RESOURCE REDISCOVERY PROJECT PRESENTATION – SEPTEMBER 28, 2017

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Presentation Outline

1. Background/Project Motivation
2. Mustang Development & Operations Team
3. Project Overview
4. Hartford Site Development Plan
5. Technology Overview
6. Project Benefits
7. Summary
1. Background/Project Motivation
Central CT Solid Waste System Reach
What’s in Your Trash (MSW)?

Figure 3-1 2015 Municipal Solid Waste Composition and Quantities Disposed

- **Electronics**: 11,906 (0.5%)
- **Other Wastes**: 291,940 (12.5%)
- **Paper**: 539,493 (23.1%)
- **Plastic**: 275,613 (11.8%)
- **Metal**: 82,443 (3.5%)
- **Glass**: 58,512 (2.5%)
- **Food Waste**: 519,832 (22.3%)
- **Other Organics**: 258,922 (11.1%)
- **C&D Debris**: 276,995 (11.9%)
- **Household Hazardous Waste**: 16,943 (0.7%)
What’s Recoverable in Your Trash?

Recoverable Materials in Disposed MSW, 2015

Valuable Recyclables >17%

Organics → Compost & Energy >41%
Is CT’s Waste Management Sustainable?

CT Landfill Diversion >85%

CT Recycling + Composting <30%
Where have you been?

Where do you want to go?
Where have you been?

Where do you want to go?
2. Mustang Team
Mustang Renewable Power Ventures

- Mustang is a Mixed Waste Processing Facility Developer
- Industrial RE Project Owner/Developer
  - >$1 Billion of projects, including 4 brownfield projects
- Mustang has collaborated with Sims Muni Recycling for the past five years on project opportunities in the US
- Proposed MIRA project based on proven Mixed Waste Processing Facility (MWPF) technology, design, engineering and environmental permitting standards
Mustang Renewable Power Ventures

- Selected Developer of 800 TPD MWPF + AD Project - Santa Barbara, CA
- Selected Developer of 900 TPD MWPF + Composting Project - Pensacola, FL
Sims Metal Management

World’s Leading Recycler of Metals & Electronics
- Sims Metal Management – ferrous & non-ferrous metals
- Sims Recycling Solutions – electronic waste
- Sims Municipal Recycling – curbside recycling

Metal recycling operations on five continents
Electronics recycling operations on four continents
Largest curbside recycling program in US – NYC
+9 million tons of recyclable material a year

More than 240 facilities & 4500 employees worldwide
- 12 deep water export facilities
- Shipment by rail, container, bulk ship, truck and barge

Committed to World Class Safety Performance
- Recordable Incident Rate = 1.3
- Lost Time Incident Rate = 0.3

Commitment to Sustainability
- Year over year improvements in energy use, water consumption, renewables production
Sims Metal Management in CT

More than 100 years operating in CT
- 4 facilities
- 100 employees
- +10,000 scale transactions per month

North Haven Facility
- 80 acres
- Receive, process, ship 18,000 tons per month
- Shredding, shearing, sensors, etc.
- Rail, container & truck loading

North Haven is Headquarters for Sims New England Region
- Transportation Dept.
- HR, IT, Procurement
- Safety, Training & Environmental Compliance support for the Region
Sims Municipal Recycling

- 20 year contract with NYC Department of Sanitation. NYC has largest curbside program in the US, serving 8.5 million people:
  - ~270,000 tons/year of commingled recyclables
  - ~160,000 tons/year of paper
- Short term contracts serving approximately 800K population in NJ.
- Approx. 200 employees – experienced management, operations and marketing teams
- 4 barge-served receiving facilities
- 2 MRFs; 1 Glass Plant
- Manage a portion of Chicago’s single stream program

10,000 Ton/Month Jersey City MRF

Rail Car Loading – Tin Can Bundles, Brooklyn
SMR Sunset Park, Brooklyn MRF

- 11-acre pier on Brooklyn’s working waterfront
- NYC-SMR partnership
- Barge, Rail & Truck Access
- 65-70 TPH capacity
- Central facility for all NYC commingled recyclables
- Wharf, buildings and equipment elevated 4’ for sea-level rise and storm surges
- 2nd largest solar array (600kW) and 1st large scale (100kW) wind turbine in NYC
- On site stormwater treatment; marine habitat-reef construction
- Education & Visitor Center
O&G INDUSTRIES, INC.

