

Press Release

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For Immediate Release
Date: February 11, 2008

Subject: 10 Year Biowastes-To-Renewable Energy, Organic foods, Biofuels, and Water Independence Global Cooling program that features...

- **Inexpensive Electricity** for all,
- **Free Potable Water** for all,
- **Free Trash Collection** for all,
- **Conversion of all fossil fueled power plants to zero greenhouse gas emissions,**
- **Total employment for the common man,**
- **Significantly increased profits for fossil fueled power plant utilities, and**
- **A resulting oil and gas surplus for every country that decides to participate.**



**Per capita greenhouse gas emissions by country
for the year 2000 including land-use change.**

WaterSmart Environmental, Inc. announces its intention to reverse global warming within 10 years. The reversing of global warming is achieved through consumptive depletion of anthropogenic greenhouse gases coupled with the capturing of water vapor produced from fossil fueled power plants. Converting fossil fueled power plants to zero greenhouse gas emissions is

first such activity. Producing and then using renewable natural gas is another such activity. Producing and then using biodiesel is the last such activity.

Above referenced inexpensive electricity refers to a retail price of US\$0.045/kWh (4-1/2 cents/kWh). Above referenced free potable water refers to water of a much better quality than that provided by municipalities since it will be both purified and sterile. Above referenced free trash collection refers to the use of company trucks and personnel to collect trash at homes and businesses. The company will additionally excavate area landfills and thereafter remediate the associated ground and contaminated aquifer thereby restoring the land for industrial development. The company will then manage the municipal solid wastes (MSW) through anaerobic digestion technology to produce methane gas and carbon dioxide gas. The methane gas will be used to generate electricity and the carbon dioxide gas will be used to create biodiesel through photosynthesis of *Spirulina microalgae*.

In converting fossil fueled power plants to zero greenhouse gas emissions each participating country can increase its per capita availability of oil (biodiesel) to 5.75 gallons/Day thus greatly exceeding the current United States per capita availability of petroleum based oil currently at 3.0 gallons/Day.

In converting fossil fueled power plants to zero greenhouse gas emissions each participating country can increase its per capita availability of natural gas (renewable methane gas) to 1,148 cubic feet thus greatly exceeding the current United States per capita availability currently at 194 cubic feet/Day.

Because of the immense attention being paid to climate change in the last few years there are many proposed fossil fueled power plants in the United States that cannot obtain required permits to operate. Should this regulatory agency permit refusal continue a shortage of marketplace electricity will likely occur. It is hoped that the regulatory agencies will reconsider their position in light of the technology disclosed herein. Proposed fossil fueled power plants in other countries are facing the same climate change opposition. The power companies are fully expected to welcome the technology as their now turned **green electricity** can then be sold at an internal balance sheet price of US\$0.25/kWh (25 cents/kWh). The attached presentation explains how.

WaterSmart Environmental is marketing its Kyoto Protocol compliant wastes-to-energy technology on an economic development platform to concentrated animal feeding operators and to municipalities. Animal farmers benefit by purchasing biodiesel, electricity, and natural gas (methane) at a 20% discount from retail. Municipalities also benefit by making biodiesel, electricity, natural gas, and potable water available to its citizens and businesses at a discount from retail. The technology is marketed on a build-own-operate basis thereby eliminating the necessity for local sales and property tax increases since project financing is entirely secured from the financial marketplace. Municipalities that embrace the waste-to-energy technology automatically become zero waste-to-landfill communities.

The waste-to-renewable energy technology has been slowly developed over the last 10 years. It is just now being introduced to the international marketplace. The technology has the clear potential for making every single city throughout the world energy and fuels independent while reducing oil and natural gas imports. The technology will also permit every single city throughout the world to improve water and wastewater treatment infrastructure while creating jobs and investment opportunities. The waste-to-energy technology can also be applied to Sugar Cane Mills as well as Pulp & Paper Mills with equal success. Both types of mills become energy, food, fuels, and water independent while significantly increasing profits from routine opera-

tions. In the case of Sugar Cane Mills temporary and seasonal jobs turn into full time better paying jobs. **Widespread use of the technology carries with it the potential for contributing substantially to the reversing of global warming.**

WaterSmart Environmental, Inc. is a provider of waste-to-energy, food independence, water independence, and energy independence technologies and a manufacturer of highly engineered water purification components and systems. The company designs and builds a wide variety of water treatment equipment including packaged water and wastewater treatment plants, UltraPac™ aerobic package plants, OAT™ Process anaerobic digesters with associated energy production, aerators, filters, PuriSep™ and SmartWater™ oil/water and solids/liquids separators, RainDrain™ perimeter trench sand filters for stormwater runoff, dissolved air flotation separators, air strippers, complete skid assembled aqueous waste treatment plants, FilterFresh™ skid mounted potable water production plants, skid mounted wastewater treatment systems for laundromats, commercial laundries, and car/truck wash facilities with water reclamation and reuse, softeners, demineralizers, activated carbon treatment equipment, and water purifiers for domestic and international markets.

*Worldwide Promoters of Renewable Energy, Organic Foods, Biofuels,
& Water Independence Technologies by and for the Common Man*



MSW-To- Renewable Energy and Biofuels BioRefinery

A zero carbon footprint biowastes-to-renewable energy, organic foods, biofuels, and water independence technology that can be combined with the conversion of coal fired power plants to achieve zero greenhouse gas (GHG) emissions.

**A presentation to
1000 MW XYZ Coal Fired Power Plant.**

A Zero Carbon Footprint Technology

Made Possible By The

OAT™

Optimized Anaerobic Treatment Process

&

**Spirulina Microalgae Photobioreactor
Production & Processing Technologies.**

MASSIVE ENVIRONMENTAL BENEFITS CONSISTING OF:

- MINIMUM 1,100 POUNDS ANTHROPOGENIC CARBON DIOXIDE (CO₂) REDUCTION/MWh
- ZERO MERCURY (Hg) EMISSIONS
- ZERO SO_x AND NO_x EMISSIONS (PRECURSORS OF ACID RAIN)
- ZERO PARTICULATES EMISSIONS
- ZERO RADIOACTIVE EMISSIONS

PLUGGED SMOKESTACK

EXISTING & CONTINUING GREENHOUSE GAS EMISSIONS (GHG)

CONVENTIONAL ENERGY TO MARKET PRICED AT US\$45.00/MWh

60 MW RENEWABLE COMBINED CYCLE GREEN ENERGY TO MARKET PRICED AT US\$45.00/MWh

1000 TON MSW/DAY PRICED AT US\$0.00/TON TIPPING FEE

(SEE WSE DRAWING NO. S-6099-1 FOR MATERIAL FLOW SCHEMATIC OF WHAT GOES ON INSIDE THIS SUPERGREEN BUILDING)

- FLY & BOTTOM ASH
- FLY & BOTTOM ASH POND WATER
- COAL PILE RUNOFF WATER
- SANITARY WASTEWATERS
- MUNICIPAL SOLID WASTES
- STORM WATER RUNOFF

MUNICIPAL SOLID WASTES (MSW) AND EXISTING LANDFILL WASTES (TO INCLUDE C&D WASTES AS WELL AS MEDICAL WASTES)

- PRECAST CONCRETE PANELS TO MARKET
- LIQUEFIED NITROGEN GAS (LN2) TO MARKET
- PROCESSED PORK TO MARKET
- PROCESSED TILAPIA FISH TO MARKET
- BIODIESEL TO MARKET
- RENEWABLE NATURAL GAS TO MARKET
- RENEWABLE ENERGY CREDITS (REC) TO MARKET
- FREE POTABLE WATER DISTRIBUTION TO MARKET

EXISTING COAL FIRED POWER PLANT

NEW BIOFUELS PRODUCTION SUPERGREEN BUILDING CONTAINING ENCLOSED PHOTOBIOREACTOR AND WASTES-TO-RENEWABLE ENERGY WITH TOTAL RECYCLING TECHNOLOGIES

FOSSIL FUELED POWER PLANT CONVERSION TO ZERO GREENHOUSE GAS (GHG) EMISSIONS MATERIAL FLOW SCHEMATIC

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WaterSmart Environmental, Inc.
Shawnee, Missouri, Kansas

