

7. LFG Collection and Control (English)



Function of Control Systems

- Migration control –designed to prevent the off-site migration of landfill gas
- Odor control –designed to alleviate landfill gas odors
- Emissions control – designed to minimize landfill gas emissions into the atmosphere
- Groundwater protection
- Cover protection – designed to keep a flexible plastic membrane cover from *floating*
- Energy/products recovery – systems designed to recover landfill gas for beneficial use.

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Landfill Gas Collection/ Control

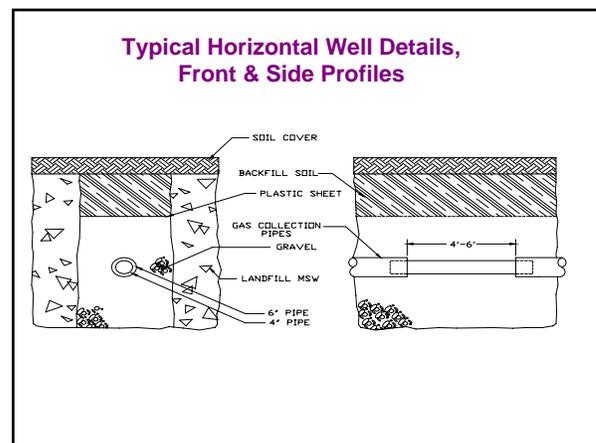
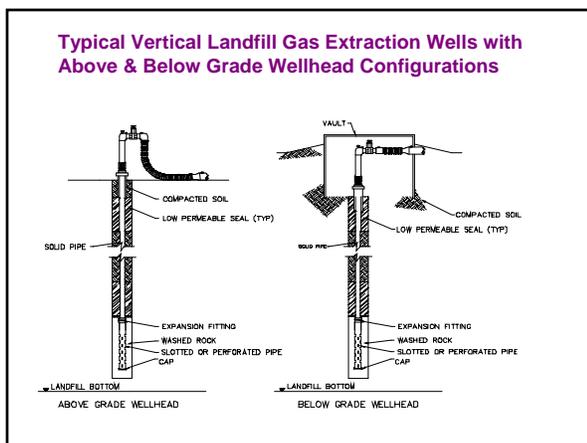
- Modes and Methods of Controlling landfill gas
 - Passive Control
 - Active Control
- The landfill gas Monitoring and Perimeter Control System

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Active Landfill Gas Collection System Components: Wellfield

- The landfill gas wellfield
- Extraction Points
 - Vertical wells
 - Horizontal wells
 - Surface collectors

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Horizontal Wells vs. Vertical Wells

- Reduced interference with LF operations
- Early landfill gas Collection
- Wells can be installed when landfill is active
- Well ROI isn't as good vertically as horizontally
- Horizontally bore wells are costly to build
- Better vacuum spread throughout the landfill
- Can be installed after filling is complete
- Must Protect wells when placing trash over or around wells

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Active Interior Wellfield Extraction

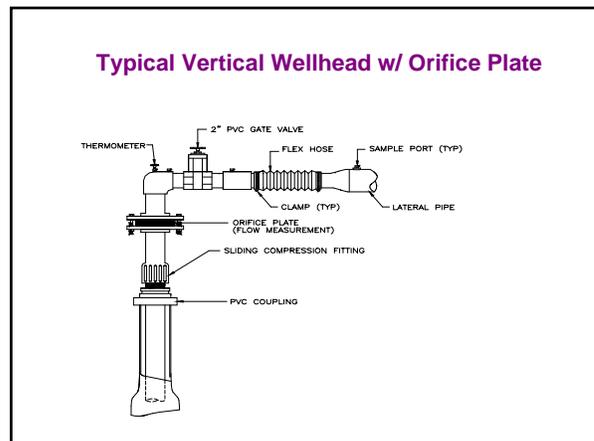
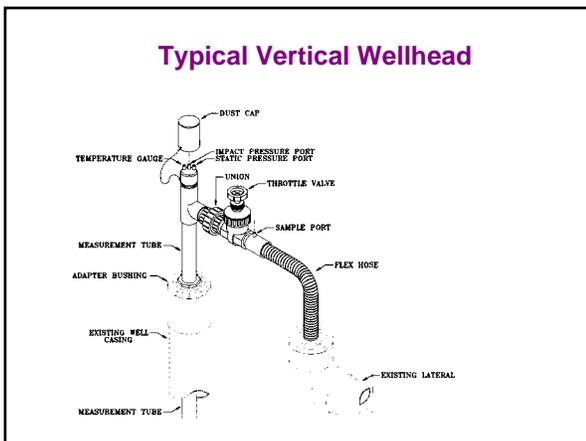
- Advantages: typically the best method for collection
- Disadvantages: flooding, interference with landfill gas system operation, well failure

