San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

MAY 28 2014

Erin Fanning
Forward Inc. Landfill
9999 S Austin Road
Manteca, CA 95336

RE: Final – Authority to Construct/Certificate of Conformity (Minor Mod)
Facility Number: N-339, Project Number: N-1123241

Dear Ms. Fanning:

The Air Pollution Control Officer has issued the Authority to Construct permit to Forward Inc. Landfill for the modification of a landfill to incorporat the requirements of an EPA Consent Decree, at 9999 S Austin Road in Manteca, CA.

Enclosed are the Authority to Construct permit, invoice, and engineering evaluation with attachments. The District's analysis of the proposal was sent to US EPA Region IX on February 28, 2014. All comments received have been addressed by the District. A summary of the comments and the District's response to each comment is included as an attachment to the engineering evaluation.

Prior to operating with modifications authorized by the Authority to Construct, you must submit an application to modify the Title V permit as an administrative amendment in accordance with District Rule 2520, Section 11.5.

Thank you for your cooperation in this matter. If you have any questions, please contact Mr. Rupi Gill at (209) 557-6400.

Sincerely,

Arnaud Marjollet
Director of Permit Services

AM: JH/st

Enclosures

cc: Gerardo C. Rios, EPA (w/enclosure), via email
Brian Riedel, EPA (w/enclosure), via email
Leslie Bove, SCS Engineers (w/enclosure), via email
Annette Ballatore-Williamson, (w/enclosure) District Counsel, via email
Catherine Redmond, (w/enclosure) Special Advisory Counsel, via email
Morgan Lambert, Director of Compliance, via email
John Cadrett, Northern Region Compliance Manager, via email

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

AUTHORITY TO CONSTRUCT

PERMIT NO: N-339-17-13 **ISSUANCE DATE:** 05/13/2014

LEGAL OWNER OR OPERATOR: FORWARD INC LANDFILL
MAILING ADDRESS: 9999 S AUSTIN RD
MANTECA, CA 95336

LOCATION: 9999 S. AUSTIN ROAD
MANTECA, CA 95336

EQUIPMENT DESCRIPTION:
MODIFICATION OF 13.8 MILLION CUBIC YARD CAPACITY (218 ACRES) LANDFILL WITH LANDFILL GAS COLLECTION SYSTEM CONTROLLED BY A 2000 SCFM (EQUIVALENT TO 48.0 MMBTU/HR) ENCLOSED FLARE AND CARBON ADSORPTION SYSTEM (CAS), AND A 3400 SCFM (EQUIVALENT TO 102 MMBTU/HR) PERRENIAL ENERGY MODEL GHS-301 LFG-FIRED ENCLOSED FLARE WITH LPG PILOT: TO INCORPORATE THE REQUIREMENTS OF EPA CONSENT DECREE CASE NO 2:11-CV-00590 EFB AND TO CORRECT THE EQUIPMENT DESCRIPTION SUCH THAT THE POST-PROJECT EQUIPMENT DESCRIPTION BECOMES: 39.0 MILLION CUBIC METER CAPACITY (354.5 ACRES) LANDFILL WITH A LANDFILL GAS COLLECTION SYSTEM CONTROLLED BY A 2,000 SCFM (EQUIVALENT TO 60 MMBTU/HR) ENCLOSED LANDFILL GAS-FIRED FLARE AND A 3,400 SCFM (EQUIVALENT TO 102 MMBTU/HR) PERRENIAL ENERGY MODEL GHS-301 ENCLOSED LANDFILL GAS-FIRED FLARE WITH AN LPG-FIRED PILOT

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. All equipment shall be constructed, maintained, and operated according to the specifications and plans contained in the permit applications, except as otherwise specified herein. [District Rule 2201] Federally Enforceable Through Title V Permit
4. The enclosed flares shall each be equipped with an LPG or natural gas-fired pilot. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-5400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commencad pursuant to Rule 2050, this Authority to Construct shall expire and epplication shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APO

Arnaud Marjollet, Director of Permit Services
N-339-17-13 May 13 2014 3:19PM – HARADERJ : Joint Inspection Required with HARADERJ

5. The enclosed flares shall each be equipped with automatic dampers, an automatic shutdown device, and a flame arrester. [District Rule 2201] Federally Enforceable Through Title V Permit
6. The gas collection system shall be operated in a manner which maximizes the quantity of landfill gas extracted while preventing overdraw that can cause fires or damage the gas collection system. [District Rule 2201] Federally Enforceable Through Title V Permit
7. During maintenance of the gas collection system or flares, emissions of landfill gas shall be minimized. [District Rule 2201] Federally Enforceable Through Title V Permit
8. Maintenance is defined as work performed on a gas collection system and/or control device in order to ensure continued compliance with District Rules, Regulations, and /or Permits to Operate, and to prevent its failure or malfunction. [District Rule 2201] Federally Enforceable Through Title V Permit
9. The landfill gas collected by the landfill gas collection system shall be controlled by at least one of the following devices: 1) The 60 MMBtu/hr flare; 2) the 102 MMBtu/hr flare; and/or 3) The siloxane removal system and one of the IC engines permitted under Facility ID N-8573. Each device shall be operated at all times when the collected gas is routed to it. [District Rule 2201 and 40 CFR 60.752(b)(2)(iii)(B), 40 CFR 60.753(f), and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit
10. The influent landfill gas flow rate to the 60 MMBtu/hr flare shall not exceed 2,000 SCFM (corrected to 50% methane). [District Rule 2201] Federally Enforceable Through Title V Permit
11. The influent landfill gas flow rate to the 102 MMBtu/hr flare shall not exceed 3,400 SCFM (corrected to 50% methane). [District Rule 2201] Federally Enforceable Through Title V Permit
12. The VOC destruction efficiency for the 60 MMBtu/hr flare shall be at least 98% by weight or the maximum non-methane organic compound NMOC emissions from the flare shall not exceed 20 ppmv @ 3% O2 (as hexane). [District Rule 2201, 40 CFR 60.752(b)(2)(iii)(B) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit
13. The VOC destruction efficiency for the 102 MMBtu/hr flare shall be at least 98% by weight or the maximum non-methane organic compound NMOC emissions from the flare shall not exceed 20 ppmv @ 3% O2 (as hexane). [District Rule 2201, 40 CFR 60.752(b)(2)(iii)(B) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit
14. Emissions from the 60 MMBtu/hr flare shall not exceed any of the following limits: 0.05 lb-NOx/MMBtu, 0.0215 lb-SOx/MMBtu, 0.034 lb-PM10/MMBtu, 0.2 lb-CO/MMBtu, and 0.0113 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O2). [District Rule 2201] Federally Enforceable Through Title V Permit
15. Emissions from the 102 MMBtu/hr flare shall not exceed any of the following limits: 0.05 lb-NOx/MMBtu, 0.0215 lb-SOx/MMBtu, (0.001 lb-PM10/hr)/scfm-methane, 0.2 lb-CO/MMBtu, and 0.0113 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O2). [District Rule 2201] Federally Enforceable Through Title V Permit
16. The volume of soil used for intermediate and final cover shall not exceed 61,768,080 cubic feet. [District Rule 2201] Federally Enforceable Through Title V Permit
17. PM10 emissions from the placement of the intermediate and final soil cover shall not exceed 0.008 lb/ton of soil. The volume of soil shall be converted to tons of soil using a soil density of 120 lb/cubic foot. [District Rule 2201] Federally Enforceable Through Title V Permit
18. The H2S concentration of the influent landfill gas to the flares shall not exceed 46.9 ppmv. [District Rule 2201] Federally Enforceable Through Title V Permit
19. For each flare, source testing to demonstrate compliance with the NOx (lb/MMBtu), CO (lb/MMBtu), and VOC (98% destruction efficiency or 20 ppmvd VOC @ 3% O2 as hexane) requirements of this permit shall be conducted at least once every 12 months. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
20. Source testing for NOx shall be conducted using CARB Method 7 or CARB Method 20. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
21. Source testing for CO shall be conducted using EPA Method 10 or 10B, CARB Methods 1 through 5 with CARB Method 10, or CARB Method 100. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

22. VOC emissions shall be conducted using EPA Method 18, 25, 25A, or 25C. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit

23. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]

24. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

25. The combustion chamber of each flare shall be maintained at a temperature of at least 1,400 degrees Fahrenheit during operation. [District Rule 2201] Federally Enforceable Through Title V Permit

26. Each flare shall be equipped with a temperature indicator and recorder that measures and continuously records the operating temperature. [District Rule 2201] Federally Enforceable Through Title V Permit

27. For each flare, the facility shall install and maintain in proper operating condition a gas flow meter with a continuous recording device that measures the quantity of landfill gas processed each day. [District Rule 2201] Federally Enforceable Through Title V Permit

28. Permittee shall perform testing to measure the H2S content of the landfill gas combusted in the flares on a quarterly basis using draeger tubes. If compliance with the landfill gas H2S content limit is demonstrated for two consecutive quarters, this testing frequency may be changed to annual. Quarterly testing shall resume if any annual test shows non-compliance with the H2S content limit. [District Rule 2201] Federally Enforceable Through Title V Permit

29. The landfill gas collection system shall be designed and operated to: 1) Handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment; 2) Collect gas from each area, cell or group of cells in the landfill in which the initial solid waste has been placed for a period of five years or more for an active landfill, or 2 years or more for a closed landfill or landfill at final grade; 3) Collect gas at a sufficient extraction rate; and 4) Minimize off-site migration of subsurface gas. [40 CFR 60.752(b)(2)(ii)(A), 40 CFR 60.753(a), and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

30. All exterior vapor extraction wells, leachate collection system components, and perimeter horizontal collectors shall not be located over any waste and are exempt from the operational standards of 40 CFR 60.753 and the compliance provisions of 40 CFR 60.755. Forward Inc. shall keep records of all components that qualify for this exemption and note their location with respect to the landfill's perimeter. [40 CFR 60.752(b)(2)(ii), 60.753, 60.755, 60.756, 60.757, 60.758, 60.759, and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

31. Permittee shall operate the landfill gas collection system with negative pressure at each wellhead except under the following conditions: 1) A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports provided in 40 CFR 60.757(f)(1); 2) Use of a geomembrane or synthetic cover. The owner shall develop acceptable pressure limits in the design plan; 3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the District. [40 CFR 60.753(b) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

32. Unless otherwise stated on this permit, the permittee shall operate each interior wellhead in the collection system with a landfill gas temperature less than 55 degrees C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. [40 CFR 60.753(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

33. For each interior wellhead, the nitrogen level shall be determined using EPA Method 3C, unless an alternative test method is established as allowed by 40 CFR 60.752(b)(2)(i). [40 CFR 60.753(c)(1) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

34. For each interior wellhead, unless an alternative test method is established as allowed by 40 CFR 60.752(b)(2)(i), the oxygen level shall be determined by an oxygen meter using EPA Method 3A or 3C except that: 1) The span shall be set so that the regulatory limit is between 20 and 50 percent of the span; 2) A data recorder is not required; 3) Only two calibration gases are required, a zero and span, and ambient air may be used as the span; 4) A calibration check is not required; and 5) The allowable sample bios, zero drift, and calibration drive are plus or minus 10 percent. [40 CFR 60.753(c)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

35. Permittee shall operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover on at least a quarterly basis. Permittee may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rational for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing. [40 CFR 60.753(d), 40 CFR 60.755, and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

36. Permittee shall operate the landfill gas collection and control system such that all collected gases are vented to a control system designed and operated in compliance with 40 CFR 60.752(b)(2)(iii). In the event the collection system or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to the venting of the gas to the atmosphere shall be closed within one hour. [40 CFR 60.753(e) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

37. If monitoring demonstrates that the operational requirements in 40 CFR 60.753(b), (c), or (d) are not met, corrective action shall be taken as specified in 40 CFR 60.755(a)(3) through (5) or 40 CFR 60.755(c). If corrective actions are taken as specified in 40 CFR 60.755, the monitored exceedance is not a violation of the operational requirements in 40 CFR 60.753. [40 CFR 60.753(g) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

38. For the purpose of demonstrating that the gas collection system is designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system, permittee shall use one of the equations that are listed in 40 CFR 60.755(a)(1). [40 CFR 60.755(a)(1) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

39. For the purpose of determining whether there is a sufficient density of gas collectors, permittee shall design a system of vertical wells, horizontal collectors, or other collection devices satisfactory to the District, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards. [40 CFR 60.755(a)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

40. For the purpose of demonstrating whether the landfill gas collection system flow rate is sufficient, the owner or operator shall measure gauge pressure in the gas collection system header at each individual well on a monthly basis. Except in cases where the conditions allow the wellhead to operate without a negative pressure (as outlined in this permit), action shall be initiated to correct the exceedance within 5 calendar days if a positive pressure exists. If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of a positive pressure. Any attempted corrective measure shall not cause exceedances or other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the District for approval. Expansion of the collection system during the first 180 days after gas collection system startup is not required. [40 CFR 60.755(a)(3), 60.755(a)(4), and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

41. For the purpose of identifying whether excess air infiltration into the landfill is occurring, the permittee shall monitor the temperature and nitrogen or oxygen on a monthly basis. If a well exceeds one of the temperature, nitrogen, or oxygen operating parameters of this permit, action shall be initiated to correct the exceedance within five calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the District for approval. [40 CFR 60.755(a)(5) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

42. Extraction wells shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of: 1) 5 years or more for an active landfill; 2) 2 years or more for a closed landfill or a landfill at final grade. [40 CFR 60.755(b) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

43. Monitoring to determine the surface concentration of methane shall be conducted using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications of 40 CFR 60.755(d). [40 CFR 60.755(c)(1), 40 CFR 60.755(d), and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

44. The background concentration of methane shall be determined by moving the prove inlet upwind and downwind the outside boundary of the landfill at a distance of at least 30 meters from the perimeter walls. [40 CFR 60.755(c)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

45. Surface monitoring of the methane concentration shall be performed in accordance with Section 4.3.1 of EPA Method 21 of Appendix A of 40 CFR, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions. [40 CFR 60.755(c)(3) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

46. Any surface monitoring reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the following actions shall be taken. As long as the following specified actions are taken, the exceedance is not a violation of the operational requirements of 40 CFR 60.753(d): t) The location of each monitored exceedance shall be marked and the location recorded; 2) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection of the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance; 3) If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance. If re-monitoring shows a third exceedance, the action specified in item #5 of this condition shall be taken, and no further monitoring of that location is required until the action specified in item #5 has been taken; 4) Any location that initially showed an exceedance but has a methane concentration of less than 500 ppm above background at the 10-day re-monitoring shall be re-monitored t month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in item #3 or item #5 of this condition shall be taken.; and 5) For any location where the monitored methane concentration equals or exceed 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within t20 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes, or control device, and a corresponding timeline for installation may be submitted to the District for approval. [40 CFR 60.755(c)(4) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

47. Permittee shall implement a program to monitor for cover integrity and implement cover repairs, as necessary, on a monthly basis. [40 CFR 60.755(c)(5) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

48. The requirements of 40 CFR 60 Subpart WWW shall apply at all times, except during periods of start-up, shutdown, or malfunction. The duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices. [40 CFR 60.755(e) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

49. Permittee shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead. [40 CFR 60.756(a) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

50. For each enclosed flare, permittee shall calibrate, maintain, and operate according to the manufacturer's specifications a temperature monitoring device to measure temperature in the enclosed flare with a minimum accuracy of plus or minus 1 percent of the temperature being measured, expressed in degrees Celsius, or plus or minus 0.5 degrees Celsius, whichever is greater. [40 CFR 60.756(b)(1) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

51. For each enclosed flare, permittee shall calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to or bypass of the control device. Permittee shall either: 1) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least once every 15 minutes; or 2) shall secure the bypass line valve in the closed position with a car-seal or a lock and key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in a closed position and that the gas flow is not diverted through the bypass line. [40 CFR 60.756(b)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

52. For a closed landfill that has no monitored exceedances of the standard for surface concentrations of methane in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring shall return the frequency of monitoring of surface concentrations to quarterly monitoring. [40 CFR 60.756(e) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

53. The permittee shall submit a closure report to the District within 30 days of waste acceptance cessation. The District may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the District, no additional wasted may be placed into the landfill without filing a notification of modification as described on 40 CFR 60.7(a)(4). [40 CFR 60.757(d) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

54. Permittee shall submit a report to the District, at least once every six months, that contains the following: 1) Value and length of time for each exceedance of applicable parameters monitored under 40 CFR 60.756(a), (b), (c), and (d); 2) Description of duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under 40 CFR 60.756; 3) Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time control device was not operating; 4) All periods when the control system was not operating in excess of five days; 5)The location of each exceedance of the 500 parts per million methane concentration as provided in 40 CFR 60.753(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month; and 6) The date of installation and the location of each well or collection system expansion added pursuant to 40 CFR 60.755(a)(3), (b), and (c)(4). [40 CFR 60.757(f) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

55. Permittee shall keep records of the design capacity report which triggered 40 CFR 60.752(b) requirements, the current amount of solid waste in-place, and the year-by-year waste acceptance rate. [40 CFR 60.758(a) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

56. Permittee shall keep records of the following data, as measured during the initial performance test or compliance determination: 1) The maximum expected gas generation flow rate as calculated per 40 CFR 60.755(a)(1); 2) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices as determined using the procedures specified in 40 CFR 60.759(a)(1); 3) For each enclosed flare, the average combustion temperature measured at least every 15 minutes and averaged over the same time period for the source test; and 4) For each enclosed flare, the percent reduction of NMOC determined as specified in 40 CFR 60.752(b)(2)(iii)(B). [40 CFR 60.758(b)(1) and (2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

57. Permittee shall keep continuous records of the equipment operating parameters specified to be monitored in 40 CFR 60.756, as well as up to date records of operation during with the parameter boundaries established during the most recent performance tests are exceeded. For each enclosed flare, all 3-hour periods of operation during with the average combustion temperature was more than 28 degree Celsius below the average combustion temperature during the most recent performance test shall constitute an exceedance and shall be recorded and reported under 40 CFR 60.757(f). [40 CFR 60.758(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

58. Permittee shall keep, for the life of the collection system, a plot map showing each existing and planned collector in the system and providing a unique identification location label of each collector. Permittee shall keep records of the installation date and location of all newly installed collectors as specified under 40 CFR 60.755(b). Permittee shall keep records of the date of disposition, amount, and location of asbestos-containing or non-degradable waste excluded from collection as provided in 40 CFR 60.759(a)(3)(i) as well as any non-productive areas excluded from collection as provided in 40 CFR 60.759(a)(3)(ii). [40 CFR 60.758(d) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

59. Permittee shall keep records of all collection and control system exceedances of the operational standards in 40 CFR 60.753, the reading in the subsequent month and whether or not the second reading is an exceedance, and the location of each exceedance. [40 CFR 60.758(e) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

60. Permittee shall site active collection wells, horizontal collectors, surface collectors, and other extraction devices at a sufficient density throughout all gas producing areas of the landfill using the procedures listed in 40 CFR 60.759(a), unless alternative procedures have been approved by the District. [40 CFR 60.759(a) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

61. The collection devices within the landfill interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat. The design shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter and exterior. [40 CFR 60.759(a)(1) and (2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

62. The placement of gas collection devices shall control all gas producing areas except the following: 1) Any segregated area of asbestos or non-degradable material may be excluded from collection if documented as provided in 40 CFR 60.758(d). The documentation shall provide the nature, date of disposition, location, and amount of asbestos or non-degradable material deposited in the area, and shall be provided to the District upon request.; 2) Any nonproductive area of the landfill may be excluded from control, provided the total of all excluded areas can be shown to contribute to less than 1 percent of the total amount of non-methane organic compound emissions from the landfill. [40 CFR 60.759(a)(3) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

63. The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases, withstand installation, static, and settlement forces, and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration. [40 CFR 60.759(b)(1) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

64. Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover area or refuse into the collection system or gas into the air. Any gravel used around pipe perforations shall be of a dimension so as not to penetrate or block perforations. [40 CFR 60.759(b)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

65. Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous materials of suitable thickness. [40 CFR 60.759(b)(3) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

66. Permittee shall convey the landfill gas to the control system through the collection header pipes. The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended period of gas moving equipment. For existing collection systems, the flow data, if flow data exists, shall be used to project the maximum flow rate. For new collection systems or existing collection systems for which no flow data exists, the maximum flow rate shall be in accordance with 40 CFR 60.755(a)(1). [40 CFR 60.759(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

67. Permittee shall develop a written SSM plan according to the provisions of 40 CFR 63.6(e)(3). A copy of the SSM plan shall be maintained on site. Failure to write or maintain a copy of the SSM plan is a deviation from the requirements of 40 CFR 63 Subpart AAAA. [40 CFR 63.1960] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

68. For parameters required to be continuously monitored by 40 CFR 60 Subpart WWW, a deviation of 40 CFR 63 Subpart AAAA shall be deemed to have occurred when 1 hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour. [40 CFR 63.1965(b)] Federally Enforceable Through Title V Permit

69. Permittee shall keep records and reports as specified in the general provisions of 40 CFR Part 60, and 40 CFR Part 63, as shown in Table 1 of 40 CFR part 63 Subpart AAAA. [40 CFR 63.1980(b)] Federally Enforceable Through Title V Permit

70. For LFG extraction wellheads A11-05, A11-06, A11-07, A11-08, A11-09, A11-10, A11-11, A12-02, A12-03, A12-14, F12-08, F12-09, F12-10, FU03-01R, FU04-14R, FU04-15R, FU04-18R, FU04-19R FU04-27R, FU04-27R, FU05-08R, FU05-10R, FU05-15R, FU06-15, FU06-16, FU-08-02, and FU08-03, the permittee shall operate each of these wellheads with a landfill gas temperature less than 141 degrees F and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The following monitoring requirements are applicable to these wellheads: 1) The permittee shall perform monthly CO monitoring using Draeger tubes, or a District/EPA approved monitoring device, for wellheads with a measured temperature greater than 131 degrees F; 2) If the measured field CO readings are less than 200 ppmv, the well may continue to operate up to a temperature less than 141 degrees F; 3) If the measured field CO readings are equal to or greater than 200 ppmv and less than or equal to 500 ppmv, the well shall be monitored on a weekly basis to verify that there is no subsurface oxidation occurring. Once the CO levels decrease to below 200 ppmv, the monthly monitoring schedule shall resume; 4) If the measured field CO readings are in excess of 500 ppmv, the well shall be temporarily closed and documented and a sample shall be obtained within one week of the exceedance and analyzed for CO using EPA Method D-1946. If results confirm the readings are in excess of 500 ppmv, the well shall remain closed and off-line and the District shall be notified within 24 hours of the exceedance; and 5) Upon receiving notification from the District, the permittee shall undertake such actions as directed by the District and/or EPA to further investigate the potential for subsurface oxidation in the area of a wellhead and develop a plan for remediation. [40 CFR 60.753(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

71. The permittee may request an alternative gas temperature limit for LFG extraction wellheads by submitting a request in writing to US EPA and the District. Any such request shall contain all available sampling and other evidence relevant to EPA's and the District's consideration of the requesting, including, but not limited to, the existence of suspected or actual subsurface combustion. After considering the request, EPA and the District will either grant the request or deny it, in writing. If EPA and the District grant the request for an alternative wellhead gas temperature limit for an existing wellhead, the alternative approved limit shall immediately supersede the previously applicable limit and become the new temperature limit for that wellhead. [40 CFR 60.753(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

72. Permittee shall keep records of any maintenance to the landfill gas collection or control devices, including the reason for maintenance, duration of the maintenance, and any collection or control system downtime. [District Rule 2201] Federally Enforceable Through Title V Permit

73. Permittee shall maintain records of system inspections including: date, time, and inspection results. [District Rule 1070] Federally Enforceable Through Title V Permit

74. For each flare, permittee shall keep records of emission source tests results. [District Rule 2201] Federally Enforceable Through Title V Permit

75. For each flare, permittee shall keep records of the continuous flare combustion temperature measurements, and the continuous volumetric landfill gas flow rate measurements. Permittee shall keep a daily and an annual record of the quantity of landfill gas processed in each flare. [District Rule 2201] Federally Enforceable Through Title V Permit

76. All records shall be retained for a period of at least five years and shall be made available for District inspection upon request. [District Rules 1070, 2201, 40 CFR 60 Subpart WWW, and 40 CFR 60 Subpart AAAA] Federally Enforceable Through Title V Permit

77. The permittee shall notify the District by telephone at least 24 hours prior to performing any maintenance work that requires the landfill gas collection and control system to be shutdown. The notification shall include a description of the work, the date work will be performed, and the quantity of time needed to complete the maintenance work. [District Rule 2201] Federally Enforceable Through Title V Permit

San Joaquin Valley Air Pollution Control District
Authority to Construct
Final Application Review
Modifications to Landfill Permit to Incorporate EPA Consent Decree Requirements and to Correct the Equipment Description

Facility Name:	Forward Inc. Landfill	Date:	May 13, 2014
Mailing Address:	9999 S Austin Road	Engineer:	James Harader
	Manteca, CA 95336	Lead Engineer:	Nick Peirce
Contact Person:	Erin Fanning		
Telephone:	(209) 684-4733		
Application #:	N-339-17-13		
Project #:	N-1123241		
Deemed Complete:	April 25, 2013		

I. Proposal

Forward Inc. Landfill submitted an Authority to Construct application for the following modifications to their current permit for a solid-waste landfill:

1. Incorporate the requirements of an EPA Consent Decree (attached in Appendix III) into the existing landfill permit.

2. Currently, the facility is operating the landfill pursuant to the EPA consent Decree and the requirements of Authority to Construct N-339-17-10, which identifies a 2,000 CFM flare, a 3,400 CFM flare, and a 300 CFM carbon adsorption system as the control devices for the landfill gas collection system. Per LandGem modeling performed for District Project N-1062444, the maximum landfill gas generation rate was expected not to exceed 5,400 CFM. Authority to Construct N-339-17-10 was written such that the two flares could process all 5,400 CFM of the landfill gas generated, while allowing the facility the option to divert up to 300 CFM of that landfill gas from the flares to a proposed carbon adsorption system. The facility has installed and is currently operating a 2,000 CFM flare and a 3,400 CFM flare; however, the facility never installed the 300 CFM carbon adsorption system and they state that they no longer plan to install that system. Therefore, this permitting action will remove the 300 CFM carbon adsorption system from the equipment description along with the associated permit requirements.

Pursuant to District FYI 111, a revision to the equipment description requires an Authority to Construct and is subject to New Source Review. Therefore, this project is subject to District Rule 2201 requirements. Note, this project does not authorize the facility to use the LandGem monitoring system in lieu of draegger tubes.

The removal of the carbon adsorption system from the equipment description is not a physical change to the current control system since it was never installed. Furthermore, this proposal does not constitute a change in the method of operation since the proposal is to route all the landfill gas to the two flares, which was already allowed in Authority to Construct N-339-17-10. Thus, this project is not a physical change to, or change in method of operation of, the landfill and landfill control equipment.

The evaluation for this project was originally sent to US EPA and the facility for comments on August 27, 2013. Comments were received from the facility (See Appendix VII). Since the facility's comments include a request to increase the temperature limits for several wells within this project and the revised temperature limits must be approved by US EPA, this project will be submitted for an additional 45-day EPA review prior to issuance of the Authority to Construct permits.

Title V

Forward Inc. Landfill currently has a Title V permit. This modification can be classified as a Title V Minor Modification pursuant to District Rule 2520, Section 3.20, and can be processed with a Certificate of Conformity (COC). Since the facility has specifically requested that this project be processed in that manner, the 45-day EPA comment period will be satisfied prior to the issuance of the Authority to Construct. Forward Inc. Landfill must apply to administratively amend their Title V Operating Permit to include the requirements of the ATCs issued with this project.

II. Applicable Rules

Rule 2201	New and Modified Stationary Source Review Rule (4/21/11)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4002	National Emissions Standards for Hazardous Air Pollutants (5/20/04)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4201	Particulate Matter Concentration (12/17/92)
Rule 4301	Fuel Burning Equipment (12/17/92)
Rule 4311	Flares (6/18/09)
Rule 4642	Solid Waste Disposal Sites (4/16/1998)
Rule 4801	Sulfur Compounds (12/17/92)
CH&SC 41700	Health Risk Assessment
CH&SC 42301.6	School Notice
40 CFR Part 64	Compliance Assurance Monitoring

Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines
US EPA Consent Decree Case No. 2:11-cv-00590 EFB

III. Project Location

This landfill is located at 9999 S Austin Road in Manteca, CA and the District has confirmed that the landfill is not located within 1,000 feet of a K-12 School.

IV. Process Description

This landfill site is designed to receive domestic waste, municipal waste, combustion ash, industrial non-hazardous waste, agricultural waste, and construction & demolition wastes. The site is essentially a cell/trench type landfill, in which the waste is spread out in excavated soil trenches. In order to prevent subsurface gas migration and leachate (i.e. water that has passed through the landfill) leakage, the trenches are lined with a combination of clay and an impermeable synthetic (i.e. high density polyethylene) liner. Collected waste that has been spread out in the cell trenches is compacted using heavy machinery (including bulldozers and planers) and covered with at least six inches of soil, on a daily basis. The storage capacity of the facility is expected to be exhausted in the near future. At the time of closure, the site will be fully sealed off by a relatively impermeable clay and topsoil layer. Forward Landfill provided LandGem modeling data for District Project N-1062444 demonstrating that the maximum collection system flow rate expected during the life of the landfill is 5,400 CFM. The gas collection system operates 24 hours per day, 365 days per year.

Ameresco Forward, LLC, operates two landfill gas-fired IC engines and a siloxane removal system that will process some of the gas generated by the landfill; however, the Ameresco Forward LLC facility was determined to be a separate stationary source in District Project N-1110808 and the units operated by Ameresco will not be considered in this evaluation.

V. Equipment Listing

Pre-Project Equipment Description:

The following equipment description was obtained from the engineering evaluation for District Project N-1062444:

N-339-17-10: 13.8 MILLION CUBIC YARD CAPACITY (218 ACRES) LANDFILL WITH LANDFILL GAS COLLECTION SYSTEM CONTROLLED BY A 2000 SCFM (EQUIVALENT TO 48.0 MMBTU/HR) ENCLOSED FLARE AND CARBON ADSORPTION SYSTEM (CAS), AND A 3400 SCFM (EQUIVALENT TO 102 MMBTU/HR) PERRENIAL ENERGY MODEL GHS-301 LFG-FIRED ENCLOSED FLARE WITH LPG PILOT

Post-Project Equipment Description:

N-339-17-13: 39.0 MILLION CUBIC METER CAPACITY (354.5 ACRES)[1] LANDFILL WITH A LANDFILL GAS COLLECTION SYSTEM CONTROLLED BY A 2,000 SCFM (EQUIVALENT TO 60 MMBTU/HR[2]) ENCLOSED LANDFILL GAS-FIRED FLARE AND A 3,400 SCFM (EQUIVALENT TO 102 MMBTU/HR) PERRENIAL ENERGY MODEL GHS-301 ENCLOSED LANDFILL GAS-FIRED FLARE WITH AN LPG-FIRED PILOT

VI. Emission Control Technology Evaluation

Landfills emit VOC air contaminants as the result of refuse being broken down. These VOC emissions are significant and must be controlled, as they are ozone precursors. LFG extraction wells collect these emissions and send them to a control device, in this case two flares, where they are combusted. The flares serving the landfill gas collection system reduce collected VOC's by at least 98%.

Additionally, uncontrolled PM10 emissions are emitted by the earthmoving activities that take place at the landfill.

VII. General Calculations

A. Assumptions

- The landfill gas (LFG) heating value is 500 Btu/scf, assuming 50% of the volume of landfill gas is methane. (per District Project N-1062444)
- This project will not affect the heat input rating and operating schedule for the flares that was permitted by Authority to Construct N-339-17-10.
- The quatntity of landfill gas flared will not exceed 5,400 CFM. (District Project N-1062444)
- The molecular weight of hexane is 86.18 lb/lb-mol. (AP-42 Section 2.4.4.2)
- The standard molar volume of gas is 379.5 ft^3/lb-mol.
- The reduced sulfur concentration of the landfill gas is 46.9 ppmv. (AP-42 Section 2.4)

---

[1] The landfill capacity and area listed on Authority to Construct N-339-17-10 was determined to be incorrect. This permit includes two landfills that were merged. When merged, the permit was not updated properly to include the merged capacity of the landfill. Therefore, the capacity must be corrected on this permit. The total capacity and area of the Forward Inc. Landfill is 39.0 million cubic meters (354.5 acres) per their Cal Recycle permit. The capacity and area have been corrected in the post-project equipment description. These values will be used for both pre-project and post-project landfill cover emission calculations. It should be noted that this correction is not due to an expansion of the landfill.

[2] The equivalent heat input for the 2,000 SCFM flare listed on Authority to Construct N-339-17-10 was determined to be incorrect. The gas flow rate was increased in the permitting action that generated Authority to Construct N-339-17-10; however, the heat input rating listed in the equipment description for Authority to Construct N-339-17-10 was not adjusted to reflect the higher gas flow rate. The landfill gas at this site has a higher heating content of 500 Btu/scf. Thus, the correct heat input for the 2,000 SCFM flare is:

Existing Flare Rating = 2,000 SCFM x 60 min/hr x 500 Btu/scf x MMBtu/10^6 Btu = 60 MMBtu/hr

- The VOC destruction efficiency of each flare is at least 98%. (District Project N-1062444)
- The VOC adsorption efficiency of the previously proposed but never installed carbon adsorption system was at least 98%. (manufacturer)
- 100% of NMOC emissions are VOC's.
- The landfill gas capture efficiency is 85%. (AP-42 Section 2.4.4)
- The maximum disposal rate is 2,139,312 tons per year. (District Project N-1062444)
- The landfill area is 354.5 acres. (Cal Recycle Permit)
- The intermediate and final cover soil depth of the landfill is 4 feet. (District Project N-1062444)
- The soil density is 120 lb/cubic foot. (District Project N-1062444)
- All other assumptions will be stated as they are made.

B. Emission Factors

1. Pre-Project Emission Factors

2,000 CFM Flare:

Pollutant	Emission Factors (EF1) and/or Emission Rates	Source
NO_X	0.05 lb-NOx/MMBtu	District Project N-1062444
SO_X	0.0215 lb-SOx/MMBtu	District Project N-1062444
PM_{10}	0.034 lb-PM10/MMBtu	District Project N-1062444
CO	0.2 lb-CO/MMBtu	District Project N-1062444
VOC	0.0113 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O_2)	District Project N-1062444

3,400 CFM Flare:

Pollutant	Emission Factors (EF1) and/or Emission Rates	Source
NO_X	0.05 lb/MMBtu	District Project N-1062444
SO_X	0.0215 lb-SOx/MMBtu	District Project N-1062444
PM_{10}	(0.001 lb-PM10/hr)/scfm-methane	District Project N-1062444
CO	0.2 lb/MMBtu	District Project N-1062444
VOC	0.0113 lb/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O_2)	District Project N-1062444

300 CFM Carbon Adsorption System

Per the application for District Project N-1062444, the VOC emission factor for the carbon adsorption system is equivalent to the VOC emission factor for the flares. The emission factor for the carbon adsorption system is calculated below, on a per SCF of gas processed basis.

EF1 VOC = 0.0113 lb/MMBtu x 500 MMBtu/MMscf = 5.65 lb-VOC/MMscf

Fugitive Landfill VOC Emissions:

Results from the LandGem modeling and the estimated capture efficiency of the gas collection system will be used to estimate fugitive landfill VOC emissions.

PM10 Emissions from Earthmoving Activities

PM10 emissions are calculated according to US EPA's AP-42 equation for material handling and drop-equation in Section 13.2.4.

$$E = k(0.0032) \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} lb/ton$$

Where k is equal to 1 (worst-case particle size), U is equal to 15 mph (worst-case for SJV wind patterns), and M is equal to 3% (driest the soil would be during summer months per District Project N-1062444). Inputting these values into the above equation yields an emission factor of **0.008 lb PM10/ton** of soil moved.

2. Post-Project Emission Factors

2,000 CFM Flare:

There are no proposed changes to the emission factors. Thus, the post-project emission factors for this flare are identical to the pre-project emission factors.

Poliutant	Emission Factors (EF2) and/or Emission Rates
NO_X	0.05 lb-NOx/MMBtu
SO_X	0.0215 lb-SOx/MMBtu
PM_{10}	0.034 lb-PM10/MMBtu
CO	0.2 lb-CO/MMBtu
VOC	0.0113 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O_2)

3,400 CFM Flare:

There are no proposed changes to the emission factors. Thus, the post-project emission factors for this flare are identical to the pre-project emission factors.

Pollutant	Emission Factors (EF2) and/or Emission Rates
NO_X	0.05 lb/MMBtu
SO_X	0.0215 lb-SOx/MMBtu
PM_{10}	0.01 lb-PM10/scfh-methane
CO	0.2 lb/MMBtu
VOC	0.0113 lb/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O_2)

300 CFM Carbon Adsorption System

This system will not be installed. Therefore, post-project emission factors are not necessary.

Fugitive Landfill VOC Emissions:

There is no proposed change to the emission factor for fugitive emissions. Therefore, post-project fugitive emissions will continue to be based on the 1,000 ppmv limit listed in the pre-project emission factors.

PM10 Emissions from Earthmoving Activities

There is no proposed change to the earthmoving emission factor of 0.008 lb-PM10/ton.

C. Calculations

1. Pre-Project Potential to Emit (PE1)

2,000 CFM Flare:

The heat input for this flare was determined to be 60 MMBtu/hr. The following formulas will be used to calculate daily and annual pre-project emissions from this flare:

$PE1_{Daily}$ = 60 MMBtu/hr x 24 hr/day x EF (lb/MMBtu)
$PE1_{Annual}$ = 60 MMBtu/day x 8760 days/year x EF (lb/MMBtu)

Pollutant	EF (lb/MMBtu)	PE1 (lb/day)	PE1 (lb/year)
NOx	0.05	72.0	26,280
SOx	0.0215	31.0	11,300
PM_{10}	0.034	49.0	17,870
CO	0.2	288.0	105,120
VOC	0.0113	16.3	5,939

3,400 CFM Flare:

The heat input for this flare was determined to be 102 MMBtu/hr. The following formulas will be used to calculate daily and annual pre-project emissions from this flare, except for PM10:

$PE1_{Daily}$ = 102 MMBtu/hr x 24 hr/day x EF (lb/MMBtu)
$PE1_{Annual}$ = 102 MMBtu/day x 8760 days/year x EF (lb/MMBtu)

Pollutant	EF (lb/MMBtu)	PE1 (lb/day)	PE1 (lb/year)
NOx	0.05	122.4	44,676
SOx	0.0215	52.6	19,211
CO	0.2	489.6	178,704
VOC	0.0113	27.7	10,097

Particulate matter emissions from the flare are based on an emission factor of

EF1 = (0.001 lb-PM10/hr)/scfm-methane

50% by volume of the landfill gas is assumed to be methane. PM10 emissions from this flare are calculated below:

PE1 PM10 = 3,400 scfm-landfill gas x 0.5 scf methane/1 scfm landfill gas
x 0.001 lb-PM10/hr)/scfm-methane) x 24 hr/day

PE1 PM10 = 40.8 lb/day

PE1 PM10 = 40.8 lb/day x 365 days/year
PE1 PM10 = 14,892 lb-PM10/year

300 CFM Carbon Adsorption System

This system is designed to process a maximum of 300 CFM of landfill gas.

PE1 = 300 CFM-landfill gas x 1440 min/day x 5.65 lb-VOC/10^6 CF-gas
PE1 = 2.4 lb-VOC/day

PE1 = 2.4 lb-VOC/day x 365 days/year
PE1 = 876 lb-VOC/year

Fugitive Landfill VOC Emissions:

Pursuant to the LandGem model results from District Project N-1062444, the Non-Methane Organic Compound (NMOC) generation rate is 89 tons/year during the year with highest landfill gas generation rate (5,400 CFM).

Fugitive VOC emissions are calculated below, based on the NMOC generation rate and the capture efficiency of the landfill gas collection system.

$PE1_{Fugitive}$ = 89 tons-NMOC/year x (1-0.85) x 1 lb-VOC/lb-NMOC x 2000 lb/ton
$PE1_{Fugitive}$ = 26,700 lb-VOC/year

Daily emissions will be estimated assuming an even distribution of the annual VOC emission rate over the 365-day operating period.

PE1 = 26,700 lb-VOC/year ÷ 365 days/year = 73.2 lb-VOC/day

PM10 Emissions from Earthmoving Activities

The landfill has an area of 354.5 acres, or equivalent to 15,442,020 square feet. Assuming a soil depth of 4 feet including intermediate and final cover, the volume of soil moved per year (assuming the entire landfill is covered), would be 61,768,080 cubic feet of soil. Assuming a soil density of 120 lb/cubic foot:

Soil Throughput = 61,768,080 cubic feet of soil/year x 120 lb/cubic foot ÷ 2000 lb/ton
Soil Throughput = 3,706,085 tons/year

PE1 = 3,706,085 tons/year x 0.008 lb-PM10/ton = 29,649 lb-PM10/year

Daily emissions will be estimated assuming an even distribution of the earthmoving activities over the 365-day operating period.

PE1 = 29,649 lb-PM10/year ÷ 365 days/year = 81.2 lb-PM10/day

Pre-Project Landfill Emissions Summary

Pre-Project Daily Landfill Emission Summary					
Operation	**NOx (lb/day)**	**SOx (lb/day)**	**PM10 (lb/day)**	**CO (lb/day)**	**VOC (lb/day)**
2,000 CFM Flare	72.0	31.0	49.0	288.0	16.3
3,400 CFM Flare	122.4	52.6	40.8	489.6	27.7
Carbon Adsorption System[3]	0.0	0.0	0.0	0.0	0.0
Fugitive Landfill Emissions	0.0	0.0	0.0	0.0	73.2
Earthmoving Activities	0.0	0.0	81.2	0.0	0.0
Total	**194.4**	**83.6**	**171.0**	**777.6**	**116.7**

Pre-Project Annual Landfill Emission Summary					
Operation	**NOx (lb/year)**	**SOx (lb/year)**	**PM10 (lb/year)**	**CO (lb/year)**	**VOC (lb/year)**
2,000 CFM Flare	26,280	11,300	17,870	105,120	5,939
3,400 CFM Flare	44,676	19,211	14,892	178,704	10,097
Carbon Adsorption System[4]	0	0	0	0	0
Fugitive Landfill Emissions	0	0	0	0	26,700
Earthmoving Activities	0	0	29,649	0	0
Total	**70,956**	**30,511**	**62,411**	**283,824**	**42,736**

2. Post Project Potential to Emit (PE2)

2,000 CFM Flare:

The applicant is not requesting any changes to the flare emissions. Thus, PE2 is equal to PE1.

Pollutant	PE2 (lb/day)	PE2 (lb/year)
NOx	72.0	26,280
SOx	31.0	11,300
PM_{10}	49.0	17,870
CO	288.0	105,120
VOC	16.3	5,939

[3] Pre-project, up to 300 CFM could be diverted to a proposed carbon adsorption system; however, the emission rate for a flare processing the 300 CFM of gas would be equivalent or higher for all pollutants. Therefore, worst-case emissions occur when the flares process the full quantity of landfill gas and the carbon adsorption system is not used. Therefore, no potential to emit is attributed to the carbon adsorption system in the emissions summary.

[4] Pre-project, up to 300 CFM could be diverted to a proposed carbon adsorption system; however, the emission rate for a flare processing the 300 CFM of gas would be equivalent or higher for all pollutants. Therefore, worst-case emissions occur when the flares process the full quantity of landfill gas and the carbon adsorption system is not used. Therefore, no potential to emit is attributed to the carbon adsorption system in the emissions summary.

3,400 CFM Flare:

The applicant is not proposing any changes to the flare emissions. Thus, PE2 is equal to PE1.

Pollutant	PE2 (lb/day)	PE2 (lb/year)
NOx	122.4	44,676
SOx	52.6	19,211
PM10	40.8	14,892
CO	489.6	178,704
VOC	27.7	10,097

300 CFM Carbon Adsorption System

This system will not be installed; thus, PE2 is equal to zero.

Fugitive Landfill VOC Emissions:

The applicant is not proposing any changes; thus PE2 is equal to PE1.

PE2 = 73.2 lb-VOC/day
PE2 = 26,700 lb-VOC/year

PM10 Emissions from Earthmoving Activities

The applicant is not proposing any changes; thus, PE2 is equal to PE1.

PE2 = 81.2 lb-PM10/day
PE2 = 29,649 lb-PM10/year

Post-Project Landfill Emissions Summary

Post-Project Daily Landfill Emission Summary					
Operation	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	CO (lb/day)	VOC (lb/day)
2,000 CFM Flare	72.0	31.0	49.0	288.0	16.3
3,400 CFM Flare	122.4	52.6	40.8	489.6	27.7
Fugitive Landfill Emissions	0.0	0.0	0.0	0.0	73.2
Earthmoving Activities	0.0	0.0	81.2	0.0	0.0
Total	**194.4**	**83.6**	**171.0**	**777.6**	**116.7**

Post-Project Annual Landfill Emission Summary					
Operation	NOx (lb/year)	SOx (lb/year)	PM10 (lb/year)	CO (lb/year)	VOC (lb/year)
2,000 CFM Flare	26,280	11,300	17,870	105,120	5,939
3,400 CFM Flare	44,676	19,211	14,892	178,704	10,097
Fugitive Landfill Emissions	0	0	0	0	26,700
Earthmoving Activities	0	0	29,649	0	0
Total	**70,956**	**30,511**	**62,411**	**283,824**	**42,736**

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to Section 4.9 of District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid ATCs or PTOs at the Stationary Source and the quantity of Emission Reduction Credits (ERCs) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site. With the exception of the emission rates for ATC N-339-17-10, the emission rates listed in the below table were obtained from District project N-1040337.

Pre-Project Stationary Source Potential to Emit (lb/year)					
Permit Unit	NO_X	SO_X	PM_{10}	CO	VOC
PTO N-339-1-2	0	0	7,300	0	0
PTO N-339-9-2	0	0	0	0	292
PTO N-339-15-2	0	0	0	0	183
PTO N-339-16-2	0	0	0	0	3,614
ATC N-339-17-10	70,956	30,511	62,411	283,824	42,736
SSPE1	**70,956**	**30,511**	**69,711**	**283,824**	**46,825**

4. Post Project Stationary Source Potential to Emit (SSPE2)

Pursuant to Section 4.10 of District Rule 2201, the Post Project Stationary Source Potential to Emit (SSPE2) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Post-Project Stationary Source Potential to Emit (lb/year)					
Permit Unit	NO_X	SO_X	PM_{10}	CO	VOC
PTO N-339-1-2	0	0	7,300	0	0
PTO N-339-9-2	0	0	0	0	292
PTO N-339-15-2	0	0	0	0	183
PTO N-339-16-2	0	0	0	0	3,614
ATC N-339-17-13	70,956	30,511	62,411	283,824	42,736
SSPE2	**70,956**	**30,511**	**69,711**	**283,824**	**46,825**

5. Major Source Determination

District Rule 2201 Major Source Determination

Pursuant to Section 3.24 of District Rule 2201, a Major Source is a stationary source with post-project emissions or a Post Project Stationary Source Potential to Emit (SSPE2), equal to or exceeding one or more of the following threshold values. However, Section 3.24.2 states, "for the purposes of determining major source status, the SSPE2 shall not include the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site."

Pursuant to section 3.24.1, fugitive emissions are only included for determining Major Source status if the source of those fugitive emissions are identified in the Major Source definition in 40 CFR Part 70.2. None of the units at this source are subject to an NSPS or NESHAPS that was promulgated on or prior to August 7, 1980 and landfills are not one of the sources of fugitives listed in 40 CFR Part 70.2. Therefore, fugitive VOC emissions from the landfill are excluded in the below Major Source determination. Furthermore, SSPE1 and SSPE2 are equal. Additionally, PM emissions from earthmoving are considered fugitive and will be excluded.

Major Source Thresholds			
Pollutant	**SSPE2 w/o fugitives (lb/year)**	**Major Source Thresholds lb/year**	**Major Source?**
NOx	70,956	20,000	Yes
SOx	30,511	140,000	No
PM_{10}	40,052	140,000	No
CO	283,824	200,000	Yes
VOC	20,125	20,000	Yes

Additionally, a major source of $PM_{2.5}$ is defined as one with the potential to emit 100 tons/yr (200,000 lb/yr) or more of $PM_{2.5}$. Since $PM_{2.5}$ is a subset of PM_{10}, it is evident that SSPE2 for $PM_{2.5}$ emissions is less than or equal to 100 tons/yr; thus, this facility is not a major source for $PM_{2.5}$.

District Rule 2410 Major Source Determination:

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). Therefore the following PSD Major Source thresholds are applicable. The pre-project GHG emission calculations are shown in Appendix IV.

PSD Major Source Determination (tons/year)							
	NO2	VOC	SO2	CO	PM	PM10	CO2e
Facility PE before Project	36	10.1	15	142	34.9	34.9	0.2[5]
PSD Major Source Thresholds	250	250	250	250	250	250	100,000
PSD Major Source ? (Y/N)	No	No	No	No	No	No	No

As shown above, the facility is not an existing Major Source for PSD.

6. Baseline Emissions (BE)

The baseline emission (BE) calculations are performed pollutant by pollutant to determine the amount of offsets required, where necessary, when the SSPE1 is greater than the offset threshold.

BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, Located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to Section 3.22.

Baseline Emissions for SOx and PM10

This facility is not a Major Source for SOx and PM10 emissions. Therefore, the baseline emissions for these pollutants are equal to the pre-project potential to emit.

$BE_{SOx} = PE1_{SOx}$
$BE_{PM10} = PE1_{PM10}$

Baseline Emissions for NOx, CO, and VOC

This facility is a Major Source for NOx, CO, and VOC emissions. District Rule 2201 states that an emission unit is clean if it meets one of the following criteria:

1. The unit is equipped with an emission control technology with a minimum control efficiency of at least 95% (or at least 85% for lean burn, internal combustion engines); or

[5] EPA issued a deferral for CO_2 emissions from bioenergy and other biogenic sources under the Prevention of Significant Deterioration (PSD) and Title V programs. As a result, biogenic CO_2 emissions from the landfill are not included for applicability purposes under the PSD and Title V programs.

2. The unit is equipped with emission control technology that meets the requirements for achieved-in-practice BACT as accepted by the APCO during five years immediately prior to the submission of the complete application.

NOx and CO emissions are generated from the flares, which are an emission control technology. A clean unit determination is not required for emission control devices. The flares control VOC emissions from the landfill gas collection system and are rated at a destruction efficiency of 98%. Therefore, the landfill meets the criteria of item #1 above and is clean for VOC emissions. Thus, the baseline emissions for these pollutants are equal to the pre-project potential to emit.

$BE_{NOx} = PE1_{NOx}$
$BE_{CO} = PE1_{CO}$
$BE_{VOC} = PE1_{VOC}$

7. SB288 Modification

An SB 288 Major Modification is defined in 40 CFR Part 51.165 (in effect 12/19/02) as "*any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act.*"

As stated earlier in the project description, this project will not result in a physical change to the landfill, nor will the project result in a change in the method of operation of the landfill. Therefore, this project cannot trigger an SB288 Modification.

