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@CityofPasco

CITY OF PASCO

Process Water Reuse Facility (PWRF)

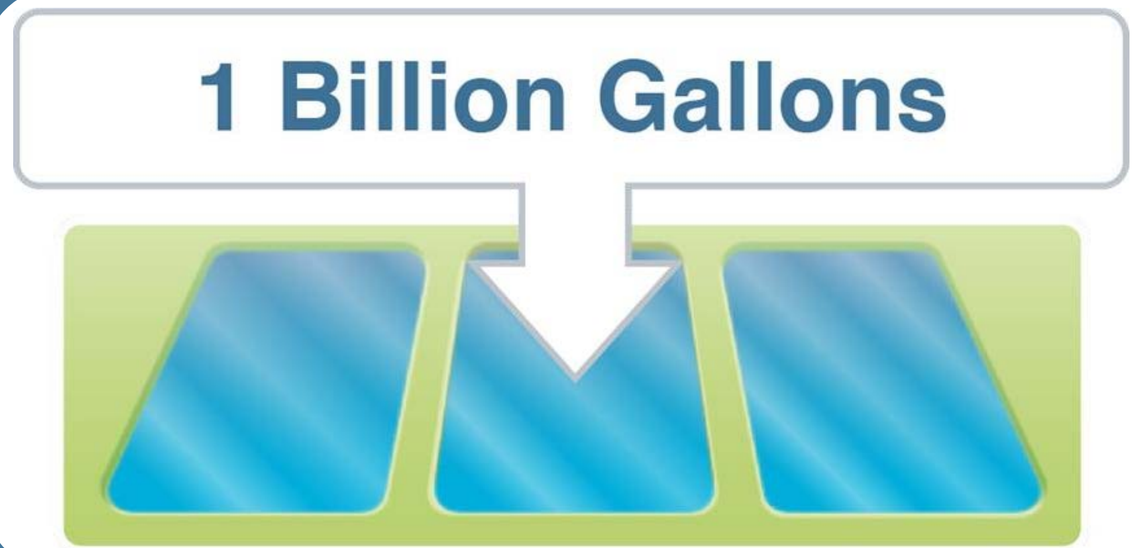
PWRF History

1995-2007

- 9 Irrigation Circles: Economic Development Opportunity
- Using land application to finish the industrial effluent
- Additional Irrigation Circles
- 14-Circles & 1,850 Acres

Who We Serve + Why

- **40-acre** facility
- Wastewater from **six food processors**
- **1,850-acres** of irrigated agriculture production fields



- **Bio solids** screened out
- **Sediment** filtered out
- **150m gallons** stored in lined ponds (winter)

01 **Foster Wells**
West of Highway 395

02 **Columbia East**
South of the facility near Highway 12

Process Water Reuse Facility Site

Process Water Reuse Facility Site

Initial Evaluation

Engineering Study

2019 Study

Completed to evaluate future improvements of the PWRF

Data Evaluation

Flow and loading data seemed questionable

Report Conclusions

Only minor upgrades needed to keep up with current flow.

Need for Solutions

2020

Too much nitrogen loading on fields

Concerning odor Issues

Processor growth expected

Why isn't it working? Time to do a Data Deep Dive!

Initial Data Review

Data from processors: BOD, TSS, and TKN concentrations were lower than expected.

Data from PWRF TKN and BOD concentrations were higher than expected.

Let's Review the Science

How are the samples being collected and handled?

What labs are performing the testing?

Where is the QA/QC data from each lab report?

Final Findings

- Samples were not properly handled when filled
- Lab bottles did not contain preservative reagents
- Inconsistent chain of custody documentation
- Labs didn't provide QA/QC Reports

Actions Taken

- We conducted split-samples with three different labs, including a newly added lab that had a strong track record of QA/QC reporting.
- We collected four months of data and calculated the relative percentage difference (RPD) between each of the previously used labs and the newly found lab.
- The city incorporated the food processors into our sampling program.

Now that the data has been vetted, what are we doing about it?

