEPARTMENT OF PUBLIC WORKS  
PROVINCETOWN, MASSACHUSETTS

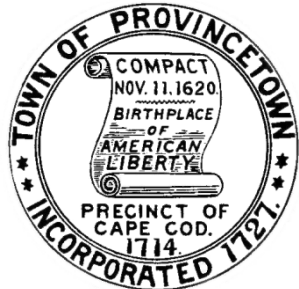
RICHARD J. WALDO, P.E.  
DIRECTOR OF PUBLIC WORKS  
CODY GILBERT  
WATER DEPARTMENT SUPERINTENDENT



VICINITY MAP  
1" = 500'

- MECHANICAL DRAWINGS**
- 1.1 MECHANICAL, LAYOUT AND GENERAL NOTES
  - 1.2 MECHANICAL, FIRST FLOOR DUCTWORK PLAN
  - 1.3 MECHANICAL, MECHANICAL DUCTWORK PLAN
  - 1.4 MECHANICAL, SCHEDULES AND DETAILS
- PLUMBING DRAWINGS**
- 1.1 PLUMBING LEGEND
  - 1.2 PLUMBING LAYOUT
  - 1.3 PLUMBING FIRST FLOOR UNDERGROUND PLAN
  - 1.4 PLUMBING FIRST FLOOR UNDERGROUND PLAN
  - 1.5 PLUMBING FIRST FLOOR PLAN
  - 1.6 PLUMBING MECHANICAL PLAN
  - 1.7 PLUMBING SCHEDULES
  - 1.8 PLUMBING DETAILS
- STRUCTURAL DRAWINGS**
- 1.1 STRUCTURAL NOTES
  - 1.2 FOUNDATION PLAN
  - 1.3 SLAB PLAN
  - 1.4 UPPER LEVEL PLANS
  - 1.5 FOUNDATION SECTIONS AND DETAILS





# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## Knowles Crossing Distribution Garage







## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### Knowles Crossing Wellfield Redevelopment

- Knowles Crossing Wellfield Redevelopment – Bid April 2022
- Project duration approximately 3 weeks for three active wells
- Wells were cleaned and redeveloped using Pantomite PM 77, muriatic acid and mechanical surging. Video footage of the wells indicated all wells were in good operating condition
- New pump/motors were installed in each well in conjunction with the project





## **TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

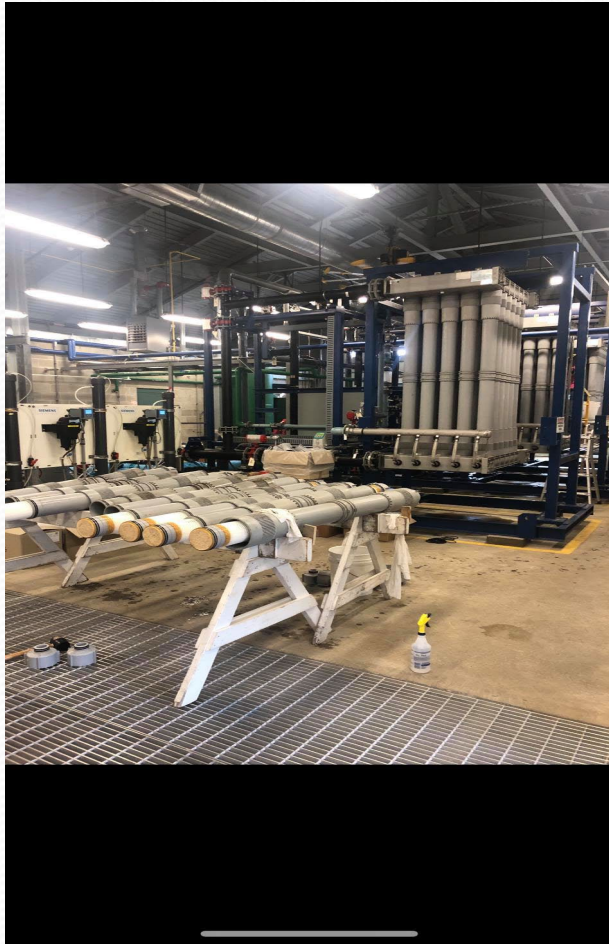
### **Shank Painter Road Water Main Improvements**

- Design 95% Complete – Replacement of existing 12" & 6" Transite, new 12" DI
- Projected slated to be completed ahead of roadway reconstruction
- Applied for USDA funding in August 2022 – grant funding will not be reality
- Project will include Browne St. and short run of Pleasant St.
- Project estimate \$2.25M



## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### Knowles Crossing Membrane Filter Replacement



- Membrane filters have approximately 6 to 7 year life expectancy
- Ninety (90) individual filter modules replaced
- Total project time one week – four person crew
- Next scheduled replacement 2027 unless failure rate is above previous modules