8. Federal Major Modification

A Federal Major Modification is defined in 40 CFR Part 51.165 (currently in effect) as:

Major modification means any physical change in or change in the method of operation of a major stationary source that would result in:

(1) A significant emissions increase of a regulated NSR pollutant; and

(2) A significant net emissions increase of that pollutant from the major stationary source.

As stated earlier in the project description, this project will not result in a physical change to the landfill, nor will the project result in a change in the method of operation of the landfill. Therefore, this project cannot trigger a Federal Major Modification.

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination Calculations

The intent of this Rule is to incorporate the federal PSD rule requirements of Title 40 Code of Federal Regulations (40 CFR) Part 52.21 into the District's Rules and Regulations by incorporating the federal requirements by reference. The prevention of significant deterioration (PSD) program is a construction permitting program for new major stationary sources and major modifications to existing major stationary sources

located in areas classified as attainment or in areas that are unclassifiable for any criteria air pollutant.

Section 4.0 states that an owner or operator must obtain a PSD permit pursuant to this Rule before beginning actual construction of a new major stationary source, a major modification, or a plantwide applicability limitation (PAL) major modification, as defined in 40 CFR 52.21(b).

As discussed earlier, Forward Inc. Landfill is an existing PSD Major Source. Pursuant to Section 52.21(2)(i), a major modification at an existing stationary source means any physical change in or change in the method of operation of a major stationary source that would result in: a significant emissions increase (as defined in paragraph (b)(40) of this section) of a regulated NSR pollutant (as defined in paragraph (b)(50) of this section); and a significant net emissions increase of that pollutant from the major stationary source.

As stated earlier in this evaluation, the changes proposed by this project will not result in physical changes to the equipment or result in changes in the method of operation of the landfill. Therefore, by definition, this project cannot trigger a major modification under PSD and the requirements of this rule are not applicable.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix V.

VIII. Compliance

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis for the following*:

a. Any new emissions unit with a potential to emit exceeding two pounds per day,
b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
d. Any new or modified emissions unit, in a stationary source project, which results in a SB288 or Federal Major Modification.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units with PE exceeding 2.0 lb/day

The applicant is not proposing any new emission units.

b. The relocation of a unit from one stationary to another stationary source.

The applicant is not proposing to relocate any emissions units to another stationary source.

c. Modifications to an existing emissions unit with an Adjusted Increase in Potential to Emit (AIPE) exceeding 2.0 pounds per day.

Modifications to existing emission units trigger BACT if the modification results in an Adjusted Increase in Potential to Emit (AIPE) exceeding 2.0 pounds per day. The following formulas are used to calculate the AIPE.

AIPE = PE2 – HAPE

where, HAPE = PE1 x (EF2/EF1)

PE1 = Pre-Project Potential to Emit (lb/day)
EF1 = Pre-Project Emissions Factor
PE2 = Post-Project Potential to Emit (lb/day)
EF2 = Post-Project Emissions Factor

This project will not result in a physical modification to any of the emission units. Furthermore, the applicant is not proposing a change to the potential to emit and is not proposing any changes to the emission factors. Thus, AIPE will equal zero for all pollutants.

d. Any new or modified emissions unit, in a stationary source project, which results in a SB288 or Federal Major Modification.

As shown in section VII.C.7, this project does not result in a SB288 or Federal Major Modification

In summary, BACT is not triggered by this proposal.

B. Offsets

1. Offset Applicability

Pursuant to Section 4.5.3, offset requirements shall be triggered on a pollutant-by-pollutant basis. Unless exempted pursuant to Section 4.6, offset requirements shall be triggered if the post-project SSPE2 equals or exceeds the following offset threshold levels.

Offsets Applicability			
Pollutant	SSPE2 (lb/yr)	Offset Threshold (lb/yr)	Offsets Triggered?
NO_x	70,956	20,000	Yes
SO_x	30,511	54,750	No
PM_{10}	69,711	29,200	Yes
CO	283,824	200,000	Yes
VOC	46,825	20,000	Yes

2. Quantity of Offsets Required

As demonstrated above, offsets are triggered for NOx, PM10, CO, and VOC. The following equation will be utilized to determine the quantity of offsets required for this project.

Quantity of Offsets Required = [Σ(PE2 - BE) + Cargo Carrier Emissions]
x Distance Offset Ratio (DOR)

As described earlier in this evaluation, the baseline emissions for NOx, PM10, CO and VOC are each equal to their respective pre-project potential to emit (PE1). Additionally, there are no cargo carrier emissions associated with this project. Thus, the equation can be reduced to:

Quantity of Offsets Required = [Σ(PE2 - PE1)] x DOR

The following table shows the results of the quantity of offset required calculations for this project.

Pollutant	PE2 (lb/year)	PE1 (lb/year)	Quantity of Offsets Required (lb/year)
NOx	70,956	70,956	0
PM10	62,411	62,411	0
CO	283,824	283,824	0
VOC	42,736	42,736	0

As demonstrated in the above table, offsets are not required for this project.

C. Public Notification

1. Applicability

Public noticing is required for:
a. Any new Major Source, which is a new facility that is also a Major Source,
b. Major Modifications,
c. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
d. Any project which results in the offset thresholds being surpassed, and/or
e. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

a. New Major Source

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

b. Major Modification

As demonstrated in VII.C.7, this project is not a Major Modification (SB288 or Federal).

c. PE > 100 lb/day

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. There are no new emissions units proposed in this project. Therefore, public noticing is not required for this purpose

d. Offset Threshold

The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Threshold				
Pollutant	**SSPE1 (lb/year)**	**SSPE2 (lb/year)**	**Offset Threshold**	**Offset Threshold Surpassed?**
NO_X	70,956	70,956	20,000 lb/year	No
SO_X	30,511	30,511	54,750 lb/year	No
PM_{10}	69,711	69,711	29,200 lb/year	No
CO	283,824	283,824	200,000 lb/year	No
VOC	46,825	46,825	20,000 lb/year	No

While facility emissions are already above the offset threshold for some pollutants, facility emissions are either decreasing or remaining the same. Thus, an offset threshold will not be surpassed.

e. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a Stationary Source Increase in Permitted Emissions (SSIPE) of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE is calculated as the Post Project Stationary Source Potential to Emit (SSPE2) minus the Pre-Project Stationary Source Potential to Emit (SSPE1), i.e. SSIPE = SSPE2 – SSPE1. The values for SSPE2 and SSPE1 are calculated according to Rule 2201, Sections 4.9 and 4.10, respectively. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table:

Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice					
Pollutant	**SSPE2 (lb/year)**	**SSPE1 (lb/year)**	**SSIPE (lb/year)**	**SSIPE Public Notice Threshold**	**Public Notice Required?**
NO_x	70,956	70,956	0	20,000 lb/year	No
SO_x	30,511	30,511	0	20,000 lb/year	No
PM_{10}	69,711	69,711	0	20,000 lb/year	No
CO	283,824	283,824	0	20,000 lb/year	No
VOC	46,825	46,825	0	20,000 lb/year	No

As demonstrated in the table above, a public notice is not required for SSIPE greater than 20,000 lb/year.

2. Public Notice Action

As discussed above, public noticing is not required for this project.

D. Daily Emission Limits (DELs)

Daily Emissions Limitations (DELs) and other enforceable conditions are required by Section 3.16 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. Per Sections 3.16.1 and 3.16.2, the DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

The following conditions will be included on the Authority to Construct permit:

- *The landfill gas collected by the landfill gas collection system shall be controlled by at least one of the following devices: 1) The 60 MMBtu/hr flare; 2) the 102 MMBtu/hr flare; and/or 3) The siloxane removal system and one of the IC engines permitted under Facility ID N-8573. Each device shall be operated at all times when the collected gas is routed to it. [District Rule 2201 and 40 CFR 60.752(b)(2)(iii)(B), 40 CFR 60.753(f), and 40 CFR 63 Subpart AAAA]*

- *The influent landfill gas flow rate to the 60 MMBtu/hr flare shall not exceed 2,000 SCFM (corrected to 50% methane). [District Rule 2201]*

- *The influent landfill gas flow rate to the 102 MMBtu/hr flare shall not exceed 3,400 SCFM (corrected to 50% methane). [District Rule 2201]*

- *The VOC destruction efficiency for the 60 MMBtu/hr flare shall be at least 98% by weight or the maximum non-methane organic compound NMOC emissions from the flare shall not exceed 20 ppmv @ 3% O_2 (as hexane). [District Rule 2201, 40 CFR 60.752(b)(2)(iii)(B) and 40 CFR 63 Subpart AAAA]*

- *The VOC destruction efficiency for the 102 MMBtu/hr flare shall be at least 98% by weight or the maximum non-methane organic compound NMOC emissions from the flare shall not exceed 20 ppmv @ 3% O_2 (as hexane). [District Rule 2201, 40 CFR 60.752(b)(2)(iii)(B) and 40 CFR 63 Subpart AAAA]*

- *Emissions from the 60 MMBtu/hr flare shall not exceed any of the following limits: 0.05 lb-NOx/MMBtu, 0.0215 lb-SOx/MMBtu, 0.034 lb-PM10/MMBtu, 0.2 lb-CO/MMBtu, and 0.0113 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O_2). [District Rule 2201]*

- *Emissions from the 102 MMBtu/hr flare shall not exceed any of the following limits: 0.05 lb-NOx/MMBtu, 0.0215 lb-SOx/MMBtu, (0.001 lb-PM10/hr)/scfm-methane, 0.2 lb-CO/MMBtu, and 0.0113 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O_2). [District Rule 2201]*

- *The volume of soil used for intermediate and final cover shall not exceed 61,768,080 cubic feet. [District Rule 2201]*

- *PM10 emissions from the placement of the intermediate and final soil cover shall not exceed 0.008 lb/ton of soil. The volume of soil shall be converted to tons of soil using a soil density of 120 lb/cubic foot. [District Rule 2201]*

- *The H_2S concentration of the influent landfill gas to the flares shall not exceed 46.9 ppmv. [District Rule 2201]*

In addition to the above DEL's, the following operating requirements will be included on the Authority to Construct:

- *All equipment shall be constructed, maintained, and operated according to the specifications and plans contained in the permit applications, except as otherwise specified herein. [District Rule 2201]*

- *The enclosed flares shall each be equipped with an LPG or natural gas-fired pilot. [District Rule 2201]*

- *The enclosed flares shall each be equipped with automatic dampers, an automatic shutdown device, and a flame arrester. [District Rule 2201]*

- *The gas collection system shall be operated in a manner which maximizes the quantity of landfill gas extracted while preventing overdraw that can cause fires or damage the gas collection system. [District Rule 2201]*

- *During maintenance of the gas collection system or flares, emissions of landfill gas shall be minimized. [District Rule 2201]*

- *Maintenance is defined as work performed on a gas collection system and/or control device in order to ensure continued compliance with District Rules, Regulations, and /or Permits to Operate, and to prevent its failure or malfunction. [District Rule 2201]*

E. Compliance Assurance

1. Source Testing

Initial source testing of the flares has already been completed. The following ongoing testing requirements will be included on the Authority to Construct permit:

- *For each flare, source testing to demonstrate compliance with the NOx (lb/MMBtu), CO (lb/MMBtu), and VOC (98% destruction efficiency or 20 ppmvd VOC @ 3% O2 as hexane) requirements of this permit shall be conducted at least once every 12 months. [District Rules 1081 and 2201]*

- *Source testing for NOx shall be conducted using CARB Method 7 or CARB Method 20. [District Rules 1081 and 2201]*

- *Source testing for CO shall be conducted using EPA Method 10 or 10B, CARB Methods 1 through 5 with CARB Method 10, or CARB Method 100. [District Rules 1081 and 2201]*

- *VOC emissions shall be conducted using EPA Method 18, 25, 25A, or 25C. [District Rules 1081 and 2201]*

- *{109} Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]*

- *{110} The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]*

2. Monitoring

In addition to the monitoring required by 40 CFR 60 Subpart WWW, the following monitoring requirements will be included on the Authority to Construct permit:

- *The combustion chamber of each flare shall be maintained at a temperature of at least 1,400 degrees Fahrenheit during operation. [District Rule 2201]*

- *Each flare shall be equipped with a temperature indicator and recorder that measures and continuously records the operating temperature. [District Rule 2201]*

- *For each flare, the facility shall install and maintain in proper operating condition a gas flow meter with a continuous recording device that measures the quantity of landfill gas processed each day. [District Rule 2201]*

- *Permittee shall perform testing to measure the H2S content of the landfill gas combusted in the flares on a quarterly basis using draeger tubes. If compliance with the landfill gas H2S content limit is demonstrated for two consecutive quarters, this testing frequency may be changed to annual. Quarterly testing shall resume if any annual test shows non-compliance with the H2S content limit. [District Rule 2201]*

3. Recordkeeping

In addition to the recordkeeping required by 40 CFR 60 Subpart WWW, the following recordkeeping requirements will be included on the Authority to Construct permit:

- *Permittee shall keep records of any maintenance to the landfill gas collection or control devices, including the reason for maintenance, duration of the maintenance, and any collection or control system downtime. [District Rule 2201]*

- *Permittee shall maintain records of system inspections including: date, time, and inspection results. [District Rule 1070]*

- *For each flare, permittee shall keep records of emission source tests results. [District Rule 2201]*

- *For each flare, permittee shall keep records of the continuous flare combustion temperature measurements, and the continuous volumetric landfill gas flow rate measurements. Permittee shall keep a daily and an annual record of the quantity of landfill gas processed in each flare. [District Rule 2201]*

- *All records shall be retained for a period of at least five years and shall be made available for District inspection upon request. [District Rules 1070, 2201, 40 CFR 60 Subpart WWW, and 40 CFR 60 Subpart AAAA]*

4. Reporting

In addition to the reporting requirements of 40 CFR 60 Subpart WWW, the following reporting requirements will be included on this Authority to Construct:

- *The permittee shall notify the District by telephone at least 24 hours prior to performing any maintenance work that requires the landfill gas collection and control system to be shutdown. The notification shall include a description of the work, the date work will be performed, and the quantity of time needed to complete the maintenance work. [District Rule 2201]*

Rule 2410 Prevention of Significant Deterioration

As discussed earlier in this evaluation, this project is not a major modification for PSD since the project does not result in a physical change in equipment and does not result in a change in the method of operation of the landfill. Therefore, the requirements of District Rule 2410 are not applicable.

Rule 2520 Federally Mandated Operating Permits

This facility is subject to this rule and has received their Title V Operating Permit. The proposed modification is a Minor Modification to the Title V Permit.

In accordance with Rule 2520, these modifications:

1. Do not violate requirements of any applicable federally enforceable local or federal requirement;
2. Do not relax monitoring, reporting, or recordkeeping requirements in the permit and are not significant changes in existing monitoring permit terms or conditions;
3. Do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis;
4. Do not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject. Such terms and conditions include:
   a. A federally enforceable emission cap assumed to avoid classification as a modification under any provisions of Title I of the Federal Clean Air Act; and
   b. An alternative emissions limit approved pursuant to regulations promulgated under section 112(i)(5) of the Federal Clean Air Act; and
5. Are not Title I modifications as defined in District Rule 2520 or modifications as defined in section 111 or 112 of the Federal Clean Air Act; and
6. Do not seek to consolidate overlapping applicable requirements.

As discussed earlier, the facility has applied for a Certificate of Conformity (COC). Therefore, the facility must apply to modify their Title V permit with an administrative amendment, prior to operating with the proposed modifications. Continued compliance with this rule is expected. The facility may operate under the ATC upon the submittal of a Title V administrative amendment application.

Rule 4001 New Source Performance Standards (NSPS)

40 CFR Part 60, Subpart CC, Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills

§60.32c Designated Facilities

§60.32c(a) states that a designated facility to which the requirements of Subpart CC are applicable to each existing municipal solid waste landfill for which construction, reconstruction, or modification was commenced before May 30, 1991. In 2005 Forward

Landfill (N-339) purchased Austin Road Landfill (N-3057) and merged the two landfills together to form what is currently Forward Inc. Landfill. Additionally, the total capacity of the merged landfills was increased at the same time. Therefore, a modification occurred after May 30, 1991 and Subpart CC requirements do not apply.

40 CFR Part 60, Subpart WWW, Standards of Performance for Municipal Solid Waste Landfills

§60.750 Applicability, Designation of Affected Facility, and Delegation of Authority

§60.750(a) states the provisions of this subpart are applicable to each municipal solid waste landfill that has commenced construction, reconstruction, or modification on or after May 30, 1991. Forward Inc. Landfill was modified after May 30, 1991; therefore, the provisions of Subpart WWW apply. The following tables demonstrate that the proposed permit conditions will comply with the requirements of Subpart WWW.

40 CFR Part 60 Subpart WWW Requirements	Proposed Method of Compliance with Subpart WWW Requirements
§60.752 Standards for Air Emissions from Municipal Solid Waste (MSW) Landfills	
§60.752(a) states that each owner or operator of a MSW landfill having a design capacity less than 2.5 million megagrams or 2.5 million cubic meters by volume must submit an initial design capacity to the administrator.	The design capacity for this landfill is much greater than these thresholds; therefore, §60.752(a) requirements do not apply to Forward Inc. Landfill.
§60.752(b) states that each owner or operator of an MSW landfill having a design capacity greater than 2.5 million megagrams and 2.5 million cubic meters must either comply with paragraph (b)(2) of this section or calculate an NMOC emission rate for the landfill using the procedure in §60.754. §60.752(b)(2) requirements are for landfills that have exceeded a 50 Mg/year NMOC threshold.	Per an NSPS submittal on September 26, 2005, modeling at Forward Inc. Landfill indicates that the 50 Mg/year NMOC threshold was exceeded in 2004. Therefore, Forward Inc. Landfill is required to comply with paragraph (b)(2).
§60.752(b)(2)(i) requires the owner or operator to submit a collection and control system design plan prepared by a professional engineer within 1 year that includes the following: (A) The collection and control system as described in the plan must meet the design requirements of paragraph (b)(2)(ii) of this section. (B) The collection and control system design plan must include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of §60.753 through §60.758. (C) The collection and control system design plan must either conform with specifications for active collection systems or include a demonstration to the Administrator's satisfaction of the sufficiency of the alternative provisions to §60.759. (D) The Administrator must review the information submitted under paragraphs (b)(2)(i)(A), (B), and (C) and either approve it, disapprove it, or request additional information be submitted.	Forward Inc. Landfill submitted the plan within 1 year; therefore, this requirement has been satisfied.

Continued on Next Page

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.752(b)(2)(ii) states that the owner or operator must install a collection and control system that captures the gas generated within the landfill as required by paragraphs (b)(2)(ii)(A) or (B) and (b)(2)(iii) of this section within 30 months after the first annual report in which the emission rate equal or exceeds 50 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the emission rate is less than 50 megagrams per year. The facility has installed an active control system. §60.752(b)(2)(ii)(A) states that an active collection system shall: (1) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment. (2) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of: (i) 5 years or more if active; or (ii) 2 years or more if closed or at final grade. (3) Collect gas at a sufficient extraction rate. (4) Be designed to minimize off-site migration of subsurface gas.	This landfill is equipped with an active control system. The following conditions will be included on the Authority to Construct permit: • *The landfill gas collection system shall be designed and operated to: 1) Handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment; 2) Collect gas from each area, cell or group of cells in the landfill in which the initial solid waste has been placed for a period of five years or more for an active landfill, or 2 years or more for a closed landfill or landfill at final grade; 3) Collect gas at a sufficient extraction rate; and 4) Minimize off-site migration of subsurface gas. [40 CFR 60.752(b)(2)(ii)(A), 40 CFR 60.753(a), and 40 CFR 63 Subpart AAAA]*
§60.752(b)(2)(ii)(B) states that a passive collection system shall: (1)Comply with the provisions specified in paragraphs (b)(2)(ii)(A)(1), (2), and (2)(ii)(A)(4) of this section. (2)Be installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners must be installed as required under §258.40.	The facility has installed an active control system. Therefore, the requirements for a passive control system are not applicable.
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.752(b)(2)(iii) states that the collected gas must be routed to a control system that complies with one of the following requirements: (A) Route all collected gas to an open flare designed and operated in accordance with 40 CFR §60.18 except as noted in §60.754(e). (B) Route all collected gas to a control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight-percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume must be established by an initial performance test no later than 180 days after the initial startup of the approved control system. (1) If a boiler or process heater is used as a control device, the landfill gas stream must be introduced into the flame zone. (2) The control device must be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in §60.756. (C) Route all collected gas to a treatment system that processes the collected gas for subsequent sale or use. All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of paragraph (b)(2)(iii)(A) or (B) of this section.	The landfill gas is routed to the two flares or the IC engines operated by Ameresco (N-8593). The permits for the Ameresco facility include conditions enforcing this requirement. Initial testing to demonstrate compliance with this requirement for each flare has already been conducted. The following conditions will be included on the Authority to Construct permit: • *The landfill gas collected by the landfill gas collection system shall be controlled by at least one of the following devices: 1) The 60 MMBtu/hr flare; 2) the 102 MMBtu/hr flare; and/or 3) The siloxane removal system and one of the IC engines permitted under Facility ID N-8573. Each device shall be operated at all times when the collected gas is routed to it. [District Rule 2201 and 40 CFR 60.752(b)(2)(iii)(B), 40 CFR 60.753(f), and 40 CFR 63 Subpart AAAA]* • *The VOC destruction efficiency for the 60 MMBtu/hr flare shall be at least 98% by weight or the maximum non-methane organic compound NMOC emissions from the flare shall not exceed 20 ppmv @ 3% O_2 (as hexane). [District Rule 2201, 40 CFR 60.752(b)(2)(iii)(B) and 40 CFR 63 Subpart AAAA]* • *The VOC destruction efficiency for the 102 MMBtu/hr flare shall be at least 98% by weight or the maximum non-methane organic compound NMOC emissions from the flare shall not exceed 20 ppmv @ 3% O_2 (as hexane). [District Rule 2201, 60.752(b)(2)(iii)(B) and 40 CFR 63 Subpart AAAA]*
§60.752(b)(2)(iv) states that the facility must operate the collection and control device installed to comply with this subpart in accordance with the provisions of §§ 60.753, 60.755 and 60.756.	Compliance with the referenced sections will be discussed later in this table.
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
Exterior vapor extraction wells, leachate collection systems, and perimeter horizontal collectors are exempt from the requirements of 40 CFR 60.753.	The following condition will be included on the Authority to Construct permit: • *All exterior vapor extraction wells, leachate collection system components, and perimeter horizontal collectors shall not be located over any waste and are exempt from the operational standards of 40 CFR 60.753 and the compliance provisions of 40 CFR 60.755. Forward Inc. shall keep records of all components that qualify for this exemption and note their location with respect to the landfill's perimeter. [40 CFR 60.752(b)(2)(ii), 60.753, 60.755, 60.756, 60.757, 60.758, 60.759, and 40 CFR 63 Subpart AAAA]*
§60.752(b)(2)(v) states that the collection and control system may be capped or removed provided that all of the following conditions are met: (A) The landfill shall be a closed landfill as defined in §60.751 of this subpart. A closure report shall be submitted to the Administrator as provided in §60.757(d); (B) The collection and control system shall have been in operation a minimum of 15 years; and (C) Following the procedures specified in §60.754(b) of this subpart, the calculated NMOC gas produced by the landfill shall be less than 50 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart.	If the applicant wishes to pursue the option of removing the control devices, an Authority to Construct application is required from the applicant and compliance with all other applicable regulations and rules will be required.
§60.752(c) states that for the purposes of obtaining a Title V operating permit, the owner of a MSW landfill subject to this subpart with a design capacity less than 2.5 million megagrams or 2.5 million cubic meters is not required to obtain a Title V permit for the landfill under Part 70 or 71 of this chapter, unless the landfill is otherwise subject to either Part 70 or 71. Otherwise, a Title V operating permit is required.	This landfill is rated greater than the thresholds listed and currently has a Title V operating permit. Therefore, this requirement has been satisfied.
§60.752(d) states that when an MSW landfill subject to this subpart is closed, the owner or operator is no longer subject to the requirement to maintain a Title V operating permit if the landfill is not otherwise subject to part the requirements of either Part 70 or Part 71 and if either of the following conditions are met: (1) The landfill was never subject to the requirement for a control system under paragraph (b)(2) of this section; or (2) The owner or operator meets the conditions for control system removal specified in paragraph (b)(2)(v) of this section.	If the applicant wishes to pursue this option upon meeting these criteria, an Authority to Construct application is required from the applicant and compliance with all other applicable regulations and rules will be required.

Continued on Next Page

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.753 Operational Standards for Collection and Control Systems	
§60.753(a) states that the owner or operator must operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill which solid waste has been in place for: • 5 years or more if active; or • 2 years or more if closed or at final grade.	The following condition will be included on the Authority to Construct permit: • *The landfill gas collection system shall be designed and operated to: 1) Handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment; 2) Collect gas from each area, cell or group of cells in the landfill in which the initial solid waste has been placed for a period of five years or more for an active landfill, or 2 years or more for a closed landfill or landfill at final grade; 3) Collect gas at a sufficient extraction rate; and 4) Minimize off-site migration of subsurface gas. [40 CFR 60.752(b)(2)(ii)(A), 40 CFR 60.753(a), and 40 CFR 63 Subpart AAAA]*
§60.753(b) states that the owner or operator of the landfill must operate the collection system with negative pressure at each wellhead except under the following conditions: (1) A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports provided in §60.757(f)(1). (2) Use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the design plan. (3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the Administrator.	The following condition will be included on the Authority to Construct permit: • *Permittee shall operate the landfill gas collection system with negative pressure at each wellhead except under the following conditions: 1) A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports provided in 40 CFR 60.757(f)(1); 2) Use of a geomembrane or synthetic cover. The owner shall develop acceptable pressure limits in the design plan; 3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the District. [40 CFR 60.753(b) and 40 CFR 63 Subpart AAAA]*
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.753(c) states that the owner or operator must operate each interior wellhead in a collection system with a landfill gas temperature less than 55 °C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens. (1) The nitrogen level shall be determined using EPA Method 3C, unless an alternative test method is established as allowed by §60.752(b)(2)(i) of this subpart. (2) Unless an alternative test method is established as allowed by §60.752(b)(2)(i) of this subpart, the oxygen level shall be determined by an oxygen meter using EPA Method 3A or 3C except that: (i) The span shall be set so that the regulatory limit is between 20 and 50 percent of the span; (ii) A data recorder is not required; (iii) Only two calibration gases are required, a zero and span, and ambient air may be used as the span; (iv) A calibration check is not required; and (v) The allowable sample bios, zero drift, and calibration drive are ± 10 percent.	The following conditions will be included on the Authority to Construct permit: • *Unless otherwise stated on this permit, the permittee shall operate each interior wellhead in the collection system with a landfill gas temperature less than 55 degrees C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. [40 CFR 60.753(c) and 40 CFR 63 Subpart AAAA]* • *For each interior wellhead, the nitrogen level shall be determined using EPA Method 3C, unless an alternative test method is established as allowed by 40 CFR 60.752(b)(2)(i). [40 CFR 60.753(c)(1) and 40 CFR 63 Subpart AAAA]* • *For each interior wellhead, unless an alternative test method is established as allowed by 40 CFR 60.752(b)(2)(i), the oxygen level shall be determined by an oxygen meter using EPA Method 3A or 3C except that: 1) The span shall be set so that the regulatory limit is between 20 and 50 percent of the span; 2) A data recorder is not required; 3) Only two calibration gases are required, a zero and span, and ambient air may be used as the span; 4) A calibration check is not required; and 5) The allowable sample bios, zero drift, and calibration drive are plus or minus 10 percent. [40 CFR 60.753(c)(2) and 40 CFR 63 Subpart AAAA]*
§60.753(d) states that the owner or operator shall operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.	The following condition will be included on the Authority to Construct permit: • *Permittee shall operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover on at least a quarterly basis. Permittee may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rational for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangarous areas may be excluded from the surface testing. [40 CFR 60.753(d), 40 CFR 60.755, and 40 CFR 63 Subpart AAAA]*

Continued on Next Page

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.753(e) states that the owner or operator shall operate the system such that all collected gases are vented to a control system designed and operated in compliance with §60.752(b)(2)(iii). In the event the collection system or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within one hour.	The following condition will be included on the Authority to Construct permit: • *Permittee shall operate the landfill gas collection and control system such that all collected gases are vented to a control system designed and operated in compliance with 40 CFR 60.752(b)(2)(iii). In the event the collection system or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to the venting of the gas to the atmosphere shall be closed within one hour. [40 CFR 60.753(e) and 40 CFR 63 Subpart AAAA]*
§60.753(f) states that the owner or operator shall operate the control or treatment system at all times when the collected gas is routed to the system.	The following condition will be included on the Authority to Construct permit: • *The landfill gas collected by the landfill gas collection system shall be controlled by at least one of the following devices: 1) The 60 MMBtu/hr flare; 2) the 102 MMBtu/hr flare; and/or 3) The siloxane removal system and one of the IC engines permitted under Facility ID N-8573. Each device shall be operated at all times when the collected gas is routed to it. [District Rule 2201 and 40 CFR 60.752(b)(2)(iii)(B), 40 CFR 60.753(f), and 40 CFR 63 Subpart AAAA]*
§60.753(g) states that if monitoring demonstrates that the operational requirements in paragraphs (b), (c), or (d) of this section are not met, corrective action shall be taken as specified in §60.755(a)(3) through (5) or §60.755(c) of this subpart. If corrective actions are taken as specified in §60.755, the monitored exceedance is not a violation of the operational requirements of this section.	The following condition will be included on the Authority to Construct permit: • *If monitoring demonstrates that the operational requirements in 40 CFR 60.753(b), (c), or (d) are not met, corrective action shall be taken as specified in 40 CFR 60.755(a)(3) through (5) or 40 CFR 60.755(c). If corrective actions are taken as specified in 40 CFR 60.755, the monitored exceedance is not a violation of the operational requirements in 40 CFR 60.753. [40 CFR 60.753(g) and 40 CFR 63 Subpart AAAA]*
§60.754 Test Methods and Procedures	
§60.754(a) specifies the procedure for calculating the landfill NMOC emission rate in order to determine whether a control device is required by §60.752(b)(2).	A collection and control system has already been installed to comply with the requirements of §60.752(b)(2); therefore, these calculations are no longer required and no further discussion is necessary.
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.754(b) states that after installation of a collection and control system in compliance with §60.755, the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be removed as provided in §60.752(b)(2)(v) and includes equations for making such a determination.	If the applicant wishes to pursue the option of removing the control devices, an Authority to Construct application is required from the applicant and compliance with all other applicable regulations and rules will be required.
§60.754(c) states that when calculating emissions for PSD purposes, the owner or operator of each MSW landfill subject to the provisions of this subpart shall estimate the NMOC rate for comparison to the PSD and Major Source and significance levels of §§ 51.166 or 52.21 of this chapter using AP-42 or other approved measurement procedures.	The NMOC emission rate has been calculated using an approved measurement procedure; therefore, this requirement has been satisfied.
§60.754(d) states the calculation method to be used for the initial performance test required in §60.752(b)(2)(iii)(B).	The initial performance test has already been conducted. Therefore, this requirement is not applicable.
§60.754(e) states the methods to determine the net heating value of the combusted landfill gas for the performance test required in §60.752(b)(2)(iii)(A).	§60.752(b)(2)(iii)(A) is applicable to open flare systems. This landfill is controlled by enclosed flares. Therefore, this requirement is not applicable.
§60.755 Compliance Provisions	
Exterior vapor extraction wells, leachate collection systems, and perimeter horizontal collectors are exempt from the requirements of 40 CFR 60.755.	The following condition will be included on the Authority to Construct permit: • *All exterior vapor extraction wells, leachate collection system components, and perimeter horizontal collectors shall not be located over any waste and are exempt from the operational standards of 40 CFR 60.753 and the compliance provisions of 40 CFR 60.755. Forward Inc. shall keep records of all components that qualify for this exemption and note their location with respect to the landfill's perimeter. [40 CFR 60.752(b)(2)(ii), 60.753, 60.755, 60.756, 60.757, 60.758, 60.759, and 40 CFR 63 Subpart AAAA]*
§60.755(a)(1) lists the methodology to be used for determining the maximum expected gas generation flow rate for the landfill to determine compliance with §60.752(b)(2)(ii)(A)(1).	The following condition will be included on the Authority to Construct permit: • *For the purpose of demonstrating that the gas collection system is designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system, permittee shall use one of the equations that are listed in 40 CFR 60.755(a)(1). [40 CFR 60.755(a)(1) and 40 CFR 63 Subpart AAAA]*
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.755(a)(2) states that for the purpose of determining sufficient density of gas collectors for compliance with §60.752(b)(2)(ii)(A)(2), the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices satisfactory to the Administrator, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.	The following condition will be included on the Authority to Construct permit: • *For the purpose of determining whether there is a sufficient density of gas collectors, permittee shall design a system of vertical wells, horizontal collectors, or other collection devices satisfactory to the District, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards. [40 CFR 60.755(a)(2) and 40 CFR 63 Subpart AAAA]*
§60.755(a)(3) states that for the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with §60.752(b)(2)(ii)(A)(3), the owner or operator shall measure gauge pressure in the gas collection system header at each individual well on a monthly basis. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under §60.753(b). If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval. §60.755(a)(4) states that owners or operators are not required to expand the system as required in paragraph (a)(3) of the section during the first 180 days after gas collection system startup.	The following condition will be included on the Authority to Construct permit: • *For the purpose of demonstrating whether the landfill gas collection system flow rate is sufficient, the owner or operator shall measure gauge pressure in the gas collection system header at each individual well on a monthly basis. Except in cases where the conditions allow the wellhead to operate without a negative pressure (as outlined in this permit), action shall be initiated to correct the exceedance within 5 calendar days if a positive pressure exists. If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of a positive pressure. Any attempted corrective measure shall not cause exceedances or other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the District for approval. Expansion of the collection system during the first 180 days after gas collection system startup is not required. [40 CFR 60.755(a)(3), 60.755(a)(4), and 40 CFR 63 Subpart AAAA]*
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.755(a)(5) states that for the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in §60.753(c). If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedance within 5 calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval.	The following condition will be included on the Authority to Construct permit: • *For the purpose of identifying whether excess air infiltration into the landfill is occurring, the permittee shall monitor the temperature and nitrogen or oxygen on a monthly basis. If a well exceeds one of the temperature, nitrogen, or oxygen operating parameters of this permit, action shall be initiated to correct the exceedance within five calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the District for approval. [40 CFR 60.755(a)(5) and 40 CFR 63 Subpart AAAA]*
§60.755(a)(6) states that an owner or operator seeking to demonstrate compliance with §60.752(b)(2)(ii)(A)(4) through the use of a collection system not conforming to the specifications provided in §60.759 shall provide information satisfactory to the Administrator as specified in §60.752(b)(2)(i)(C) demonstrating that off-site migration is being controlled.	Compliance with the specifications of §60.759 will be required by the permit; therefore, this requirement does not apply.
§60.755(b) states that for the purposes of compliance with §60.753(a), each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan as provided in §60.752(b)(2)(i). Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of: (1) 5 years or more if active; or (2) 2 years or more if closed or at final grade.	The following condition will be included on the Authority to Construct permit: • *Extraction wells shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of: 1) 5 years or more for an active landfill; 2) 2 years or more for a closed landfill or a landfill at final grade. [40 CFR 60.755(b) and 40 CFR 63 Subpart AAAA]*
§60.755(c)(1) states that after installation of the collection system, the owner or operator shall monitor surface concentrations of methane along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of this section.	A condition requiring quarterly monitoring of the surface concentration of methane was presented earlier in this evaluation. The following condition will be included on the Authority to Construct permit: • *Monitoring to determine the surface concentration of methane shall be conducted using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications of 40 CFR 60.755(d). [40 CFR 60.755(c)(1), 40 CFR 60.755(d), and 40 CFR 63 Subpart AAAA]*

Continued on Next Page

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.755(c)(2) states that the background concentration of methane shall be determined by moving the probe inlet upwind and downwind the outside boundary of the landfill at a distance of at least 30 meters from the perimeter wells.	The following condition will be included on the Authority to Construct permit: • *The background concentration of methane shall be determined by moving the prove inlet upwind and downwind the outside boundary of the landfill at a distance of at least 30 meters from the perimeter walls. [40 CFR 60.755(c)(2) and 40 CFR 63 Subpart AAAA]*
§60.755(c)(3) states that surface emission monitoring shall be performed in accordance with section 4.3.1 of EPA Method 21 of Appendix A of Part 40, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions.	The following condition will be included on the Authority to Construct Permit: • *Surface monitoring of the methane concentration shall be performed in accordance with Section 4.3.1 of EPA Method 21 of Appendix A of 40 CFR, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions. [40 CFR 60.755(c)(3) and 40 CFR 63 Subpart AAAA]*
§60.755(c)(4) states that any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the following actions shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of §60.753(d). i. The location of each monitored exceedance shall be marked and the location recorded. ii. Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection of the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance. iii. If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance. If re-monitoring shows a third exceedance for the same location, the actions specified in item v shall be taken, and no further monitoring of that locations is required until the action specified in item v has been taken. **This section is continued on the next page**	The following condition will be included on the Authority to Construct permit: • Any surface monitoring reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the following actions shall be taken. As long as the following specified actions are taken, the exceedance is not a violation of the operational requirements of 40 CFR 60.753(d): 1) The location of each monitored exceedance shall be marked and the location recorded; 2) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection of the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance; 3) If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance. If re-monitoring shows a third exceedance, the action specified in item #5 of this condition shall be taken, and no further monitoring of that location is required until the action specified in item #5 has been taken;... **This condition is continued on the next Page**
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
iv. Any location that initially showed an exceedance but has a methane concentration of less than 500 ppm above background at the 10-day re-monitoring shall be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in item iii or item v shall be taken. v. For any location where the monitored methane concentration equals or exceeds 500 parts per million above backgrounds three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes, or control device, and a corresponding timeline for installation may be submitted to the Administrator for approval.	• ...4) Any location that initially showed an exceedance but has a methane concentration of less than 500 ppm above background at the 10-day re-monitoring shall be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in item #3 or item #5 of this condition shall be taken.; and 5) For any location where the monitored methane concentration equals or exceed 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes, or control device, and a corresponding timeline for installation may be submitted to the District for approval. [40 CFR 60.755(c)(4) and 40 CFR 63 Subpart AAAA]
§60.755(c)(5) states that the owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.	The following condition will be included on the Authority to Construct permit: • *Permittee shall implement a program to monitor for cover integrity and implement cover repairs, as necessary, on a monthly basis. [40 CFR 60.755(c)(5) and 40 CFR 63 Subpart AAAA]*
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.755(d) states that each owner or operator seeking to comply with the provisions of paragraph (c) of this section shall comply with the following instrumentation specifications and procedures for surface emission monitoring devices: (1) The portable analyzer shall meet the instrumentation specifications provided in section 3 of EPA Method 21 of Appendix A of this part, except that "methane" shall replace all references to VOC. (2) The calibration gas shall be methane, diluted to a nominal concentration of 500 parts per million in air. (3) To meet the performance evaluation requirements in Section 3.1.3 of EPA Method 21 of Appendix A of this part, the instrument evaluation procedures of section 4.4 of EPA Method 21 of Appendix A of this part shall be used. (4) The calibration procedures provided in section 4.2 of EPA Method 21 of Appendix A of this part shall be followed immediately before commencing a surface monitoring survey.	The following condition will be included on the authority to Construct permit: • *Monitoring to determine the surface concentration of methane shall be conducted using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications of 40 CFR 60.755(d). [40 CFR 60.755(c)(1), 40 CFR 60.755(d), and 40 CFR 63 Subpart AAAA]*
§60.755(e) states that the provisions of this subpart shall apply at all times, except during periods of start-up, shutdown, or malfunction, provided the duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices.	The following condition will be included on the Authority to Construct: • *The requirements of 40 CFR 60 Subpart WWW shall apply at all times, except during periods of start-up, shutdown, or malfunction. The duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices. [40 CFR 60.755(e) and 40 CFR 63 Subpart AAAA]*
§60.756 Monitoring of Operations	
§60.756(a) states that each owner or operator seeking to comply with §60.752(b)(2)(ii)(A) for an active gas collection system shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each well head and: (1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in §60.755(a)(3); and (2) Monitor the nitrogen or oxygen concentration of the landfill gas on a monthly basis as provided in §60.755(a)(5); and (3) Monitor the temperature of the landfill gas on a monthly basis as provided in §60.755(a)(5)	Conditions requiring monthly gauge pressure, nitrogen or oxygen, and temperature measurements were included earlier in this evaluation. The following condition will be included on the Authority to Construct: • *Permittee shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead. [40 CFR 60.756(a) and 40 CFR 63 Subpart AAAA]*
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.756(b) states that each owner or operator seeking to comply with §60.752(b)(2)(iii) using an enclosed combustor shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment: (1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts. (2) A device that records flow to or bypass of the control device. The owner or operator shall either: (i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or (ii) Secure the bypass line valve in the closed position with a car-seal or a lock and key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.	The following conditions will be included on the Authority to Construct permit: • *For each enclosed flare, permittee shall calibrate, maintain, and operate according to the manufacturer's specifications a temperature monitoring device to measure temperature in the enclosed flare with a minimum accuracy of plus or minus 1 percent of the temperature being measured, expressed in degrees Celsius, or plus or minus 0.5 degrees Celsius, whichever is greater. [40 CFR 60.756(b)(1) and 40 CFR 63 Subpart AAAA]* • *For each enclosed flare, permittee shall calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to or bypass of the control device. Permittee shall either: 1) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least once every 15 minutes; or 2) shall secure the bypass line valve in the closed position with a car-seal or a lock and key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in a closed position and that the gas flow is not diverted through the bypass line. [40 CFR 60.756(b)(2) and 40 CFR 63 Subpart AAAA]*
§60.756(c) lists requirements for owners seeking to comply with §60.752(b)(2)(iii) using an open flare.	This facility uses enclosed flares to comply with §60.752(b)(2)(iii); therefore, the requirements of §60.756(c) are not applicable.
§60.756(d) lists requirements for owners seeking to comply with §60.752(b)(2)(iii) using devices other than an open flare or enclosed combustor.	This facility uses enclosed flares to comply with §60.752(b)(2)(iii); therefore, the requirements of §60.756(d) are not applicable.
§60.756(e) states that each owner or operator seeking to install a collection device that does not meet the specifications in §60.759 or is seeking to monitor alternative parameters to those required by §60.753 through §60.756 shall provide information satisfactory to the Administrator as provided in §60.752(b)(2)(i)(B) and (C) describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator may specify additional appropriate monitoring procedures.	The control system meets the specifications of §60.759 and the facility monitors the parameters listed in §60.753 through §60.756. Therefore, the requirement listed in §60.756(e) requirement is not applicable.
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.756(e) states that each owner or operator seeking to demonstrate compliance with §60.755(c) shall monitor surface concentrations of methane according to the instrument specifications and procedures provided in §60.755(d). Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.	The following condition will be included on the Authority to Construct permit: • *For a closed landfill that has no monitored exceedances of the standard for surface concentrations of methane in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring shall return the frequency of monitoring of surface concentrations to quarterly monitoring. [40 CFR 60.756(e) and 40 CFR 63 Subpart AAAA]*
§60.757 Reporting Requirements	
§60.757(a) states that each owner or operator subject to the requirements of this subpart shall submit an initial design capacity report to the Administrator.	This reporting requirement has already been satisfied.
§60.757(b) states that each owner or operator subject to the requirements of this subpart shall submit an NMOC emission rate report to the Administrator initially and annually thereafter, except as provided for in §60.757(b)(1)(ii) or (b)(3) of this section. §60.757(b)(3) states that each owner or operator subject to the requirements of this Subpart is exempted from the requirements of paragraphs (b)(1) and (2) of this section, after the installation of a collection and control system in compliance with §60.752(b)(2), during such time as the collection and control system is in operation and in compliance with §§ 60.753 and 60.755.	The facility has installed a control device and meets the exemption requirements listed in §60.757(b)(3); therefore, this reporting requirement is not applicable.
§60.757(c) states that each owner subject to the provisions of §60.752(b)(2)(i) shall submit a collection and control system design plan to the administrator within 1 year of the first report required under paragraph (b) of this section in which the emission rate equals or exceeds 50 megagrams per year.	This reporting requirement has already been satisfied.
§60.757(d) states that each owner of a controlled landfill shall submit a closure report to the Administrator within 30 days of waste acceptance cessation. The Administrator may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the Administrator, no additional wastes may be placed into the landfill without filing a notification of modification as described under §60.7(a)(4).	The following condition will be included on the Authority to Construct permit: • *The permittee shall submit a closure report to the District within 30 days of waste acceptance cessation. The District may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the District, no additional wasted may be placed into the landfill without filing a notification of modification as described on 40 CFR 60.7(a)(4). [40 CFR 60.757(d) and 40 CFR 63 Subpart AAAA]*

Continued on Next Page

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.757(e) states that each owner or operator of a controlled landfill shall submit an equipment removal report to the Administrator within 30 days prior to removal or cessation of operation of the control equipment. (1) The equipment removal report shall contain the following: (i) A copy of the closure report submitted in accordance with paragraph (d) of this section. (ii) A copy of the initial performance test report demonstrating that the 15 year minimum control period has expired; and (iii) Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year. (2) The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in §60.752(b)(2)(v) have been met.	If the applicant wishes to pursue the option of removing the control devices, an Authority to Construct application is required from the applicant and compliance with all other applicable regulations and rules will be required.
§60.757(f) states that each owner of a landfill seeking to comply with §60.752(b)(2) using an active collection system designed in accordance with §60.752(b)(2)(ii) shall submit to the Administrator annual reports of the recorded information in (f)(1) through (f)(6) of this paragraph. The initial report is required within 180 days of installation and start-up of the collection system. For enclosed combustion devices and flares, reportable exceedances are defined under §60.758(c). The report shall include the following: (1) Value and length of time for exceedance of applicable parameters monitored under §60.756(a), (b), (c), and (d). (2) Description of duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under §60.756. (3) Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time control device was not operating (4) All periods when the control system was not operating in excess of 5 days. (5) The location of each exceedance of the 500 parts per million methane concentration as provided in §60.753(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month; and (6) The date of installation and the location of each well or collection system expansion added pursuant to paragraphs (a)(3), (b), and (c)(4) of §60.755.	The following condition will be included in the Authority to Construct permit: • *Permittee shall submit a report to the District, at least once every six months, that contains the following: 1) Value and length of time for each exceedance of applicable parameters monitored under 40 CFR 60.756(a), (b), (c), and (d); 2) Description of duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under 40 CFR 60.756; 3) Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time control device was not operating; 4) All periods when the control system was not operating in excess of five days; 5)The location of each exceedance of the 500 parts per million methane concentration as provided in 40 CFR 60.753(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month; and 6) The date of installation and the location of each well or collection system expansion added pursuant to 40 CFR 60.755(a)(3), (b), and (c)(4). [40 CFR 60.757(f) and 40 CFR 63 Subpart AAAA]*

Continued on Next Page

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.757(g) states each owner or operator seeking to comply with §60.752(b)(2)(iii) shall include the information in §60.757(g)(1) through §60.757(g)(6) with the initial performance test.	The initial performance test has already been conducted and this requirement was satisfied.
§60.758 Recordkeeping Requirements	
§60.758(a) states that except as provided in §60.752(b)(2)(i)(B), each owner or operator of an MSW landfill subject to the provisions of §60.752(b) shall keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report which triggered §60.752(b), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.	The following condition will be included on the Authority to Construct permit. • *Permittee shall keep records of the design capacity report which triggered 40 CFR 60.752(b) requirements, the current amount of solid waste in-place, and the year-by-year waste acceptance rate. [40 CFR 60.758(a) and 40 CFR 63 Subpart AAAA]*
§60.758(b) states that except as provided in §60.752(b)(2)(i)(B), each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control equipment of the following data, as measured during the initial performance test or compliance determination. Records of subsequent tests and monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal. (1) Where an operator or owner subject to the provisions of this subpart seeks to demonstrate compliance with §60.752(b)(2)(ii) (i) The maximum expected gas generation flow rate as calculated in §60.755(a)(1). (ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in §60.759(a)(1). (2) Where an owner or operator subject to this subpart seeks to demonstrate compliance with §60.752(b)(2)(iii) through the use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity greater than 44 megawatts. (i) The average combustion temperature measured at least every 15 minutes and averaged over the same time period of the performance test. (ii) The percent reduction of NMOC determined as specified in §60.752(b)(2)(iii)(B) achieved by the control device. (3) This section lists requirements for units served by a process heater or boiler. (4) This section lists requirements for units served by an open flare.	The unit is not served by an open flare or process heater. Therefore, the requirements of 40 CFR 60.758(b)(3) and (4) do not apply. The following condition will be included on the Authority to Construct permit to address the remaining 40 CFR 60.758(b) requirements: • *Permittee shall keep records of the following data, as measured during the initial performance test or compliance determination: 1) The maximum expected gas generation flow rate as calculated per 40 CFR 60.755(a)(1); 2) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices as determined using the procedures specified in 40 CFR 60.759(a)(1); 3) For each enclosed flare, the average combustion temperature measured at least every 15 minutes and averaged over the same time period for the source test; and 4) For each enclosed flare, the percent reduction of NMOC determined as specified in 40 CFR 60.752(b)(2)(iii)(B). [40 CFR 60.758(b)(1) and (2) and 40 CFR 63 Subpart AAAA]*
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.758(c) states that the owner or operator of a controlled landfill shall keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in §60.756, as well as up to date, readily accessible records of operation during which the parameter boundaries established during the most recent performance tests are exceeded. (1) The following shall constitute exceedances that shall be recorded and reported under §60.757(f); (i) For enclosed combustors except for boilers and process heaters with a design heat capacity of 44 megawatts or greater, all 3-hour periods of operation during which the average combustion temperature was more than 28 °C below the average combustion temperature during the most recent performance test at which compliance with §60.752(b)(2)(iii) was determined. (ii) For boilers or process heaters, whenever there is a change in location at which the vent steam is introduced into the flame zone as required under paragraph (b)(3) of this section.	The following condition will be included on the Authority to Construct permit: • *Permittee shall keep continuous records of the equipment operating parameters specified to be monitored in 40 CFR 60.756, as well as up to date records of operation during with the parameter boundaries established during the most recent performance tests are exceeded. For each enclosed flare, all 3-hour periods of operation during with the average combustion temperature was more than 28 degree Celsius below the average combustion temperature during the most recent performance test shall constitute an exceedance and shall be recorded and reported under 40 CFR 60.757(f). [40 CFR 60.758(c) and 40 CFR 63 Subpart AAAA]*
§60.758(d) states that the owner or operator subject to the provision of this subpart shall keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label of each collector. (1) Each owner or operator shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under §60.755(b). (2) Each owner or operator shall keep up-to-date, readily accessible documentation of the nature, date of disposition, amount, and location of asbestos-containing or non-degradable waste excluded from collection as provided in §60.759(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in §60.759(a)(3)(ii).	The following condition will be included on the Authority to Construct permit: • *Permittee shall keep, for the life of the collection system, a plot map showing each existing and planned collector in the system and providing a unique identification location label of each collector. Permittee shall keep records of the installation date and location of all newly installed collectors as specified under 40 CFR 60.755(b). Permittee shall keep records of the date of disposition, amount, and location of asbestos-containing or non-degradable waste excluded from collection as provided in 40 CFR 60.759(a)(3)(i) as well as any non-productive areas excluded from collection as provided in 40 CFR 60.759(a)(3)(ii). [40 CFR 60.758(d) and 40 CFR 63 Subpart AAAA]*
§60.758(e) states that each owner or operator shall keep for at least 5 years up-to-date, readily accessible records of all collection and control system exceedances of the operational standards in §60.753, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.	The following condition will be included on the Authority to Construct permit: • Permittee shall keep records of all collection and control system exceedances of the operational standards in 40 CFR 60.753, the reading in the subsequent month and whether or not the second reading is an exceedance, and the location of each exceedance. [40 CFR 60.758(e) and 40 CFR 63 Subpart AAAA]

Continued on Next Page

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.758(f) outlines recordkeeping requirements that convert their design capacity from volume to mass or mass to volume to demonstrate that the capacity is less than 2.5 million megagrams or 2.5 million cubic meters.	Forward Inc. Landfill is larger than these thresholds; therefore the recordkeeping requirements of §60.758(f) do not apply.
§60.759 Specifications for Active Collection Systems	
§60.759(a) requires each owner or operator to site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures, unless alternative procedures have been approved by the administrator: (1) The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat. (2) The sufficient density of gas collection devices determined in (a)(1) shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter and exterior. (3) The placement of gas collection devices in paragraph (a)(1) of this section shall control all gas producing areas except the following: (i) Any segregated area of asbestos or non-degradable material may be excluded from collection if documented as provided under §60.758(d). The documentation shall provide the nature, date of deposition, location and amount of asbestos or non-degradable material deposited in the area, and shall be provided to the Administrator upon request. (ii) Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute to less than 1 percent of the total amount of NMOC emissions from the landfill.	The following conditions will be included on the Authority to Construct permit: • *Permittee shall site active collection wells, horizontal collectors, surface collectors, and other extraction devices at a sufficient density throughout all gas producing areas of the landfill using the procedures listed in 40 CFR 60.759(a), unless alternative procedures have been approved by the District. [40 CFR 60.759(a) and 40 CFR 63 Subpart AAAA]* • *The collection devices within the landfill interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat. The design shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter and exterior. [40 CFR 60.759(a)(1) and (2) and 40 CFR 63 Subpart AAAA]* • *The placement of gas collection devices shall control all gas producing areas except the following: 1) Any segregated area of asbestos or non-degradable material may be excluded from collection if documented as provided in 40 CFR 60.758(d). The documentation shall provide the nature, date of disposition, location, and amount of asbestos or non-degradable material deposited in the area, and shall be provided to the District upon request.; 2) Any nonproductive area of the landfill may be excluded from control, provided the total of all excluded areas can be shown to contribute to less than 1 percent of the total amount of non-methane organic compound emissions from the landfill. [40 CFR 60.759(a)(3) and 40 CFR 63 Subpart AAAA)*

Continued on Next Page

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.759(b) states that each owner or operator shall construct the gas collection devices using the following equipment or procedures: (1) The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration. (2) Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover area or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations. (3) Collections devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous materials of suitable thickness.	The following conditions will be included on the Authority to Construct permit: • *The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases, withstand installation, static, and settlement forces, and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration. [40 CFR 60.759(b)(1) and 40 CFR 63 Subpart AAAA]* • *Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover area or refuse into the collection system or gas into the air. Any gravel used around pipe perforations shall be of a dimension so as not to penetrate or block perforations. [40 CFR 60.759(b)(2) and 40 CFR 63 Subpart AAAA]* • *Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous materials of suitable thickness. [40 CFR 60.759(b)(3) and 40 CFR 63 Subpart AAAA]*
Continued on Next Page	

40 CFR Part 60 Subpart WWW Requirements Continued from Previous Page	Proposed Method of Compliance with Subpart WWW Requirements
§60.759(c) states that each owner or operator shall convey the landfill gas to a gas control system in compliance with §60.752(b)(2)(iii) through the collection header pipes. The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended period of the gas moving equipment using the following procedures: (1) For existing collection systems, the flow data, if flow data exists, shall be used to project the maximum flow rate. (2) For new collection systems or existing collection system for which no flow data exists, the maximum flow rate shall be in accordance with §60.755(a)(1).	The following condition will be included on the Authority to Construct permit: • *Permittee shall convey the landfill gas to the control system through the collection header pipes. The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended period of gas moving equipment. For existing collection systems, the flow data, if flow data exists, shall be used to project the maximum flow rate. For naw collection systems or existing collection systems for which no flow data exists, the maximum flow rate shall be in accordance with 40 CFR 60.755(a)(1). [40 CFR 60.759(c) and 40 CFR 63 Subpart AAAA]*

Rule 4002 National Emission Standards for Hazardous Air Pollutants

40 CFR Part 62, Subpart GGG Federal Plan Requirements for Municipal Solid Waste Landfills that Commenced Construction Prior to May 30, 1991 and Have Not Been Modified or Reconstructed Since May 30, 1991

As stated earlier in this evaluation, this landfill has been modified since May 30, 1991. Therefore, the requirements of Subpart GGG do not apply to this landfill.