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WaterSmart Environmental, Inc.
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Power Plant Conversion To Zero Greenhouse Gas Emissions

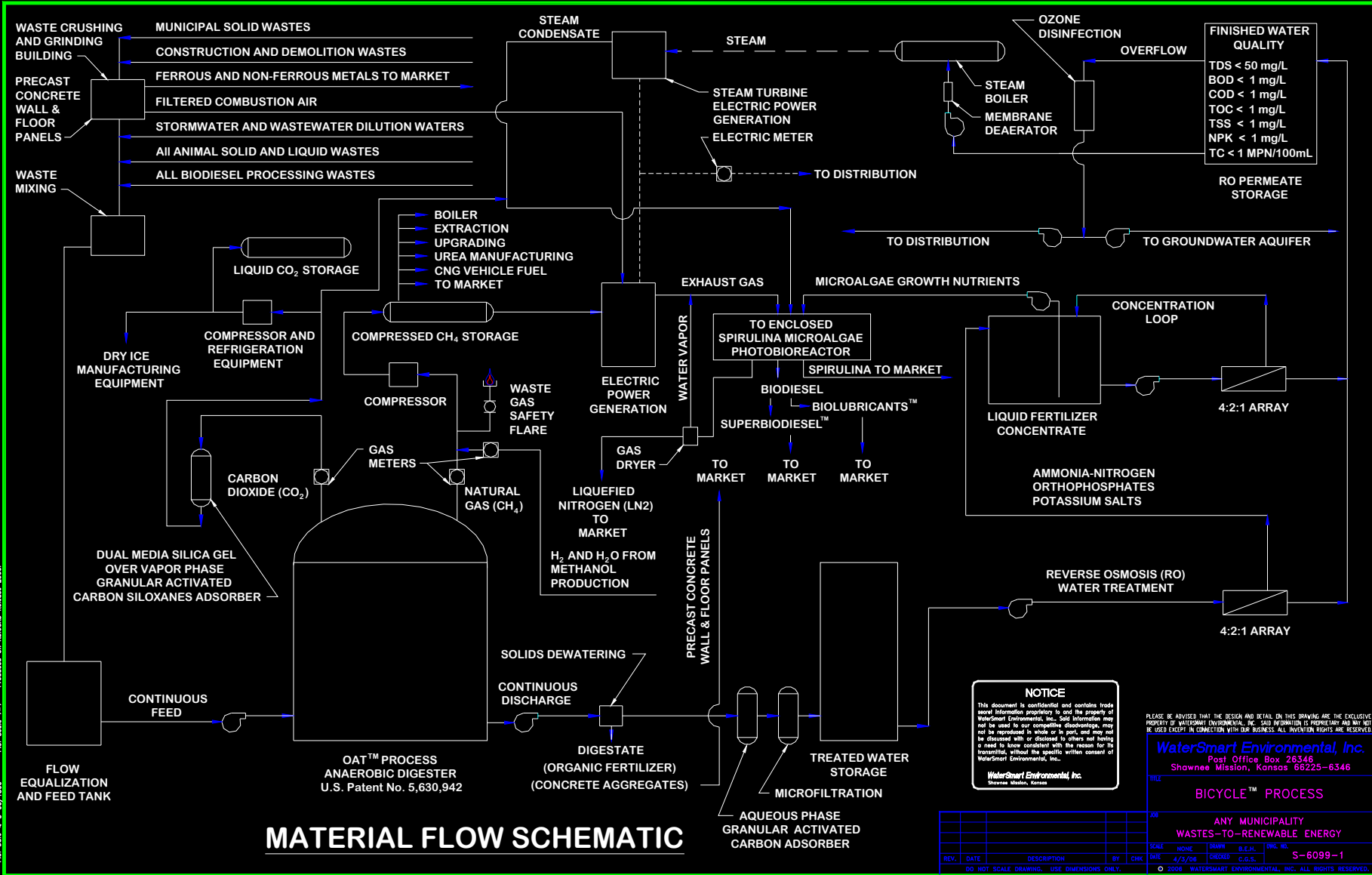
ANY FOSSIL FUELED POWER PLANT ANYWHERE LOCATED

REV.	DATE	DESCRIPTION	BY	CHK

SCALE: NONE DRAWN: S.E.H. DWG. NO. S-6099-111

DATE: 2/10/07 CHECKED: C.O.S. © 2007 WATERSMART ENVIRONMENTAL, INC. ALL RIGHTS RESERVED.

Plot Date: 4/3/08 / 1:50
 Plot Scale: 1"=1'
 Prepared On: AutoCAD Release: 2007i



MATERIAL FLOW SCHEMATIC

Conversion Process Creates Significant Values

- 💧 From Heat Content of Power Plant Exhaust Gas
- 💧 From Carbon Dioxide Content of Power Plant Exhaust Gas

From Heat Content

- 💧 A 1,000 MW coal fired power plant burns 11,000 tons of coal/day.
- 💧 2/3 of the heat content escapes out the stack.
- 💧 Btu content of coal = 26 million Btu/ton.
- 💧 $11,000 \text{ tons} \times 26 \text{ million Btu/ton} \times 2/3 = 190,762,000,000 \text{ Btu/day}$.
- 💧 Dividing 190,762,000,000 by 3,414 Btu/kWh = 55,876,391 kWh/day.

From Heat Content

- 💧 Cost of producing electricity from coal = US\$0.0375/kWh.
- 💧 $\text{US\$0.0375} \times 55,876,391 \text{ kWh/day} = \text{US\$2,095,364/day}$.
- 💧 The conversion process will beneficially use the heat content of the exhaust gas to produce steam during combined cycle generation thus capturing the value of the heat content.

From Carbon Dioxide Content

- 💧 2.09 lbs CO₂ are produced/kWh or
- 💧 2,090 lbs are produced/MWh.
- 💧 A 1,000 MW power plant generates
 $1,000 \times 24 = 24,000$ MWh/day.
- 💧 $24,000$ MWh/day \times 2,090 lbs/MWh =
50,000,000 lbs CO₂/day or 25,000
tons/day.

From Carbon Dioxide Content

- 💧 1 ton CO₂/day produces 90.91 gallons of biodiesel/day through photosynthesis of *Spirulina* microalgae.
- 💧 The *Spirulina* microalgae, in turn, are made into biodiesel through a transesterification process—a technology already proved by the National Renewable Energy Laboratory

From Carbon Dioxide Content

- 💧 25,000 tons CO₂/day x 90.91 gallons biodiesel/ton = 2,272,750 gallons/day
- 💧 At a value of, say, US\$2.50/gallon,
2,272,750 x US\$2.50 =
US\$5,681,875/day.
- 💧 But wait, there's more.

From Carbon Dioxide Content

- 💧 Each gallon of biodiesel produced, in turn, produces 21.12 lbs of volatile solids.
- 💧 Other marketplace players, like Cargill, produce glycerine from these volatile solids.
- 💧 Our company produces additional methane gas and carbon dioxide gas from these volatile solids through anaerobic digestion since these gases together represent far greater marketplace value than glycerine.

From Carbon Dioxide Content

- 💧 2,272,750 gallons biodiesel produced x 21.12 lbs volatile solids/gallon = 48,000,000 lbs volatile solids/day.
- 💧 Volatile solids x 12 = cubic feet of methane gas produced or 48,000,000 x 12 = 576,000,000 cubic feet CH₄/day.
- 💧 1,000 cubic feet CH₄ = US\$6.00 marketplace value.
- 💧 576,000,000/1,000 x US\$6.00 = US\$3,456,000/day from methane gas.

From Carbon Dioxide Content

- ◆ Cubic feet of methane gas produced/day \div 24 cu. ft./lb = lbs methane gas produced or $576,000,000 \div 24 = 24,000,000$ lbs CH₄/day.
- ◆ Lbs methane gas produced/day \times 1.375 = lbs CO₂ produced or $24,000,000$ lbs \times 1.375 = $33,000,000$ lbs CO₂/day.
- ◆ $33,000,000$ lbs \div 2,000 lbs/ton = 16,500 tons CO₂/day.
- ◆ 16,500 tons CO₂/day \times 90.91 gallons biodiesel = 1,500,000 gallons/day.
- ◆ $1,500,000 \times$ US\$2.50 = US\$3,750,000/day.

