The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

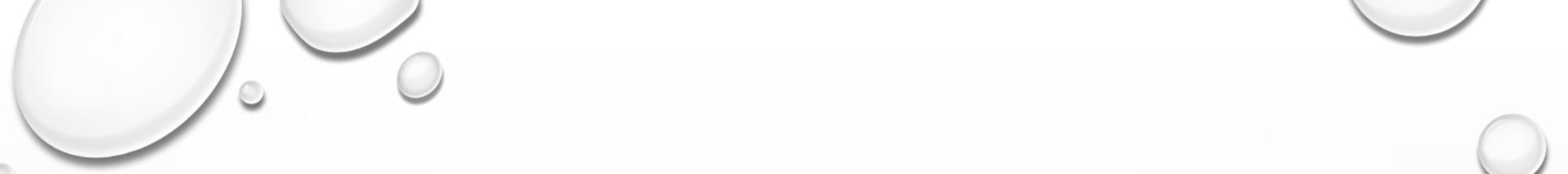
# TRACKING & RECOVERY OF WINERY WASTEWATER

KEN NAVIDI

BAINBRIDGE ASSOCIATES INC – REPRESENTATIVE FOR  
INSTRUMENTATION FOR WATER & WASTEWATER INDUSTRY

# COLLECTING DATA ON FLOW

- IS PROCESS WATER BEING TREATED ONSITE OR TO A PUBLIC WASTE WATER TREATMENT PLANT
- ONSITE – DOE OR DEQ – LAGOON
  - ONSITE DISCHARGE PERMIT
- OFFSITE – COLLECTION SYSTEM – PUBLIC WWTP
  - WORK WITH MUNICIPALITIES PRETREATMENT COORDINATOR

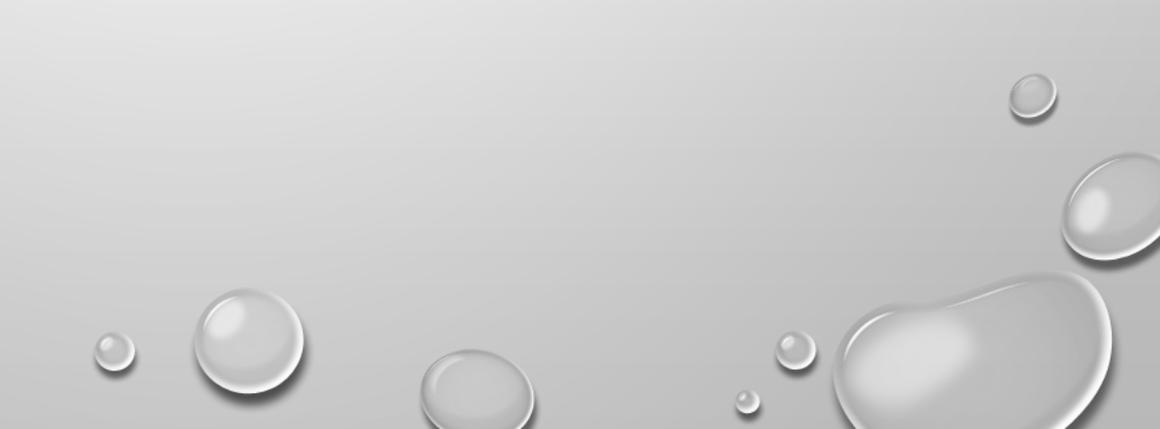


# KEEPING TRACK OF SOURCE WATER

- TYPICALLY A CLOSED SOURCE – FULL CIRCULAR PIPE
  - TYPICALLY HIGH PRESSURE – KNOWN ID
  - SOURCED FROM PUBLIC MUNICIPALITY OR PRIVATE WELL
  - WATER LINE MAY BE SIZED FOR FIRE FLOW
  - TYPICALLY MEASURED BY PROPELLER METER
  - ALTERNATIVE MEASUREMENT PUMP RUN TIME OR WELL DRAW DOWN
- 



