

Addressing Water Supply Reliability through Seawater Desalination

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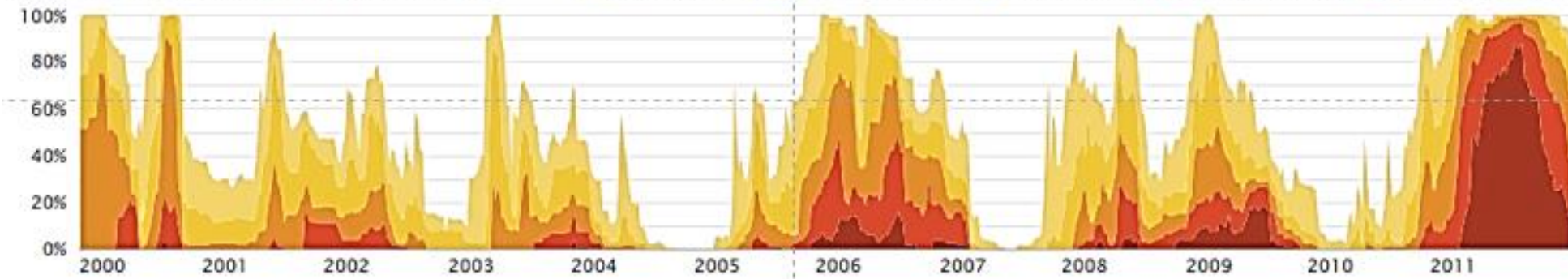
Texas Desalination Association Annual Conference

September 29, 2016

Austin, Texas

Surface Area of Texas in Drought by Severity

Abnormally Dry Moderate Drought Severe Drought Extreme Drought Exceptional Drought



