



GOLDER

LESSONS LEARNED – DESIGN, CONSTRUCTION, AND OPERATION OF GAS COLLECTION & CONTROL SYSTEM (GCCS)

CITY OF CASPER'S CLOSED BALEFILL

Wyoming Solid Waste and Recycling Association
August 21, 2018

AGENDA

CASPER'S CLOSED BALEFILL GCCS LESSONS LEARNED

- 1) **WHY INSTALL A GCCS? - Mark McClain, Golder**
- 2) **GCCS DESIGN – Andy Wang, Golder**
- 3) **GCCS CONSTRUCTION – Bill Hensley, Peak Geo**
- 4) **GCCS OPERATIONS – Jason Knopp, Edge Engr. Group**
- 5) **GCCS COST SAVINGS - Cindie Langston, City of Casper**



WHY INSTALL A GCCS?

Mark McClain

Golder Associates

WHY INSTALL A GCCS?

REGULATORY TRIGGERS

- 89 Acre Balefill closure capping, with 95 passive gas vents
- 19 perimeter gas monitoring probes installed
- Multiple probes consistently exceeded lower explosive limit (LEL) for methane

WHY INSTALL A GCCS?

GROUNDWATER CLEAN-UP REMEDY

- Volatile Organic Compounds (VOCs, mostly PCE and TCE) were consistently detected in downgradient groundwater monitoring wells before and after capping in 2009.
- Assessment of Corrective Measures (ACM) concluded that an active GCCS was needed to both abate perimeter gas exceedances and reduce VOC concentrations in groundwater.