# WHY TRACK SOURCE WATER

- FOR REPORTING PURPOSES TO LOCAL MUNICIPALITIES /STATE / FEDS
  - FOR BILLING
- 

# TYPES OF SOURCE WATER METERS



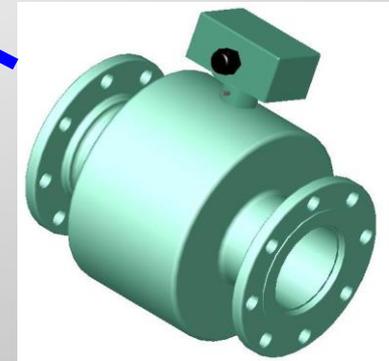
*VENTURI* FLOW METERING



Insertion Magnetometer  
Water Meter



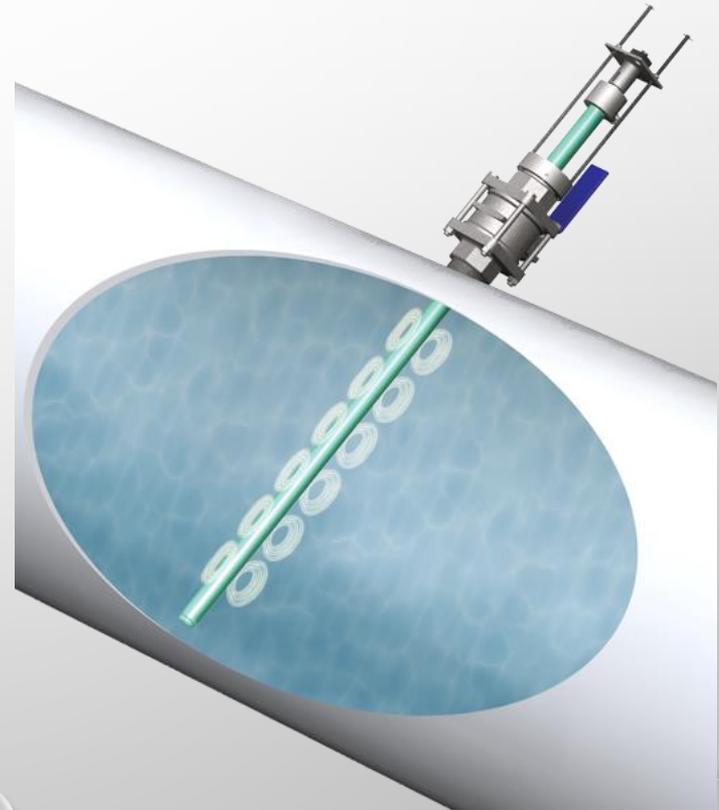
