Water Board Briefing:
Review of the Nutrient Reduction Study

November 14, 2018

HDR
Brown AND Caldwell

BACWA
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Agenda

1. Background
2. Study Limitations
3. Nutrient Reduction Study Findings
4. Key Observations

1. Background

Watershed Permit

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
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San Francisco Bay Regional Water Quality Control Board

ORDER No. R2-2014-0014
NPDES No. CA0038873

WASTE DISCHARGE REQUIREMENTS FOR NUTRIENTS FROM MUNICIPAL WASTEWATER DISCHARGES TO SAN FRANCISCO BAY

The following dischargers are subject to waste discharge requirements (WDRs) set forth in this Order, for the purpose of regulating nutrient discharges to San Francisco Bay and its contiguous bay segments:

Table 1. Discharger Information

Discharger	Facility Name	Facility Address	Minor/ Major

April 9, 2014

37 Participating Agencies

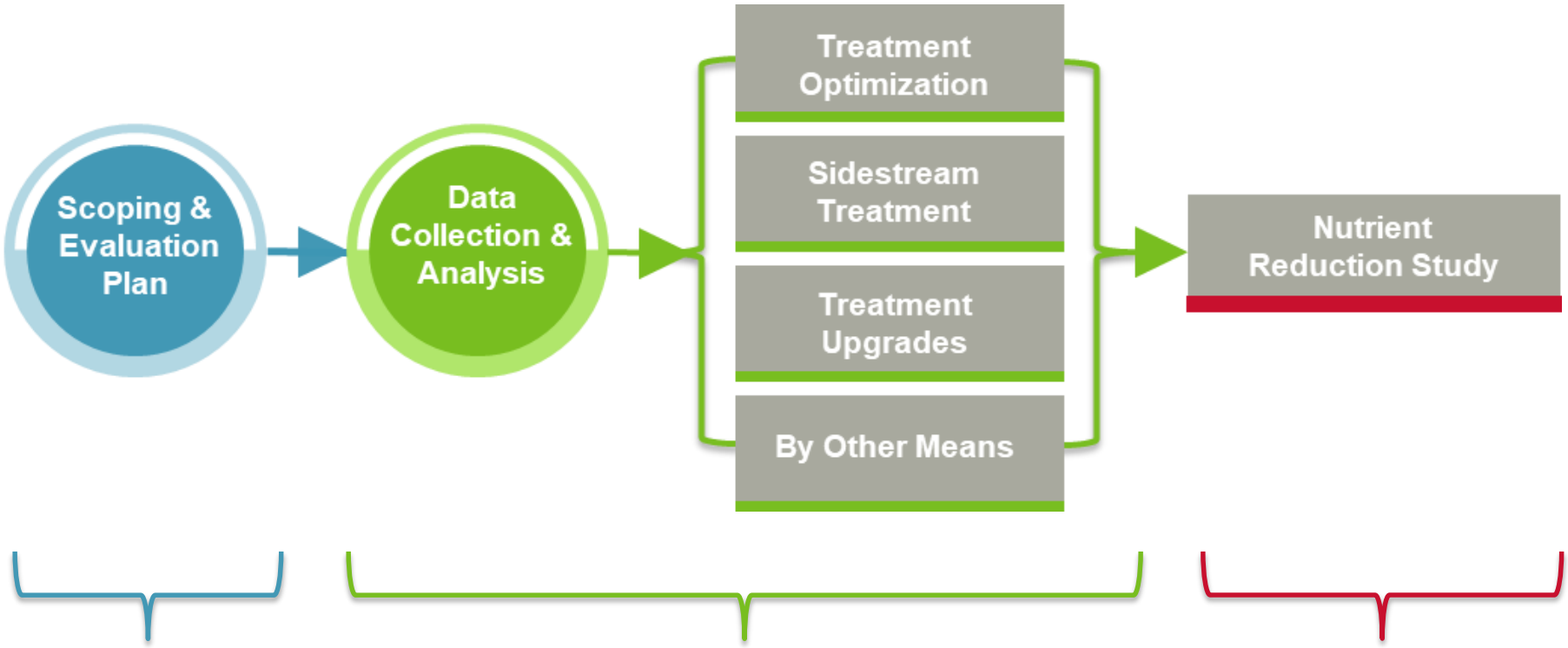
7+ Million
Service Population

37 WWTPs → **Treats** ~450 Mil Gals per Day

- Plants range from 1–167 mgd
- Approx. Half of the Plants are <10 mgd
- Each WWTP is unique

Wastewater Treatment Plants Represent about 2/3's of Nutrient Discharge Loads to the Bay