Total Value From Heat Content, Methane Gas, and Carbon Dioxide Gas

- 💧 US\$5,681,875 + US\$3,750,000 from biodiesel = US\$9,432,000/day from biodiesel.
- 💧 US\$2,095,364/day from heat content.
- 💧 US\$3,456,000/day from produced methane.
- 💧 US\$9,432,000 + US\$2,095,364 + US\$3,456,000 = US\$14,983,364!

Summarizing

- 💧 If 1,000 MW XYZ power plant sells electricity @US\$0.08/kWh, associated revenue becomes $1,000,000 \text{ kW} \times 24 \text{ hour/day} \times \text{US\$}0.08/\text{kWh} = \text{US\$}1,920,000/\text{day}$.
- 💧 If 1,000 MW XYZ power plant sells electricity @US\$0.045/kWh, associated revenue becomes $1,000,000 \text{ kW} \times 24 \text{ hour/day} \times \text{US\$}0.045/\text{kWh} = \text{US\$}1,080,000/\text{day}$.
- 💧 $\text{US\$}1,920,000 - \text{US\$}1,080,000 = \text{US\$}840,000$ deficit/day.
- 💧 Deficit would be paid from US\$14,983,364 surplus/day.

Summarizing

- 💧 If XYZ sells electricity at an internal price of US\$0.25/kWh revenue = $1,000,000 \text{ kW} \times 24 \text{ hour/day} = \text{US}6,000,000/\text{day}$.
- 💧 Difference between US\$0.25/kWh and US\$0.08/kWh = US\$0.17/kWh.
- 💧 If 1,000 MW XYZ power plant sells electricity internally @US\$0.25/kWh, associated deficit becomes $1,000,000 \text{ kW} \times 24 \text{ hour/day} \times \text{US}0.17/\text{kWh} = \$4,080,000/\text{day}$.
- 💧 This deficit would also be paid from from US\$14,983,364 surplus/day.

Summarizing

- 💧 Total deficit the would be subsidized by WaterSmart Environmental = US\$840,000 + US\$4,080,000 = US\$4,920,000/day from our surplus of US\$14,983,364/day.
- 💧 Marketplace winners = XYZ power plant owners, marketplace itself, environment, and WaterSmart Environmental.

Negotiations & Marketplace Credits

- ◆ WaterSmart Environmental is willing to subsidize XYZ power plant's internal sell price at US\$0.25/kWh as well as its power production costs on a fully sustainable basis.
- ◆ XYZ power plant then accepts full marketplace credit for discovering and implementing the technology that enables it to eliminate greenhouse gas emissions (GHG) while reducing the marketplace flat price of sold electricity to US\$0.045/kWh regardless of time of day, amount consumed, or by whom.

Next Generation

BioWastes-to-Renewable Energy

Kyoto Protocol Compliant

Global Cooling

Technologies

That Feature...

Technology Features:

- 💧 **The Free Distribution Of Potable Water.**
- 💧 **The Free Collection And Treatment Of Sanitary Wastewater.**
- 💧 **The Free Collection And Management Of Municipal Solid Wastes (MSW).**
- 💧 **The Generation And Distribution Of Renewable Energy Electricity At US\$0.045/kWh Regardless Of Time Of Day Used Or Amount Consumed.**
- 💧 **The 50:50 Sharing Of Annual Profits With The Communities Served.**

Technology Explained

- 💧 Wastes are anaerobically digested to produce methane gas and carbon dioxide gas.
- 💧 The methane gas is used to generate electricity. Excess methane gas is sold to the marketplace as a renewable biofuel.
- 💧 The carbon dioxide gas from power generation and from anaerobic digestion is used to grow Spirulina microalgae for use as animal feed & the production of biodiesel.

Technology Explained

- 💧 Wastes from the production of biodiesel are recycled back to the digester to produce additional methane gas and additional carbon dioxide gas.
- 💧 All solids materials left over from anaerobic digestion are used as aggregates in the manufacture of concrete products.

Technology Explained

- 💧 All liquids left over from anaerobic digestion are managed with reverse osmosis treatment that produces two liquid streams.
- 💧 The concentrate stream is rich in nutrients and therefore used to increase the growth rate of *Spirulina* microalgae.
- 💧 The very clean permeate stream is subjected to ozone disinfection and sterilization to produce potable water of a quality of bottled water.

Business Model 1

- 💧 Cities become electricity, natural gas, organic foods, and biodiesel fuel independent. No more expensive imports from the power grids, natural gas pipelines, and oil companies.
- 💧 City residents and businesses will be able to purchase electricity, renewable natural gas, and biodiesel fuel at a discount from existing marketplace prices on a sustainable basis.
- 💧 Communities thereby become zero-waste-to-landfill societies.

Business Model 1

- 💧 The generated electricity is always **green** and 100% renewable.
- 💧 City residents and businesses will be able to purchase electricity, natural gas, and biodiesel fuel at a 20% or more discount from existing marketplace prices.