- Connecticut’s largest privately-held construction company.
- Consistently ranked as one of the country’s 400 largest construction companies for over 50 years.
- Over 900 highly-skilled construction industry professionals and 1,900 pieces of the industry’s most well-maintained equipment.
- O&G self-performs such trade work as sitework, building demolition, cast-in-place concrete, masonry, and rough and finish carpentry.

1000+ EMPLOYEES
Over 900 highly-skilled construction industry professionals, including more than 700 skilled trades people.

0.79 SAFETY RATING
O&G’s aggressive safety program ensures that everyone goes home safe each work day.

400+ ANNUAL VOLUME
O&G Industries is one of the largest builders in the Northeast with an average annual volume of business in excess of $400 million.

$2B BONDING CAPACITY
One of the largest and most diversified construction companies, O&G has a bonding capacity in excess of $2 billion.
O&G is Connecticut’s largest privately-held construction company.

**Building Construction & Renovation**
O&G is Connecticut’s Top Construction Builder for Municipal and Energy Construction Projects.

**Heavy Civil Construction**
O&G is Connecticut’s Top Heavy Civil Contractor for Road & Bridge Projects.

**Construction Materials**
O&G manufactures and distributes asphalt, concrete, sand and stone through our network of 6 quarries, 8 concrete and 9 asphalt plants.

**Asphalt Paving**
O&G is one of Connecticut’s leading Asphalt Paving contractors.
SAFETY IS MORE THAN A SLOGAN

Work Zone Separation
Good Neighbor Policy
Dust Controls
Soil and Sedimentation Controls
Weekly Safety Meetings
Constant Monitoring

24-HOUR SAFETY HOTLINE
SAFETY MONITORING & INCIDENT TRACKING
EXPERT SAFETY TEAM
A.I. Prince Technical High School Additions & Renovations
American Airlines Building Demolition, Concrete, Steel, Exterior Finish and Commercial Development
Bushnell on the Park
Bushnell Theater Expansion and Renovation
Cabela’s Store Rentschler Field Site and Access Road
Founders Bridge And I-91 Rehabilitation / Riverfront Recapture
Gayle King Studio
Hartford Civic Center Reconstruction
Hartford Insurance Company Parking Garage Concrete
Hartford Municipal Garage Cast-In-Place Concrete Work
Hartford School Construction Program
Hartford Railroad Station Upgrades
High Street Garage Concrete
I-84 Bridge Deck Repairs & Resurfacing
MIRA Facility
MIRA Hartford Landfill
MIRA Truck Maneuvering Hall
Murtha Cullina, CityPlace I Floor 29 & 30 Renovation
One Commercial Plaza Excavation Work
One Commercial Plaza Phase II
Pedestrian Bridge Over Columbus Boulevard & Access Ramp
Sarah J. Rawson Elementary School Renovations & Additions
Sport and Medical Sciences Academy
Thomas Quirk Middle School
Trinity College Chiller Replacement
Trinity College Koeppel Sports Complex
YMCA of Greater Hartford Renovations
YMCA of Greater Hartford Towers
FUTURE POTENTIAL DEVELOPMENT

• Mustang proposes to discontinue burn plant operations in lieu of recyclable recovery, anaerobic digestion and indoor composting
• Burn Plant could be redeveloped as a Class I Renewable fuel cell electrical generating facility
• Distributed generation to power greenhouse and hydroponic farming
• Supporting a restaurant/lifestyle zone with farm-to-table food processing, refrigeration and chilling systems
• Also supporting expansion of the Regional Farmers Market consistent with the Market Ventures “Master Plan”

CT Energy & Technology, LLC is a Connecticut limited liability company and a wholly owned subsidiary company of O&G Industries, Inc.
• Specializing in large electrical, combined heat and power and distributed generation projects
• Integrating environmentally beneficial renewable energy, CO₂ absorption with greenhouse and hydroponic farming
• Supporting a robust feasibility study of complementary site uses synergistic with the Mustang Resource Recovery Project Proposal and City of Hartford objectives
Harvest Power

Harvest harnesses the maximum value from organic materials through the production of renewable energy and soils, mulches and natural fertilizers.

