



City of Grand Island

Tuesday, February 14, 2006

Council Session

Item G19

#2006-47 - Approving Bid Award for the Lease of an Aerated Static Pile Compost Pilot Testing Unit; Wastewater Division

Staff Contact: Steven P. Riehle, Public Works Director

Council Agenda Memo

From: Steven P. Riehle, Public Works Director

Meeting: February 14, 2006

Subject: Approving Bid Award for the Lease of an Aerated Static Pile Compost Pilot Testing Unit; Wastewater Division

Item #'s: G-19

Presenter(s): Steven P. Riehle, Public Works Director

Background

On January 26, 2006 the Wastewater Division of the Public Works Department advertised for bids for the lease of an aerated static pile compost pilot testing unit. Notices were sent to four (4) potential bidders.

Discussion

One bid was received and opened on February 2, 2006. The Wastewater Division reviewed the bid that was received. The exceptions to the bid were noted deemed reasonable and acceptable. The bid is shown below.

<i>Bidder</i>	<i>Exceptions</i>	<i>Bid Security</i>	<i>Total Bid</i>
CH2M Hill Englewood, CO	Noted **See Attachments	\$800.00	\$13,696.00

The bid included \$9,226.00 for set up and for the first month of operation. The second month lease payment and any additional months for up to one year were bid at \$4,470.00. The bid was based on using the pilot testing unit for a 2 month period.

There are sufficient funds in Account No. 53030052-85213 to fund this lease.

Alternatives

It appears that the Council has the following alternatives concerning the issue at hand. The Council may:

1. Approve awarding the lease of the compost pilot testing unit.
2. Refer the issue to a Committee.

3. Postpone the issue to a future date.
4. Take no action on the issue.

Recommendation

City Administration recommends that the Council approve awarding the contract for the lease of an aerated static pile compost pilot testing unit from CH2M Hill of Englewood, Colorado in the amount of \$13,696.00.

Sample Motion

Move to approve awarding the lease.

Lease of an Aerated Static Pile Compost Pilot Testing Unit

Exceptions to Specifications

TO: City of Grand Island

FROM: CH2M HILL

DATE: January 31, 2006

The following is a list of exceptions to the specifications.

1. Unloading assistance by the City is required. This includes using their loader to move the equipment.
2. Severe weather during equipment setup and subsequent delays may cause additional work to the City.
3. The equipment consists of 23 active aeration lances for use with a total of 1,500 cubic yards.
4. Assembly assistance by the City will be required. Assume 2 personnel for 8 hours.
5. The City will provide biofilter media consisting of wood chips, bark or other similar material with a high carbon content. A total of 250 cubic yards will be required.
6. The City will provide adequate drainage and connections for the piping. Drainage can be by gravity or through a separate dewatering pump provided by the City. Pump to consist of a submersible or diaphragm pump.
7. Equipment provided, including piping, is used but is in good working order.
8. City will supply minor hand tools during assembly. These are expected to consist of a sawzall and a power hand grinder.
9. City will provide 480 volts, 3 phase, 30 amp breaker for connection.
10. City will supply water through a standard garden hose.

Aerated Static Pile Compost Pilot Testing Unit

Project Understanding

The equipment proposed herein is designed to continuously aerate approximately 1,500 cubic yards of compost pile, with fully adjustable airflow rate and odor control biofilter. The equipment is portable in the sense in can be assembled quickly with above ground piping and portable power.

Demonstration

The unit has been demonstrated and a copy of earlier test reports is available upon request. The projects that are available for review include:

- ✓ Ontario, Canada (Grobark)
- ✓ Petaluma, California (Sonoma Compost)
- ✓ Corona, California (Synagro)
- ✓ Mountain Home, Idaho (MHAFB)

Lease Price

The lease price is provided according to the terms and conditions requested.

Quality

The equipment is entirely constructed of stainless steel or high density polyethylene. No carbon steel or PVC is used in its construction. The corrosion and heat associated with composting is not compatible with these materials. The piping is specifically designed to be reused and not disposed after use. Many compost plants use disposable plastic drain pipe, but this generates waste and additional operating cost.

Economy of Operation

The equipment allows a variable airflow through the use of a variable frequency drive on the fan motor. This saves power by reducing the fan rpm to the optimum level for any given condition. The equipment also eliminates the need to throw away aeration pipe after each batch cycle.

Experience of the Manufacturer

The equipment was fabricated by an experienced fabricator. CH2M HILL provided the design. This design contains portions of the inventions covered in US Patents number 6,534,306 B1 and 6,383,806 B1.

