EAST BAY MUNICIPAL UTILITY DISTRICT

Lead Service Line Inventory

Planning Committee

July 10, 2018

Overview

- Background
- Senate Bill 1398
- Tap record review
- Service line inventory
- Next steps

Background

- 372,873 service lines (e.g., copper, polybutylene, and galvanized)
- District began effort to replace lead service lines in 1989 prior to adoption of Lead and Copper Rule (LCR)
- Notified state of removal of all known lead service lines in 1998
- District crews occasionally found and replaced lead service lines
- LCR data confirms District's corrosion control program is effective

Senate Bill 1398

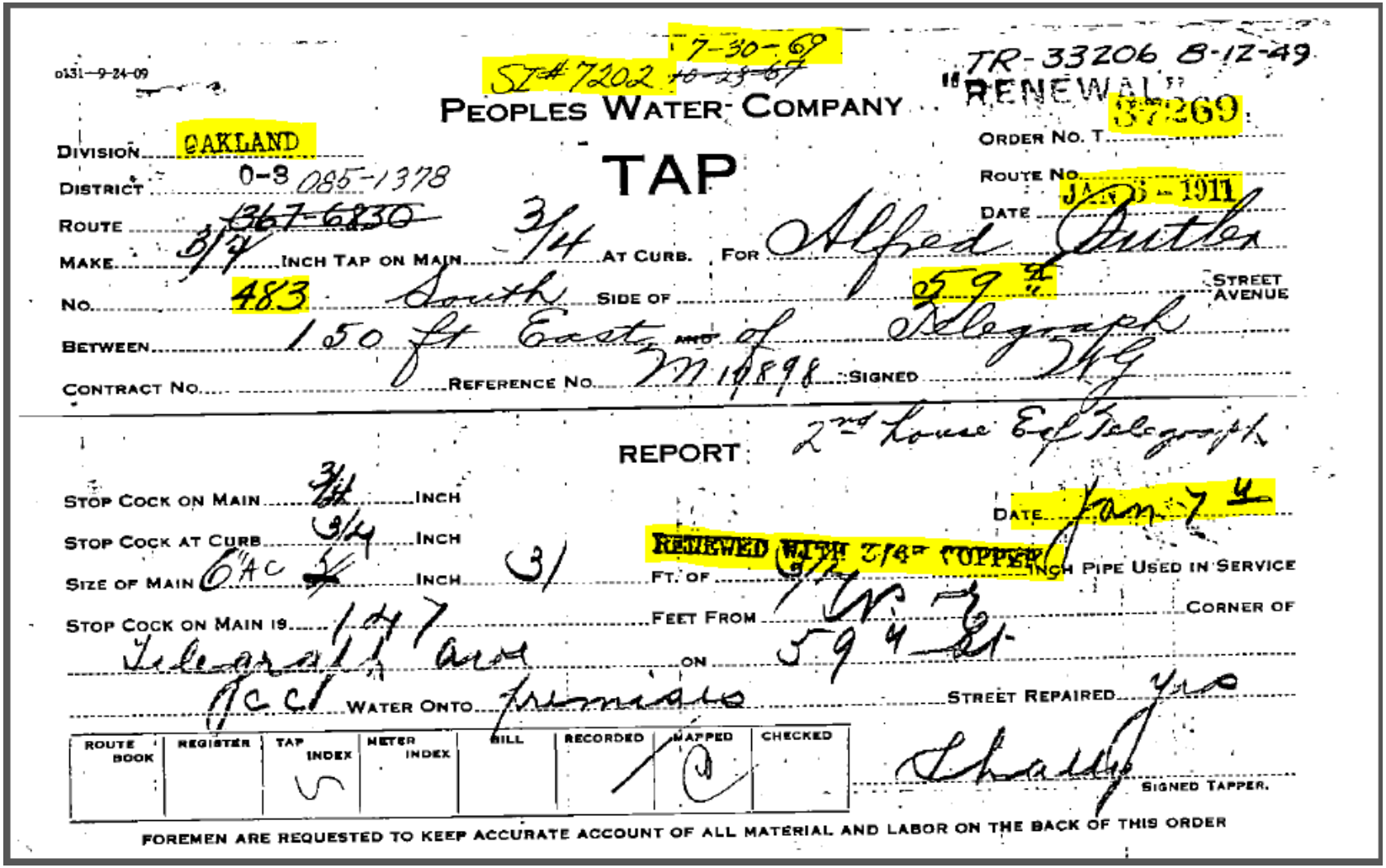
SB 1398 requires public water systems to

- By July 1, 2018
  - Compile an inventory of known lead service lines
  - Identify areas that may have lead pipes
- By July 1, 2020
  - Provide a timeline for replacement of known lead service lines or areas that may have lead service lines

Tap Record Review

- No single database of service line materials
- Began review of paper tap records in March 2016
- Prioritized review of tap records
  - Streets where known lead services were replaced
  - Installations between 1940 – 1950
  - Tap records for galvanized analysis
  - Installations between 1935 – 1939
  - Remaining records
- Tap data consolidation project initiated in FY18

Tap Record Example #1



0131—9-24-09

SI# 7202 7-30-69 ~~10-25-67~~

TR-33206 8-12-49

"RENEWAL"

PEOPLES WATER COMPANY

ORDER NO. T 37269

DIVISION OAKLAND

DISTRICT O-3 085-1378

ROUTE ~~367-6830~~

DATE JAN 3 - 1911

MAKE 3/4 INCH TAP ON MAIN 3/4 AT CURB. FOR Alfred Cutler

NO. 483 SIDE OF 59th STREET AVENUE

BETWEEN 150 ft East and of Telegraph

CONTRACT NO. REFERENCE NO. M10898 SIGNED HG

2nd house Est Telegraph

REPORT

STOP COCK ON MAIN 3/4 INCH

STOP COCK AT CURB 3/4 INCH

SIZE OF MAIN 6"AC INCH

STOP COCK ON MAIN IS 147 Telegraph Ave

ACC WATER ONTO Premises

DATE Jan 7 4

RENEWED WITH 3/4" COPPER

FT. OF 3/4 INCH PIPE USED IN SERVICE

FEET FROM 7 N & 3 CORNER OF

ON 59th St.

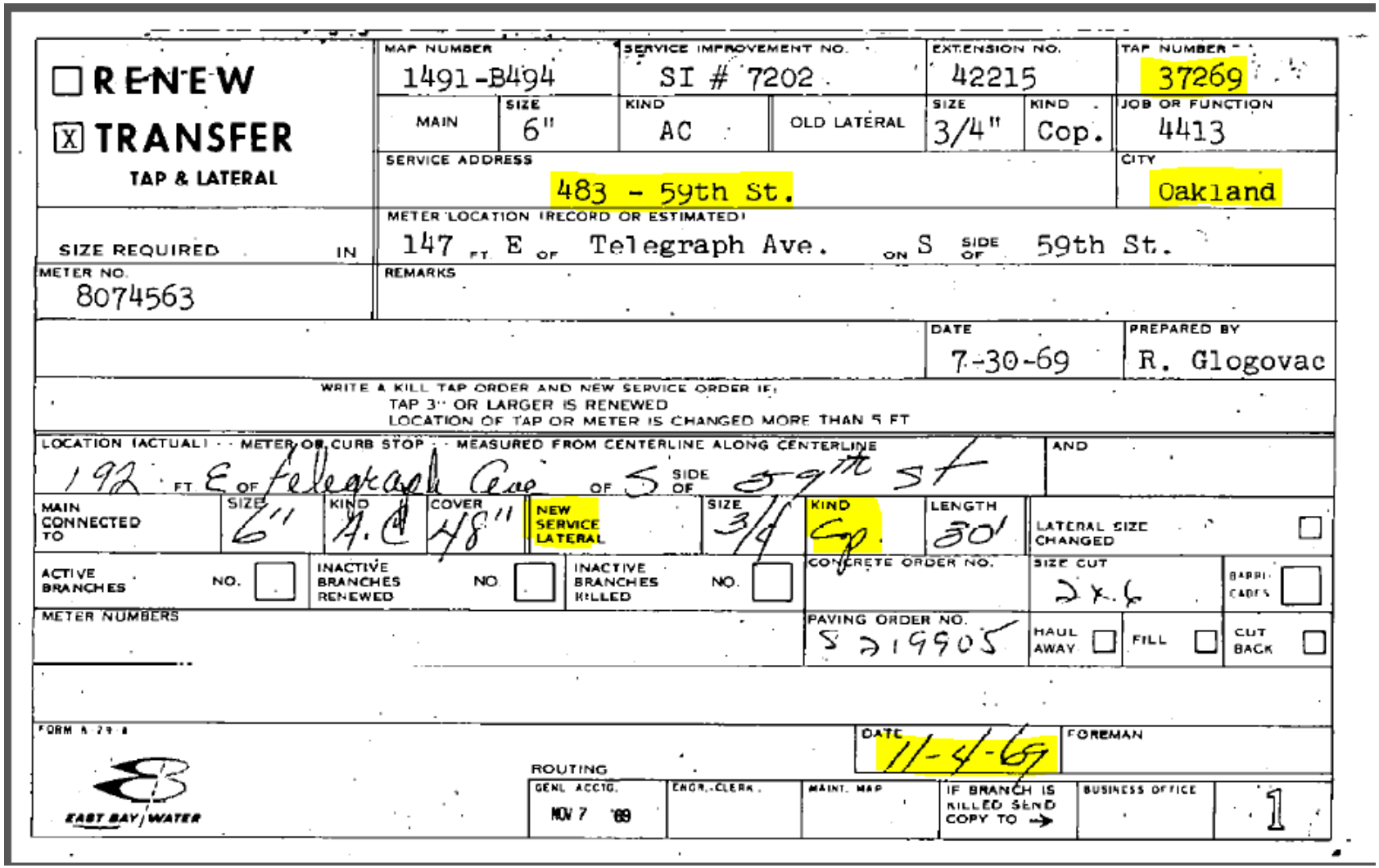
STREET REPAIRED Yes

Chadd SIGNED TAPPER.