PWRF Challenges

Capacity Reached

- Land treatment capacity limit reached
- Facility expansion needed to accommodate Darigold
- More Winter Storage Capacity Needed
- Additional nitrogen treatment needed

PWRF Needs

Growth = Demand

Grimmway

Plant expansion means a need to direct their flow from Municipal WWTP to PWRF

Reser’s

Recently built a larger processing plant

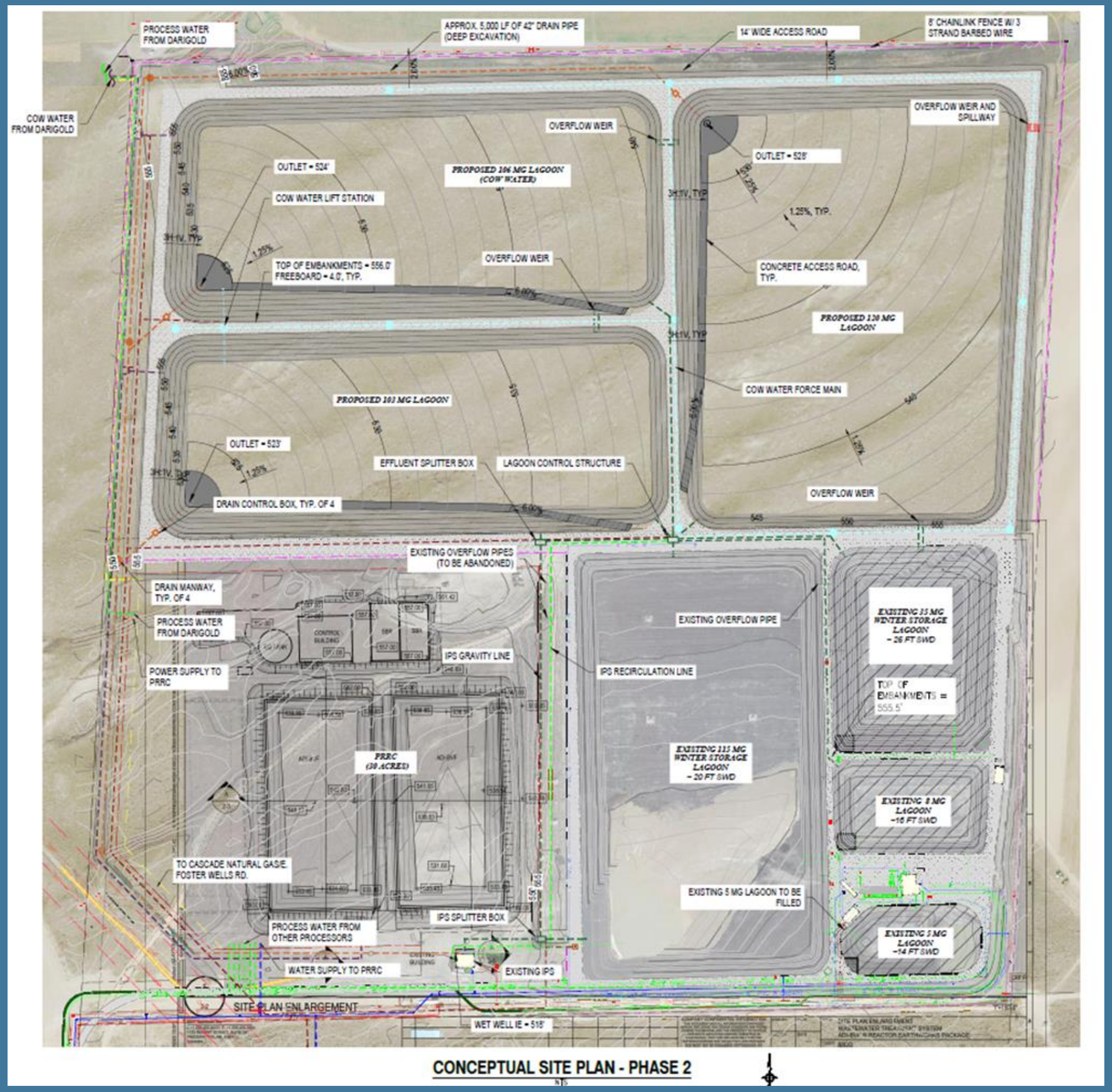
Simplot

Plant expansion

Darigold

Building a new $500M plant

How can we Create Opportunities from Agricultural Waste?