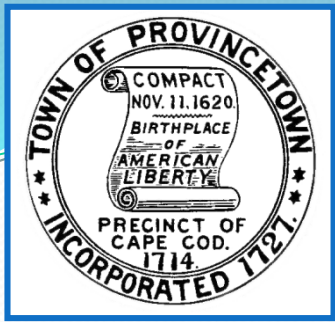


## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### Alden Street Service Replacements



- Replaced 21 service connections on Alden Street, prior to paving
- LGN Removals
- Logged removal date in GIS system
- Several other streets/services will be identified as parts of LCRR, due October 2024



**TOWN OF PROVINCETOWN  
DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

**PROJECTS ON THE HORIZON**

- Paul Daley Wellfield Redevelopment – 6 wells
- Shank Painter Road Water Main Construction
- LCRR, Service Line Inventory
- UCMR 5
- Tank Maintenance





**TOWN OF PROVINCETOWN  
DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

## **FUTURE GROWTH**

### **Key Questions:**

- How much more growth is on the horizon?
- Do we have sufficient capacity to serve future growth?
- What about Truro?



## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### FUTURE GROWTH

- Provincetown continues to see growth throughout the system with several condominium developments (500 add'l accounts since 2010)
- Cloverleaf (Truro) approved, not yet constructed
- Former VFW parcel planned for housing (65 units)
- Several other projects planned but not yet permitted (Provincetown)
- Truro investigating expansion in Pond Road Area, Walsh Property, and potentially beyond