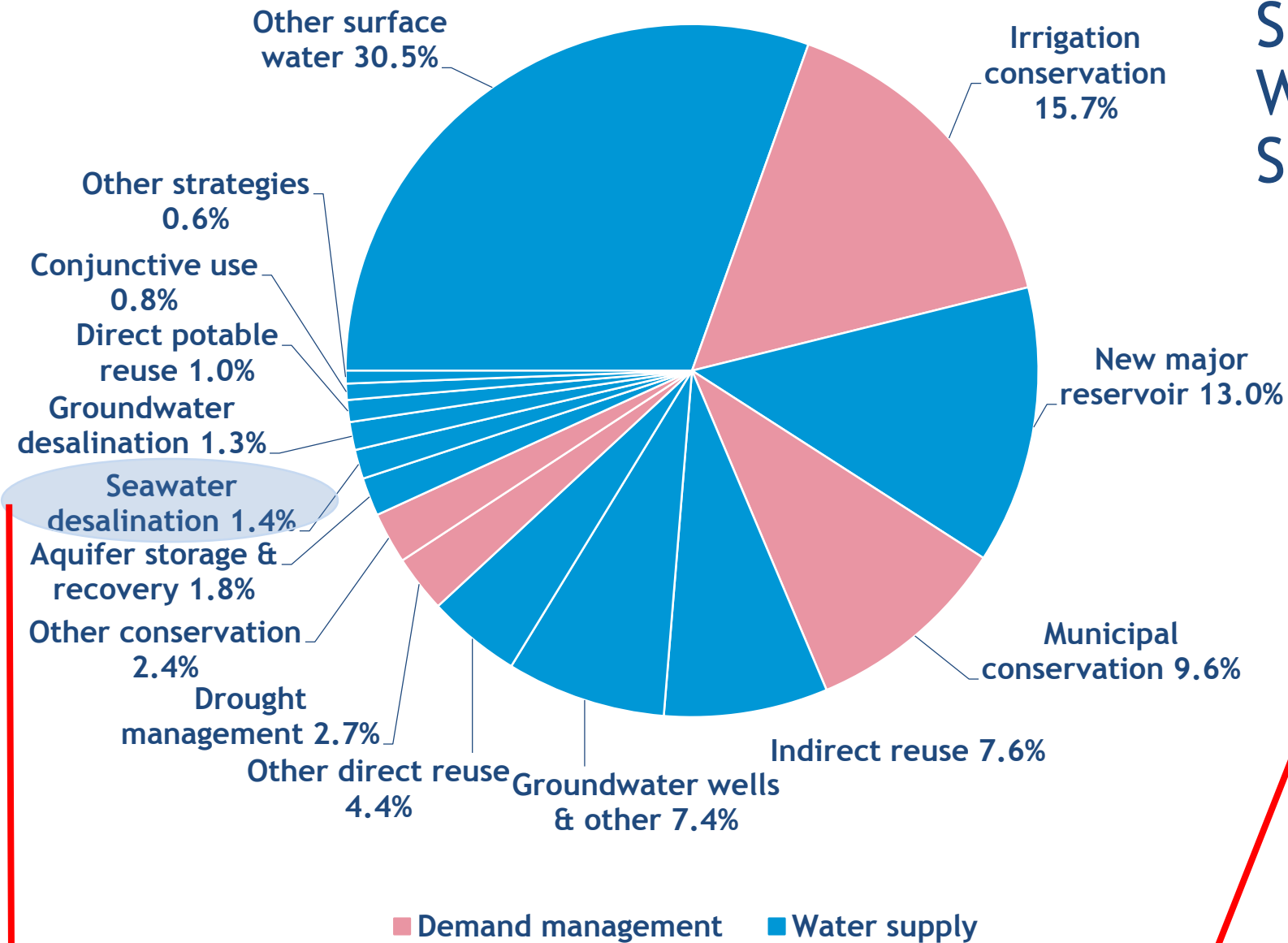
Sarah Backhouse – 8/2/16

Texas Water
Development Board

“Texas is a land of eternal drought interrupted occasionally by biblical storms”

Isaac Cline, Meteorologist - Quoted by WF Strong, Texas Standard, January 27, 2016

State of Texas Water Management Strategies by type in 2070



Seawater Desalination
1.4 %

Sarah Backhouse – 8/2/16

Seawater Desalination and Variable Salinity Program: 22,420 AFY in 2030

Coastal Bend Regional Water Planning Area Region N



Why Interest in Seawater Desalination?

- Period of prolonged drought and increased economic activity...
- Desire to reduce risk of water rationing or curtailment to industrial operations
- Concern that available water supply was impacting competitiveness of region in attracting new industry and expansions
- Interest in diversifying and strengthening the region's water supply

Study Partners

- Corpus Christi Regional EDC
- City of Corpus Christi
- San Patricio MWD
- Port of Corpus Christi
- Chemours
- Cheniere Energy
- Flint Hills Resources
- Lyondell-Basell
- OxyChem
- CITGO
- Sherwin Alumina
- Valero
- voestalpine Texas
- AEP Texas
- Talen Energy

FNI Consulting Team



John Wolfhope



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Neil Callahan

Original Concept - Industrial Desal

- Construct 20 MGD plant for industrial consumption
- Customers subscribe for output with long-term “take or pay” contracts
- Product water not subject to water rationing/curtailment
- Water “owned” by the company paying for it
- Water wheeling, or water exchange, or “water bank” concept to enable geographically distant customers to participate in project