Adaptability to this Particular Use

This equipment was specifically designed for demonstrating high speed composting with forced aeration and odor control.

Experience on Aerated Static Pile Composting

Biosolids Market Assessment. City of Austin, Texas. Evaluated the existing capabilities of the Dillo Dirt operation and conducted a market survey of other products on the market. This included an assessment of the experience and perception of Dillo Dirt in the marketplace.

Biosolids Market Assessment. Fred Hill Materials, Poulsbo, Washington. Evaluated the existing market for manufactured soil in and around the greater Puget Sound region. This was in the form of a feasibility study for the development of a new biosolids composting business venture.

Biosolids Market Assessment. Las Virgenes Municipal Water District, Calabasas, California. Evaluated the existing products on the market and developed a marketing strategy for product improvement and multiple product production at an existing composting operation.

Composting. Synagro Technologies, Riverside County, California. Design on an enclosed aerated static pile facility for multiple feedstocks at a maximum daily rate of 2,200 tons per day. Work involved development of the mass balance, economic pro forma, basis of design, conceptual design and pricing with three General Contractors. This is a fast-track process with close coordination between the client, the engineer, and the contractor. Additional work on operating plans, community acceptance, peer review, and permitting was also provided. The process was demonstrated in pilot phase with 98% measure odor removal efficiency.

Composting. Inland Composting and Organic Recycling, Colton, California. Commercial composting design work involved a team of local and specialized consultants to create a basis of design, conceptual site plan, and project cost estimate for Inland Composting. The facility is a 1,200-ton per day biosolids and green waste co-composting facility. Technology selection focused on cost and odor control. Aerated static pile with reversible airflow, aerated pavement, and above ground aeration pipe systems. Work includes consultation with regional biosolids agencies that will fund and use the facility services.

Composting. Las Virgenes Municipal Water District, Calabasas, California. Provided the District with projections of solids production and an optimized schedule of alternatives and recommended improvements to upgrade existing facilities and implement new facilities as needed to accommodate future growth. The work included a review of digestion, thickening, transport, composting, and compost marketing issues. Improvements included increasing the current composting capacity in the future.

Composting. US Air Force, Mountain Home Air Base, Mountain Home, Idaho. Biosolids composting feasibility study for biosolids beneficial reuse on the air base. This involved approximately 2,000 wet tons per year of dewatered biosolids. The project was integrated with an existing yard waste composting program. The work later expanded into a composting pilot study to test the feasibility of year-round composting outside.

Composting and Biofiltration. Gro-Bark Ltd, Toronto, Ontario, Canada. Pilot biosolids composting demonstration project using a portable aerated static pile system. Aeration volume of 1,000 cubic yards and biofilter volume of 125 cubic yards. The pilot was to demonstrate the optimum pile height, aeration rate, feedstock proportions, and residence time. The equipment was owned and operated by CH2M HILL, based on US Patent 6,383,803 B1.

Digestion, Composting, and Biofiltration. Colusa Biomass Energy Corporation, Colusa, California. To evaluate a short list of both anaerobic and aerobic decomposition technologies on technical, mass balance, and economic bases. To help develop a conceptual design for the optimum system for one specific project at 125 tons per day input rate. Feedstocks are rice straw, tomato processing waste, and other select organic waste materials. Products include energy, heat, and soil.

Foodwaste Processing for Digestion and Composting. Norcal Waste Systems, San Francisco, California. Design of a foodwaste processing facility sized for 10 tons per hour to mechanically separate pure food from mixed commercial waste collection. The separation system includes grinding of the foodwaste for anaerobic digestion. The residual waste is processed for composting.

Greenwaste Composting. Sacramento County Solid Waste Authority, Sacramento, California. Design of a 100,000 to 250,000 ton-per-year greenwaste facility to handle multiple jurisdictions waste collection and recycling systems. This involved the design of a public-private partnership where the facility was developed and owned by the public sector and operated by the private sector under contract.

Foodwaste and Greenwaste Composting. Norcal Jepson Prairie Organics, Vacaville, California. Design of an 180,000 ton-per-year facility for composting commercial sector organics including post-consumer protein, fat, and oil. The design included a first stage polyethylene bag system for the initial time and temperature hydrolysis and decomposition. This is followed by reversed aeration system using aerated static piles with biofiltration. The project included a water balance design to reuse the liquid from hydrolysis in the composting phase.

Composting. Inland Empire Regional Composting Facility (jointly owned by Inland Empire Utility Agency and County Sanitation Districts of Los Angeles County) is proposed for a 2003 startup date. Responsibilities are Lead Design Engineer for Process Design, Aeration Methods and Controls for a biosolids and greenwaste co-composting facility. Design throughput is 830 tons per day (100 dry tons biosolids per day). Process is fully enclosed and relies upon vacuum aerated static pile technology. Odor control is designed as a two stage wet water scrubbing and biofiltration system. Product quality is oriented to high quality urban markets.