ROUTE BOOK	REGISTER	TAP INDEX	METER INDEX	BILL	RECORDED	MAPPED	CHECKED
		5			/	C	

FOREMEN ARE REQUESTED TO KEEP ACCURATE ACCOUNT OF ALL MATERIAL AND LABOR ON THE BACK OF THIS ORDER

Tap Record Example #1 Renewal



☐ RENEW
☒ TRANSFER
TAP & LATERAL

MAP NUMBER: 1491-B494
SERVICE IMPROVEMENT NO.: SI # 7202
EXTENSION NO.: 42215
TAP NUMBER: 37269

MAIN: SIZE 6" KIND AC
OLD LATERAL: SIZE 3/4" KIND Cop.
JOB OR FUNCTION: 4413

SERVICE ADDRESS: 483 - 59th St.
CITY: Oakland

SIZE REQUIRED IN
METER LOCATION (RECORD OR ESTIMATED): 147 FT E OF Telegraph Ave. ON S SIDE OF 59th St.

METER NO.: 8074563
REMARKS:

DATE: 7-30-69
PREPARED BY: R. Glogovac

WRITE A KILL TAP ORDER AND NEW SERVICE ORDER IF:
TAP 3" OR LARGER IS RENEWED
LOCATION OF TAP OR METER IS CHANGED MORE THAN 5 FT

LOCATION (ACTUAL) - METER OR CURB STOP - MEASURED FROM CENTERLINE ALONG CENTERLINE
192 FT E OF Telegraph Ave OF S SIDE OF 59th St
AND

MAIN CONNECTED TO: SIZE 6" KIND A.C. COVER 48"
NEW SERVICE LATERAL: SIZE 3/4 KIND Cop. LENGTH 30'
LATERAL SIZE CHANGED ☐

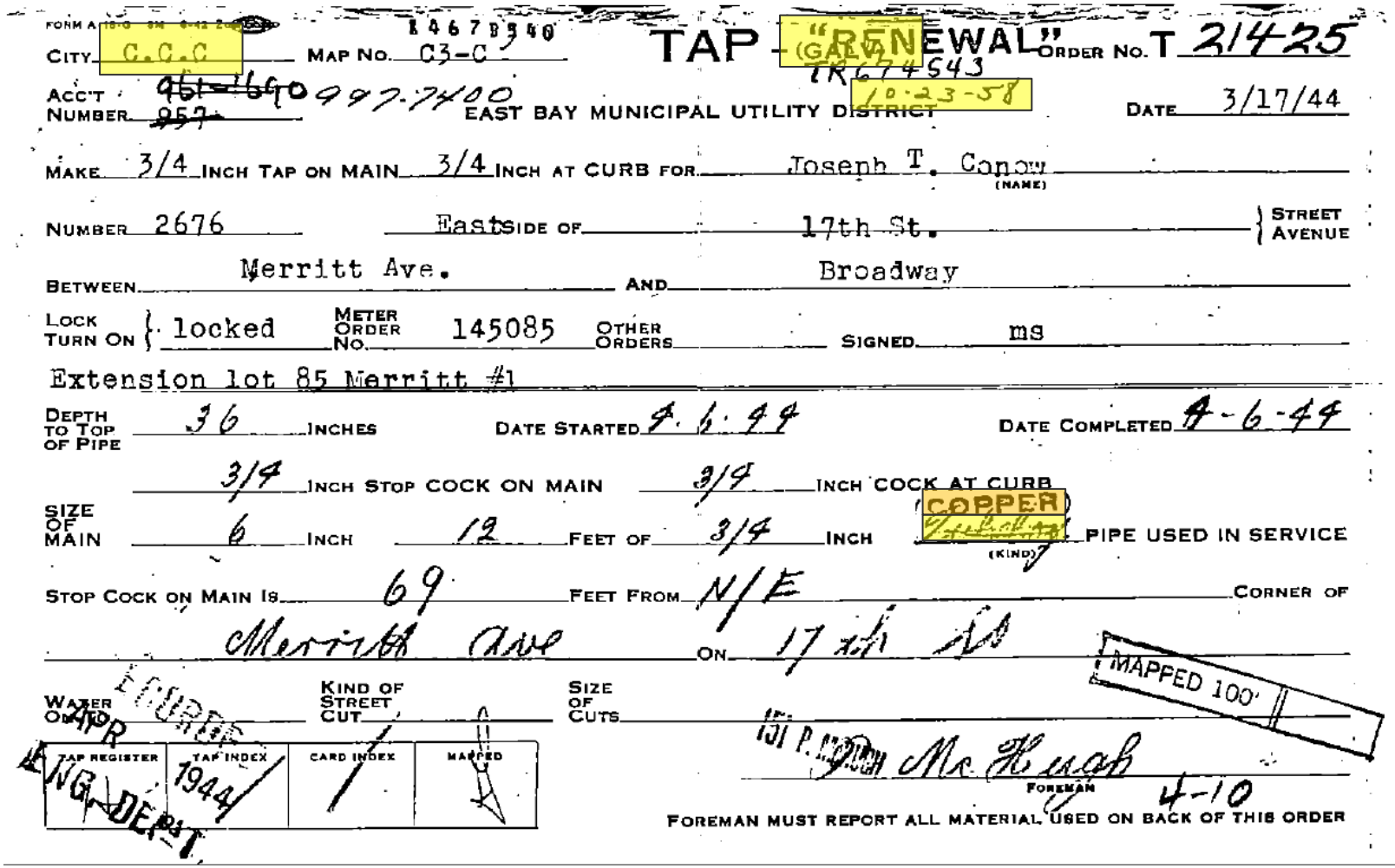
ACTIVE BRANCHES NO. ☐
INACTIVE BRANCHES RENEWED NO. ☐
INACTIVE BRANCHES KILLED NO. ☐
CONCRETE ORDER NO.
SIZE CUT 2 x 6
BARRICADES ☐

METER NUMBERS
PAVING ORDER NO. S 21905
HAUL AWAY ☐ FILL ☐ CUT BACK ☐

FORM A 29 A
EAST BAY WATER
DATE: 11-4-69
FOREMAN:

ROUTING
GENL. ACCTG.: NOV 7 '69
ENGR.-CLERK.:
MAINT. MAP:
IF BRANCH IS KILLED SEND COPY TO →
BUSINESS OFFICE: 1

Tap Record Example #2



FORM A
CITY C.C.C. MAP NO. C3-C
ACC'T NUMBER 951-660 997-7400
TAP - "RENEWAL" ORDER NO. T 21425
(GALV) TR 674543 10-23-58
EAST BAY MUNICIPAL UTILITY DISTRICT
DATE 3/17/44

MAKE 3/4 INCH TAP ON MAIN 3/4 INCH AT CURB FOR Joseph T. Conow (NAME)

NUMBER 2676 East SIDE OF 17th St. } STREET AVENUE

BETWEEN Merritt Ave. AND Broadway

LOCK TURN ON } locked METER ORDER NO. 145085 OTHER ORDERS SIGNED ms

Extension lot 85 Merritt #1

DEPTH TO TOP OF PIPE 36 INCHES DATE STARTED 4.6.44 DATE COMPLETED 4-6-44

3/4 INCH STOP COCK ON MAIN 3/4 INCH COCK AT CURB

SIZE OF MAIN 6 INCH 12 FEET OF 3/4 INCH COPPER (KIND) PIPE USED IN SERVICE

STOP COCK ON MAIN IS 69 FEET FROM N/E CORNER OF

Merritt Ave ON 17th Ave

WATER ON FIGURES APR ENG DEPT

KIND OF STREET CUT

SIZE OF CUTS

MAPPED 100'

TAP REGISTER	TAP INDEX	CARD INDEX	MAPPED
	1944	1	

151 P. 17th Mc Hugh FOREMAN 4-10

FOREMAN MUST REPORT ALL MATERIAL USED ON BACK OF THIS ORDER

Tap Records Indicating Lead Service Lines

City	Tap Record Indicated Lead	Lead Found in Field
Alameda	1	0
Berkeley	1	1
Castro Valley	8	0
El Cerrito	1	0
Hayward	7	0
Oakland	163	12
Richmond	150	1
Rodeo	1	0
San Leandro	107	1
San Pablo	63	4
TOTAL	**537**	**19**

- Services identified as lead on tap record checked in field
- No lead services found in field since November 2017

Lead Service Replacement Process

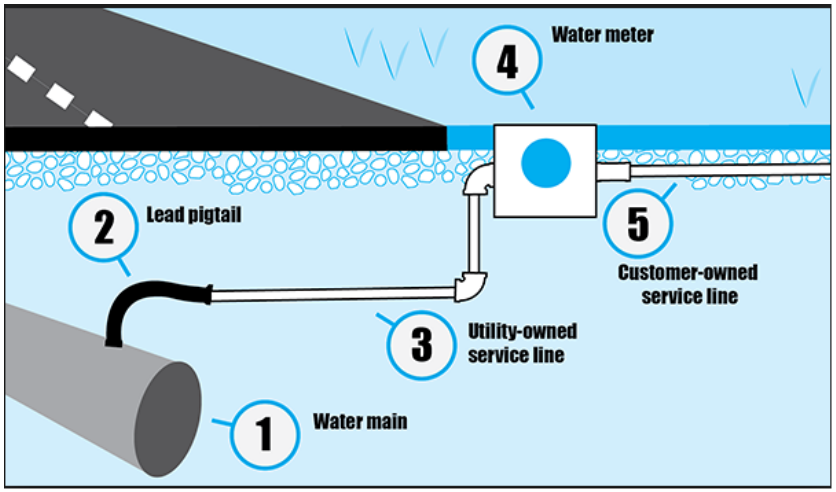
- Completed field verification
- Provided customer outreach package to affected customers
- If customer's external pipe material
  - **Is not lead**, District replaces lead service following customer notification, outreach, and sampling
  - **Is lead**, District will work with customer to replace all lead pipes at the same time (*No customer with lead pipe found*)
- Customer's tap sampling
  - Pre-replacement
  - Post replacement