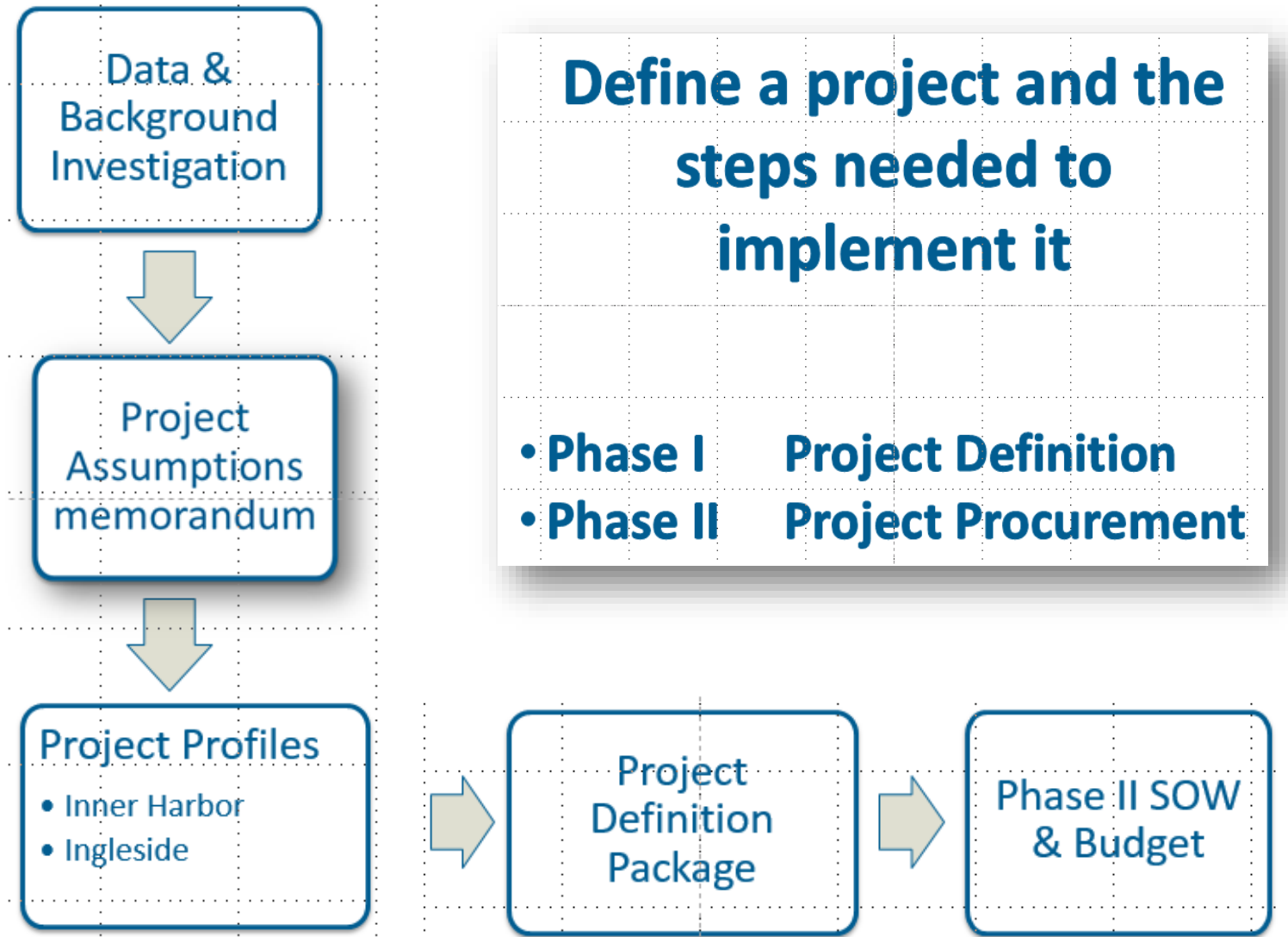
Study Objectives - Engineering/Technical

- What is best location to build a plant?
- How large should it be?
- How much will it cost?
- What quality water should be produced?
- How will the water be distributed?
- Discharge locations? Technical Processes? Permitting?