40 CFR Part 63 Subpart AAAA National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

§63.1935 Am I Subject to This Subpart

§63.1935 states that an owner or operator is subject to this subpart if they own or operate a municipal solid waste landfill that has accepted waste since November 8, 1987 or has additional capacity for waste deposition and meets any one of the following criteria:

(a) The MSW landfill is a Major Source as defined in 40 CFR 63.2 of Subpart A.
(b) The MSW landfill is collocated with a major source as defined in 40 CFR 63.2 of Subpart A.
(c) The MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million MG or 2.5 million m^3 and that is not permanent closed as of January 16, 2003.

It was previously determined that the landfill is subject to the requirements of Subpart AAAA. The following table shows the requirements of Subpart AAAA and the proposed method of compliance with those requirements.

40 CFR Part 63 Subpart AAAA Requirements	Proposed Method of Compliance with Subpart AAAA Requirements
§63.1955 What Requirements Must I Meet?	
§63.1955(a)(1) states that the landfill must comply with the requirements of 40 CFR 60 Subpart WWW.	Compliance with 40 CFR 60 Subpart WWW was demonstrated earlier in this evaluation. The permit conditions for compliance with 40 CFR 60 Subpart WWW will include a rule reference to 40 CFR 63 Subpart AAAA.
§63.1955(b) states that for landfills required to install a collection and control system by §40 CFR 60.752(b)(2) of 40 CFR 60 Subpart WWW the requirements of §§63.1960 through 63.1985 and the general NESHAPs provisions is required.	As demonstrated earlier in this evaluation, compliance is expected with 40 CFR 60 Subpart WWW requirements.
§63.1960 How is Compliance Determined?	
§63.1960 states that compliance with Subpart AAAA is determined in the same way it is determined for 40 CFR 60 Subpart WWW. If a deviation occurs for Subpart WWW, then the operator or owner has failed to meet the control device operating conditions described in Subpart AAAA and has deviated from the requirements of Subpart AAAA. Finally, the facility must develop a written SSM plan according to the provisions of 40 CFR 63.6(e)(3). A copy of the SSM plan must be maintained on site. Failure to write or maintain a copy of the SSM plan is a deviation from the requirements of Subpart AAAA.	In addition to the 40 CFR 60 Subpart WWW requirements listed earlier, the following condition will be included on the Authority to Construct permit: • *Permitee shall develop a written SSM plan according to the provisions of 40 CFR 63.6(e)(3). A copy of the SSM plan shall be maintained on site. Failure to write or maintain a copy of the SSM plan is a deviation from the requirements of 40 CFR 63 Subpart AAAA. [40 CFR 63.1960]*
§63.1965 What is a Deviation?	
§63.1965(a) states that a deviation occurs when the control device operating parameter boundaries described in §40 CFR 60.758(c)(1) of Subpart WWW are exceeded. §63.1965(b) states that a deviation occurs when 1 hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured the values for at least three 15-minute monitoring periods within the hour. §63.1965(c) states that a deviation occurs when the SSM plan is not developed or maintained on site.	In addition to previously stated permit conditions for 40 CFR 60 Subpart WWW and deviations for not developing or maintaining the SSM plan on site, the following condition shall be included on the Authority to Construct permit: • *For parameters required to be continuously monitored by 40 CFR 60 Subpart WWW, a deviation of 40 CFR 63 Subpart AAAA shall be deemed to have occurred when 1 hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour. [40 CFR 63.1965(b)]*
§63.1980 What Records and Reports Must I Keep and Submit?	
§63.1980(a) states that the owner or operator must keep records and reports as specified in 40 CFR 60 Subpart WWW. §63.1980(b) states that the owner or operator must also keep records and reports as specified in the general provisions of 40 CFR Part 60, and 40 CFR Part 63 as shown in Table 1 of this Subpart. The remainder of the recordkeeping requirements of this section is for landfills that operate bioreactors.	This landfill does not operate a bioreactor. The following condition will be included on the Authority to Construct permit: • *Permittee shall keep records and reports as specified in the general provisions of 40 CFR Part 60, and 40 CFR Part 63, as shown in Table 1 of 40 CFR part 63 Subpart AAAA. [40 CFR 63.1980(b)]*

Rule 4101 Visible Emissions

District Rule 4101, Section 5.0, indicates that no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour, which is dark or darker than Ringelmann 1 or equivalent to 20% opacity.

The following condition will be included on the Authority to Construct permit

- *{4383} No air contaminants shall be discharged into the atmosphere for a period or periods aggregating more than 3 minutes in any one hour which is as dark or darker than Ringelmann #1 or equivalent to 20% opacity and greater, unless specifically exempted by District Rule 4101 (02/17/05). If the equipment or operation is subject to a more stringent visible emission standard as prescribed in a permit condition, the more stringent visible emission limit shall supersede this condition. [District Rule 4101, and County Rules 401 (in all eight counties in the San Joaquin Valley)]*

Rule 4102 Nuisance

Section 4.0 prohibits discharge of air contaminants, which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations provided the equipment is well maintained. Therefore, compliance with this rule is expected.

The following condition will be included on the Authority to Construct permit:

- *No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]*

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – Risk Management Policy for Permitting New and Modified Sources specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

This project does not result in an increase in emissions from the landfill, nor will the project result in changes to parameters that might affect the previously determined health risk from the landfill. Therefore, a risk management review is not necessary for this project.

Rule 4201 Particulate Matter Concentration

Section 3.1 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot.

Compliance with the requirements of District Rule 4201 was demonstrated in District Project N-1062444 and this proposal will not affect that determination. The following condition will be included on the Authority to Construct permit:

- *Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]*

Rule 4301 Fuel Burning Equipment

This rule applies to fuel burning equipment, which is defined as any furnace, boiler, apparatus, stack, and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer.

The enclosed flares at this site are direct-fired and do not produce heat or power for use. Therefore, the requirements of District Rule 4301 are not applicable.

District Rule 4311 Flares

Section 4.2 of this Rule states that the requirements of District Rule 4311 are not applicable to flares that are subject to the requirements of 40 CFR 60 Subpart WWW. Since the flares are subject to the requirements of 40 CFR 60 Subpart WWW, the requirements of District Rule 4311 do not apply.

Rule 4642 Solid Waste Disposal Sites

Section 4.1.2 of this Rule states that the requirements of District Rule 4642 are not applicable to any solid waste disposal site that is subject to the requirements of 40 CFR 60 Subpart WWW. Since this landfill is subject to the requirements of 40 CFR 60 Subpart WWW, the requirements of District Rule 4642 do not apply.

Rule 4801 Sulfur Compounds

Per Section 3.1, a person shall not discharge into the atmosphere sulfur compounds, which would exist as a liquid or gas at standard conditions, exceeding in concentration at the point of discharge: 0.2 % by volume calculated as SO_2 on a dry basis averaged over 15 consecutive minutes.

Compliance with District Rule 4801 requirements was demonstrated in District Project N-1062444 and this proposal will not affect that determination.

40 CFR Part 64 Compliance Assurance Monitoring

40 CFR Part 64 requires Compliance Assurance Monitoring (CAM) for units that meet the following three criteria:

1) the unit must have an emission limit for the pollutant;
2) the unit must have add-on controls for the pollutant; these are devices such as flue gas recirculation (FGR), baghouses, and catalytic oxidizers; and
3) the unit must have a pre-control potential to emit of greater than the major source thresholds.

The following Major Source thresholds are generally used, as necessary, to determine whether CAM is triggered.

Pollutant	lb/year	ton/year
NOx	20,000	10
SOx	140,000	70
PM10	140,000	70
CO	200,000	100
VOC	20,000	10

The facility is a Major Source for NOx, CO, and VOC; therefore, a CAM determination must be performed for those pollutants. The landfill is not equipped with an add-on control device for NOx or CO; therefore, CAM is not triggered for those pollutants. While the permit includes VOC emission limitations and standards for the enclosed flares; those emission limits are based on emission limitations or standards that were proposed by EPA after November 15, 1990 pursuant to Sections 111 (NSPS) and 112 (NESHAPS) of the Clean Air Act. Pursuant to §64.2(b)(i), the requirements of Part 64 do not apply to emission limitations or standards proposed after November 15, 1990 pursuant to Sections 111 and 112 of the Clean Air Act. Since the permit will only contain emission limits that are exempt from Part 64, CAM is not triggered for VOC emissions.

California Environmental Quality Act (CEQA)

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The District adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities;
- Identify the ways that environmental damage can be avoided or significantly reduced;
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The District performed an Engineering Evaluation (this document) for the proposed project and determined that all project specific emission units do not trigger Best Available Control Technology (BACT) requirements. Furthermore, the District has determined that potential emission increases would have a less than significant health impact on sensitive receptors.

Issuance of permits for emissions units not subject to BACT requirements and with health impact less than significant is a matter of ensuring conformity with applicable District rules and regulations and does not require discretionary judgment or deliberation. Thus, the District concludes that this permitting action constitutes a ministerial approval. Section 21080 of the Public Resources Code exempts from the application of CEQA those projects over which a public agency exercises only ministerial approval. Therefore, the District finds that this project is exempt from the provisions of CEQA.

EPA Consent Decree Case No. 2:11-cv-00590 EFB

The following table lists the requirements of the EPA Consent Decree and the method of compliance with the consent decree.

EPA Consent Decree Requirement	Method of Compliance with EPA Consent Decree Requirement
Paragraph 11 of the consent decree states that except as provided in Paragraph 13, Forward Inc. Landfill shall comply with all permits issued for the Facility pursuant to the Act, District Rules 2010, 2070, 2201, and 2520 and with all applicable requirements in the following regulations relating to the operation of the gas collection and control system: (a) 40 CFR 60 Subpart WWW (b) 40 CFR 63 Subpart AAAA	Compliance with the District rules, 40 CFR 60 Subpart WWW, and 40 CFR 63 Subpart AAAA was outlined earlier in this evaluation.
Paragraph 12(a) states that Forward Landfill shall complete the previously planned "Improvements to Facility GCCS" described in Appendix A by October 31, 2012.	This requirement has been satisfied.
Paragraph 12(b) states that Forward Landfill shall apply to the District on an expedited basis for, and take all necessary action to obtain, a modification to its Title V operating permit for the Facility that will require it to operate interior wells in the GCCS at oxygen levels less than the numerical limit specified in 40 CFR 60.753(c), currently 5 percent.	This project is based on the application submitted by Forward Landfill Inc. to satisfy this requirement of the consent decree and the application was submitted prior to December 31, 2012.
Paragraph 12(c) states that Forward Landfill shall move gas probes 7 through 12 located at the edge of the landfill at least 100 feet outside of the waste line and shall maintain a minimum 100 foot buffer between the probes and the waste.	This requirement has been satisfied.
Continued on Next Page	

EPA Consent Decree Requirement Continued from Previous Page	Method of Compliance with EPA Consent Decree Requirement
Paragraph 12(d) states that Forward Landfill shall comply with the intermediate cover requirements established in California Code of Regulations Title 27 §§ 20700-20705, and shall implement a program to monitor, on a monthly basis, the integrity of the landfill's cover, and shall implement landfill cover repairs as necessary, as provided in 40 CFR §60.755(c)(5).	This requirement is not a clean air act requirement and will not be included on the permit.
Paragraph 12(e) states that Forward Landfill shall implement a program to monitor, on a monthly basis, the integrity of all well boots and seals in the GCCS, and shall repair and replace those well boots and seals as necessary to minimize oxygen intrusion into the Landfill.	This requirement is not a clean air act requirement and will not be included on the permit.
Paragraph 12(f) states that if a well is installed after February 1, 2012, as part of the GCCS, Forward Landfill shall install a sampling port at each such wellhead to take measurements of oxygen and other parameters as provided in 40 CFR §60.756(a).	A condition requiring compliance with this requirement was included in the 40 CFR 60 Subpart WWW section of this evaluation.
Paragraph 13 lists interim wellhead oxygen limit requirements.	The requirements of this paragraph expire upon the issuance and implementation of this Authority to Construct permit.
Paragraph 14 lists an interim wellhead temperature limit of 141 degrees Fahrenheit for wellheads A11-05, A11-06, A11-07, A11-08, A11-09, A11-10, A11-11, FU03-01R, FU04-14R, FU04-15R, FU04-18R, FU04-27R, FU05-08R, FU05-10R, FU06-15, FU06-16, FU08-02, and FU08-03. The alternative gas temperature limit is necessary for the indicated wells to maintain compliance and will continue to apply after the expiration of the EPA Consent Decree.	Discussed in the following section.

Request to Increase Wellhead Operating Temperature Limit for Various Wellheads

As stated in the table in the previous section, several wellheads were granted a higher operating limit of 141 degrees F by the US EPA consent decree. It is expected that these wellheads will require the 141 degree F limit for continued compliance following the issuance of the new permit; therefore, these wells will continue to be subject to the higher 141 degree F limit in the new permit.

In addition to the wells listed in the section above, the applicant has resubmitted a request (See Appendix VI) to increase the operating temperature limit for several other wellheads at the landfill. The following wellheads are listed in the latest request: A11-04, A12-02, A12-03, A12-04, A12-05, A12-13S, A12-14, A12-16, AO65RS, 05-15R, 04-19R, F12-01, F12-02, F12-03, F12-06, F12-08, F12-09, F12-10, F12-11, Top Deck Well 01, Top Deck Well 04, and Top Deck Well 05.

The facility has submitted the following reasons to supplement the request for the higher operating temperature limit for these wellheads:

1. Elevated temperatures have been observed in the deepest portions of the landfill, as shown in Figure 1 (See Appendix VI). This is a common occurrence in landfills where the deep gas exhibits the highest temperatures.

2. Installation of additional wells, as required by the New Source Performance Standards (NSPS) and the EPA Consent Decree, have not significantly helped to correct the elevated temperatures monitored in these wells; rather the installations continue to show that this area of the landfill (red location points in Figure 1, See Appendix VI) consistently operates at a higher temperature. Elevated operated temperatures can be attributed to the type of refuse in that area, decomposition rates, and depth of the refuse in the areas with the red locations points (up to 120 feet of waste material).

3. CO Concentrations detected in wells for these areas indicate normal anaerobic decomposition with no oxidation occurring; no readings in excess of 200 parts per million (ppm), the limit set by the EPA Consent Decree, have been detected. Methane Concentrations for these wells generally range from 40 to 65%.

4. In September 2012, a sample from well F12-08 was analyzed for CO by a licensed laboratory to verify the CO concentrations. The laboratory results indicate that the sample did not contain detectable concentrations of CO.

5. Limiting these wellheads to the NSPS temperature requirement of 131 degrees F requires that Forward Inc. Landfill reduces, significantly in some cases, the extraction rates on these wells, which inhibits optimal operation of the well field and will result in less LFG being collected. Consequences of continuing to operate the wells at a lower temperature include:

    a. Wells operating at a reduced vacuum result in reduced LFG extraction rates, which result in a decrease in the removal of residual heat that is generated during the decomposition process. This could cause other wells to exhibit elevated temperatures in the future.

    b. Limiting well extraction reduces the radius of influence for each well and has led to surface emissions exceedances in the vicinity of the wells. Forward Inc. Landfill has been able to reduce surface emissions by temporarily increasing the extraction rates for the wells in the affected zones. However, the well operating temperature increase due to the increase extraction rates, requiring a reducing in the extraction rate to reduce the temperature, resulting in a cyclic process of increasing/decreasing flow to correct well temperature or surface emissions. This inhibits optimal wellfield operation and the landfill gas recovery ability of the system.

40 CFR Part 60 Subpart WWW states that the owner may establish a higher operating temperature at a particular well provided there is supporting data that the elevated temperature does not cause fires or significantly inhibit anaerobic decomposition of methanogens.

The District will evaluate the request for higher operating temperatures using the following criteria:

1. Each wellhead will be evaluated independently and the decision to approve or deny a higher operating temperature limit will be determined using the data for that wellhead. This is consistent with US EPA Region III's correspondence dated January 11, 2002, which states: "Region III believes that exemptions or waivers should be granted on the basis of data for each wellhead" (US EPA Applicability Determination Index Control #0200002).

2. There must be no physical evidence of a subsurface fire, such as smoke or subsidence in the area around the wellhead.

3. Prior to approving a higher operating temperature limit for a wellhead, a temperature exceedance shall have occurred and all possible corrections to eliminate the temperature limit exceedance should have been explored. This is consistent with the Ohio EPA's "Higher Operating Value Demonstrations" guidance document and past US EPA practice.

4. In order to demonstrate that a fire is not causing the high operating temperatures in each wellhead, the measured CO concentrations should be less than 500 ppmv. This is consistent with the criteria cited by US EPA Region 4 (EPA Applicability Determination Index Control # 0600081) and the US EPA Consent Decree cited earlier in this evaluation.

5. In order to demonstrate that a higher operating temperature limit will not inhibit anaerobic digestion in the landfill, the methane concentration should be no lower than 43% by volume and the oxygen concentration should not exceed 5% by volume. This is consistent with the criteria cited by US EPA Region 5 (EPA Applicability Determination Index Control # 0800022).

The data submitted for wellheads A11-04, A12-04, A12-05, A12-13S, A12-16, AO65RS, F12-01, F12-02, F12-03, F12-06, F12-11, Top Deck Well 01, Top Deck Well 04, and Top Deck Well 05 indicates that these wells have not exceeded the NSPS limit of 131 degrees F. Since the data submitted indicates that these wellheads have not exceeded 131 degrees F, corrective action hasn't been necessary and the District cannot make a determination that all possible corrections to eliminate a temperature limit exceedance have been attempted. Therefore, these wellheads do not qualify for a higher operating temperature limit at this time. This determination doesn't preclude the applicant from submitting a higher operating temperature limit request in the future, in the event that the operating temperatures rise in these wellheads.

Wellheads A12-02, A12-03, A12-14, FU05-15R, FU04-19R, F12-08, F12-09, F12-10 have all experienced temperature exceedances and corrective actions have only been minimally effective for the reasons described by the applicant in their request. Therefore, criteria #3 from above is satisfied. No physical evidence of a subsurface fire around these wellheads has been observed. The following table shows the average temperature, average CO concentration, average methane concentration, and average oxygen content measured during the temperature exceedances in these wells:

Wellhead	Average Temperature (degrees F)	Average CO (ppmv)	Average CH_4 (% by volume)	Average O_2 (% by volume)
A12-02	135.3	90.6	56.9	0
A12-03	134.8	90	55.16	0
A12-14	135.9	99.5	57.6	0
FOFU05-15R	135.2	116.9	53.4	0.2
FOFU04-19R	135.3	50.9	103.7	0.1
F12-08	137.9	72.3	55.3	0
F12-09	134.7	48.0	56.4	0
F12-10	135.3	44.0	55.8	0.1

As demonstrated in the table above, these wells meet the criteria listed in criteria #4 and #5 on the previous page. Additionally, criteria #2 and #3 have been satisfied. Therefore, these wells qualify for a higher operating temperature limit of 141 degrees Fahrenheit.

The following CO monitoring, consistent with the US EPA Consent Decree, will be required for wells that are approved for a higher operating temperature limit:

1. Monthly CO field monitoring will be performed using draeger tubes or a District approved monitoring device, for all wells that show a temperature of 131 degrees F or greater.

2. If the field CO readings are less than 200 ppmv CO, the well may continue to operate up to 141 degrees F.

3. If the field readings are equal or greater than 200 ppmv, but below or equal to 500 ppmv CO, the well will be monitored on a weekly basis to verify that there is no subsurface oxidation occurring. Once the CO levels decrease to below 200 ppmv, monthly monitoring will be resumed.

4. If CO field monitoring results indicate a reading in excess of 500 ppmv CO, the wellhead will be temporarily closed and documented, and a sample will be obtained within one week of the exceedance and analyzed for CO using EPA Method D-1946. If results confirm the readings are in excess of 500 ppmv, the wellhead will remain closed and off-line and the District will be notified within 24 hours of the exceedance.

5. Upon notification of the District and/or EPA, Forward shall undertake such actions as directed by the District and/or EPA to further investigate the potential for subsurface oxidation in the area of the well and develop a plan for remediation

The following conditions will be included on the draft Authority to Construct permit:

- *For LFG extraction wellheads A11-05, A11-06, A11-07, A11-08, A11-09, A11-10, A11-11, A12-02, A12-03, A12-14, F12-08, F12-09, F12-10, FU03-01R, FU04-14R, FU04-15R, FU04-18R, FU04-19R FU04-27R, FU04-27R, FU05-08R, FU05-10R, FU05-15R, FU06-15, FU06-16, FU-08-02, and FU08-03, the permittee shall operate each of these wellheads with a landfill gas temperature less than 141 degrees F and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The following monitoring requirements are applicable to these wellheads: 1) The permittee shall perform monthly CO monitoring using Draeger tubes, or a District/EPA approved monitoring device, for wellheads with a measured temperature greater than 131 degrees F; 2) If the measured field CO readings are less than 200 ppmv, the well may continue to operate up to a temperature less than 141 degrees F; 3) If the measured field CO readings are equal to or greater than 200 ppmv and less than or equal to 500 ppmv, the well shall be monitored on a weekly basis to verify that there is no subsurface oxidation occurring. Once the CO levels decrease to below 200 ppmv, the monthly monitoring schedule shall resume; 4) If the measured field CO readings are in excess of 500 ppmv, the well shall be temporarily closed and documented and a sample shall be obtained within one week of the exceedance and analyzed for CO using EPA Method D-1946. If results confirm the readings are in excess of 500 ppmv, the well shall remain closed and off-line and the District shall be notified within 24 hours of the exceedance; and 5) Upon receiving notification from the District, the permittee shall undertake such actions as directed by the District and/or EPA to further investigate the potential for subsurface oxidation in the area of a wellhead and develop a plan for remediation. [40 CFR 60.753(c) and 40 CFR 63 Subpart AAAA]*

- *The permittee may request an alternative gas temperature limit for LFG extraction wellheads by submitting a request in writing to US EPA and the District. Any such request shall contain all available sampling and other evidence relevant to EPA's and the District's consideration of the requesting, including, but not limited to, the existence of suspected or actual subsurface combustion. After considering the request, EPA and the District will either grant the request or deny it, in writing. If EPA and the District grant the request for an alternative wellhead gas temperature limit for an existing wellhead, the alternative approved limit shall immediately supersede the previously applicable limit and become the new temperature limit for that wellhead. [40 CFR 60.753(c) and 40 CFR 63 Subpart AAAA]*

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Issue Authority to Construct permit N-339-17-13 subject to the permit conditions on the attached draft Authority to Construct permit in Appendix I.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Previous Fee Schedule
N-339-17-13	3020-02-H	162 MMBtu/hr	3020-02-H

Appendices

I: Draft Authority to Construct Permit
II: Authority to Construct N-339-17-10
III. Copy of EPA Consent Decree
IV: Landfill Greenhouse Gas Emission Calculations
V: Quarterly Net Emission Change Calculations
VI: Applicant's Request to Increase Wellhead Temperature Limits
VII: Facility Comments and District Response
VIII: EPA Comments and District Response
IX: EPA Request for Alternative Operating Temperatures Approval Letter

APPENDIX I

Draft Authority to Construct Permit

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: N-339-17-13 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: FORWARD INC LANDFILL
MAILING ADDRESS: 9999 S AUSTIN RD
MANTECA, CA 95336

LOCATION: 9999 S. AUSTIN ROAD
MANTECA, CA 95336

EQUIPMENT DESCRIPTION:
MODIFICATION OF 13.8 MILLION CUBIC YARD CAPACITY (218 ACRES) LANDFILL WITH LANDFILL GAS COLLECTION SYSTEM CONTROLLED BY A 2000 SCFM (EQUIVALENT TO 48.0 MMBTU/HR) ENCLOSED FLARE AND CARBON ADSORPTION SYSTEM (CAS), AND A 3400 SCFM (EQUIVALENT TO 102 MMBTU/HR) PERRENIAL ENERGY MODEL GHS-301 LFG-FIRED ENCLOSED FLARE WITH LPG PILOT: TO INCORPORATE THE REQUIREMENTS OF EPA CONSENT DECREE CASE NO 2:11-CV-00590 EFB AND TO CORRECT THE EQUIPMENT DESCRIPTION SUCH THAT THE POST-PROJECT EQUIPMENT DESCRIPTION BECOMES: 39.0 MILLION CUBIC METER CAPACITY (354.5 ACRES) LANDFILL WITH A LANDFILL GAS COLLECTION SYSTEM CONTROLLED BY A 2,000 SCFM (EQUIVALENT TO 60 MMBTU/HR) ENCLOSED LANDFILL GAS-FIRED FLARE AND A 3,400 SCFM (EQUIVALENT TO 102 MMBTU/HR) PERRENIAL ENERGY MODEL GHS-301 ENCLOSED LANDFILL GAS-FIRED FLARE WITH AN LPG-FIRED PILOT

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. All equipment shall be constructed, maintained, and operated according to the specifications and plans contained in the permit applications, except as otherwise specified herein. [District Rule 2201] Federally Enforceable Through Title V Permit
4. The enclosed flares shall each be equipped with an LPG or natural gas-fired pilot. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DRAFT

Arnaud Marjollet, Director of Permit Services

Northern Regional Office • 4800 Enterprise Way • Modesto, CA 95356-8718 • (209) 557-6400 • Fax (209) 557-6475

5. The enclosed flares shall each be equipped with automatic dampers, an automatic shutdown device, and a flame arrester. [District Rule 2201] Federally Enforceable Through Title V Permit

6. The gas collection system shall be operated in a manner which maximizes the quantity of landfill gas extracted while preventing overdraw that can cause fires or damage the gas collection system. [District Rule 2201] Federally Enforceable Through Title V Permit

7. During maintenance of the gas collection system or flares, emissions of landfill gas shall be minimized. [District Rule 2201] Federally Enforceable Through Title V Permit

8. Maintenance is defined as work performed on a gas collection system and/or control device in order to ensure continued compliance with District Rules, Regulations, and /or Permits to Operate, and to prevent its failure or malfunction. [District Rule 2201] Federally Enforceable Through Title V Permit

9. The landfill gas collected by the landfill gas collection system shall be controlled by at least one of the following devices: 1) The 60 MMBtu/hr flare; 2) the 102 MMBtu/hr flare; and/or 3) The siloxane removal system and one of the IC engines permitted under Facility ID N-8573. Each device shall be operated at all times when the collected gas is routed to it. [District Rule 2201 and 40 CFR 60.752(b)(2)(iii)(B), 40 CFR 60.753(f), and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

10. The influent landfill gas flow rate to the 60 MMBtu/hr flare shall not exceed 2,000 SCFM (corrected to 50% methane). [District Rule 2201] Federally Enforceable Through Title V Permit

11. The influent landfill gas flow rate to the 102 MMBtu/hr flare shall not exceed 3,400 SCFM (corrected to 50% methane). [District Rule 2201] Federally Enforceable Through Title V Permit

12. The VOC destruction efficiency for the 60 MMBtu/hr flare shall be at least 98% by weight or the maximum non-methane organic compound NMOC emissions from the flare shall not exceed 20 ppmv @ 3% O2 (as hexane). [District Rule 2201, 40 CFR 60.752(b)(2)(iii)(B) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

13. The VOC destruction efficiency for the 102 MMBtu/hr flare shall be at least 98% by weight or the maximum non-methane organic compound NMOC emissions from the flare shall not exceed 20 ppmv @ 3% O2 (as hexane). [District Rule 2201, 40 CFR 60.752(b)(2)(iii)(B) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

14. Emissions from the 60 MMBtu/hr flare shall not exceed any of the following limits: 0.05 lb-NOx/MMBtu, 0.0215 lb-SOx/MMBtu, 0.034 lb-PM10/MMBtu, 0.2 lb-CO/MMBtu, and 0.0113 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O2). [District Rule 2201] Federally Enforceable Through Title V Permit

15. Emissions from the 102 MMBtu/hr flare shall not exceed any of the following limits: 0.05 lb-NOx/MMBtu, 0.0215 lb-SOx/MMBtu, (0.001 lb-PM10/hr)/scfm-methane, 0.2 lb-CO/MMBtu, and 0.0113 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC as Hexane @ 3% O2). [District Rule 2201] Federally Enforceable Through Title V Permit

16. The volume of soil used for intermediate and final cover shall not exceed 61,768,080 cubic feet. [District Rule 2201] Federally Enforceable Through Title V Permit

17. PM10 emissions from the placement of the intermediate and final soil cover shall not exceed 0.008 lb/ton of soil. The volume of soil shall be converted to tons of soil using a soil density of 120 lb/cubic foot. [District Rule 2201] Federally Enforceable Through Title V Permit

18. The H2S concentration of the influent landfill gas to the flares shall not exceed 46.9 ppmv. [District Rule 2201] Federally Enforceable Through Title V Permit

19. For each flare, source testing to demonstrate compliance with the NOx (lb/MMBtu), CO (lb/MMBtu), and VOC (98% destruction efficiency or 20 ppmvd VOC @ 3% O2 as hexane) requirements of this permit shall be conducted at least once every 12 months. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit

20. Source testing for NOx shall be conducted using CARB Method 7 or CARB Method 20. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit

21. Source testing for CO shall be conducted using EPA Method 10 or 10B, CARB Methods 1 through 5 with CARB Method 10, or CARB Method 100. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

22. VOC emissions shall be conducted using EPA Method 18, 25, 25A, or 25C. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit

23. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]

24. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

25. The combustion chamber of each flare shall be maintained at a temperature of at least 1,400 degrees Fahrenheit during operation. [District Rule 2201] Federally Enforceable Through Title V Permit

26. Each flare shall be equipped with a temperature indicator and recorder that measures and continuously records the operating temperature. [District Rule 2201] Federally Enforceable Through Title V Permit

27. For each flare, the facility shall install and maintain in proper operating condition a gas flow meter with a continuous recording device that measures the quantity of landfill gas processed each day. [District Rule 2201] Federally Enforceable Through Title V Permit

28. Permittee shall perform testing to measure the H2S content of the landfill gas combusted in the flares on a quarterly basis using draeger tubes. If compliance with the landfill gas H2S content limit is demonstrated for two consecutive quarters, this testing frequency may be changed to annual. Quarterly testing shall resume if any annual test shows non-compliance with the H2S content limit. [District Rule 2201] Federally Enforceable Through Title V Permit

29. The landfill gas collection system shall be designed and operated to: 1) Handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment; 2) Collect gas from each area, cell or group of cells in the landfill in which the initial solid waste has been placed for a period of five years or more for an active landfill, or 2 years or more for a closed landfill or landfill at final grade; 3) Collect gas at a sufficient extraction rate; and 4) Minimize off-site migration of subsurface gas. [40 CFR 60.752(b)(2)(ii)(A), 40 CFR 60.753(a), and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

30. All exterior vapor extraction wells, leachate collection system components, and perimeter horizontal collectors shall not be located over any waste and are exempt from the operational standards of 40 CFR 60.753 and the compliance provisions of 40 CFR 60.755. Forward Inc. shall keep records of all components that qualify for this exemption and note their location with respect to the landfill's perimeter. [40 CFR 60.752(b)(2)(ii), 60.753, 60.755, 60.756, 60.757, 60.758, 60.759, and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

31. Permittee shall operate the landfill gas collection system with negative pressure at each wellhead except under the following conditions: 1) A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports provided in 40 CFR 60.757(f)(1); 2) Use of a geomembrane or synthetic cover. The owner shall develop acceptable pressure limits in the design plan; 3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the District. [40 CFR 60.753(b) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

32. Unless otherwise stated on this permit, the permittee shall operate each interior wellhead in the collection system with a landfill gas temperature less than 55 degrees C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. [40 CFR 60.753(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

33. For each interior wellhead, the nitrogen level shall be determined using EPA Method 3C, unless an alternative test method is established as allowed by 40 CFR 60.752(b)(2)(i). [40 CFR 60.753(c)(1) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

34. For each interior wellhead, unless an alternative test method is established as allowed by 40 CFR 60.752(b)(2)(i), the oxygen level shall be determined by an oxygen meter using EPA Method 3A or 3C except that: 1) The span shall be set so that the regulatory limit is between 20 and 50 percent of the span; 2) A data recorder is not required; 3) Only two calibration gases are required, a zero and span, and ambient air may be used as the span; 4) A calibration check is not required; and 5) The allowable sample bios, zero drift, and calibration drive are plus or minus 10 percent. [40 CFR 60.753(c)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

35. Permittee shall operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover on at least a quarterly basis. Permittee may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rational for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing. [40 CFR 60.753(d), 40 CFR 60.755, and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

36. Permittee shall operate the landfill gas collection and control system such that all collected gases are vented to a control system designed and operated in compliance with 40 CFR 60.752(b)(2)(iii). In the event the collection system or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to the venting of the gas to the atmosphere shall be closed within one hour. [40 CFR 60.753(e) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

37. If monitoring demonstrates that the operational requirements in 40 CFR 60.753(b), (c), or (d) are not met, corrective action shall be taken as specified in 40 CFR 60.755(a)(3) through (5) or 40 CFR 60.755(c). If corrective actions are taken as specified in 40 CFR 60.755, the monitored exceedance is not a violation of the operational requirements in 40 CFR 60.753. [40 CFR 60.753(g) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

38. For the purpose of demonstrating that the gas collection system is designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system, permittee shall use one of the equations that are listed in 40 CFR 60.755(a)(1). [40 CFR 60.755(a)(1) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

39. For the purpose of determining whether there is a sufficient density of gas collectors, permittee shall design a system of vertical wells, horizontal collectors, or other collection devices satisfactory to the District, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards. [40 CFR 60.755(a)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

40. For the purpose of demonstrating whether the landfill gas collection system flow rate is sufficient, the owner or operator shall measure gauge pressure in the gas collection system header at each individual well on a monthly basis. Except in cases where the conditions allow the wellhead to operate without a negative pressure (as outlined in this permit), action shall be initiated to correct the exceedance within 5 calendar days if a positive pressure exists. If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of a positive pressure. Any attempted corrective measure shall not cause exceedances or other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the District for approval. Expansion of the collection system during the first 180 days after gas collection system startup is not required. [40 CFR 60.755(a)(3), 60.755(a)(4), and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

41. For the purpose of identifying whether excess air infiltration into the landfill is occurring, the permittee shall monitor the temperature and nitrogen or oxygen on a monthly basis. If a well exceeds one of the temperature, nitrogen, or oxygen operating parameters of this permit, action shall be initiated to correct the exceedance within five calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the District for approval. [40 CFR 60.755(a)(5) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

42. Extraction wells shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of: 1) 5 years or more for an active landfill; 2) 2 years or more for a closed landfill or a landfill at final grade. [40 CFR 60.755(b) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

43. Monitoring to determine the surface concentration of methane shall be conducted using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications of 40 CFR 60.755(d). [40 CFR 60.755(c)(1), 40 CFR 60.755(d), and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

44. The background concentration of methane shall be determined by moving the prove inlet upwind and downwind the outside boundary of the landfill at a distance of at least 30 meters from the perimeter walls. [40 CFR 60.755(c)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

45. Surface monitoring of the methane concentration shall be performed in accordance with Section 4.3.1 of EPA Method 21 of Appendix A of 40 CFR, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions. [40 CFR 60.755(c)(3) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

46. Any surface monitoring reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the following actions shall be taken. As long as the following specified actions are taken, the exceedance is not a violation of the operational requirements of 40 CFR 60.753(d): 1) The location of each monitored exceedance shall be marked and the location recorded; 2) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection of the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance; 3) If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance. If re-monitoring shows a third exceedance, the action specified in item #5 of this condition shall be taken, and no further monitoring of that location is required until the action specified in item #5 has been taken; 4) Any location that initially showed an exceedance but has a methane concentration of less than 500 ppm above background at the 10-day re-monitoring shall be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in item #3 or item #5 of this condition shall be taken.; and 5) For any location where the monitored methane concentration equals or exceed 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes, or control device, and a corresponding timeline for installation may be submitted to the District for approval. [40 CFR 60.755(c)(4) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

47. Permittee shall implement a program to monitor for cover integrity and implement cover repairs, as necessary, on a monthly basis. [40 CFR 60.755(c)(5) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

48. The requirements of 40 CFR 60 Subpart WWW shall apply at all times, except during periods of start-up, shutdown, or malfunction. The duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices. [40 CFR 60.755(e) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

49. Permittee shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead. [40 CFR 60.756(a) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

50. For each enclosed flare, permittee shall calibrate, maintain, and operate according to the manufacturer's specifications a temperature monitoring device to measure temperature in the enclosed flare with a minimum accuracy of plus or minus 1 percent of the temperature being measured, expressed in degrees Celsius, or plus or minus 0.5 degrees Celsius, whichever is greater. [40 CFR 60.756(b)(1) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

51. For each enclosed flare, permittee shall calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to or bypass of the control device. Permittee shall either: 1) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least once every 15 minutes; or 2) shall secure the bypass line valve in the closed position with a car-seal or a lock and key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in a closed position and that the gas flow is not diverted through the bypass line. [40 CFR 60.756(b)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

52. For a closed landfill that has no monitored exceedances of the standard for surface concentrations of methane in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring shall return the frequency of monitoring of surface concentrations to quarterly monitoring. [40 CFR 60.756(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

53. The permittee shall submit a closure report to the District within 30 days of waste acceptance cessation. The District may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the District, no additional wasted may be placed into the landfill without filing a notification of modification as described on 40 CFR 60.7(a)(4). [40 CFR 60.757(d) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

54. Permittee shall submit a report to the District, at least once every six months, that contains the following: 1) Value and length of time for each exceedance of applicable parameters monitored under 40 CFR 60.756(a), (b), (c), and (d); 2) Description of duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under 40 CFR 60.756; 3) Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time control device was not operating; 4) All periods when the control system was not operating in excess of five days; 5)The location of each exceedance of the 500 parts per million methane concentration as provided in 40 CFR 60.753(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month; and 6) The date of installation and the location of each well or collection system expansion added pursuant to 40 CFR 60.755(a)(3), (b), and (c)(4). [40 CFR 60.757(f) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

55. Permittee shall keep records of the design capacity report which triggered 40 CFR 60.752(b) requirements, the current amount of solid waste in-place, and the year-by-year waste acceptance rate. [40 CFR 60.758(a) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

56. Permittee shall keep records of the following data, as measured during the initial performance test or compliance determination: 1) The maximum expected gas generation flow rate as calculated per 40 CFR 60.755(a)(1); 2) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices as determined using the procedures specified in 40 CFR 60.759(a)(1); 3) For each enclosed flare, the average combustion temperature measured at least every 15 minutes and averaged over the same time period for the source test; and 4) For each enclosed flare, the percent reduction of NMOC determined as specified in 40 CFR 60.752(b)(2)(iii)(B). [40 CFR 60.758(b)(1) and (2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

57. Permittee shall keep continuous records of the equipment operating parameters specified to be monitored in 40 CFR 60.756, as well as up to date records of operation during with the parameter boundaries established during the most recent performance tests are exceeded. For each enclosed flare, all 3-hour periods of operation during with the average combustion temperature was more than 28 degree Celsius below the average combustion temperature during the most recent performance test shall constitute an exceedance and shall be recorded and reported under 40 CFR 60.757(f). [40 CFR 60.758(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

58. Permittee shall keep, for the life of the collection system, a plot map showing each existing and planned collector in the system and providing a unique identification location label of each collector. Permittee shall keep records of the installation date and location of all newly installed collectors as specified under 40 CFR 60.755(b). Permittee shall keep records of the date of disposition, amount, and location of asbestos-containing or non-degradable waste excluded from collection as provided in 40 CFR 60.759(a)(3)(i) as well as any non-productive areas excluded from collection as provided in 40 CFR 60.759(a)(3)(ii). [40 CFR 60.758(d) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

59. Permittee shall keep records of all collection and control system exceedances of the operational standards in 40 CFR 60.753, the reading in the subsequent month and whether or not the second reading is an exceedance, and the location of each exceedance. [40 CFR 60.758(e) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

60. Permittee shall site active collection wells, horizontal collectors, surface collectors, and other extraction devices at a sufficient density throughout all gas producing areas of the landfill using the procedures listed in 40 CFR 60.759(a), unless alternative procedures have been approved by the District. [40 CFR 60.759(a) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

61. The collection devices within the landfill interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat. The design shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter and exterior. [40 CFR 60.759(a)(1) and (2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

62. The placement of gas collection devices shall control all gas producing areas except the following: 1) Any segregated area of asbestos or non-degradable material may be excluded from collection if documented as provided in 40 CFR 60.758(d). The documentation shall provide the nature, date of disposition, location, and amount of asbestos or non-degradable material deposited in the area, and shall be provided to the District upon request.; 2) Any nonproductive area of the landfill may be excluded from control, provided the total of all excluded areas can be shown to contribute to less than 1 percent of the total amount of non-methane organic compound emissions from the landfill. [40 CFR 60.759(a)(3) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

63. The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases, withstand installation, static, and settlement forces, and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration. [40 CFR 60.759(b)(1) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

64. Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover area or refuse into the collection system or gas into the air. Any gravel used around pipe perforations shall be of a dimension so as not to penetrate or block perforations. [40 CFR 60.759(b)(2) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

65. Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous materials of suitable thickness. [40 CFR 60.759(b)(3) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

66. Permittee shall convey the landfill gas to the control system through the collection header pipes. The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended period of gas moving equipment. For existing collection systems, the flow data, if flow data exists, shall be used to project the maximum flow rate. For new collection systems or existing collection systems for which no flow data exists, the maximum flow rate shall be in accordance with 40 CFR 60.755(a)(1). [40 CFR 60.759(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

67. Permittee shall develop a written SSM plan according to the provisions of 40 CFR 63.6(e)(3). A copy of the SSM plan shall be maintained on site. Failure to write or maintain a copy of the SSM plan is a deviation from the requirements of 40 CFR 63 Subpart AAAA. [40 CFR 63.1960] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

68. For parameters required to be continuously monitored by 40 CFR 60 Subpart WWW, a deviation of 40 CFR 63 Subpart AAAA shall be deemed to have occurred when 1 hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour. [40 CFR 63.1965(b)] Federally Enforceable Through Title V Permit

69. Permittee shall keep records and reports as specified in the general provisions of 40 CFR Part 60, and 40 CFR Part 63, as shown in Table 1 of 40 CFR part 63 Subpart AAAA. [40 CFR 63.1980(b)] Federally Enforceable Through Title V Permit

70. For LFG extraction wellheads A11-05, A11-06, A11-07, A11-08, A11-09, A11-10, A11-11, A12-02, A12-03, A12-14, F12-08, F12-09, F12-10, FU03-01R, FU04-14R, FU04-15R, FU04-18R, FU04-19R FU04-27R, FU04-27R, FU05-08R, FU05-10R, FU05-15R, FU06-15, FU06-16, FU-08-02, and FU08-03, the permittee shall operate each of these wellheads with a landfill gas temperature less than 141 degrees F and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The following monitoring requirements are applicable to these wellheads: 1) The permittee shall perform monthly CO monitoring using Draeger tubes, or a District/EPA approved monitoring device, for wellheads with a measured temperature greater than 131 degrees F; 2) If the measured field CO readings are less than 200 ppmv, the well may continue to operate up to a temperature less than 141 degrees F; 3) If the measured field CO readings are equal to or greater than 200 ppmv and less than or equal to 500 ppmv, the well shall be monitored on a weekly basis to verify that there is no subsurface oxidation occurring. Once the CO levels decrease to below 200 ppmv, the monthly monitoring schedule shall resume; 4) If the measured field CO readings are in excess of 500 ppmv, the well shall be temporarily closed and documented and a sample shall be obtained within one week of the exceedance and analyzed for CO using EPA Method D-1946. If results confirm the readings are in excess of 500 ppmv, the well shall remain closed and off-line and the District shall be notified within 24 hours of the exceedance; and 5) Upon receiving notification from the District, the permittee shall undertake such actions as directed by the District and/or EPA to further investigate the potential for subsurface oxidation in the area of a wellhead and develop a plan for remediation. [40 CFR 60.753(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

71. The permittee may request an alternative gas temperature limit for LFG extraction wellheads by submitting a request in writing to US EPA and the District. Any such request shall contain all available sampling and other evidence relevant to EPA's and the District's consideration of the requesting, including, but not limited to, the existence of suspected or actual subsurface combustion. After considering the request, EPA and the District will either grant the request or deny it, in writing. If EPA and the District grant the request for an alternative wellhead gas temperature limit for an existing wellhead, the alternative approved limit shall immediately supersede the previously applicable limit and become the new temperature limit for that wellhead. [40 CFR 60.753(c) and 40 CFR 63 Subpart AAAA] Federally Enforceable Through Title V Permit

72. Permittee shall keep records of any maintenance to the landfill gas collection or control devices, including the reason for maintenance, duration of the maintenance, and any collection or control system downtime. [District Rule 2201] Federally Enforceable Through Title V Permit

73. Permittee shall maintain records of system inspections including: date, time, and inspection results. [District Rule 1070] Federally Enforceable Through Title V Permit

74. For each flare, permittee shall keep records of emission source tests results. [District Rule 2201] Federally Enforceable Through Title V Permit

75. For each flare, permittee shall keep records of the continuous flare combustion temperature measurements, and the continuous volumetric landfill gas flow rate measurements. Permittee shall keep a daily and an annual record of the quantity of landfill gas processed in each flare. [District Rule 2201] Federally Enforceable Through Title V Permit

76. All records shall be retained for a period of at least five years and shall be made available for District inspection upon request. [District Rules 1070, 2201, 40 CFR 60 Subpart WWW, and 40 CFR 60 Subpart AAAA] Federally Enforceable Through Title V Permit

77. The permittee shall notify the District by telephone at least 24 hours prior to performing any maintenance work that requires the landfill gas collection and control system to be shutdown. The notification shall include a description of the work, the date work will be performed, and the quantity of time needed to complete the maintenance work. [District Rule 2201] Federally Enforceable Through Title V Permit