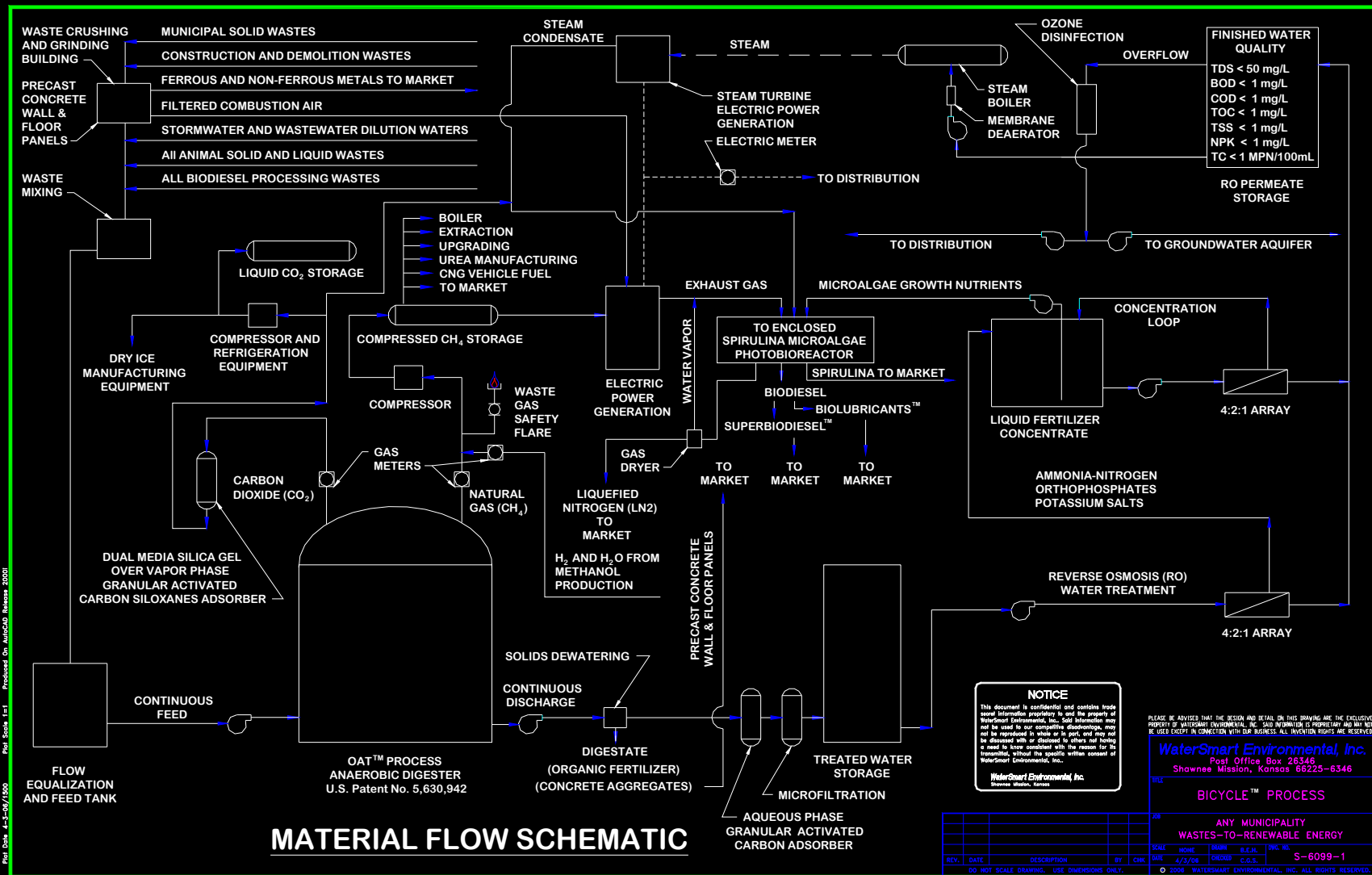
Business Model 1

Is marketed and developed as

BioWaste Energy Regional Industrial Parks

- ◆ **Each park always treats sanitary wastewater, municipal solid wastes, fish processing wastes, and biodiesel refining wastes.**
- ◆ **Many other wastes will also be accepted.**
- ◆ **Each Park is operated by BioWasteEnergy, A Division of WaterSmart Environmental, Inc.**

Material Flow Schematic



MATERIAL FLOW SCHEMATIC

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BICYCLE™ PROCESS

ANY MUNICIPALITY
 WASTES-TO-RENEWABLE ENERGY

S-6099-1

REV.	DATE	DESCRIPTION	BY	CHK.	SCALE	WORK	ISSUE	DATE	NO.

DO NOT SCALE DRAWINGS. USE DIMENSIONS ONLY.

Plot Date 4-15-09/1500
 Plot Scale 1/1
 Prepared On AutoCAD Release 2000

Regional Industrial Parks

- 💧 **Never require tax money for their construction. Project financing is raised from financial markets. Sales and property taxes will never increase due to park construction.**
- 💧 **Always generate significant renewable energy credits because they have a positive impact on global warming.**
- 💧 **Have zero greenhouse (GHG) emissions to the environment.**
- 💧 **Have zero wastes that require landfill disposal.**
- 💧 **Always create temporary and permanent jobs.**

Regional Industrial Parks

- ◆ Generate 100% of a community's electricity demand thereby permitting a city to eventually disconnect from the grid.
- ◆ Generate 100% of a community's biodiesel fuel demand since biodiesel is a perfect replacement for petroleum diesel.
- ◆ Generate 100% of a community's demand for natural gas since digester methane gas is a perfect replacement for pipeline supplied natural gas.
- ◆ Have the ability to generate 100% of the local demand for fresh fish through fish farming activities. All fish raised will be Mercury free since they are grown under cover. Additional Mercury-free fish will be exported to the marketplace. Fish farming will be practiced 365 days/year as excess energy from the park will permit effective heating of pond water during winter months.
- ◆ Microalgae farming and associated biodiesel production will also be practiced around the clock 365 days/year.

Regional Industrial Parks

- ◆ Require the full privatization of a community's wastewater treatment plant.
- ◆ Require the conversion of the community's potable water plant to membrane treatment. Membrane treatment is far more secure from terrorist attack than all lesser forms of water treatment. The cost of membrane conversion is included within total project financing. If the water plant is fully privatized the potable water is distributed on a no charge to the user basis.
- ◆ Permit the continuance or elimination of community trash recycling programs. Each park will recycle ferrous and non-ferrous metals (beer and pop cans) and nothing else.
- ◆ Will accomplish stormwater treatment by beneficially using it as municipal solid waste dilution water.
- ◆ Will be organized as for-profit corporations. Each park will share its annual profits with the community on a 50:50 donation basis to enhance municipal employee pay and to help fund routine municipal projects.

There Are Over 50 Existing North American MSW-To-Energy Plants That Use Incineration To Generate Electricity

- 💧 Other than scrap metals no other valuable co-products are produced.
- 💧 Associated air pollution is always a concern.
- 💧 The resulting ash must be landfill disposed.
- 💧 The plant's owner/operator makes very little profit.
- 💧 Consequently, existing MSW-to-energy technology is held in low esteem by both investors and environmentalists.

One Major Reason For Low Profits--

The High Moisture Content Of MSW

- 💧 The efficiency of incineration technology is **Greatly Diminished** by the ever present high moisture content of MSW.
- 💧 Incineration Technology is a **Dry Process**.
- 💧 Anaerobic Digestion is a **Wet Process**.

Anaerobic Digestion

- 💧 Is already being used by municipalities to generate methane gas to fuel electricity power generators.
- 💧 Is already being used by dairies and swine producers to generate electricity.
- 💧 Is already being used by the food and beverage industry to generate electricity.
- 💧 Can be beneficially used to produce methane gas from municipal solid wastes.

WaterSmart's MSW-To-Energy Anaerobic Treatment Process

- 💧 Has been carefully designed to recycle 100% of its residuals.
- 💧 Therefore, no material left over requires landfill or other disposal.

System Design

- ◆ MSW is mechanically sorted to remove ferrous and non-ferrous metals (beer and pop cans) which are sold to ferrous and non-ferrous metal buyers.
- ◆ Everything else is mechanically reduced in size to about 2.5 mm (approximately 1/10th inch) by mechanical grinding.
- ◆ The ground material is then mixed with sanitary wastewater and added to the anaerobic digester.
- ◆ Represents **next generation** technology in the marketplace.

Each System Component Is Established Technology

- 💧 MSW sorting to remove beer and pop cans.
- 💧 Size reduction (grinding).
- 💧 Slurry mixing.
- 💧 Anaerobic digestion of MSW.
- 💧 Carbon dioxide compression.
- 💧 Methane compression.
- 💧 CNG fuel for gas generators.
- 💧 Reverse osmosis membrane treatment.

Digester Co-Products

- 💧 Methane gas
- 💧 Carbon dioxide gas
- 💧 Organic fertilizer (digestate)
- 💧 Liquid fertilizer concentrate
- 💧 Reverse osmosis permeate water

Methane Gas

- Is dried, compressed, and beneficially used as a fuel to power internal combustion engines or *gas turbines* to generate electricity.
- Waste heat from power generation equipment is beneficially used to make steam. The steam is used to make additional electricity. When two methods are simultaneously used to make electricity its power generation is referred to as **combined cycle**. The efficiency of combined cycle generation is about 15% greater than simple cycle electricity generation.
- The compressed methane gas (called CNG) can also be used to fuel transportation equipment.
- The compressed methane gas can also be used to manufacture anhydrous ammonia and urea fertilizers.
- No methane gas from the anaerobic treatment process is released to the environment.

Carbon Dioxide Gas

- 💧 Some is liquefied for use in manufacturing dry ice.
- 💧 The balance is beneficially used in the photosynthesis of carbohydrates during fish farming and lipids during microalgae farming.
- 💧 No carbon dioxide will be released to the environment.

Digestate Solids Composition (From Anaerobic Digester)

- ◆ Ground glass, ground sand, ground rubber, ground leather, and ground plastics.
- ◆ Highly insoluble sulfides of Cadmium, Calcium, Copper, Iron, Lead, Manganese, and zinc, Chromium Oxides, and Calcium salts. These metals and salts are beneficial, necessary, and valuable micronutrients in soil.
- ◆ Approximately 1-1-1 N-P-K (Nitrogen, Phosphorus, and Potassium).
- ◆ Qualifies as Class “A” Biosolids in compliance with 40 CFR Part 503.
- ◆ Also qualifies as an organic fertilizer.

Solids Management.

- 💧 May be sold to the marketplace as an organic fertilizer at 30% moisture content.
- 💧 May be sold to the marketplace as a soil conditioner or soil amendment at 30% moisture content.

Liquid Streams (From Digester)

- 💧 Liquid fertilizer concentrate.
- 💧 Reverse osmosis permeate water.