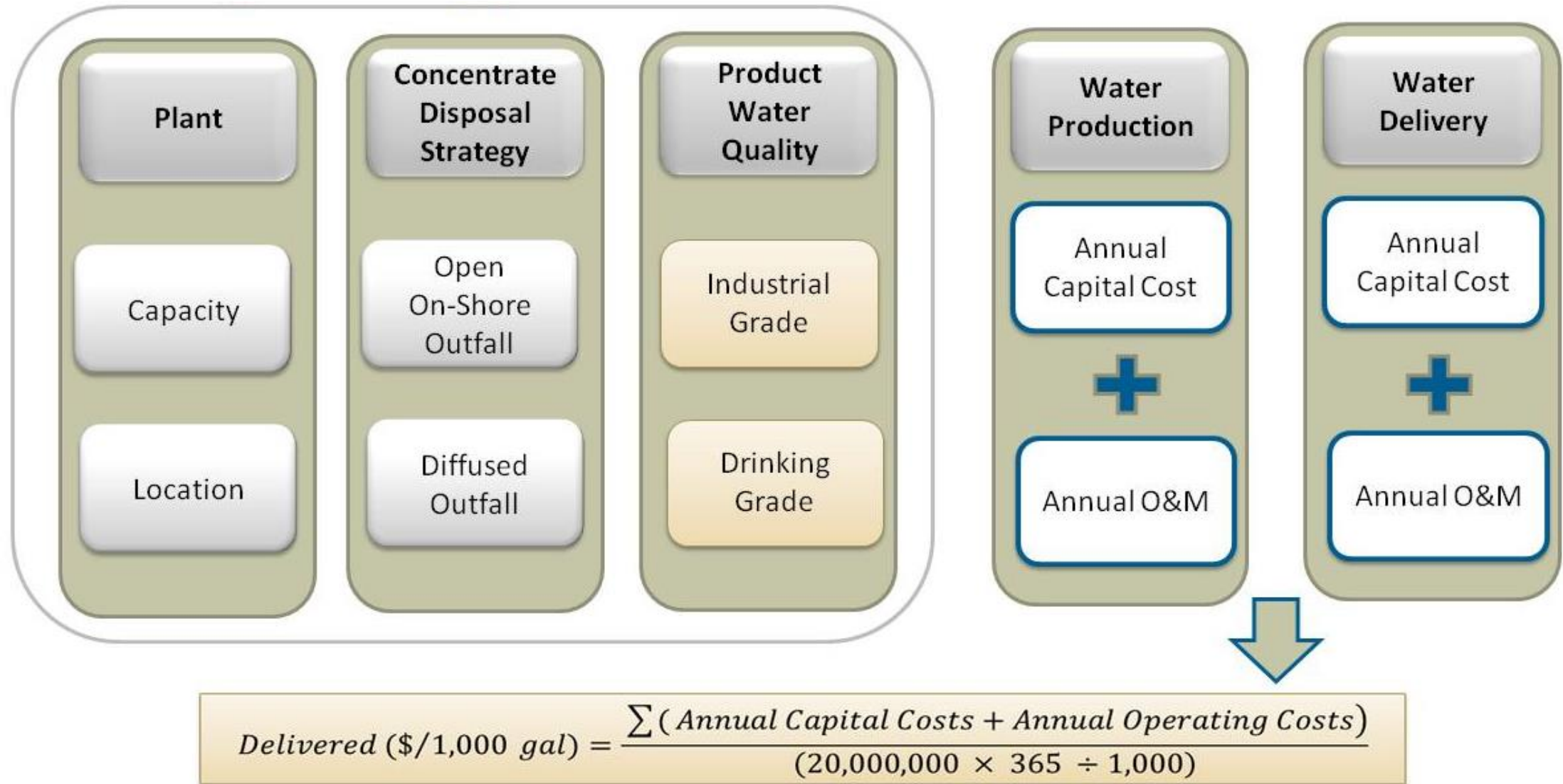
Study Objectives - Implementation/Financial

- Can Water be Wheeled from one area to another?
- Publicly Owned or Privately Owned?
- Design, Build, Operate, and Maintain?
- Financing Options?
- Impact on City water rates?