CONCEPTUAL SITE PLAN - PHASE 2

Proposed Solution – Four Phases

Gas Upgrading System

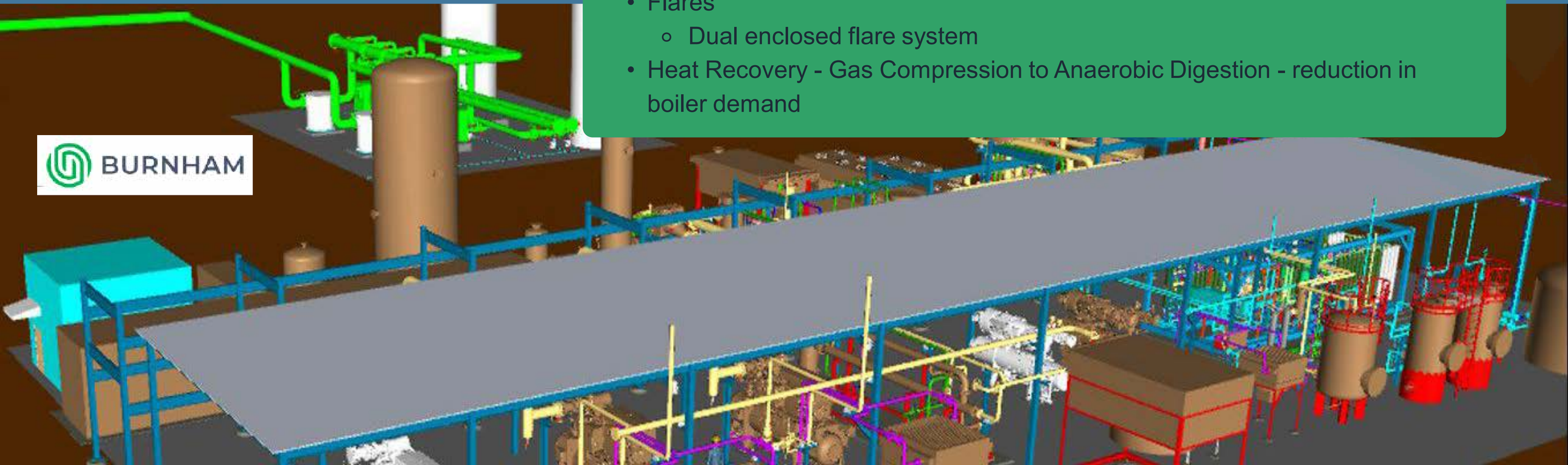
RNG Production

Methane from Anaerobic Digesters

Renewable Natural Gas Revenue

Produces enough RNG to heat 4,500 homes

- Total system capacity: 2,500 scfm biogas
- H2S Removal
  - Bulk removal, 95%, with regenerative technology
  - Final reduction w/polishing vessels
- CO2 Removal
  - 3 stage membrane separation, high methane recovery, >99%.
  - High purity CO2, >98.5%; opportunity for additional uses
- Flares
  - Dual enclosed flare system
- Heat Recovery - Gas Compression to Anaerobic Digestion - reduction in boiler demand



Burnham helping Pasco Create Bioenergy from Agricultural Wastewater.

BURNHAM

But Wait, There is more!

GWT GROSS-WEN TECHNOLOGIES

Nitrogen Removal Technology

A Closer Look:

Options Included:

Shallow Lagoons

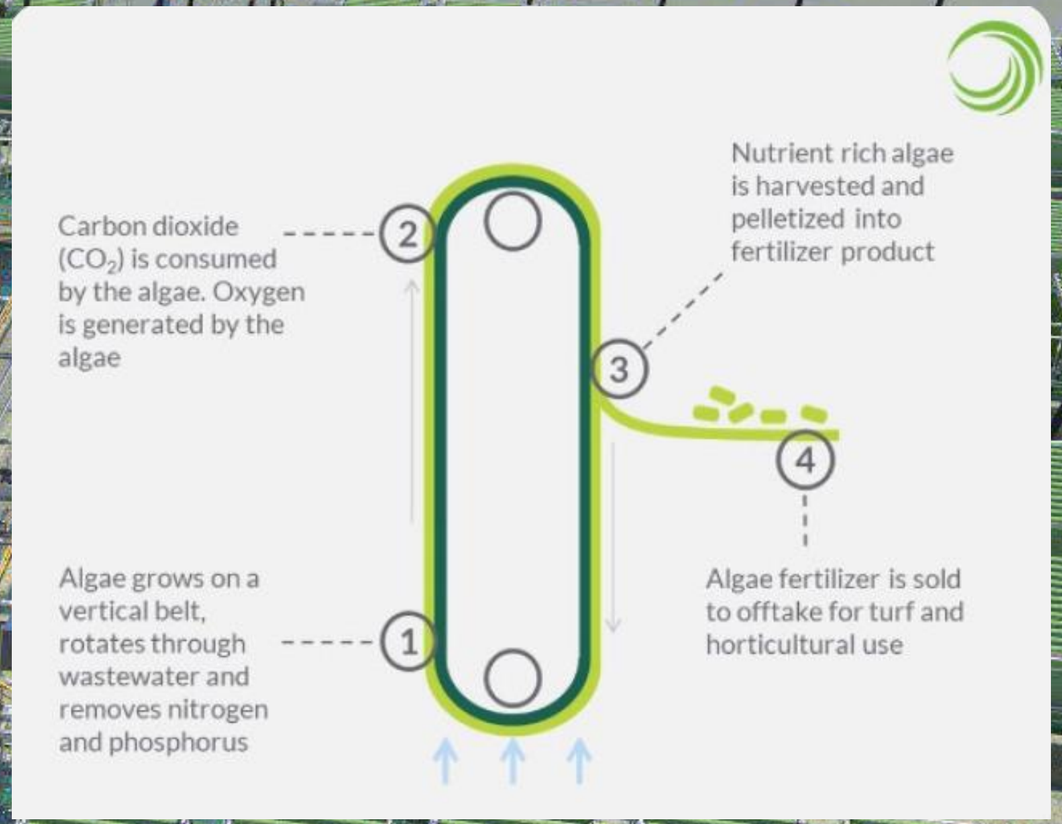
PhotoBioReactor

Sequencing Batch Reactor

GWT Rab

Algae Nitrogen Removal

- Gross Wen's RAB System is world's #1 algae treatment system with 30+ (commercial & pilot) installations globally
- Reduces operating costs, energy usage and carbon footprint vs traditional nitrogen removal
- PWRF will be GWT's largest installation to date



RAB Installation in Pasco, WA

GWT GROSS-WEN TECHNOLOGIES

Algae Nitrogen Removal

Algae System

Reduces Nitrogen

Cleans Wastewater

Carbon Capture = 8,000 acres of forest land

Feedstock for future Biofuels

Equivalent acres of forest to make same carbon impact

The Future of PWRF

An Economically Sustainable Model

RNG

GAS

GRASS

Heat Recovery

Low Rate Anaerobic Digester

Revolving Algal Biofilm

Algae-Based Fertilizer

Future Biofuels feedstock

Industrial Food Processing Industrial Effluent

City of Pasco

PWRF/PRRC

Irrigation

Agriculture Leases

CASH

O&M

Economic Development

Pasco's PWRF Improvements

- Recycles over 2 billion gallons of agricultural wastewater per year
- Produces enough clean energy (RNG) to heat 4,500 homes
- Supports over $800 million of local investment and creation of 100s of jobs
- Allows current processors to grow
- Allows Darigold to build new facility
- Furthers City's long-term economic development
- Removes nitrogen from wastewater and provides balance of nutrients as organic soil amendment
- Reduce wastewater odor prior to land application, alleviating previous community concerns

> The Project is "**taking something that was a problem and turning it into a solution**… this treatment of agricultural industrial wastewater can **lead the world** in how we handle water, and **turn water from a wasted product into a useful product**. We know we need more clean energy and this is producing clean energy with clean methane."
> *-Washington State Governor Jay Inslee*

Gov. Inslee visits the Project on May 19th

Estimated Costs + Funding

Burnham to Design, Build, Own, Operate, Maintain + Finance

$137M

INVESTMENT

- Darigold
- State/Federal Grants
- Exising Processors
- Burnham SEV
- Gross-Wen Technologies

$81M

LOW-RATE ANAEROBIC DIGESTER

$26M

BIOGAS CLEANING TO RNG

$30M

BIOLOGICAL NITROGEN REMOVAL

To help reduce the financial burden to all Processors, the City of Pasco and the Processors request state/federal investment

$20 MILLION

in the project over the next 2 years.

Other funding partners for ongoing PWRF projects could include:

U.S. Department of Housing and Urban Development

The Seal of the State of Washington 1889

40 Years Economic Revitalization CERB of Excellence!

?

You?