Propeller meters  
Water Metering



Magnetometer  
Water & Waste Water  
Metering

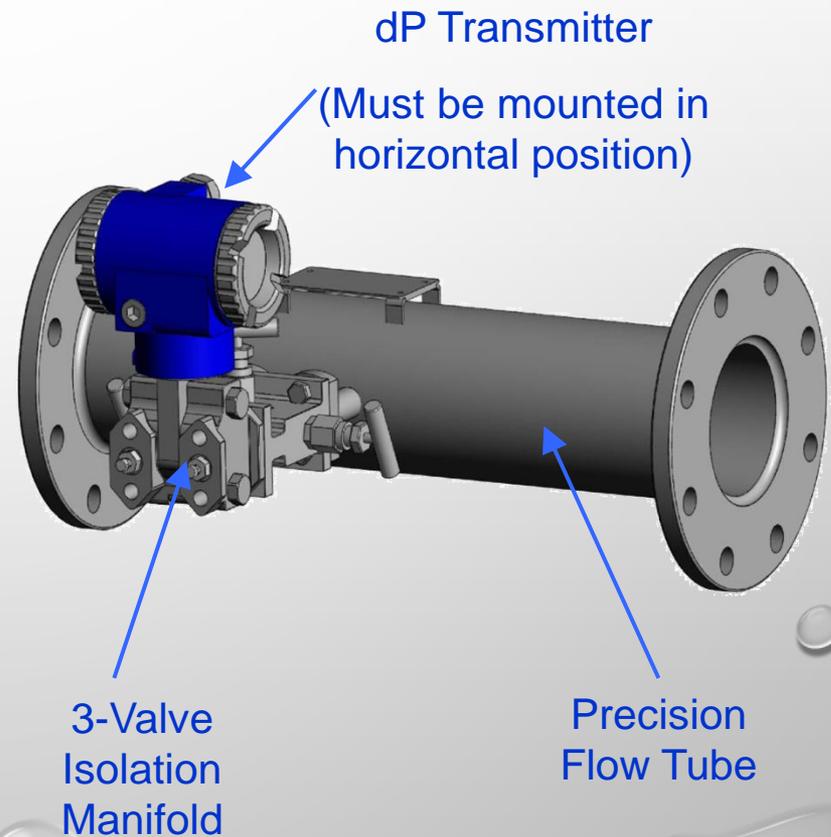
# TYPES OF SOURCE WATER METERS

## Full Pipe Insertion Mag Meter



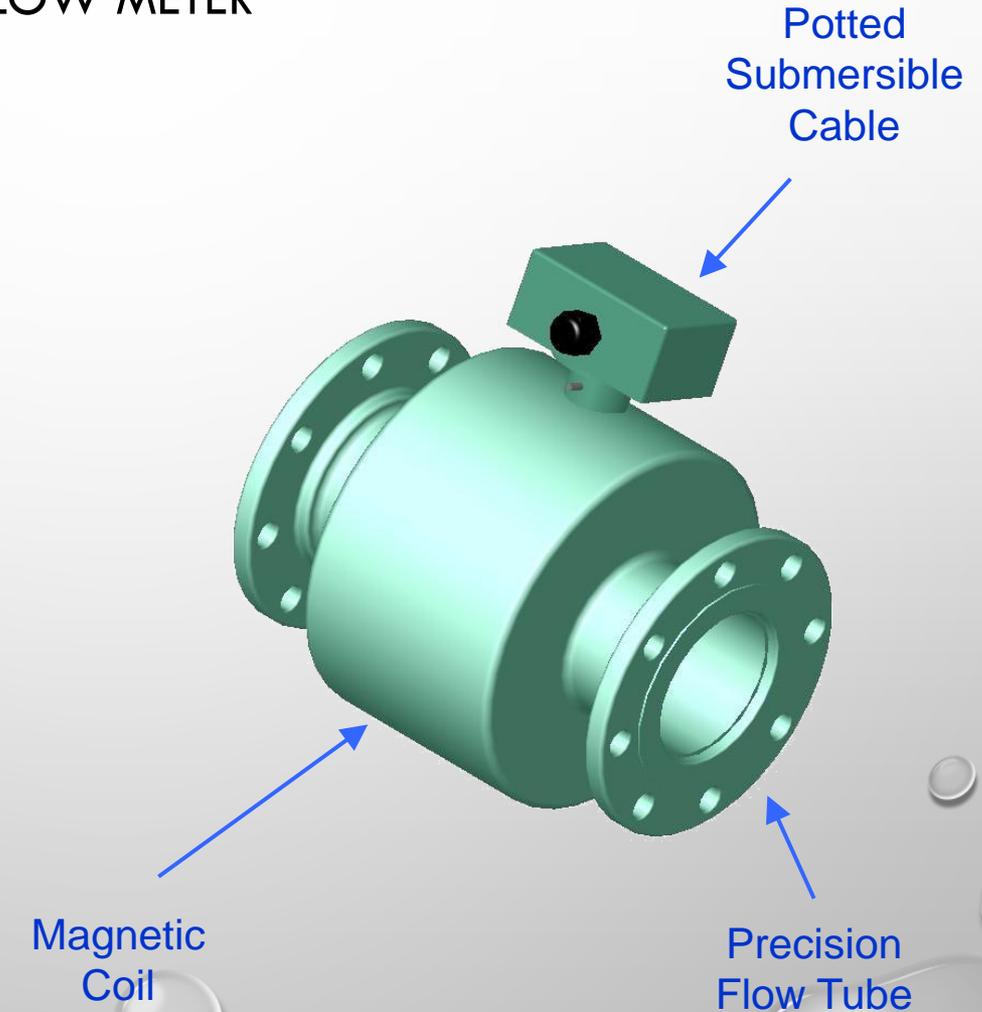
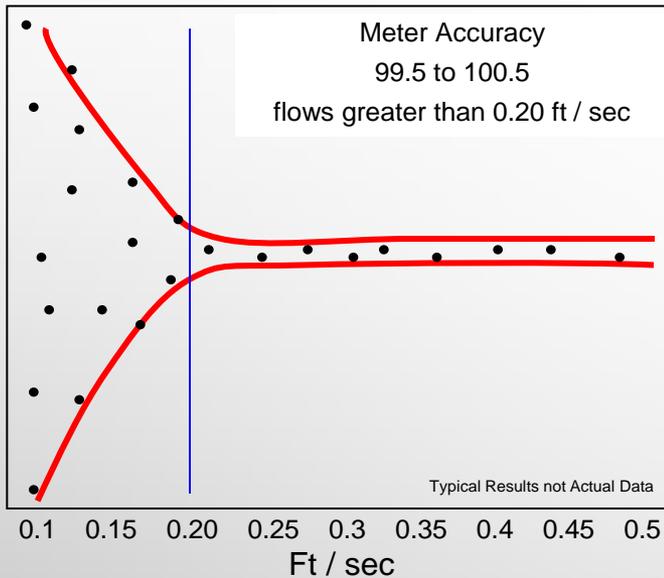
# TYPES OF SOURCE WATER METERS