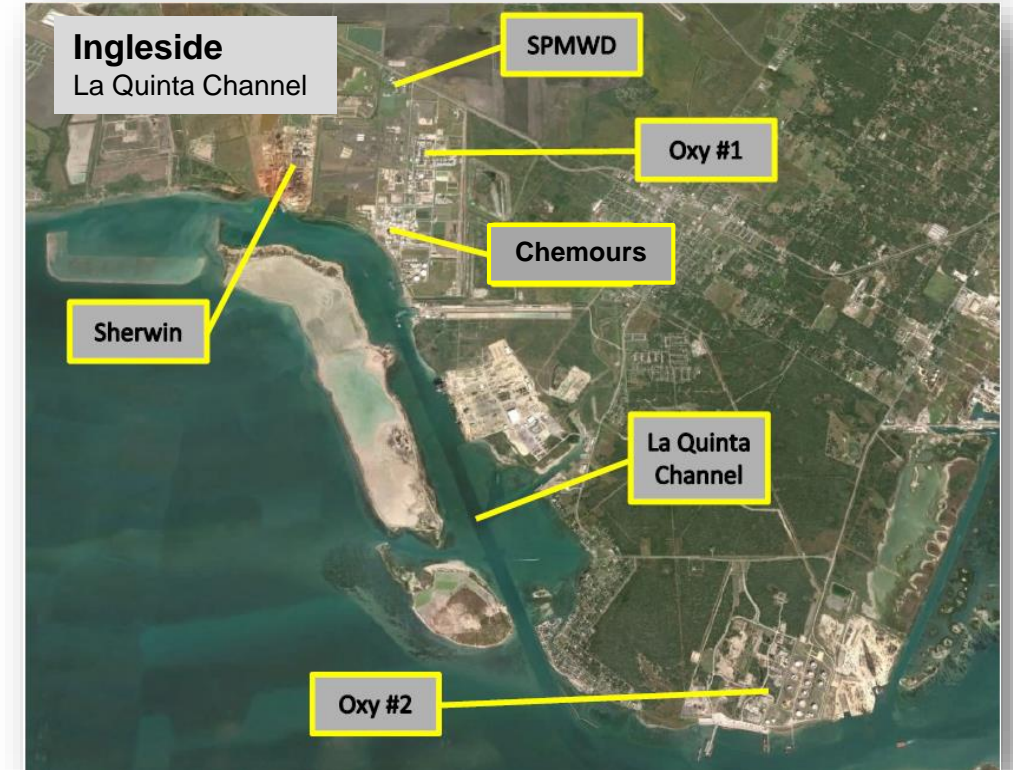
