



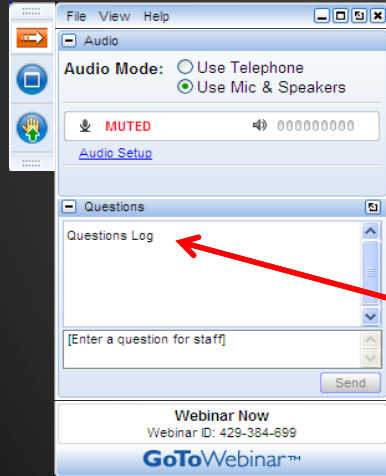
# How to Win with RINs

Thursday, April 19, 2018

1:30 - 2:45 PM ET



## How to Participate Today



- Audio Modes
  - Listen using Mic & Speakers
  - Or, select "Use Telephone" and dial the conference (please remember long distance phone charges apply).
- Submit your questions using the Questions pane.
- A recording will be available for replay shortly after this webcast.



## Today's Moderator



**Dru Whitlock**  
Vice President  
Environmental Engineer



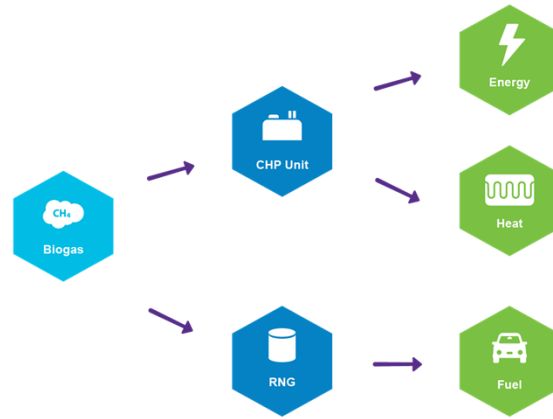
## Today's discussion will focus on

- ▶ What are RINs (Renewable Identification Numbers) and how do they work?
- ▶ What are the California LCFS (Low Carbon Fuel Standard) credits and how do they work?
- ▶ Grand Junction, CO Case Study
- ▶ Panel Discussion

## Facilities That Generate Biogas

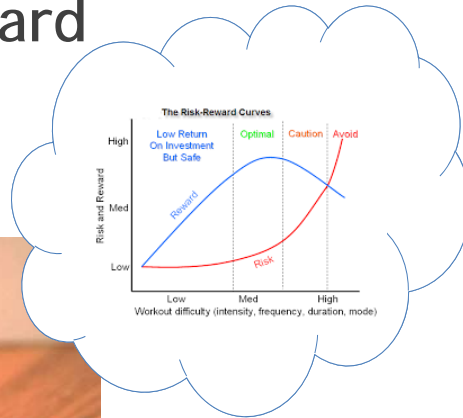
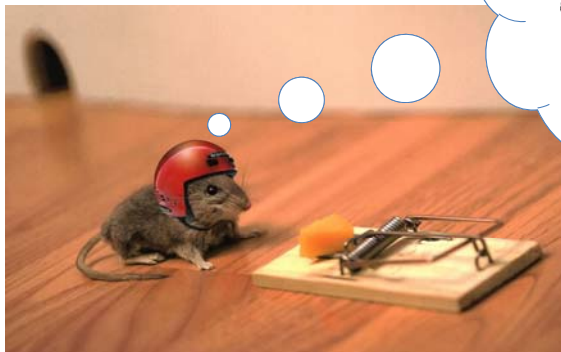