Service Line Inventory

	Pipe Material	Est Number of Total Service Lines (Enter "0" if none)
A	**Lead**	0
B	**Unknown Material**	0
C	Copper	353086
D	Cast Iron (ductile pipe)	123
E	Ductile iron	0
F	Galvanized Steel	2275
G	Polyvinyl chloride (PVC)	1901
H	Polyethylene (PE)	8
I	High density polyethylene (HDPE)	0
J	Polybutylene (PB)	14300
K	Transite/asbestos cement	0
L Other materials not listed above		
L1	Steel	1180
L2		
L3		
L4		
Total number of services inventoried (calc total A thru L)		372873

Galvanized Services

- 2,275 galvanized services
- Galvanized services may have lead pigtails
- Service line includes the pipe, tubing, and fittings (includes pigtails)



Next Steps

- Review remaining paper tap records
- Complete database by July 1, 2020
- Develop plan to replace galvanized services by July 1, 2020

Questions

EAST BAY MUNICIPAL UTILITY DISTRICT

Richmond Advanced Recycled Expansion Waste pH Caustic Injection System

Planning Committee

July 10, 2018

Agenda

- Background
- Scope of Work
- Potential Impacts
- Next Steps

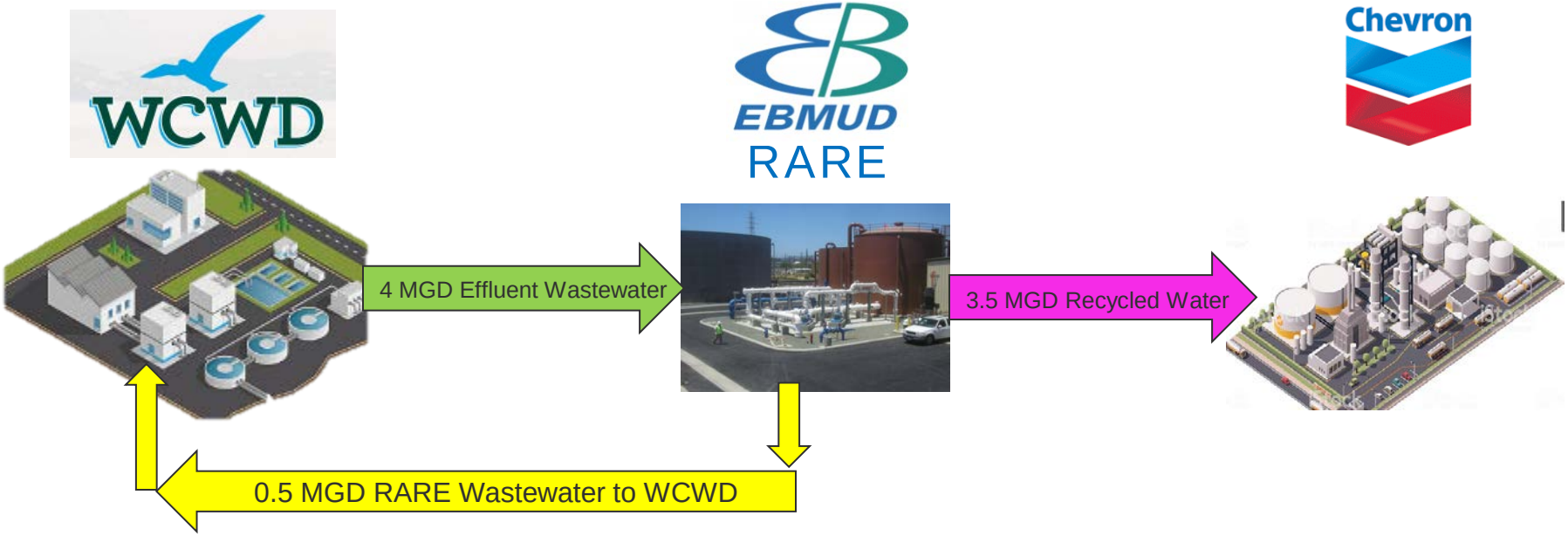
Background
RARE Facility

Overall Site Plan

RARE Product Water Tank and Pumps

- The Richmond Advanced Recycled Expansion (RARE) facility is inside the Chevron Richmond Refinery
- District has operated and maintained the facility since 2010
- Uses a microfiltration/ reverse osmosis (MF/RO) treatment process to produce recycled water

Background
RARE Partnership

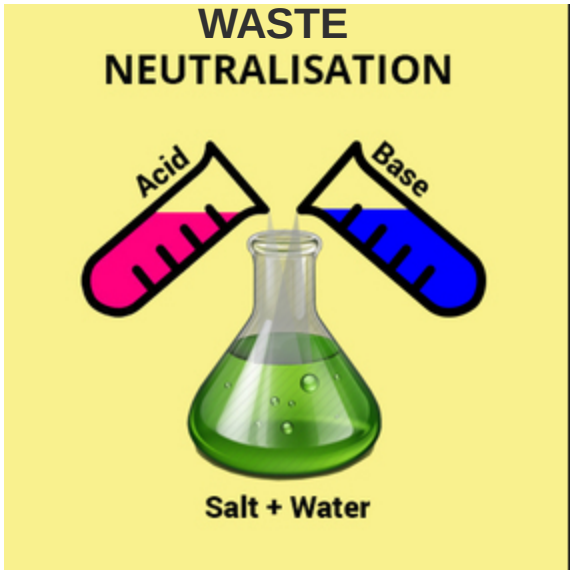


- 4 million gallons per day (MGD) of effluent wastewater from the West County Wastewater District (WCWD) to RARE
- 3.5 MGD highly-purified recycled water produced by RARE for Chevron's boiler feed
- 0.5 MGD of MF/RO process wastewater discharged to WCWD

Background
RARE Wastewater Discharge Permit

- RARE wastewater is subject to WCWD discharge permit requirements:
  - Continuous (1-minute interval) monitoring for pH
  - pH between 6 and 12
  - pH may be outside limits for a period of time each month
- The District has reported pH as daily average since 2010
- WCWD requested that the District report continuous pH per permit
- Past data showed pH was outside limits beyond the time allowed each month based on continuous monitoring data

Background
RARE Existing Condition

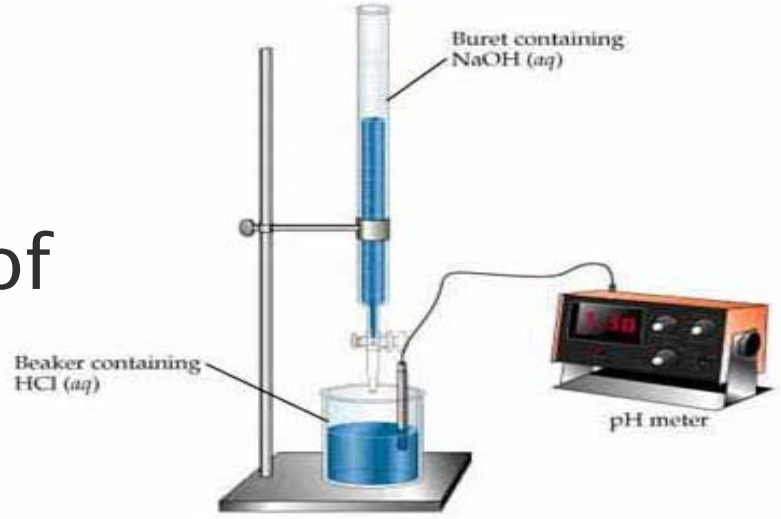


Acid – Base Reaction

- Original design assumed that waste streams would neutralize each other in the tank
- Due to timing, low pH waste stream was not neutralized prior to discharge
- Due to the auto sequencing of MF/RO processes, optimization was not successful

RARE Waste pH Caustic Injection System
Scope of Work

- Verified source of low pH waste problem
  - Reviewed drawings and operational data, and interviewed operations staff to pinpoint problem source and when it occurs
  - Verified through sampling and analysis of waste stream to confirm problem
- Performed bench scale chemical titrations to determine the quantity of caustic for waste neutralization



RARE Waste pH Caustic Injection System
Scope of Work

- Completed design and bid documents for construction of the caustic metering pump system
- Submitted design to WCWD for review
- District staff to modify controls system for automatic pump operations