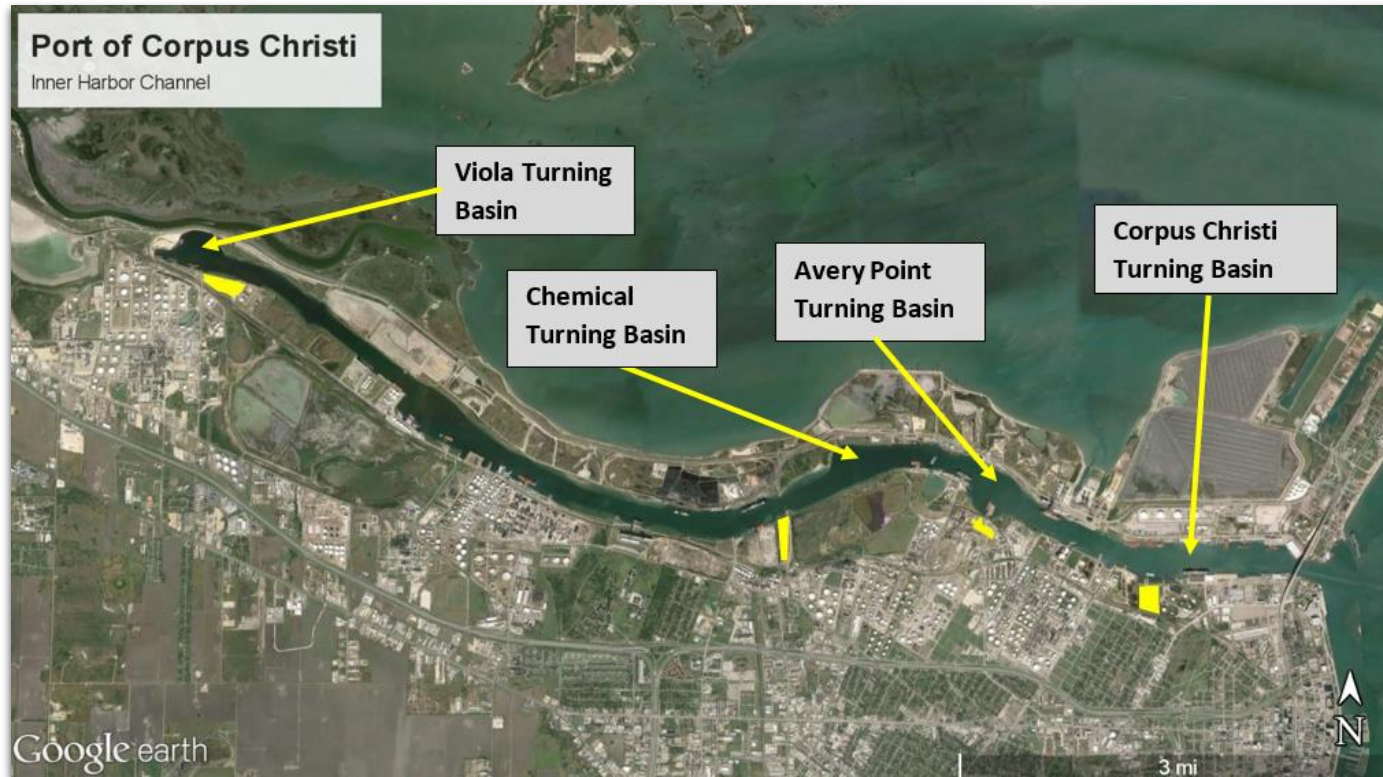
Study Organization