Liquid Fertilizer Concentrate.

- 💧 Contains about 20-10-10 N-P-K in a concentrated 10% dissolved solids water solution.
- 💧 Will also contain soluble aluminum, magnesium, and sodium salts.
- 💧 Will be beneficially used to increase production of *Spirulina* microalgae.

Reverse Osmosis Permeate Water.

- 💧 Is used as boiler water make-up in making steam for the steam turbines.
- 💧 May be added to MSW to prepare a 5% slurry.
- 💧 May also be used for aquifer recharge to repair and replace contaminated groundwater.
- 💧 May be used for irrigation.
- 💧 Excess may be discharged under an NPDES permit.

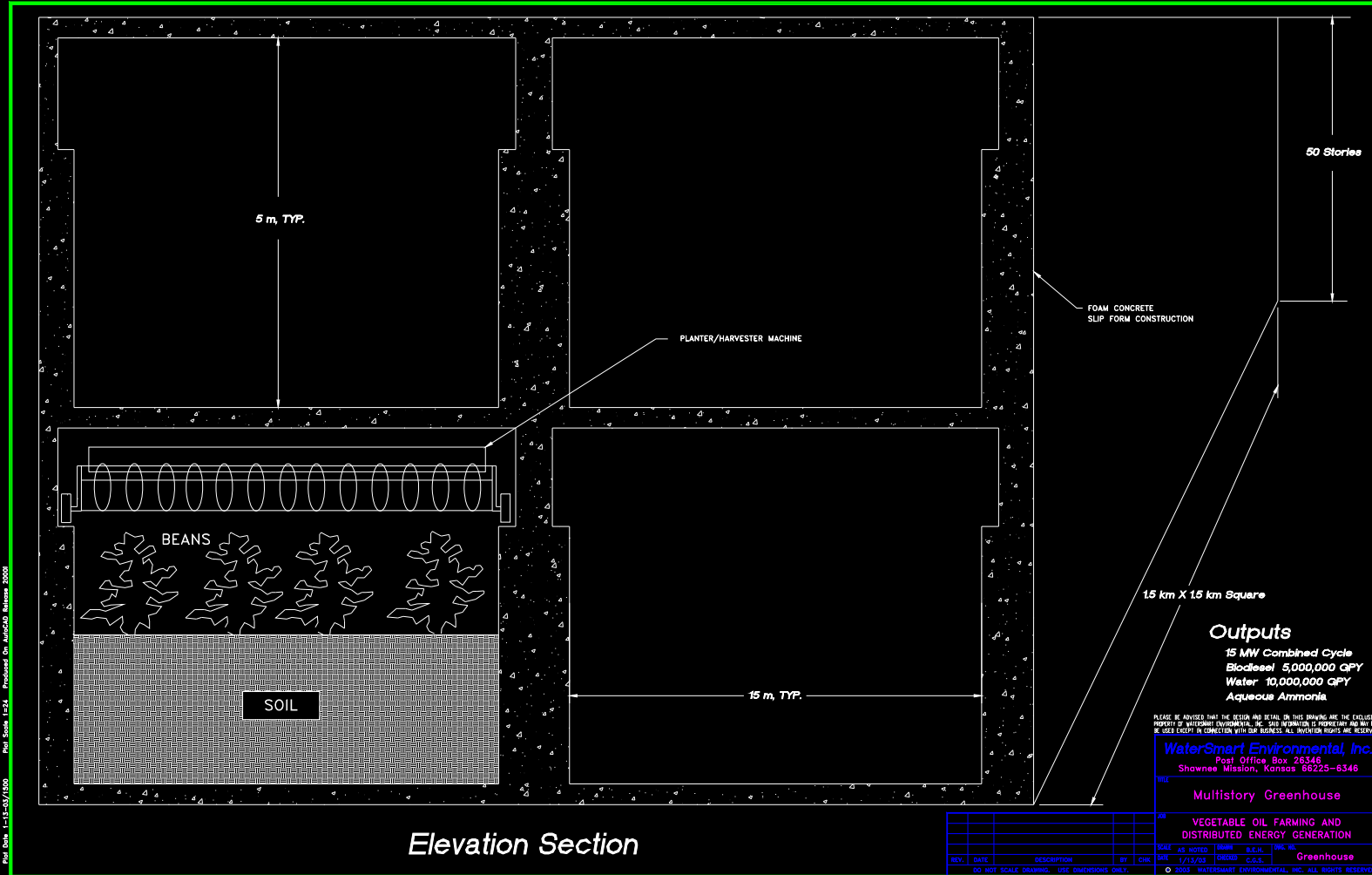
Gas Management.

- 💧 No digester release of methane gas to the environment.
- 💧 No digester release of carbon dioxide gas to the environment.
- 💧 Eliminating digester gas releases to the environment accomplishes a 500%+ reduction in greenhouse gas emissions.
- 💧 At the same time significant carbon dioxide credits are generated, on the order of 85 grams/kWh of electricity generated.

Business Model 2

- ◆ Entire Nations become energy, food, fuels, and water independence through massive greenhouse farming. By massive is 1 mile square (1.5 km square) by 50 stories high.
- ◆ North America requires some 5,000 massive greenhouses to achieve energy, food, fuels, and water independence.
- ◆ By connecting each of the several greenhouses together to form a SuperGrid, energy, food, fuels, and water can be economically delivered to the marketplace under secure conditions.
- ◆ Greenhouse farming results in several harvests per year. By controlling moisture, humidity, carbon dioxide concentration, temperature, nutrient addition, lighting, and other variables, successful intercropping can be practiced. All foods grown and processed result in organic and natural food production. The use of pesticides and weed killers can be totally eliminated. Massive greenhouse farming represents highly efficient land management. Upwards of 500 times as much food can be grown/horizontal acre with this technology.
- ◆ Pipeline products consist of electricity, biodiesel fuel, anhydrous ammonia, urea, compressed natural gas, liquefied nitrogen, and water. Foods may consist of anything that can be grown as well as concentrated animal feeding operations. All food products will be processed to achieve value added. All wastes associated with farming, food production, and food processing will be anaerobically digested to produce the same five co-products referenced in Business Model 1.