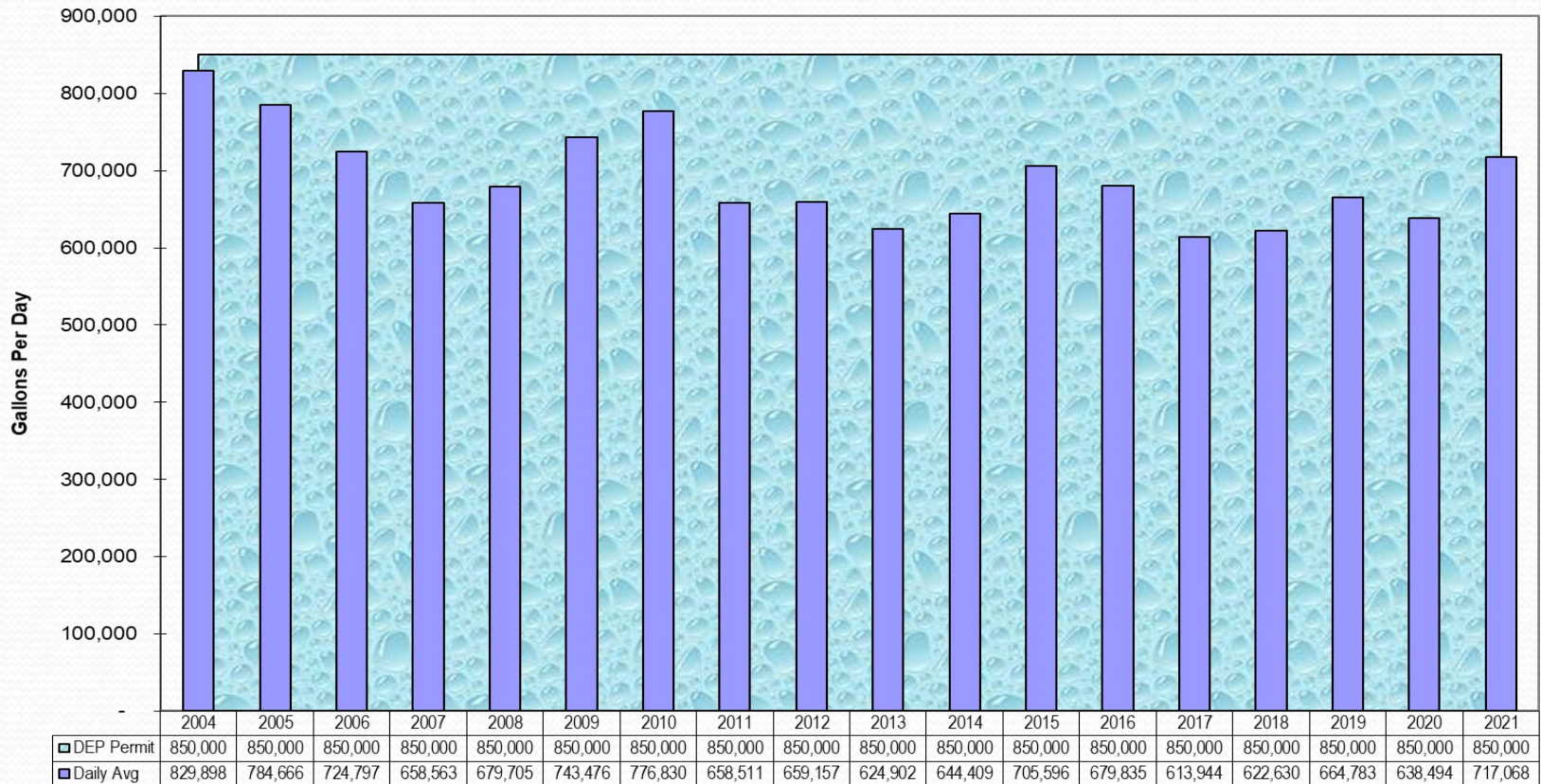




# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## FUTURE GROWTH

**Provincetown Water System  
Average Daily Water Withdrawal 2004-2021**





# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## FUTURE GROWTH

WELL SOURCE	PWSID	MAX DAY WITHDRAWAL (MG)	ANNUAL AVG. DAILY WITHDRAWAL LIMIT	TOTAL ANNUAL WITHDRAWAL LIMIT	COMPLIANCE REGULATION
PAUL DALEY WELLFIELD (6 active wells, manifolded, one source)	4242000-03G	0.864	0.85	311.62	WMA REGISTRATION
Knowles Crossing Wellfield (3 active wells, manifolded, one source)	4242000-02G	0.216			
North Union Field Well 1	4242000-06G	0.734			WMA PERMIT
North union Field Well 2	4242000-07G				
NTAFB 4 (EMERGENCY SOURCE)	4242000-04G	0.334			WMA REGISTRATION/MOU CCNS/DEC OF
NTAFB 5 (EMERGENCY SOURCE)	4242000-05G				





## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### FUTURE GROWTH

- Water Department has not exceeded permit since 2002 (annual 317 MG)
- Currently operating between 75%-85% of (annual) permitted capacity
- 100K gallon buffer built into WMA registrations...non-compliance at 950,000 daily average
- Peak days/months are always the limiting factor; NUF is a redundant supply, not an overall increase in capacity



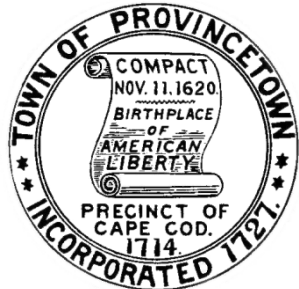
## **TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

### **FUTURE GROWTH**

### **DEMAND FORECAST**

- Water System Demand Assessment currently underway
- Analyze trends in in system demands and pumping rates (short term & long term)
- Evaluate maximum available capacities, including current pumping and available withdrawals
- Conclusions and recommendations based on current and predicted trends





# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## FUTURE GROWTH







## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### FUTURE GROWTH

- Former “Walsh” property, approx. 57 acres, abutting North Union Field (NUF) well site
- Provincetown leases existing site of the wells, 99 Year Lease. Provincetown purchased Zone I radius area that was previously privately owned
- NUF is located in the central portion of the Pamet Lens, approx. 1 mile northwest of the high point of the freshwater “mound”, where groundwater lens is the thickest.





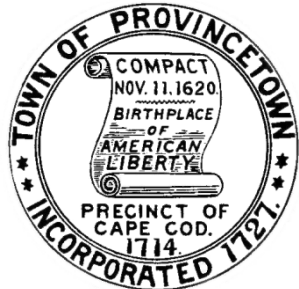
## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### FUTURE GROWTH

- Former Walsh Property is “the” site for both watershed protection *and* future water supply
- Both Towns should work closely together to preserve the resource, collectively reaching the goals of each (housing/system expansion/add'l supply)
- Parcel has the ability to site at least two more wells and easily achieve Zone 1 wellhead protection...a difficult task given limited parcel availability







# TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

## FUTURE GROWTH







## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### FUTURE GROWTH

- Funding expansion efforts within Truro
- Management of assets
- Current Inter-Municipal Agreement (IMA) renewed 2010. Revisions for expansion? Future structure?





## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### FUTURE GROWTH



- Watershed Management Plan – Pamet Lens (article 11)
- “...Parties agree to jointly develop, fund, and adopt a watershed management plan for the Pamet Lens...”
- Pamet Lens Oversight Group (PLOG) disbanded once the 2010 IMA was executed
- “...Water & Sewer Board shall become responsible for the oversight of the Conservation Plan, Watershed management Plan, and Water System Master Plan..”



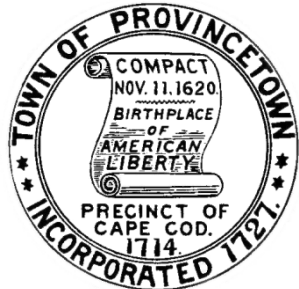


## TOWN OF PROVINCETOWN DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT

### FUTURE GROWTH



- Staff level (cooperative) working group (Town Management & senior staff)
- More frequent joint meetings to report findings and recommended actions



**TOWN OF PROVINCETOWN  
DEPARTMENT OF PUBLIC WORKS – WATER DEPARTMENT**

**THANK YOU!**