Analysis & Costing Strategy



Candidate Sites



Representative Sites



Configurations Developed/Assessed

- Desalination Plants - 6 options (4 @ 20 MGD; 2 @ 10 MGD)
- Distribution Pipeline Arrangement - 12 options
- Gulf Discharge Pipeline
- Organizational Structure (Public, Private, PPP)
- Pre-Procurement Development Strategy (Early or Late Exit)
- Financing Options
- Project Delivery Methods (DBO, DBOM, DBFOM, etc.)

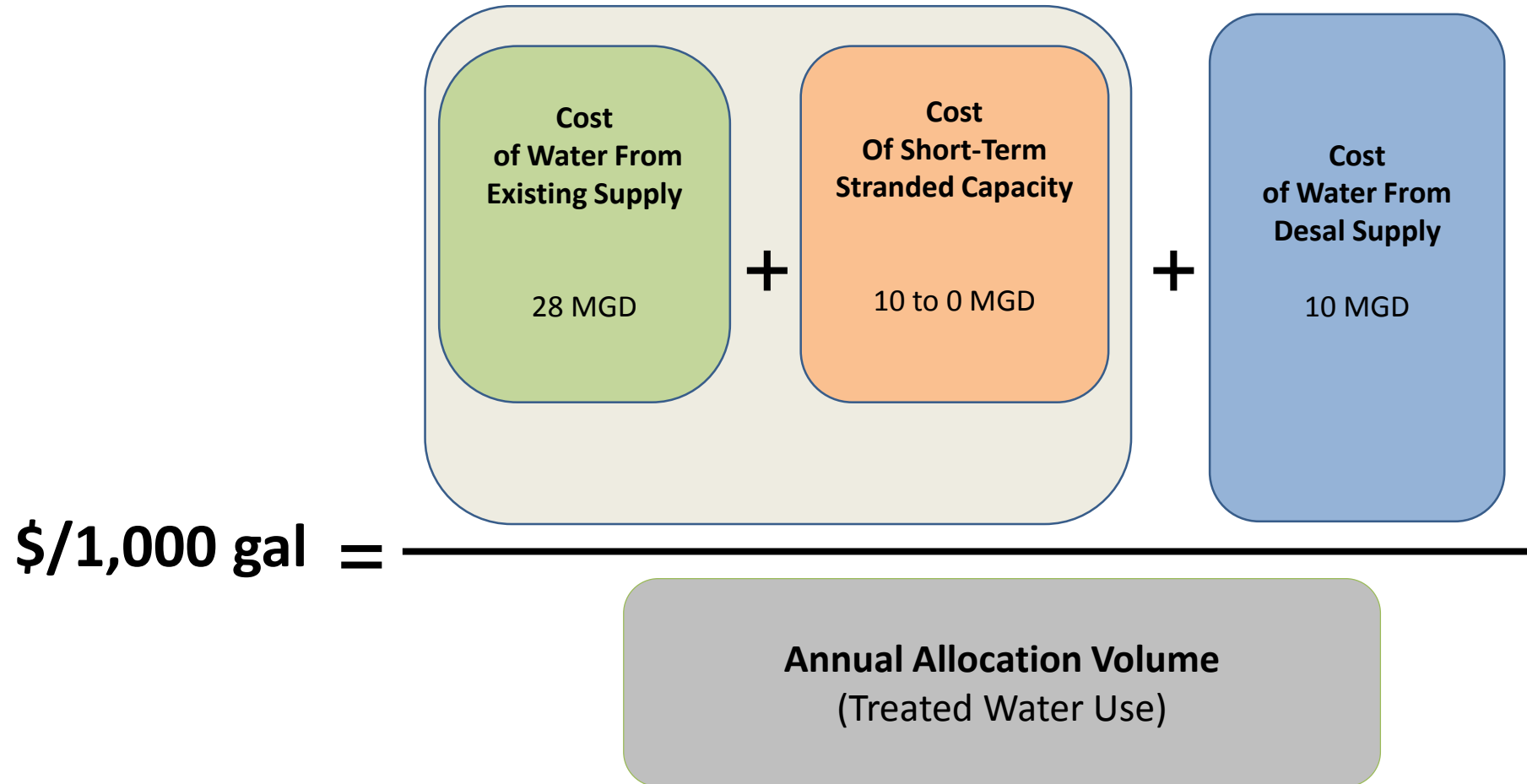
Current Consensus

- Two 10 MGD plants
 - Start with a facility located on the Corpus Christi side
- Plant production
 - Desalinated drinking water
 - Delivered to the Corpus Christi Regional System
- Local Government Corporation is preferred project agency
 - Seek funding through State Water Infrastructure Financing for Texas (SWIFT)
 - Additional planning studies and permitting to be conducted under the LGC's purview (with deferred SWIFT loan funding)
 - Expected procurement option: DBO (could also be DBOM, DBFOM)
 - Opportunity for desalination contractors to participate