# Biogas Beneficial Reuse



7

# Risk Versus Reward



8

## Our Panel

### Panelists



**Patrick Serfass**  
ABC



**Greg Kester**  
CASA



**Will Overly**  
BlueSource

### Moderator



**Dru Whitlock, PE**  
Vice President,  
Environmental Engineer at  
CDM Smith



## Our Next Speaker




**Patrick Serfass**  
Executive Director



# RFS, RINs and Biogas

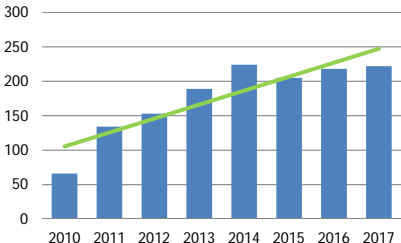
## For Water Resource Recovery Facilities




## American Biogas Council: Voice of the US Biogas Industry

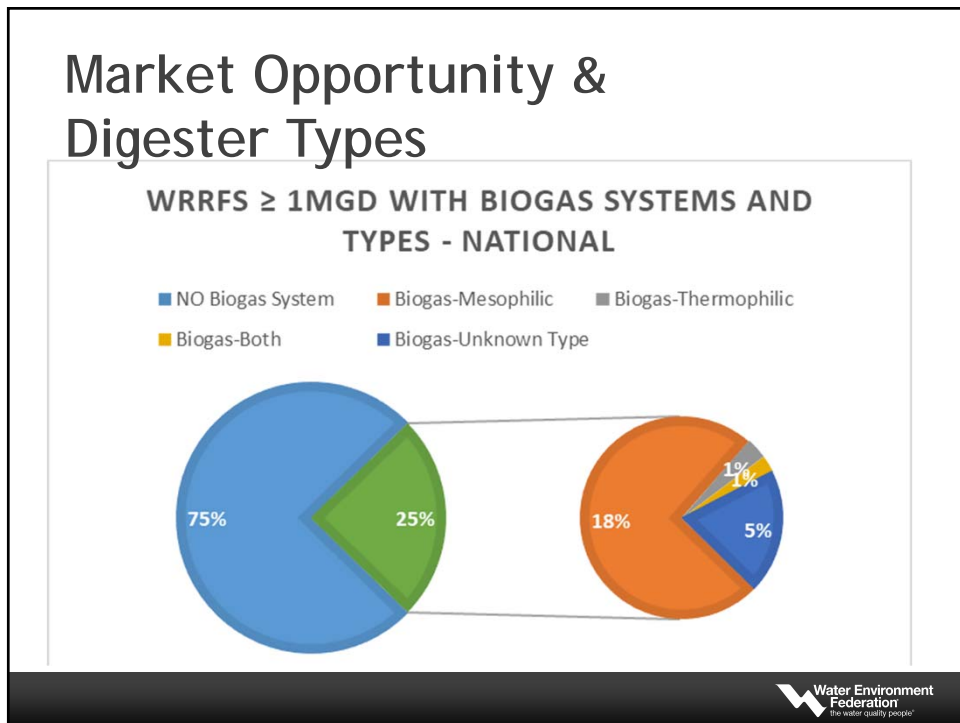
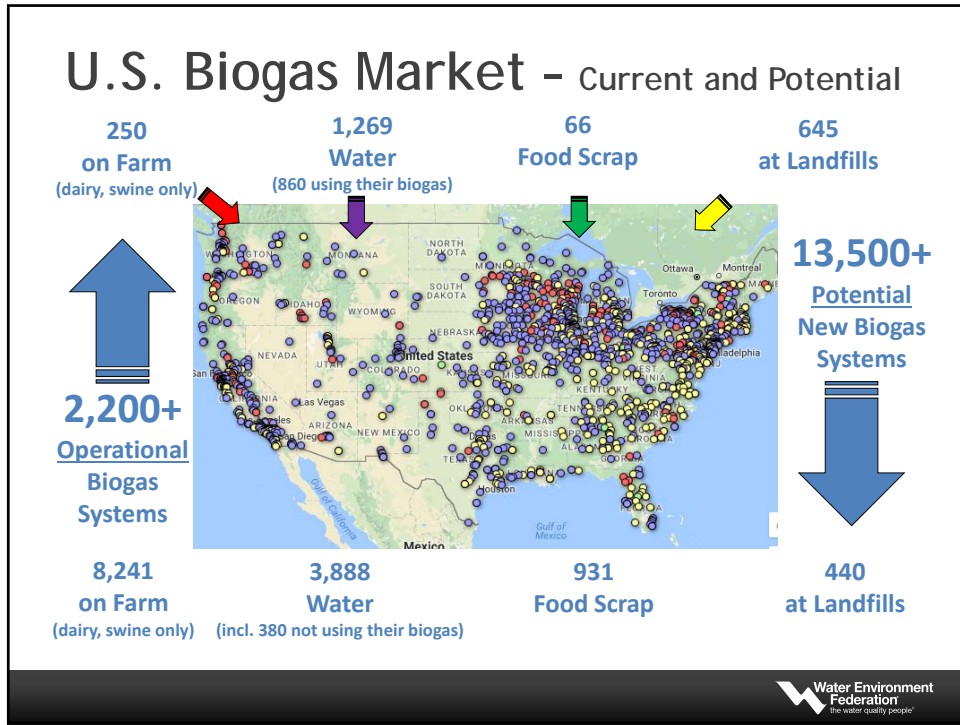
- The only U.S. organization representing the biogas and anaerobic digestion industry
- Over 200+ Organizations from the U.S., Germany, Italy, Canada, Sweden, Belgium and the UK
- All Industry Sectors Represented:
  - project developers/owners
  - anaerobic digestion designers
  - equipment dealers
  - waste managers
  - waste water companies
  - farms
  - utilities
  - consultants and EPCs
  - financiers, accountants, lawyers and engineers
  - Non-profits, universities and government agencies
- Join Us! [www.AmericanBiogasCouncil.org](http://www.AmericanBiogasCouncil.org)