## V-CONE – DIFFERENTIAL PRESSURE FLOW METER



# TYPES OF SOURCE WATER METERS

## FULL BORE MAGNETIC FLOW METER





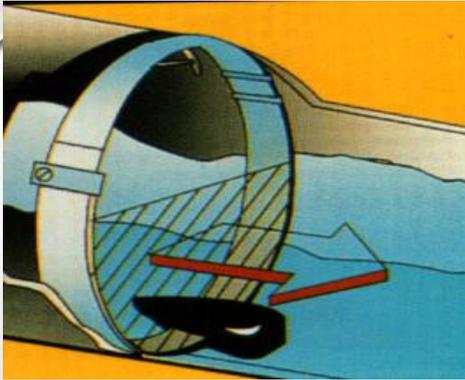
# KEEPING TRACK OF PROCESS WATER

- IS GENERALLY AN OPEN SOURCE – PARTIAL PIPE OR CHANNEL
  - GENERALLY A NON-PRESSURIZED GRAVITY OUTFALL
  - FLOW IS BY GRAVITY WITH VARIABLE FLOW RATES AND CHANNEL DIMENSIONS
  - METERS TYPICALLY MEASURE VELOCITY & LEVELS.
  - EASY ACCESS TO MAINTANANCE & CLEANING.
- 

# WHY TRACK PROCESS WATER

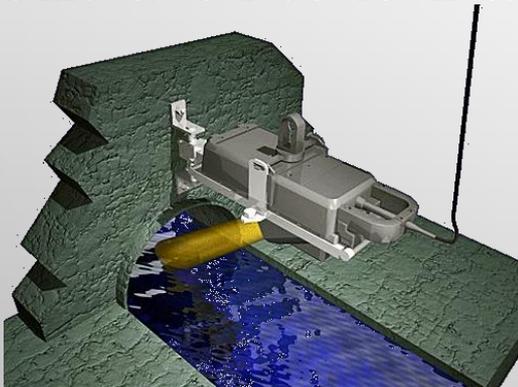
- RECYCLE / REUSE
- BILLING
- REPORT TO STATE
- REPORT TO MUNICIPALITY
- FLOW BASED SAMPLING VERSUS TIME BASED SAMPLING (PH/BOD)