Typical pump skid, includes pumps, piping, valves, and control panel

RARE Waste pH Caustic Injection System
Potential Impacts to Chevron

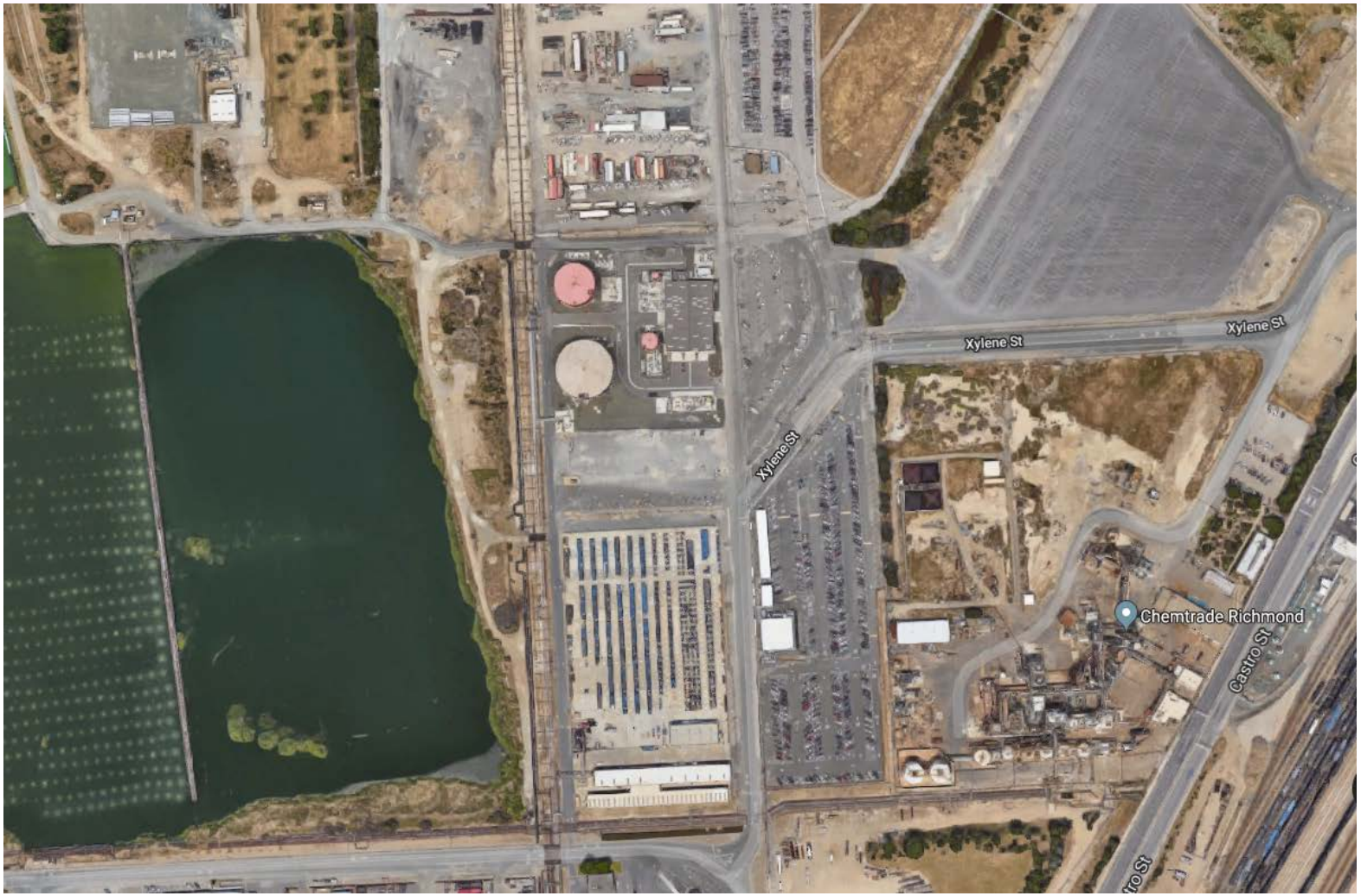
- Construction work will be coordinated to prevent any impact to water production and delivery to the Chevron Refinery

The Chevron Oil Refinery in Richmond. Courtesy of KQED

RARE Waste pH Caustic Injection System
Schedule and Budget

- Schedule
  - Construction bid period: July – August 2018
  - Board Award of construction contract: September 11, 2018
  - Construction period: October 2018 – March 31, 2019
- Budget
  - Construction estimate: $250,000
  - Project to be paid by Chevron

Questions



EAST BAY MUNICIPAL UTILITY DISTRICT

Alameda Siphon Cleaning 2018

Planning Committee

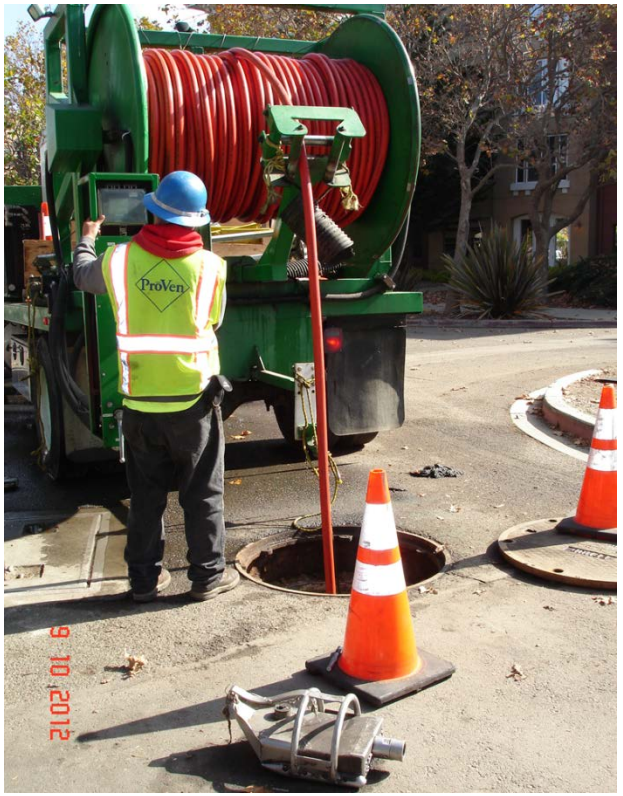
July 10, 2018

Agenda

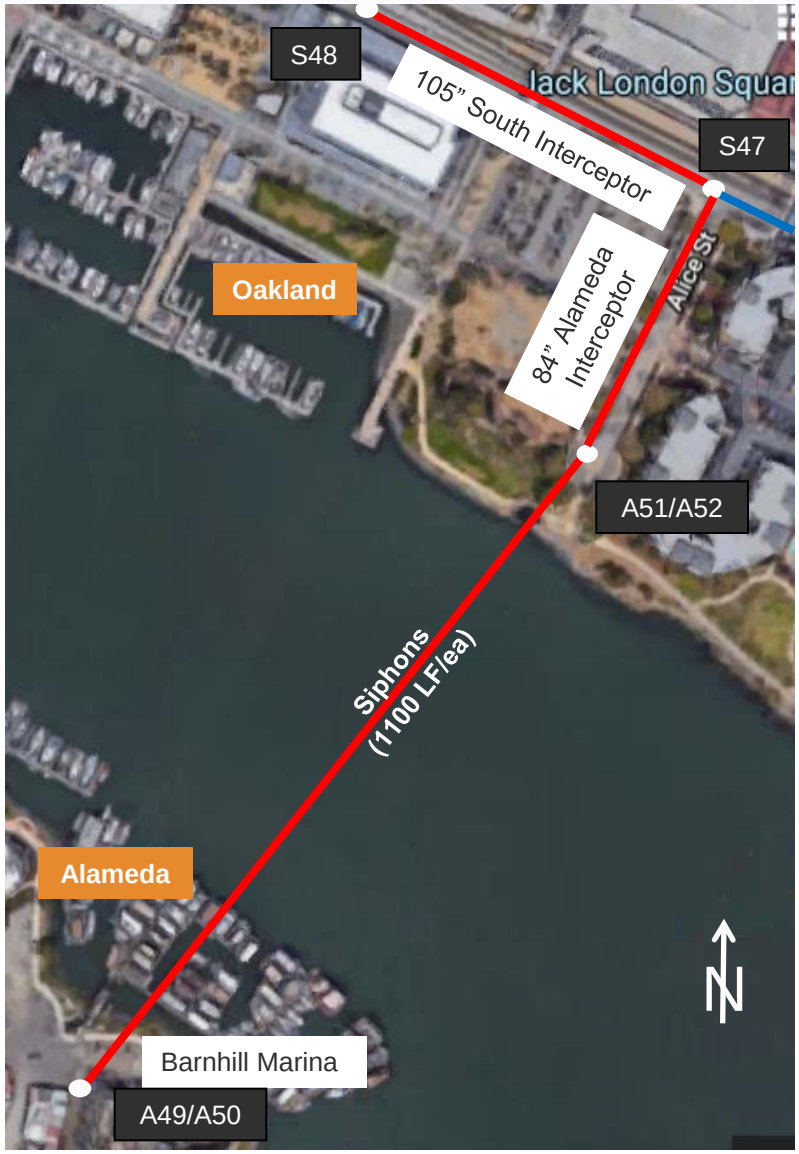
- Purpose/Background
- Scope
- Challenges
- Next Steps

Purpose/Background

- Purpose: Clean siphons before wet weather season, to avoid potential sewer overflows
- Background
  - 1950 – Two original siphons (48-inch, 30-inch) constructed
  - 2000 – Third siphon added (36-inch)
  - 2011 – Last major cleaning contract
  - 2013 – Last sonar inspection
    - Primary siphons had low sedimentation (8%, 24%)
    - Bypass had higher sedimentation (40%) cleaned
  - 2018 – Recent sonar inspection
    - Limited sonar data due to rags
    - Siphons estimated at 50% pipe blockage



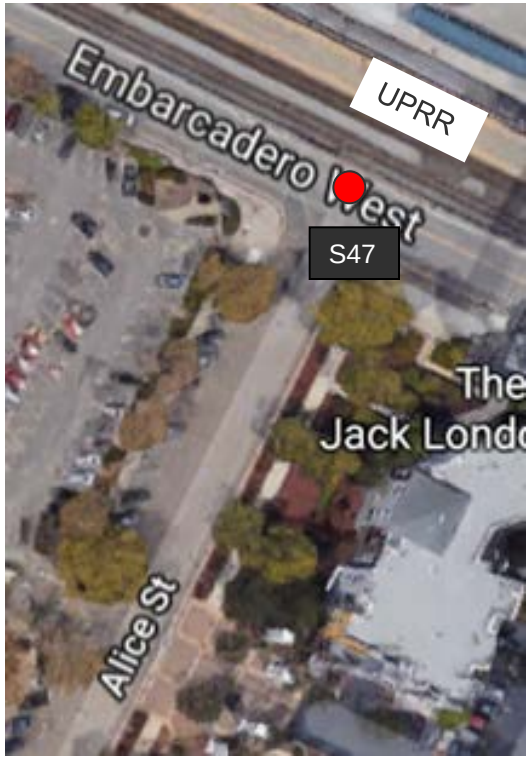
Scope



- Siphons
  - Cleaning
  - Sonar inspection
- 84-inch Alameda Interceptor
  - Cleaning
  - CCTV and sonar inspection
- 105-inch South Interceptor
  - CCTV and sonar inspection
- Debris handling
  - Use Oakport site for debris and equipment
  - Sampling, testing, drying required
- Approximate cost = $700,000
- Approximate duration = 48 days