APPENDIX II

Authority to Construct N-339-17-10

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

AUTHORITY TO CONSTRUCT

PERMIT NO: N-339-17-10 **ISSUANCE DATE:** 05/14/2007

LEGAL OWNER OR OPERATOR: FORWARD, INC. LANDFILL
MAILING ADDRESS: 9999 S AUSTIN RD
MANTECA, CA 95336

LOCATION: 9999 S. AUSTIN ROAD
MANTECA, CA 95336

EQUIPMENT DESCRIPTION:
MODIFICATION OF 13.8 MILLION CUBIC YARDS CAPACITY (218 ACRES) WITH LANDFILL GAS COLLECTION SYSTEM CONTROLLED BY A 2,000 SCFM (EQUIVALENT TO 48 MMBTU/HR) ENCLOSED FLARE: INCREASE PERMITTED LFG FLOWRATE FOR THE EXISTING FLARE FROM 1,530 CFM TO 2,000 CFM (EQUIVALENT TO 48 MMBTU/HR) FOR 40 CFR SUBPART WWW COMPLIANCE, AND REVISE VOC EMISSION LIMIT TO 20 PPMV AT 3% O2 OR 98% DESTRUCTION EFFICIENCY FOR THE FLARE; INSTALL A SECOND NEW LANDFILL GAS COLLECTION SYSTEM SERVED BY A 3,400 SCFM (EQUIVALENT TO 102 MMBTU/HR) PERRENIAL ENERGY MODEL GHS-301 LFG-FIRED ENCLOSED FLARE WITH LPG PILOT FOR COMPLIANCE WITH 40 CFR 60 SUBPART WWW

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule] Federally Enforceable Through Title V Permit
2. Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. All equipment shall be constructed, maintained and operated according to the specifications and plans contained in the permit application except as otherwise specified herein. [District NSR Rule] Federally Enforceable Through Title V Permit
4. The flare shall maintain a temperature of at least 1,400 degrees F during operation. [District NSR Rule] Federally Enforceable Through Title V Permit
5. All landfill gas collected shall be controlled by the flare and/or the carbon adsorption system (CAS). [District NSR Rule] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DAVID WARNER, Director of Permit Services

N-339-17-10 : May 14 2007 3:06PM – LEE : Joint Inspection NOT Required

6. Influent LFG flowrate to the 48 MMBtu/hr flare shall not exceed 2,000 scfm @ 50% methane. [District Rule 2201] Federally Enforceable Through Title V Permit
7. Influent LFG flowrate to the 102 MMBtu/hr flare shall not exceed 3,400 scfm at 50% methane. [District Rule 2201]
8. The VOC destruction efficiency for the flares shall be at least 98% by weight or maximum NMOC emissions from the flare shall not exceed 20 ppmv @ 3% oxygen (as hexane). [District NSR Rule] Federally Enforceable Through Title V Permit
9. The carbon adsorption system (CAS) shall be at least 98% efficient by weight in controlling VOCs from the landfill gas collection system, or NMOC emissions from the CAS shall not exceed 20 ppmv @ 3% oxygen (as hexane). [District Rule 2201] Federally Enforceable Through Title V Permit
10. The landfill gas consumption rate for the CAS shall not exceed 300 scf/min. [District Rule 2201] Federally Enforceable Through Title V Permit
11. The total VOC emissions from the (CAS) shall not exceed 1.5 pounds in any one day. [District Rule 2201] Federally Enforceable Through Title V Permit
12. A minimum of two carbon canisters which are connected in series shall be utilized for the CAS. [District Rule 2201] Federally Enforceable Through Title V Permit
13. Sampling ports adequate for extraction of grab samples, measurement of gas flow rate, and use of an FID, PID, or other District-approved VOC detection device shall be provided for both the influent and the effluent gas streams of the CAS. [District Rule 1081] Federally Enforceable Through Title V Permit
14. Laboratory samples shall be taken at the initial inspection of the CAS, under the supervision of the APCD Inspector. Samples shall be taken from both the influent and the effluent gas stream sampling ports. [District Rule 1081] Federally Enforceable Through Title V Permit
15. Measurements to determine the influent and the effluent gas flow rates of the CAS shall be taken at the initial inspection. Flow rate calculations shall be submitted to the District along with the laboratory sample analysis results. [District Rule 1081] Federally Enforceable Through Title V Permit
16. Initial compliance with VOC emission rate and control efficiency requirements of the CAS shall be demonstrated by the results of the laboratory sample analysis. The results shall be submitted to the District within 60 days of the test. [District Rule 1081] Federally Enforceable Through Title V Permit
17. Sampling to demonstrate ongoing compliance with the VOC emission rate and control efficiency requirements of the CAS shall be performed at least once per week by sampling both the influent and the effluent gas streams with an FID, PID, or other District-approved VOC detection device. [District Rule 1081] Federally Enforceable Through Title V Permit
18. If carbon breakthrough is found in the first carbon canister, the second carbon canister shall be moved to the first position and a new or regenerated carbon canister shall be installed to replace the second carbon canister. [District Rule 2201] Federally Enforceable Through Title V Permit
19. The carbon canisters removed from the system shall be sealed vapor tight. [District Rule 2201] Federally Enforceable Through Title V Permit
20. Records of the cumulative running time and the measured influent and effluent VOC concentrations of the CAS shall be maintained. [District Rule 2201] Federally Enforceable Through Title V Permit
21. Carbon canister on condensate storage tank vent shall be inspected monthly for breakthrough with a District-approved portable analyzer. [District NSR Rule] Federally Enforceable Through Title V Permit
22. Emissions from the 48 MMBtu/hr flare shall not exceed any of the following emission limits: 0.05 lb NOx/MMbtu, 0.0215 lb SOx/MMbtu, 0.2 lb CO/MMbtu, 0.0113 lb VOC/MMbtu (20 ppmv), or 0.034 lb PM10/MMbtu. [District NSR Rule] Federally Enforceable Through Title V Permit
23. Emissions from the 102 MMBtu/hr flare shall not exceed any of the following emission limits: 0.05 lb NOx/MMbtu, 0.0215 lb SOx/MMbtu, 0.2 lb CO/MMbtu, 0.0113 lb VOC/MMbtu (20 ppmv), or 0.001 lb PM10/scf/hour. [District NSR Rule] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

24. The facility shall install and maintain in proper operating condition a gas flow meter with a continuous recording device which measures the amount of landfill gas consumed in the flares and the amount of landfill gas controlled by the CAS per day, each. [District NSR Rule] Federally Enforceable Through Title V Permit

25. The flares shall be equipped with a temperature indicator and recorder that measures and records the operating temperature. The temperature indicator and recorder must operate continuously. [District NSR Rule] Federally Enforceable Through Title V Permit

26. The enclosed flares shall be equipped with automatic dampers, an automatic shutdown device, and a flame arrester. [District NSR Rule] Federally Enforceable Through Title V Permit

27. The enclosed flares shall be equipped with an LPG or natural gas fired pilot. [District NSR Rule] Federally Enforceable Through Title V Permit

28. Source testing on the flares shall be performed to demonstrate compliance with the NOx and CO limits, and the VOC destruction efficiency of 98% or 20 ppmv @ 3% oxygen (as hexane) as required by this permit shall be conducted annually. [District NSR Rule] Federally Enforceable Through Title V Permit

29. Source testing for NOx shall be conducted using CARB Method 7 or Method 20. [District Rule 1081] Federally Enforceable Through Title V Permit

30. Source testing for CO shall be conducted using EPA Method 10 or 10B, CARB Methods 1 through 5 with 10, or CARB Method 100. [District Rule 1081] Federally Enforceable Through Title V Permit

31. VOC emissions shall be measured by EPA Method 18, 25, 25A, or 25C. [District Rule 1081] Federally Enforceable Through Title V Permit

32. H2S concentration of the influent landfill gas to the flares shall not exceed 46.9 ppmv. [District NSR Rule] Federally Enforceable Through Title V Permit,

33. Gas combusted in the flares shall be tested for H2S content on a quarterly basis using draeger tubes. If compliance is shown for two consecutive quarters, the testing frequency may be changed to annual. Quarterly testing shall resume if any annual test shows noncompliance. [District Rule 1081] Federally Enforceable Through Title V Permit

34. Upon receiving an approved plan for closure, or partial closure, the operator shall modify this operating permit to comply with the requirements of District Rule 4642. [District Rule 4642, 3.2 and 4.1.1] Federally Enforceable Through Title V Permit

35. Gas collection system shall be operated in a manner which maximizes the amount of landfill gas extracted while preventing overdraw that can cause fires or damage the gas collection system. [District NSR Rule] Federally Enforceable Through Title V Permit

36. During maintenance of the gas collection system or incineration device, emissions of landfill gas shall be minimized during shutdown. [District NSR Rule] Federally Enforceable Through Title V Permit

37. Maintenance is defined as work performed on a gas collection system and/or control device in order to ensure continued compliance with District rules, regulations, and/or Permits to Operate, and to prevent its failure or malfunction. [District NSR Rule] Federally Enforceable Through Title V Permit

38. The permittee shall notify the APCO by telephone at least 24 hours before performing any maintenance work that requires the system to be shutdown. The notification shall include a description of work, the date work will be performed and the amount of time needed to complete the maintenance work. [District NSR Rule] Federally Enforceable Through Title V Permit

39. Permittee shall maintain records of system inspections including: date, time and inspection results. [District Rule 1070] Federally Enforceable Through Title V Permit

40. Permittee shall maintain records of maintenance related or other collection system and control device downtime, including individual well shutdown. [District Rule 1070] Federally Enforceable Through Title V Permit

41. The operator shall record emission control device source tests (emissions of CO, NOx, and VOC) in pounds per MMbtu heat input. Operator shall also record VOC destruction/treatment efficiency. [District Rule 1081] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

42. Annual amount of soil used for intermediate and final covering shall not exceed 1,406,827 cubic yards of soil, and PM10 emissions shall not exceed 0.008 lb PM10/ton of soil (using a soil density of 3,240 lbs/cubic yard of soil). Permittee shall keep annual records of the amount of soil used for intermediate and final covering. [District NSR Rule] Federally Enforceable Through Title V Permit

43. Permittee shall maintain daily and annual records of landfill gas flow rate to the flares. [District Rule 1070] Federally Enforceable Through Title V Permit

44. All records shall be retained for a period of at least 5 years and shall be made available for District inspection upon request. [District Rule 1070] Federally Enforceable Through Title V Permit

45. A record of continuous flare combustion temperature, continuous volumetric gas flow rate, net heating value of landfill gas being combusted, daily average fuel consumption, daily average heat input, and carbon canister inspection shall be maintained, retained on the premises for a period of at least five years and made readily available for District inspection upon request. [District NSR Rule] Federally Enforceable Through Title V Permit

46. This operating permit may be cancelled with APCO approval when the landfill is closed, pursuant to the requirements of this permit, if the landfill is not otherwise subject to the requirements of either 40 CFR part 70 or part 71 and if either 1) it was never subject to the requirement for a control system under 40 CFR 60.752(b)(2); or 2) the owner or operator meets the conditions for control system removal specified in 40 CFR 60.752(b)(2)(v). [40 CFR 60.752(d)] Federally Enforceable Through Title V Permit

47. If the landfill is permanently closed, a closure notification shall be submitted to the APCO within 30 days of waste disposal cessation. A permanent closure must take place in accordance with 40 CFR 258.60. If a closure report has been submitted, no additional waste may be placed in the landfill without filing a notification of modification to the APCO, pursuant to 40 CFR 60.7(a)(4). [40 CFR 60.752(b)(1)(ii)(B), 60.757(d)]

48. An active collection system shall be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment, collect has from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade, collect gas at a sufficient extraction rate, and be designed to minimize off-site migration of subsurface gas. [40 CFR 60.752(b)(2)(ii)(A)] Federally Enforceable Through Title V Permit

49. All collected gas shall be routed to a control system designed and operated to reduce the NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency shall be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in Section 60.754(d). [40 CFR 60.752(b)(2)(iii)(B)] Federally Enforceable Through Title V Permit

50. Permittee shall operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing. [40 CFR 60.753(d)] Federally Enforceable Through Title V Permit

51. Compliance with this surface methane operational standard shall be demonstrated using the procedures outlined in 40 CFR 60.755(c) within 180 days of installation and startup of the collection and control system and quarterly thereafter. [40 CFR 60.753(d), 40 CFR 60.755(c), and 40 CFR 60.8] Federally Enforceable Through Title V Permit

52. Permittee shall operate the enclosed flare at all times when the collected gas is routed to it. [40 CFR 60.753(f)] Federally Enforceable Through Title V Permit

53. Permittee shall operate the landfill gas collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for: (1) five years or more if active; or (2) two years or more if closed or at final grade. [40 CFR 60.753(a)] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

54. Permittee shall operate the landfill gas collection system with negative pressure at each wellhead except under the following conditions: (1) A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports ass provided in 60.757(f)(1); (2) Use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the design plan; (3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the APCO. [40 CFR 60.753(b)] Federally Enforceable Through Title V Permit

55. Permittee shall operate each interior wellhead in the collection system with a landfill gas temperature less than 55 C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decompositions by killing methanogens. [40 CFR 60.753(c)] Federally Enforceable Through Title V Permit

56. The collection system shall be operated so that the methane concentration is less than 500 parts per million above background at the surface of the landfill, and such that all collected gases are vented to a control system designed and operated in compliance with § 60.752(b)(2)(iii). In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour. [40 CFR 60.753(d), (e)] Federally Enforceable Through Title V Permit

57. If monitoring demonstrates that the operational requirements in paragraphs (b), (c), or (d) of section 60.753 are not met, corrective action shall be taken as specified in 40 CFR 60.755(a)(3 - 5) or (c). If corrective actions are taken as specified in 60.755, the monitored exceedance is not a violation of the operational requirements in this section. [40 CFR 60.753(g)] Federally Enforceable Through Title V Permit

58. For each interior wellhead, the nitrogen level shall be determined using Method 3C, unless an alternative test method is established as allowed by 60.752(b)(2)(i) of this subpart. [40 CFR 60.753(c)(1)] Federally Enforceable Through Title V Permit

59. For each interior wellhead, unless an alternative test method is established as allowed by 60.752(b)(2)(i) of this subpart, the oxygen shall be determined by an oxygen meter using Method 3A or 3C except that: (i) The span shall be set so that the regulatory limit is between 20 and 50 percent of the span; (ii) A data recorder is not required; (iii) Only two calibration gases are required, a zero and span, and ambient air may be used as the span; (iv) A calibration error check is not required; (v) The allowable sample bias, zero drift, and calibration drift are ±10 percent. [40 CFR 60.753(c)(2)] Federally Enforceable Through Title V Permit

60. Permittee shall calculate the NMOC emission rate for purposes of determining when the collection and control system can be removed as provided in 40 CFR 60.752(b)(2)(v) by using the equation found in 40 CFR 60.754(b). [40 CFR 60.754(b)] Federally Enforceable Through Title V Permit

61. For the performance test required in 60.752(b)(2)(iii)(B), Method 25, 25C, or Method 18 of Appendix A must be used to determine compliance with the 98 weight percent efficiency or the 20 ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the APCO as provided by 60.752(b)(2)(i)(B). Method 3 or 3A shall be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), Method 25A should be used in place of Method 25. If using Method 18 of appendix A, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). The following equation shall be used to calculate efficiency: (NMOCin - NMOCout)/NMOCin. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081; 40 CFR 60.754(d)] Federally Enforceable Through Title V Permit

62. For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with 60.752(b)(2)(ii)(A)(1), one of the equations in Section 60.755(a)(1)(i) or (ii) or (iii) shall be used. [40 CFR 60.755(a)(1)] Federally Enforceable Through Title V Permit

63. For the purposes of determining sufficient density of gas collectors for compliance with 60.752(b)(2)(ii)(A)(2), the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the APCO, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards. [40 CFR 60.755(a)(2)] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

64. For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with 60.752(b)(2)(ii)(A)(3), the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under 60.753(b). If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the APCO for approval. [40 CFR 60.755(a)(3)] Federally Enforceable Through Title V Permit

65. Owners or operators are not required to expand the system as required in paragraph 60.755(a)(3) during the first 180 days after gas collection system startup. [40 CFR 60.755(a)(4)] Federally Enforceable Through Title V Permit

66. For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in 60.753(c). If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedance within 5 calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedance of other operational or performance standards. An alternative timeline for corrected in the exceedance may be submitted to the APCO for approval. [40 CFR 60.755(a)(5)] Federally Enforceable Through Title V Permit

67. The provisions of this subpart apply at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices. [40 CFR 60.755(e)] Federally Enforceable Through Title V Permit

68. Surface testing shall be performed on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in 40 CFR 60.755(d). [40 CFR 60.755(c)(1)] Federally Enforceable Through Title V Permit

69. The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells. [40 CFR 60.755(c)(2)] Federally Enforceable Through Title V Permit

70. Surface emission monitoring shall be performed in accordance with section 4.3.1 of Method 21 of appendix A, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions. Any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified in 40 CFR 60.755(c)(4)(i-v) shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of 60.753(d). [40 CFR 60.755(c)(3), (4)] Federally Enforceable Through Title V Permit

71. Permittee shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis. [40 CFR 60.755(c)(5)] Federally Enforceable Through Title V Permit

72. The portable analyzer shall meet the instrument specifications of Method 21, section 3 (except that "methane" shall replace all references to VOC). The calibration gas shall be methane, diluted to a nominal concentration of 500 parts per million in air. To meet the performance evaluation requirements of Method 21, section 3.1.3, the instrument evaluation procedures of Method 21, section 4.4 shall be used. The calibration procedures provided in Method 21, section 4.2 shall be followed immediately before commencing a surface monitoring survey. The provisions of this condition apply at all times, except during periods of start-up, shutdown, or malfunction which shall not exceed 5 days for collections systems and shall not exceed 1 hour for treatment or control devices. [40 CFR 60.755(d), (e)] Federally Enforceable Through Title V Permit

73. Each wellhead shall have a sampling port and a thermometer, other temperature-measuring device, or an access port for temperature measurements. [40 CFR 60.756(a)] Federally Enforceable Through Title V Permit

74. The enclosed flare shall be equipped with a temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ± 0.5 degrees Celsius, whichever is greater. [District NSR Rule; 40 CFR 60.756(b)(1)] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

75. The enclosed flare shall be equipped with either a device that records flow to the control device. The owner or operator shall install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes. [40 CFR 60.756(h)(2)] Federally Enforceable Through Title V Permit

76. Operator shall measure the gauge pressure in the gas collection header on a monthly basis as provided in § 60.755(a)(3); and monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as provided in § 60.755(a)(5); and monitor temperature of the landfill gas on a monthly basis as provided in § 60.755(a)(5). [40 CFR 60.756(a)] Federally Enforceable Through Title V Permit

77. Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring. [40 CFR 60.756(f)] Federally Enforceable Through Title V Permit

78. Each owner or operator shall keep for at least 5 years up-to-date, readily accessible, on-site records of the maximum design capacity, the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. [40 CFR 60.758(a) and District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

79. The initial annual report shall be submitted within 180 days of installation and start-up of the collection and control system, and shall include the initial performance test report required under 40 CFR 60.8. The initial report shall include information specified in 40 CFR 60.757(g)(1-6). [40 CFR 60.757(f), (g)] Federally Enforceable Through Title V Permit

80. The following constitute exceedances that shall be recorded and reported under 40 CFR 60.757(f): all 3-hour periods of operation during which the average combustion temperature was more than 28 °C below the average combustion temperature during the most recent performance test (flare source test). [40 CFR 60.758(c)] Federally Enforceable Through Title V Permit

81. Except as provided in 60.752(b)(2)(i)(B), each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control equipment of the data listed in paragraphs 60.758(b)(1) through (b)(4) as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal. [40 CFR 60.758(b)] Federally Enforceable Through Title V Permit

82. Permittee shall keep the following records: (1)(i) the maximum expected gas generation flow rate as calculated in 60.755(a)(1). The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the APCO; (ii) the density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in 60.759(a)(1); (2)(i) the average combustion temperature measured at least every 15 minutes and averaged over the same time period of the performance test; (ii) the percent reduction of NMOC determined as specified in 60.752(b)(2)(ii)(B) achieved by the control device. [40 CFR 60.758(b)(1) and (2)] Federally Enforceable Through Title V Permit

83. Permittee shall keep up-to-date, readily accessible continuous records of the indication of flow to the enclosed flare. [40 CFR 60.758(c)] Federally Enforceable Through Title V Permit

84. Except as provided in 60.752(b)(2)(i)(B), permittee shall keep, for the life of the collection system, an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector. Permittee shall keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as well as any nonproductive areas excluded from collection. [40 CFR 60.758(d)] Federally Enforceable Through Title V Permit

85. Except as provided in 60.752(b)(2)(i)(B), permittee shall keep for at least 5 years up-to-date, readily accessible records of all collection and control system exceedances of the operational standards in 60.753, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance. [40 CFR 60.758(c)] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

86. Each owner or operator seeking to comply with 40 CFR 60.752(b)(2)(i) shall site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the APCO as provided in 60.752(b)(2)(i)(C) and (D). [40 CFR 60.759(a)] Federally Enforceable Through Title V Permit

87. The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandibility, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat. [40 CFR 60.759(a)(1)] Federally Enforceable Through Title V Permit

88. The placement of gas collection devices determined in paragraph 60.759(a)(1) shall control all gas producing areas, except as provided by paragraphs 60.759(a)(3)(i) and (a)(3)(ii). [40 CFR 60.759(a)(3)] Federally Enforceable Through Title V Permit

89. The sufficient density of gas collection devices determined in paragraph 60.759(a)(1) shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior. [40 CFR 60.759(a)(2)] Federally Enforceable Through Title V Permit

90. Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under 60.758(d). The documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and shall be provided to the Administrator upon request. [40 CFR 60.759(a)(3)(i)] Federally Enforceable Through Title V Permit

91. Any nonproductive area of the landfill may be excluded from control provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material shall be documented and provided to the Administrator upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill. Emissions from each section shall be computed using the equation in Section 60.759(a)(3)(ii). [40 CFR 60.759(a)(3)(ii)] Federally Enforceable Through Title V Permit

92. The values for k and CNMOC in equation in Section 60.759(a)(3)(ii) determined in field testing shall be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (this distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k, Lo, and CNMOC provided in 60.754(a)(1) or the alternative values from 60.754(a)(5) shall be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in paragraph 60.759(a)(3)(i). [40 CFR 60.759(a)(3)(iii)] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

93. Each owner or operator seeking to comply with 60.752(b)(2)(i)(A) shall construct the gas collection devices using the following equipment or procedures: (1) The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration; (2) Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices shall he designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations; (3) Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness. [40 CFR 60.759(b)] Federally Enforceable Through Title V Permit

94. Each owner or operator seeking to comply with 60.752(b)(2)(i)(A) shall convey the landfill gas to a control system in compliance with 60.752(b)(2)(iii) through the collection header pipe(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures: (1) For existing collection systems, the flow data shall be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph 60.759(c)(2) shall be used; (2) For new collection systems, the maximum flow rate shall be in accordance with 60.755(a)(1). [40 CFR 60.759(c)] Federally Enforceable Through Title V Permit

APPENDIX III

Copy of EPA Consent Decree

BENJAMIN B. WAGNER
United States Attorney
SYLVIA QUAST
Assistant United States Attorneys
501 I Street, Suite 10-100
Sacramento, CA 95814
Telephone: (916) 554-2700
Facsimile: (916) 554-2900

Attorneys for the United States of America

IN THE UNITED STATES DISTRICT COURT

EASTERN DISTRICT OF CALIFORNIA

UNITED STATES OF AMERICA, et al. Plaintiffs, v. FORWARD, INC., Defendant.	Case No. 2:11-cv-00590 EFB CONSENT DECREE

TABLE OF CONTENTS

Plaintiffs United States of America, on behalf of the United States Environmental Protection Agency ("EPA"), and the San Joaquin Valley Unified Air Pollution Control District ("District") filed a complaint in this action on March 2, 2010, as amended by a Second Amended Complaint filed concurrently with this Consent Decree, alleging that Defendant Forward, Inc., violated Sections 111, 112, and 502 of the Clean Air Act ("Act"), 42 U.S.C. §§ 7411, 7412, and 7661a , and California Health and Safety Code §§ 39000 *et seq.*

The Complaint alleges that from 2006 to the present, Defendant, as owner and operator of the Forward Landfill ("Landfill") in Manteca, California, has operated the Landfill's gas collection and control system ("GCCS") in violation of the operating permit that Defendant obtained from the District pursuant to the Title V of the Act ("Operating Permit") and in violation of regulations for municipal solid waste landfills promulgated by EPA pursuant to the Act. The alleged violations include operating the Landfill's GCCS to allow oxygen concentrations to exceed the 15% limit and the 55 degree Celsius temperature limit for landfill gases in the Operating Permit, failing to operate the Landfill's GCCS in a manner that would prevent overdraw that could cause fires, submitting inaccurate certifications of compliance and an incomplete response to EPA's information request under section 114 of the Act, and failing to submit deviation reports to the District and EPA. The Complaint also alleges that Defendant violated District Rule 2010 and the California State Implementation Plan by operating a composting facility, a green waste and food receiving operation, a screening machine, and a tub grinder at the Landfill without first obtaining appropriate permits from the District.

Defendant denies the allegations of the Complaint and does not admit any liability to the United States or the District arising out of the transactions or occurrences alleged in the Complaint.

The Parties recognize, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith and will avoid litigation between the Parties and that this Consent Decree is fair, reasonable, and in the public interest.

NOW, THEREFORE, before the taking of any testimony, without the adjudication or admission of any issue of fact or law except as provided in Section I, and with the consent of the Parties, IT IS HEREBY ADJUDGED, ORDERED, AND DECREED as follows:

I. JURISDICTION AND VENUE

1. This Court has jurisdiction over the subject matter of this action, pursuant to 28 U.S.C. §§ 1331, 1345, and 1355, and Sections 113 and 304(a) of the Act, 42 U.S.C. §§ 7413, 7604(a), and over the Parties. The Court has jurisdiction over the District Rule violation claims asserted by the District pursuant to 28 U.S.C. § 1367. Venue lies in this judicial district pursuant to Section 113(b) of the Act, 42 U.S.C. § 7413(b), Section 304(c) of the Act, 42 U.S.C. § 7604(c), and 28 U.S.C. §§ 1391(b) and 1395(a), and 28 U.S.C. §§ 1391(b) and 1395(a), because the violations alleged in the Complaint are alleged to have occurred in, and Defendant conducts business in, this judicial district.

2. For purposes of this Decree, or any action to enforce this Decree, Defendant consents to the Court's jurisdiction and to venue in this judicial district. For purposes of this Consent Decree, Defendant agrees that the Complaint states claims upon which relief may be granted under Sections 113 and 604 of the Act, 42 U.S.C. § 7413 and § 7604, and California Health and Safety Code sections 39000 et seq.

II. APPLICABILITY

3. The obligations of this Consent Decree apply to and are binding upon the United States and the District, and upon Defendant and any successors, assigns, or other entities or persons otherwise bound by law.

4. No transfer of ownership or operation of the Facility, whether in compliance with the procedures of this Paragraph or otherwise, shall relieve Defendant of its obligation to ensure that the terms of the Decree are implemented. At least 30 Days prior to such transfer, Defendant shall provide a copy of this Consent Decree to the proposed transferee and shall simultaneously provide written notice of the prospective transfer, together with a copy of the proposed written agreement, to EPA Region 9, the United States Attorney for the Eastern District of California, and the United States Department of Justice, in accordance with Section XIV of this Decree (Notices). Any attempt to transfer ownership or operation of the Facility without complying with this Paragraph constitutes a violation of this Decree.

5. Defendant shall provide a copy of this Consent Decree to all officers, employees, and agents whose duties might reasonably include compliance with any provision of this Decree, as well as to any contractor retained to perform work required under this Consent Decree. Defendant shall

condition any such contract upon performance of the work in conformity with the terms of this Consent Decree.

6. In any action to enforce this Consent Decree, Defendant shall not raise as a defense the failure by any of its officers, directors, employees, agents, or contractors to take any actions necessary to comply with the provisions of this Consent Decree.

III. DEFINITIONS

7. Terms used in this Consent Decree that are defined in the Act or in regulations promulgated pursuant to the Act shall have the meanings assigned to them in the Act or such regulations, unless otherwise provided in this Decree. Whenever the terms set forth below are used in this Consent Decree, the following definitions shall apply:

a. "CO Analysis" shall mean the analysis of carbon monoxide ("CO") gas captured in either a summa canister or Cali-5-Bond Bag®, which is performed by a third-party independent laboratory that uses ASTM-1945, ASTM-1946, or an equivalent method with a detection limit of at least 100 parts per million by volume ("ppmv") of CO in high concentrations of methane. Alternatively, Defendants may analyze CO concentrations by using Draeger tubes or similar colorimetric gas detection tubes, provided that such CO collection and analysis shall be done in accordance with manufacturer instructions, and provided, that if the CO concentrations analyzed using such tubes exceed 200 ppmv for a sample, Defendants shall re-sample and re-analyze the landfill gas well using a third-party independent laboratory as provided above.

b. "Complaint" shall mean the Second Amended Complaint filed concurrently with this Consent Decree by the United States and the District;

c. "Consent Decree" or "Decree" shall mean this Decree and all appendices attached hereto;

d. "Day" shall mean a calendar day unless expressly stated to be a business day. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next business day;

e. "Defendant" shall mean Forward, Inc.;

f. "District" shall mean the San Joaquin Valley Unified Air Pollution Control District;

g. "EPA" shall mean the United States Environmental Protection Agency and any of its successor departments or agencies;

h. "Effective Date" shall have the definition provided in Section XV.

i. "Facility" shall mean Defendant's landfill located in Manteca, California;

j. "GCCS" means the Facility's gas collection and control system described in the Facility's Title V permit;

k. "Paragraph" shall mean a portion of this Decree identified by an arabic numeral;

l. "Parties" shall mean the United States, the District, and Defendant;

m. "Plaintiffs" shall mean the United States and the District;

n. "Section" shall mean a portion of this Decree identified by a roman numeral;

o. "United States" shall mean the United States of America, acting on behalf of EPA.

IV. CIVIL PENALTY

8. Within 30 Days after the Effective Date of this Consent Decree, Defendant shall pay the sum of $100,000 to the United States Department of Justice as a civil penalty, together with interest accruing from the date on which the Consent Decree is lodged with the Court, at the rate specified in 28 U.S.C. § 1961 as of the date of lodging. Defendant shall pay the civil penalty due by FedWire Electronic Funds Transfer ("EFT") to the U.S. Department of Justice in accordance with written instructions to be provided to Defendant, following entry of the Consent Decree, by the Financial Litigation Unit of the U.S. Attorney's Office for the Eastern District of California, 501 I Street Suite 10-100, Sacramento, CA 95818, (916) 554-2700. At the time of payment, Defendant shall send a copy of the EFT authorization form and the EFT transaction record, together with a transmittal letter, which shall state that the payment is for the civil penalty owed pursuant to the Consent Decree in *United States et al. v. Forward, Inc,* E.D. Cal. Case No. 2:11-cv-00590-EFB, and shall reference the DOJ file

number 90-5-2-1-09873, to the United States in accordance with Section XIV of this Decree (Notices); by email to acctsreceivable.CINWD@epa.gov; and by mail to:

EPA Cincinnati Finance Office
26 Martin Luther King Drive
Cincinnati, Ohio 45268

9. Defendant shall not deduct any penalties paid under this Decree pursuant to this Section or Section VIII (Stipulated Penalties) in calculating its federal, state or local income tax.

10. No later than 30 Days after the Effective Date of this Consent Decree, Defendant shall pay a civil penalty of $100,000 to the District by check made payable to the "San Joaquin Valley Unified Air Pollution Control District" and delivered by U.S. Mail to its District Counsel's office, located at 1990 E. Gettysburg Avenue, Fresno, California 93726.

V. COMPLIANCE REQUIREMENTS

11. Except as provided in Paragraph 13, Defendant shall comply with all permits issued for the Facility pursuant to the Act, District Rules 2010, 2070, 2201, and 2520, and with all applicable requirements in the following regulations relating to the operation of the GCCS:

a. "New Source Performance Standards for Municipal Solid Waste Landfills," 40 C.F.R. Part 60, Subpart WWW, 40 C.F.R. §§ 60.750-60.759 ("Landfill NSPS"); and

b. "National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills," 40 C.F.R. Part 63, Subpart AAAA, 40 C.F.R. §§ 630.1930-630.1990 ("Landfill NESHAP").

12. In addition to the applicable compliance requirements set forth in Paragraph 11, Defendant shall comply with the following specific requirements, which shall be completed no later than thirty (30) days from the Effective Date of the Consent Decree, except as provided in subparagraphs (a) and (b):

a. Defendant shall complete the Defendant's previously planned "Improvements to Facility GCCS" described in Appendix A by October 31, 2012;

b. By December 31, 2012, Defendant shall apply to the District on an expedited basis for, and take all necessary action to obtain, a modification to its Title V operating permit for the Facility that will require it to operate interior wells in the GCCS at oxygen levels at less than the

numerical limit specified in 40 C.F.R. § 60.753(c) (the numerical limit is currently 5 percent) at the time of Defendant's application. Defendant's application may seek higher limits for the wells in the Interim Well Program described in Appendix B at the time of Defendant's application, but must justify higher limits for each such well pursuant to 40 C.F.R. § 60.753(c);

c. Defendant shall move gas probes 7 through 12 located at the edge of the Landfill at least one hundred (100) feet outside of the waste line and shall maintain a minimum 100-foot buffer between the probes and the waste;

d. Defendant shall comply with the intermediate cover requirements established in California Code of Regulations Title 27 §§ 20700-20705, and shall implement a program to monitor, on a monthly basis, the integrity of the Landfill's cover, and shall implement Landfill cover repairs as necessary, as provided in 40 C.F.R. § 60.755(c)(5);

e. Defendant shall implement a program to monitor, on a monthly basis, the integrity of all well boots and seals in the GCCS, and shall repair and replace those well boots and seals as necessary to minimize oxygen intrusion into the Landfill; and

f. If any well is installed after February 1, 2012, as part of the GCCS, Defendant shall install a sampling port at each such wellhead to take measurements of oxygen and other parameters, as provided in 40 C.F.R. § 60.756(a).

13. Interim Wellhead Oxygen Limits. Between the Effective Date of this Consent Decree and the effective date of the modified permit that Defendant will apply for pursuant to Paragraph 12(b) of this Consent Decree, Defendant shall operate each interior wellhead in the GCCS with an oxygen level at less than the numerical limit specified in 40 C.F.R. § 60.753(c) (the numerical limit is currently 5 percent), except as provided for in Appendix B.

14. Interim Wellhead Gas Temperature Limits.

a. Between the Effective Date of this Consent Decree and the effective date of the modified permit that Defendant will apply for pursuant to Paragraph 12(b), Defendant shall operate extraction wells A11-05, A11-06, A11-07, A11-08, A11-09, A11-10, A11-11, FU03-01R, FU04-14R, FU04-15R, FU04-18R, FU04-27R, FU05-08R, FU05-10R, FU06-15, FU06-16, FU08-02, and FU08-03 at a gas temperature of no more than 141° F. If after the Effective Date of the Consent

Decree and prior to the effective date of the modified permit, the gas temperature in one of these wells exceeds the gas temperature limit specified in 40 C.F.R. § 60.753(c) (currently 55° C or 131° F), Defendant shall conduct a CO Analysis for that well within five business days of the exceedance. Defendant shall report the results in the quarterly reports required pursuant to Paragraph 17. If any CO Analysis reading is 1000 ppmv or above, Defendant shall notify EPA and the District Compliance Office verbally and via email within 24 hours of receipt of such reading. Also, if the gas temperature in one of these wells exceeds 141 degrees Fahrenheit, Defendant shall initiate corrective action within five Days. If correction of the exceedance cannot be achieved within 120 Days of the initial exceedance, Defendant shall:

i. Submit a request to EPA and the District for an alternative timeline for correcting exceedance; or

ii. Request an alternative gas temperature limit pursuant to Subparagraph (b) below; or

iii. Undertake such other corrective action as mutually agreed to by the Defendant and EPA.

b. As described in subparagraphs 14(a)(ii) and 14(c)(ii), Defendant may request an alternative gas temperature limit for the wellheads identified in this Paragraph by submitting its request in writing to EPA and the District. Any such request shall contain all available sampling and other evidence relevant to EPA's and the District's consideration of the requesting, including, but not limited to, the existence of suspected or actual subsurface combustion. At the Defendant's request, EPA and the District will meet with the Defendant to provide it an opportunity to present the reasons for its request. EPA and the District shall be guided in their decision by the following standards: If the results of two consecutive monthly CO Analyses for a given well that are taken immediately prior to Forward's request are below 200 ppmv, then Forward may stop monthly CO monitoring and operate the well with the higher operating temperature, but not to exceed 145 °F. If the monthly CO Analysis is above 200 ppmv and below 500 ppmv, Forward shall continue monthly monitoring but may still utilize the higher operating temperature, but not to exceed 145 °F. If the well is above 145°F or CO is above 500 ppmv, Forward shall close the well as corrective action and undertake such further actions as directed by

District and/or EPA to further investigate the potential for a subsurface fire in the area of the well. After considering Defendant's request, EPA and the District will either grant the request or deny it, in writing. If EPA and the District grant Defendant's request for an alternative wellhead gas temperature limit for an existing wellhead, the alternative approved limit shall immediately supersede the previously applicable limit and become the new interim temperature limit for that wellhead.

c. For any well installed after February 1, 2012, if the gas temperature in one of these wells exceeds 131 degrees Fahrenheit, Defendant shall initiate corrective action within five Days. If correction of the exceedance cannot be achieved within 120 Days of the initial exceedance, Defendant shall:

i. Submit a request to EPA and the District for an alternative timeline for correcting exceedance; or

ii. Request an alternative gas temperature limit pursuant to Subparagraph (b) above; or

iii. Undertake such other corrective action as mutually agreed to by the Defendant and EPA.

15. Permits. Where any compliance obligation under this Section requires Defendant to obtain a federal, District, or local permit or approval, Defendant shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals. Defendant may seek relief under the provisions of Section IX of this Consent Decree (Force Majeure) for any delay in the performance of any such obligation resulting from a failure to obtain, or a delay in obtaining, any permit or approval required to fulfill such obligation, if Defendant has submitted timely and complete applications and has taken all other actions necessary to obtain all such permits or approvals.

VI. ADDITIONAL INJUNCTIVE RELIEF

16. By December 31, 2012, Defendant will replace the seven diesel trucks currently in use in the Stockton area and three diesel trucks currently in use in the Fresno area that are all listed under the heading "2012 Replacements Stockton and Fresno" on Appendix C attached hereto, with model year 2010 or newer diesel fuel trucks. By December 31, 2013, Defendant will replace the nine diesel trucks currently in use in the Fresno area that are all listed under the heading "2013 Replacements

Fresno" on Appendix C attached hereto, with model year 2010 or newer diesel fuel trucks or, at Defendant's sole option, with CNG or LNG fueled trucks. The parties agree that implementing the truck replacement project described in this Section will reduce air emissions beyond emission reductions required by applicable California regulations, including the Diesel Particulate Matter Control Measures, 13 CCR §§ 2020 - 2021, and estimate those extra reductions to be approximately 83.2 tons of nitrogen oxide and 3.4 tons of particulate matter. Any public statement, oral or written, in print, film, or other media, made by Defendants making reference to the Additional Injunctive Relief under this Section shall include the following language: "This project was undertaken in connection with the settlement of an enforcement action, United States, et al. v. Forward, Inc, taken on behalf of the U.S. Environmental Protection Agency and the San Joaquin Valley Unified Air Pollution Control District under the Clean Air Act." Defendants shall not use or rely on emissions reductions generated as a part of the Additional Injunctive Relief under this Section in any federal, state, or local emissions averaging, banking, trading, netting, credit, or offset program.

VII. REPORTING REQUIREMENTS

17. After lodging of this Consent Decree and until termination of this Decree pursuant to Section XVIII, Defendant shall submit a quarterly report on March 30, June 30, September 30, and December 31 for the preceding quarter that includes the well monitoring data for the quarter for those parameters included in Defendant's semi-annual Title V reports to the District and EPA, the status of any construction required by Appendix A, the status of all activities required by subsection 12(c) through (f), the information required in paragraph 7 of Appendix B, and the status of any pending permit applications required by this Consent Decree. The report shall also include a description of any non-compliance with the requirements of this Consent Decree and an explanation of the violation's likely cause and of the remedial steps taken, or to be taken, to prevent or minimize such violation. The information required in a quarterly report for the second quarter of the period covered by any of Defendant's Semi-Annual Reports may be submitted in the Semi-Annual Report in lieu of a separate quarterly report. If Defendant violates, or has reason to believe that it may violate, any requirement of this Consent Decree, Defendant shall notify the United States and the District of such violation and its likely duration, in writing, within ten working Days of the Day that Defendant first becomes aware of

the violation, with an explanation of the violation's likely cause and of the remedial steps taken, or to be taken, to prevent or minimize such violation. If the cause of a violation cannot be fully explained at the time the report is due, Defendant shall so state in the report. Defendant shall investigate the cause of the violation and shall then submit an amendment to the report, including a full explanation of the cause of the violation, within 30 Days of the Day Defendant becomes aware of the cause of the violation. Nothing in this Paragraph or the following Paragraph relieves Defendant of its obligation to provide the notice required by Section IX of this Consent Decree (Force Majeure). As used herein, a permit violation will not be deemed to have occurred, and no deviation report need be submitted by Defendant to EPA or the District, if a given interior gas extraction wells exceeds the NSPS operating parameters in 40 CFR section 60.753(b)(3) for oxygen, nitrogen, or temperature so long as Forward is in compliance with the corrective action timelines in 40 CFR section 60.755(a)(5).

18. Whenever any violation of this Consent Decree or any other event affecting Defendant's performance under this Decree, or the performance of its Facility, may pose an immediate threat to the public health or welfare or the environment, Defendant shall notify EPA and the District orally or by electronic or facsimile transmission as soon as possible, but no later than 24 hours after Defendant first knew of the violation or event. This procedure is in addition to the requirements set forth in the preceding Paragraph.

19. All reports shall be submitted to the persons designated in Section XIV of this Consent Decree (Notices).

20. Each report submitted by Defendant under this Section shall be signed by an official of the submitting party and include the following certification:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

This certification requirement does not apply to emergency or similar notifications where compliance would be impractical.

21. The reporting requirements of this Consent Decree do not relieve Defendant of any reporting obligations required by the Act or implementing regulations, or by any other federal, state, or local law, regulation, permit, or other requirement.

22. Any information provided pursuant to this Consent Decree may be used by the United States or the District in any proceeding to enforce the provisions of this Consent Decree or any violation of federal or state law and as otherwise permitted by law.

VIII. STIPULATED PENALTIES

23. Defendant shall be liable for stipulated penalties to the United States and the District for violations of this Consent Decree as specified below, unless excused under Section IX (Force Majeure).

24. Late Payment of Civil Penalty. If Defendant fails to pay the civil penalty required to be paid under Section IV of this Decree (Civil Penalty) when due, Defendant shall pay a stipulated penalty of $1000 per Day for each Day that the payment is late.

25. Interim Limits. The following stipulated penalties shall accrue per violation per Day for each violation of a requirement of Paragraphs 13 or 14:

Penalty Per Violation Per Day	Period of Noncompliance
$ 1000	1st through 14th Day
$ 2000	15th through 30th Day
$ 2500	31st Day and beyond

A well will not be considered to be in violation of Paragraphs 13 or 14 for purposes of this Paragraph during the time period that Defendant is taking corrective action in accordance with 40 C.F.R. § 60.755(a)(5).

26. Injunctive Relief. The following stipulated penalties shall accrue per violation per Day for each violation of the requirements identified in Paragraphs 12 and 16:

Penalty Per Violation Per Day	Period of Noncompliance
$ 1000	1st through 14th Day
$ 2000	15th through 30th Day
$ 2500	31st Day and beyond

27. Reporting Requirements. The following stipulated penalties shall accrue per violation per Day for each violation of the reporting requirements of Section VII and Appendix B, paragraph 7, of this Consent Decree:

Penalty Per Violation Per Day	Period of Noncompliance
$ 1000	1st through 14th Day
$ 2000	15th through 30th Day
$ 4000	31st Day and beyond

28. If Defendant fails to perform as required by this Consent Decree or violates this Consent Decree, stipulated penalties under this Section shall begin to accrue on the Day after the performance was due or on the Day a violation occurred, whichever is applicable, and shall continue to accrue until performance is completed or until the violation ceases. However, if a stipulated penalty would otherwise accrue because a report required by Section VII or Appendix B, paragraph 7, is deemed by the United States or the District to contain a material deficiency, stipulated penalties shall not begin to accrue until the United States or the District has notified Defendant of any such deficiency. Stipulated penalties shall accrue simultaneously for separate violations of this Consent Decree.

29. Defendant shall pay stipulated penalties to the United States and the District within 30 Days of a written demand by either Plaintiff. Defendant shall pay 50 percent of the total stipulated penalty amount due to the United States and 50 percent to the District. The Plaintiff making a demand for payment of a stipulated penalty shall simultaneously send a copy of the demand to the other Plaintiff.

30. Either Plaintiff may in the unreviewable exercise of its discretion, reduce or waive stipulated penalties otherwise due it under this Consent Decree.

31. Stipulated penalties shall continue to accrue as provided in Paragraph 29, during any Dispute Resolution, but need not be paid until the following:

a. If the dispute is resolved by agreement or by a decision of EPA or the District that is not appealed to the Court, Defendant shall pay accrued penalties determined to be owing, together with interest, to the United States or the District within 30 Days of the effective date of the agreement or the receipt of EPA's or the District's decision or order.

b. If the dispute is appealed to the Court and the United States or the District prevails in whole or in part, Defendant shall pay all accrued penalties determined by the Court to be owing, together with interest, within 60 Days of receiving the Court's decision or order, except as provided in subparagraph c, below.

c. If any Party appeals the District Court's decision, Defendant shall pay all accrued penalties determined to be owing, together with interest, within 15 Days of receiving the final appellate court decision.

32. Defendant shall pay stipulated penalties owing to the United States in the manner set forth and with the confirmation notices required by Paragraph 8, except that the transmittal letter shall state that the payment is for stipulated penalties and shall identify the violations for which the penalties are being paid. Defendant shall pay stipulated penalties owing to the District by check made payable to the "San Joaquin Valley Unified Air Pollution Control District" and delivered by U.S. Mail to its District Counsel's office, located at 1990 E. Gettysburg Avenue, Fresno, California 93726.

33. If Defendant fails to pay stipulated penalties according to the terms of this Consent Decree, Defendant shall be liable for interest on such penalties, as provided for in 28 U.S.C. § 1961, accruing as of the date payment became due. Nothing in this Paragraph shall be construed to limit the United States or the District from seeking any remedy otherwise provided by law for Defendant's failure to pay any stipulated penalties.

34. Subject to the provisions of Section XII of this Consent Decree (Effect of Settlement/Reservation of Rights), the stipulated penalties provided for in this Consent Decree shall be in addition to any other rights, remedies, or sanctions available to the United States for Defendant's violation of this Consent Decree or applicable law. Where a violation of this Consent Decree is also a violation of a Clean Air Act requirement, Defendant shall be allowed a credit, for any stipulated penalties paid, against any statutory penalties imposed for such violation.

IX. FORCE MAJEURE

35. "Force majeure," for purposes of this Consent Decree, is defined as any event arising from causes beyond the control of Defendant, of any entity controlled by Defendant, or of Defendant's contractors that delays or prevents the performance of any obligation under this Consent

Decree despite Defendant's best efforts to fulfill the obligation. The requirement that Defendant exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure event and best efforts to address the effects of any such event (a) as it is occurring and (b) after it has occurred to prevent or minimize any resulting delay to the greatest extent possible. "Force Majeure" does not include Defendant's financial inability to perform any obligation under this Consent Decree.

36. If any event occurs or has occurred that may delay the performance of any obligation under this Consent Decree, whether or not caused by a force majeure event, Defendant shall provide notice orally or by electronic or facsimile transmission to the Plaintiffs within 72 hours of when Defendant first knew that the event might cause a delay. Within seven business days thereafter, Defendant shall provide in writing to EPA and the District an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Defendant's rationale for attributing such delay to a force majeure event if it intends to assert such a claim; and a statement as to whether, in the opinion of Defendant, such event may cause or contribute to an endangerment to public health, welfare or the environment. Defendant shall include with any notice all available documentation supporting the claim that the delay was attributable to a force majeure. Failure to comply with the above requirements shall preclude Defendant from asserting any claim of force majeure for that event for the period of time of such failure to comply, and for any additional delay caused by such failure. Defendant shall be deemed to know of any circumstance of which Defendant, any entity controlled by Defendant, or Defendant's contractors knew or should have known.

37. If EPA, after a reasonable opportunity for review and comment by the District, agrees that the delay or anticipated delay is attributable to a force majeure event, the time for performance of the obligations under this Consent Decree that are affected by the force majeure event will be extended by EPA, after a reasonable opportunity for review and comment by the District, for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure event shall not, of itself, extend the time for performance of

any other obligation. EPA will notify Defendant in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure event.

38. If EPA, after a reasonable opportunity for review and comment by the District, does not agree that the delay or anticipated delay has been or will be caused by a force majeure event, EPA will notify Defendant in writing of its decision.

39. If Defendant elects to invoke the dispute resolution procedures set forth in Section X (Dispute Resolution), it shall do so no later than 30 days after receipt of EPA's notice. In any such proceeding, Defendant shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Defendant complied with the requirements of Paragraphs 36 and 37, above. If Defendant carries this burden, the delay at issue shall be deemed not to be a violation by Defendant of the affected obligation of this Consent Decree identified to EPA and the Court.

X. DISPUTE RESOLUTION

40. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Decree. Defendant's failure to seek resolution of a dispute under this Section shall preclude Defendant from raising any such issue as a defense to an action by the United States to enforce any obligation of Defendant arising under this Decree.

41. Informal Dispute Resolution. Any dispute subject to Dispute Resolution under this Consent Decree shall first be the subject of informal negotiations. The dispute shall be considered to have arisen when one Party sends the other Party a written Notice of Dispute. Such Notice of Dispute shall state clearly the matter in dispute. The period of informal negotiations shall not exceed 20 Days from the date the dispute arises, unless expressly agreed to by all Parties and confirmed by electronic or written communication verifying such agreement. If the Parties cannot resolve a dispute by informal negotiations, then the position advanced by the United States shall be considered binding unless, within

30 Days after the conclusion of the informal negotiation period, Defendant invokes formal dispute resolution procedures as set forth below.

42. Formal Dispute Resolution. Defendant shall invoke formal dispute resolution procedures, within the time period provided in the preceding Paragraph, by serving on the United States and the District a written Statement of Position regarding the matter in dispute. The Statement of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting Defendant's position and any supporting documentation relied upon by Defendant.

43. The United States and the District shall serve their Statements of Position, if any, within 45 Days of receipt of Defendant's Statement of Position. The Plaintiffs' Statements of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting that position and any supporting documentation relied upon by the Plaintiffs. The Plaintiffs' Statements of Position shall be binding on Defendant, unless Defendant files a motion for judicial review of the dispute in accordance with the following Paragraph.