### ABC Membership

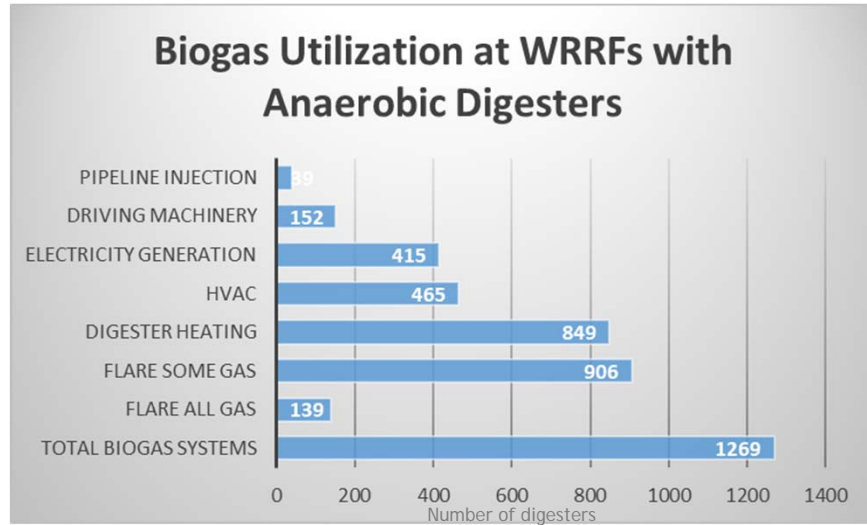


Year	Membership
2010	~60
2011	~120
2012	~140
2013	~180
2014	~220
2015	~200
2016	~210
2017	~220