# TYPES OF PROCESS WATER METERS



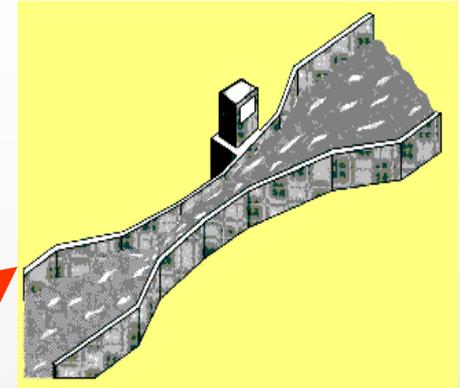
## SUBMERSIBLE AREA VELOCITY METERS

USING ELECTROMAGNETIC OR DOPPLER US SENSORS



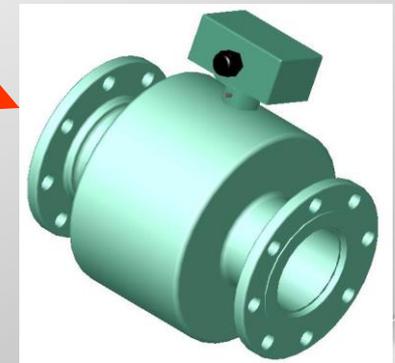
## Non-Contact AV Meters

Using Radar and Ultrasonic Sensors



## Flume & Weirs

Ultrasonic Sensor over Channel



## Ultra Mag

Water & Waste Water Metering

# TYPES OF PROCESS WATER METERS

USE OF ULTRASONIC OF LEVEL SENSING DEVICE OVER FLUME OR WEIR

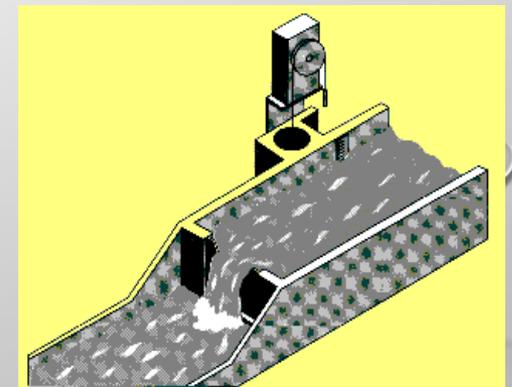
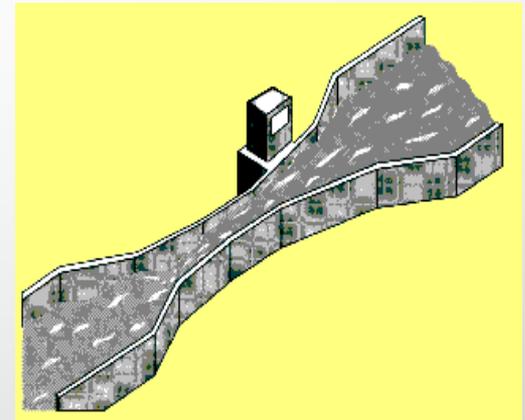
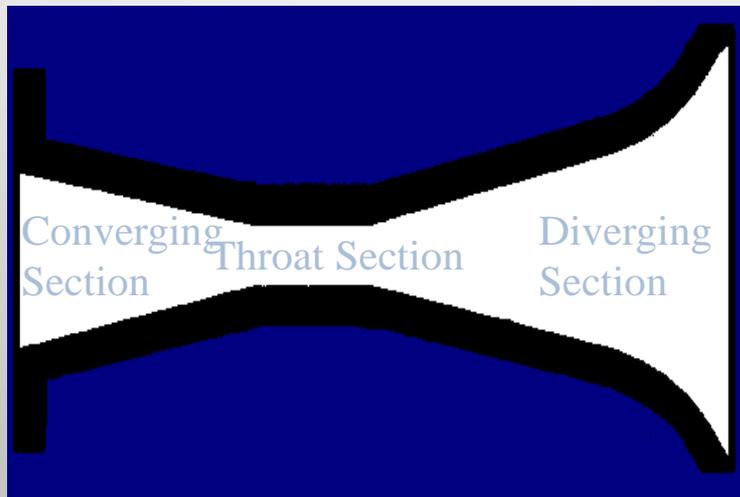
Limitations:

Expensive installation

Requires the correct approach conditions to be accurate

Generally Requires velocity greater than 2 feet per second

Does not operate during surcharge (submergence)

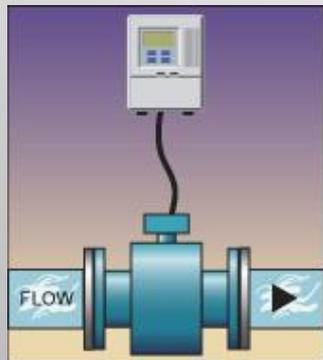


# TYPES OF PROCESS WATER METERS

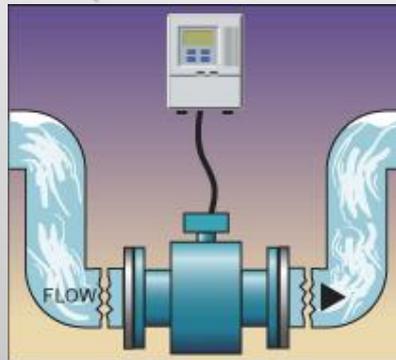
## USE OF FULL PIPE MAGMETER

For proper accuracies any 90 or 45 degree elbows, valves, partially opened valves, etc., should be placed no closer than 5 to 10 pipe diameters upstream and 2 pipe diameters downstream.