44. Defendant may seek judicial review of the dispute by filing with the Court and serving on the United States, in accordance with Section XIV of this Consent Decree (Notices), a motion requesting judicial resolution of the dispute. The motion must be filed within 30 Days of receipt of the Plaintiffs' Statements of Position pursuant to the preceding Paragraph. The motion shall contain a written Statement of Defendant's position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation, and shall set forth the relief requested and any schedule within which the dispute must be resolved for orderly implementation of the Consent Decree.

45. The United States and the District shall respond to Defendant's motion within the time period allowed by the Local Rules of this Court. Defendant may file a reply memorandum, to the extent permitted by the Local Rules.

46. Standard of Review.

a. Disputes Concerning Matters Accorded Record Review. Except as otherwise provided in this Consent Decree, in any dispute brought under Paragraph 43 (Formal Dispute Resolution) pertaining to any request by Defendant to EPA and the District pursuant to Paragraph 14 (Interim Wellhead Gas Temperature Limits) for an alternative gas temperature limit or for an alternative

timeline for correcting an exceedance, Defendant shall have the burden of demonstrating, based on the administrative record, that the position of the United States is arbitrary and capricious or otherwise not in accordance with law.

b. Other Disputes. Except as otherwise provided in this Consent Decree, Defendant shall bear the burden of demonstrating by a preponderance of the evidence that its position complies with this Consent Decree and furthers the objectives of the Consent Decree.

47. The invocation of dispute resolution procedures under this Section shall not, by itself, extend, postpone, or affect in any way any obligation of Defendant under this Consent Decree, unless and until final resolution of the dispute so provides. Stipulated penalties with respect to the disputed matter shall continue to accrue from the first Day of noncompliance, but payment shall be stayed pending resolution of the dispute as provided in Paragraph 32. If Defendant does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section VIII (Stipulated Penalties).

XI. INFORMATION COLLECTION AND RETENTION

48. The United States, the District, and their representatives, including attorneys, contractors, and consultants, shall have the right of entry into any facility covered by this Consent Decree, at all reasonable times, upon presentation of credentials, to:

a. monitor the progress of activities required under this Consent Decree;

b. verify any data or information submitted to the United States or the District in accordance with the terms of this Consent Decree;

c. obtain samples and, upon request, splits of any samples taken by Defendant or its representatives, contractors, or consultants;

d. obtain documentary evidence, including photographs and similar data; and

e. assess Defendant's compliance with this Consent Decree.

49. Upon request, Defendant shall provide EPA and the District, or their authorized representatives, splits of any samples taken by Defendant. Upon request, EPA and the District shall provide Defendant splits of any samples taken by EPA or the District.

50. Until three years after the termination of this Consent Decree, Defendant shall retain, and shall instruct its contractors and agents to preserve, all non-identical copies of all documents, records, or other information (including documents, records, or other information in electronic form) in its or its contractors' or agents' possession or control, or that come into its or its contractors' or agents' possession or control, and that relate in any manner to Defendant's performance of its obligations under this Consent Decree. This information-retention requirement shall apply regardless of any contrary corporate or institutional policies or procedures. At any time during this information-retention period, upon request by the United States or the District, Defendant shall provide copies of any documents, records, or other information required to be maintained under this Paragraph.

51. At any time during the applicable retention period in this Section and upon request by the United States or the District, Defendant shall deliver to the requestor a copy of any documents, record, or other information required to be maintained under this Section. Defendant may assert that certain documents, records, or other information is privileged under the attorney-client privilege or any other privilege recognized by federal law. If Defendant asserts such a privilege, it shall provide the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the name and title of each author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the subject of the document, record, or information; and (6) the privilege asserted by Defendant. However, no documents, records, or other information created or generated pursuant to the requirements of this Consent Decree shall be withheld on grounds of privilege.

52. Defendant may also assert that information required to be provided under this Section is protected as Confidential Business Information ("CBI") under 40 C.F.R. Part 2. As to any information that Defendant seeks to protect as CBI, Defendant shall follow the procedures set forth in 40 C.F.R. Part 2.

53. This Consent Decree in no way limits or affects any right of entry and inspection, or any right to obtain information, held by the United States or the District pursuant to applicable federal or state laws, regulations, or permits, nor does it limit or affect any duty or obligation of Defendant to

maintain documents, records, or other information imposed by applicable federal or state laws, regulations, or permits.

XII. EFFECT OF SETTLEMENT/RESERVATION OF RIGHTS

54. This Consent Decree resolves the civil claims of the United States and the District for the violations alleged in the Complaint filed through the date of lodging of this Decree.

55. The United States and the District reserve all legal and equitable remedies available to enforce the provisions of this Consent Decree, except as expressly stated in Paragraph 55. This Consent Decree shall not be construed to limit the rights of the United States or the District to obtain penalties or injunctive relief under the Act or implementing regulations, or under other federal, state, or District laws, regulations, or permit conditions, except as expressly specified in Paragraph 55. The United States and the District further reserve all legal and equitable remedies to address any imminent and substantial endangerment to the public health or welfare or the environment arising at, or posed by, Defendant's Facility, whether related to the violations addressed in this Consent Decree or otherwise.

56. In any subsequent administrative or judicial proceeding initiated by the United States or the District for injunctive relief, civil penalties, other appropriate relief relating to the Facility, Defendant shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States or the District in the subsequent proceeding were or should have been brought in the instant case, except with respect to claims that have been specifically resolved pursuant to Paragraph 54 of this Section.

57. This Consent Decree is not a permit, or a modification of any permit, under any federal, District, or local laws or regulations. Defendant is responsible for achieving and maintaining complete compliance with all applicable federal, District, and local laws, regulations, and permits; and Defendant's compliance with this Consent Decree shall be no defense to any action commenced pursuant to any such laws, regulations, or permits, except as set forth herein. The United States and the District do not, by their consent to the entry of this Consent Decree, warrant or aver in any manner that

Defendant's compliance with any aspect of this Consent Decree will result in compliance with provisions of the Act or with any other provisions of federal, state, or local laws, regulations, or permits.

58. This Consent Decree does not limit or affect the rights of Defendant or of the United States or the District against any third parties, not party to this Consent Decree, nor does it limit the rights of third parties, not party to this Consent Decree, against Defendant, except as otherwise provided by law.

59. This Consent Decree shall not be construed to create rights in, or grant any cause of action to, any third party not party to this Consent Decree.

XIII. COSTS

60. The Parties shall bear their own costs of this action, including attorneys' fees, except that the United States and the District, if they are determined to be the prevailing party by the Court, shall be entitled to collect the costs (including attorneys' fees) incurred in any action necessary to collect any portion of the civil penalty or any stipulated penalties due but not paid by Defendant.

XIV. NOTICES

61. Unless otherwise specified herein, whenever notifications, submissions, or communications are required by this Consent Decree, they shall be made in writing and addressed as follows:

To the United States:

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
Box 7611 Ben Franklin Station
Washington, D.C. 20044-7611
Re: DOJ No. 90-5-2-1-09873

and

Sylvia Quast
United States Attorney's Office
Eastern District of California
Suite 10-100
501 I Street
Sacramento, CA 95814

To EPA:

Brian P. Riedel
U.S. Environmental Protection Agency
Office of the Regional Counsel
Region 9
75 Hawthorne Street
Mail Code: ORC-2
San Francisco, CA 94105

To the District:

Catherine Redmond, District Counsel
San Joaquin Valley Unified Air Pollution Control District
1990 E. Gettysburg Avenue
Fresno, CA 92726

and

Morgan Lambert, Compliance Director
San Joaquin Valley Unified Air Pollution Control District
1990 E. Gettysburg Avenue
Fresno, CA 92726

To Defendant(s):

Kevin Basso
General Manager
Forward, Inc.
1145 W Charter Way
Stockton, CA 95206

and

Tim Benter
Vice President & Deputy General Counsel
Republic Services, Inc.
18500 North Allied Way
Phoenix, AZ 85054

and

Thomas Bruen
Law Offices of Thomas M. Bruen, P.C.
1990 N. California Blvd, Ste 620
Walnut Creek, CA 94596

62. Any Party may, by written notice to the other Parties, change its designated notice recipient or notice address provided above.

63. Notices submitted pursuant to this Section shall be deemed submitted upon mailing, unless otherwise provided in this Consent Decree or by mutual agreement of the Parties in writing.

XV. EFFECTIVE DATE

64. The Effective Date of this Consent Decree shall be the date upon which this Consent Decree is entered by the Court or a motion to enter the Consent Decree is granted, whichever occurs first, as recorded on the Court's docket.

XVI. RETENTION OF JURISDICTION

65. The Court shall retain jurisdiction over this case until termination of this Consent Decree, for the purpose of resolving disputes arising under this Decree or entering orders modifying this Decree, pursuant to Sections X and XVII, or effectuating or enforcing compliance with the terms of this Decree.

XVII. MODIFICATION

66. The terms of this Consent Decree, including any attached appendices, may be modified only by a subsequent written agreement signed by all the Parties. Where the modification constitutes a material change to this Decree, it shall be effective only upon approval by the Court.

XVIII. TERMINATION

67. All obligations set forth in Section V, including all reporting requirements pertaining to Section V obligations, shall terminate when the District permit that Defendant is applying for under paragraph 12(b) becomes effective, provided that:

a. Defendant has certified to the EPA and the District that it has fulfilled all obligations of Section V of this Decree and all reporting requirements pertaining to those obligations, has paid the civil penalty under Section IV of this Decree and any outstanding stipulated penalties under Section VIII, and

b. EPA, after consultation with the District, has accepted Defendant's certification and agrees that termination of the Section V obligations, including the relevant reporting obligations, is appropriate under the terms of the Consent Decree.

68. This Consent Decree, including all remaining obligations under this Consent Decree, shall terminate on July 1, 2014, provided that Defendant has certified to the EPA and the District that it has fulfilled all obligations of this Decree, and that EPA, after consultation with the District, has accepted Defendant's certification and agrees that termination of the remaining obligations is appropriate under the terms of the Consent Decree. The Parties shall file with the Court an appropriate stipulation reciting that the requirements of the Consent Decree have been met and notifying the Court of the termination of the Decree.

69. If EPA or the District does not agree that the obligations of the Consent Decree have been fulfilled by Defendant, Defendant may invoke Section X (Dispute Resolution) of this Decree. However, Defendant shall not seek Dispute Resolution under Paragraph 41 (Formal Dispute Resolution) of any dispute regarding termination until after it submits to EPA and the District certification that it has fulfilled the obligations in question.

XIX. PUBLIC PARTICIPATION

70. This Consent Decree shall be lodged with the Court for a period of not less than 30 Days for public notice and comment in accordance with 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations indicating that the Consent Decree is inappropriate, improper, inadequate, or that it is inconsistent with the requirements of the Act. This Consent Decree is also subject to the public participation requirement in section 113(g) of the Act, 42 U.S.C. § 7413(g). Defendant consents to entry of this Consent Decree without further notice and agrees not to withdraw from or oppose entry of this Consent Decree by the Court or to challenge any provision of the Decree, unless the United States has notified Defendant in writing that it no longer supports entry of the Decree.

XX. SIGNATORIES/SERVICE

71. Each undersigned representative of Defendant, the District, and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind the Party he or she represents to this document.

72. This Consent Decree may be signed in counterparts, and its validity shall not be challenged on that basis. Defendant agrees to accept service of process by mail with respect to all matters arising under or relating to this Consent Decree and to waive the formal service requirements set forth in Rules 4 and 5 of the Federal Rules of Civil Procedure and any applicable Local Rules of this Court including, but not limited to, service of a summons.

XXI. INTEGRATION

73. This Consent Decree constitutes the final, complete, and exclusive agreement and understanding among the Parties with respect to the settlement embodied in the Decree and supercedes all prior agreements and understandings, whether oral or written, concerning the settlement embodied herein. No other document, nor any representation, inducement, agreement, understanding, or promise, constitutes any part of this Decree or the settlement it represents, nor shall it be used in construing the terms of this Decree.

XXII. FINAL JUDGMENT

74. Upon approval and entry of this Consent Decree by the Court, this Consent Decree shall constitute a final judgment of the Court as to the United States, the District, and Defendant.

XXIII. APPENDICES

75. The following appendices are attached to and part of this Consent Decree:

"Appendix A" is the "Improvements to Facility GCCS," "Appendix B" is the "Intermittent Well Program," and "Appendix C" is the "Schedule for Landfill Fleet Truck Replacement."

Dated and entered this __ day of _____, 2012.

Edmund F. Brennan
UNITED STATES MAGISTRATE JUDGE
Eastern District of California

FOR PLAINTIFF UNITED STATES OF AMERICA:

DATED: March ___, 2012

IGNACIA S. MORENO
Assistant Attorney General
Environment and Natural Resources Division
United States Department of Justice

DATED: March ___, 2012

BENJAMIN B. WAGNER
United States Attorney

SYLVIA QUAST
Assistant U.S. Attorney
U.S. Attorney's Office
Eastern District of California

FOR PLAINTIFF UNITED STATES OF AMERICA:

DATED: March ___, 2012

JARED BLUMENFELD
Regional Administrator
U.S. Environmental Protection Agency
Region 9

OF COUNSEL:
BRIAN P. RIEDEL
Assistant Regional Counsel
U.S. Environmental Protection Agency
Region 9

DATED: March ___, 2012

CYNTHIA GILES
Assistant Administrator
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency

FOR PLAINTIFF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT:

DATED: March ___, 2012

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

CATHERINE T. REDMOND
District Counsel
Attorneys for the San Joaquin Valley Unified Air Pollution Control District

FOR DEFENDANT FORWARD, INC.:

DATED: March ___, 2012

TIM BENTER
Vice-President and Assistant Secretary
Forward, Inc.

DATED: March ___, 2012

LAW OFFICES OF THOMAS M. BRUEN
A Professional Corporation

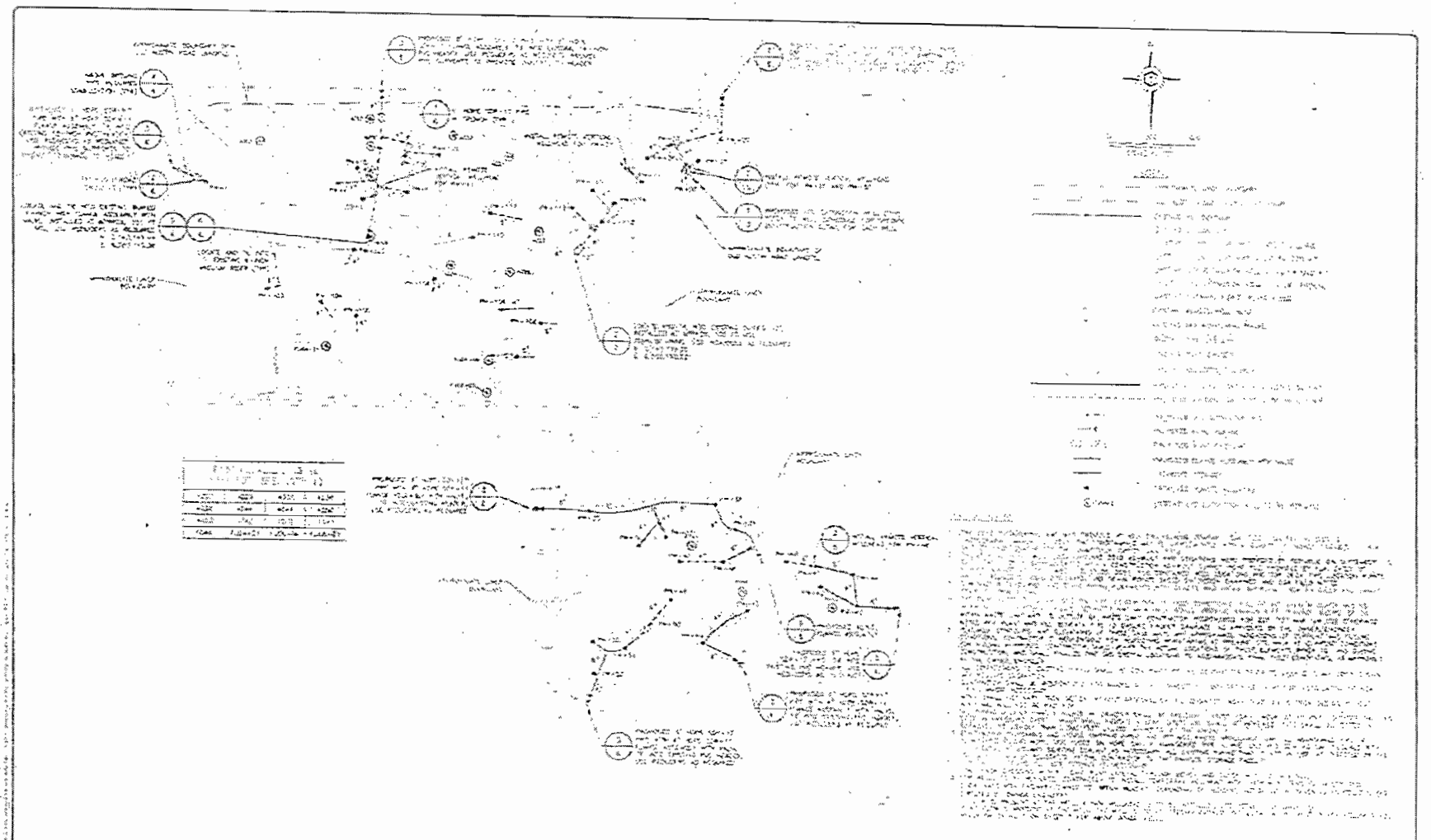
THOMAS M. BRUEN
Attorneys for Forward, Inc.

APPENDIX A

IMPROVEMENTS TO FACILITY GCCS

1) Defendant shall abandon the following gas extraction wells in the GCCS: AO01, AO02, AO03, AO04, AO05, AO06, AO08, AO09, AO10, AO11, AO12, AO13, AO14, AO15, AO16, AO17, AO18, AO19, AO20, AO21, AO22, AO23, AO24, AO25, AO28, AO32, AO37, AO40, AO41, AO42, AO46, AO48, AO49, AO54, AO56, AO59, AO61, AO62, AO65, AO64, AO67, AO68, AO70, AO71, FOFU6-HC1, FU03-01, FU03-03, FU03-05, FU03-08, FU03-14, FU04-01, FU04-02, FU04-03, FU04-09, FU04-10, FU04-14, FU04-15, FU04-18, FU04-19, FU04-22, FU04-27, FU05-04, FU05-08, FU05-10, FU05-15, FU05-16, FU06-04, FU06-05, FU06-10, FU06-14, FO03, FO05, FO06, FO07, FO09, FO10, FO11, FO13, FO14, FO15, FO16, FO17, FO18, FO20, FO23, FO25, FO26, FO27, FO28, FO29, FO31, FO32, FO33, FO34, FO35, FO36, FO37, FO38, FO44, FO48, FO49, FO50, FO54, FO55, FO56, FO59, FO60, FO61, FO63, FO65, FO69, FO70, FO71, FO72, FO85, FO88, FO94, FO98, FO100, FO101, FOHC-1A, FOHC-2A, FOHC-3A, FOHC-3B, FOHC-4B, FOHC-5A; Covanta East Manifold Wells -02, -05, -06, -07, -11, -12; and Covanta West Manifold Wells -01 and -02.

2) Defendant shall install gas extraction wells PW-1 through PW-53 in compliance with the drawing entitled "2012 GCCS Improvements Construction Site Plan" attached hereto, except that the number of wells to be installed may be modified by up to 10% of the total, and the specified placement of the wells may be altered by up to 75 feet. The placement of specific wells may be altered by more than 75 feet where required due to the presence of soil stockpiles, site traffic patterns or the location of the work face, as long as the total number of wells has not decreased. Defendant shall notify the United States and the District 21 days in advance if it decides to modify the number or alter the placement of the wells to be installed, and explain why the proposed change is required.



ISSUED FOR BIDDING

CORNERSTONE

2

APPENDIX B

INTERMITTENT WELL PROGRAM

1) The Intermittent Well Program ("IWP") shall consist of the following extraction wells:

A) AO26, AO30, AO43, AO47, AO51, AO53, AO55, AO57, AO60, AO65R, AO68, AO66, AO69, FU03-HORZ-1, FU03-HORZ-2, FU03-10, FU03-12, FU03-13, FU04-16, FU04-17, FU04-23, FU04-28, FU05-11, FU06-HC1, FU06-HC2, FU06-01, FU06-02, FU06-08, FU034-WEL, FO02, FO04, FO08, FO19, FO21, FO43, FO47, FO52, FO57, FO63, FO64, FO67, FO89, FO90, FO91, FO99, FOHC-2B, and FOHC-4A.

B) Those extraction wells added to the IWP pursuant to paragraphs 6 and 7 of this Appendix.

2) Defendant shall keep wells in the IWP closed, unless the 500 parts per million by volume ("ppmv") methane concentration limits established in 40 C.F.R. 60.753(d) and 60.755(c) or the 25 ppmv methane concentration limit for integrated surface monitoring are exceeded within 50 meters of the well, in which case Defendant may open and operate the well until methane concentrations return to below 500 ppmv or 25 ppmv, as applicable. Defendant may also open a well in the IWP if Defendant receives approval in writing in advance from the Compliance Director of the District or his designee. A well that has been opened and is being operated pursuant to this paragraph is not subject to the 5% oxygen limit set forth in Paragraph 14 of the Consent Decree.

3) Defendant may open and operate a well in the IWP provided that oxygen concentrations in the well are below 5% for two consecutive monthly monitoring events. If the well subsequently exceeds the 5% limit, Defendant shall take the actions specified in paragraph 6 of this Appendix. Within ten days of opening a well pursuant to paragraph (2), Defendant will notify EPA and the Compliance Director of the District that it has opened the well, the basis for doing so, and the current oxygen levels in the well.

4) If a well in the IWP has been closed for twelve continuous months after the Effective Date, Defendant shall permanently close and seal it, subject to the District and EPA's approval, unless Defendant can demonstrate that the well is still producing methane.

5) Defendant may propose that an additional extraction well be added to the IWP, provided the well meets the following conditions:

A) Within 5 days of the well exceeding the 5% oxygen limit, Defendant has visually inspected the wellhead for air intrusion (including sampling ports, leaky pneumatic pumps, wellhead boot seals, caps and hoses) and, if air intrusion is detected, repaired or replaced the well component allowing air intrusion.

B) Defendant has reviewed the wellfield and surface monitoring data to ensure adequate well coverage and to rule out a subsurface oxidation event. If there is evidence of a subsurface oxidation event, Defendant has immediately conducted maintenance on and augmented cover in the area of the subsurface oxidation event.

C) After complying with subparagraphs (a) and (b) above, Defendant has reduced vacuum in the well for one hour, but oxygen levels continued to exceed the 5% oxygen limit, at which time, Defendant has closed the well and is operating it under positive pressure.

D) Defendant notifies the District and EPA that it has closed the well, including a description of the actions it has taken pursuant to subparagraphs (a), (b), and (c) above.

6) Upon receiving notice from the Defendant pursuant to Paragraph 6 of this Appendix that it proposes to add a well to the IWP, the well shall become part of the IWP unless the District or EPA notify Defendant within thirty days of receiving the notice that they object to including it in the IWP, including the reason for such objection. Any disputes about the inclusion of a well in the IWP shall be resolved pursuant to Section X (Dispute Resolution) of the Consent Decree, and while any such dispute is pending, the well shall remain closed and no stipulated penalties shall accrue until the dispute is resolved.

As part of its semi-annual monitoring report required by the NSPS and as required in Section VIII, paragraph 16 of the Consent Decree, Defendant shall provide the EPA and the District with reports

on the status of each of the wells in the IWP, including monthly oxygen and methane monitoring results and when the well was opened and closed during the quarter, and identify any wells that it is proposing for inclusion in the IWP and any wells that it is proposing for abandonment. Defendant shall also provide such a report to EPA and the District whenever Defendant seeks to add a well to the IWP pursuant to Paragraphs 6 and 7 of this Appendix; the report shall be current as of the date of the proposal.

APPENDIX C – SCHEDULE FOR LANDFILL FLEET TRUCK REPLACEMENT

2012 Replacements Stockton & Fresno

Stockton

Unit #	VIN	Description	Horse Power	Annual Hours	Mileage
1324	4V2DC2HE8YN246665	2000 VOLVO FL TRUCK	275	1513	34,799
1331	5VCDC6MF87H204201	2007 AUTOCAR FL TRUCK	330	2303	52,969
1332	5VCDC6MFX7H204202	2007 AUTOCAR FL TRUCK	330	2577	59,271
2445	5VCDC6MF36H202760	2006 AUTOCAR SL TRUCK	330	2154	49,542
2451	5VCHC6MF67H204408	2007 AUTOCAR SL TRUCK	330	2120	48,760
2452	5VCHC6MF87H204409	2007 AUTOCAR SL TRUCK	330	2432	55,936
2455	5VCHC6JF89H209424	2009 AUTOCAR SL TRUCK	345	2174	50,002

Fresno

Unit #	VIN	Description	Horse Power	Annual Hours	Mileage
1253	4V2DC6UE22N337032	2002 VOLVO FL TRUCK	320	635	14605
1254	4V2DC6UE42N337033	2002 VOLVO FL TRUCK	320	1034	23782
2255	5VCHC6UE83N194404	2003 AUTOCAR FL TR.	280	399	9177

2013 Replacements Fresno

Unit #	VIN	Description	Horse Power	Annual Hours	Mileage
2470	5VCDC6UE03N194377	2003 AUTOCAR SL TRUCK	320	1679	38617
2471	5VCDC6UE23N194378	2003 AUTOCAR SL TRUCK	320	1967	45241
2472	5VCDC6UE43N194379	2003 AUTOCAR SL TRUCK	320	1837	42251
2473	5VCDC6UE23N194381	2003 AUTOCAR SL TRUCK	320	2227	51221
2474	5VCDC6UE03N194380	2003 AUTOCAR SL TRUCK	320	1425	32775
2475	5VCDC6UE83N194384	2003 AUTOCAR SL TRUCK	320	805	18515
2476	5VCDC6UEX3N194385	2003 AUTOCAR SL TRUCK	320	2124	48852
2477	5VCDC6UE13N194386	2003 AUTOCAR SL TRUCK	320	799	18377
2468	4V2DC6HE52N337035	2002 VOLVO SL TRUCK	275	1550	35650

APPENDIX IV

Landfill Greenhouse Gas Emission Calculations

Greenhouse Gas Emission Calculations

N-339-1-2: Wood Waste Receiving

No GHG emissions are expected from this operation.

N-339-9-2: GASOLINE DISPENSING OPERATION WITH ONE 500 GALLON ABOVE GROUND GASOLINE STORAGE TANK SERVED BY TWO-POINT PHASE I VAPOR RECOVERY SYSTEM (G-70-102-A), AND 1 FUELING POINT WITH 1 PHASE II EXEMPT GASOLINE DISPENSING NOZZLE

Annual fuel dispensing is limited by the permit to 24,000 gallons per year. An emission factor of 0.0143 lb-CO_2e/1000 gallons is assumed, per the District's GHG calculations for non-gear gasoline dispensing facilities guidance. Thus,

GHG = 24,000 gal/year x 0.0143 lb-CO_2e/1000 gal x ton/2000 lb
GHG = 0.2 tons CO_2e/year

N-339-15-2: Sludge Drying Operation

No GHG emissions are expected from this operation.

N-339-16-2: Bioremediation Operation

No GHG emissions are expected from this operation.

N-339-17-8: 13.8 MILLION CUBIC YARD CAPACITY (218 ACRES) LANDFILL WITH LANDFILL GAS COLLECTION SYSTEM CONTROLLED BY A 2000 SCFM (EQUIVALENT TO 48.0 MMBTU/HR) ENCLOSED FLARE AND CARBON ADSORPTION SYSTEM (CAS), AND A 3400 SCFM (EQUIVALENT TO 102 MMBTU/HR) PERRENIAL ENERGY MODEL GHS-301 LFG-FIRED ENCLOSED FLARE WITH LPG PILOT

Only biogenic GHG emissions are expected from this operation. Biogenic emissions are not currently included when making PSD and Title V determinations, per an EPA deferral ruling.

APPENDIX V

Quarterly Net Emission Change Calculations

QNEC Calculations

QNEC = (PE2 – BE) ÷ 4

As shown in Section VII.C.5, BE is equal to PE1 for all pollutants. Therefore, the equation for QNEC reduces to:

QNEC = (PE2 – PE1) ÷ 4

This project will not result in a change in the potential to emit for any pollutant. Therefore, QNEC is equal to zero for all pollutants.

APPENDIX VI

Applicant's Request to Increase Wellhead Temperature Limits

Environmental Consultants
and Contractors

3843 Brickway Blvd.
Suite 208
Santa Rosa, CA 95403

707 546-9461
FAX 707 544-5769
www.scsengineers.com

SCS ENGINEERS

November 21, 2013
Project No. 01205164.00, Task 24

Rupi Gill
Permit Services Manager
4800 Enterprise Way
Modesto, CA 95356
San Joaquin Valley Air Pollution Control District
District Northern Regional Office

SUBJECT: ADDITIONAL INFORMATION - ALTERNATIVE WELL TEMPERATURES FORWARD LANDFILL, MANTECA, CALIFORNIA (FACILITY # N-339)

Dear Rupi:

We wish to thank you and the other District staff for meeting with the representatives of Forward Inc. (Forward) and SCS Engineers (SCS) to discuss the draft Authority to Construct (ATC) and alternative well operating temperature scenarios. The meeting was productive and helped provide a guide for the additional information necessary for the San Joaquin Valley Air Pollution Control District (SJVAPCD or District) and United States Environmental Protection Agency (EPA) to re-evaluate Forward's request for an alternative operating temperature for appropriate wells. Pursuant to the meeting discussion, SCS has, on behalf Forward, prepared this letter providing additional information supporting the proposed alternative temperatures.

CONSENT DECREE PROVISIONS

The SJVAPCD incorporated in its draft ATC the alternative temperature operating limits in Paragraph 14 of the Consent Decree (Decree) for interior wellheads All-05, All-06, All-07, All-08, A11-09, A11-10, All-11, FU03-01R, FU04-14R, FU04-15R, FU04-18R, FU04-27R, FU05-08R, FU05-10R, FU06-15, FU06-16, FU-08-02, and FU08-03. The alternative temperature limits allow Forward to operate each of these interior wellheads with a landfill gas (LFG) temperature less than 141 degrees Fahrenheit (°F) and with either a nitrogen level less than 20 percent or an oxygen level less than five (5) percent. However, the Decree also includes specific carbon monoxide (CO) monitoring requirements for those wells operating with the approved alternative temperature. Monitoring CO concentrations in these wells will provide data confirming that the alternative operating temperature allowed by the Decree neither increases subsurface oxidation nor inhibits anaerobic decomposition.

Forward requests that the CO monitoring requirements defined in the Decree are included in Condition 73 as they relate to the wellhead limits specified above. These requirements are as follows:

"Paragraph 14a of the Decree requires that a CO analysis (monitoring) be performed within five (5) business days of when the gas temperature in one of the wells identified in Paragraph 14a exceeds the gas temperature limit specified in the NSPS (55 degrees Celsius (°C) or 131 °F), and that the results be reported in the semi-annual reports required pursuant to Condition 54 of draft ATC N-339-117-13.

Per Paragraph 14a, if any CO analysis reading is 1000 parts per million by volume (ppmv) or above, Forward will notify the District verbally and via email within 24 hours of receipt of such a reading."

ALTERANTIVE WELL OPERATING TEMPERATURE

On October 4, 2012, Forward submitted an application for an ATC to the SJVAPCD requesting an alternative operating temperature for wells A12-14, 05-15R, 04-19R, F12-08, F12-09, and F12-10, which were not on the original list. The SJVAPCD denied Forward's request on March 13, 2013, stating that the data provided by Forward indicated the corrective actions were successful in correcting the temperature exceedances within the 120 days of the initial exceedance.

SCS Field Services (SCSFS) provided additional well monitoring data at the October 30th meeting with the District. Monitoring results for wells A11-04, A12-02, A12-03, A12-04, A12-05, A12-13S, A12-14, A12-16, AO-65RS, 05-15R, 04-19R, F12-01, F-12-02, F12-03, F-12-06, F12-08, F12-09, F12-10, F12-11, Top Deck Well 01, Top Deck Well 04 and Top Deck Well 05 indicate operating temperatures for these wells have consistently been 125 °F or above during the past 18 months. These wells were either installed, or began operation, after February 1, 2012. Monitoring data for these wells suggest the following:

- Elevated temperatures were observed in the deepest portions of the landfill as shown on Figure 1 (Attachment A). This is a common occurrence at landfills where the deep gas exhibits the highest temperatures.
- Installation of additional wells, as required by the New Source Performance Standards (NSPS) standards and the Decree, have not significantly helped to correct the elevated temperatures monitored in these wells; rather the installations continue to show that this area of the landfill (red location points - Figure 1) consistently operates at a higher temperature. Elevated operating temperatures can be attributed to the type of refuse in that area, decomposition rates, and depth of the refuse in the areas with red location points (up to 120 feet of waste material).
- CO concentrations detected in wells for these areas indicate normal anaerobic decomposition with no oxidation occurring; no readings in excess of 200 parts per million (ppm) (the limit set by the Decree) have been detected (Attachment A). Methane concentrations for these wells generally range from 40 to 65 percent (%).
- In September 2012, a sample from well F12-08 was analyzed for CO by a licensed laboratory to verify the CO concentration in the well. The laboratory results indicate that the sample did not contain detectable concentrations of CO (Attachment B).

Limiting the temperature to the NSPS requirement of less than 131 °F, requires that Forward reduces, significantly in some cases, the extraction rates on these wells, which inhibits optimal operation of the well field and will result in less LFG being collected. Consequences of operating the wells at a lower temperature include:

- Wells operating at a reduced vacuum result in reduced LFG extraction rates, which results in a decrease in the removal of residual heat that is generated during the decomposition process. This could cause other wells to exhibit elevated temperatures in the future.

- Limiting well extraction reduces the radius of influence for each well and has led to surface emissions exceedances in the vicinity of these wells. Forward has been able to reduce the surface emissions by temporarily increasing the extraction rates for the wells in the affected zones. However, the well operating temperatures increase due to increased extraction rates requiring a reduction in the extraction rate to lower the temperature, resulting in a cyclic process of increasing/decreasing flow to correct well temperature or surface emissions exceedances thus inhibiting optimal wellfield operation and therefore LFG recovery.

Current well monitoring data indicate compliance with the NSPS standards. However, actions available to maintain compliance have been limited to: (1) minimizing well extraction rates; and (2) expanding the collection system. Since the landfill has already undergone significant expansion, and the temperatures for wells in select areas of the landfill continue to fluctuate around the NSPS temperature limit, it is Forward's and SCS' opinion that elevated temperatures recorded in these areas are due to the type of fill and its depth, and warrant an alternative operating temperature. Forward proposes revision of the draft ATC to incorporate the following conditions using verbiage similar to that in the Decree.

> **" LFG Extraction Well Nos. A11-04, A12-02, A12-03, A12-04, A12-05, A12-13S, A12-14, A12-16, AO-65RS, 05-15R, 04-19R, F12-01, F-12-02, F12-03, F-12-06, F12-08, F12-09, F12-10, F12-11, Top Deck Well 01, Top Deck Well 04 and Top Deck Well 05 and Consent Decree Interim Well Nos. A11-05, A11-06, A11-07, A11-08, A11-09, A11-10, A11-11, FU03-01R, FU04-14R, FU04-15R, FU04-18R, FU04-27R, FU05-08R, FU05-10R, FU06-15, FU06-16, FU08-02, and FU08-03 may be operated at a temperature of up to 141 °F provided the following monitoring is performed:**
>
> **(1) Perform monthly CO field monitoring using Draeger™ tubes, or a District-approved monitoring device, for all wells that show a temperature of 131 °F. If the field CO readings are less than 200, the well may continue to operate up to 141 °F.**
>
> **(2) If field readings indicate a CO level between 200 and 500 ppmv, the well will be monitored on a weekly basis to verify that there is no subsurface oxidation occurring. Once the CO levels decrease to below 200 ppmv monthly monitoring will be resumed.**

(3) If CO field monitoring results indicate a reading in excess of 500 parts per million by volume (ppmv) the well will be temporarily closed and documented and a sample shall be obtained within one week of the exceedance and analyzed for CO using EPA Method D-1946. If results confirm the readings are in excess of 500 ppmv, the well will remain closed and off line and the district will be notified within 24 hours of the exeedance.

(4) Upon notification of the district, Forward shall undertake such actions as directed by District and/or EPA to further investigate the potential for subsurface oxidation in the area of the well, and develop a plan for remediation."

FUTURE WELLS – ALTERNATIVE OPERATING TEMPERATURE

Forward proposes to incorporate a protocol into its Title V permit to allow for the operation of additional wells with an alternative operating temperature without having to schedule a meeting with the SJVAPCD for each proposal. Scheduling a meeting with the District each time Forward proposes to operate a well with an alternative temperature (141°F) and waiting for the District to evaluate each well that follows the same pattern would result in unnecessary significant delays and could drastically affect the operational efficiency of Forward's the collection system. We believe it would be beneficial for both District and site staff if a process were in place for allowing additional wells to operate at the alternative temperature, when conditions warrant it. Forward suggests that a protocol, such as has been provided in the Decree, could be included in the permit thereby allowing Forward to safely and efficiently operate the well(s). If wells consistently exhibit elevated temperatures, and where the installation of another well(s) would not be the appropriate corrective action, as required in the NSPS, Forward would follow the proposed monitoring protocol in the permit and operate the well with an alternative temperature (141°F). The proposed protocol, which is taken from the Decree, is as follows:

"CO analysis (monitoring) will performed within five (5) business days of when the gas temperature in one of the well exceeds the gas temperature limit specified in the NSPS (55 degrees Celsius (°C) or 131 °F). The CO monitoring results shall be reported in the semi-annual reports required pursuant to Condition 54 of draft ATC N-339-117-13.

If any CO analysis reading is 1000 parts per million by volume (ppmv) or above, Forward will notify the District verbally and via email within 24 hours of receipt of such a reading.

If the gas temperature in a well exceeds 141°F, permittee shall initiate corrective action within five days. If correction of the exceedance cannot be achieved within 120 Days of the initial exceedance, permittee shall:

i. **Submit a request to EPA and the District for an alternative timeline for correcting exceedance; or**

ii. Request an alternative gas temperature limit by submitting a request in writing to the District. The request will contain all available sampling data and other evidence relevant to the District's consideration of the permittee's request; or

iii. Undertake such other corrective action as mutually agreed to by the Permittee and District."

Landtec GEM™ 5000 DOCUMENTATION

SCSFS proposed using an alternative means of monitoring CO concentration in extraction wells. Paragraph 7a of the Decree requires that the CO concentration in extraction wells is monitored using Drager™ tubes in accordance with manufacturer's instructions. SCSFS conducts CO monitoring in accordance with Paragraph 7a of the Decree and the manufacturer's instructions.

Landtec has recently introduced a CO monitoring component in its GEM 5000. Specifications for the GEM™ 5000 (GEM) are provided in Attachment C. SCSFS has been using this monitoring device since March 2013 at several landfills and has taken CO readings from components using both the GEM and the Draeger™ tube to determine the disparity between CO concentrations measured using the GEM and the Draeger™ tubes. To date, data indicates that the GEM and Draeger™ readings are within 5 to 10 ppm of each other. SCSFS believes this slight discrepancy is due to the method with which the CO concentration is obtained from the Draeger™ tubes. The CO readings are obtained by viewing a color change on a glass tube, which can be very subjective, as compared to the GEM 5000, which provides a digital reading. It is SCSFSs' opinion that the CO concentrations obtained from the GEM 5000 are as accurate as those obtained from the Draeger™ tubes. SCSFS proposes to perform the following procedure for several designated locations at Forward Landfill to compare CO field testing readings.

SCSFS proposes to collect a sample from several designated locations using the GEM and Draeger™ tube and then collect a gas sample at the same location for laboratory analysis using EPA Method D 1946. The data from each of the field monitoring devices and the lab sample would then be evaluated to determine how closely each CO monitoring device compares to the laboratory result. If the GEM reading for each location is similar to the Draeger™ tube, and correlates with the laboratory result, SCSFS and Forward request that the use of the GEM for CO monitoring is approved by the SJVAPCD. Forward would then request that a condition for this allowance is incorporated into the modified Title V permit.

PROPOSED PERMIT LANGUAGE FOR CO MONITORING PROTOCOL

If the District adds the GEM to its list of District-approved monitoring devices for CO field monitoring, Forward proposes adding a permit condition that would allow the use of either the GEM or Draeger™ Tubes to monitor field CO concentrations. SCS proposes general language such as the example provided below.

"CO monitoring for extraction wells with temperatures of 131°F or above shall be conducted using Draeger™ tubes or a District-approved monitoring device, such as the Landtec GEM 5000™"

CLOSING

Forward appreciates the District's willingness to further evaluate an alternative operating temperature for the extraction wells. The data provided herein supports Forward's proposal for an alternative well operating temperature. The alternative temperature limit will allow Forward to maximize the collection efficiency, which will be especially important as the installation of the new LFG to-energy (LFGTE) facility is almost complete. The CO monitoring protocol, which is not required by NSPS, will allow for early detection of potential subsurface oxidation. Forward requests that approval of field monitoring the CO concentration using the GEM be considered separately from the alternative well temperature request if it would delay the SJVAPCD's approval of an alternative well operating temperature. It has always been Forward's intent to operate the landfill in a manner which protects the public and the environment.

In closing, we wish to summarize our understanding of the process of the final transition from the Decree to the new permit conditions, once these remaining items are resolved and the final permit is issued. According to the Decree, the requirements in the modified Title V permit will supersede the requirements in the Decree provided that the EPA and District have certified that Forward has fulfilled the obligations of Section V of the Decree and the reporting requirements pertaining to those obligations. Please note that the once the Decree expires (July 14, 2014), and EPA and the District agree that the termination obligations of the Decree are appropriate, documentation must be filed by each party certifying that the requirements of the Decree have been met and that the Decree has been terminated.

If you have any questions or require any additional information, please contact the undersigned at (707) 546-9461.

Sincerely,

Leslie M. Bove
Project Professional
SCS ENGINEERS

Michael O'Connor
Senior Project Professional
SCS ENGINEERS

Attachments: A – Figure 1
B – Well Data and Lab Data
C – GEM™ 5000 Specifications

cc List

To the United States:

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
Box 7611 Ben Franklin Station
Washington, D.C. 20044-7611
Re: DOJ No. 90-5-2-1-09873

Sylvia Quast
United States Attorney's Office
Eastern District of California
Suite 10-100
501 I Street
Sacramento, CA 95814

To EPA:

Brian P. Riedel
U.S. Environmental Protection Agency
Office of the Regional Counsel
Region 9
75 Hawthorne Street
Mail Code: ORC-2
San Francisco, CA 94105

To the District:

Catherine Redmond, District Counsel
San Joaquin Valley Unified Air Pollution Control District
1990 E. Gettysburg Avenue
Fresno, CA 92726

Morgan Lambert, Compliance Director
San Joaquin Valley Unified Air Pollution Control District
1990 E. Gettysburg Avenue
Fresno, CA 92726

Kevin Basso
General Manager
Forward, Inc.
1145 W Charter Way
Stockton, CA 95206

Tim Benter
Vice President & Deputy General Counsel
Republic Services, Inc.
18500 North Allied Way
Phoenix, AZ 85054

Thomas Bruen
Law Offices of Thomas M. Bruen, P.C.
1990 N. California Blvd, Ste. 620
Walnut Creek, CA 94596

Additional recipients

U.S. EPA Administrator, Air Division, Region IX
Air – 3
75 Hawthorne Street
San Francisco, CA 94105

Erin Fanning, Forward
Forward Landfill
9999 S. Austin Road
Manteca, CA 95336

James Harader
4800 Enterprise Way
Modesto, CA 95356
San Joaquin Valley Air Pollution Control District
District Northern Regional Office

Nick Peirce
4800 Enterprise Way
Modesto, CA 95356
San Joaquin Valley Air Pollution Control District
District Northern Regional Office

Patrick Sullivan (SCS), Electronic Copy

Arthur Jones (SCS), Electronic Copy

Sean Bass (SCS), Electronic Copy

Attachment A

Figure 1

Forward Landfill, LFG Extraction Well Temperatures

Attachment B

Well Data and Laboratory Data

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
A11-04	6/15/2012 13:51	57.5	40.2	0	2.3		-2.2	-2.2	127	127	13	13	No Change; Well bore seal okay
A11-04	8/13/2012 13:45	55.5	43.4	0.4	0.7		-1.5	-1.6	126	126	22	21	No Change; Well bore seal okay
A11-04	9/10/2012 16:47	56.3	42.5	0	1.2		-1.6	-2.1	129	129	20	21	Opened valve 1/2 turn or less;
A11-04	5/3/2013 13:35	57.7	42.3	0	0		-0.63	-0.63	125	125	22	23	No Change; Well bore seal okay
A11-04	6/28/2013 11:29	58.4	41.6	0	0		-1.35	-1.33	125	125	35	35	No Change; Well bore seal okay
A11-04	8/29/2013 16:19	58.4	41.6	0	0		-1.12	-1.12	125	125	4	4	No Change; Well bore seal okay
A11-05 (Interim Temp)	6/15/2012 13:47	52.9	40.4	0	6.7	150	-0.9	-0.9	134	134	14	13	No Change; Well bore seal okay
A11-05 (Interim Temp)	8/29/2012 17:08	50.7	41.5	0	7.8	110	-1	-1.1	134	133	17	17	No Change; Well bore seal okay
A11-05 (Interim Temp)	7/5/2012 12:12	54.4	41.3	0	4.3	90	-1.3	-1.3	134	134			No Change; Well bore seal okay
A11-05 (Interim Temp)	9/7/2012 12:08	56.8	42.7	0.3	0.2	100	-3.8	-3.9	134	135	29	40	Back online (offline for filling
A11-05 (Interim Temp)	9/24/2012 11:39	54.2	45.6	0.1	0.1	90	-5.7	-5.8	134	134	41	44	Opened valve 1/2 turn or less;
A11-05 (Interim Temp)	10/5/2012 12:55	54.7	45.1	0	0.2	120	-5.9	-5.8	132	132	39	39	No Change; Well bore seal okay
A11-05 (Interim Temp)	10/30/2012 11:17	51.3	48.4	0.1	0.2	140	-6.1	-6	132	131	32	32	No Change; Well bore seal okay
A11-05 (Interim Temp)	11/13/2012 14:28	51.1	48.7	0	0.2		-4.6	-4.6	129	129	38	37	No Change; Well bore seal okay
A11-05 (Interim Temp)	11/28/2012 16:00	49.7	50.2	0	0.1		-6.5	-6.5	128	128	38	39	No Change; Well bore seal okay
A11-05 (Interim Temp)	12/13/2012 15:16	51.7	48.2	0	0.1	140	-5.6	-5.6	132	132	37	35	No Change; Well bore seal okay
A11-05 (Interim Temp)	12/31/2012 15:51	53.3	46.6	0	0.1		-6.4	-6.4	127	129	39	40	No Change; Well bore seal okay
A11-05 (Interim Temp)	1/10/2013 11:35	53.8	45.6	0	0.6	120	-6.7	-6.8	131	132	38	40	Opened valve 1/2 turn or less;
A11-05 (Interim Temp)	1/30/2013 13:44	53.8	46.1	0	0.1	150	-5.6	-5.7	133	134	35	34	No Change; Well bore seal okay
A11-05 (Interim Temp)	2/14/2013 15:51	51.6	46.7	0	1.7	140	-3.7	-3.7	133	133	30	30	No Change; Well bore seal okay
A11-05 (Interim Temp)	2/21/2013 13:51	52.5	47.4	0	0.1	140	-3.8	-3.8	131	132	27	27	No Change; Well bore seal okay
A11-05 (Interim Temp)	3/6/2013 11:41	53.1	45.8	0.1	1		-4.5	-4.4	129	130	21	22	No Change; Well bore seal okay
A11-05 (Interim Temp)	3/21/2013 10:28	53.8	45.7	0.3	0.2		-3.5	-3.5	127	128	27	28	No Change; Well bore seal okay
A11-05 (Interim Temp)	4/15/2013 11:13	54.9	44.5	0	0.6	160	-3.56	-3.56	132	132	23	23	No Change; Well bore seal okay
A11-05 (Interim Temp)	5/3/2013 13:38	55.9	44.1	0	0	170	-1.55	-1.55	135	135	20	21	No Change; Well bore seal okay
A11-05 (Interim Temp)	5/28/2013 15:45	56	44	0	0	140	-1.31	-1.31	134	134	30	30	No Change; Well bore seal okay
A11-05 (Interim Temp)	6/14/2013 8:43	55.9	44.1	0	0	160	-2.45	-2.42	132	133	19	19	No Change; Well bore seal okay
A11-05 (Interim Temp)	6/28/2013 11:31	57.3	42.7	0	0	140	-2.01	-2	136	136	31	31	No Change; Well bore seal okay
A11-05 (Interim Temp)	7/5/2013 8:58	55.8	44	0	0.2	130	-2.8	-2.79	133	133	21	21	No Change; Well bore seal okay
A11-05 (Interim Temp)	7/26/2013 7:38	56.4	43.6	0	0		-2.88	-2.88	129	129	19	19	No Change; Well bore seal okay
A11-05 (Interim Temp)	8/12/2013 13:35	56.4	43.6	0	0	180	-1.88	-1.88	135	135	35	35	No Change; Well bore seal okay
A11-05 (Interim Temp)	8/29/2013 16:22	56.8	43.2	0	0	180	-1.87	-1.86	135	135	14	14	No Change; Well bore seal okay
A11-05 (Interim Temp)	9/11/2013 12:33	56.3	43.7	0	0	140	-2.57	-2.58	134	134	14	14	No Change; Well bore seal okay
A11-05 (Interim Temp)	9/18/2013 15:00	55.5	43.5	0	1	160	-1.45	-1.46	135	135	26	26	No Change; Well bore seal okay
A11-06(Interim Temp)	6/15/2012 14:10	54.9	40.9	0	4.2	80	-2.9	-2.9	131	131	31	32	No Change; Well bore seal okay
A11-06(Interim Temp)	6/28/2012 17:12	52.8	42.4	0	4.8	80	-3.1	-3.1	131	131	32	33	No Change; Well bore seal okay
A11-06(Interim Temp)	7/6/2012 11:30	57.5	40.7	0	1.8	60	-3.5	-3.5	131	131	31	30	No Change; Well bore seal okay
A11-06(Interim Temp)	7/20/2012 11:23	51.8	43.3	0.1	4.8	70	-3.4	-3.5	131	131	30	29	No Change; Well bore seal okay
A11-06(Interim Temp)	8/13/2012 13:48	54.4	43.4	0.1	2.1	90	-2.7	-2.8	132	133	15	14	No Change; Well bore seal okay
A11-06(Interim Temp)	8/28/2012 10:44	55.5	42.5	0	2	70	-3.4	-3.5	132	133	27	26	No Change; Well bore seal okay
A11-06(Interim Temp)	9/11/2012 11:00	57.7	42.2	0	0.1	70	-4	-4	137	137	30	29	No Change; Well bore seal okay
A11-06(Interim Temp)	9/24/2012 11:44	55.3	44.5	0.1	0.1	100	-3.8	-3.8	131	131	30	30	Opened valve 1/2 turn or less;
A11-06(Interim Temp)	10/5/2012 13:00	57	42.9	0	0.1		-3.8	-3.8	130	130	32	33	No Change; Well bore seal okay
A11-06(Interim Temp)	10/30/2012 11:22	55.2	44.4	0.2	0.2		-4.2	-4.2	129	129	30	30	No Change; Well bore seal okay
A11-06(Interim Temp)	11/13/2012 14:32	55.5	44.3	0	0.2		-2.5	-2.6	128	129	33	34	No Change; Well bore seal okay
A11-06(Interim Temp)	11/28/2012 16:03	55.3	44.6	0	0.1		-4.6	-4.5	129	129	30	30	No Change; Well bore seal okay
A11-06(Interim Temp)	12/13/2012 15:07	56.1	43.5	0	0.4	100	-3.6	-3.6	131	130	31	30	No Change; Well bore seal okay
A11-06(Interim Temp)	12/31/2012 15:54	54.9	42.7	0	2.4		-4.8	-4.7	129	129	35	35	No Change; Well bore seal okay
A11-06(Interim Temp)	1/10/2013 11:23	54.2	41.8	0	4		-4.9	-5.1	130	130	33	34	Opened valve 1/2 turn or less;