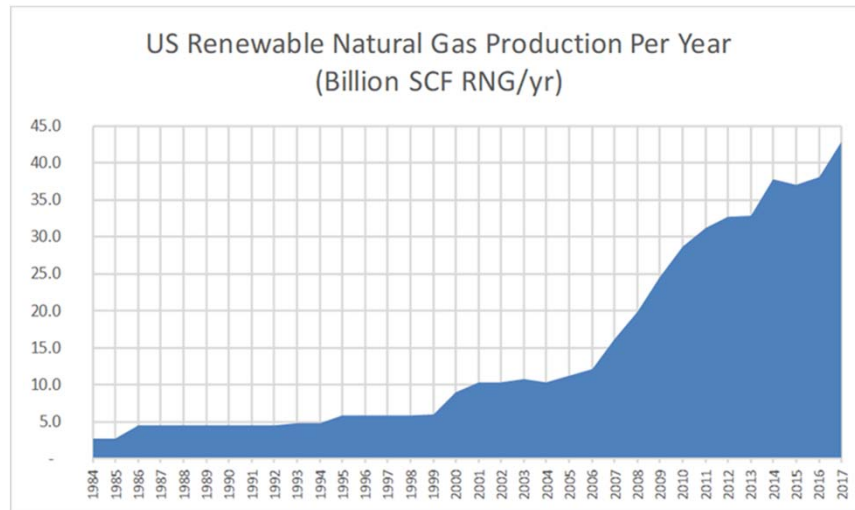




# Biogas Utilization



# RNG Production: US

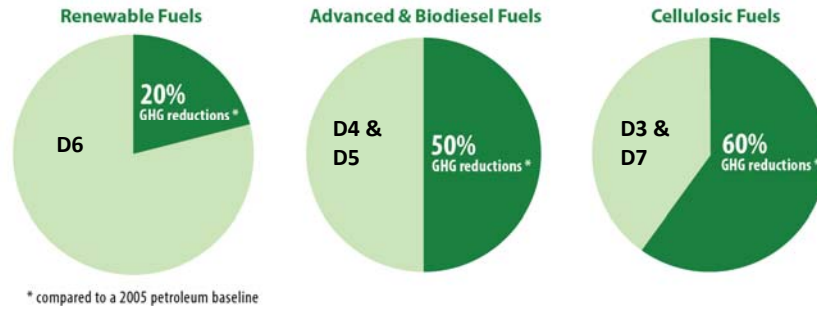




## RFS Fuel Categories and D-Codes

### Lifecycle Greenhouse Gas (GHG) Emissions

GHG emissions must take into account direct and significant indirect emissions, including land use change.



Credit: ecoengineers



## RNG Fuel Pathways

PATHWAY	FUEL TYPE	FEEDSTOCK	PRODUCTION PROCESS	D CODE
Q	Renewable Compressed Natural Gas, Renewable Liquefied Natural Gas, Renewable Electricity	Biogas From Landfills, <b>Municipal Wastewater Treatment Facility Digesters</b> , Agricultural Digesters, and Separated MSW Digesters; and Biogas From The Cellulosic Components Of Biomass Processed In Other Waste Digesters	ANY	<b>D3</b>
T	Renewable Compressed Natural Gas, Renewable Liquefied Natural Gas, Renewable Electricity	Biogas From Waste Digesters	ANY	D5

Credit: ecoengineers



# Cellulosic Feedstocks must meet 75% threshold

- Landfill gas qualifies for D3 RINs
- WWRF feedstock streams entering the AD, modeled by EPA only included: “activated sludge and biosolids – which are aerobically treated residuals from the processing of municipal wastewater solids” (79%--22% cellulose, 36% hemicellulose, 21% lignin)
- EPA definition of agricultural digesters: “anaerobic digesters that process predominantly cellulosic materials, including animal manure, crop residues, and/or separated yard waste”
- Other feedstocks which do not meet the 75% cellulosic threshold can generate a D5 RIN



Credit: ecoengineers



# RIN Math

- For upgraded biogas/RNG as vehicle fuel
  - Fossil NG = \$3.00/MMBTU +
- OR + D3 RIN @ \$2.50 = \$30.00/MMBTU +
- + D5 RIN @ \$0.75 = \$9.00/MMBTU
- Electricity: 1MMBTU will run a 100kW engine for 1hr*
- Biosolids, LFG (\$5/MMBTU @ 1hr)*
- Manure, MSW (\$5/MMBTU @ 1hr)*
- Food waste (\$0.05/kWh)*
- Other (+ 1/10 of a REC)*



