



The Solutions Network

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Rochester, New York

# Landfill Gas to Energy

Kent Nomura  
Hill AFB Energy Manager

Presented by Joe Price – Exelon Services Federal Group  
[jprice@exelonservicesfederal.com](mailto:jprice@exelonservicesfederal.com)



## THE TEAM

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- ❖ Hill AFB
  - Energy Office, Environmental, Contracting, Legal
- ❖ Department of Energy
  - National Energy Technology Laboratory (NETL)
  - FEMP
- ❖ Utah State Energy and Environmental Offices
- ❖ Davis County and Wasatch Energy Systems
- ❖ Exelon Services Federal Group
- ❖ Utah Power and Light (UP&L)



# OVERVIEW

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- ❖ Background
- ❖ Description
- ❖ Challenges
- ❖ Timelines
- ❖ Benefits

August 8-11, 2004

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## BACKGROUND

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- ❖ Federal “Industrial” Installations to Meet Executive Order Mandate of 20% Reduction by 2005
- ❖ Increase Use of Renewable Energy
- ❖ Federal Installations Authorized to Use Energy Savings Performance Contracting (ESPC)
  - No Federal Funding Available
  - No Out-of-Pocket Funding Required
  - No Change in Budget Allocation



## BACKGROUND - SITUATION

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- ❖ Hill AFB is located in Davis County, Utah  
Adjacent to a County Landfill
- ❖ Landfill was Flaring Gas
- ❖ Landfill Operator Approached Hill AFB to  
See if a Use for LFG Could Be Found
  - Selling Gas to Benefit Community
  - Increase Revenue Stream
  - Environmental Benefit



## BACKGROUND - SOLUTION

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- ❖ Department of Energy's ESPC Program
  - Biomass and Alternative Methane Fuels
  - Capture Energy Savings
  - Use of Renewable Energy Source

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## BACKGROUND – HILL AFB

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- ❖ Base is a Small City
- ❖ 16 Million Square Feet – Buildings
- ❖ Annual Energy Consumption of 228,000,000 kWh and 1.2 Million Decatherms of Natural Gas
- ❖ Electrical Demand – 40 to 45 mW
- ❖ Annual Steam Load of 30 to 100 klbs/hr
- ❖ One of Utah's Leading Employers



## BACKGROUND - LANDFILL

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- ❖ Approximately 2,224,000 Tons of Waste
  - Open 1984
  - Disposal Rate of 400 Tons per Day
- ❖ Existing Landfill Collection System
  - 1 Phase Closed – 3 Additional Planned
  - Collection System Constructed in 2001
  - Flare Station Capacity 1,200 cfm
- ❖ Projected Landfill Closure - 2025