Composting. Sonoma Compost, Petaluma, California. Pilot greenwaste composting demonstration project using a portable aerated static pile system. Aeration volume of 1,800 cubic yards and biofilter volume of 25 cubic yards. The pilot was to demonstrate the optimum pile height, aeration rate, feedstock proportions, and residence time. The equipment was owned and operated by CH2M HILL, based on US Patent 6,383,803 B1. The economics, product quality, odor control, and stormwater control were all evaluated.

Odor Control and Composting. Smith Brothers Farms, Royal City, Washington. This work involved the review and redesign of a 3,200 cow freestall animal feeding operation together with fiber composting and 9 acres of lagoon treatment and storage. The redesign included conversion to scrape/vacuum manure collection, improved composting for pathogen and odor control, anaerobic treatment with a gas permeable cover, and aerobic treatment in a facultative lagoon.

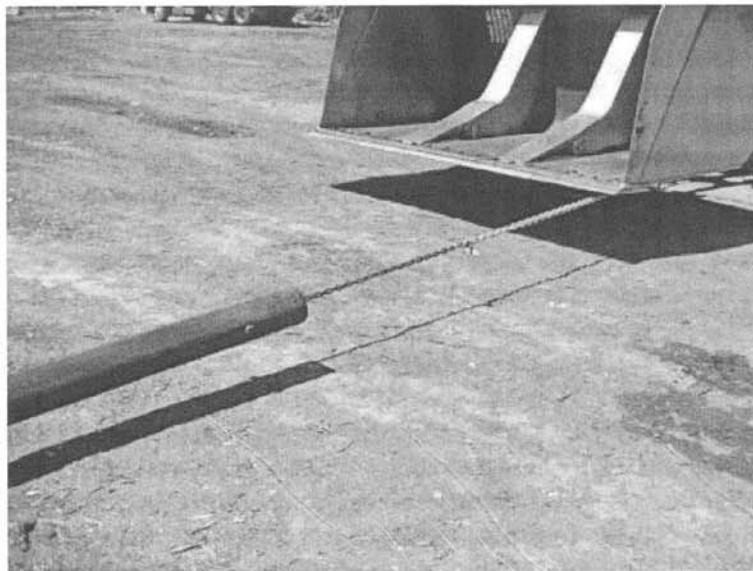
Sustainable Practice Workshop. Aurora Organic Dairy, Platteville, Colorado. This work involved the participation in an executive sustainability review of all the dairy operations and practices. The dairy is a 6,000 cow certified organic dairy.

Foodwaste and Greenwaste Composting. Celtic Composting Systems, Cork, Ireland. Design of a 3,000 tonne-per-year "brown bin" system for mixed residential curbside organics (source separated). This included all forms of protein, fat, oil, and dairy products. The system was an in-vessel containerized aerobic digestion technology followed by a reversed aeration aerobic curing technology. The facility served as a model for other facilities now being designed.

Approach to Aerated Static Pile Composting

The system does not need extensive pavement and drainage site improvements. It is ideal for existing facilities that would like to pilot an aerated static pile technology with negative aeration and biofilter odor control. The system can also be portable, which makes it attractive for temporary operations. This system will address the need to find more effective ways to compost at existing sites. Many existing static pile and windrow sites are looking for ways to improve odor control, increase capacity, or increase moisture control for more efficient screening. This system can improve all three characteristics simultaneously.

Aerated static piles (ASPs) can be configured to match any site layout. The piles can be any length and width, and heights typically range from four to five meters. ASPs usually require seven to ten weeks to produce finished compost. ASPs are operated as a batch process and do not require mechanical agitation. They are typically sized so that a single pile can be built in three days or less, and each pile must be dismantled and rebuilt every 15 to 20 days to prevent compaction and odor generation. The piles are generally built with front-end loaders, although conveyors can be used at larger operations to improve material handling efficiency. The front-end loaders used in this system are frequently fitted with a special high-lift, or "roll-out", bucket.



The air lances are removed using a front end loader before the pile is moved. This allows the piping to be reused and allows rapid movement of the pile itself.

Odor Control

The system is designed to draw air through the compost piles and exhaust the moist, odorous, hot air through a biofilter for odor removal.