# Project example:

Example: Municipal wastewater treatment plant just digesting biosolids OR co-digesting municipal biosolids and outside high strength waste (two options)

100% D3 RINs (without food waste)	100 % D5 RINs (with food waste)	33% D3 RINs   66% D5 RINs (with food waste)
300 MMBtu/day	1,000 MMBtu/day	1,000 MMBtu/day
\$3,210,000 gross revenue	\$3,210,000 gross revenue + tip fee	\$5,705,000 gross revenue + tip fees
@ \$2.50 per D3 RIN	@ \$0.75 per D5 RIN	@ \$2.50 / D3 RIN, \$0.75 / D5 RIN
1 MMBtu = 11.727 RINs		

Same revenue (+ tip fees)

\$2.5 million in additional revenue!



Credit:  ecoengineers



# Thank You!

- Learn More
  - Sign up for the FREE Biogas News
  - [www.AmericanBiogasCouncil.org](http://www.AmericanBiogasCouncil.org)
- Become a Member
  - Application online, or contact us
  - Municipalities: \$600 covers entire organization

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## Our Next Speaker



**Greg Kester**

Director of Renewable  
Resource Programs



## Update on the California Low Carbon Fuel Standard Program

## California Association of Sanitation Agencies

- Represent more than 90% of sewerred pop of California
- Executive Director - Bobbi Larson
- Director of Government Affairs - Adam Link
- Manager of Legislative Affairs - Jessica Gauger
- Director of Renewable Resource Programs - Greg Kester
- Climate Change Manager - Sarah Deslauriers
- Federal Advocate - Eric Sapirstein
- State Advocate - Mike Dillon



## State Mandates/Goals

- 50% Renewable Energy by 2030
- 75% Recycling of Solid Waste by 2020
- Achieve 40% below 1990 levels of CO2 emissions by 2030
- 10% reduction in Carbon Intensity of transportation fuel by 2020 and 20% by 2030
- Reduce Short Lived Climate Pollutants
- Healthy Soils Initiative



## State Mandates and Policy

- Reduce Short Lived Climate Pollutants (SB 1383)
  - 40% below 2013 methane emissions by 2030
  - 50% organics diversion below 2014 by 2020
  - (75% organics diversion below 2014 by 2025)
  
- Healthy Soils Initiative
  - Biosolids help achieve every goal of Action Plan
  - Carbon Sequestration, improved soil tilth, reduced need for irrigation, increased crop yield
  - Reduce the use of fossil fuel intense inorganic fertilizer

## Opportunities Offered by the Wastewater Sector

- Use of existing infrastructure to accept at least 75% of food waste currently landfilled for anaerobic digestion
- Increase biogas production to generate renewable energy, low carbon transportation fuel, and pipeline grade RNG, in turn decreasing greenhouse gas emissions
- Build healthy soils, sequester carbon, and reduce fossil fuel based inorganic fertilizer use through land application of biosolids
- Develop collaborative partnerships with private sector

## Co-digestion Accelerates Diversion of Organics from Landfills

### Opportunity:

- ~150 wastewater plants already utilize anaerobic digestion and have excess capacity
  - Plants are often located in urban areas near waste generation -> shorter haul

### Challenges/Needs:

- Must build partnerships with solid waste sector to maximize effective diversion
- Cleanliness of organic waste stream must be assured (whether for co-digestion, digestion, or compost)
- Markets must be assured for both biogas and biosolids

## California Low Carbon Fuel Standard (LCFS)

- California Air Board charged with reducing Carbon Intensity (CI) of transportation fuel by 10% by 2020 as part of Global Warming Solutions Act of 2006
- Developed LCFS as essential cap and trade program in 2010
- Entities unable to meet requirement purchase credits from those who do meet it
- Sold > 5 Million credits in 2016 at average price of \$101/MT CO<sub>2</sub>e but biomethane from all sources were less than 7% of them