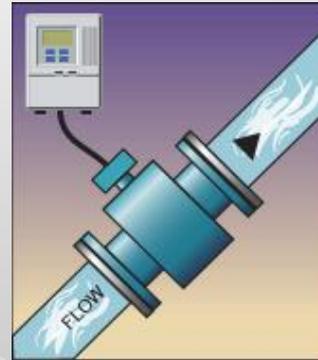
Horizontal



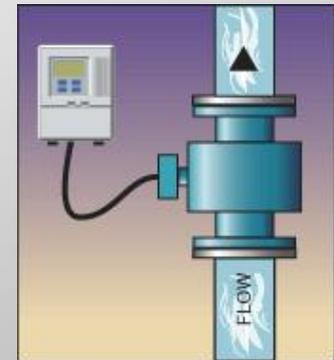
Trap



Incline

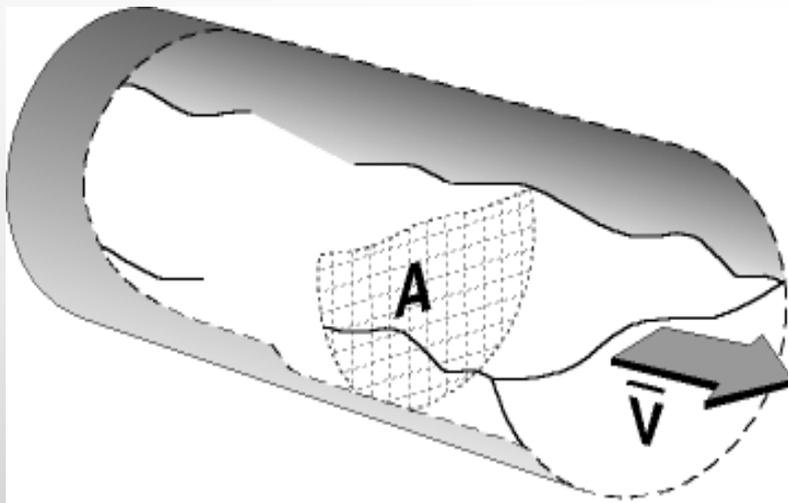


Vertical



# TYPES OF PROCESS WATER METERS

## SUBMERSIBLE AREA VELOCITY METER



$$Q = \bar{V} \times A$$

Q = Flow  
 $\bar{V}$  = Average  
Velocity  
A = Area

Maintenance may be Problematic  
Limited Reliability in Low Flows

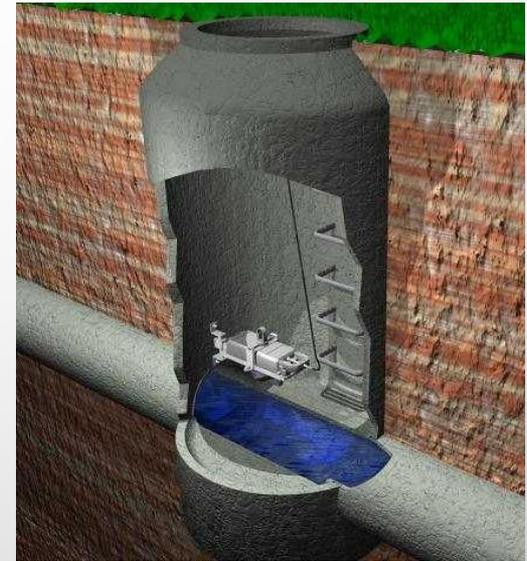


- Velocity of liquid is measured by electromagnetic sensor or Doppler Ultrasonic
- Level Measured by Pressure Sensor or Bubbler

# TYPES OF PROCESS WATER METERS

## NON-CONTACT OPEN CHANNEL FLODAR METER

- Flo-Dar was designed to solve installation, maintenance, and reliability problems.
- Uses Radar to measure Velocity and Ultrasonic for measuring level with coming into contact with flow.



- Largest Flow Range of any Meter on the Market.
- Easily Install and field calibrate without taking your plant out of service.
- Reliable enough to be a Billing Meter

# TRACKING WATER THROUGH YOUR PLANT - TEMPORARY

- INSERTION MAGMETER THROUGH TAP & VALVE.
- SADDLE TRANSIT TIME ULTRASONIC.
- LIMITATIONS FLOW DISTURBANCES – AIR – FOULING
- ACCURACY 2-5%
- LOWER COST



# POINTS TO CONSIDER WHEN SELECTING A FLOW METER

1. WHAT IS THE QUALITY OF WATER - CLEAN OR DIRTY?
2. DOES MY SOURCE WATER HAVE IRON OR MAGNESE?
3. DOES MY METER READ MY EXPECTED FLOW RANGE?
4. CAN I SHUT DOWN SERVICE TO INSTALL OR CALIBRATE
5. WHAT'S MY PREFERRED LOCATION TO METER FLOW, WHAT'S THE APPROACH OR SITE CONDITIONS. FULL PIPE VS OPEN CHANNEL
6. WHAT'S MY BUDGET FOR PURCHASE AND MAINTENANCE
  - HIGHER \$\$\$ METER = LESS \$\$\$ MAINTAINING

# CASE STUDY – CHATEAU ST. MICHELLE WINERIES

1. SITE – OUTFALL AT CANOE RIDGE WINERY
2. METER – WIRELESS SOLAR POWERED FLODAR FLOW METER MONITORING FLOW TO ONSITE LAGOONS.
3. MONTHLY REPORTS DOWNLOADED FROM CLOUD AND DELIVERED TO DOE.



# CASE STUDY – CHATEAU ST. MICHELLE WINERIES

1. SITE – OUTFALL AT COL SALARE WINERY
2. METER – WIRELESS SOLAR POWERED FLODAR FLOW METER MONITORING FLOW TO ONSITE LAGOONS.
3. MONTHLY REPORTS DOWNLOADED FROM CLOUD AND DELIVERED TO DOE.