GCCS DESIGN

Andy Wang

Golder Associates

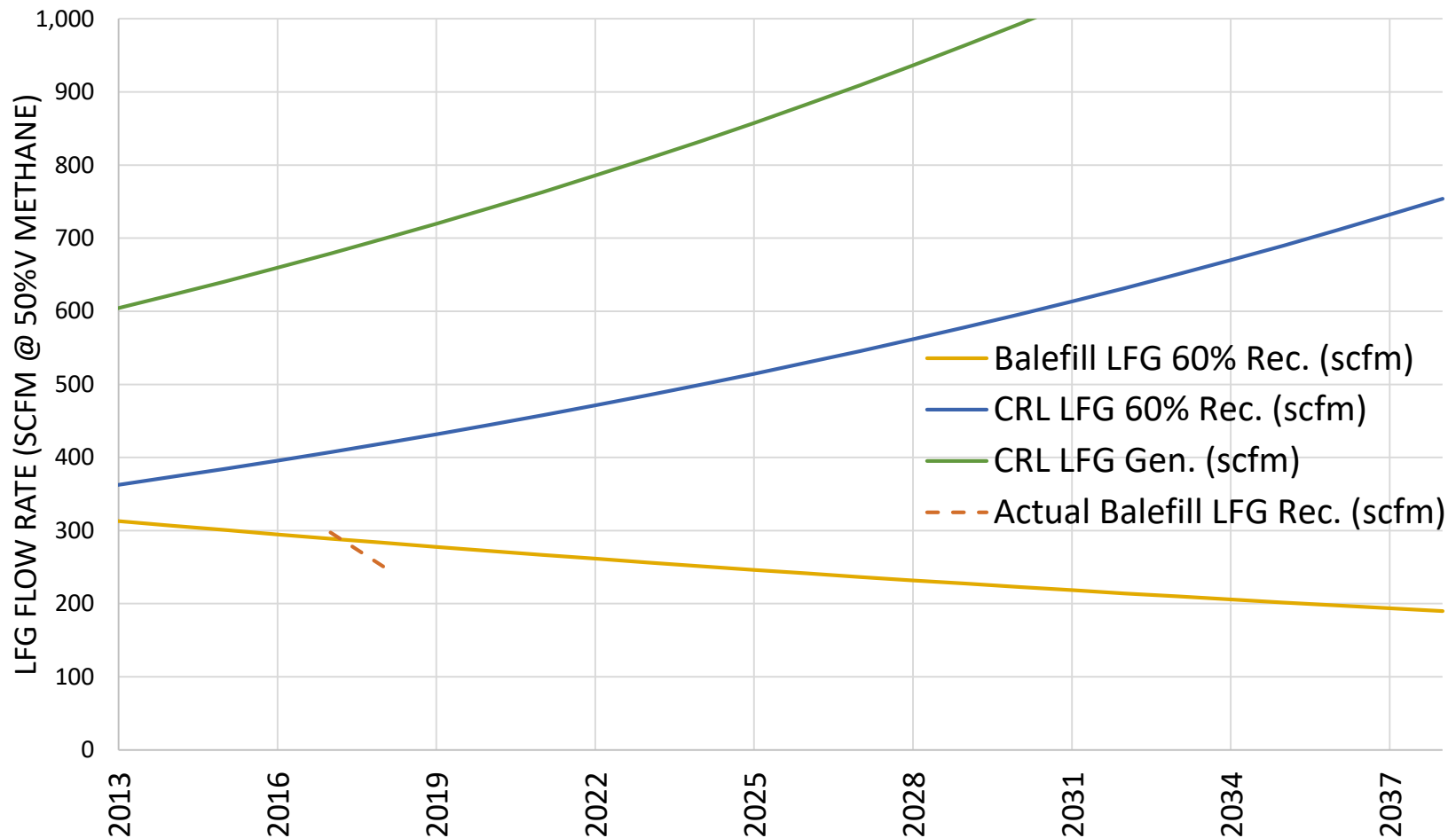
GCCS DESIGN

FEATURES OF THE BALEFILL LFG COLLECTION SYSTEM

- Interior LFG & Perimeter SVE Wells
- Loop Header & Condensate Collection System
- Cold Climate Provisions
- Existing Gas Vent Retrofits

HOW MUCH GAS ARE WE CAPTURING?

Casper Regional Landfill and Balefill: LFG Generation and Recovery Projections (2013)



ADDITIONAL BENEFITS: AHEAD OF THE PACK!!!

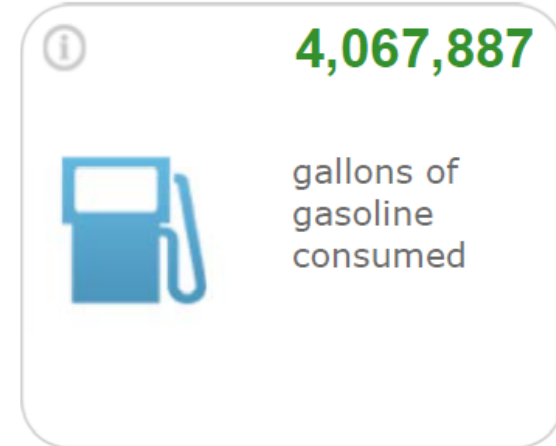
Actual Capture since May 2017 was 1,594 tons Methane =
36,151 Metric Tons Carbon Dioxide Equivalent (CO₂e) =



-or-



-or-



-or-



GCCS DESIGN

Features of the Balefill LFG Treatment Facility:

- Enclosed LFG Flare
- Variable Speed Blower Controls
- Air Permitting / Compliance: Ahead of the pack!
 - Ready to meet updated Federal NSPS requirements.
- Simple SCADA System: GolderWatch



GCCS CONSTRUCTION

Bill Hensley

Peak GeoSolutions

GCCS CONSTRUCTION

CONSTRUCTION QUALITY ASSURANCE: EXPECT THE UNEXPECTED!

- Health & Safety: Drilling and Earthwork precautions
- Protecting the existing final cover cap
- Inadequate cover cap on western 14 acres



GCCS CONSTRUCTION

CONSTRUCTION QUALITY ASSURANCE: EXPECT THE UNEXPECTED!

- Grading corrections required for landfill subsidence
- GCCS construction differences: before and after closure capping





GCCS OPERATIONS

Jason Knopp

Edge Engineering Group

GCCS OPERATIONS

- Start-up and Monthly Tuning of LFG Wellfield
 - Very low system vacuum required 5.5 in.w.c. to 3.2 in.w.c.
 - LFG flow decrease ~400 scfm to ~275 scfm currently
 - Methane concentration decrease ~55% to ~45% methane
 - Cleared out 12 of 14 original “hot” probes
 - System up-time above 96%
 - LFG flow swings, daily and seasonally



GCCS OPERATIONS

- Flare Station Inspections
- Routine and Unplanned Maintenance
 - Cold weather issues
 - Preventive maintenance and spare parts
 - Flare repairs
- Monitoring and record keeping