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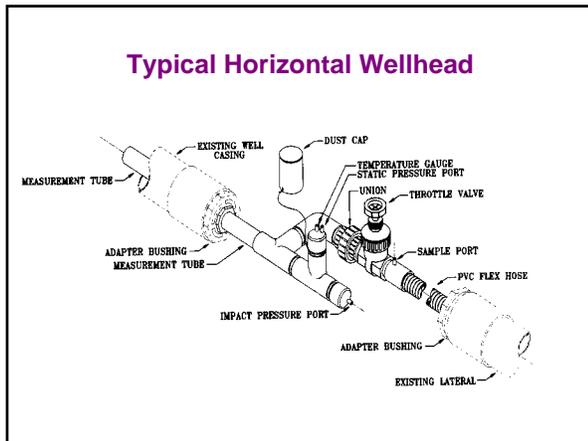
Landfill Gas Wells and Wellheads

- Components of the Wellhead
- Wellhead Flow Measurement
- Wellhead Valve
- Wellhead Flex Hoses
- Wellhead Access Ports (Gas Sampling)
- Access Ports and Wellhead Instrumentation

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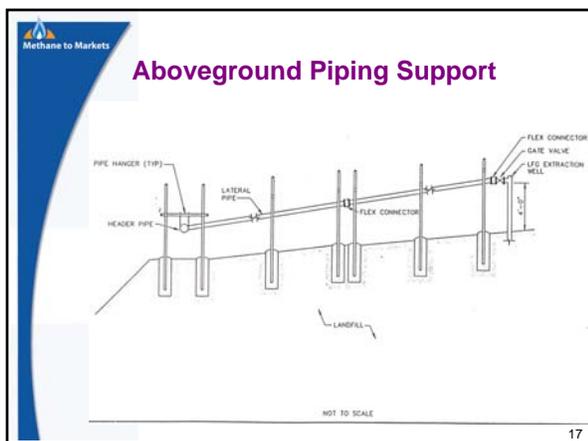
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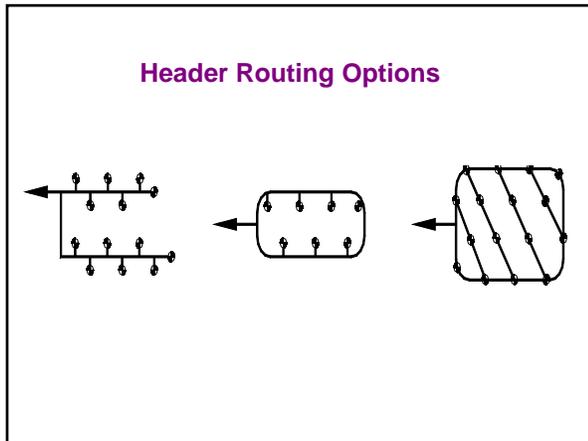
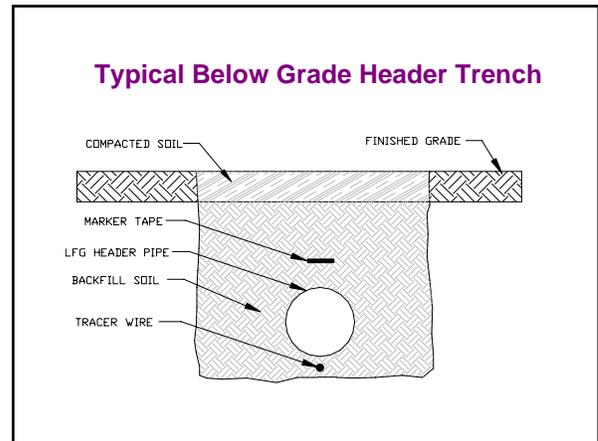
Active Landfill Gas Collection System Components: Collection/ Treatment

- Header pipelines
 - Aboveground
 - Belowground
- The landfill gas Treatment and Disposal Facility
 - Blowers (exhausters)
 - Activated Carbon (does not remove methane); Flares