## California Low Carbon Fuel Standard (LCFS)

- 2 pathways were developed by ARB for mesophilic anaerobic digestion at wastewater treatment plants in 2014
- CI of 30 g CO<sub>2</sub>e/MJ for WWTP treating less than 20 MGD
- CI of 7.9 CO<sub>2</sub>e/MJ for WWTP treating more than 20 MGD
- Gasoline and Diesel CI are both ~ 96 CO<sub>2</sub>e/MJ
- Site specific pathways could also be developed and utilize
- Problem due to price uncertainty and volatility, among other issues - pathways remained unused until 2017



## California Low Carbon Fuel Standard (LCFS)

- Revisions are currently proposed with comments due April 23
- Eliminate the two current pathways for wastewater and replace them with simplified calculator
- Calculator less complicated and invites greater participation by wastewater sector
- ARB necessarily used conservative assumptions in previously adopted pathways so believes CI will be lower with calculator
- Benefits of land application of biosolids and co-digestion are built-in to calculator





## California Low Carbon Fuel Standard (LCFS)

- Draft regulatory revisions amend CI reduction levels
- Propose to reduce CI 1.25% annually from a 5% reduction from 2010 levels in 2018 to achieve a 20% reduction by 2030
- This means only a 7.25% reduction by 2020
- But a more ambitious target of 20% by 2030 (opposed to original proposal of 18%)

## California Low Carbon Fuel Standard (LCFS)

- Draft regulatory revisions also incentivize electric vehicles (EV); and
- Near zero emission vehicles
- Also will require third party audits and verification of credits claimed

## California Low Carbon Fuel Standard (LCFS)

- ARB Staff have been great to work with and are dedicated to wastewater sector participation
- Four CA plants either currently producing transportation fuel or in construction/planning to do so
- At least 10 more plan to do so by 2019
- Currently only proposals in front of ARB are San Antonio, TX and San Mateo, CA



## Our Next Speaker



**Will Overly**

Vice President of Business Development



# How can facilities generate & sell RINs

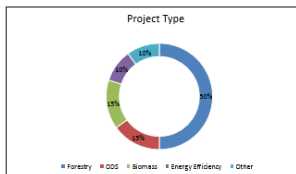
Grand Junction, CO WWTP example



## Blue Source



- ✓ Over 200 carbon offset projects developed
- ✓ Offsets sold for 30 million tonnes CO<sub>2</sub>e reduced
- ✓ 20 Project types
- ✓ Oldest and largest carbon offset developer in the N.America