Biofiltration is the use of microorganisms growing in a media bed to remove and oxidize compounds in a foul airstream. A typical biofilter consists of a media bed containing contaminant degrading microorganisms, a media support structure, a foul air distribution system, and some method of controlling the biofilter moisture content. The media can consist of various materials including soil, peat, compost, sand or synthetic material (plastic packing material). Typically, the foul airstream to be treated is distributed over the bottom of the biofilter bed and forced upward through the media. The moist filter media provides physical and chemical conditions appropriate for the transfer of the contaminants from the vapor phase and supports microbial biodegradation of the adsorbed and absorbed contaminants. The figure below is a simplified schematic of a typical open-vessel biofilter system.

Typically, a medium such as soil or mulch is spread loosely and evenly over the air distribution system. The media provides an environment for microorganisms that biologically degrade the odorous compounds. The filter media serves four primary purposes. It provides;

- ✓ A stable matrix through which the airstream flows evenly
- ✓ A surface area and moist medium for sorption of odorous compounds
- ✓ Large surface area for microbial attachment and growth
- ✓ A source of nutrients and water for the microorganisms.

The filter material is usually a combination of soil, leaf compost, wood chips, bark, or other organic materials. Peat and heather have also been used in some applications, as have synthetic media such as granular carbon, ceramics, perlite, and plastics.

Biofilters have successfully removed a wide range of inorganic and organic compounds in gas streams, including rendering, wastewater treatment, composting, food processing, agricultural operations, landfill gas treatment, painting facilities, and reinforced plastics manufacturing. Easily biodegradable odorous compounds such as aldehydes and organic acids as well as sulfur dioxide, nitrous oxides, and hydrogen sulfide, can be removed to a level of 90% or better with biofilters. Ammonia, amines and other nitrogen-based compounds in low concentrations can also be effectively reduced. The removal efficiencies for each system are a function of numerous design and operating criteria, such as media type, temperature, pH, superficial velocity, and moisture content.

Rapid Shipment and Setup

This system is entirely portable. The following site features are needed to set up the equipment:

- ✓ Space: approximately 200 x 100 feet, with a 1 – 2% slope
- ✓ Power: 480 volt, 3 phase, 30 amp
- ✓ Water: garden hose supply
- ✓ Sewer: sump pump
- ✓ Sump: the piping will require a single pit to be constructed to install a sump



Sump must be approximately 24" diameter and 30" deep below finish grade

Purchasing Division of Legal Department
INTEROFFICE MEMORANDUM



Dale M. Shotkoski, Assistant City Attorney

*Working Together for a
Better Tomorrow, Today*

BID OPENING

BID OPENING DATE: February 2, 2006 at 10:30 a.m.

FOR: Lease of an Aerated Static Pile Compost Pilot Testing Unit

DEPARTMENT: Public Works

ESTIMATE: \$15,000.00

FUND/ACCOUNT: 53030052-85213

PUBLICATION DATE: January 26, 2006

NO. POTENTIAL BIDDERS: 4

SUMMARY

Bidder: CH2M Hill
Englewood, CO

Bid Security: \$800.00

Exceptions: Noted

Bid Price: \$13,696.00

cc: Steve Riehle, Public Works Director
Danelle Collins, Admin. Assist. PW
Dale Shotkoski, Purchasing Agent

Ben Thayer, Supt. WWTP
Gary Greer, City Administrator
Laura Berthelsen, Legal Assistant

P1062

RESOLUTION 2006-47

WHEREAS, the City of Grand Island invited sealed bids for the Lease of an Aerated Static Pile Compost Pilot Testing Unit for the Waste Water Treatment Plant, according to plans and specifications on file with the City Engineer; and

WHEREAS, on February 2, 2006, bids were received, opened and reviewed; and

WHEREAS, CH2M Hill of Englewood, Colorado, submitted a bid in accordance with the terms of the advertisement of bids and plans and specifications and all other statutory requirements contained therein, such bid being in the amount of \$13,696; and

WHEREAS, CH2M Hill's bid is less than the estimate for such leased equipment.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE CITY OF GRAND ISLAND, NEBRASKA, that the bid of CH2M Hill of Englewood, Colorado, in the amount of \$13,696 for the lease of an aerated static pile compost pilot testing unit is hereby approved as the lowest responsible bid.

BE IT FURTHER RESOLVED, that a lease between the City and CH2M Hill be entered into for such project; and the Mayor is hereby authorized and directed to execute such lease on behalf of the City of Grand Island.

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Adopted by the City Council of the City of Grand Island, Nebraska, February 14, 2006.

Jay Vavricek, Mayor

Attest:

RaNae Edwards, City Clerk

Approved as to Form	☐ _____
February 9, 2006	☐ City Attorney