Business Model 2

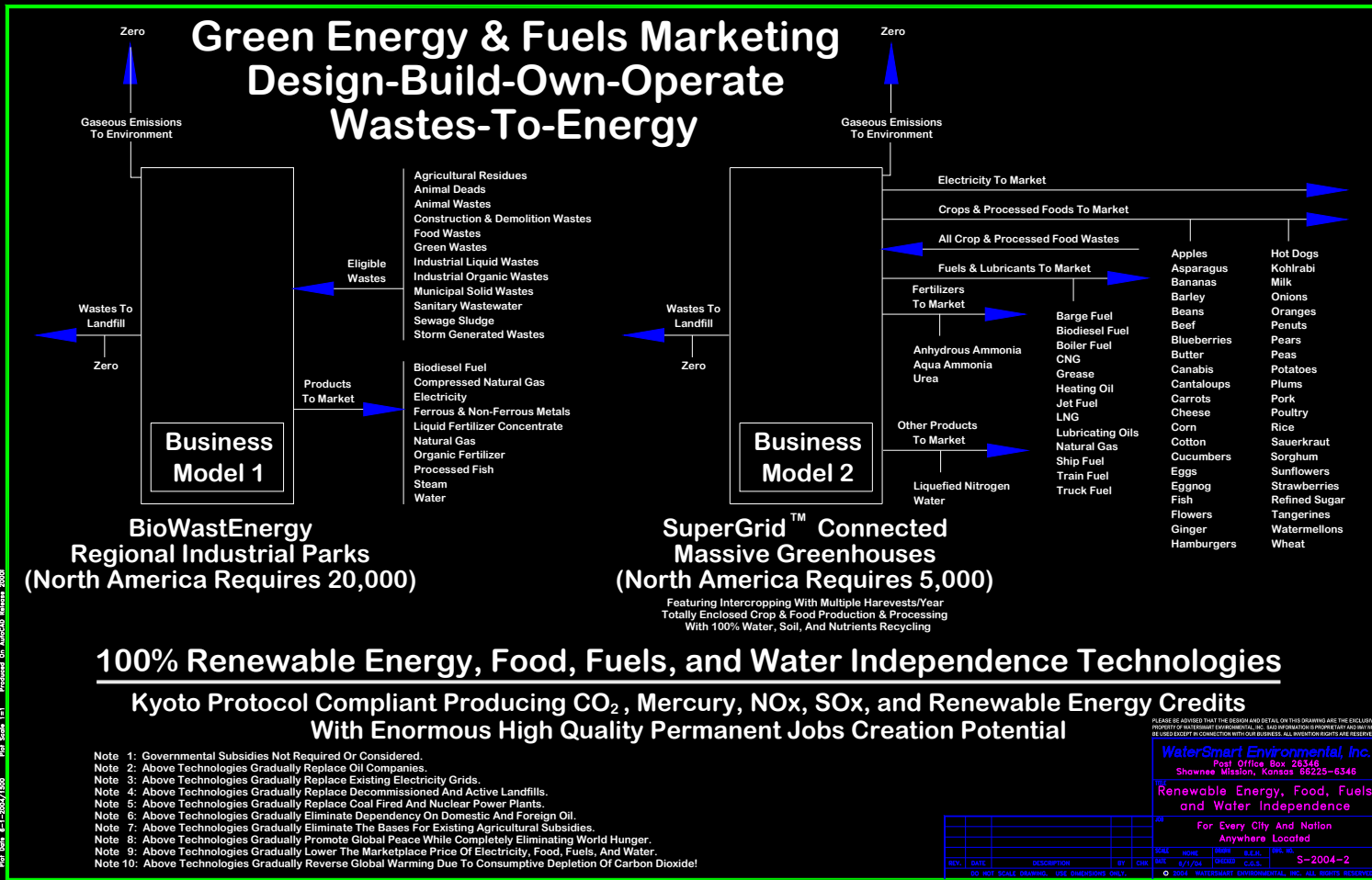


Elevation Section

NO		200	
VEGETABLE OIL FARMING AND DISTRIBUTED ENERGY GENERATION			
DATE		DESCRIPTION	
NO.	DATE	BY	CHK.
SCALE AS NOTED		DATE	BY
NO.		DESCRIPTION	
NO.		DESCRIPTION	
DO NOT SCALE DRAWING, USE DIMENSIONS ONLY.			

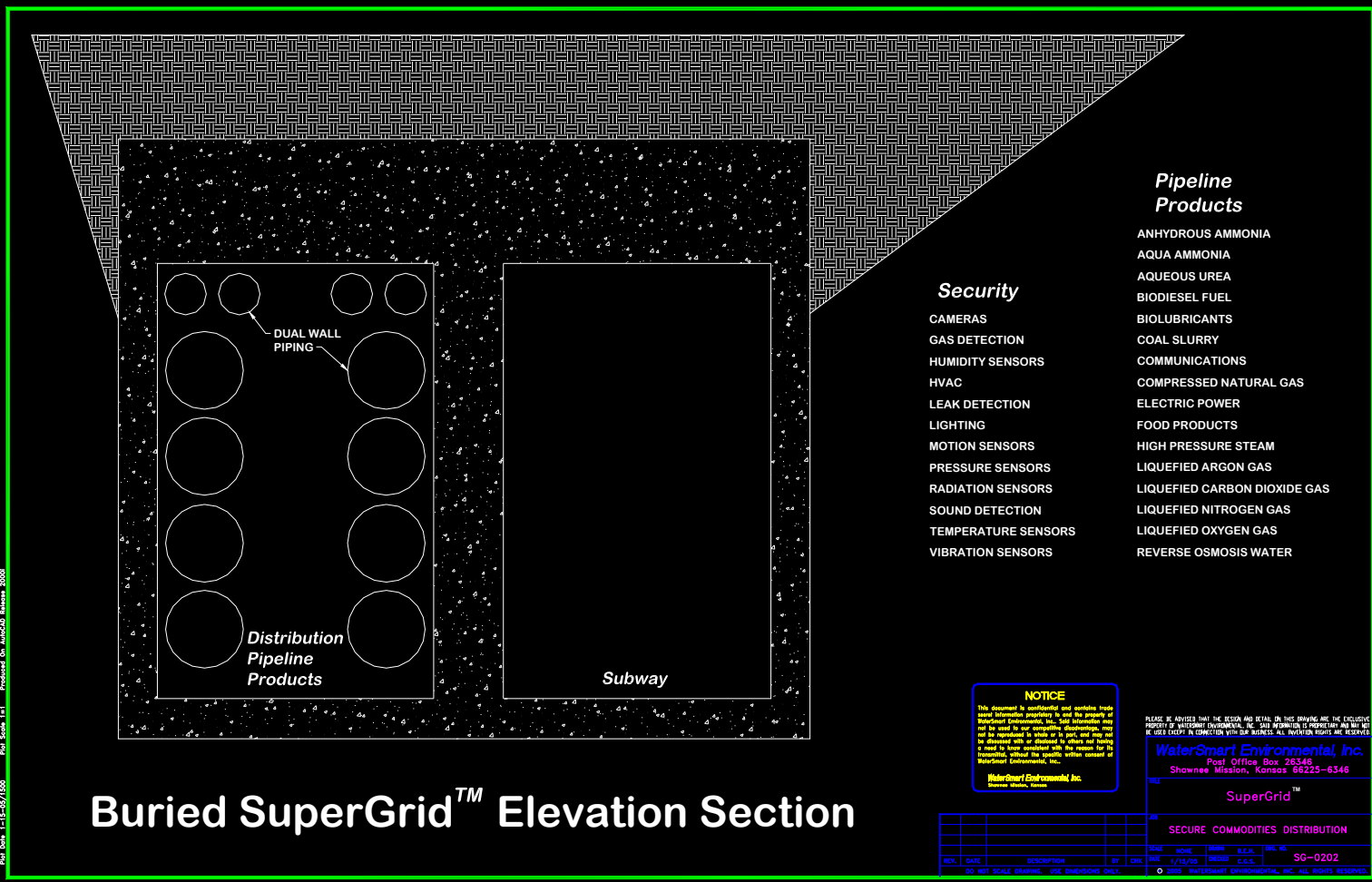
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 Ref. Scale: 1" = 150'-0"/100'

Business Models 1 & 2



Rev. Date: 8-1-2004/1/00 Phil Wade, LCI Prepared On: AutoCAD Release: 2000

SuperGrid™



Buried SuperGrid™ Elevation Section

Pipeline Products

- ANHYDROUS AMMONIA
- AQUA AMMONIA
- AQUEOUS UREA
- BIODIESEL FUEL
- BIOLUBRICANTS
- COAL SLURRY
- COMMUNICATIONS
- COMPRESSED NATURAL GAS
- ELECTRIC POWER
- FOOD PRODUCTS
- HIGH PRESSURE STEAM
- LIQUEFIED ARGON GAS
- LIQUEFIED CARBON DIOXIDE GAS
- LIQUEFIED NITROGEN GAS
- LIQUEFIED OXYGEN GAS
- REVERSE OSMOSIS WATER

Security

- CAMERAS
- GAS DETECTION
- HUMIDITY SENSORS
- HVAC
- LEAK DETECTION
- LIGHTING
- MOTION SENSORS
- PRESSURE SENSORS
- RADIATION SENSORS
- SOUND DETECTION
- TEMPERATURE SENSORS
- VIBRATION SENSORS

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 Shawnee Mission, Kansas 66225-6346

TITLE: **SuperGrid™**

NO: **SECURE COMMODITIES DISTRIBUTION**

SCALE: NONE DRAWN: S.E.A. INC IN: SO-0202

DATE: 1/19/03 CHECKED: C.G.S.