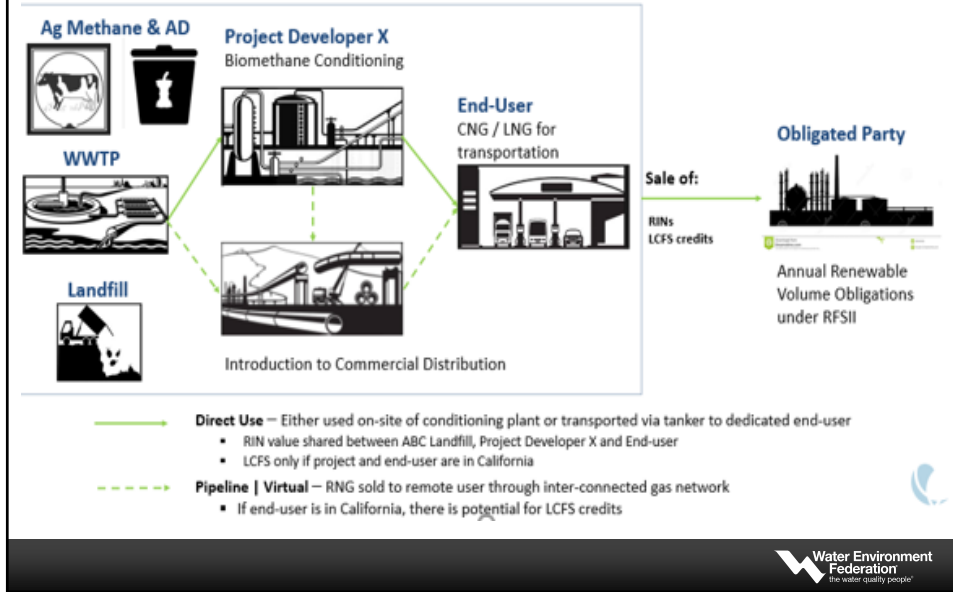


### Services:

- ✓ Carbon opportunity assessment
- ✓ Feasibility confirmation
- ✓ GHG Inventory development
- ✓ Carbon growth and yield modeling
- ✓ Project design & documentation
- ✓ 3<sup>rd</sup> party verification
- ✓ Public registration
- ✓ Credit marketing, sales & contracting
- ✓ Continual Project support



## Practical Example of a RIN/LCFS project



## Registration Requirements

### RFS2- RINs

- Ensure renewable fuel can meet RFS qualifications
- Create New Company Request in OTAQ (EMTS & DC Fuel)
- Obtain Engineering Review & Submit necessary documents to EPA

### CA- LCFS

- Register Company & Facility with ARB by creating account in LCFS Reporting Tool & CBTS & AFP
- Use or determine CI value for renewable fuel
- Submit 3<sup>rd</sup> party engineering review & necessary ARB documents

## Benefits of Direct vs Virtual RNG Use

### Direct (Onsite RNG)

#### PROs

- Fuel cost savings & certainty
  - (known production & O&M costs)
- Receive lionshare of EA value
- Lower volume mgd possible

#### CONs

- Need fuel demand in area (end transport user)

### Virtual (Pipeline RNG)

#### PROs

- Can partner with almost any end transport user
- Large WWTP can utilize high biogas generation

#### CONs

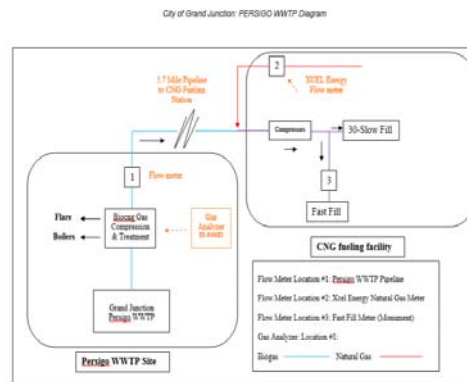
- Give up value for end user
- Area interconnections are dependent on utility (for or against RNG)



## Grand Junction Direct Use Project

- 8.1 mgd WWWT (12.5 mgd capacity)
- BioCNG 100 Conditioning Unit
- 100k ft<sup>3</sup>/day biogas
- 5.7 mile pipeline
- 38 CNG Vehicles

Grand Junction	2016-2017
RNG GGEs	171,401
RNG \$	\$ 257,101
RINs	250,299
RIN Value	\$ 372,214



\*125,000 btu/gge  
 \*\*\$1.50/qge



## Grand Junction's biocng/RIN project



## Lessons Learned

- Storage & Dispensing
  - Gas is continuously produced
  - CNG is dispensed periodically through out week
  - Installed more Slow Fill & Storage
- Tail gas & flared gas could generate 70k/yr RINs+
- GJ has greatly benefited from being early adopter & increase in CWC | D3 prices

## Areas of Uncertainty

- D3 RIN price= D5 + CWC
  - Cellulosic Biofuel Waiver Authority & Post 2022 RVOs
- QAP market mandatory for smaller producers
  - “Small Refinery Exemptions” have eliminated small buyers
- Co-digestion

Questions?