Company Profile

- Managing close to 2 million tons of organic materials, largest processor of yard waste & food waste in North America
- Operate or partner with over 25 processing facilities in North America with more than 400 employees
- Operating three of North America’s largest commercial anaerobic digestion facilities
- Harvest’s investors include True North Venture Partners, Industry Ventures, and Generation Investment Management LLP
National and Local Knowledge
Our Solution

**Organics Processing**
- Yard waste and industrial wood residues
- Composting and mulching
- Bulk and bagged soils and mulches

**Food Waste and energy**
- Food waste, biosolids, and agricultural residues
- Anaerobic digestion
- Biogas
- Fertilizers
Harvest Thompson Farm Facility
Ellington, Connecticut

20 years of composting without an odor complaint

- 17.85 acres currently permitted
- 157 total acres
- 21 miles from Hartford

2,300 Feet to nearest house
3. Project Description - Overview

- Mustang proposes to develop an integrated Mixed Waste Processing Facility (MWPF), Anaerobic Digestion (AD) Facility and Composting Facility (using fully enclosed boxes)

- Mustang’s project estimated to divert ~70% of MSW from landfill disposal and incineration

- The project includes proven technologies to recover valuable resources (recyclables, compost & energy) from waste
Project Description - Overview

- **MIRA Recycling Facility**
  - Select modifications and upgrades
  - Continued processing of 50-100,000 TPY SSR (i.e., Recyclables)
  - Seek to grow this tonnage (i.e., education and outreach)

- **Mixed Waste Processing Facility (MWPF)**
  - ~15-20% of post-recycled waste is valuable recyclables
    - glass, paper, plastic, metal

- **Anaerobic Digestion Facility and Composting Boxes**
  - Converts organics (~35% food/green waste & wet -2” paper) into compost and biogas for electricity to meet on-site uses

- **Offsite Compost Storage**
  - Finished compost transported to a Harvest Power CT site
  - ~3 weeks final curing/maturation prior to marketing
Project Description - Overview

- **Process Engineered Fuel (PEF)**
  - Baled plastic waste residue (>9,000 btu/lb)
  - Sold to cement kilns, paper mills & industrial boiler applications

- **Rail-Based Residue Disposal**

- **Transfer Stations**
  - Select modifications and improvements
  - Continued acceptance of MSW and SSR
  - Seek to attract addt’l tonnage of both MSW and recyclables

- **Diversion Summary**
  - Curbside + Recyclables + Organics + PEF
  - Overall landfill diversion rate of ~70%
4. Mustang’s Resource Rediscovery Project
Rail Spur
(On site rail is preferred; off-site rail options exist)

- Track Work – 3,600’
  - 4 switches @ 80’ each
  - Modify existing crossings
  - Rail Scale
  - 4 rail stops
  - Derail @ main line switch
  - Misc – grading erosion control, seeding
  - Compatible w/ Regional Market
5. Mixed Waste Processing Facility

- 3 MSW lines (700,000 TPY= 2,250 TPD, 180 TPH)
  - ~20% Recyclable Recovery
  - ~35% Organics Recovery to AD/Composting
  - ~15% Residue to Process Engineered Fuel-PEF
  - ~30% residue to landfill
- Export of Recyclables to Markets
- ~175 full time employees
- Waste delivered by collection & transfer trucks
- ~300,000 TPY organic waste to Anaerobic Digestion & Composting
- Residue exported to remote landfill via rail
Anaerobic Digestion & Composting Boxes