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REV.	DATE	DESCRIPTION	BY	CHK

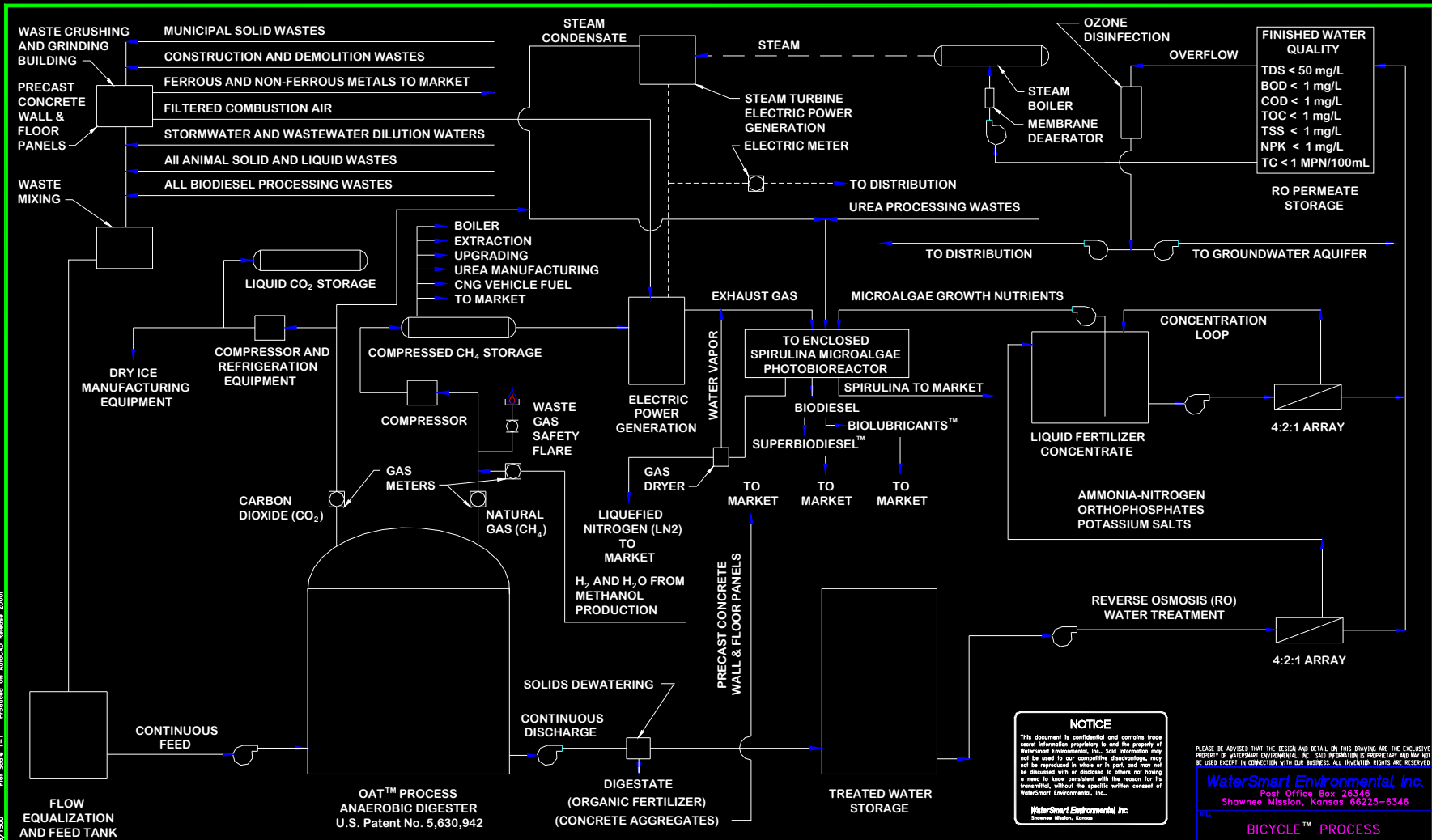
DO NOT SCALE DRAWING, USE DIMENSIONS ONLY.

Rev. 0204 1-19-03/030 Produced by AutoCAD Release 2000 Rev. 0204 1-19-03/030

Combined Cycle Electricity Generation.

- 💧 Methane gas is used to generate electricity with reciprocating engines or gas turbines.
 - 💧 Waste heat from methane gas electric power generation is used to make steam.
 - 💧 Steam is then used in a steam turbine generator to make additional electricity.
- ...Very efficient cogeneration of electricity.

Total Treatment Design.



MATERIAL FLOW SCHEMATIC

Plot Date: 4-23-09/1500 Plot Scale: 1:1 Produced On: AutoCAD Release: 2000

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BICYCLE™ PROCESS

REV.	DATE	DESCRIPTION	BY	CHK	SCALE	MOND	TUE	WED	THUR	FRI	SAT	SUN
JOB: ANY MUNICIPALITY WASTES-TO-RENEWABLE ENERGY SCALE: NONE DRAWN: S.E.H. DATE: 4/23/09 DESIGNED: S.E.H. CHECKED: S-6099-1 © 2009 WATERSMART ENVIRONMENTAL, INC. ALL RIGHTS RESERVED.												

Odor Control.

- 💧 MSW receiving and sorting building is kept under negative pressure thereby preventing odor escape to the environment.
- 💧 Air quality within receiving and sorting building is continuously purified by vapor phase activated carbon.

The OAT™ Process.

Is the *only* process that combines:

- 💧 Two-phase Anaerobic Digestion
- 💧 Thermophilic Bacteria
- 💧 Staged Phase Treatment
- 💧 Fixed Growth Media
- 💧 Flow Recirculation
- 💧 pH and Temperature Control
- 💧 Essential Nutrient Addition

Bacteria Can Produce Fuel From Liquid & Solid Wastes.

- 💧 Solid waste landfills biologically generate methane gas (called *biogas*) as clear evidence of the ability of bacteria to produce fuel.
- 💧 Biogas is a mixture of carbon dioxide and methane gas. It has a heating value of about 25,000 kJ per cubic meter.
- 💧 Biogas may be used as a primary fuel or to generate electricity.

Wastewater Treatment Plants Use Bacteria.

- 💧 Almost all wastewater treatment plants use bacteria to treat the water.
- 💧 Aerobic plants use aeration. They *consume* about 8,000 kJ per kg COD (Chemical Oxygen Demand) removed.
- 💧 WaterSmart's OAT™ anaerobic plant *generates* about 22,000 kJ/kg COD for an energy improvement of about 30,000 kJ/kg COD.

Wastes That Can Be Converted Into Methane.

- 💧 Municipal Wastewater
- 💧 Landfill Leachate
- 💧 Chemical Manufacturing
- 💧 Pulp & Paper Mills
- 💧 Sugar Mills
- 💧 Palm Oil Mills
- 💧 Breweries & Distilleries
- 💧 Fish & Food Processing
- 💧 Agricultural Solid Wastes
- 💧 Cardboard & Sawdust
- 💧 Ethanol Plants
- 💧 Rubber Plantations

...More Eligible Wastes.

- 💧 Animal Feed Lot Wastes
- 💧 Dairy & Cheese Production
- 💧 Fruit & Vegetable Canning
- 💧 Pharmaceutical Wastes
- 💧 Rendering Plants
- 💧 Textile Manufacturing
- 💧 Municipal & Industrial Digester Sludge
- 💧 Municipal Solid Wastes
- 💧 Landfill Wastes

A Renewable And Alternative Energy Source.

- 💧 These many wastes are generated each and every day in the normal course of living.
- 💧 The routine treatment or disposal of wastes is tremendously *expensive*.
- 💧 The OAT™ process, however, makes their conversion into methane gas and other co-products *profitable*, an extremely pleasant surprise.
- 💧 This was made possible by viewing wastes as a resource rather than a burden on society.

Excess Energy Produced.

- 💧 The OAT process uses some of the methane it generates to heat the wastewater being treated.
- 💧 The excess methane can be sold, used to operate equipment, or generate electricity.
- 💧 The excess **green power** electricity can be used by the treatment plant, sold to the local electric utility, or even to a distant business or city through the Internet.

Positive Return On Investment.

- 💧 When one generates a profit from the treatment of wastes, a *positive return on investment* (ROI) always results.
- 💧 Rather than a burden on society, wastes may now be viewed as an asset--an incredible reversal of common perception.
- 💧 Wastewater treatment plants of the patented OAT™ design pay for themselves!