Challenges

Union Pacific Railroad ROW Access – On Embarcadero West



Alameda Interceptor (Alice St.) – junction to South Interceptor at Embarcadero

Manhole (MH) S-47, junction of Alameda Interceptor and South Interceptor

- MH S-47 is five feet from rail
- MH S-48 also in railroad ROW
- Gate was removed with new fence and guard-rail installation
- Access impacts all work on 84-inch and 105-inch gravity sewer sections
- If the scope of cleaning the 84-inch pipe is deleted, sonar inspection is still required to verify quantity of silt and debris for disposal

Next Steps

- Continue working with Union Pacific Railroad for access
- Board approval of cleaning contract: July 24
- Cleaning: August to September 2018

Questions

EAST BAY MUNICIPAL UTILITY DISTRICT

Nutrients Update

Planning Committee

July 10, 2018

7
N
Nitrogen
14.007

15
P
Phosphorus
30.974

Agenda

- Background
- Potential Nutrient Reduction Study at Bay Area Wastewater Treatment Plants
- Nutrient Permit Renewal in July 2019
- Summary and Next Steps

1,400 pages

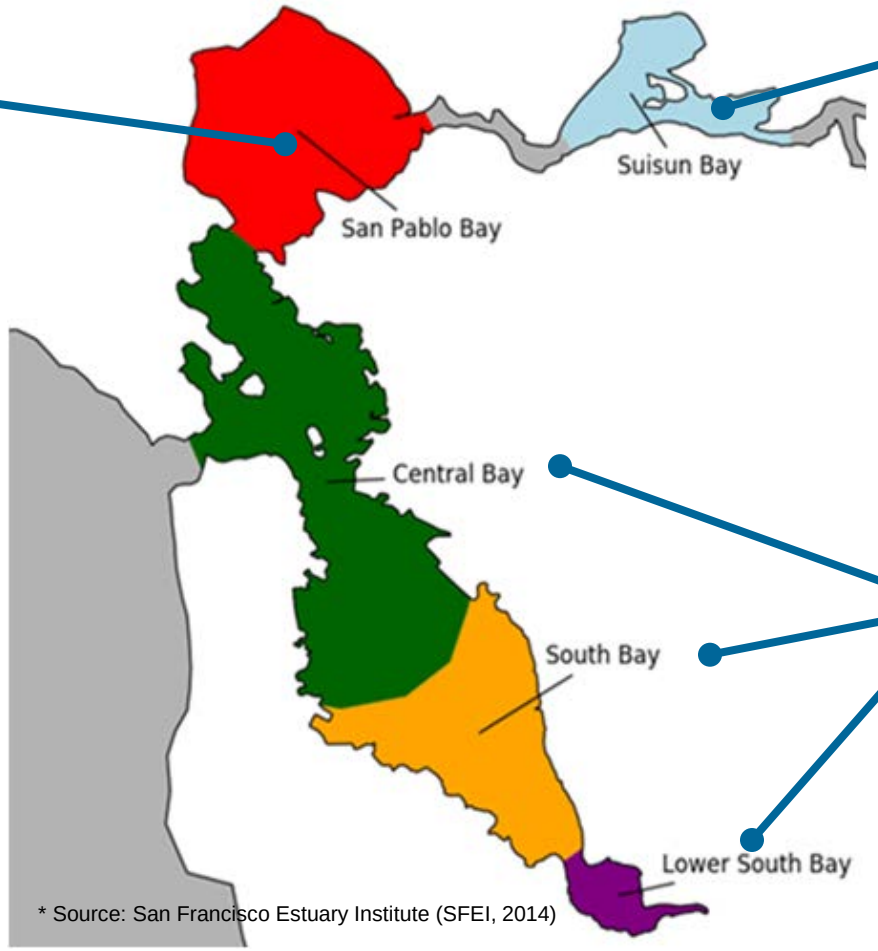
Major Nutrient Sources to San Francisco Bay

Nutrient Sources to the San Francisco Bay*

21%

by Publicly Owned Treatment Works (**POTWs**)

- Rest by Delta and storm water
- Large seasonal variability



24%

by **POTWs**

- Rest by Delta and storm water
- Large seasonal variability

>90%

by **POTWs**

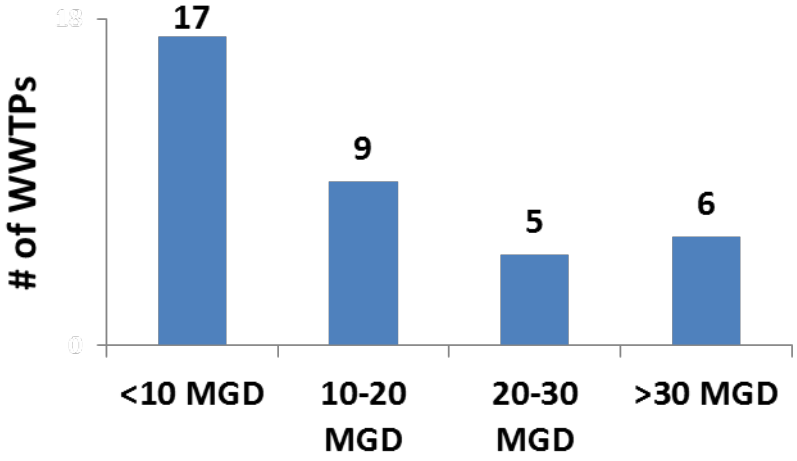
- Rest by storm water
- Minimal seasonal variability

* Source: San Francisco Estuary Institute (SFEI, 2014)

Bay Area Wastewater Treatment Plants

37 WWTPs | **~450 MGD** Treated wastewater | **7⁺ million** Service population

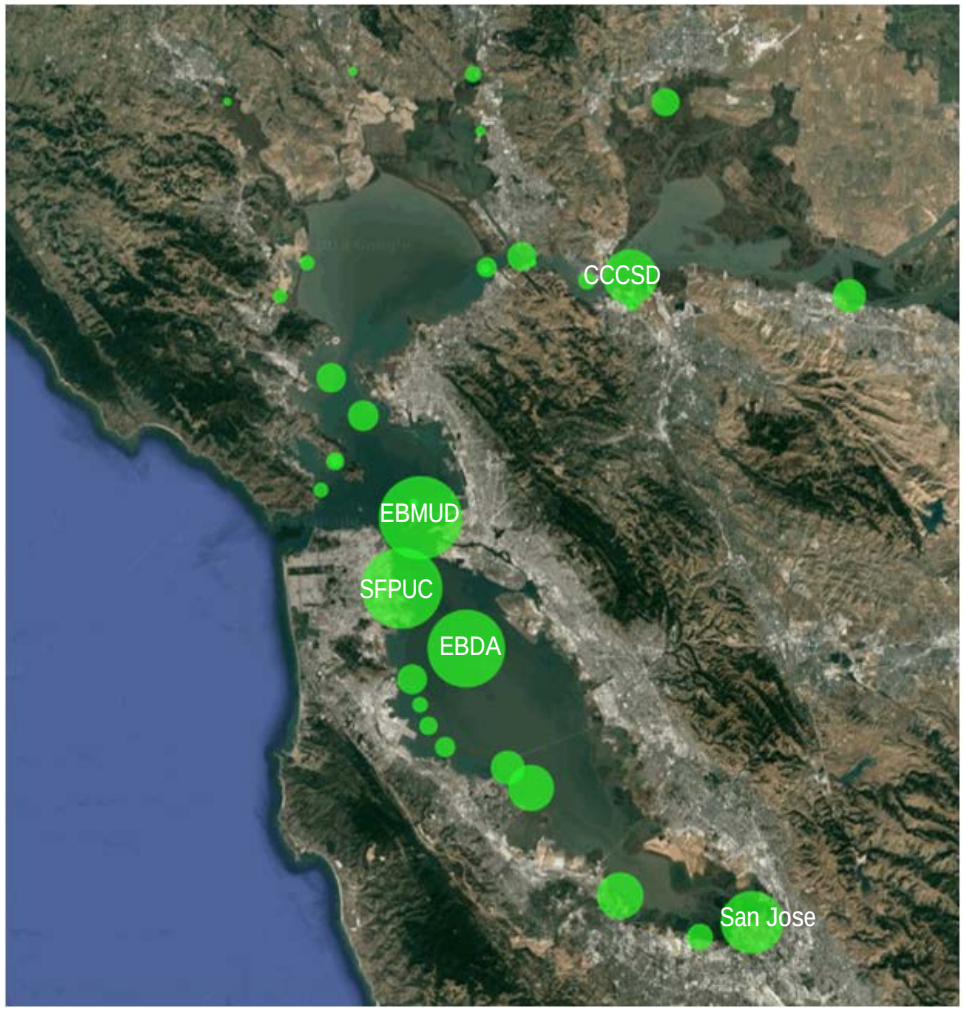
- Various treatment processes
- Plant size ranges from 1–167 MGD



WWTP Size
(by permitted average dry weather flow)

Bay Area WWTPs Nutrient Discharge

Dissolved Inorganic Nitrogen (DIN) Discharge (kg-N/day)
(DIN = ammonium + nitrite + nitrate)



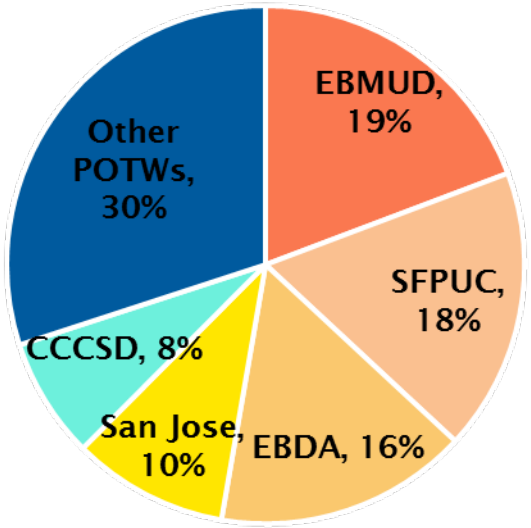
~450 MGD
Treated wastewater to the Bay

7 N Nitrogen 14.007

15 P Phosphorus 30.974

12,200 lbs/day
(55,600 kg/d)