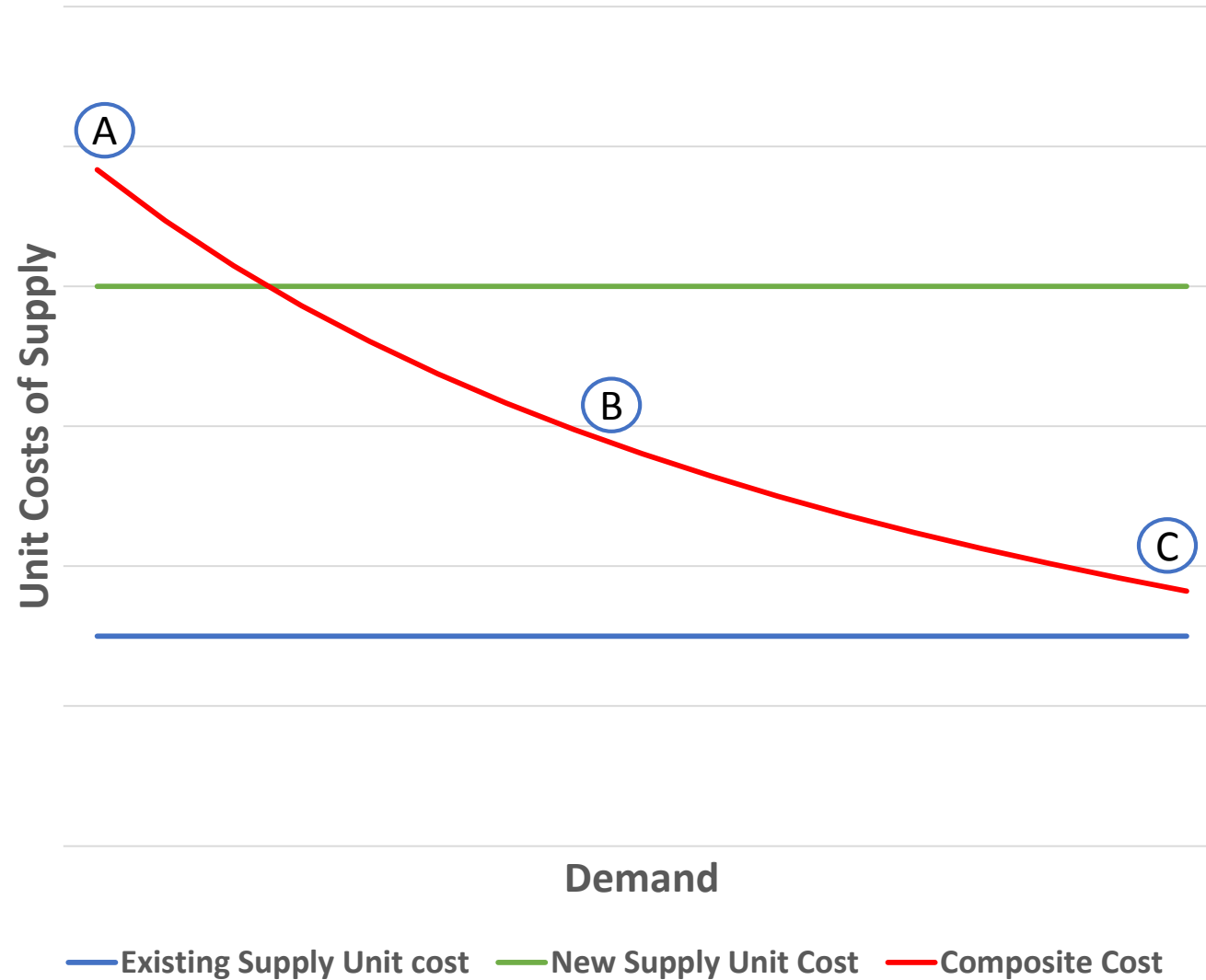
Local Governmental Corporation (LGC) - Concept

- Public entity
- Flexible
 - Can be set up for limited/single purpose
 - Can be set up to function relatively independently
 - Board of Directors structure options - members from both public and private sectors
- Enables access to public funding (SWIFT) and other benefits
- Allows for private developer participation - PPP
- Procurement delivery method needs to maintain public ownership to qualify for public funding - DBO, DBOM, DBFOM

Rate Impact / Cost of Service Approach



Cost of Water



Areas for Additional Development

- More fully examine/develop LGC concept
- More fully develop and vet pricing approaches
- Determine SWIFT requirements and application deadlines
- Assess environmental and permitting risk

Thank You

Questions