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
A11-06(Interim Temp)	1/30/2013 13:48	55.1	41.5	0	3.4	80	-4.8	-4.7	132	132	35	34	No Change; Well bore seal okay
A11-06(Interim Temp)	2/14/2013 15:58	52.2	42.4	0	5.4	90	-3	-3	132	132	27	28	No Change; Well bore seal okay
A11-06(Interim Temp)	2/25/2013 9:58	56.4	41.5	0	2.1	80	-1.2	-1.2	132	132	25	25	No Change; Well bore seal okay
A11-06(Interim Temp)	3/6/2013 11:45	53.5	42.5	0	4		-4	-4	129	129	23	23	No Change; Well bore seal okay
A11-06(Interim Temp)	3/21/2013 10:46	55.9	43	0.5	0.6		-2.8	-2.7	127	129	24	26	No Change; Well bore seal okay
A11-06(Interim Temp)	4/15/2013 11:09	55.9	42.9	0	1.2	70	-2.99	-2.99	133	133	24	23	No Change; Well bore seal okay
A11-06(Interim Temp)	5/3/2013 13:42	57.6	42.4	0	0	140	-0.4	-0.4	134	134	21	21	No Change; Well bore seal okay
A11-06(Interim Temp)	5/28/2013 15:52	56.6	43.4	0	0	100	-0.64	-0.65	134	134	24	24	No Change; Well bore seal okay
A11-06(Interim Temp)	6/14/2013 8:40	56.5	43.5	0	0	170	-1.83	1.82	133	133	16	16	No Change; Well bore seal okay
A11-06(Interim Temp)	6/28/2013 11:33	57.2	42.8	0	0	150	-1.34	-1.34	135	135	21	20	No Change; Well bore seal okay
A11-06(Interim Temp)	7/5/2013 9:03	55.9	44.1	0	0	90	-2.11	-2.09	133	133	20	20	No Change; Well bore seal okay
A11-06(Interim Temp)	7/26/2013 7:34	56.6	43.4	0	0		-2.23	-2.21	128	127	21	21	No Change; Well bore seal okay
A11-06(Interim Temp)	8/12/2013 13:51	57.8	42.1	0	0.1	130	-1.18	-1.18	135	135	15	15	No Change; Well bore seal okay
A11-06(Interim Temp)	8/29/2013 16:27	57.3	42.7	0	0	160	-1.39	-1.39	135	135	13	14	No Change; Well bore seal okay
A11-06(Interim Temp)	9/11/2013 12:38	56.8	43.2	0	0	130	-2.21	-2.22	134	134			No Change; Well bore seal okay
A11-06(Interim Temp)	9/18/2013 15:13	56.7	42.9	0	0.4	110	-0.96	-0.97	135	135	33	33	No Change; Well bore seal okay
A11-07(Interim Temp)	6/15/2012 14:15	51.8	40.9	0	7.3	150	-5.4	-5.4	139	138	27	27	No Change; Well bore seal okay
A11-07(Interim Temp)	6/28/2012 17:16	50.2	41.7	0	8.1	100	-5.7	-5.7	138	138	28	28	No Change; Well bore seal okay
A11-07(Interim Temp)	7/6/2012 11:34	52.7	40.9	0	6.4	80	-4.1	-4	138	138	28	28	No Change; Well bore seal okay
A11-07(Interim Temp)	7/20/2012 11:28	48.1	42	0	9.9	110	-3.9	-4	137	137	29	28	No Change; Well bore seal okay
A11-07(Interim Temp)	8/13/2012 13:54	51.1	43	0.3	5.6	190	-3.4	-3.3	136	138	5	7	No Change; Well bore seal okay
A11-07(Interim Temp)	8/28/2012 10:55	52.1	42.2	0.1	5.6	110	-4.3	-4.3	139	139			No Change; Well bore seal okay
A11-07(Interim Temp)	9/11/2012 11:05	53.4	41.8	0	4.8	140	-4.5	-4.5	139	138	26	25	No Change; Well bore seal okay
A11-07(Interim Temp)	9/24/2012 11:49	51.7	43.6	0.1	4.6	120	-4.1	-4.1	137	137	27	28	No Change; Well bore seal okay
A11-07(Interim Temp)	10/5/2012 13:03	54.9	42.5	0	2.6	110	-3.9	-3.9	136	136	28	28	No Change; Well bore seal okay
A11-07(Interim Temp)	10/30/2012 11:25	52.2	43.9	0.2	3.7	110	-4.3	-4.3	135	135	23	24	No Change; Well bore seal okay
A11-07(Interim Temp)	11/13/2012 14:40	52.3	43.5	0	4.2	110	-2.7	-2.7	136	136	25	26	No Change; Well bore seal okay
A11-07(Interim Temp)	11/28/2012 16:06	51.9	44.7	0	3.4	100	-4.7	-4.7	136	136	25	26	No Change; Well bore seal okay
A11-07(Interim Temp)	12/13/2012 15:01	52.6	43.2	0	4.2	110	-3.7	-3.8	136	136	26	26	No Change; Well bore seal okay
A11-07(Interim Temp)	12/31/2012 15:57	51.3	42.1	0	5.5		-4.4	-4.3	136	137	25	24	No Change; Well bore seal okay
A11-07(Interim Temp)	1/10/2013 11:16	51.3	40.7	0	8	110	-4.5	-4.5	135	136	23	22	No Change; Well bore seal okay
A11-07(Interim Temp)	1/30/2013 13:52	51.4	41.1	0	7.5	130	-4.1	-4	138	139	25	25	No Change; Well bore seal okay
A11-07(Interim Temp)	2/14/2013 16:04	50.1	42.3	0	7.6	100	-2.5	-2.4	138	138	15	21	No Change; Well bore seal okay
A11-07(Interim Temp)	2/25/2013 10:02	52.6	41.4	0	5	130	-0.6	-0.6	137	137			No Change; Well bore seal okay
A11-07(Interim Temp)	3/6/2013 11:46	51.3	41.6	0	7.1	100	-3.7	-3.7	135	136	15	14	No Change; Well bore seal okay
A11-07(Interim Temp)	3/21/2013 10:40	54	42.4	0.3	3.3	42	-2.6	-2.6	134	134	9	10	No Change; Well bore seal okay
A11-07(Interim Temp)	4/15/2013 11:20	54.1	42.9	0	3	110	-2.79	-2.8	138	138	18	17	No Change; Well bore seal okay
A11-07(Interim Temp)	5/3/2013 13:47	57.7	42.2	0	0.1	180	-0.21	-0.21	138	138	28	28	No Change; Well bore seal okay
A11-07(Interim Temp)	5/28/2013 15:57	56.9	43.1	0	0	120	-0.61	-0.63	139	139	17	17	No Change; Well bore seal okay
A11-07(Interim Temp)	6/14/2013 9:18	56.4	43.1	0	0.5	180	-1.62	-1.62	138	138	25	24	No Change; Well bore seal okay
A11-07(Interim Temp)	6/28/2013 11:36	57.5	42.5	0	0	160	-1.24	-1.26	137	137	15	14	No Change; Well bore seal okay
A11-07(Interim Temp)	7/5/2013 9:08	55.2	44.8	0	0	110	-2.01	-2.03	137	138	17	16	No Change; Well bore seal okay
A11-07(Interim Temp)	7/26/2013 7:49	56.9	43.1	0	0	100	-2.28	2.29	137	137	15	15	No Change; Well bore seal okay
A11-07(Interim Temp)	8/12/2013 14:25	56.7	41.7	0.1	1.5	170	-1.1	-1.1	137	137	37	18	No Change; Well bore seal okay
A11-07(Interim Temp)	8/29/2013 16:31	57.9	42.1	0	0	180	-1.32	-1.32	138	138	27	27	No Change; Well bore seal okay
A11-07(Interim Temp)	9/13/2013 12:56	57	43	0	0	180	-1.08	-1.08	139	139	28	29	No Change; Well bore seal okay
A11-07(Interim Temp)	9/24/2013 16:02	56.8	43.2	0	0	130	-0.64	-0.65	139	139	10	10	No Change; Well bore seal okay
A11-08(Interim Temp)	6/15/2012 14:19	51	41.5	0	7.5	170	-1.8	-1.8	133	134	20	20	No Change; Well bore seal okay
A11-08(Interim Temp)	6/25/2012 17:20	50.2	41.6	0	8.2	110	-2.1	-2.1	133	133	37	33	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
A11-08(Interim Temp)	7/6/2012 11:40	51	40.7	0	8.3	120	-2.2	-2.2	133	133	28	28	No Change; Well bore seal okay
A11-08(Interim Temp)	7/20/2012 11:33	46.2	41.6	0	12.2	130	-1.9	-1.9	132	136	33	34	No Change; Well bore seal okay
A11-08(Interim Temp)	8/13/2012 13:53	49.4	41.8	0	8.7	190	-1.7	-1.8	135	135			No Change; Well bore seal okay
A11-08(Interim Temp)	8/28/2012 13:26	50.8	43.2	0.6	4.9	100	-1.7	-1.9	134	134	26	26	No Change; Well bore seal okay
A11-08(Interim Temp)	9/11/2012 11:09	50.5	41.8	0	7.7	150	-2.8	-2.8	139	139	14	14	No Change; Well bore seal okay
A11-08(Interim Temp)	9/24/2012 11:53	50.9	42.6	0.1	6.3	130	-2.3	-2.4	132	132	20	20	No Change; Well bore seal okay
A11-08(Interim Temp)	10/5/2012 13:05	54.4	42	0	3.6	120	-2	-2	132	132	22	22	No Change; Well bore seal okay
A11-08(Interim Temp)	10/30/2012 11:28	53	42.6	0.2	4.2	150	-2.5	-2.5	131	131	15	14	No Change; Well bore seal okay
A11-08(Interim Temp)	11/13/2012 14:45	52.5	44	0	3.5	130	-1	-0.9	131	132	29	29	No Change; Well bore seal okay
A11-08(Interim Temp)	11/28/2012 16:11	53.5	44.3	0	2.2		2.9	-2.9	129	130	17	16	No Change; Well bore seal okay
A11-08(Interim Temp)	12/13/2012 14:55	54.8	43.9	0	1.3	90	-1.8	-1.9	131	131	28	28	No Change; Well bore seal okay
A11-08(Interim Temp)	12/31/2012 16:00	54.2	42.9	0	2.9		2.5	2.5	129	131	21	20	No Change; Well bore seal okay
A11-08(Interim Temp)	1/10/2013 11:13	54	41.8	0	4.2		-2.6	-2.7	130	130	22	18	Opened valve 1/2 turn or less.
A11-08(Interim Temp)	1/30/2013 13:55	57.6	41.9	0	0.5	170	-2.1	-2.1	133	134	22	21	No Change; Well bore seal okay
A11-08(Interim Temp)	2/14/2013 16:08	53	43.1	0	3.9	130	1.2	-1.2	134	134	16	15	No Change; Well bore seal okay
A11-08(Interim Temp)	2/25/2013 10:07	55	42.5	0	2.5	150	-0.1	-0.2	133	135	19	20	No Change; Well bore seal okay
A11-08(Interim Temp)	3/6/2013 11:52	52.5	43.4	0	5.1	120	-4.5	-4.5	133	134	26	27	No Change; Well bore seal okay
A11-08(Interim Temp)	3/21/2013 10:32	54	43.4	0	2.6	61	-3.5	-3.5	133	133	33	33	No Change
A11-08(Interim Temp)	4/15/2013 11:24	53.2	43.6	0	3.2	100	-3.6	3.6	136	136	15	17	No Change; Well bore seal okay
A11-08(Interim Temp)	5/3/2013 13:50	57.3	42.8	0		190	-0.91	-0.92	138	138	25	25	No Change; Well bore seal okay
A11-08(Interim Temp)	5/28/2013 16:02	56.1	43.9	0	0	160	1.34	-1.35	138	138	26	26	No Change; Well bore seal okay
A11-08(Interim Temp)	6/14/2013 9:14	54.4	43.8	0	1.8	180	-2.4	-2.38	136	137	25	25	No Change; Well bore seal okay
A11-08(Interim Temp)	6/28/2013 11:39	56.9	43.1	0	0	170	1.87	-1.89	139	139	23	23	No Change; Well bore seal okay
A11-08(Interim Temp)	7/5/2013 9:13	54.3	43.1	0	0.6	130	-2.77	-2.77	136	136	23	23	No Change; Well bore seal okay
A11-08(Interim Temp)	7/26/2013 7:43	54.2	43.7	0	2.1	120	-2.91	-2.91	136	136	24	24	No Change; Well bore seal okay
A11-08(Interim Temp)	8/12/2013 14:30	54.1	43.1	0	2.8	190	1.48	-1.49	139	139	21	21	No Change; Well bore seal okay
A11-08(Interim Temp)	8/29/2013 16:36	57	43	0	0	150	-1.96	-1.96	138	138	19	19	No Change; Well bore seal okay
A11-08(Interim Temp)	9/11/2013 12:43	54.9	43.3	0	1.8	160	-2.82	-2.82	138	138	20	20	No Change; Well bore seal okay
A11-08(Interim Temp)	9/24/2013 16:07	56.2	43.8	0	0	160	-1.52	-1.52	138	138	14	14	No Change; Well bore seal okay
A11-09(Interim Temp)	6/15/2012 14:28	57.4	41.3	0	1.3	190	-4.1	-4.1	136	135	36	36	No Change; Well bore seal okay
A11-09(Interim Temp)	6/28/2012 17:24	54.7	41.5	0	3.8	170	-4.5	-4.5	135	135	39	39	No Change; Well bore seal okay
A11-09(Interim Temp)	7/6/2012 11:44	57.4	40.2	0	2.4	130	-4.6	-4.6	135	135	38	37	No Change; Well bore seal okay
A11-09(Interim Temp)	7/20/2012 11:37	51.4	41.7	0	6.9	150	-4.5	-4.4	135	135	34	34	No Change; Well bore seal okay
A11-09(Interim Temp)	8/13/2012 14:02	54.7	40.7	0.3	4.3	180	-4	-3.9	136	136	22	23	No Change; Well bore seal okay
A11-09(Interim Temp)	8/28/2012 13:31	56.5	43.4	0	0.1	180	-3.9	-3.9	137	137	49	48	No Change; Well bore seal okay
A11-09(Interim Temp)	9/11/2012 11:13	57.2	41.9	0	0.9	130	-4.9	-5.3	138	136	33	37	Opened valve 1/2 turn or less.
A11-09(Interim Temp)	9/24/2012 11:58	56.7	43	0.1	0.2	160	-5.4	-5.6	135	135	40	41	Opened valve 1/2 turn or less.
A11-09(Interim Temp)	10/5/2012 13:11	57.5	42.4	0	0.1	150	5.7	-5.7	133	134	46	46	No Change; Well bore seal okay
A11-09(Interim Temp)	10/30/2012 11:32	57.2	42.5	0.2	0.1	170	-6.2	-6.5	134	134	43	46	Opened valve 1/2 turn or less.
A11-09(Interim Temp)	11/13/2012 14:49	57.1	42.7	0	0.2	140	-5.4	-5.5	134	134	50	50	No Change; Well bore seal okay
A11-09(Interim Temp)	11/28/2012 16:14	55.7	44.2	0	0.1	110	-7.5	-7.5	134	134	44	44	No Change; Well bore seal okay
A11-09(Interim Temp)	12/13/2012 14:40	57.5	42.4	0	0.1		-6.6	-6.6	135	136	51	52	No Change; Well bore seal okay
A11-09(Interim Temp)	12/31/2012 16:02	57.7	42.2	0	0.1	110	-8	-8.1	136	137	52	52	No Change; Well bore seal okay
A11-09(Interim Temp)	1/10/2013 10:57	57.7	41	0	1.3	130	-8.3	-8.6	135	136	51	56	Opened valve 1/2 turn or less.
A11-09(Interim Temp)	1/30/2013 13:58	58.7	41.2	0	0.1	140	-7.5	-7.6	137	137	53	53	No Change; Well bore seal okay
A11-09(Interim Temp)	2/14/2013 16:12	56.4	42.1	0	1.5	140	-5.1	-5	137	137	42	43	No Change; Well bore seal okay
A11-09(Interim Temp)	2/25/2013 10:10	57.3	41.2	0	1.5	170	2.4	-2.3	135	136	34	34	No Change
A11-09(Interim Temp)	3/6/2013 11:56	56.7	41.7	0	1.6	160	-5.8	-5.9	135	136	33	34	No Change; Well bore seal okay
A11-09(Interim Temp)	3/25/2013 12:07	56.4	43.6	0	0	140	-4.24	-4.24	138	138	33	33	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
A11-09(Interim Temp)	4/19/2013 12:45	57.8	42.2	0	0	150	-4.53	-4.53	137	137	32	31	No Change; Well bore seal okay
A11-09(Interim Temp)	5/3/2013 13:55	58.6	41.4	0	0	180	-1.57	-1.57	138	138	29	28	No Change; Well bore seal okay
A11-09(Interim Temp)	5/28/2013 16:07	57.5	42.5	0	0	170	-2.12	-2.11	138	138	27	27	No Change; Well bore seal okay
A11-09(Interim Temp)	6/14/2013 9:06	57.8	42.1	0	0.1	130	-3.21	-3.2	138	138	28	28	No Change; Well bore seal okay
A11-09(Interim Temp)	6/28/2013 11:42	58.6	41.4	0	0	150	-2.57	-2.55	139	139	26	25	No Change; Well bore seal okay
A11-09(Interim Temp)	7/5/2013 9:18	58.2	42.9	0	0.9	150	-3.47	-3.46	137	137	35	40	No Change; Well bore seal okay
A11-09(Interim Temp)	7/26/2013 7:52	58.1	41.9	0	0	160	-3.59	-3.59	137	137	25	25	No Change; Well bore seal okay
A11-09(Interim Temp)	8/12/2013 14:36	57.9	41.4	0	0.7	180	-2	-2	139	139	23	23	No Change; Well bore seal okay
A11-09(Interim Temp)	8/29/2013 16:40	58.9	41.1	0	0	170	-2.65	2.65	139	139	21	21	No Change; Well bore seal okay
A11-09(Interim Temp)	9/11/2013 12:47	58.4	41.6	0	0	180	-3.64	-3.64	139	139	24	24	No Change; Well bore seal okay
A11-09(Interim Temp)	9/24/2013 16:11	58.4	41.6	0	0	190	-2.19	-2.19	138	138	23	23	No Change; Well bore seal okay
A11-10(Interim Temp)	6/15/2012 14:24	57.5	40.9	0	1.6	180	-3	-2.9	136	137	21	20	No Change; Well bore seal okay
A11-10(Interim Temp)	6/26/2012 17:27	53.2	42.7	0	4.1	180	-3.3	-3.4	136	136	21	21	No Change; Well bore seal okay
A11-10(Interim Temp)	7/6/2012 11:48	57.7	41.5	0	0.8	100	-3.4	-3.5	136	136	25	25	No Change; Well bore seal okay
A11-10(Interim Temp)	7/20/2012 11:41	51.9	41.5	0.1	6.5	120	-3.4	-3.3	135	135	7	8	No Change; Well bore seal okay
A11-10(Interim Temp)	8/13/2012 14:05	54	41.4	0.3	4.3	170	-2.9	-2.9	139	138			No Change; Well bore seal okay
A11-10(Interim Temp)	8/28/2012 13:26	57	42.6	0	0.4	170	-2.9	-2.8	137	138	41	41	No Change; Well bore seal okay
A11-10(Interim Temp)	9/11/2012 11:18	57.3	41.1	0	1.6	160	-3.5	-3.6	138	136	17	20	Opened valve 1/2 turn or less;
A11-10(Interim Temp)	9/24/2012 12:03	56.3	42.7	0.1	0.9	110	-3.6	-3.7	136	136	23	23	Opened valve 1/2 turn or less;
A11-10(Interim Temp)	10/5/2012 13:16	58.1	41.7	0	0.2	170	-3.8	-3.8	135	135	25	25	No Change; Well bore seal okay
A11-10(Interim Temp)	10/30/2012 11:30	56.8	42.9	0.2	0.1	160	-4.2	-4.2	135	134	21	21	No Change; Well bore seal okay
A11-10(Interim Temp)	11/13/2012 14:59	58	43.9	0	0.1	130	-2.7	-2.7	134	135	22	22	No Change; Well bore seal okay
A11-10(Interim Temp)	11/28/2012 14:19	56.1	43.8	0	0.1	120	-4.7	-4.7	134	134	23	22	No Change; Well bore seal okay
A11-10(Interim Temp)	12/13/2012 14:45	56.6	43.3	0	0.1	130	-3.5	-3.7	135	135	24	24	Opened valve 1/2 turn or less;
A11-10(Interim Temp)	12/31/2012 16:04	57.9	42	0	0.1		-5.3	-5.3	135	136	27	27	No Change; Well bore seal okay
A11-10(Interim Temp)	1/10/2013 11:03	57.7	41.2	0	1.1	120	-5.3	-5.4	135	136	25	27	Opened valve 1/2 turn or less;
A11-10(Interim Temp)	1/30/2013 14:02	58.5	41.5	0	0.2	160	-4.8	-4.8	137	138	26	26	No Change; Well bore seal okay
A11-10(Interim Temp)	2/13/2013 8:33	57.4	41.7	0.4	0.5		-4.5	-4.5	125	126	24	24	No Change; Well bore seal okay
A11-10(Interim Temp)	2/25/2013 10:15	56.8	40.9	0	2.3	150	-4.1	-4.1	136	137	19	18	No Change; Well bore seal okay
A11-10(Interim Temp)	3/6/2013 12:01	55.9	41.8	0	2.3	150	-4	-4.1	136	136	17	16	No Change; Well bore seal okay
A11-10(Interim Temp)	3/25/2013 12:04	58.6	43.4	0	0	150	-2.64	-2.63	137	136	21	21	No Change; Well bore seal okay
A11-10(Interim Temp)	4/15/2013 12:34	56.9	41.9	0	1.2	150	-2.97	-2.95	137	138	20	20	No Change; Well bore seal okay
A11-10(Interim Temp)	5/3/2013 13:55	58.2	41.8	0	0	180	-0.37	-0.35	138	138	18	18	No Change; Well bore seal okay
A11-10(Interim Temp)	5/28/2013 16:10	57.7	42.3	0	0	130	-0.93	-0.92	139	139	20	20	No Change; Well bore seal okay
A11-10(Interim Temp)	6/14/2013 9:09	56	42.3	0	1.7	160	-1.87	-1.86	138	138	13	14	No Change; Well bore seal okay
A11-10(Interim Temp)	6/28/2013 11:45	58.6	41.4	0	0	140	-1.43	-1.44	137	137	17	16	No Change; Well bore seal okay
A11-10(Interim Temp)	7/5/2013 9:23	55.5	43.9	0	0.6	170	-2.29	-2.29	138	138	16	16	No Change; Well bore seal okay
A11-10(Interim Temp)	7/26/2013 7:57	56.1	41.9	0	2	150	-2.5	-2.49	138	138	19	19	No Change; Well bore seal okay
A11-10(Interim Temp)	8/12/2013 14:40	56.3	41.2	0	2.5	190	-1.03	1.02	138	137	16	16	No Change; Well bore seal okay
A11-10(Interim Temp)	8/29/2013 16:45	58.6	41.4	0	0	140	-1.55	-1.56	139	139	31	31	No Change; Well bore seal okay
A11-10(Interim Temp)	9/11/2013 12:51	58.1	41.9	0	0	190	-2.34	-2.34	137	137	20	21	No Change; Well bore seal okay
A11-10(Interim Temp)	9/24/2013 16:15	58.1	41.9	0	0	180	-0.86	-0.86	139	139			No Change; Well bore seal okay
A11-11(Interim Temp)	6/15/2012 15:35	56.7	42	0.1	1.2	100	-2.9	-2.9	133	133	5	5	No Change; Well bore seal okay
A11-11(Interim Temp)	6/28/2012 17:31	58.7	41.9	0	2.4	130	-3.8	-3.8	134	133	12	12	No Change; Well bore seal okay
A11-11(Interim Temp)	7/6/2012 11:51	58	41	0	1	80	-4.1	-4.1	133	133	19	19	No Change; Well bore seal okay
A11-11(Interim Temp)	7/20/2012 11:45	52.5	42.8	0	4.7	110	-4.1	-4.1	133	133			No Change; Well bore seal okay
A11-11(Interim Temp)	8/13/2012 14:09	54.2	42.7	0.2	2.9	150	-3.7	-3.7	136	136	9	10	No Change; Well bore seal okay
A11-11(Interim Temp)	8/28/2012 13:40	56.8	43.1	0	0.1	100	-9.4	-9.3	137	137	42	41	No Change; Well bore seal okay
A11-11(Interim Temp)	9/11/2012 11:22	57.3	40.6	0	2.3	120	-10.6	-11	138	138	20	20	Opened valve 1/2 turn or less;

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
A11-11(Interim Temp)	9/24/2012 12:07	57.5	42.2	0.1	0.2	110	-11.7	-12.1	135	135	24	27	Opened valve 1/2 turn or less;
A11-11(Interim Temp)	10/5/2012 13:21	58.6	41.2	0	0.2	120	-12.9	-13.5	134	134	28	31	Opened valve 1/2 turn or less;
A11-11(Interim Temp)	10/30/2012 11:40	57.7	42	0.2	0.1	100	-14.6	-14.6	134	134	27	26	No Change; Well bore seal okay
A11-11(Interim Temp)	11/13/2012 15:04	57	42.8	0	0.2	80	-13.4	-13.4	133	134	23	27	No Change; Well bore seal okay
A11-11(Interim Temp)	11/28/2012 16:25	56.7	43.2	0	0.1	80	-15.4	-15.3	133	133	28	26	No Change; Well bore seal okay
A11-11(Interim Temp)	12/13/2012 14:37	57.3	42.2	0	0.5	100	-14.7	-15.3	134	134	33	35	Opened valve 1/2 turn or less;
A11-11(Interim Temp)	12/31/2012 16:07	58.4	41.5	0	0.1		-16.7	-16.8	135	134	31	32	No Change; Well bore seal okay
A11-11(Interim Temp)	1/10/2013 10:54	57.7	40.7	0	1.6	100	-17.2	-17.9	133	134	29	34	Opened valve 1/2 turn or less;
A11-11(Interim Temp)	1/30/2013 14:05	59.1	40.8	0	0.1	90	-16.2	-16.2	136	136	32	33	No Change; Well bore seal okay
A11-11(Interim Temp)	2/14/2013 16:16	57.2	41.8	0	1	100	-11	-11	134	135	24	24	No Change; Well bore seal okay
A11-11(Interim Temp)	2/25/2013 10:18	58.8	40.4	0	0.8	100	-7	-6.9	134	133	21	20	No Change; Well bore seal okay
A11-11(Interim Temp)	3/6/2013 12:05	57.9	41.3	0	0.8	90	-10.5	-10.4	133	134	20	18	No Change; Well bore seal okay
A11-11(Interim Temp)	3/21/2013 11:07	57.8	42.1	0	0.1	23	-9.6	-9.6	132	132	25	25	No Change; Well bore seal okay
A11-11(Interim Temp)	4/15/2013 12:39	58.4	41.6	0	0	90	-9.01	-9.01	135	135	20	20	No Change; Well bore seal okay
A11-11(Interim Temp)	5/3/2013 14:03	58.5	41.5	0	0	160	-4.83	-4.82	136	136	19	19	No Change; Well bore seal okay
A11-11(Interim Temp)	5/28/2013 16:14	57.9	42.1	0	0	110	-5.3	-5.28	136	136	17	17	No Change; Well bore seal okay
A11-11(Interim Temp)	6/14/2013 9:03	58	41.9	0	0.1	150	-6.71	-6.71	135	135	19	18	No Change; Well bore seal okay
A11-11(Interim Temp)	6/28/2013 11:47	59.1	40.9	0	0	160	-5	-5	137	137	17	16	No Change; Well bore seal okay
A11-11(Interim Temp)	7/5/2013 9:29	56.6	43.4	0	0	140	-6.21	-6.2	135	135	17	17	No Change; Well bore seal okay
A11-11(Interim Temp)	7/26/2013 8:01	58.4	41.6	0	0	130	-6.48	-6.44	134	134	19	19	No Change; Well bore seal okay
A11-11(Interim Temp)	8/12/2013 14:44	58.4	40.9	0	0.7	170	-4.17	-4.18	137	137	16	16	No Change; Well bore seal okay
A11-11(Interim Temp)	8/29/2013 16:48	59.3	40.7	0	0	150	-5.12	-5.13	137	137	13	12	No Change; Well bore seal okay
A11-11(Interim Temp)	9/11/2013 12:55	58.8	41.2	0	0	150	6.48	-6.48	137	137			No Change; Well bore seal okay
A11-11(Interim Temp)	9/24/2013 16:24	58.3	41.7	0	0	140	-5.3	-5.3	135	135	27	27	No Change; Well bore seal okay
A12-02	9/11/2012 12:44	57.5	42.3	0	0.2		-1.1	-1.3	129	129			Opened valve 1/2 turn or less;
A12-02	9/25/2012 12:25	56.3	43.6	0	0.1		-1.2	-1.1	129	127	11	9	No Change; Well bore seal okay
A12-02	10/8/2012 11:38	54.4	45.4	0	0.2		-2.5	-2.8	128	128	15	18	Opened valve 1/2 turn or less;
A12-02	10/24/2012 15:36	56.3	43.4	0.1	0.2		-3	-3.2	129	128	17	21	No Change; Well bore seal okay
A12-02	11/14/2012 11:05	56	43.9	0	0.1	90	-3.5	-3.4	131	130	22	21	
A12-02	11/14/2012 11:06	56.1	43.8	0	0.1	90	-3.9	-3.9	130	130	26	26	Opened valve 1/2 turn or less;
A12-02	11/29/2012 14:54	56	43.9	0	0.1		-3.8	-3.8	129	129	25	26	No Change; Well bore seal okay
A12-02	12/13/2012 15:33	55.9	44	0	0.1		-4.1	-4.1	129	129	24	24	No Change; Well bore seal okay
A12-02	12/31/2012 16:34	56.4	43.5	0	0.1		-4.9	-4.9	128	127	27	27	No Change; Well bore seal okay
A12-02	1/30/2013 10:37	58.6	41.3	0	0.1	80	5.9	-6.3	126	126	27	32	No Change; Well bore seal okay
A12-02	2/14/2013 15:38	55.7	43.5	0	0.8	80	-3.9	-3.9	127	127	25	24	
A12-02	2/14/2013 15:40	56	43.7	0	0.3		-4	-4	127	127	24	24	No Change; Second Reading;
A12-02	2/26/2013 15:25	56.8	43.1	0	0.1	90	-2.9	-2.8	128	128	21	20	No Change; Well bore seal okay
A12-02	3/6/2013 14:25	56.1	43.8	0	0.1	70	-3.6	-3	128	128	21	13	Closed valve 1/2 turn or less; Well
A12-02	3/18/2013 10:24	55.4	44.6	0	0	80	-1.99	-1.98	131	131	16	15	
A12-02	3/18/2013 10:26	55.4	44.6	0	0	80	-1.35	-1.35	131	131			Closed valve 1/2 turn or less;
A12-02	3/29/2013 15:24	55.9	44.1	0	0	80	-0.15	-0.15	130	130	5	38	No Change; Well bore seal okay
A12-02	4/8/2013 15:56	56.7	43.3	0	0		-1.64	-1.68	129	129			No Change; Well bore seal okay
A12-02	4/26/2013 12:49	56.9	43.1	0	0		-2.39	-2.4	126	127	16	16	No Change; Well bore seal okay
A12-02	5/3/2013 10:26	56.5	43.5	0	0		-1.53	-1.6	129	130	24	24	No Change; Well bore seal okay
A12-02	5/29/2013 7:42	56.7	43.3	0	0	80	-2.01	-1.99	124	124	17	16	
A12-02	5/29/2013 7:44	56.8	43.3	0			-1.37	-1.36	123	123	14	13	Closed valve 1/2 turn or less;
A12-02	6/6/2013 11:11	56.6	43.3	0	0.1	140	-0.49	-0.46	131	130	28	27	Closed valve 1/2 turn or less; Well
A12-02	6/6/2013 11:13	56.6	43.3	0	0.1	140	-0.35	-0.33	130	131	14	26	Closed valve 1/2 turn or less;
A12-02	6/14/2013 10:04	55.9	44.1	0	0		-1.43	-1.42	128	132	14	13	Adjusted vacuum; inspected well

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
A12-02	7/8/2013 11:18	56.9	43	0	0.1	90	-2	-2.01	[illegible]	[illegible]	10	9	Adjusted vacuum; inspected well
A12-02	7/8/2013 11:20	55	45	0	0	90	-1.5	-1.5	[illegible]	[illegible]			Closed valve 1/2 turn or less;
A12-02	7/26/2013 14:59	56.3	43.6	0	0.1	80	-0.26	-0.25	[illegible]	[illegible]	38	38	No Change; Well bore seal okay
A12-02	8/13/2013 11:23	64.6	35.4	0	0	100	-1.57	-1.57	[illegible]	[illegible]	12	12	Adjusted vacuum; inspected well
A12-02	8/29/2013 12:46	56.6	43.4	0	0	90	-1.8	-1.8	[illegible]	[illegible]			Adjusted vacuum; inspected well
A12-02	9/13/2013 15:20	57	43	0	0	100	-0.8	-0.8	[illegible]	[illegible]	17	17	No Change; Well bore seal okay
A12-02	9/24/2013 15:46	56.7	43.3	0	0	100	-1.02	-1.02	[illegible]	[illegible]	21	21	
A12-02	9/24/2013 15:48	56.3	43.7	0	0	100	-0.36	-0.35	[illegible]	[illegible]	7	7	Closed valve 1/2 turn or less;
A12-03	3/6/2013 14:29	52.9	47	0	0.1		-1.6	-1.5	128	128	34	34	No Change; Well bore seal okay
A12-03	3/18/2013 10:30	53	47	0	0		-1.47	-1.45	129	128			No Change; Well bore seal okay
A12-03	4/8/2013 15:59	54.2	45.8	0	0		-0.47	-0.48	126	126	12	12	No Change; Well bore seal okay
A12-03	4/26/2013 12:53	55.2	44.4	0	0.4		-1.29	-1.26	129	129	11	11	No Change; Well bore seal okay
A12-03	5/3/2013 10:29	54.8	45.2	0	0		-0.15	-0.15	130	130	18	18	No Change; Well bore seal okay
A12-03	5/29/2013 7:48	55.2	44.8	0	0		-0.87	-0.86	126	126	15	14	No Change; Well bore seal okay
A12-03	6/14/2013 10:06	54.6	45.3	0.1	0		-0.58	-0.58	129	129	27	27	No Change; Well bore seal okay
A12-03	6/19/2013 12:03	54.8	45.1	0.1	0	90	-1.71	-1.68	130	130	13	13	No Change; Well bore seal okay
A12-03	7/8/2013 11:25	53.9	44.1	0	2	80	-1.19	-1.18	[illegible]	[illegible]	29	29	
A12-03	7/8/2013 11:26	54.3	45.7	0	0	80	-1.06	-1.05	[illegible]	[illegible]	23	23	Closed valve 1/2 turn or less;
A12-03	8/29/2013 12:51	55.5	44.5	0	0	100	-1.76	-1.76	[illegible]	[illegible]	26	26	Adjusted vacuum; inspected well
A12-03	9/13/2013 15:24	55.8	44.2	0	0	90	-0.73	-0.73	[illegible]	[illegible]	36	35	No Change; Well bore seal okay
A12-03	9/24/2013 15:52	55.3	44.7	0	0	90	-0.96	-0.97	[illegible]	[illegible]	13	13	
A12-03	9/24/2013 15:53	55.3	44.7	0	0	90	-0.27	-0.27	[illegible]	[illegible]			Closed valve 1/2 turn or less;
A12-04	6/14/2013 10:08	56.2	43.6	0.1	0.1		-0.85	-0.86	125	126	30	30	No Change; Well bore seal okay
A12-04	7/8/2013 11:30	49.6	42	0	8.4		-2.42	-2.26	128	128	16	13	Closed valve 1/2 turn or less; Well
A12-04	7/26/2013 15:08	54	43.3	0	2.7		-0.53	-0.52	129	129	14	14	No Change; Well bore seal okay
A12-04	8/13/2013 11:33	62	34.8	0	3.2		-0.86	-0.87	129	129	14	15	No Change; Well bore seal okay
A12-04	8/29/2013 12:55	54.9	42.3	0	2.8		-1.39	-1.39	127	127	26	26	No Change; Well bore seal okay
A12-04	9/13/2013 15:28	57.2	42.8	0	0	100	-0.56	-0.96	[illegible]	[illegible]	16	16	
A12-04	9/13/2013 15:29	57.1	42.9	0	0	100	-0.63	-0.62	[illegible]	[illegible]	20	21	No Change; Second Reading; Well
A12-04	9/24/2013 15:57	57.1	42.9	0	0		-0.74	-0.74	129	129	9	9	No Change; Well bore seal okay
A12-05	2/14/2013 16:01	56.1	42.3	0	1.6		-1.9	-1.9	125	126	31	30	No Change; Well bore seal okay
A12-05	3/18/2013 10:52	56.4	43.6	0	0		-2.13	-2.11	125	126	26	26	No Change; Well bore seal okay
A12-05	4/8/2013 16:06	56.9	43.1	0	0		-1.12	-1.1	125	125	13	13	No Change; Well bore seal okay
A12-05	4/27/2013 11:22	56.9	43.1	0	0		-1.72	-1.73	126	126	35	36	No Change; Well bore seal okay
A12-05	5/3/2013 10:36	57.2	42.8	0	0		-0.32	-0.32	126	126	16	16	No Change; Well bore seal okay
A12-05	5/29/2013 7:53	57.4	42.6	0	0		-1.33	-1.33	125	125	35	35	No Change; Well bore seal okay
A12-05	6/14/2013 10:09	57.1	42.8	0	0.1		-1.03	-1.02	126	126	33	33	No Change; Well bore seal okay
A12-05	7/8/2013 11:33	56.3	43.7	0	0		-1.62	-1.61	126	127	31	31	No Change; Well bore seal okay
A12-05	7/26/2013 15:23	56.8	43.2	0	0		-0.12	-0.13	128	128	28	13	No Change; Well bore seal okay
A12-05	8/13/2013 11:36	65.7	34.3	0	0		-0.63	-0.63	127	128	15	15	No Change; Well bore seal okay
A12-05	8/29/2013 12:57	58.1	41.9	0	0		-1.23	-1.22	127	127	15	15	No Change; Well bore seal okay
A12-05	9/13/2013 15:32	58.2	41.8	0	0		-0.12	-0.13	130	130	10	10	No Change; Well bore seal okay
A12-05	9/24/2013 15:59	58	42	0	0		-0.78	-0.78	129	129	17	17	No Change; Well bore seal okay
A12-13S	9/11/2012 12:58	59.7	40.1	0	0.2		-2.8	-3.1	125	125	27	29	Opened valve 1/2 turn or less;
A12-13S	7/30/2013 12:05	58.6	41.4	0	0		-2.06	-2.06	125	125	17	17	No Change; Well bore seal okay
A12-13S	8/13/2013 12:19	66.6	33.4	0	0		-1.24	-1.24	125	125	20	20	No Change; Well bore seal okay
A12-13S	8/29/2013 14:02	59.8	40.2	0	0		-1.82	-1.82	125	125	20	20	No Change; Well bore seal okay
A12-13S	9/13/2013 16:03	59.7	40.3	0	0		-0.83	-0.84	126	126	23	23	No Change; Well bore seal okay
A12-14	8/22/2012 13:18	55.1	41.5	0.1	3.3	160	-0.9	-0.9	[illegible]	[illegible]			