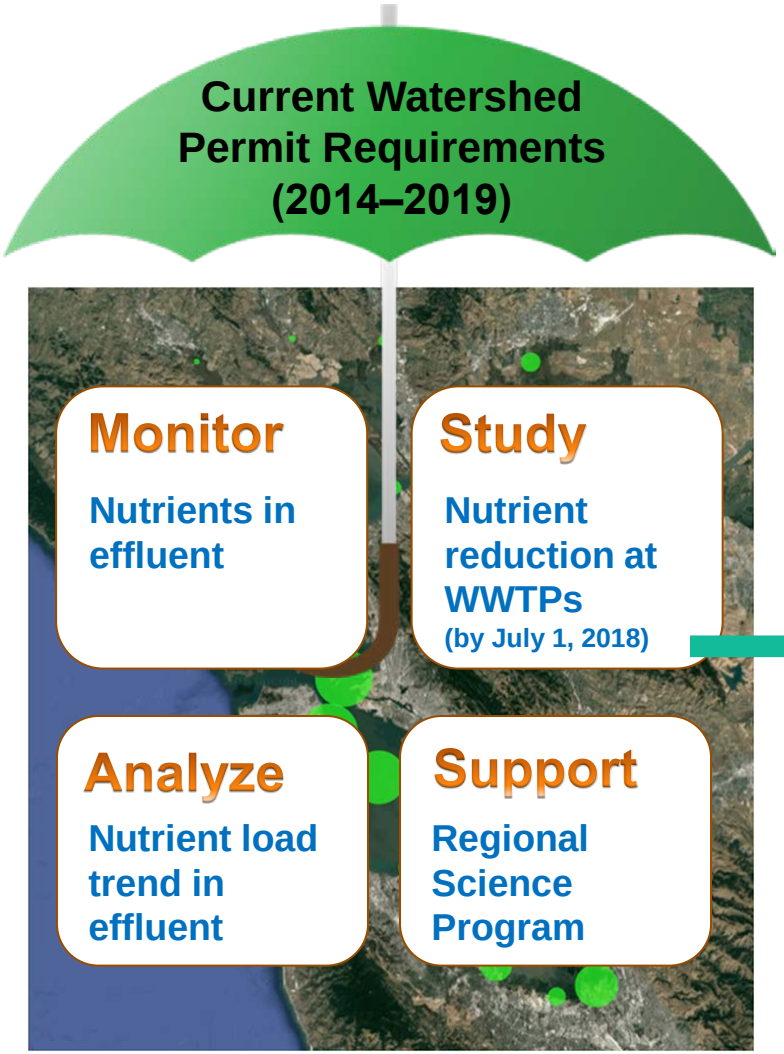
8,600 lbs/day
(3,900 kg/d)



Total Nitrogen Discharge
(70% by the top five dischargers)

Data by BACWA/HDR (2016 average), graph by SFEI. CCCSD = Central Contra Costa Sanitary District; EBDA = East Bay Dischargers Authority (joint power of five local agencies); SFPUC = San Francisco Public Utilities Commission Southeast Plant; San Jose = San Jose-Santa Clara Regional Wastewater Facility

Current Nutrient Watershed Permit

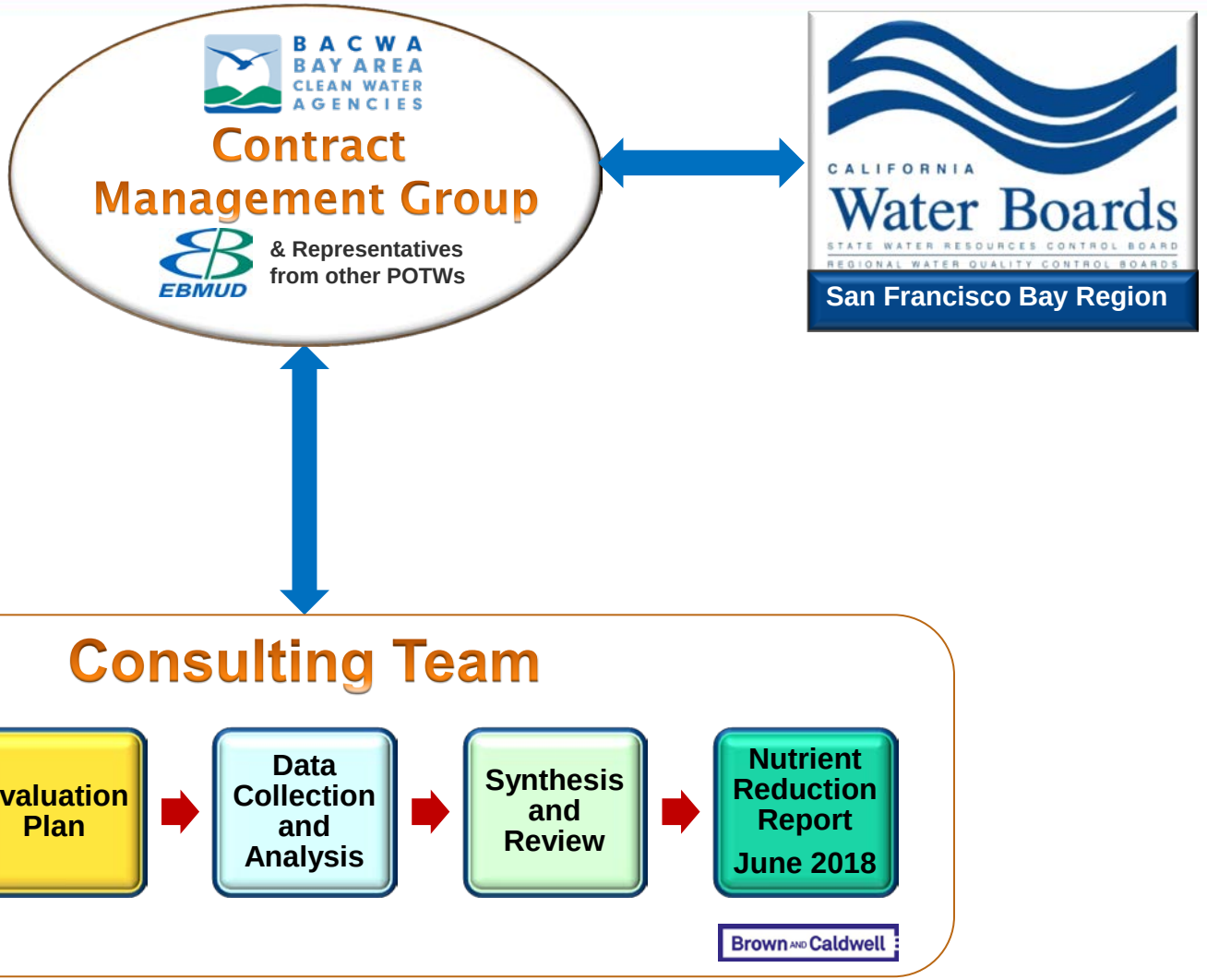


Nutrient Management Strategy (NMS)

To develop the best science-supported nutrient management solutions for San Francisco Bay

Action	Status
Investigate nutrients impact to the Bay through scientific studies	In Progress SFEI AQUATIC SCIENCE CENTER
Understand potential nutrient load reduction and costs at WWTPs	√
Explore non-WWTPs solutions (wetland, water recycling etc.)	Next

Nutrient Reduction Study Approach



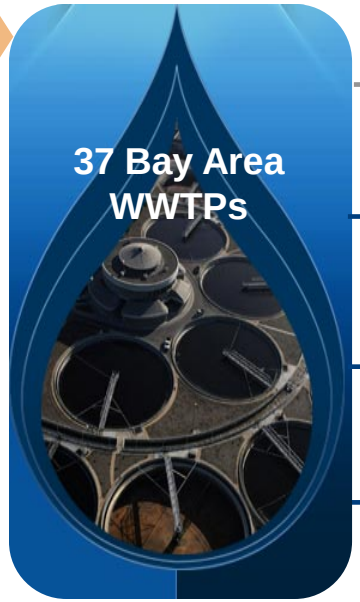
Study Assumptions

Conceptual-level Study

Influent*

~50 mg-N/l

~6 mg-P/l



Current Effluent Concentration*

~35 mg-N/l; ~2–3 mg-P/l

(~⅓ N removal, ~⅔ P removal)

Optimization (10-y project life, no eff. target)

Sidestream (30-y project life, no eff. target)

Upgrades (30-y project life, yes eff. targets)

Level 2

15 mg-N/l; 1.0 mg-P/l

Level 3

6 mg-N/l; 0.3 mg-P/l

* Source: BACWA/HDR, based on limited data available

Study Findings for EBMUD MWWTP

Not a candidate for Optimization — difficult for pure oxygen plant with limited reactor volume