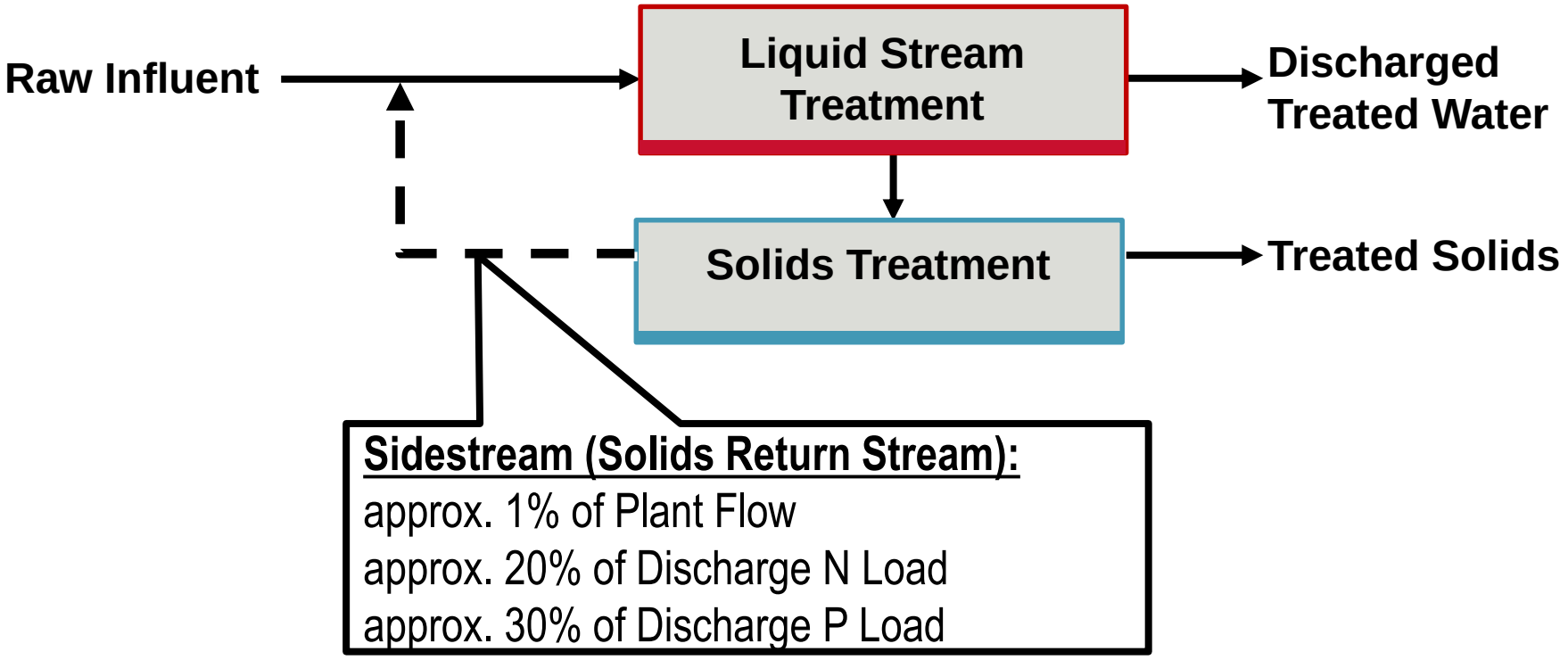
Project Approach Summary



Treatment Levels

Level	Study	Ammonia	TN	TP
Level 1	Optimization / Sidestream	--	--	--
Level 2	Upgrades	2 mg N/L	15 mg N/L	1.0 mg P/L
Level 3	Upgrades	2 mg N/L	6 mg N/L	0.3 mg P/L

What is the Sidestream? The nutrient-rich water extracted during solids treatment