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
A12-14	8/22/2012 13:20	55.5	41.2	0.1	3.2		-0.9	-1	[illegible]	[illegible]	7		No Change; Second Reading; Well
A12-14	9/5/2012 14:52	56.2	43.3	0	0.5		-1.1	-1.5	[illegible]	[illegible]		23	Opened valve 1/2 turn or less;
A12-14	9/7/2012 9:21	57.5	41.2	0	1.3		-2.9	-2.9	[illegible]	[illegible]	15	14	
A12-14	9/7/2012 9:25	57.4	42.2	0	0.4	85	-1.8	-1.8	[illegible]	[illegible]			Closed valve 1/2 to 1 turn; Second
A12-14	9/25/2012 12:34	56.3	43.6	0	0.1		-0.5	-0.5	128	128	7	7	No Change; Well bore seal okay
A12-14	10/8/2012 11:52	56	43.8	0	0.2		-0.9	-0.9	126	126	8	7	No Change; Well bore seal okay
A12-14	10/29/2012 11:44	57.5	42	0.3	0.2		-0.8	-0.9	125	126			Opened valve 1/2 turn or less;
A12-14	11/14/2012 11:22	56.8	43.1	0	0.1		-0.6	-0.7	127	128	6	8	No Change; Well bore seal okay
A12-14	11/29/2012 15:06	57.7	42.2	0	0.1		-0.5	-0.4	126	127	11	11	No Change; Well bore seal okay
A12-14	12/13/2012 14:43	56.4	43.5	0	0.1		-0.5	-0.6	127	129	16	20	Opened valve 1/2 turn or less;
A12-14	12/31/2012 17:03	57.6	42.3	0	0.1		-1.5	-1.5	127	128	19	18	No Change; Well bore seal okay
A12-14	1/10/2013 11:01	58.5	41.4	0	0.1		-1.6	-1.7	126	127			Opened valve 1/2 turn or less;
A12-14	2/26/2013 15:39	57.2	42.7	0	0.1		-0.2	-0.3	129	128			No Change; Well bore seal okay
A12-14	3/6/2013 15:02	57.1	42.8	0	0.1		-1.3	-1.3	128	127			No Change; Well bore seal okay
A12-14	3/18/2013 10:56	56.3	43.7	0	0	110	-1.2	-1.16	[illegible]	[illegible]	16	15	
A12-14	3/18/2013 10:59	56.2	43.8	0	0	110	-1	-0.95	[illegible]	[illegible]			Closed valve 1/2 turn or less;
A12-14	3/29/2013 15:19	56.3	43.7	0	0		-0.24	-0.25	129	129	36	38	No Change; Well bore seal okay
A12-14	4/8/2013 16:11	56.9	43.1	0	0		-0.77	-0.79	128	127	29	30	No Change; Well bore seal okay
A12-14	4/27/2013 11:26	57	43	0	0		-1.36	-1.36	129	129	37	36	No Change; Well bore seal okay
A12-14	5/3/2013 10:40	57.5	42.5	0	0		-0.29	-0.3	129	129	21	28	No Change; Well bore seal okay
A12-14	5/29/2013 7:57	57.5	42.5	0	0		-0.96	-0.95	129	129	34	35	No Change; Well bore seal okay
A12-14	6/14/2013 10:12	56.9	43.1	0	0		-0.75	-0.72	129	127	37	36	No Change; Well bore seal okay
A12-14	7/30/2013 12:08	57.3	41.3	0	1.4	80	-1.17	-1.17	[illegible]	[illegible]	9	8	Adjusted vacuum; inspected well
A12-14	8/13/2013 12:22	65.7	34.3	0	0	100	-0.56	-0.6	[illegible]	[illegible]	13	13	Adjusted vacuum; inspected well
A12-14	8/29/2013 14:05	57.5	41.3	0	1.2	90	-0.92	-0.92	[illegible]	[illegible]	34	34	Adjusted vacuum; inspected well
A12-14	9/13/2013 16:05	58.6	41.4	0	0	100	-0.27	-0.27	[illegible]	[illegible]	27	27	No Change; Well bore seal okay
A12-14	9/24/2013 16:19	57.8	42.2	0	0	80	-0.26	-0.26	[illegible]	[illegible]	13	13	
A12-14	9/24/2013 16:20	57.6	42.4	0	0	80	-0.14	-0.14	[illegible]	[illegible]	8	9	Closed valve 1/2 turn or less;
A12-16	8/22/2012 15:28	57.5	42.1	0.2	0.2		1.1	1	128	127			
A12-16	8/22/2012 15:30	56.6	43	0.2	0.2		-0.8	-0.9	129	129			Opened valve 1/2 turn or less;
A12-16	9/11/2012 14:43	59.7	39.5	0.4	0.4		-3.4	-3.8	128	128	21	23	Opened valve 1/2 turn or less
A12-16	9/25/2012 13:30	58.6	41.3	0	0.1		-5	-5.1	129	129	20	20	No Change; Well bore seal okay
A12-16	10/8/2012 13:52	58.4	41	0.5	0.1		-5.2	-5.2	126	126	21	21	No Change; Well bore seal okay
A12-16	10/29/2012 14:15	59.2	40.1	0.5	0.2		-4.7	-4.7	127	127	20	20	No Change; Well bore seal okay
A12-16	11/14/2012 12:22	58.7	40.4	0.2	0.7		-4.9	-4.9	127	128	20	20	No Change; Well bore seal okay
A12-16	11/29/2012 15:51	59.1	40.7	0	0.2		-5.6	-5.6	126	127			No Change; Well bore seal okay
A12-16	12/28/2012 12:47	58.3	40.2	0	1.5		-5.8	-5.8	125	126	22	23	No Change; Well bore seal okay
A12-16	1/14/2013 16:06	57.9	41.9	0.1	0.1		-24.6	-24.5	128	128	48	48	No Change; Well bore seal okay
A12-16	1/30/2013 11:39	57.2	38.8	0.1	3.9	70	-20.2	-20.1	130	130	41	42	No Change; Well bore seal okay
A12-16	2/13/2013 12:30	54.9	39.6	0.4	5.1	70	-14.9	-14.9	130	[illegible]	32	30	
A12-16	2/13/2013 12:31	55.2	39.9	0.4	4.5		-14.9	-15	[illegible]	[illegible]	34	34	No Change; Second Reading; Well
A12-16	2/21/2013 9:06	57.8	39.6	0.2	2.4		-14.9	-14.9	129	129	28	26	No Change; Well bore seal okay
A12-16	6/14/2013 10:38	59.5	40.5	0	0		-4.76	-4.73	126	126	16	17	No Change; Well bore seal okay
A12-16	6/27/2013 12:34	59.6	40.4	0	0		-3.35	-3.33	127	127	15	15	No Change; Well bore seal okay
A12-16	7/8/2013 11:04	59	41	0	0		-5.81	-5.82	127	127	20	29	No Change; Well bore seal okay
A12-16	7/30/2013 12:13	60.3	39.7	0	0		-5.4	-5.42	127	127	3	3	No Change; Well bore seal okay;
AO65RS (IWP)	8/2/2012 13:56	54.8	41.3	0.3	3.6		-1.7	-1.9	125	125	25	27	Opened valve 1/2 turn or less;
AO65RS (IWP)	8/22/2012 16:43	54.1	45.8	0	0.1		-2	-2.1	125	125	33	31	No Change; Well bore seal okay
AO65RS (IWP)	9/10/2012 16:23	54.3	44.2	0	1.5		-2.3	-2.3	128	128	31	31	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
AO65RS (IWP)	7/24/2013 11:54	56.9	43.1	0	0		-0.63	-0.62	125	125	26	26	No Change; Well bore seal okay
AO65RS (IWP)	8/10/2013 15:32	56.7	43.3	0	0		-1.03	-1.03	125	125	18	19	No Change; Well bore seal okay
F12-01	3/12/2013 12:54	57.7	42.2	0	0.1		-0.7	-0.7	125	126	5	4	No Change; Well bore seal okay
F12-01	4/2/2013 10:57	56.9	43.1	0	0		-0.54	-0.54	126	125	32	33	No Change; Well bore seal okay
F12-01	5/13/2013 15:08	58.1	41.9	0	0		-0.26	-0.26	128	128	8	8	No Change; Well bore seal okay
F12-01	5/29/2013 14:08	56.4	43.6	0	0		-0.52	-0.53	126	126	31	30	No Change; Well bore seal okay
F12-01	6/12/2013 15:33	59	40.2	0	0.8		-0.16	-0.13	127	128	33	33	No Change; Well bore seal okay
F12-01	6/28/2013 12:25	58.6	40.8	0	0.6		-0.17	-0.14	127	127	19	18	No Change; Well bore seal okay
F12-01	7/11/2013 11:19	58.7	41.3	0	0		-0.3	-0.3	126	126	30	30	No Change; Well bore seal okay
F12-01	7/19/2013 12:08	58.1	41.9	0	0		-0.18	-0.18	126	126	15	14	No Change; Well bore seal okay
F12-01	8/8/2013 14:35	58	42	0	0		-0.11	-0.21	127	128	12	13	No Change; Well bore seal okay
F12-01	8/21/2013 11:43	57.1	42.9	0	0		-1.3	-1.3	128	129	17	18	No Change; Well bore seal okay
F12-01	9/13/2013 18:45	58.6	41.4	0	0		-1.13	-1.13	129	129	6	7	No Change; Well bore seal okay
F12-01	9/19/2013 14:18	58	42	0	0		-1.11	-1.11	129	129	37	36	No Change; Well bore seal okay
F12-02	8/22/2012 11:43	58.3	41.1	0	0.6		-0.2	-0.3	126	126	8	8	Opened valve 1/2 turn or less;
F12-02	9/11/2012 15:53	58	41.4	0.5	0.1		-0.2	-0.4	129	129	11	15	Opened valve 1/2 turn or less;
F12-02	9/24/2012 14:18	56.4	41.1	0.4	2.1		-0.4	-0.5	126	127	16	17	Opened valve 1/2 turn or less;
F12-02	10/4/2012 14:29	57.3	40.7	0	2		-0.7	-0.8	126	126	16	18	Opened valve 1/2 turn or less;
F12-02	10/24/2012 13:43	50	38.4	0	11.6		-1	-1	125	125	19	18	No Change; Well bore seal okay
F12-02	11/26/2012 13:21	52.4	38.6	0	9		-0.8	-0.8	126	126	35	34	No Change; Well bore seal okay
F12-02	12/13/2012 11:51	54	39.4	0	6.6		-0.7	-0.7	125	125			No Change; Well bore seal okay
F12-02	12/31/2012 13:51	53	39.1	0.4	7.5		-0.8	-0.9	127	127			No Change; Well bore seal okay
F12-02	1/9/2013 10:04	52.5	38.6	0	8.9		-0.9	-1	126	126			Opened valve 1/2 turn or less;
F12-02	1/29/2013 15:27	52.6	38.4	0.5	8.5		-1.1	-1.1	126	126			No Change; Well bore seal okay
F12-02	3/12/2013 12:18	55.6	40.6	0.2	3.6		-0.5	-0.4	126	127	13	12	No Change; Well bore seal okay
F12-02	4/2/2013 10:00	55.4	40.7	0	3.9		-0.4	-0.4	126	126			No Change; Well bore seal okay
F12-02	5/13/2013 14:13	59.3	40.6	0	0.1		-0.12	-0.12	128	127		29	No Change; Well bore seal okay
F12-02	5/29/2013 13:38	53.6	42.3	0.2	3.9		-0.16	-0.14	129	129	16	16	No Change; Well bore seal okay
F12-02	6/12/2013 14:58	55.8	41.3	0	2.9		-0.47	-0.49	129	129	26	25	No Change; Well bore seal okay
F12-02	6/28/2013 12:02	57.4	40.8	0	1.8		-0.26	-0.26	125	125	18	30	No Change; Well bore seal okay
F12-02	7/11/2013 10:54	55.5	40.8	0	3.7		-0.6	-0.59	127	127	39	39	No Change; Well bore seal okay
F12-02	7/19/2013 11:45	55.9	41.8	0	2.3		-0.35	-0.35	126	126	15	15	No Change; Well bore seal okay
F12-02	8/8/2013 13:46	57.1	42.4	0	0.5		-0.23	-0.23	129	129	13	13	No Change; Well bore seal okay
F12-02	8/21/2013 11:16	57.1	42.5	0	0.4		-0.56	-0.56	127	127	17	17	No Change; Well bore seal okay
F12-02	9/13/2013 18:05	59.2	40.8	0	0		-0.22	-0.22	130	130	34	34	No Change; Well bore seal okay
F12-02	9/19/2013 13:59	55.2	41.6	0	3.2		-0.1	-0.1	129	130	16	15	No Change; Well bore seal okay
F12-03	9/11/2012 15:56	58.9	40.9	0.1	0.1		-0.4	-0.5	127	127	20	23	Opened valve 1/2 turn or less;
F12-06	9/11/2012 16:02	63.1	36.8	0	0.1		-0.6	-0.8	128	128	20	23	Opened valve 1/2 turn or less;
F12-06	12/31/2012 13:59	54.6	37.5	0.1	7.8		-2.3	-2.4	125	125	44	45	No Change; Well bore seal okay
F12-06	4/2/2013 10:20	57.2	38.5	0	4.3		-1.18	-1.17	125	125	28	28	No Change; Well bore seal okay
F12-06	5/13/2013 14:24	61.8	38.2	0	0		-0.56	-0.55	126	127	24	25	No Change; Well bore seal okay
F12-06	5/29/2013 13:46	55	37.9	0	7.1		-0.88	-0.88	125	125	23	23	No Change; Well bore seal okay
F12-06	6/12/2013 15:06	61.4	38.5	0	0.1		-0.76	-0.8	126	127	18	21	Opened valve 1/2 turn or less;
F12-06	6/28/2013 12:10	60.1	36.3	0	3.6		-0.82	-0.83	126	126	30	30	No Change; Well bore seal okay
F12-06	7/11/2013 11:02	59.7	37.9	0	2.4		-1.26	-1.24	125	125	24	25	No Change; Well bore seal okay
F12-06	7/19/2013 11:54	60.2	38.5	0	1.3		-1.01	-1.01	126	126	27	27	No Change; Well bore seal okay
F12-06	8/8/2013 13:54	60.6	39.4	0	0		-0.69	-0.7	126	126	24	24	No Change; Well bore seal okay
F12-06	8/21/2013 11:25	60.2	39.3	0	0.5		-1.07	-1.06	125	125	28	27	No Change; Well bore seal okay
F12-06	9/13/2013 18:11	62.1	37.9	0	0		-0.98	-0.97	126	126	23	23	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
F12-06	9/19/2013 14:06	59.7	38.6	0	1.7		-0.79	-0.8	126	126	27	27	No Change; Well bore seal okay
F12-07	9/11/2012 16:05	58.2	41.7	0	0.1		-0.3	-0.6	129	129	18	21	Opened valve 1/2 turn or less;
F12-08	8/22/2012 12:05	56.4	42.5	0	1.1	70	0.5	0.4	[illegible]	[illegible]			
F12-08	8/22/2012 12:07	56.1	42	0	1.9	70	-0.4	-0.6	[illegible]	[illegible]	15	16	Opened valve 1/2 turn or less;
F12-08	9/5/2012 15:09	56.5	43.4	0	0.1	60	-0.9	-1.2	[illegible]	[illegible]	27	20	Opened valve 1/2 turn or less;
F12-08	9/7/2012 10:00	58	41.4	0	0.6	45	-1.6	-1.6	[illegible]	[illegible]	22	22	
F12-08	9/7/2012 10:09	57.2	42.6	0	0.2	45	-0.1	-0.2	[illegible]	[illegible]			Closed valve 1/2 to 1 turn; Second
F12-08	9/24/2012 14:34	56.3	43.4	0.2	0.1		-0.1	-0.2	129	130	16	9	No Change; Well bore seal okay
F12-08	10/4/2012 15:49	56.5	43.4	0	0.1		-0.2	-0.2	129	129	11	11	No Change; Well bore seal okay
F12-08	10/24/2012 14:01	57.5	42.4	0	0.1		-0.1	-0.3	129	130	23	33	Opened valve 1/2 turn or less;
F12-08	11/8/2012 13:40	57.2	42.5	0.1	0.2		-0.4	-0.7	128	129	20	25	Opened valve 1/2 turn or less;
F12-08	11/26/2012 13:35	52.8	39.2	0.1	7.9		-0.9	-0.9	129	129	23	22	No Change; Well bore seal okay
F12-08	12/13/2012 12:09	52.7	39.6	0	7.7		-1.3	-1.2	128	128			No Change; Well bore seal okay
F12-08	12/31/2012 14:06	50.9	37	0.1	12		-1.9	-1.9	127	128	34	35	No Change; Well bore seal okay
F12-08	1/9/2013 10:20	50.1	37.4	0	12.5		-1.8	-2	128	129	18	26	Opened valve 1/2 turn or less;
F12-08	1/29/2013 15:39	48.7	36.8	0.2	14.3		-1.9	-1.9	129	129	22	25	No Change; Well bore seal okay
F12-08	2/12/2013 13:35	48.1	36.2	0	15.6	80	-1.5	-1.4	[illegible]	[illegible]	28	27	
F12-08	2/12/2013 13:37	46.8	36.4	0	16.8		-1.5	-1.5	[illegible]	[illegible]	27	26	No Change; Second Reading; Well
F12-08	2/25/2013 12:28	57.7	41.8	0	0.5		-0.3	-0.3	128	128	18	18	No Change; Well bore seal okay
F12-08	3/12/2013 12:30	55.6	41.2	0	3.2	100	-0.8	-0.7	[illegible]	[illegible]	20	20	
F12-08	3/12/2013 12:32	56.4	43.5	0	0.1	100	-0.2	-0.1	[illegible]	[illegible]	13	12	Closed valve 1/2 to 1 turn; Second
F12-08	4/2/2013 10:27	57.9	42.1	0	0		-0.18	-0.18	129	129	29	20	No Change; Well bore seal okay
F12-08	5/13/2013 14:33	59	41	0	0		-0.24	-0.23	129	129	16	15	No Change; Well bore seal okay
F12-08	5/29/2013 13:51	55.4	43.5	0	1.1		-0.31	-0.31	129	129	31	30	No Change; Well bore seal okay
F12-08	6/28/2013 12:19	57.6	41.3	0	1.1		0.02	0.03	127	127	21	21	Adjusted vacuum; inspected well
F12-08	7/11/2013 11:10	56.5	40.1	0.4	3		-0.35	-0.34	129	128	21	22	No Change; Well bore seal okay
F12-08	8/8/2013 14:01	57.3	42.7	0	0	60	-0.11	-0.13	[illegible]	[illegible]	15	14	
F12-08	8/8/2013 14:03	58	42	0	0	60	-0.61	-0.63	[illegible]	[illegible]	21	21	Opened valve 1/2 turn or less;
F12-08	8/21/2013 11:33	57.1	42.2	0	0.7		-0.93	-0.94	127	127	25	25	No Change; Well bore seal okay
F12-08	9/13/2013 18:15	54.4	39.2	0	6.4	80	-0.93	-0.93	[illegible]	[illegible]	22	22	
F12-08	9/13/2013 18:16	54.6	39.4	0	6		-0.1	-0.1	126	126	23	23	No Change; Second Reading; Well
F12-08	9/13/2013 18:16	54.6	39.4	0	6	80	-0.95	-0.95	[illegible]	[illegible]	23	23	No Change; Second Reading; Well
F12-08	9/19/2013 14:11	50	39.2	0	10.8	90	-0.94	-0.93	[illegible]	[illegible]	26	26	No Change; Well bore seal okay
F12-09	8/22/2012 12:11	54.7	41.6	0	3.7	70	-0.3	-0.3	130	[illegible]			
F12-09	8/22/2012 12:13	54.6	42.5	0.1	2.9		-0.2	-0.2	[illegible]	[illegible]			No Change; Second Reading; Well
F12-09	9/5/2012 15:05	56.1	44.4	0	0.5	40	-0.5	-1	[illegible]	[illegible]			Opened valve 1/2 turn or less;
F12-09	9/7/2012 9:46	56.8	43.1	0	0.1	52	-1.9	-1.9	[illegible]	[illegible]	3	4	
F12-09	9/7/2012 9:49	57.2	42.7	0	0.1	52	-0.6	-0.3	[illegible]	[illegible]			Closed valve 1/2 to 1 turn; Second
F12-09	9/24/2012 14:37	55.7	43.8	0.2	0.3		-0.2	-0.2	126	128	32	33	No Change; Well bore seal okay
F12-09	10/4/2012 15:53	56.6	43.3	0	0.1		-1.2	-1.2	129	129	8	7	No Change; Well bore seal okay
F12-09	10/24/2012 14:05	55.4	42.5	0	2.1		-1	-1	126	127	11	11	No Change; Well bore seal okay
F12-09	11/26/2012 13:38	54.1	41	0	4.9		-1.6	-1.6	128	128	32	31	No Change; Well bore seal okay
F12-09	12/13/2012 12:14	52.4	40.8	0	6.8		-1.9	-1.9	126	126			No Change; Well bore seal okay
F12-09	12/31/2012 14:09	47.2	37.9	0	14.9		-2.4	-2.4	127	127	35	36	No Change; Well bore seal okay
F12-09	1/29/2013 15:42	51	38.5	0.2	10.3		-2.2	-2.2	125	126	17	17	No Change; Well bore seal okay
F12-09	3/12/2013 12:36	54.9	43.8	0	1.3		-1.1	-1.1	127	128	12	11	No Change; Well bore seal okay
F12-09	4/2/2013 10:33	52.8	41.8	0	5.4		-1.94	-1.93	127	128			No Change; Well bore seal okay
F12-09	5/13/2013 14:37	59.5	40.5	0	0		-1.43	-1.45	129	129	12	13	No Change; Well bore seal okay
F12-09	5/29/2013 13:54	50.4	42.3	0	7.3		-1.45	-1.45	128	128	13	13	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
F12-09	6/12/2013 15:18	56.5	41.4	0	2.1		-1.1	-1.09	129	129			No Change; Well bore seal okay
F12-09	7/11/2013 10:50	54.5	41.6	0	3.9		-1.06	-1.06	128	128	27	27	No Change; Well bore seal okay
F12-09	7/19/2013 11:42	54.8	42.9	0	2.3		-0.93	-0.93	128	128	16	16	No Change; Well bore seal okay
F12-09	8/8/2013 14:08	54.5	42.2	0	3.3		-0.57	-0.58	129	129	22	22	No Change; Well bore seal okay
F12-09	8/21/2013 11:12	50.9	41.5	0	7.6		-2.2	-2.21	128	128	20	21	No Change; Well bore seal okay
F12-09	9/13/2013 18:20	49.3	38.2	0	12.5		-2.04	-2.04	129	129	19	19	No Change; Well bore seal okay
F12-09	9/19/2013 13:56	44.3	38.5	0	17.4		-2.06	-2.07	128	128	19	19	No Change; Well bore seal okay
F12-10	8/22/2012 12:17	55.9	41.9	0	2.2	60	0	0	[illegible]	[illegible]	12	13	
F12-10	8/22/2012 12:19	55.6	41.4	0.1	2.7		-0.4	-0.4	[illegible]	[illegible]	23	23	Opened valve 1/2 turn or less;
F12-10	9/5/2012 15:14	55.5	43.7	0	0.8	30	-0.9	-1.1	[illegible]	[illegible]	4	21	Opened valve 1/2 turn or less;
F12-10	9/7/2012 10:52	56.1	40.7	0.1	3.1	42	-1.2	-1.2	[illegible]	[illegible]			
F12-10	9/7/2012 10:56	55.9	42.1	0	2	42	-0.2	-0.2	129	127			Closed valve 1/2 to 1 turn, Second
F12-10	9/24/2012 14:40	56.1	43.5	0.3	0.1		-0.1	-0.1	125	126	28	27	No Change; Well bore seal okay
F12-10	10/4/2012 15:56	56.8	43.1	0	0.1		-0.4	-0.5	127	128	21	26	Opened valve 1/2 turn or less;
F12-10	10/24/2012 14:09	52.1	42.3	0	5.6		-0.5	-0.5	127	127	13	13	No Change; Well bore seal okay
F12-10	11/26/2012 13:42	53.8	41.5	0	4.7		-0.5	-0.6	127	127	24	28	Opened valve 1/2 turn or less;
F12-10	12/31/2012 14:16	53.5	40.3	0	6.2		-0.9	-0.9	125	125	19	19	No Change; Well bore seal okay
F12-10	3/12/2013 12:44	52	47.9	0	0.1		-0.4	-0.4	126	127	20	21	No Change; Well bore seal okay
F12-10	5/13/2013 14:54	57.2	42.8	0	0		-0.41	-0.41	129	129	38	38	No Change; Well bore seal okay
F12-10	5/29/2013 13:56	53.5	43.7	0	2.8		-0.47	-0.46	127	128	9	9	No Change; Well bore seal okay
F12-10	6/12/2013 15:22	57	43	0	0		-4.79	-0.17	129	129	30	30	No Change; Well bore seal okay
F12-10	6/28/2013 11:47	56.7	42.4	0	0.9		-0.09	-0.09	128	129	15	15	No Change; Well bore seal okay
F12-10	7/11/2013 10:43	57.1	42.4	0	0.5		-0.31	-0.31	126	127	35	35	No Change; Well bore seal okay
F12-10	7/19/2013 11:19	56.8	43	0	0.2		-0.19	-0.18	128	128	16	16	No Change; Well bore seal okay
F12-10	8/8/2013 14:12	56.5	43.5	0	0		-0.1	-0.15	129	129	35		Opened valve 1/2 turn or less;
F12-10	8/21/2013 11:05	55.7	43.9	0	0.4		-0.57	-0.57	127	128	40	39	No Change; Well bore seal okay
F12-10	9/13/2013 18:22	53.5	41	0	5.5		-0.61	-0.61	128	128	29	29	No Change; Well bore seal okay
F12-10	9/19/2013 13:49	48.2	41.1	0	10.7		-0.51	-0.51	128	128	37	37	No Change; Well bore seal okay
F12-11	8/22/2012 12:25	57.1	41.4	0.1	1.4		-0.2	-0.2	126	126	19	20	Opened valve 1/2 turn or less;
F12-11	9/11/2012 16:10	56.5	43.2	0.1	0.2		-0.4	-0.6	129	129	26	25	Opened valve 1/2 turn or less;
F12-11	9/24/2012 14:43	56.4	43.3	0.2	0.1		-0.7	-0.8	126	127	24	26	Opened valve 1/2 turn or less;
F12-11	10/4/2012 15:59	56.2	43.7	0	0.1		-1.1	-1.2	127	127	25	27	Opened valve 1/2 turn or less;
F12-11	10/24/2012 14:12	52.3	42	0	5.7		-1.2	-1.2	126	126	30	30	No Change; Well bore seal okay
F12-11	11/8/2012 13:59	51.5	42.1	0.1	6.3		-1.4	-1.4	125	125	30	30	No Change; Well bore seal okay
F12-11	11/26/2012 13:45	51.5	40.1	0	8.4		-1.2	-1.2	127	127	28	28	No Change; Well bore seal okay
F12-11	12/13/2012 12:20	51.8	40.5	0	7.7		-1.1	-1.2	126	127	33	33	No Change; Well bore seal okay
F12-11	12/31/2012 14:13	50.5	39.1	0	10.4		-1.3	-1.3	128	128	25	24	No Change; Well bore seal okay
F12-11	1/9/2013 10:31	50.4	38.7	0	10.9		-1.4	-1.5	127	127	15	18	Opened valve 1/2 turn or less;
F12-11	1/29/2013 15:45	51.7	38.6	0.2	9.5		-1.6	-1.6	128	128	17	20	No Change; Well bore seal okay
F12-11	3/12/2013 12:40	55.3	44.4	0	0.3		-0.7	-0.8	128	129	38	38	No Change; Well bore seal okay
F12-11	4/2/2013 10:40	56.4	42.5	0	1.1		-0.53	-0.51	128	128	14	13	No Change; Well bore seal okay
F12-11	5/13/2013 14:57	57.7	42.3	0	0		-0.31	-0.33	128	128	38	31	No Change; Well bore seal okay
F12-11	5/29/2013 13:59	53.9	43.1	0	3		-0.45	-0.45	128	128	14	14	No Change; Well bore seal okay
F12-11	6/12/2013 15:24	58	42	0	0		-0.11	-0.09	129	129			No Change; Well bore seal okay
F12-11	7/11/2013 10:46	57	42	0	1		-0.53	-0.53	128	128	33	33	No Change; Well bore seal okay
F12-11	7/19/2013 11:22	56.8	42.4	0	0.8		-0.37	-0.37	128	129	20	20	No Change; Well bore seal okay
F12-11	8/8/2013 14:15	57.1	42.9	0	0		-0.17	-0.17	129	129	37	16	No Change; Well bore seal okay
F12-11	8/21/2013 11:08	56.4	43.6	0	0		-0.68	-0.69	128	129	22	22	No Change; Well bore seal okay
F12-11	9/13/2013 18:24	58.2	41.5	0	0.3		-0.65	-0.65	130	130	18	18	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
F12-11	9/19/2013 13:52	54.5	42.4	0	3.1		-0.57	-0.55	130	130	21	21	No Change; Well bore seal okay
FOFU03-01R(Interim Temp)	6/15/2012 13:21	52.8	37.5	0.2	9.4	90	-0.5	-0.5	131	131	26	25	No Change; Well bore seal okay
FOFU03-01R(Interim Temp)	6/27/2012 11:11	51	41.1	0.6	7.3		-0.6	-0.7	129	129	32	32	No Change; Well bore seal okay
FOFU03-01R(Interim Temp)	7/3/2012 13:35	56.4	40.6	0	3		-0.2	-0.3	130	130	29	31	No Change; Well bore seal okay
FOFU03-01R(Interim Temp)	8/7/2012 17:02	54.5	45.2	0.2	0.1	90	-0.1	-0.4	130	130	34	37	Opened valve 1/2 turn or less;
FOFU03-01R(Interim Temp)	8/28/2012 14:56	52.2	47.5	0.2	0.1		-0.4	-0.4	128	128	14	14	No Change; Well bore seal okay
FOFU03-01R(Interim Temp)	9/10/2012 12:57	48.9	49.7	0	1.4		-0.6	-0.6	130	130	35	35	No Change; Well bore seal okay
FOFU03-01R(Interim Temp)	6/28/2013 14:28	54.4	44.2	0	1.4		-0.29	-0.29	127	127	20	20	No Change; Well bore seal okay
FOFU03-01R(Interim Temp)	7/30/2013 14:36	51.4	42.8	0.1	6.2		-0.56	-0.59	125	125	14	15	No Change; Well bore seal okay
FOFU03-01R(Interim Temp)	8/28/2013 15:56	53.7	43.9	0	2.4		-0.63	-0.63	126	126	23	23	No Change; Well bore seal okay
FOFU03-01R(Interim Temp)	9/6/2013 15:20	53.1	44.4	0.2	2.3		-0.54	-0.53	127	127	17	17	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	6/15/2012 13:30	53.1	40	0	6.9	110	-0.5	-0.5	136	136	17	17	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	6/28/2012 15:38	49.3	41.1	0	9.6	120	-0.4	-0.4	135	135	14	14	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	7/3/2012 13:47	54.5	42	0	3.1	100	-0.4	-0.5	137	137	29	30	Opened valve 1/2 turn or less;
FOFU04-14R(Interim Temp)	7/30/2012 14:51	53.3	41.3	0.3	5.1	150	-0.6	-0.7	136	135			No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	8/17/2012 11:14	55.9	44	0	0.1	80	-0.3	-0.3	137	138			No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	8/28/2012 15:03	54.8	45	0.1	0.1	110	-0.1	-0.3	137	137	6	14	Opened valve 1/2 turn or less;
FOFU04-14R(Interim Temp)	9/10/2012 13:06	52.5	45.4	0	2.1	90	1	-1	138	138	20	23	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	9/19/2012 12:25	51	48.6	0	0.4	100	-0.9	-0.9	131	131	25	24	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	10/5/2012 10:17	51.4	48.6	0	0.1	70	-1.6	1.6	130	130	25	26	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	10/31/2012 11:02	50.8	49.1	0	0.1		-1.3	-1.3	129	129	21	22	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	11/8/2012 11:22	49.7	48.2	0	2.1		-1.6	-1.6	128	128	22	25	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	11/28/2012 10:07	52.9	47	0	0.1		-1.3	-1.3	128	128	24	26	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	12/13/2012 15:27	53.8	46.1	0	0.1		-1.2	-1.3	130	130	22	22	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	12/31/2012 16:40	54.6	45.3	0	0.1	90	-1.8	-1.7	130	131	29	26	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	1/10/2013 11:49	55.5	44.4	0	0.1		-1.7	-1.9	129	130	27	27	Opened valve 1/2 turn or less;
FOFU04-14R(Interim Temp)	1/29/2013 13:07	54.4	45.5	0	0.1		-1.7	-1.6	128	128	27	26	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	2/13/2013 14:23	53.6	45.9	0.3	0.2	100	-0.7	-0.7	132	133	21	21	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	2/26/2013 13:43	55.7	44.2	0	0.1	80	-0.4	-0.4	132	132	16	18	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	3/5/2013 11:06	54.7	43.3	0	2	140	-0.6	0.6	132	133	17	15	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	3/14/2013 11:10	56.4	43.6	0	0	100	-0.33	-0.31	133	133			No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	4/15/2013 9:01	54.2	45.7	0.1	0	70	-1.24	-1.25	132	132			No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	4/23/2013 13:29	55.5	44.5	0	0	70	-0.12	-0.13	134	135	29	28	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	5/7/2013 10:06	54.5	45.5	0	0	90	-1.87	-1.87	133	133	25	25	No Change; No Change; Well bore
FOFU04-14R(Interim Temp)	5/29/2013 7:03	54	45.8	0.2	0	70	-1	0.99	132	132	32	32	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	6/7/2013 13:05	56.1	43.9	0	0	120	-0.43	-0.41	135	136	19	19	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	6/28/2013 14:32	55.2	44.8	0	0	160	-0.12	-0.12	137	137	28	27	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	7/11/2013 11:07	54.1	45.9	0	0	100	0.61	-0.61	135	135	23	23	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	7/30/2013 14:42	55.6	44.2	0	0	140	-0.49	-0.48	135	135	18	27	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	8/8/2013 11:44	54.8	45.2	0	0	90	-0.52	-0.53	135	134	20	19	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	8/28/2013 16:06	56.2	43.8	0	0	180	-0.39	-0.39	136	136	22	22	No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	9/6/2013 15:27	55.5	44.5	0.1		180	-0.12	-0.12	137	137			No Change; Well bore seal okay
FOFU04-14R(Interim Temp)	9/24/2013 14:45	55.7	44.3	0	0	120	-0.14	-0.16	135	135			No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	6/15/2012 13:26	52.5	40.4	0.4	6.7	180	-0.2	-0.3	138	138	22	22	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	6/28/2012 15:35	48.2	42.9	0.3	8.2	90	-0.2	-0.1	136	137	16	16	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	7/3/2012 13:39	56	43.1	0	0.9	70	-0.2	-0.3	139	139	38	38	Opened valve 1/2 turn or less;
FOFU04-15R(Interim Temp)	8/17/2012 11:10	54.7	43.5	0	1.8	70	0.2	-0.3	137	136			No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	8/28/2012 14:59	54.7	45.1	0	0.2	140	-1.2	-1.2	138	138	30	30	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	9/10/2012 13:01	53.6	45.5	0	0.9	80	-1.7	-1.8	139	139	33	33	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
FOFU04-15R(Interim Temp)	9/19/2012 12:23	51.7	46.6	0	1.7	110	-1.8	-1.8	133	132	32	32	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	10/5/2012 10:11	52.2	47.7	0	0.1	80	-2.5	-2.5	131	131	31	31	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	10/31/2012 10:59	48.2	51.1	0	0.1		-2.3	-2.4	129	128	33	32	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	11/8/2012 11:19	46.3	50.9	0	2.8		-2.7	-2.7	129	129	33	32	No Change
FOFU04-15R(Interim Temp)	11/28/2012 10:04	49.3	50.6	0	0.1		-1.5	-1.5	127	127	25	25	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	12/13/2012 15:30	51.9	48	0	0.1		-1.5	-1.5	129	129	25	25	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	12/31/2012 16:27	51.3	48.5	0	0.2		-2.2	-2.2	129	129	27	28	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	1/10/2013 11:52	51.8	47.9	0	0.4		-2.3	-2.2	127	128	26	25	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	1/29/2013 13:05	50	48.6	0	1.4		-1.7	-1.8	128	128	24	25	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	2/13/2013 14:20	49.2	48.2	0.3	2.3	100	-0.7	-0.8	141	132	20	18	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	3/26/2013 13:30	53.7	46.2	0	0.1	80	-0.5	-0.4	133	132	17	15	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	3/5/2013 11:01	51.9	45	0	3.1	90	-0.6	-0.7	132	132	33	33	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	3/14/2013 11:04	55.4	44.6	0	0	90	-0.13	-0.15	136	136			No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	4/15/2013 8:53	54.4	45.6	0	0	80	-1.3	-1.3	131	131			No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	4/27/2013 13:34	55.1	44.9	0	0	80	-0.14	-0.16	134	135	30	29	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	5/7/2013 10:04	54.2	45.8	0	0	90	-2.07	-2.08	133	133	27	26	No Change; No Change; Well bore
FOFU04-15R(Interim Temp)	5/29/2013 6:59	53.7	46.1	0.2		70	-0.95	-0.97	133	133	17	17	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	6/7/2013 13:01	56.6	43.2	0.2		130	-0.24	0.26	138	138	30	30	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	6/28/2013 14:30	56.1	43.9	0	0	120	-0.21	-0.19	139	139	20		No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	7/11/2013 11:04	54	46	0	0	120	-0.51	-0.51	138	138	19	19	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	7/30/2013 14:38	55.9	44.1	0	0	120	-0.53	-0.53	137	137	29	29	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	8/8/2013 11:39	54.8	45.2	0	0	100	-0.57	-0.56	137	138	16	16	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	8/28/2013 16:01	56.2	43.8	0	0	170	-0.36	-0.36	139	139	27	27	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	9/6/2013 15:23	55.2	44.7	0.1	0	100	-0.12	-0.13	139	139	19	20	No Change; Well bore seal okay
FOFU04-15R(Interim Temp)	9/24/2013 14:41	55.5	44.5	0	0	110	-0.47	-0.47	137	138	21	21	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	6/15/2012 13:35	50.9	40	0	9.1	130	-0.4	-0.4	132	132	21	22	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	6/28/2012 15:42	48.7	41.6	0	9.7	70	-0.3	-0.3	132	132	32	32	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	7/3/2012 13:46	54.1	42.1	0	3.8	70	-0.3	-0.3	133	133	28	25	Opened valve 1/2 turn or less.
FOFU04-18R(Interim Temp)	7/20/2012 14:55	52.8	41.6	0.2	5.4	130	-0.5	-0.5	133	132			No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	9/7/2012 12:39	56.8	42.9	0.1	0.2	70	-0.9	-0.9	131	131	13	12	Well back online (offline for filling
FOFU04-18R(Interim Temp)	9/19/2012 12:32	51.7	46.9	0	1.4		-0.9	-0.9	129	129	23	21	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	10/5/2012 10:28	49.3	50.6	0	0.1		-1.5	-1.5	127	127	26	26	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	10/31/2012 11:07	44.7	55.2	0	0.1		-1.3	-1.3	127	127	18	17	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	11/8/2012 11:29	43.3	53.9	0	2.8		-1.6	-1.5	126	126	23	21	Closed valve 1/2 turn or less; Well
FOFU04-18R(Interim Temp)	12/13/2012 15:21	49.2	50.7	0	0.1		-0.9	-0.9	126	127	21	20	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	12/31/2012 16:43	50.6	49.3	0	0.1		-1.4	-1.5	126	126	23	23	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	1/10/2013 11:40	50.6	48.5	0	0.9		-1.5	-1.5	125	125	20	19	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	1/28/2013 13:13	49.9	50	0	0.1		-0.8	-0.8	126	126	17	17	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	2/13/2013 14:33	48.5	48.9	0.3	2.3		-0.2	-0.2	128	129			No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	2/26/2013 13:51	52.7	47	0	0.3		-0.1	-0.1	125	127			No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	3/5/2013 11:14	50.5	45.9	0	3.6		-0.5	-0.5	129	129	15		No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	3/14/2013 11:21	54.1	45.9	0	0		-0.18	-0.18	130	130	15	15	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	4/15/2013 9:08	52.5	47.5	0	0		-1.16	-1.16	127	128	25	14	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	4/27/2013 13:45	53.6	46.4	0	0	70	-0.11	-0.12	131	131	27	27	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	5/7/2013 10:15	53	47	0	0		-1.17	-1.16	129	129	30	37	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	5/29/2013 7:13	52.1	47.8	0.2			-0.52	-0.53	127	127	33	33	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	6/6/2013 13:22	52.6	45.4	0	2	170	-0.13	-0.16	130	132	30	25	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	6/28/2013 14:38	53.3	46.7	0	0	160	-0.17	-0.17	135	135	37	37	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	7/11/2013 11:15	52.7	47.3	0	0	70	-0.52	-0.54	131	132	36	36	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
FOFU04-18R(Interim Temp)	7/30/2013 14:49	54.1	45.9	0	0	80	-0.69	-0.65	133	133	35	35	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	8/8/2013 11:52	53.2	46.8	0	0	90	-0.58	-0.57	133	133	36	36	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	8/28/2013 16:12	55	45	0	0	150	-0.45	-0.45	135	135	23	23	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	9/6/2013 15:34	54.1	45.8	0.1	0	140	-0.11	-0.11	135	135	29	29	No Change; Well bore seal okay
FOFU04-18R(Interim Temp)	9/24/2013 14:57	54.1	45.9	0	0	80	-0.35	-0.36	133	133	30	14	No Change; Well bore seal okay
FOFU04-19R	6/7/2012 9:01	39.4	35.3	0	25.3	70	-0.4	-0.4	[illegible]	[illegible]	8	7	
FOFU04-19R	6/7/2012 9:03	39.3	35.7	0	25	70	-0.4	-0.4	[illegible]	[illegible]	33	33	No Change; Second Reading; Well
FOFU04-19R	6/22/2012 11:14	44.5	37.3	0	18.2	40	-0.4	-0.5	[illegible]	[illegible]	19	19	
FOFU04-19R	6/22/2012 11:16	44.9	36.4	0	18.7	40	-0.4	-0.4	[illegible]	[illegible]	36	36	No Change; Second Reading; Well
FOFU04-19R	6/28/2012 15:45	42.3	39.7	0	18	100	-0.2	-0.2	[illegible]	[illegible]	11	11	No Change; Well bore seal okay
FOFU04-19R	7/3/2012 13:50	47.3	39.6	0	13.1	90	-0.2	-0.2	[illegible]	[illegible]	34	30	Opened valve 1/2 turn or less;
FOFU04-19R	7/20/2012 14:59	46	39	0.1	14.9	170	-0.4	-0.4	[illegible]	[illegible]			
FOFU04-19R	7/20/2012 15:01	45.9	38.6	0.2	15.3	170	-0.4	-0.4	[illegible]	[illegible]			No Change; Second Reading; Well
FOFU04-19R	9/10/2012 13:10	55.4	41.8	0	2.8	80	-0.5	-0.5	[illegible]	[illegible]	21	19	
FOFU04-19R	9/10/2012 13:12	56.2	42.1	0	1.7	80	-0.7	-0.7	[illegible]	[illegible]	24	23	Opened valve 1/2 turn or less;
FOFU04-19R	9/19/2012 12:35	49.2	47.8	0.1	2.9		-0.7	-0.7	[illegible]	[illegible]	24	24	No Change; Well bore seal okay
FOFU04-19R	10/5/2012 10:21	49.3	50.4	0	0.3		-1.3	-1.3	129	129	26	24	No Change; Well bore seal okay
FOFU04-19R	10/31/2012 11:05	47.6	52.2	0	0.2		-1	-1	129	129	24	25	No Change; Well bore seal okay
FOFU04-19R	11/8/2012 11:25	46.4	50.8	0	2.8		-1.4	-1.3	129	129	26	24	Closed valve 1/2 turn or less; Well
FOFU04-19R	11/28/2012 10:10	49.3	50.6	0	0.1		-0.7	-0.7	127	128	26	25	No Change; Well bore seal okay
FOFU04-19R	12/13/2012 15:24	51.4	48.5	0	0.1		-0.8	-0.8	129	130			No Change; Well bore seal okay
FOFU04-19R	12/31/2012 16:46	52	47.9	0	0.1		-1.2	-1.2	130	129	24	24	No Change; Well bore seal okay
FOFU04-19R	1/10/2013 11:45	53.2	46.7	0	0.1		-1.2	-1.3	129	129	22	22	No Change; Well bore seal okay
FOFU04-19R	1/29/2013 13:10	52.1	47.8	0	0.1		-0.7	-0.7	129	129	23	22	No Change; Well bore seal okay
FOFU04-19R	2/13/2013 14:28	50.7	47.8	0.3	1.2	80	-0.2	-0.3	[illegible]	[illegible]	22	22	
FOFU04-19R	2/13/2013 14:29	50.1	46.4	0.3	3.2		-0.3	-0.3	[illegible]	[illegible]	6	8	No Change; Second Reading; Well
FOFU04-19R	2/26/2013 13:46	53	46.7	0	0.3	100	-0.1	-0.2	[illegible]	[illegible]	14	12	No Change; Well bore seal okay
FOFU04-19R	3/5/2013 11:10	51.4	45.3	0	3.3	120	-0.3	-0.5	[illegible]	[illegible]	13	19	Opened valve 1/2 turn or less;
FOFU04-19R	3/14/2013 11:14	54.6	45.4	0	0	80	-0.43	-0.42	[illegible]	[illegible]	21	21	
FOFU04-19R	3/14/2013 11:16	54.6	45.4	0	0	80	-0.32	-0.34	[illegible]	[illegible]	34	34	No Change; Second Reading; Well
FOFU04-19R	3/29/2013 15:29	52.8	47.2	0	0	70	-0.13	-0.14	[illegible]	[illegible]	31	29	No Change; Well bore seal okay
FOFU04-19R	4/15/2013 9:05	52.3	47.7	0	0		-1.91	-1.9	129	129	30	30	No Change; Well bore seal okay
FOFU04-19R	4/27/2013 13:43	53.4	46.6	0	0		-0.84	-0.84	129	129	24	23	No Change; Well bore seal okay
FOFU04-19R	5/7/2013 10:12	52.6	47.4	0	0		-1.97	-1.97	129	129	32	33	No Change; Well bore seal okay
FOFU04-19R	5/29/2013 7:07	50.9	48.9	0.2	0	80	-1.12	-1.13	[illegible]	[illegible]	23	23	
FOFU04-19R	5/29/2013 7:09	51.1	48.8	0.2			-0.78	-0.77	[illegible]	[illegible]			Closed valve 1/2 turn or less;
FOFU04-19R	6/6/2013 13:13	52.1	45.3	0	2.6	190	0.18	0.34	[illegible]	[illegible]	18	33	
FOFU04-19R	6/6/2013 13:19	52	45.6	0	2.4	190	-0.13	-0.12	[illegible]	[illegible]	28	28	Closed valve 1/2 turn or less;
FOFU04-19R	6/28/2013 14:35	54	46	0	0	180	-0.47	-0.46	[illegible]	[illegible]	23	23	
FOFU04-19R	6/28/2013 14:36	53.9	46.1	0	0	180	-0.41	-0.41	[illegible]	[illegible]	21	21	Adjusted vacuum; inspected well
FOFU04-19R	7/11/2013 11:11	52.3	45.7	0.1	1.9	90	-0.84	-0.84	[illegible]	[illegible]	27	28	Adjusted vacuum; inspected well
FOFU04-19R	7/30/2013 14:45	54.1	45.5	0	0.4	100	-0.62	-0.62	[illegible]	[illegible]	18	19	Adjusted vacuum; inspected well
FOFU04-19R	8/8/2013 11:49	53.2	46.8	0	0	70	-0.8	-0.8	[illegible]	[illegible]	21	21	Adjusted vacuum; inspected well
FOFU04-19R	8/28/2013 16:09	55.8	44.2	0	0	90	-0.7	-0.69	[illegible]	[illegible]	23	23	Adjusted vacuum; inspected well
FOFU04-19R	9/6/2013 15:31	54.3	45.7	0.1		100	-0.32	-0.32	[illegible]	[illegible]	23	23	No Change; Well bore seal okay
FOFU04-19R	9/24/2013 14:48	54.7	45.3	0	0	100	-0.43	-0.43	[illegible]	[illegible]	23	23	
FOFU04-19R	9/24/2013 14:53	55	45	0	0		-0.13	-0.14	130	129	15		Closed valve 1/2 turn or less; Second Reading; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
FOFU04-27R(Interim Temp)	6/7/2012 9:50	47	39.4	0.3	13.3	50	-2.5	-2.4	136	136	15	14	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	6/28/2012 15:49	46.6	38.6	0	14.8	110	-1.8	-1.8	137	137	10	10	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	7/3/2012 13:54	51.1	39.9	0	9	130	-1.7	-1.8	138	138	31	34	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	7/20/2012 15:05	49.5	39.8	0.2	10.5	150	-1.9	-1.9	138	138			No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	8/7/2012 17:08	51.7	43.6	0.1	4.6	170	-1.7	-1.7	137	138	44	42	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	8/28/2012 15:20	52.8	40.3	0.2	6.7	160	-1.5	-1.5	136	136	31	19	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	9/10/2012 13:17	50	39.9	0	10.1	160	-2.2	-2.2	136	136	14	13	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	9/19/2012 12:38	49.4	40.6	0	10	180	2.7	2.7	136	136	42	42	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	10/5/2012 10:31	52	43.2	0	4.8	80	-3	-3	134	135	17	18	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	10/31/2012 11:11	51.8	47.9	0.1	0.2		-2.6	-3	176	129	16	40	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	11/8/2012 11:31	48.4	46.7	0	4.9	110	-2.9	-2.9	135	136	19	19	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	11/28/2012 10:16	52	47.9	0	0.1	120	-2	-2	134	134			No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	12/13/2012 15:13	54.4	45.5	0	0.1	130	-2.6	-2.6	136	136	18	18	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	12/31/2012 16:56	54.8	45.6	0	0.1	125	-3	-3	136	137	20	19	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	1/10/2013 11:32	56	43	0	1	120	-3.1	-3.1	136	136	10	20	Opened valve 1/2 turn or less.
FOFU04-27R(Interim Temp)	1/25/2013 13:16	54.8	45.1	0	0.1	100	-2.8	-2.8	136	137	18	17	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	2/13/2013 14:39	51	44.7	0.2	4.1	120	-1.6	-1.6	137	138	17	16	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	2/26/2013 13:57	54	44.1	0	1.9	120	1.3	-1.2	136	136	22	24	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	3/5/2013 11:22	51.7	43	0	5.3	120	-1.5	-1.5	138	138	12	13	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	3/14/2013 11:29	54.7	45.3	0	0	140	-0.89	-0.87	137	138	13	13	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	4/15/2013 9:37	54.8	45.4	0	0.1	110	-2.29	-2.26	138	138	16	16	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	4/27/2013 13:52	56.3	43.7	0	0	100	-1.04	-1.04	137	137	12	11	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	5/7/2013 10:23	55.7	44.3	0	0	120	-2.09	-2.09	137	137	18	17	No Change; No Change; Well bore
FOFU04-27R(Interim Temp)	5/29/2013 7:19	54.9	45	0.2		100	-1.57	-1.58	138	138	23	23	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	6/7/2013 13:16	56.9	43.1	0	0	180	-0.69	-0.71	136	135	8	11	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	6/28/2013 14:43	56.9	43.1	0	0	170	0.56	0.56	136	136	14	14	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	7/11/2013 11:23	55.4	42.9	0	1.7	100	-1.08	-1.05	138	139	18	18	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	7/30/2013 14:57	56.6	42.3	0	1.1	130	-0.73	0.75	138	138	14	25	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	8/8/2013 12:01	56.1	43.9	0	0	120	-0.85	-0.86	139	139	21	21	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	8/26/2013 16:20	57.6	42.4	0	0	160	-0.92	-0.91	138	139	18	19	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	9/6/2013 15:41	56.5	43.5	0	0	160	-0.62	-0.62	138	139	15	15	No Change; Well bore seal okay
FOFU04-27R(Interim Temp)	9/24/2013 15:05	56.4	43.6	0	0	120	-0.86	-0.86	139	139	31	31	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	6/7/2012 9:44	46.8	40	0.3	12.9	90	-4.2	-4.3	131	131	33	32	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	6/28/2012 15:52	48.3	42.2	0	9.5	160	-3.4	-3.4	132	132	27	27	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	7/3/2012 14:00	52.7	41.9	0	5.4	100	-3.3	-3.2	133	133	40	38	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	7/20/2012 15:10	51.5	41.2	0.1	7.2	140	-3.3	-3.2	133	132	30	30	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	8/7/2012 17:12	53.9	46	0	0.1	160	-3.1	-3.1	134	135	35	36	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	8/28/2012 15:09	53.6	41.4	0.1	4.9	150	-3	-3.1	135	133	27	27	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	9/10/2012 13:26	51.5	41.5	0	7	120	-4.2	-4.2	138	138	31	31	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	9/19/2012 12:42	49.8	43	0	7.2		-3.9	-3.9	129	129	39	39	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	10/5/2012 10:35	51.5	42.6	0	5.9		-4.7	-4.6	129	130	33	32	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	10/31/2012 11:13	47.3	43	0	9.7		-4.3	-4.3	129	128	33	30	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	11/8/2012 11:37	43.1	42.7	0	14.2	120	-4.6	-4.2	131	131	30	21	Closed valve 1/2 turn or less; Well
FOFU05-08R(Interim Temp)	11/28/2012 10:23	48	43.5	0	8.5		-3	-2.9	128	129	25	26	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	12/13/2012 14:58	48.8	42.3	0	8.9		-3.1	-3.1	130	130	23	24	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	12/31/2012 16:51	48	41.4	0	10.6		-3.5	-3.5	130	130	25	24	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	1/10/2013 11:26	47.3	40.3	0	12.4		-3.8	-3.8	129	129	23	23	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	1/29/2013 13:22	47.3	40.9	0	11.8	80	-3.4	-3.4	130	131	24	24	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	2/13/2013 14:36	45.6	41.6	0.2	12.6	90	-1.8	-1.9	132	133	19	18	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
FOFU05-08R(Interim Temp)	2/26/2013 13:53	51.5	42.1	0	6.4	100	1.4	1.5	131	131	32	29	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	3/5/2013 11:18	48.7	40	0	11.3	100	-1.6	-1.8	132	132	15	16	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	3/14/2013 11:24	55.6	44.2	0	0.2	130	-0.76	-0.74	132	132	25	26	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	4/15/2013 9:33	54.3	43.2	0	2.5	80	-2.36	-2.39	131	131	21	20	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	4/27/2013 13:49	57.3	42.7	0	0	90	1.23	1.22	133	134	14	14	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	5/7/2013 10:17	54.9	42.7	0	2.4	110	-2.42	-2.41	132	132	19	19	No Change; No Change; Well bore
FOFU05-08R(Interim Temp)	5/29/2013 7:16	55.8	44.1	0.1	0	100	1.66	-1.66	132	132	33	33	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	6/7/2013 13:12	57.5	42.5	0	0	180	0.95	-0.94	135	135	18	17	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	6/28/2013 14:41	57.3	43	0		170	-0.64	-0.64	136	136	13	14	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	7/11/2013 11:19	56	44	0	0	90	-1.22	-1.22	133	133	20	20	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	7/30/2013 14:54	55.8	43.1	0	1.1	120	-0.93	-0.93	134	134	15	15	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	8/8/2013 11:57	56	44	0	0	130	-1.08	-1.07	133	134	16	16	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	8/28/2013 16:16	57.2	42.8	0	0	170	-1.01	-1.01	135	135	20	20	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	9/6/2013 15:38	55.9	44	0	0.1	170	-0.58	-0.6	136	136	11	11	No Change; Well bore seal okay
FOFU05-08R(Interim Temp)	9/24/2013 15:01	56	44	0	0	140	-0.93	0.93	134	134	29	29	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	6/7/2012 9:54	41.4	37.2	0.3	21.1		-1.4	-1.4	128	128	14	14	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	6/28/2012 15:56	42.9	39.4	0	17.7	110	-1	-1	131	131	25	25	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	7/3/2012 14:04	46.3	39.8	0	13.9	110	1	-1	132	133	30	29	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	7/20/2012 15:14	43.5	38.6	0.1	17.8	160	1.1	-1	132	132	22	21	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	8/7/2012 17:16	44.7	40.8	0.2	14.3	160	-1	-1	134	134	27	27	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	8/28/2012 15:23	44.5	38.7	0	16.8	160	-0.9	-0.8	134	134	25	24	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	9/10/2012 13:30	43.6	38.5	0	17.9	170	-1.2	-1.2	137	137	9	9	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	9/19/2012 12:45	44.8	39.4	0	15.8		-0.8	-0.8	129	129	27	28	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	10/5/2012 10:37	49.5	44.7	0	5.8		-1.2	-1.2	126	126	31	33	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	10/31/2012 11:16	50.8	49.1	0	0.1		-1	-1	128	128			No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	11/8/2012 11:41	49.5	48.2	0	2.3		-1.3	-1.2	128	128	20	20	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	11/28/2012 10:26	52.5	47.4	0	0.1		-1	-1	127	127	29	29	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	12/13/2012 14:52	55	44.9	0	0.1		-0.9	-0.9	128	129	18	18	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	12/31/2012 16:58	56.2	43.7	0	0.1		-1.4	-1.3	127	128			No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	1/10/2013 11:10	56.6	43.3	0	0.1		-1.4	-1.4	125	127		15	Opened valve 1/2 turn or less.
FOFU05-10R(Interim Temp)	1/29/2013 13:26	56.1	43.7	0	0.2		-1.3	-1.2	129	129			No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	2/13/2013 11:42	53	43.4	0.3	3.3	120	-0.6	-0.5	132	132	33	33	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	2/26/2013 14:00	55.5	42.9	0	1.6	110	-0.5	-0.5	130	131	28	28	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	3/5/2013 11:26	54.5	42	0	3.5	130	-0.7	-0.7	130	131	24	25	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	3/14/2013 11:33	55.2	44.8	0	0	110	-0.2	0.19	132	132	26	26	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	4/15/2013 9:41	55.5	44.4	0	0.1		-1.07	-1.08	129	129	15	15	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	4/27/2013 13:55	56.8	43.2	0	0	105	-0.3	-0.3	133	133	35	34	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	5/7/2013 10:26	56.5	43.5	0	0		0.94	0.93	130	130			No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	5/29/2013 7:23	55.5	44.4	0.1	0		-0.71	-0.72	130	130	14	13	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	6/6/2013 10:53	55.7	43	0	1.3	190	-0.61	-0.6	132	132	13	13	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	6/28/2013 14:46	57.3	42.7	0	0	180	-0.11	-0.14	138	138	17	17	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	7/11/2013 11:27	56.4	43.6	0	0	110	-0.64	-0.65	134	134	21	21	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	7/30/2013 15:01	55.4	42.6	0	2	160	-0.84	-0.78	135	135	32	32	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	8/8/2013 12:15	55.5	43.2	0	1.3	120	-0.45	-0.45	135	135	19	19	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	8/28/2013 16:23	57.7	42.3	0	0	130	-0.68	-0.68	137	137	21	21	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	9/6/2013 15:45	56.6	43.4	0	0	180	-0.48	-0.48	137	137	17	17	No Change; Well bore seal okay
FOFU05-10R(Interim Temp)	9/24/2013 15:08	56.4	43.6	0	0	160	-0.69	-0.69	135	135	13	13	No Change; Well bore seal okay
FO-FU05-15R	6/7/2012 8:51	50.1	39.4	0.2	10.3	100	-5.4	-5.5	130	131	51	51	
FO-FU05-15R	6/7/2012 8:53	49.9	39.2	0	10.9	100	-5.4	-5.4	130	131	52	51	No Change; Second Reading; Well

