



CITY OF PORTLAND ENVIRONMENTAL SERVICES



1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ■ Nick Fish, Commissioner ■ Michael Jordan, Director

**Earth Day 2017:
100% waste methane recovery**

ORDINANCES 370-372

**April 19, 2017
9:45 am City Council**

- **Commissioner Nick Fish** to introduce the project and ordinances

First panel:

- **Environmental Services Director Mike Jordan**
- **Environmental Services staff member Paul Suto**
- **Bureau of Planning and Sustainability Director Susan Anderson**

Second panel: Invited testimony

- **NW Natural President and CEO David H. Anderson**
- **Citizens Utility Board member Janice Thompson**
- **Oregon Environmental Council climate director Jana Gastellum (Gast-el-um)**



City of Portland Environmental Services
Columbia Boulevard Wastewater Treatment Plant

100% Waste Methane Recovery

CUT

21,000 tons

OF CLIMATE-CHANGING EMISSIONS/YEAR

ADD

\$3 million

IN ANNUAL REVENUE

REPLACE ENOUGH DIESEL TO POWER

154 garbage trucks

FOR A YEAR



@BESPortland

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Earth Day 2017: From flare to fuel – creating a triple win for Portland

By Nick Fish and Mike Jordan

At the Bureau of Environmental Services, we know that what’s good for the environment is typically good for our ratepayers. That’s why, in celebration of Earth Day, we are excited to announce an innovative venture to turn waste into clean energy while earning money for Portlanders.

Every year, we process 28 billion gallons of sewage. A little-known, natural byproduct of sewage treatment is methane, a potent greenhouse gas. For years, the City has been capturing a portion of this methane gas to produce electricity. The rest has been burned off in a process called “flaring” where it turns into carbon dioxide and is released into the atmosphere.

That’s about to change.

Starting this summer, Environmental Services will kick off an innovative effort designed to capture 100% of the methane from our waste, dramatically reducing our carbon footprint. We will then convert the methane into a clean bio-fuel to reduce our reliance on dirty diesel. And through our partnership with local utility NW Natural, we will generate \$3 million each year for our ratepayers. This is a triple win for Portland!

So how big a deal is this, really?

It will be the City's single largest greenhouse gas reduction project to date.

Converting methane into renewable natural gas and using it to power vehicles will cut greenhouse gas emissions by 21,000 tons each year. That will help us reach the ambitious goals of our City-County Climate Action Plan as well as Mayor Wheeler's pledge to transition to 100% renewable energy sources by 2050. That's win one.

The renewable natural gas will be used to replace more than a million gallons of dirty diesel truck fuel every year. By the end of 2018, we will supply enough clean fuel to run the equivalent of 154 garbage trucks for an entire year. That's win two.

And we'll pass the proceeds from our natural gas sales directly to you—our customer. That's win three.

Tomorrow, we will present our proposal to the City Council for review and approval. It already has the blessing of the Citizen's Utility Board of Oregon, our residential ratepayer watchdog. To make this exciting plan a reality, we'll seek Council's approval to build a compressed natural gas fueling station at the Columbia Boulevard Treatment Plant, and a separate facility to send our methane to NW Natural. From there, it will be sold on the renewable energy market.

This year we are celebrating the 47th Earth Day. On April 22nd, 1970, millions of people took to the streets and committed to protecting our planet. The first Earth Day launched the modern environmental movement.

Today, that movement faces unprecedented challenges. While we have limited control over what is happening in Washington D.C. and around the country, the City of Portland will continue to lead by example on clean air, clean water, and clean energy. And we are very proud to do our part.

Nick Fish is a Portland City Commissioner. He leads the City's two public utilities: The Bureau of Environmental Services and the Portland Water Bureau.

Mike Jordan is the Director of the Bureau of Environmental Services.