A candidate for sidestream treatment

If upgrade to

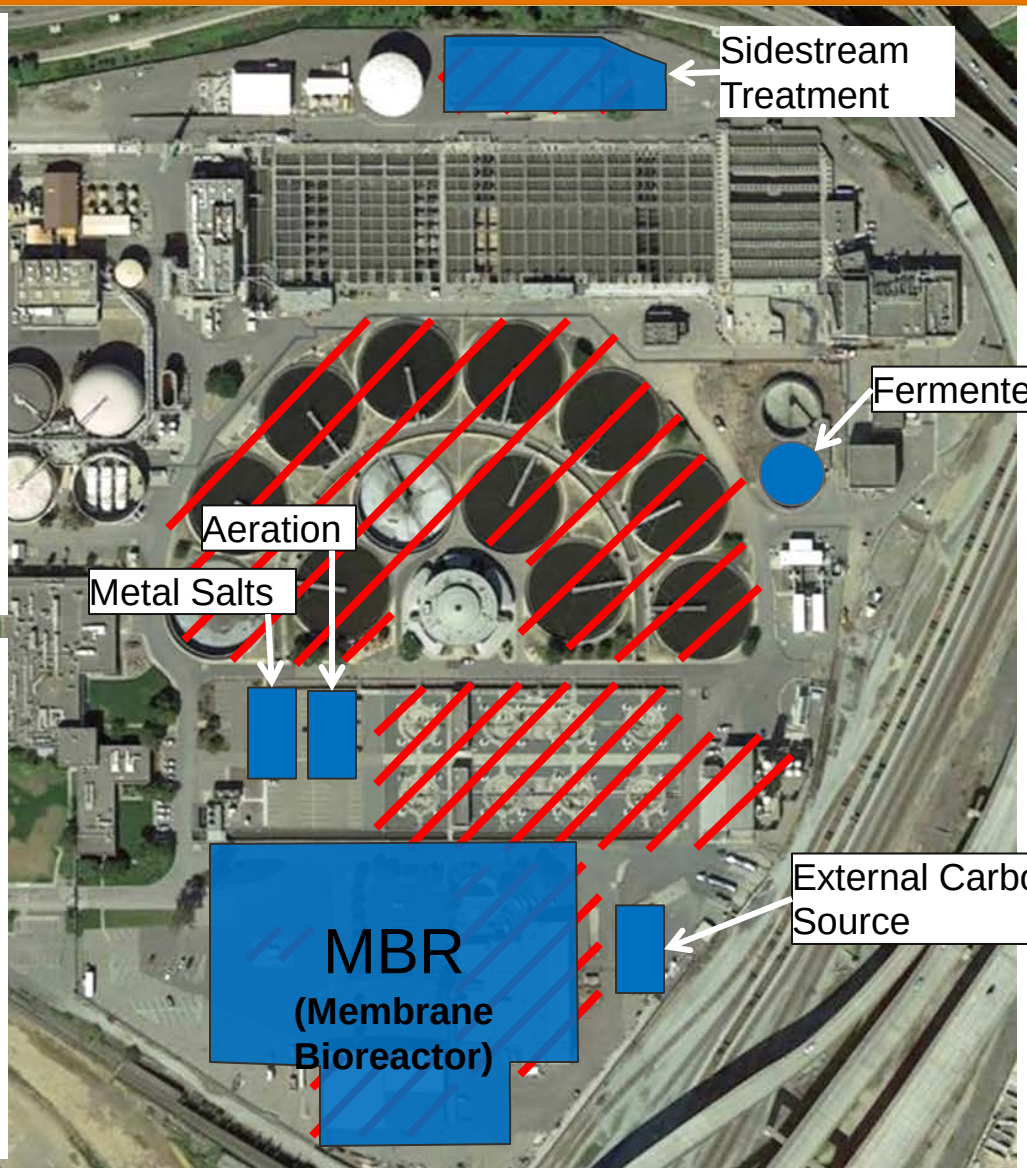
- Treat 120 MGD permitted dry weather flow (current ~50 MGD)
- Build new secondary treatment
- Build new sidestream treatment **$164M ($75M capital)**

$2.6B for Level 2 ($2.3B capital)

$2.9B for Level 3 ($2.4B capital)

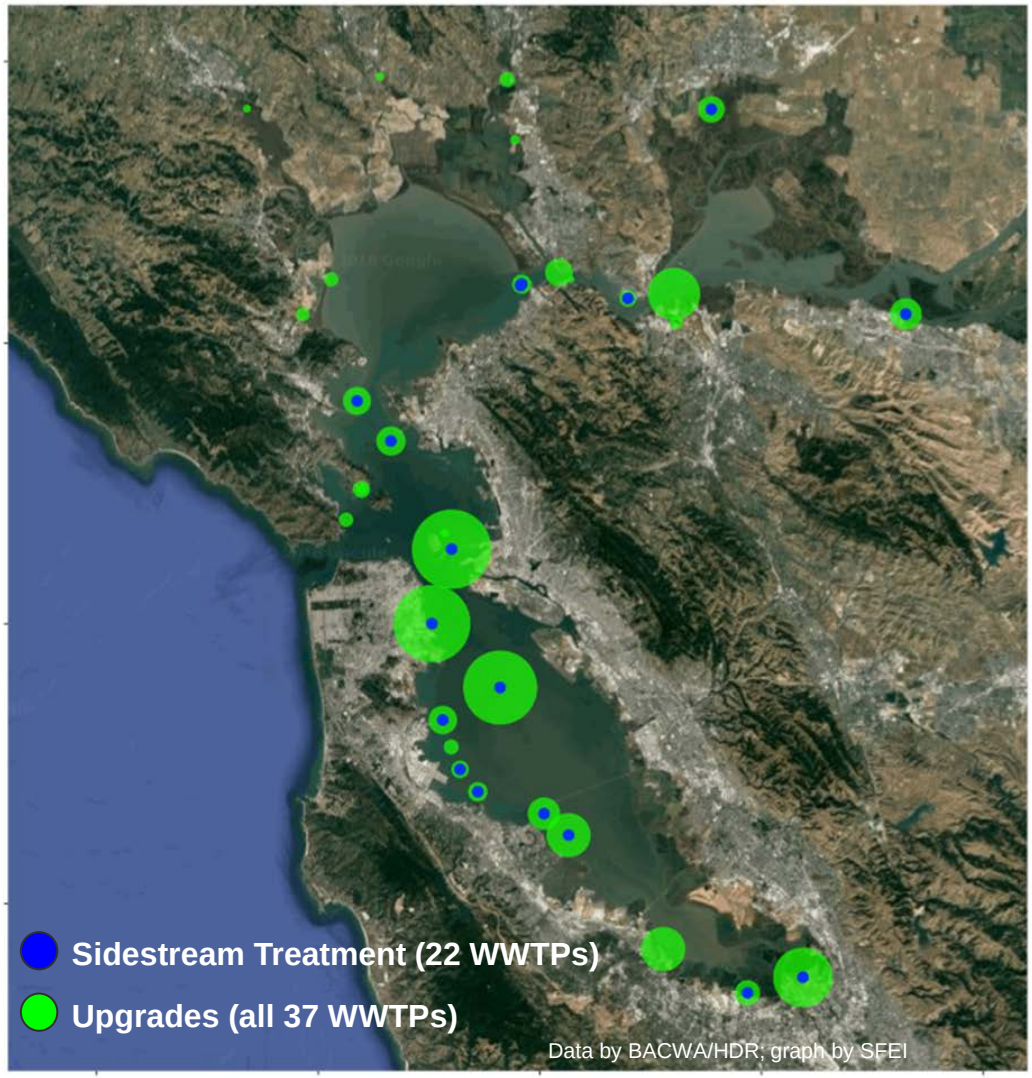
$2.4B Level 3 Upgrade Details

- Demolish/relocate Maintenance Facility
- Construct Membrane Bioreactor (MBR)
- Construct aeration system
- Demolish Reactors, O2 Plant, Secondary Clarifiers, and Old Maintenance Building
- Construct Sidestream Treatment Reactor
- Construct Fermenter to treat primary solids (to produce carbon needed for denitrification)
- Construct chemical addition facility (external carbon source)
- Construct chemical addition facility (metal salts)