Energy Costs.

- 💧 Wastewater treatment is very expensive, particularly because of energy costs that frequently seem to increase at 3-5% every year.
- 💧 A typical biological wastewater treatment plant uses about 8,000 kJ per kg COD (Chemical Oxygen Demand) removed.
- 💧 WaterSmart's OAT process can produce up to 22,000 kJ/kg COD removed, for an *energy improvement* of about 30,000 kJ per kg COD.

Capital Equipment Costs.

- 💧 Are also very expensive, on the order of US\$2K+ for every kg of COD treatment capacity.
- 💧 If ammonia, nitrate, phosphorus, or heavy metal removals are required, the associated costs are much higher.
- 💧 WaterSmart's OAT™ Anaerobic Treatment Plant costs about half as much as other anaerobic systems treating the same amount of COD or Volatile Solids.

Environmentally Friendly And Sensible.

- 💧 Korea's Sudokwon Landfill, the world's largest, has the motto: *"Don't Waste Wastes."*
- 💧 We share that view and believe wastes should be converted into something useful, like fuel or electricity, if it can be done so safely and economically.
- 💧 In so doing, waste volumes are greatly reduced to better manage the environment for ourselves and the next generation.

Odors?

Absolutely None!

- 💧 All treatment is carried out in closed vessels
- 💧 Hydrogen Sulfide is removed from produced biogas.
- 💧 All gasses are captured and used or recycled. None escape.

Environmental Damage? Absolutely None!

- 💧 No emissions to atmosphere
- 💧 Heavy metals removed as insoluble sulfides
- 💧 Organic constituents are converted into methane gas.
- 💧 All nutrients are captured and recycled.

Beneficial Co-Products.

In addition to **methane gas**, the OAT™ process generates other useful and profitable co-products.

- 💧 Carbon Dioxide
- 💧 Organic Fertilizer
- 💧 Liquid Fertilizer Concentrate
- 💧 Reverse Osmosis Permeate Water

Greenhouse Gas.

- All power generation combustion gas is routed to an enclosed photobioreactor for the purpose of enhancing the growth of Spirulina microalgae.
- Carbon dioxide gas from the anaerobic digester is used for dry ice production with excess routed to an enclosed photobioreactor for the purpose of enhancing the growth of Spirulina microalgae.
- No methane or other gas is ever discharged to the environment.

Noise...

Practically none!

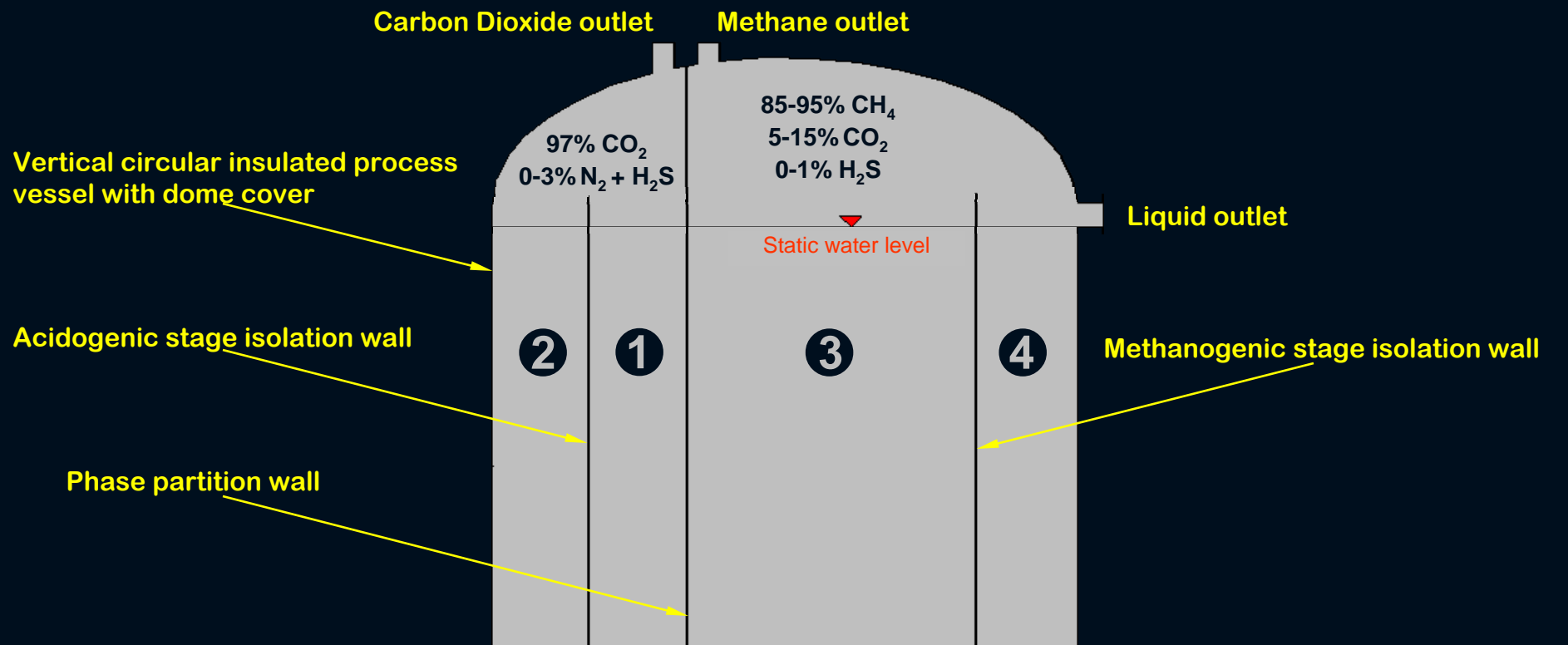
The loudest component is a biogas powered generator or turbine -- similar to a truck engine.

Noise producing equipment can easily be enclosed for noise attenuation

Sludge

- 💧 0.01 pounds of solids produced for every pound of BOD removed—about 25% that of competitive anaerobic treatment plants!
- 💧 OAT™ process sludge qualifies as **Class “A” Biosolids** that can be sold as fully certified organic fertilizer.

Single Vessel Design.



① 1st stage acidogenic digester

② 2nd stage acidogenic digester

③ 1st stage methanogenic digester

④ 2nd stage methanogenic digester

Headworks.

- 💧 Trash and grit removal.
- 💧 Grind or comminute the raw wastewater.
- 💧 No primary treatment required.
- 💧 Biosolids may be ground and added.
- 💧 Organic solid wastes may also be added.
- 💧 Liquid organic wastes may also be added.
- 💧 Green wastes may also be added.
- 💧 Food wastes may also be added.
- 💧 Existing landfill wastes may also be added.

Sophisticated Design But Easy To Operate.

- 💧 **Automatic controls simplify routine plant operations.**
- 💧 **Close process control translates into a high degree of treatment efficiency.**
- 💧 **Minimal plant operator skill required.**

OAT Upgrades Available.

- Existing anaerobic digesters may usually be upgraded to the OAT process thus saving project site construction and piping costs.
- A complete upgrade to the OAT process can increase the digester organic loading capacity 10 times.
- Beneficial use or sale of the produced methane gas, generated electricity, Class A biosolids, reverse osmosis permeate water, and carbon dioxide gas makes the upgrade a positive ROI.

BioRefinery

- 💧 Consists of SuperBiodiesel™
- 💧 Consists of Compressed Natural Gas (CNG)
- 💧 And also includes BioLubricants™

Summary.

- 💧 Wastes can be beneficially converted into fuel or electricity.
- 💧 An efficient anaerobic treatment process results in a positive return on investment.
- 💧 The OAT™ process is the **most efficient** anaerobic treatment available worldwide.
- 💧 OAT™ plants are smaller, less expensive, do not smell, and generate a profit.
- 💧 Reverse Osmosis permeate water can be used for aquifer recharge.

SuperBiodiesel™

- 💧 Will be sold at a 20% discount from petroleum diesel.
- 💧 Fueling stations will be installed at each project building and elsewhere convenient to the transportation industry.

For Project Development and Feasibility Studies

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