IMPACT STATEMENT

Legislation title: *Authorize a competitive solicitation and contract with the lowest responsible bidder, and provide payment for construction of the Columbia Boulevard Wastewater Treatment Plant Renewable Natural Gas Facility Project, for an estimated cost of \$9,000,000. (Ordinance)

Contact name: Scott T. Gibson, PE

Contact phone: 503-823-7615

Presenter name: Scott T. Gibson, PE

Purpose of proposed legislation and background information:

Authorize a competitive solicitation and contract with the lowest responsible bidder for construction of the Renewable Natural Gas Facility project.

The RNG Facility project will recover waste resources and convert them to renewable natural gas for vehicle fuel, which will generate a source of revenue for the City, while providing social and environmental benefits in greenhouse gas emission reduction.

The CBWTP produces an average of 600 million cubic feet of biogas a year from its anaerobic digestion treatment process; this gas is mostly methane. The biogas is currently used in boilers for heating the digesters, cogeneration to produce electricity used on site, sold to Malarkey Roofing Company for the manufacturing process, and the rest of the biogas is flared through the waste gas burners.

The Bureau of Environmental Services (BES) has performed alternatives analysis, using triple-bottom line approach, to evaluate for highest values and most beneficial use for the biogas that is currently flared. The result of the analysis recommended the biogas be treated to natural gas quality, or Renewable Natural Gas (RNG), injected into the gas company pipeline and used as vehicle fuel. Through the analysis, the use of biogas for vehicle fuel will provide the highest financial benefits, and also the highest social and environmental benefits.

BES will produce RNG and will partner with an off-taker for the marketing, distribution and final sales of the RNG and its associated environmental attributes. The off-take arrangement will allow BES to focus on its core business, i.e., wastewater treatment and resource recovery, and its partner in the energy industry to take on the marketing, distribution and sales. Through RFP #00000496, BES has selected Clean Energy Renewables as the off-taker for the RNG.

BES has partnered with Northwest Natural Gas Company (NWN), with a signed Memorandum of Understanding, to utilize its gas pipeline for transporting RNG. On September 1, 2016, NWN received approval from Oregon Public Utility Commission on revised Receipt Tariff (Revised Gas Transportation Schedule T), allowing RNG to be transported through the NWN gas piping system.

The amount of RNG will be produced, and available for off-take, will be 100,000 dekatherms (1 dekatherm equals 10 therms) minimum to 340,000 dekatherms maximum a year, depending on uses and prioritization of the biogas. 340,000 dekatherms a year will be the capacity of the RNG production system. At the current market prices of RNG for the volume range, the gross revenue to BES would be \$3 million to \$10 million a year, and the payback would be less than 3 years. These prices even exceeded our high-end projections, in which had we projected payback to be in the 6 to 8 years range.

The prices for the attributes associated with the RNG fluctuate significantly, depending on regulatory and market factors. BES staff has performed numerous what-if scenarios and sensitivity analyses to ensure the project is economically viable. BES also retained Dakessian Consulting, as an independent financial reviewer for the project financials. The final report of the independent financial analysis by Dakessian confirmed the project was viable. The received proposals from the RNG off-take RFP further confirmed the RNG market and the financial projections.

Financial and budgetary impacts:

The estimated construction cost is \$9,000,000. The level of confidence in this cost estimate is high. The project is included in the adopted BES CIP budget for FY-18. However, this is a revenue generating project, with payback expected to be in the range of 3 to 8 years for the overall biogas project.

The project is consistent with City Policy for treating wastewater and recovering resources, minimizing ratepayer impacts, and is aligning with the Climate Action Plan.

Community impacts and community involvement:

The project will have significant positive impacts to the community. BES will have a RCNG (Renewable Compressed Natural Gas) fueling station on the treatment plant site, with vehicles operated on clean fuel of RNG. BES, and its partners, will also help develop a local market for RNG in the region, which currently doesn't exist.

There is already a Citizen Advisory Committee (CAC) established for the CBWTP projects, and the CAC is periodically updated, and provides feedbacks, on these projects, including this biogas project. Furthermore, the Citizen Utility Board and Public Utility Board are involved in this project. They get regular project updates, and provide feedbacks to the project team, as well as inputs to the budget office.