The Summary

This Expansion Benefits:

Environment

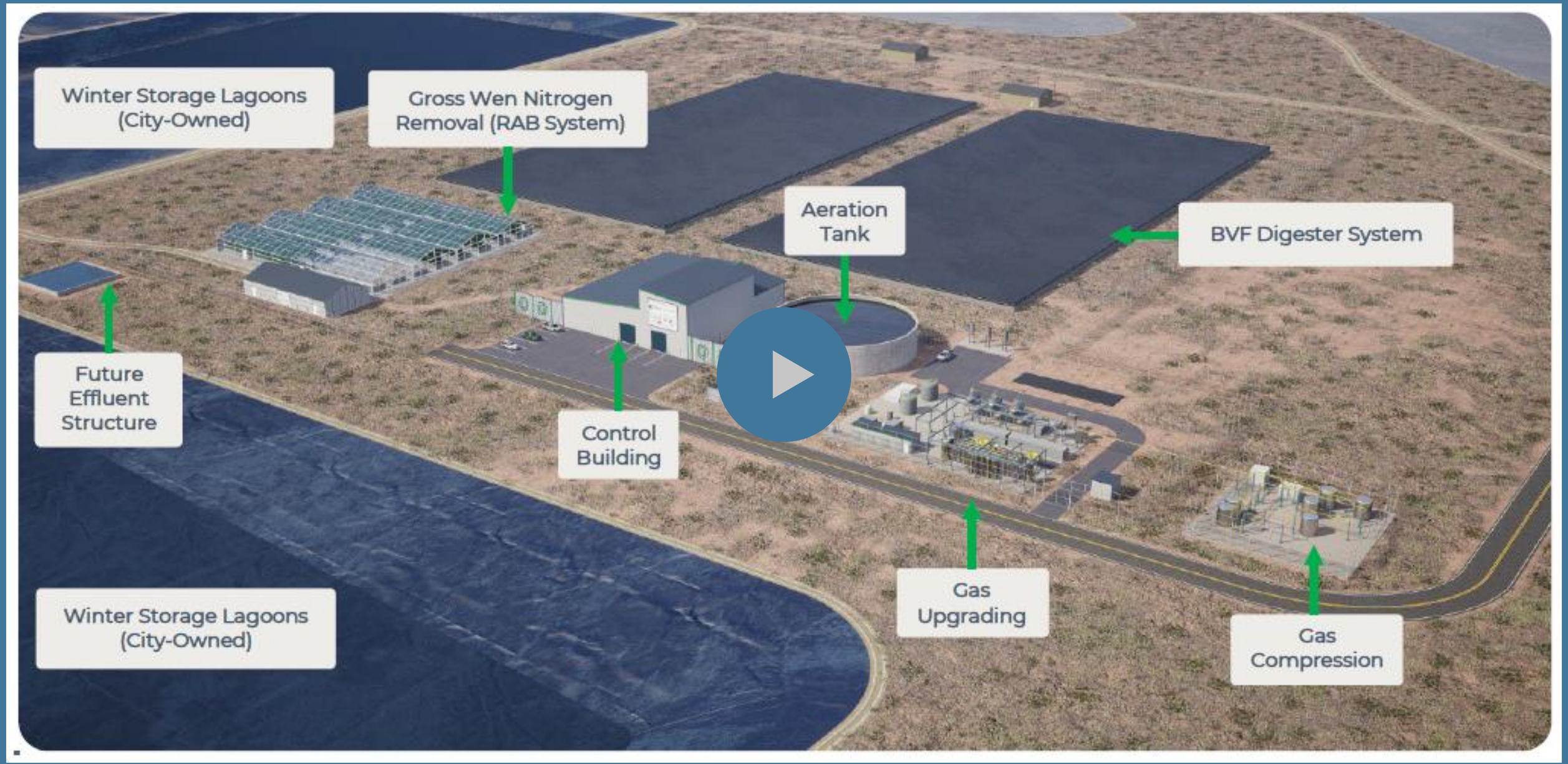
Farmers

Food Processors

Pasco + Washington

Site Progress

Video


Winter Storage Lagoons (City-Owned)
Gross Wen Nitrogen Removal (RAB System)
Aeration Tank
BVF Digester System
Future Effluent Structure
Control Building
Gas Upgrading
Gas Compression
Winter Storage Lagoons (City-Owned)

It takes a village

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2024

THANKS

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