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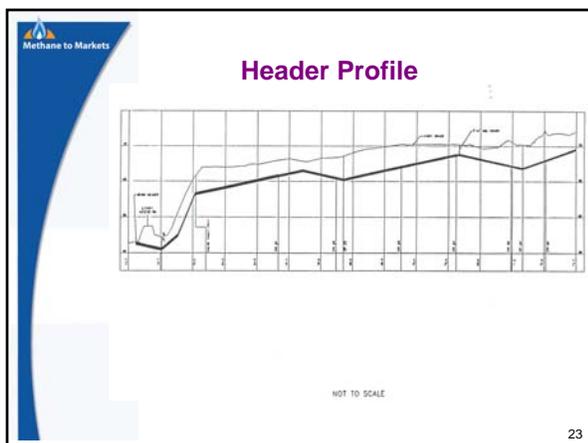


Methane to Markets

Extraction System Condensate Management

- Landfill gas is saturated
- Condensate can contaminate groundwater
- Re-injection/infiltration
- Off-site transportation

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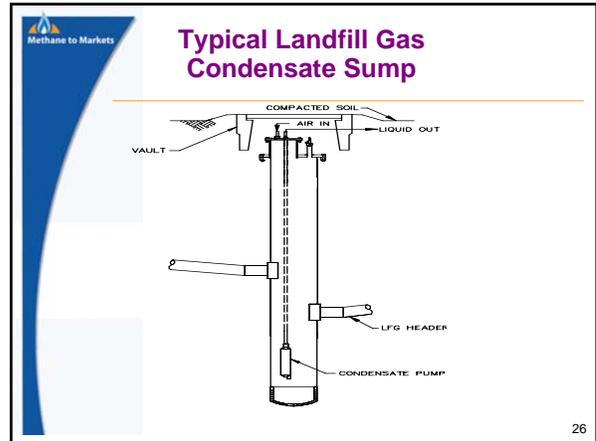
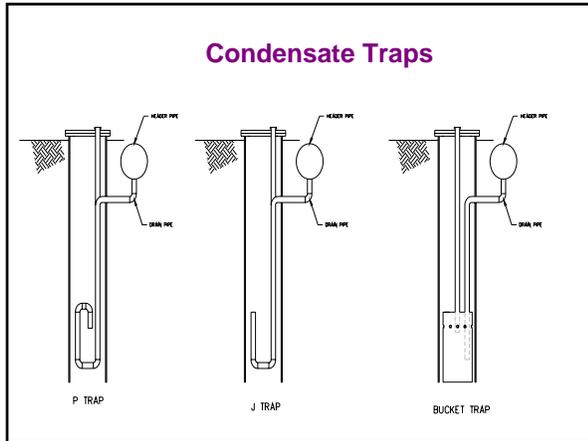
Methane to Markets

Condensate System Components

- Traps
 - collect and drain condensate back to landfill or sump/container
 - configurations vary - "liquid" or "loop seal"
 - "J", "P", or "bucket" types
- Sumps
 - collection point
 - manually or automatically drained
 - fitted with a pump
- In-Line Knockouts

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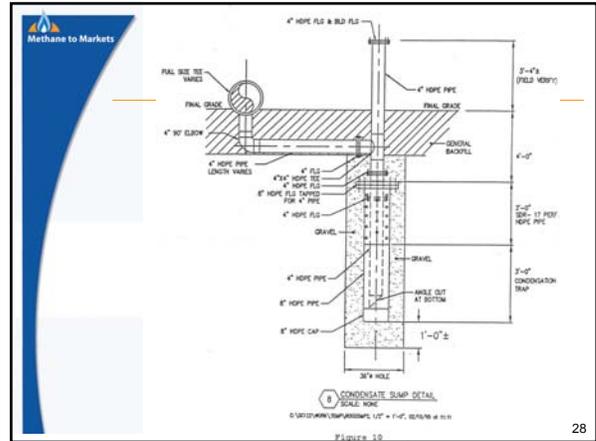
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Condensate Collection and Storage

- Storage tanks
- Manually or automatically pumped
- Single tank is most common
- Must check levels
- Tank may have: level gauge, flame arrester vent, emission control system, secondary containment, anchoring tie downs, drain valve, and liquid transfer connection fittings.

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Condensate Treatment and Disposal

- Treatment may be simple or complex
- May consist of two phases - aqueous and hydrocarbon
- Number of treatment options
- Appropriate protective gear should always be used when handling or working with condensate

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