# SAMPLE DAILY FLOW REPORT

Data Summary Report - Google Chrome  
FSData Data Summary Report  
Secure | <https://fsdata.hach.com/pdfview.aspx?name=Data%20Summary%20Report.pdf&method=inline>

## Data Summary Report

Previous Month  
Ste. Michele Wine Estates  
Canoe Ridge  
01/01/2017 12:00 AM - 02/01/2017 12:00 AM

### Flow Summary

Maximum (gpm): 134.51 01/12/2017 04:15 PM  
Minimum (gpm): 0.00 01/01/2017 12:00 AM  
Average (gpm): 6.62  
Total (gal): 295,509.0

Date	Maximum (gpm)	Maximum Time	Minimum (gpm)	Minimum Time	Average (gpm)	Total (gal)
01/01/2017 12:00 AM	0.00	00:00	0.00	00:00	0.00	0.0
01/02/2017 12:00 AM	0.00	00:00	0.00	00:00	0.00	0.0
01/03/2017 12:00 AM	36.75	10:30	0.00	00:00	8.71	12,548.7
01/04/2017 12:00 AM	59.57	23:30	0.00	03:00	9.71	13,980.3
01/05/2017 12:00 AM	64.84	11:15	0.00	00:45	12.36	17,792.3
01/06/2017 12:00 AM	80.00	01:45	0.00	03:00	7.87	11,332.1
01/07/2017 12:00 AM	20.62	02:30	0.00	00:00	0.45	641.3
01/08/2017 12:00 AM	2.85	20:30	0.00	00:00	0.45	652.4
01/09/2017 12:00 AM	1.83	00:00	0.00	00:15	0.02	27.4
01/10/2017 12:00 AM	64.46	11:00	0.00	00:00	8.33	12,000.4
01/11/2017 12:00 AM	0.00	00:00	0.00	00:00	0.00	0.0
01/12/2017 12:00 AM	134.51	16:15	0.00	00:00	22.15	31,902.8
01/13/2017 12:00 AM	112.89	10:00	0.00	19:00	21.44	30,878.2
01/14/2017 12:00 AM	24.41	02:30	0.00	01:00	1.22	1,762.7
01/15/2017 12:00 AM	0.00	00:00	0.00	00:00	0.00	0.0
01/16/2017 12:00 AM	0.80	10:00	0.00	00:00	0.02	29.1
01/17/2017 12:00 AM	43.68	10:00	0.00	00:00	7.44	10,715.8
01/18/2017 12:00 AM	52.28	08:00	0.00	00:00	6.12	8,816.2
01/19/2017 12:00 AM	58.10	13:45	0.00	06:30	7.25	10,437.4
01/20/2017 12:00 AM	23.98	08:30	0.00	01:15	4.83	6,950.7
01/21/2017 12:00 AM	23.00	02:30	2.00	23:15	4.20	6,053.4
01/22/2017 12:00 AM	16.49	13:45	1.57	06:00	5.66	8,156.9
01/23/2017 12:00 AM	52.67	21:15	1.62	01:45	10.19	14,670.4
01/24/2017 12:00 AM	57.85	14:15	0.00	06:15	12.06	17,371.8
01/25/2017 12:00 AM	40.54	10:15	0.00	04:15	6.67	9,608.5



# TRACKING & RECOVERY OF WINERY WASTEWATER

PRESENTER: KEN NAVIDI

BAINBRIDGE ASSOCIATES INC – REPRESENTATIVE

## Resources:

[www.hachflow.com](http://www.hachflow.com)

<https://fsdata.hach.com/>



# TRACKING AND REDUCING WINERY WATER USAGE - SUMMARY

- WATER SOURCES IN OREGON ARE FINITE - CONSERVATION MEASURES ARE ESSENTIAL FOR INDUSTRY GROWTH
  - COMMIT TO REDUCE YOUR WINERY WATER/WASTEWATER
  - COLLECT FLOW DATA
  - BRAINSTORM REDUCTION OPTIONS (USE IDEAS FROM PROVEN REDUCTION STRATEGIES)
  - DEVELOP & IMPLEMENT YOUR PLAN
  - CELEBRATE SUCCESS!



# ANY QUESTIONS?

## **YOUR PRESENTERS**

**JUDY THOET**  
WINERYWISE

**DR. STUART CHILDS**  
KENNEDY/JENKS

**KEN NAVIDI**  
BAINBRIDGE ASSOCIATES, INC.