2. Study Limitations

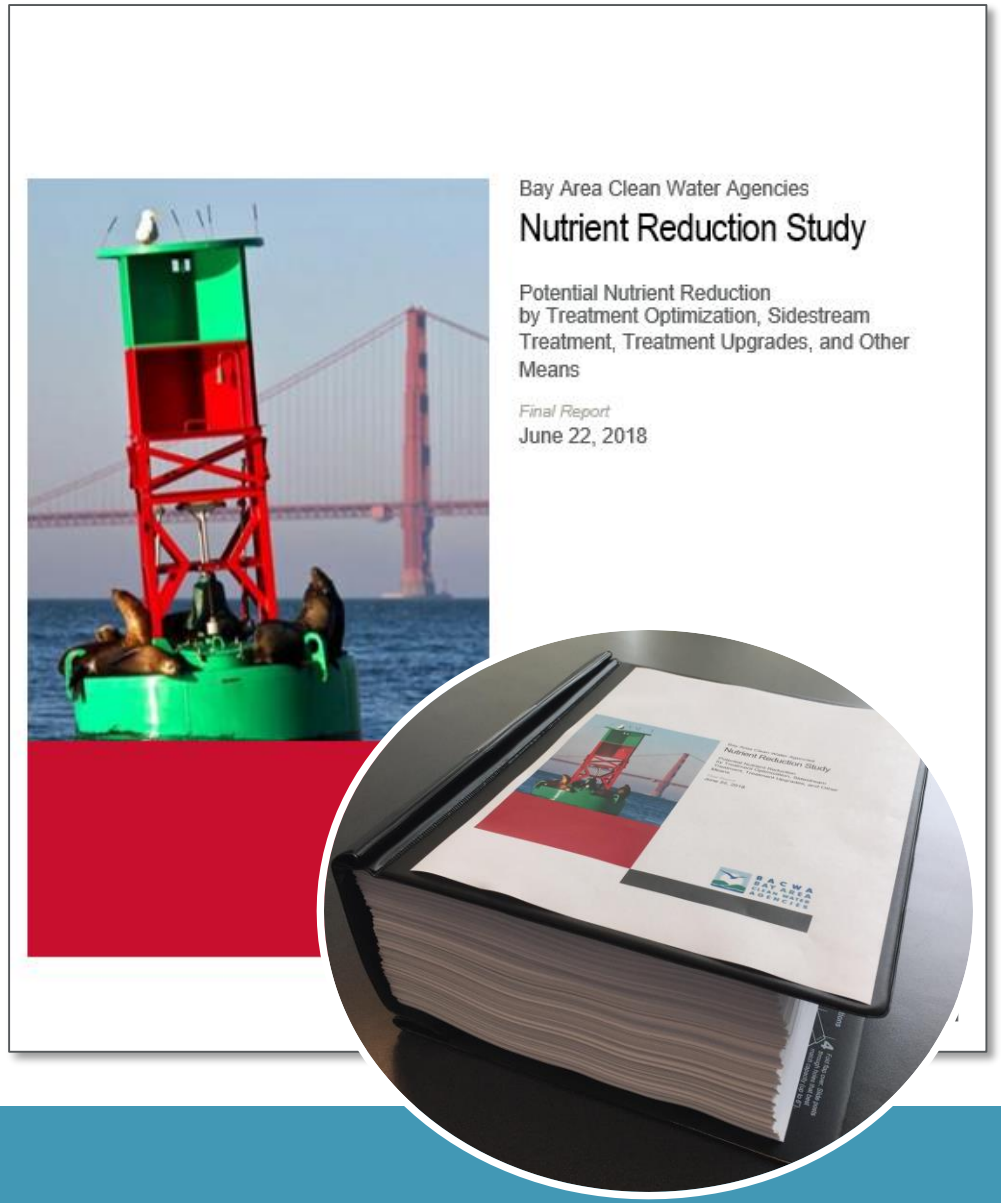
Study Limitations

1. Treatment levels are based on treatment performance (not water quality needs of the Bay)
2. Technology selection considered removal of all 3 nutrients (ammonia, TN, and TP)
3. Costs are based on established technologies (not emerging technologies)
4. Planning level effort (not a basis of design report)

3. Nutrient Reduction Study Findings

Nutrient Reduction Study Report (June 2018)

- Main report summarizes study findings for all plants
- 37 individual plant appendices:
  - Existing plant data
  - Optimization
  - Sidestream treatment
  - Plant upgrades
  - Emerging technologies



Study Findings for Total Nitrogen (TN) Load Reduction Across the Bay

Summary

Strategy	TN Load Reduction to the Bay	Capital Cost ($Millions)
Optimization	7%	$119 M
Sidestream Treatment	19%	$391 M
Upgrade Level 2	57%	$7 B
Upgrade Level 3	82%	$8.5 B

4. Key Observations

Key Observations

1. Treatment upgrades come with significant cost
2. Nutrient reduction results in:
   - Increase in energy and chemical demands
   - Increase in greenhouse gas emissions
   - Reduction in chemicals of emerging concern discharged to the Bay
   - Reduction in solids produced at treatment plants
3. Each plant is unique and the costs vs. nutrient reduction potential are wide-ranging. The information in this study provides a menu to optimize the tradeoffs between costs and nutrient reduction.

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