- **Dranco Fermenter**
  - Biogas
  - Biogas utilization
  - Digestate
  - To post-treatment
  - Steam
  - Waste < 40 mm
  - Mixer
  - Pump
  - Shredding < 150 mm
  - Intensive composting in Herhof composting boxes

Supply of organic waste and structural material.
6. Project Benefits

- Retirement of 30-year old Waste Incinerator
- Potential re-use of Power Block Facility to renewables or other economic development uses
- MWPF recovers maximum recyclables from MSW
- Anaerobic Digestion & Composting process wet, organic waste into compost & energy without combustion
- Generate renewable natural gas (RNG) transportation fuel from AD biogas
- Eliminate once through cooling warming of CT River
- ~70% landfill diversion rate
- 150-175 Full-Time Jobs (MRF, Composting, ADF and MIRA Recycling Facility)
GHG Benefits

US EPA Waste Reduction Model (WARM) ~700,000 MTCO$_2$e/Year
Project Impact Issues

- Odor – 99% controlled with negative pressure buildings, biofilters and active filtration
- Traffic – could be reduced by ~30-40% with proposed rail based residue and some recyclable transport
- Noise – all operations indoors
- Air Quality – improved through shut-down of WTE plant
- Soil Quality – includes brownfield cleanup of impacted coal storage pond area
Financial Summary: CapEx, GHG Reductions & Jobs

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<thead>
<tr>
<th></th>
<th>Phase 1 - MRF + Composting + ADF + MIRA Recycling Facility</th>
<th>Phase 2 - MRF + Composting + ADF + MIRA Recycling Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Delivery Tonnage</td>
<td>465,000 tpy MSW 100,000 tpy SSR</td>
<td>700,000 tpy MSW 100,000 tpy SSR</td>
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<tr>
<td>Diversion &amp; Conversion Technologies</td>
<td>MWPF + Composting Boxes + ADF</td>
<td>MWPF + Composting Boxes + ADF</td>
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<tr>
<td>Est. Total Diversion Rate (incl. Curbside)</td>
<td>~70%</td>
<td>~70%</td>
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<tr>
<td>Future Tip Fee/Rate Increases</td>
<td>Limited to CPI</td>
<td>Limited to CPI</td>
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<tr>
<td>CapEx &amp; OpEx Increase Risks</td>
<td>Borne by Project</td>
<td>Borne by Project</td>
</tr>
<tr>
<td>GHG Reduction (per EPA WARM Model)</td>
<td>(365,806) MTCO$_2$e 77,012 Cars Removed</td>
<td>(587,864) MTCO$_2$e 123,761 Cars Removed</td>
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<tr>
<td>Total Clean Tech Jobs</td>
<td>~150 FTE jobs</td>
<td>~175 FTE jobs</td>
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Mustang Team Project Benefits

- Recycling Experience & Sustainability Focused Private Public Partnership Developer/Operator/Financing team with extensive and long standing CT experience

- Santa Barbara experience is unique and directly applicable to achieving the CT-DEEP goals/objectives

- Best-in-class: Technologies (MRF, AD), MRF & ADF Operators (Sims Municipal Recycling & Harvest Power), Financial Partners (Mustang and Bank of America Merrill Lynch)

- Transparent, Collaborative, Flexible, Innovative, Cost Conscious Partner with Extraordinary Attention to Details
7. Summary

Fulfilling a Green Vision for CT-DEEP, MIRA, City of Hartford, 51+ Towns

- Green/Clean Tech Jobs
- Significant Reduction of Greenhouse Gas Emissions
- ~70% Overall Waste Diversion
- Clean Renewable Heat, Power, Fuel & Compost
- De-risk Project for Communities

Triple Bottom Line – Good for the Planet, Great for the Communities, Economically Sustainable for Central Connecticut Solid Waste System, City of Hartford, Towns
Where have you been?

CSWS WTE Plant-Today

Retired CSWS WTE Plant-Future

Where do you want to go?