Region-wide Study Findings

Candidate WWTPs for TN Removal

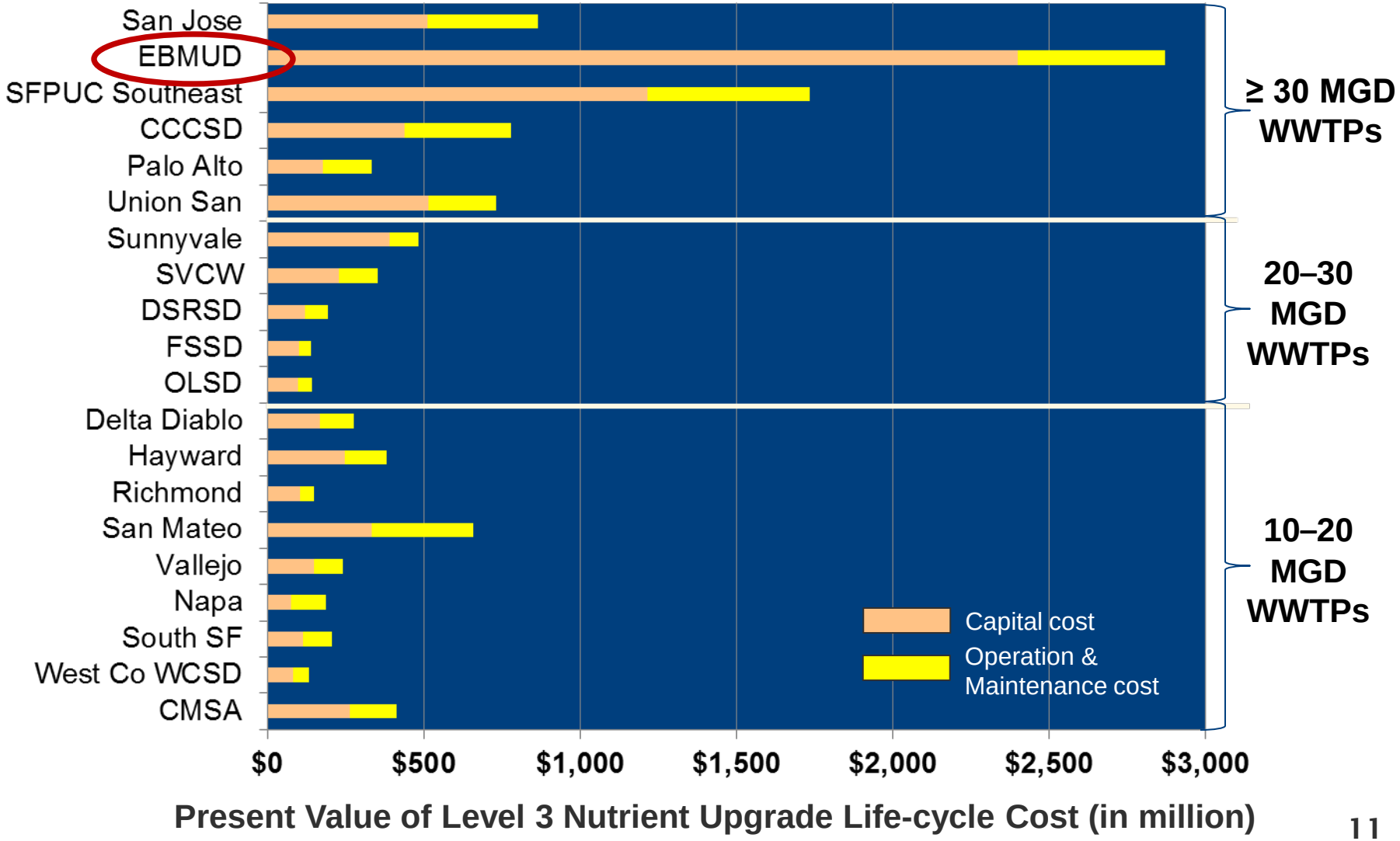


Region-wide Summary

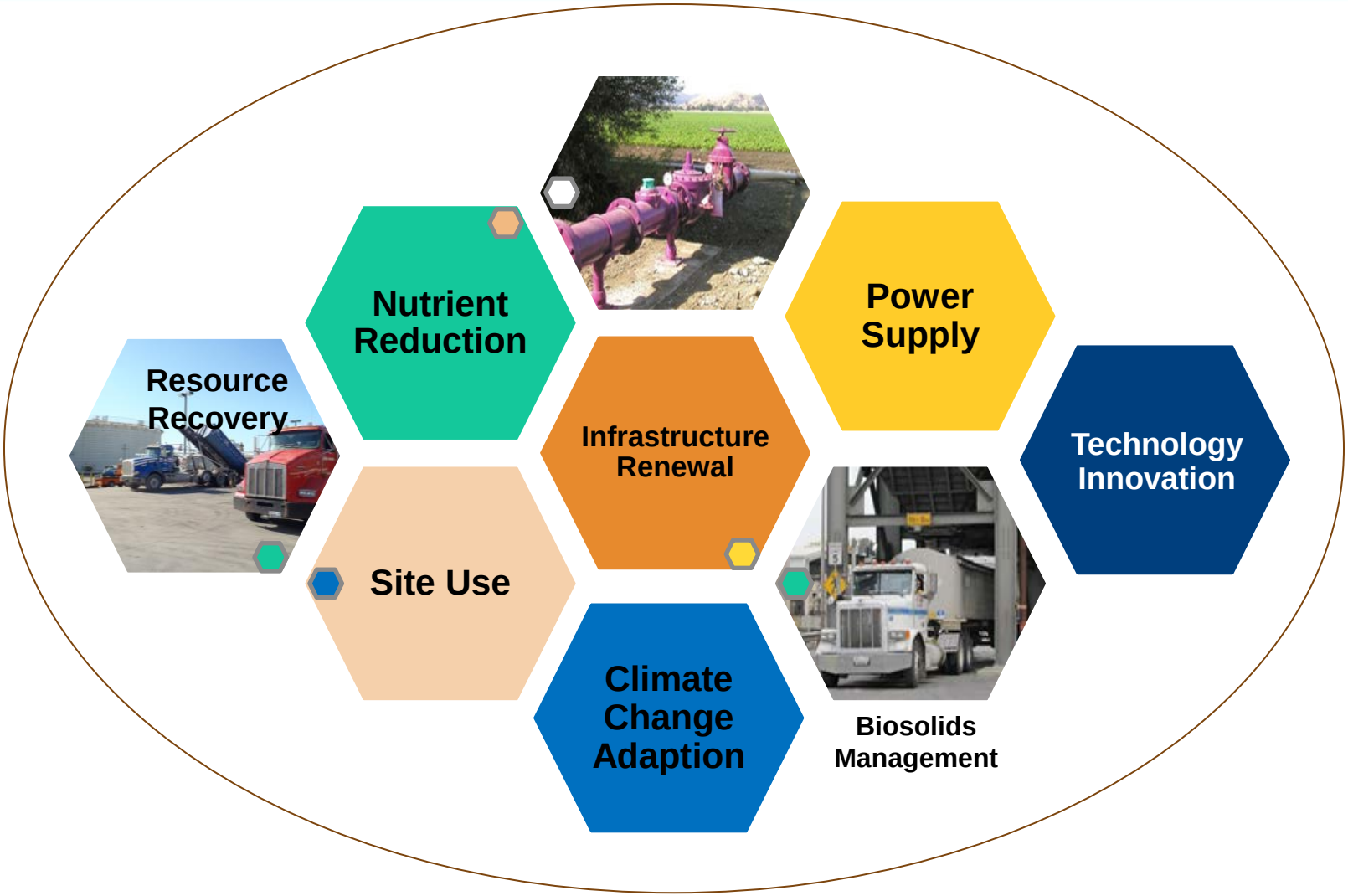
Strategy	TN Load Reduction to the Bay	Standalone Life-cycle Cost* (Capital cost)
Optimization	**7%**	**$266M** ($119M)
Sidestream Treatment	**19%**	**$736M** ($391M)
Upgrade Level 2	**57%**	**$9.4B** ($7B)
Upgrade Level 3	**82%**	**$12.4B** ($8.5B)

* Costs are for both TN and TP reductions. Costs are in present value.

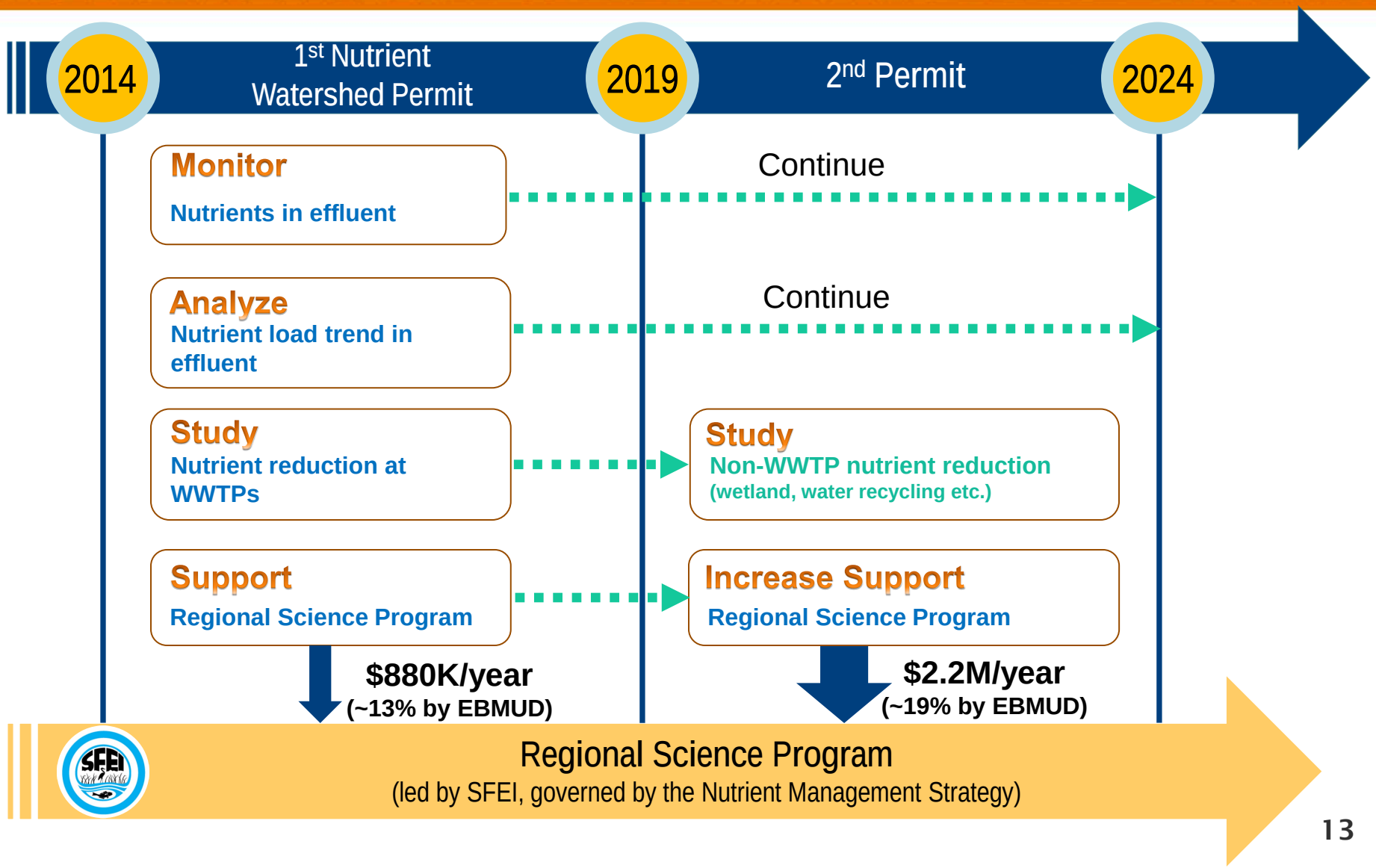
Nutrient Upgrade Costs for WWTPs (with ≥10 MGD permitted flow)



Develop Integrated Master Plan for the MWWTP



Possible Requirements for 2019 Nutrient Watershed Permit



Summary and Next Steps

- **Costs for nutrient upgrades at WWTPs will be substantial**
- **Science is critical to inform future nutrient management decisions**
- **Regional collaboration is important to develop the best nutrient management decisions**

EBMUD Actions	
Continue support the regional scientific studies	✓
Continue regulatory strategy development	✓
Develop MWWTP Master Plan	✓
Continue regional collaboration	✓
Provide ongoing Board updates	✓