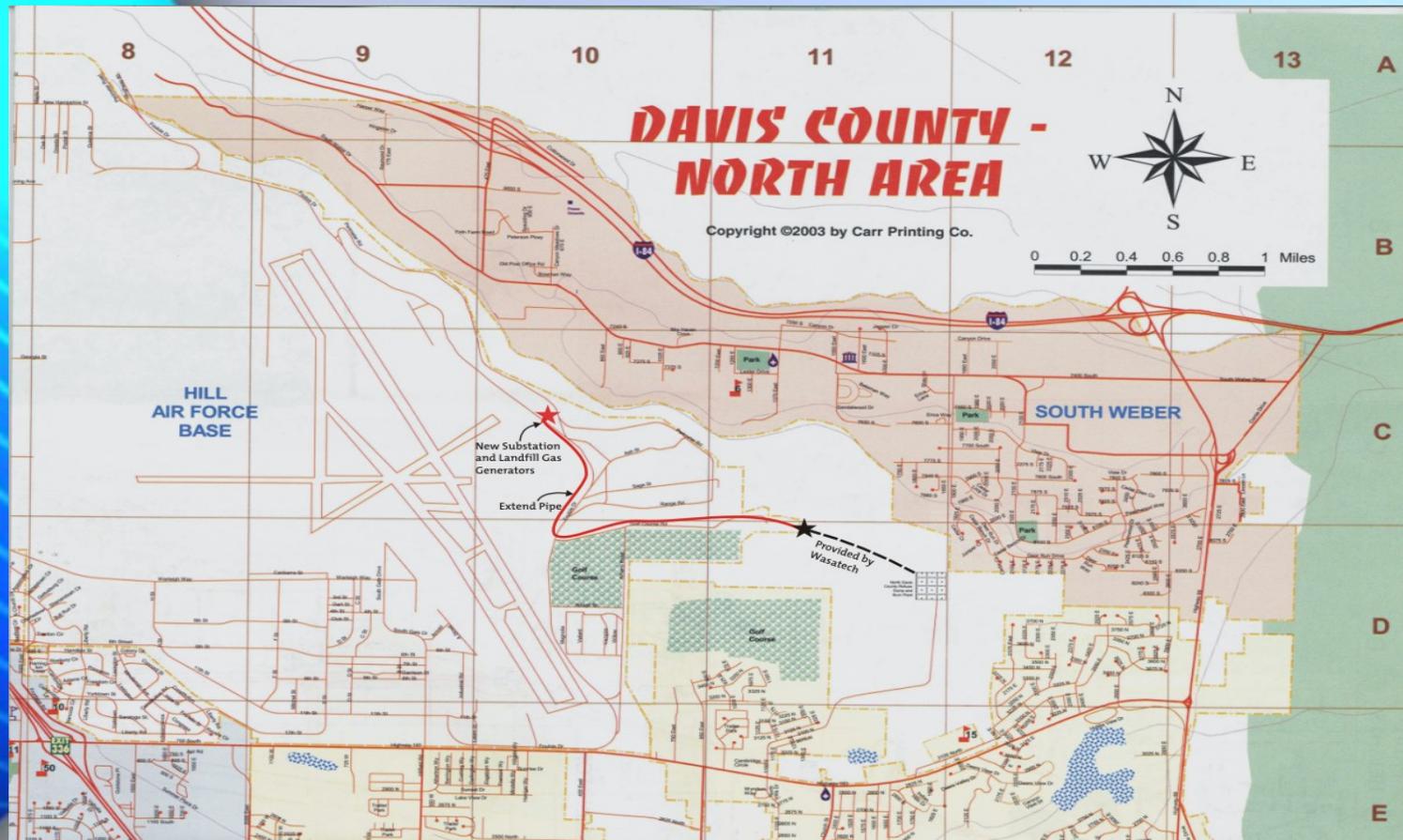
## PROJECT LOOK



- 2 engine generators rated for total of 1.4 mW
- Gas Dryer and Compressor System for 14 mbtu/hr of landfill gas
- Potential to expand plant in the next five years



# DELIVERY ROUTE



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# PROJECT ECONOMICS

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- ❖ Annual Savings of \$400,000
  - Simple Payback Under 10 Years
  - No Capital Investment by Hill AFB
  - Helps Goal Reduction for “Green Power”
- ❖ Addition Annual Savings of \$350,000
  - 8 Additional Energy Conservation Projects Implemented Under Same Contract
  - Decrease in Electrical, Natural Gas and Water Consumption



# PROJECT CHALLENGES

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- ❖ Utility Agreement with Local Provider
  - Qualified Facility Process
  - Interconnection
- ❖ Air Quality Permit
  - State Regulated – Lengthy Process
- ❖ Landfill Gas
  - Defined Gas Quantity
  - Defined Gas Quality



## TIMELINES

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- ❖ “FAST-TRACK” Pace; Task Order Award Required Prior to 30 Sept
  - Sunset Clause – Energy Bill to Expire
- ❖ Started Feasibility Study – June 2003
- ❖ Engineering and Financial Analysis Completed
- ❖ Contract Awarded 30 Sept – 8:00 pm
- ❖ Construction Start – April 2004
- ❖ Project Completion – September 2004



## PROJECT BENEFITS

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- ❖ Air Emission Reduction
- ❖ Long-Term Secure Source of Power
- ❖ Green Power Source
- ❖ Allowed Funding for Additional Energy Conservation Projects
- ❖ Receipt of Over \$580K in Incentive Payments from Local Utility



## ENVIRONMENTAL BENEFITS

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- ❖ Calculated Emissions Reduction
  - 5,000 Tons of Greenhouse Gases
  - 5.5 Tons of Nitrogen Oxide
  - 4.8 Tons of Carbon Monoxide
  - 19 Tons of Sulfur Dioxide



## PERSPECTIVE

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- ❖ Landfill Gas Used to Generate 1 mW of Power is Equivalent to:
  - Taking 8800 Cars Off the Road
  - 12,000 Acres of Trees Saved
  - 200 Railcars of Coal
  - 93,000 Barrels of Oil
  - 660 Homes Powered



# QUESTIONS???

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- ❖ [kent.nomura@hill.af.mil](mailto:kent.nomura@hill.af.mil)
- ❖ (801) 777-7268

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