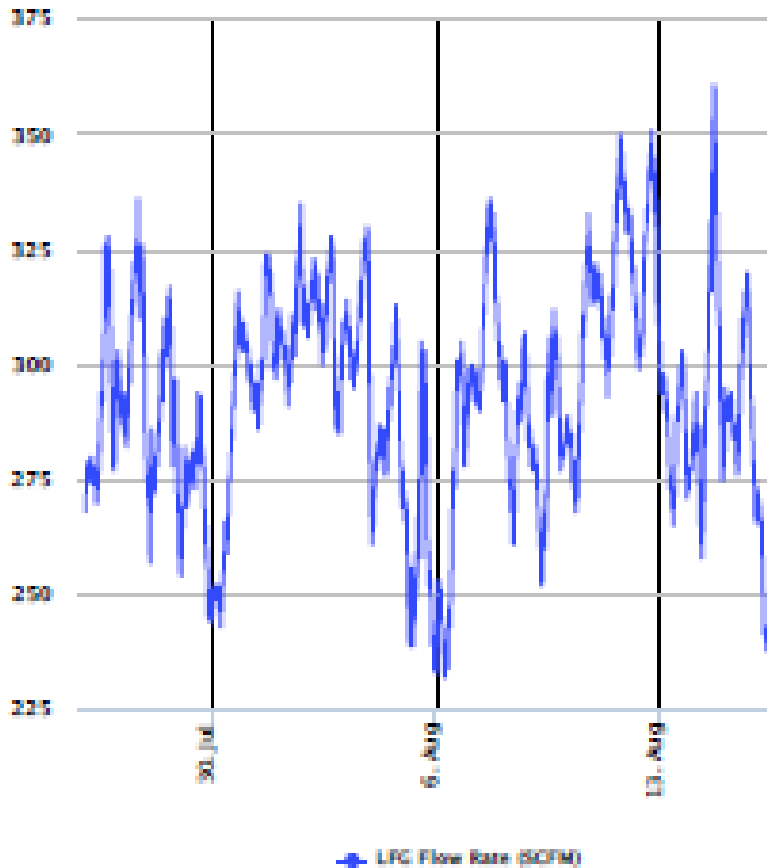


GCCS OPERATIONS

SCADA SIMPLIFIED USING GOLDERWATCH

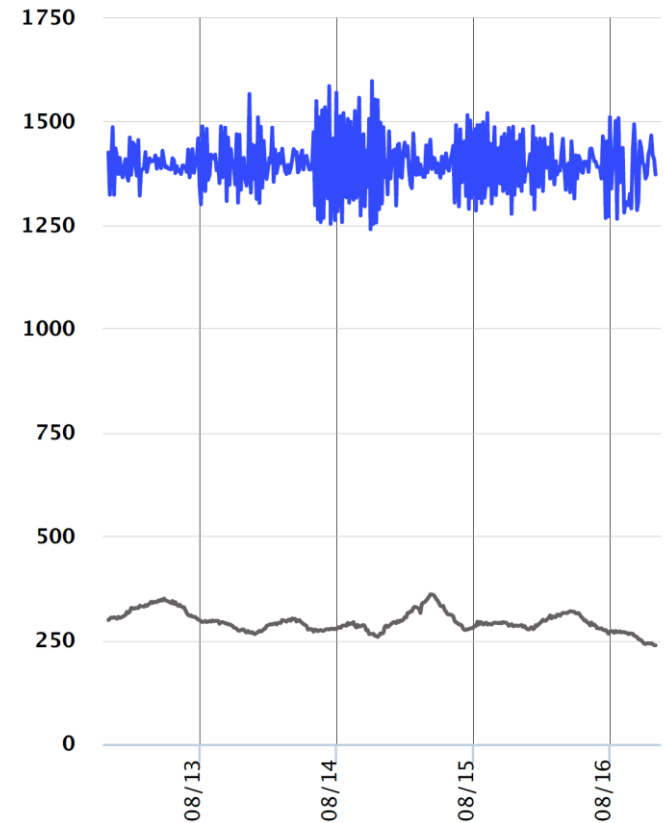
Casper Landfill Flare Historical Data

7/26/2018 12:00 AM – 8/16/2018 8:10 AM



Casper Landfill Flare Historical Data

8/12/2018 08:00 AM – 8/16/2018 8:10 AM





GCCS COST SAVINGS

Cindie Langston

City of Casper

GCCS COST SAVINGS

Effective GCCS Project Implementation:

- Team Approach to Design, Construction and Operation
- SWANA Training
- Regulatory Communications & Compliance
- Best Management Practices for Operations



THANK YOU!

Cindie Langston:
clangston@casperwy.gov

Bill Hensley:
bhensley@peakgeo.com

Jason Knopp:
jknopp@edgeenggroup.com

Mark McClain:
mmcclain@golder.com

Andy Wang:
awang@golder.com