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
FO-FU05-15R	6/22/2012 11:20	54.7	41	0	4.3	110	-4.9	-4.9	[illegible]	[illegible]	51	52	
FO-FU05-15R	6/22/2012 11:22	54.7	41.4	0	3.9	110	-4.9	-4.9	[illegible]	[illegible]	52	52	No Change; Second Reading; Well
FO-FU05-15R	6/28/2012 16:00	48.4	41.5	0	10.1	100	-5	-5.1	[illegible]	[illegible]	46	48	No Change; Well bore seal okay
FO-FU05-15R	7/3/2012 14:08	54	40.9	0	5.1	100	-5	-5.2	[illegible]	[illegible]	60	60	Opened valve 1/2 turn or less;
FO-FU05-15R	7/20/2012 15:18	49.6	39.3	0.1	11	110	-5.9	-5.8	[illegible]	[illegible]	56	56	
FO-FU05-15R	7/20/2012 15:19	49.8	39.9	0	10.3		-6.1	-6.1	[illegible]	[illegible]	64	63	Opened valve 1/2 turn or less;
FO-FU05-15R	8/7/2012 17:20	50.1	42.2	0.2	7.5	180	-6.1	-6.1	[illegible]	[illegible]	64	64	No Change; Well bore seal okay
FO-FU05-15R	8/14/2012 11:35	46.4	39.1	0.4	14.1	90	-6.4	-6.4	[illegible]	[illegible]	57	57	
FO-FU05-15R	8/14/2012 11:35	47	38.3	0.5	14.2	90	-6.4	-6.3	[illegible]	[illegible]	56	56	No Change; Second Reading; Well
FO-FU05-15R	8/28/2012 15:27	49.7	40	0.1	10.2	170	-5.8	-5.8	[illegible]	[illegible]	56	54	No Change; Well bore seal okay
FO-FU05-15R	9/5/2012 14:49	47	41	0	12	30	-6.5	-6.4	[illegible]	[illegible]	58	58	No Change; Well bore seal okay
FO-FU05-15R	9/7/2012 9:07	46.9	38.4	0.1	14.6	20	-6.8	-2.3	[illegible]	[illegible]	61		Closed valve > 1 turn
FO-FU05-15R	9/19/2012 12:50	54.4	40.1	0	5.5		-0.1	-0.1	129	129	5	5	No Change; Well bore seal okay
FO-FU05-15R	10/5/2012 10:41	57.9	41.7	0	0.4		-0.3	-0.3	128	128			No Change; Well bore seal okay
FO-FU05-15R	10/31/2012 11:18	57.4	42.4	0	0.2		-0.1	-0.1	128	128			No Change; Well bore seal okay
FO-FU05-15R	11/8/2012 11:43	54.4	42.4	0	3.2		-0.2	-0.2	129	129	12	11	No Change; Well bore seal okay
FO-FU05-15R	11/28/2012 10:29	56.1	43.8	0	0.1		-0.1	-0.1	129	128			No Change; Well bore seal okay
FO-FU05-15R	12/13/2012 14:49	55.8	44.1	0	0.1		-0.3	-0.2	128	128	34	36	No Change; Well bore seal okay
FO-FU05-15R	12/31/2012 17:00	56.5	43.4	0	0.1		-1.2	-1.2	129	129	38	36	No Change; Well bore seal okay
FO-FU05-15R	1/10/2013 11:06	57.8	42.1	0	0.1		-0.6	-0.6	128	129			No Change; Well bore seal okay
FO-FU05-15R	1/29/2013 13:28	57	42.9	0	0.1		-0.2	-0.3	129	128	10	12	No Change; Well bore seal okay
FO-FU05-15R	2/26/2013 14:06	57.3	42.4	0	0.3		-0.1	-0.2	128	127	28	25	No Change; Well bore seal okay
FO-FU05-15R	3/5/2013 11:30	55.4	41.4	0	3.2	160	-1	-1.1	[illegible]	[illegible]	20	20	
FO-FU05-15R	3/5/2013 11:31	55.5	41.4	0	3.1	160	-0.6	-0.6	[illegible]	[illegible]	24	26	Closed valve 1/2 turn or less;
FO-FU05-15R	3/14/2013 11:38	56.4	43.6	0	0	150	-0.24	-0.23	[illegible]	[illegible]	23	21	
FO-FU05-15R	3/14/2013 11:40	55.8	44.2	0	0	150	-0.28	-0.23	[illegible]	[illegible]			No Change; Well bore seal okay
FO-FU05-15R	3/29/2013 15:34	55.9	44.1	0	0	145	-0.38	-0.37	[illegible]	[illegible]	22	23	
FO-FU05-15R	3/29/2013 15:36	55.7	44.3	0	0	145	-0.14	-0.14	[illegible]	[illegible]	23	23	Closed valve 1/2 turn or less;
FO-FU05-15R	4/15/2013 9:43	56.2	43.8	0	0		-1.24	-1.23	129	129	32	32	No Change; Well bore seal okay
FO-FU05-15R	4/27/2013 13:59	61.6	38.4	0	0		-0.33	-0.31	128	128	25	15	No Change; Well bore seal okay
FO-FU05-15R	5/7/2013 10:29	57	43	0	0		-1.13	-1.14	127	127	28	28	No Change; Well bore seal okay
FO-FU05-15R	5/29/2013 7:26	56.7	42.1	1.2		120	-1.2	-1.18	[illegible]	[illegible]	22	22	
FO-FU05-15R	5/29/2013 7:27	56.9	41.6	1.5	0		-0.77	-0.76	[illegible]	[illegible]	18	18	Closed valve 1/2 turn or less;
FO-FU05-15R	6/6/2013 10:29	55.4	42.6	0	2	180	-0.47	-0.44	[illegible]	[illegible]	29	34	Opened valve 1/2 turn or less;
FO-FU05-15R	6/6/2013 10:30	55.1	42.3	0.2	2.4	180	-0.4	-0.38	[illegible]	[illegible]	26	26	Opened valve 1/2 turn or less;
FO-FU05-15R	6/28/2013 14:50	56.4	43.6	0	0		-0.38	-0.3	129	129	24	24	No Change; Well bore seal okay
FO-FU05-15R	7/30/2013 15:05	56.5	42	0	1.5	90	-0.84	-0.84	[illegible]	[illegible]	23	24	Adjusted vacuum; inspected well
FO-FU05-15R	8/8/2013 12:19	55.6	42.7	0.1	1.6	100	-0.58	-0.6	[illegible]	[illegible]	22	23	Adjusted vacuum, inspected well
FO-FU05-15R	8/28/2013 16:27	58.1	41.9	0	0	100	-0.93	-0.93	[illegible]	[illegible]	26	26	Adjusted vacuum; inspected well
FO-FU05-15R	9/5/2013 15:48	56.9	43.1	0	0	100	-0.61	-0.61	[illegible]	[illegible]	22	22	No Change; Well bore seal okay
FO-FU05-15R	9/24/2013 15:12	57.1	42.9	0	0	90	-0.72	-0.73	[illegible]	[illegible]	21	21	
FO-FU05-15R	9/24/2013 15:14	56.7	43.3	0	0	90	-0.24	-0.23	[illegible]	[illegible]	12	24	Closed valve 1/2 turn or less;
FOFU0616(Interim Temp)	6/28/2012 15:19	55.1	41.3	0.2	3.4		-1.5	-2.1	130	129	13	18	Opened valve 1/2 turn or less;
FOFU0616(Interim Temp)	7/5/2012 13:17	59.7	40.2	0	0.1	100	-2.5	-3.5	137	137	21	23	Opened valve 1/2 turn or less;
FOFU0616(Interim Temp)	7/20/2012 14:04	57.3	41.7	0	1	110	-4.3	-4.9	138	137	28	29	Opened valve 1/2 turn or less;
FOFU0616(Interim Temp)	8/7/2012 17:42	53.2	46.7	0	0.1	150	-5.4	-5.3	139	139	34	33	No Change; Well bore seal okay
FOFU0616(Interim Temp)	8/30/2012 11:06	52.6	46.1	0	1.3	130	-5.4	-5.4	137	136	11	10	No Change; Well bore seal okay
FOFU0616(Interim Temp)	9/10/2012 15:53	51.1	42.9	0.5	5.5	160	-5.6	-5.6	138	138	22	22	No Change; Well bore seal okay
FOFU0616(Interim Temp)	9/24/2012 16:11	55.7	43.9	0.3	0.1	120	-5.5	-5.5	135	135	22	22	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
FOFU0615(Interim Temp)	10/9/2012 15:56	55.7	44.2	0	0.1	140	5.7	5.7	135	135	22	22	No Change; Well bore seal okay
FOFU0615(Interim Temp)	10/30/2012 16:48	55.5	44.1	0.3	0.1		5.4	5.4	128	128	22	21	No Change; Well bore seal okay
FOFU0615(Interim Temp)	11/15/2012 16:22	55.8	44.1	0	0.1		5.8	5.8	127	129	23	23	No Change; Sample Port needs
FOFU0615(Interim Temp)	11/29/2012 15:59	56.0	43.2	0	0.1		-6.2	-6.2	129	129	44	42	No Change; Well bore seal okay
FOFU0615(Interim Temp)	12/28/2012 12:35	55.8	41	0	3.2		-6.2	-6.2	120	127	26	26	No Change; Sample Port needs
FOFU0616(Interim Temp)	1/14/2013 15:54	55.8	44.1	0	0.1		-12.8	-12.8	128	128	36	36	No Change; Sample Port needs
FOFU0616(Interim Temp)	1/30/2013 14:45	58.1	41.7	0.1	0.1		-10.8	-10.8	129	129	35	34	No Change; Sample Port needs
FOFU0616(Interim Temp)	2/13/2013 12:24	55	41.9	0.3	2.8	100	-6.9	-6.9	133	133	24	23	No Change; Well bore seal okay
FOFU0616(Interim Temp)	2/21/2013 9:18	56	42.3	0	1.7	90	-7	-7.1	132	132	23	23	No Change; Well bore seal okay
FOFU0616(Interim Temp)	4/15/2013 11:24	58.6	41.4	0	0		-4.1	-4.1	129	128	15	14	No Change; Well bore seal okay
FOFU0616(Interim Temp)	4/27/2013 11:36	59.2	40.8	0	0		-3.61	-3.64	129	129	20	19	No Change; Well bore seal okay
FOFU0616(Interim Temp)	5/3/2013 12:13	60.4	39.6	0	0		-1.95	-1.93	130	130	11	11	No Change; Well bore seal okay
FOFU0616(Interim Temp)	5/28/2013 13:22	59.6	40.4	0	0		-1.93	-1.96	129	129	11	11	No Change; Well bore seal okay
FOFU0616(Interim Temp)	6/5/2013 10:03	59.3	40.7	0	0		-2.71	-2.73	129	129	33	34	No Change; Well bore seal okay
FOFU0616(Interim Temp)	6/28/2013 14:19	59.4	40.5	0	0.1	120	-0.4	-0.36	131	131	15	15	No Change; Well bore seal okay
FOFU0616(Interim Temp)	7/8/2013 10:51	60.4	39.5	0.1	0		2.42	2.39	129	129	15	15	No Change; Well needs
FOFU0616(Interim Temp)	7/24/2013 12:58	59	41	0	0		-0.8	-0.79	129	129	18	18	No Change; Well bore seal okay
FOFU0616(Interim Temp)	8/29/2013 14:18	61.3	38.6	0	0.1	110	-1.67	1.68	132	132	10	11	No Change; Sample Port needs
FOFU0802(Interim Temp)	6/7/2012 9:34	57	40	0.2	2.8	110	-1.1	-1.1	134	133			No Change; Well bore seal okay
FOFU0802(Interim Temp)	6/28/2012 15:16	52.4	41.9	0	5.7		-1.1	-1.1	128	127	26	28	No Change; Well bore seal okay
FOFU0802(Interim Temp)	7/5/2012 13:12	60.3	39.6	0	0.1	120	-1.1	-1.4	134	134	12	27	Opened valve 1/2 turn or less;
FOFU0802(Interim Temp)	7/20/2012 13:58	50.6	38.2	0	11.2	90	-1.8	-2	135	134	18	17	No Change; Well bore seal okay
FOFU0802(Interim Temp)	8/7/2012 17:37	52.3	40.8	0.1	6.5	140	-2	-2.3	136	136	27	27	No Change; Well bore seal okay
FOFU0802(Interim Temp)	8/30/2012 11:00	40	35.4	0.1	24.5	100	-1.8	-1.8	134	135	17	11	No Change; Well bore seal okay
FOFU0802(Interim Temp)	9/10/2012 15:47	49.4	37.7	0	13.9	140	-1.9	-1.9	137	137	8	6	No Change; Well bore seal okay
FOFU0802(Interim Temp)	9/24/2012 16:05	50.8	37.2	0.6	11.4	130	-1.9	-1.9	133	132	11	11	No Change; Well bore seal okay
FOFU0802(Interim Temp)	10/9/2012 15:50	50.6	39	0	10.4	160	-1.9	-2	132	132	36	37	No Change; Remote wellhead ns
FOFU0802(Interim Temp)	10/30/2012 16:41	48.6	38.2	0.3	12.9		-2.1	-2.6	129	129	23	39	No Change; Well bore seal okay
FOFU0802(Interim Temp)	11/15/2012 16:10	48.9	38.1	0	13		-1.9	-2	128	127	15	13	No Change; Well bore seal okay
FOFU0802(Interim Temp)	11/29/2012 16:56	49.7	37.7	0	12.6		-2	-2	128	129			No Change; Well bore seal okay
FOFU0802(Interim Temp)	12/28/2012 12:28	56.8	38.6	0	4.6		-2.8	3.1	129	129	70	72	No Change; Well bore seal okay
FOFU0802(Interim Temp)	1/14/2013 15:48	55.6	39.6	0	4.8		-3	-3.3	128	129	64	66	No Change; Well bore seal okay
FOFU0802(Interim Temp)	1/30/2013 14:42	57.1	37.9	0.1	4.9		-2.2	-2.3	128	129	53	50	No Change; Well bore seal okay
FOFU0802(Interim Temp)	2/13/2013 12:15	53	38.3	0.2	8.5	110	-1.2	-1.2	131	132	6	1	No Change; Well bore seal okay
FOFU0802(Interim Temp)	2/21/2013 9:11	56.1	39.8	0	4.1		-1.3	-1.3	128	129	13	16	No Change; Well bore seal okay
FOFU0802(Interim Temp)	3/14/2013 9:18	57.9	42.1	0	0		-1.78	-1.8	128	129	48	53	No Change; Well bore seal okay
FOFU0802(Interim Temp)	4/15/2013 11:11	58.4	41.5	0.2			1.74	-2.24	129	129	81	78	No Change; Well bore seal okay
FOFU0802(Interim Temp)	4/27/2013 12:27	58.3	41.7	0	0		-0.97	-0.99	129	129	61	57	No Change; Well bore seal okay
FOFU0802(Interim Temp)	7/8/2013 10:54	58.6	40.2	0	1.2		-0.69	0.68	128	128	34	31	No Jump Seen; Well off-line for
FOFU0802(Interim Temp)	7/24/2013 13:02	59.5	40.5	0	0	130	-1.07	-1.07	132	132	73	73	No Change; Well bore seal okay
FOFU0802(Interim Temp)	8/13/2013 12:35	67.6	32.4	0	0		-5.62	-5.63	129	129	159	159	No Change; Sample Port needs
FOFU0802(Interim Temp)	8/29/2013 14:15	60.1	38.6	0	1.3	150	-2.15	2.15	131	131	82	82	No Change; Well bore seal okay
FOFU0802(Interim Temp)	9/6/2013 13:55	60.1	39.8	0.2		130	-1.81	-1.81	131	131	92	95	No Change; Sample Port needs
FOFU0802(Interim Temp)	9/24/2013 15:30	60.9	38.9	0.2	0		-0.76	-0.79	126	126	68	70	No Change; Sample Port needs
FOFU0803(Interim Temp)	6/7/2012 9:31	59.4	39.8	0.3	0.5		-7	-7	127	128	12	10	No Change
FOFU0803(Interim Temp)	6/28/2012 15:13	54.6	39.8	0	5.6		-6.4	-6.4	126	127	21	21	No Change; Well bore seal okay
FOFU0803(Interim Temp)	7/6/2012 13:09	59.8	40.1	0	0.1		-5.8	-6.8	126	126	22	25	Opened valve 1/2 turn or less;
FOFU0803(Interim Temp)	7/20/2012 13:55	54.6	39.1	0	6.3		-7	-7	125	126	41	40	No Change; Well bore seal okay
FOFU0803(Interim Temp)	8/7/2012 17:34	56.2	41.4	0.5	1.9		-6.8	-6.7	125	127	35	35	No Change; Well bore seal okay

Forward Well Data for Selected Wells
July 2012 through September 2013

Name	Date Time	(% by vol)	Dioxide	(% by vol)	(% by vol)	(ppm)	Static	Static	Temp	Temp	Flow	(scfm)	Comments
FOFU0803(Interim Temp)	8/30/2012 10:58	43.4	35.5	0.1	21		-6.3	-6.3	126	126	32	24	No Change; Well bore seal okay
FOFU0803(Interim Temp)	9/10/2012 15:43	47.2	37.4	0.3	15.1	180	-7.1	-7.1	131	131	21	21	No Change; Well bore seal okay
FOFU0803(Interim Temp)	9/24/2012 16:01	49.7	37.5	0.6	12.2		-7.3	-7.3	126	126	23	23	No Change; Well bore seal okay
FOFU0803(Interim Temp)	10/3/2012 19:47	50	38.2	0	11.8		-7.7	-7.7	126	127	20	21	No Change; Well bore seal okay
FOFU0803(Interim Temp)	10/30/2012 16:38	53.8	38.9	0.6	8.7		-8	-8	126	126	20	21	No Change; Well bore seal okay
FOFU0803(Interim Temp)	11/15/2012 16:15	51.9	39.4	0	8.7		-8.8	-8.7	127	127	22	22	No Change; Well bore seal okay
FOFU0803(Interim Temp)	11/29/2012 16:10	52.8	38.4	0	8.8		-9.5	-9.5	126	127	23	24	No Change; Well bore seal okay
FOFU0803(Interim Temp)	12/28/2012 12:25	58.5	38.5	0	3		-9.2	-9.1	127	127	25	26	No Change; Well bore seal okay
FOFU0803(Interim Temp)	1/14/2013 15:45	50.8	38	0.4	10.8		-15	-14.9	127	128	31	30	No Change; Well bore seal okay
FOFU0803(Interim Temp)	1/30/2013 14:40	52.8	37.1	0.3	9.8		-12.4	-12.4	128	128	28	28	No Change; Well bore seal okay
FOFU0803(Interim Temp)	2/13/2013 12:12	48.9	36.7	0.5	13.9		-9.4	-9.2	129	129	22	22	No Change; Well bore seal okay
FOFU0803(Interim Temp)	2/21/2013 9:08	52.4	38.3	0	9.3		-8.7	-8.7	127	127	20	20	No Change; Well bore seal okay
FOFU0803(Interim Temp)	3/14/2013 9:14	55.2	39.8	2	5.9		-7.53	-7.51	128	127	22	22	No Change; Well bore seal okay
Top Deck Well 01	6/14/2013 9:34	57.7	42.1	0	0		-5.55	-5.55	125	125	28	28	No Change; Well bore seal okay
Top Deck Well 01	6/28/2013 10:17	58.3	40.7	0	0		-4.07	-4.08	125	126	29	28	No Change; Well bore seal okay
Top Deck Well 01	7/11/2013 9:41	58.2	41.6	0	0		-4.95	-4.96	125	125	26	26	No Change; Well bore seal okay
Top Deck Well 01	7/22/2013 16:25	57.8	42.2	0	0		-4.24	-4.23	126	126	25	25	No Change; Well bore seal okay
Top Deck Well 01	8/1/2013 12:50	58.4	41.5	0.1	0		-4.66	-4.67	125	125	14	14	No Change; Well bore seal okay
Top Deck Well 01	8/26/2013 16:34	58.5	41.5	0	0		-4.08	-4.22	126	126	23	25	Opened valve 1/2 turn or less;
Top Deck Well 01	9/9/2013 12:19	57.3	42.6	0.1	0		-5.26	-5.26	127	127	22	22	No Change; Well bore seal okay
Top Deck Well 01	9/23/2013 15:21	59.3	40.7	0	0		-4.96	-4.98	126	126	25	25	No Change; Well bore seal okay
Top Deck Well 04	6/28/2013 10:24	58.9	41.1	0	0		-2	-2	126	126	24	24	No Change; Well bore seal okay
Top Deck Well 04	7/22/2013 16:44	57.2	42.7	0	0.1		-2.01	-1.99	126	126	19	20	No Change; Well bore seal okay
Top Deck Well 04	8/7/2013 11:22	57.2	42.8	0	0		-2.76	-2.8	125	125	18	18	No Change; Well bore seal okay
Top Deck Well 04	8/26/2013 16:42	58.4	41.6	0	0		-0.91	-1.13	125	126	16	19	Opened valve 1/2 turn or less;
Top Deck Well 04	9/9/2013 12:26	57.4	42.6	0	0		-2.49	-2.49	127	127	15	15	No Change; Well bore seal okay
Top Deck Well 04	9/23/2013 15:27	58.1	41.9	0	0		-2.16	-2.17	125	125	37	37	No Change; Well bore seal okay
Top Deck Well 05	6/28/2013 10:26	58.8	41.2	0	0		-1.56	-1.56	125	126	23	22	No Change; Well bore seal okay
Top Deck Well 05	9/9/2013 12:29	57.5	42.5	0	0		-1.99	-1.99	125	125	27	27	No Change; Well bore seal okay

eurofins | Air Toxics

10/3/2012
Mr. Sean Bass
SCS Field Services
4730 Enterprise Way
Suite A
Modesto CA 95356

Project Name: 07207048.01
Project #: Forward
Workorder #: 1209083R1

Dear Mr. Sean Bass

The following report includes the data for the above referenced project for sample(s) received on 9/7/2012 at Air Toxics Ltd.

The data and associated QC analyzed by Modified ASTM D-1946 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kyle Vagadori at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kyle Vagadori
Project Manager

eurofins | Air Toxics

WORK ORDER #: 1209083R1

Work Order Summary

CLIENT:	Mr. Sean Bass SCS Field Services 4730 Enterprise Way Suite A Modesto, CA 95356	**BILL TO:**	Mr. Art Jones SCS Field Services 4730 Enterprise Way Suite A Modesto, CA 95356
PHONE:	209-545-8490	**P.O. #**	MO8172
FAX:		**PROJECT #**	Forward 07207048.01
DATE RECEIVED:	09/07/2012	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	09/11/2012		
DATE REISSUED:	10/03/2012		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	F-1208	Modified ASTM D-1946	1.0 "Hg	15 psi
02A	F-1208 Dup.	Modified ASTM D-1946	1.5 "Hg	15 psi
03A	Lab Blank	Modified ASTM D-1946	NA	NA
04A	LCS	Modified ASTM D-1946	NA	NA
04AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: _____ DATE: 10/03/12

Technical Director

Certfication numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NY NELAP - 11291,
TX NELAP - T104704434-12-5, UT NELAP CA009332012-3, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2011, Expiration date: 10/17/2012.
Eurofins Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1946
SCS Field Services
Workorder# 1209083R1

Two 1 Liter Summa Canister samples were received on September 07, 2012. The laboratory performed analysis via Modified ASTM Method D-1946 for Carbon Monoxide in air using GC/TCD. The method involves direct injection of 1.0 mL of sample.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	*ASTM D-1946*	*ATL Modifications*
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A 3-point calibration curve is performed. Quantitation is based on a daily calibration standard which may or may not resemble the composition of the associated samples.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a >/= 95% accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

Receiving Notes

The Chain of Custody (COC) was not relinquished properly. A signature and date were not provided by the field sampler.

Analytical Notes

There were no analytical discrepancies.

THE WORKORDER WAS REISSUED ON 10/03/12 TO REPORT ESTIMATED VALUES FOR TARGET COMPOUND HITS THAT ARE BELOW THE REPORTING LIMIT BUT GREATER THAN THE METHOD DETECTION LIMIT.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

eurofins | Air Toxics

Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: F-1208

Lab ID#: 1209083R1-01A

No Detections Were Found.

Client Sample ID: F-1208 Dup.

Lab ID#: 1209083R1-02A

No Detections Were Found.

eurofins | Air Toxics

Client Sample ID: F-1208

Lab ID#: 1209083R1-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9091005b**	**Date of Collection: 9/7/12 10:18:00 AM**	
Dil. Factor:	**2.09**	**Date of Analysis: 9/10/12 10:55 AM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Carbon Monoxide	0.021	Not Detected J

J = Estimated value.

MDL Value: 0.0073%

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: F-1208 Dup.

Lab ID#: 1209083R1-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9091006b**	**Date of Collection: 9/7/12 10:23:00 AM**	
Dil. Factor:	**2.13**	**Date of Analysis: 9/10/12 11:20 AM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Carbon Monoxide	0.021	Not Detected J

J = Estimated value.
MDL Value: 0.0074%

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1209083R1-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9091004b**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/10/12 10:05 AM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Carbon Monoxide	0.010	Not Detected J

J = Estimated value.

MDL Value: 0.0035%

Container Type: NA - Not Applicable

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1209083R1-04AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9091022b**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/10/12 06:43 PM**	

Compound	%Recovery
Carbon Monoxide	97

Container Type: NA - Not Applicable

Attachment C

GEM 5000 Specifications

This document explains the GEM5000 accuracy for the CO (H_2)* compensated electrochemical cell and the testing protocol to assure best measurements.

*Hydrogen compensated carbon monoxide measurement. Compensated for interference from up to 2,000ppm hydrogen.

Accuracy

The accuracy of the CO (H_2) compensated cell is ±1% Full Scale.

Range of Cell is 0 – 2,000ppm

User Calibration Protocol

Section 9.0 of the operation manual explains the calibration procedure in detail. Two important terms that are used within this section are **'Zero'** and **'Span'**.

Zero: The point at which the gas analyzer is calibrated when there is none (Zero percent or ppm) of the target gases present.

Span: The point at which the gas analyzer is calibrated when a known quantity of the target gas is present.

A field calibration should be performed if the ambient temperature changes by more than 20° Fahrenheit over the course of a monitoring since the last field calibration.

User calibration of a gas analyzer will greatly improve the data accuracy in the range of the calibration gases used. This may cause less accurate readings of concentrations outside this calibrated range. Users should select the correct calibration gas for the expected gas levels on their particular application.

For the calibration you will need CO certified calibration gas and 100% N2 gas to zero. If 100% N2 gas is not available fresh ambient air can be used. The recommended CO certified concentration to be used depends on what readings you will be expecting to read from your sample point(s). If this concentration is unknown 1,000ppm CO certified gas can be used which is half of the range of the cell.

Certified calibration gas cylinders are supplied with the LANDTEC calibration kit. The volume of gas is typically 34 liters. Certain gas mixtures may have different volumes. Please refer to the LANDTEC website www.landtena.com for further information.

The regulator supplied with the calibration kit is pre-set for flow and pressure rates that are factory set. If using other gas sources and regulators please match the flow and pressure of the LANDTEC regulators. An optional pressure relief valve is suggested if using a NON-LANDTEC regulator just as a safety precaution. Over pressurization of the analyzer can cause damage to the analyzer and cause it to malfunction.

Please contact LANDTEC for any questions regarding the calibration or to request a copy of section 9.0 of the operating manual which describes the calibration procedure on calibrating your GEM5000.

APPENDIX VII

Facility Comments and District Response

Facility Comments and District Response

Facility Comment #1: Forward would like to have the opportunity to review the U.S. Environmental Protection Agency (EPA) landfill gas (LFG) emissions model (LandGem) used for District Project N-1062444 to confirm that the limit of 5,400 standard cubic feet per minute (scfm) is not based on the flares capacities but the potential landfill gas (LFG) generation rate for the landfill. It also appears that the maximum rate of 5,400 scfm is used as both the maximum LFG generation and the maximum collection rate in the application review (page 1); these values should not be the same. Forward requests clarification of the 5,400 scfm value as either a maximum LFG generation rate or LFG collection rate.

District Response: The LandGem modeling results that are referenced to in District Project N-1062444 was provided to the District by Forward Landfill in the application package for that project. The modeling was performed to determine the maximum landfill gas generation rate. The permittee decided to permit their flares at a CFM equal to the landfill gas generation rate. A copy of the LandGem results supplied to the District in Project N-1062444 was emailed to your attention. The District does not believe this comment will result in any changes to the Authority to Construct permit.

Facility Comment #2: In conditions #10 and #11 of the Draft ATC, the District provides the maximum LFG flow rate capacities for the two flares as permitted limits. Forward requests clarification that the maximum flow rates provided herein have been corrected to 50 percent (%) methane, such that the flow rates could exceed these values if the methane content is less than 50. Alternatively, Forward requests that the maximum capacity limit for each flare be based on the heat input (MMBtu/hr) as it is a more accurate measurement of flare capacity.

District Response: Conditions #10 and #11 of the Draft ATC have been modified to clarify that the scfm limits are referenced to 50 percent methane.

Facility Comment #3: The landfill is not an existing PSD site for criteria air pollutants; facility-wide potential to emit (PTE) for each criteria air pollutant is less than 250 tons per year. If a facility is not an existing PSD facility, two thresholds must be met for GHGs to be "subject to regulation, which would constitute an existing major source. The requirements are as follows:

- New Source PTE ≥ 100,000 tpy carbon dioxide equivalent (CO_2e)
- Existing source (or project) PTE ≥ 100,000 tpy CO_2e
- Increase from proposed project is ≥ 75,000 tpy CO_2e

According to the District's emission calculations the landfill is an existing source with the PTE of ≥ 100,000 tpy of CO_2e; it is not a new source. However, the emissions from the proposed project, as specified throughout the District's evaluation is zero (e.g. < 75,000 tpy). Therefore, GHGs are not subject to regulation, and the Landfill would not be considered an existing Major Source for PSD at this time.

We also wish to not that the recent legal finding vacating the deferral of biogenic GHG emissions has not yet taken effect. Therefore, as of the date of this letter, biogenic emissions are still not considered for applicability and Major Source status under the PSD. As such, we question that the calculated GHG emissions could be as high as indicated without the inclusion of biogenic emissions. We request the opportunity to review the basis for the GHG emissions total presented in the above table.

District Response: The District has revised the evaluation and removed the biogenic emissions from the calculations used determine the PSD status of the landfill.

Facility Comment #4: Condition 42 of ATC N-339-17-10 specifies a limit of 1,406,827 cubic yards (cy) or 37,984,329 cubic feet (cf). Forward requests that the District provide calculations for how it derived the limit of 61,768,080 cf for condition #16 of the draft ATC.

District Response: The 1,406,827 cubic yards limit for the volume of soil used for intermediate and final cover of the landfill was determined based on the landfill area and an assumed soil cover depth and density. This project corrects the landfill area listed in the equipment description. The new limit was based on the corrected landfill area, using the same assumption for the soil cover depth and soil density. The District believes the revised limit for the volume of soil used is conservative and accurate for estimating emissions from the soil cover.

Facility Comment #5: Condition #54 cites New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPS), which require semi-annual reporting. The requirement to submit a report to the District at least every 12 months is misleading. Forward requests a requirement of semi-annual reporting to eliminate any potential for misinterpretation of Landfill's reporting requirement per NSPS and NESHAPs.

District Response: The District has revised condition #54 to require semi-annual reporting.

Facility Comment #6: Condition #70, LFG probes 7 through 12 were relocated to the edge of the Landfill, at least 100 feet outside of the waste line and with a minimum 100-foot buffer between probes and waste on June 1 through 7, 2011. The regulatory citation for this Condition is the Consent Decree. Forward requests that Condition #70 is removed from the ATC because this requirement has been satisfied.

District Response: This condition has been removed from the draft ATC.

Facility Comment #7: Condition #71, to comply with the intermediate cover requirements established in California Code of Regulations 27 Section 20700 through 20705, is not a Clean Air Act (CAA) requirement and not related to air emissions. As such, Forward request that it is removed from the draft ATC.

District Response: This condition has been removed from the draft ATC.

Facility Comment #8: The requirement of monitoring the integrity of the well boots and seals is a requirement of the Consent Decree Forward requests that Condition #72 is removed from the draft ATC, as it is not a regulatory monitoring requirement that is based on any CAA rule or regulation.

District Response: This condition has been removed from the draft ATC.

Facility Comment #9: Condition #73 lists wells that have been approved for a higher operating temperature limit. Forward requests that the carbon monoxide requirements defined in the Consent decree be included in this condition as they relate to the wellhead limits.

District Response: This condition has been revised to include the CO monitoring requirements, and is now listed as condition #70 on the draft Authority to Construct permit in this document.

Facility Comment #10: Condition #76, which requires Forward to keep records of all emission source tests, does not include a rule retention limit of 5 years. Forward requests that a records retention limit of 5 years is specified in this condition.

District Response: The condition language has been modified such that it does not imply that records of source tests older than 5 years must be kept, and is now listed as condition #74 on the draft Authority to Construct permit in this document.

Facility Comment #11: Forward would like to meet with the District to discuss the District's previous denial of higher operating limits for several wellheads located at the landfill and to resubmit that request along with new supporting data.

District Response: The District has received and reviewed the revised request (See Appendix VI for copy of this request and supporting data). The application review has been modified to include a section addressing this request, and the permit conditions have been modified accordingly (See permit conditions #70 and #71 in the Draft Authority to Construct attached to this document.

APPENDIX VIII

EPA Comments and District Response

EPA Comments and District Response

EPA Comment #1: The evaluation contains a discussion of the sources request to increase wellhead operating temperature at specific wellheads. (See page 51) The discussion lays out specific facts that are the basis of the facilities requests and the criteria the District used to evaluate the request. While EPA agrees with the outcome of this evaluation (i.e., approving the request to increase the wellhead operating temperature), we do not agree with all the listed criteria for determining the need to increase the wellhead temperatures.

District Response: Upon further clarification from EPA Region IX, the District understands your comment regarding the criteria used to evaluate the request for higher operating temperatures for the wellheads listed in the application review. The O_2, CO, and methane concentrations measured for the wellheads in this specific request are not indicitive of a fire at this specific landfill. Since EPA's separate evaluation of the request for higher operating temperatures (See Appendix IX) concurs with the result of the District's evaluation, the District will issue the Authority to Construct permit.

EPA Comment #2: EPA notes that while the Consent Decree specifies in Section 14(b) how the specific wellheads listed in 14(a) and any new wellheads constructed after February 1, 2012 may increase the allowable operating temperature, there are no provisions provided to increase the current temperature limit of 131 degree Fahrenheit for existing wellheads which are not specifically listed. This means that the District can not issue an Authority to Construct authorizing operation of the wellheads specified in the proposed permit until the Consent Decree has been modified to allow such an action.

District Response: EPA has issued a letter approving a higher operating temeprature for the wellheads listed on the Draft ATC (See Appendix IX). Therefore, this matter has been resolved and the District will issue the Authority to Construct permit.

APPENDIX IX

EPA Request for Alternative Operating Temperatures Approval Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

(ORC-2) MAY 1 2 2014

Ms. Leslie M. Bove
Project Professional
SCS ENGINEERS
3843 Brickway Boulevard, Suite 208
Santa Rosa, California 95403

Mr. Michael O'Connor
Senior Project Professional
SCS ENGINEERS
3843 Brickway Boulevard, Suite 208
Santa Rosa, California 95403

RE: Request for Alternative Operating Temperature at Forward Landfill under *United States of America, et al. v. Forward, Inc.*, Consent Decree, Case No. 2:11-cv-00590 EFB (E.D.Cal. May 2, 2012)

On behalf of Forward, Inc., you have made a request, dated November 21, 2013, to the U.S. Environmental Protection Agency, Region 9 ("EPA") and the San Joaquin Valley Air Pollution Control District ("District") for a higher gas temperature operating limit of 141° F at 22 wells[1] that are part of the gas collection and control system at Forward Landfill ("Landfill"). Pursuant to 40 C.F.R. § 60.753(c) of the Standards of Performance for Municipal Solid Waste Landfills 40 C.F.R. Part 60, Subpart WWW, §§ 60.750 – 60.759 ("Landfill NSPS"), the regulatory operating limit for these wells is 131° F. We have reviewed these requests and make the following determinations in accordance with Paragraph 14 of the above-referenced Consent Decree and with the Landfill NSPS.

Paragraph 14(b) of the Consent Decree contains standards for guiding a decision whether to grant a request for higher operating temperature limit for certain wells listed in Paragraph 14(a), and for "new" wells installed after February 1, 2012. Paragraph 14(b) states as follows, in relevant part:

> As described in subparagraphs 14(a)(ii) and 14(c)(ii), Defendant may request an alternative gas temperature limit for the wellheads identified in this Paragraph by submitting its request in writing to EPA and the District. Any such request shall contain all available sampling and other evidence relevant to EPA's and the District's consideration of the requesting [sic], including, but not limited to, the existence of suspected or actual subsurface combustion. ... EPA and the District shall be guided in their decision by the following standards: If the results of two consecutive monthly CO Analyses for a given well that are taken immediately prior to Forward's request are below 200 ppmv, then Forward may stop monthly CO monitoring and operate the well with the higher operating temperature, but not to exceed 145 °F. If the monthly CO Analysis is above 200 ppmv and below 500 ppmv, Forward shall continue monthly monitoring

[1] A11-04, A12-02, A12-03, A12-04, A12-05, A12-13S, A12-14, A12-16, A0-65RS, FU05-15R, FU04-19R, F12-01, F12-02, F12-03, F12-06 F12-08, F12-09, F12-10, F12-11, Top Deck Well 01, Top Deck Well 04, and Top Deck Well 05.

> but may still utilize the higher operating temperature, but not to exceed 145 °F. If the well is above 500 ppmv, Forward shall close the well as corrective action and undertake such further actions as directed by District and/or EPA to further investigate the potential for a subsurface fire in the area of the well. After considering Defendant's request, EPA and the District will either grant the request or deny it, in writing. If EPA and the District grant Defendant's request for an alternative wellhead gas temperature limit for an existing wellhead, the alternative approved limit shall immediately superseded the previously applicable limit and become the new interim temperature limit for that wellhead.

Paragraph 14(e) of the Consent Decree states as follows, in relevant part:

> For any well installed after February 1, 2012, if the gas temperature in one of these wells exceeds 131 degrees Fahrenheit, Defendant shall initiate corrective action within five Days. If correction of the exceedance cannot be achieved within 120 Days of the initial exceedance, Defendant shall: … iii. Request an alternative gas temperature limit pursuant to Subparagraph (b) above; ….

Paragraph 11(a) of the Consent Decree requires Forward to comply with regulations in the Landfill NSPS and the National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills, 40 C.F.R. Part 63, Subpart AAAA, §§ 63.1930 – 63.1990 ("Landfill NESHAP") relating to operation of the gas collection and control system at the Landfill. The Landfill NESHAP requires compliance with the Landfill NSPS.

Forty C.F.R. § 60.753(c) of the Landfill NSPS states as follows, in relevant part:

> Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of § 60.752(b)(2)(ii) of this subpart shall: … (c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 °C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.

Fourteen of the 22 wells for which a higher operating temperature limit is requested do not have monitored temperatures which exceed 131° F. Consequently, a higher operating temperature limit for these 14 wells is not necessary. As a result, EPA and the District deny the request for a higher operating temperature limit of 141° F for the following 14 wells: A11-04, A12-04, A12-05, A12-13S, A12-16, AO-65RS,[2] F12-01, F12-02, F12-03, F12-06, F12- 11, Top Deck Well 01, Top Deck Well 04, and Top Deck Well 05.

The remaining eight wells for which a request is submitted are A12-02, A12-03, A12-14, F12-08, F12-09,

[2] Well AO-65RS is part of the Intermittent Well Program established in Appendix B of the Consent Decree.

F12-10, FU04-19R, and FU05-15R. Six of these wells are "new" wells, installed after February 1, 2012, for which Paragraph 14(c) of the Consent Decree states that Forward may request an alternative gas temperature limit pursuant to Paragraph 14(b). Paragraph 14(b) in turn provides standards to guide a decision whether grant a higher operating temperature limit. Specifically, Paragraph 14(b) states that if two consecutive monthly carbon monoxide ("CO") readings taken immediately prior to Forward's request are below 200 parts per million by volume ("ppmv"), then Forward may discontinue monthly CO monitoring and operate at a higher temperature not to exceed 145° F.

Two wells, FU04-19R and FU05-15R, are existing wells not specifically covered by Paragraph 14 but are addressed by the regulatory requirements of the Landfill NSPS which applies to all interior wells at the Landfill unless otherwise indicated. As stated above, "[a] higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens." 40 C.F.R. § 60.753(c). Information and data categories relevant to this provision include, but are not limited to, any overt evidence of subsurface combustion (e.g., smoke, smoldering ash, burnt materials); gas temperatures; CO, oxygen and methane levels; and attempted corrective action.

Upon application of the standards set forth in Paragraph 14(b) of the Consent Decree, and consideration of the information and data categories relevant to the Landfill NSPS that are identified above, EPA and District make the following findings with respect to the remaining eight wells:

1) There is no overt evidence of suspected or actual subsurface combustion.

2) Wellhead gas temperatures were at 138° F or below at all eight wells in February 2014.

3) Six of the eight wells had CO readings at 100 ppmv or below in September and October 2013, the two months of available data prior to the request (and in February 2014 at the four wells where data was available). The most current data at two other wells, F12-09 and F12-10, showed CO readings at 52 ppmv or below in September 2012. Well F12-08, a well in close proximity to wells F12-09 and F12-10, had a CO reading of 60 ppmv in December 2013.

4) Oxygen levels at all eight wells were at or near 0%[3] in February 2014.

5) Methane levels at all eight wells ranged from 47% to 58% in February 2014.

6) Attempted corrective action, such as installation of additional wells and reducing vacuum, have been unsuccessful.

Based on the above findings, standards, and information and data, EPA and the District grant Forward's request for a temperature operating limit of 141° F at wells AI2-02, AI2-03, AI2-14, F12-08, F12-09, F12-10, FU04-19R, and FU05-15R, and impose additional monitoring and notification requirements on these wells as set forth below.

[3] At well A12-14, one oxygen reading was at 0.2% on 2/28/14, and the previous available readings were at 0% on 2/13/14, 1/27/14, 1/10/14, 12/31/13, and 12/12/13.

In sum, for LFG extraction wellheads A12-02, A12-03, A12-14, F12-08, F12-09, F12-10, FU04-19R, and FU05-15R, Forward shall operate each of these wellheads with a landfill gas temperature less than 141 degrees F and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The following monitoring requirements are applicable to these wellheads: 1) Forward shall perform monthly CO monitoring using Draeger tubes, or a District/EPA approved monitoring device, for wellheads with a measured temperature greater than 131 degrees F; 2) If the measured field CO readings are less than 200 ppmv, the well may continue to operate up to a temperature less than 141 degrees F; 3) If the measured field CO readings are equal to or greater than 200 ppmv and less than or equal to 500 ppmv, the well shall be monitored on a weekly basis to verify that there is no subsurface oxidation occurring. Once the CO levels decrease to below 200 ppmv, the monthly monitoring schedule shall resume; 4) If the measured field CO readings are in excess of 500 ppmv, the well shall be temporarily closed and documented and a sample shall be obtained within one week of the exceedance and analyzed for CO using EPA Method D-1946. If results confirm the readings are in excess of 500 ppmv, the well shall remain closed and off-line and the District shall be notified within 24 hours of the exceedance; and 5) Upon receiving notification from the District, Forward shall undertake such actions as directed by the District and/or EPA to further investigate the potential for subsurface oxidation in the area of a wellhead and develop a plan for remediation.

At any time, if you have any additional questions concerning this matter, please contact Charles Aldred, at (415) 972-3986, or me, at (415) 972-3924.

Sincerely,

Brian P. Riedel

Brian P. Riedel
Assistant Regional Counsel

cc: Catherine Redmond, SJVAPCD (via e-mail)
Sylvia Quast (via e-mail)
Charles Aldred, EPA (via e-mail)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

(ORC-2) MAY 1 2 2014

Ms. Leslie M. Bove
Project Professional
SCS ENGINEERS
3843 Brickway Boulevard, Suite 208
Santa Rosa, California 95403

Mr. Michael O'Connor
Senior Project Professional
SCS ENGINEERS
3843 Brickway Boulevard, Suite 208
Santa Rosa, California 95403

RE: Request for Alternative Operating Temperature at Forward Landfill under *United States of America, et al. v. Forward, Inc.*, Consent Decree, Case No. 2:11-cv-00590 EFB (E.D.Cal. May 2, 2012)

On behalf of Forward, Inc., you have made a request, dated November 21, 2013, to the U.S. Environmental Protection Agency, Region 9 ("EPA") and the San Joaquin Valley Air Pollution Control District ("District") for a higher gas temperature operating limit of 141° F at 22 wells[1] that are part of the gas collection and control system at Forward Landfill ("Landfill"). Pursuant to 40 C.F.R. § 60.753(c) of the Standards of Performance for Municipal Solid Waste Landfills 40 C.F.R. Part 60, Subpart WWW, §§ 60.750 – 60.759 ("Landfill NSPS"), the regulatory operating limit for these wells is 131° F. We have reviewed these requests and make the following determinations in accordance with Paragraph 14 of the above-referenced Consent Decree and with the Landfill NSPS.

Paragraph 14(b) of the Consent Decree contains standards for guiding a decision whether to grant a request for higher operating temperature limit for certain wells listed in Paragraph 14(a), and for "new" wells installed after February 1, 2012. Paragraph 14(b) states as follows, in relevant part:

> As described in subparagraphs 14(a)(ii) and 14(c)(ii), Defendant may request an alternative gas temperature limit for the wellheads identified in this Paragraph by submitting its request in writing to EPA and the District. Any such request shall contain all available sampling and other evidence relevant to EPA's and the District's consideration of the requesting [sic], including, but not limited to, the existence of suspected or actual subsurface combustion. ... EPA and the District shall be guided in their decision by the following standards: If the results of two consecutive monthly CO Analyses for a given well that are taken immediately prior to Forward's request are below 200 ppmv, then Forward may stop monthly CO monitoring and operate the well with the higher operating temperature, but not to exceed 145 °F. If the monthly CO Analysis is above 200 ppmv and below 500 ppmv, Forward shall continue monthly monitoring

[1] A11-04, A12-02, A12-03, A12-04, A12-05, A12-13S, A12-14, A12-16, A0-65RS, FU05-15R, FU04-19R, F12-01, F12-02, F12-03, F12-06 F12-08, F12-09, F12-10, F12-11, Top Deck Well 01, Top Deck Well 04, and Top Deck Well 05.

> but may still utilize the higher operating temperature, but not to exceed 145 °F. If the well is above 500 ppmv, Forward shall close the well as corrective action and undertake such further actions as directed by District and/or EPA to further investigate the potential for a subsurface fire in the area of the well. After considering Defendant's request, EPA and the District will either grant the request or deny it, in writing. If EPA and the District grant Defendant's request for an alternative wellhead gas temperature limit for an existing wellhead, the alternative approved limit shall immediately superseded the previously applicable limit and become the new interim temperature limit for that wellhead.

Paragraph 14(e) of the Consent Decree states as follows, in relevant part:

> For any well installed after February 1, 2012, if the gas temperature in one of these wells exceeds 131 degrees Fahrenheit, Defendant shall initiate corrective action within five Days. If correction of the exceedance cannot be achieved within 120 Days of the initial exceedance, Defendant shall: ... iii. Request an alternative gas temperature limit pursuant to Subparagraph (b) above; ....

Paragraph 11(a) of the Consent Decree requires Forward to comply with regulations in the Landfill NSPS and the National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills, 40 C.F.R. Part 63, Subpart AAAA, §§ 63.1930 – 63.1990 ("Landfill NESHAP") relating to operation of the gas collection and control system at the Landfill. The Landfill NESHAP requires compliance with the Landfill NSPS.

Forty C.F.R. § 60.753(c) of the Landfill NSPS states as follows, in relevant part:

> Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of § 60.752(b)(2)(ii) of this subpart shall: ... (c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 °C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.

Fourteen of the 22 wells for which a higher operating temperature limit is requested do not have monitored temperatures which exceed 131° F. Consequently, a higher operating temperature limit for these 14 wells is not necessary. As a result, EPA and the District deny the request for a higher operating temperature limit of 141° F for the following 14 wells: A11-04, A12-04, A12-05, A12-13S, A12-16, AO-65RS,[2] F12-01, F12-02, F12-03, F12-06, F12- 11, Top Deck Well 01, Top Deck Well 04, and Top Deck Well 05.

The remaining eight wells for which a request is submitted are A12-02, A12-03, A12-14, F12-08, F12-09,

[2] Well AO-65RS is part of the Intermittent Well Program established in Appendix B of the Consent Decree.

F12-10, FU04-19R, and FU05-15R. Six of these wells are "new" wells, installed after February 1, 2012, for which Paragraph 14(c) of the Consent Decree states that Forward may request an alternative gas temperature limit pursuant to Paragraph 14(b). Paragraph 14(h) in turn provides standards to guide a decision whether grant a higher operating temperature limit. Specifically, Paragraph 14(b) states that if two consecutive monthly carbon monoxide ("CO") readings taken immediately prior to Forward's request are below 200 parts per million by volume ("ppmv"), then Forward may discontinue monthly CO monitoring and operate at a higher temperature not to exceed 145° F.

Two wells, FU04-19R and FU05-15R, are existing wells not specifically covered by Paragraph 14 but are addressed by the regulatory requirements of the Landfill NSPS which applies to all interior wells at the Landfill unless otherwise indicated. As stated above, "[a] higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens." 40 C.F.R. § 60.753(c). Information and data categories relevant to this provision include, but are not limited to, any overt evidence of subsurface combustion (e.g., smoke, smoldering ash, burnt materials); gas temperatures; CO, oxygen and methane levels; and attempted corrective action.

Upon application of the standards set forth in Paragraph 14(b) of the Consent Decree, and consideration of the information and data categories relevant to the Landfill NSPS that are identified above, EPA and District make the following findings with respect to the remaining eight wells:

1) There is no overt evidence of suspected or actual subsurface combustion.

2) Wellhead gas temperatures were at 138° F or below at all eight wells in February 2014.

3) Six of the eight wells had CO readings at 100 ppmv or below in September and October 2013, the two months of available data prior to the request (and in February 2014 at the four wells where data was available). The most current data at two other wells, F12-09 and F12-10, showed CO readings at 52 ppmv or below in September 2012. Well F12-08, a well in close proximity to wells F12-09 and F12-10, had a CO reading of 60 ppmv in December 2013.

4) Oxygen levels at all eight wells were at or near 0%[3] in February 2014.

5) Methane levels at all eight wells ranged from 47% to 58% in February 2014.

6) Attempted corrective action, such as installation of additional wells and reducing vacuum, have been unsuccessful.

Based on the above findings, standards, and information and data, EPA and the District grant Forward's request for a temperature operating limit of 141° F at wells AI2-02, AI2-03, AI2-14, F12-08, F12-09, F12-10, FU04-19R, and FU05-15R, and impose additional monitoring and notification requirements on these wells as set forth below.

---

[3] At well A12-14, one oxygen reading was at 0.2% on 2/28/14, and the previous available readings were at 0% on 2/13/14, 1/27/14, 1/10/14, 12/31/13, and 12/12/13.

In sum, for LFG extraction wellheads A12-02, A12-03, A12-14, F12-08, F12-09, F12-10, FU04-19R, and FU05-15R, Forward shall operate each of these wellheads with a landfill gas temperature less than 141 degrees F and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The following monitoring requirements are applicable to these wellheads: 1) Forward shall perform monthly CO monitoring using Draeger tubes, or a District/EPA approved monitoring device, for wellheads with a measured temperature greater than 131 degrees F; 2) If the measured field CO readings are less than 200 ppmv, the well may continue to operate up to a temperature less than 141 degrees F; 3) If the measured field CO readings are equal to or greater than 200 ppmv and less than or equal to 500 ppmv, the well shall be monitored on a weekly basis to verify that there is no subsurface oxidation occurring. Once the CO levels decrease to below 200 ppmv, the monthly monitoring schedule shall resume; 4) If the measured field CO readings are in excess of 500 ppmv, the well shall be temporarily closed and documented and a sample shall be obtained within one week of the exceedance and analyzed for CO using EPA Method D-1946. If results confirm the readings are in excess of 500 ppmv, the well shall remain closed and off-line and the District shall be notified within 24 hours of the exceedance; and 5) Upon receiving notification from the District, Forward shall undertake such actions as directed by the District and/or EPA to further investigate the potential for subsurface oxidation in the area of a wellhead and develop a plan for remediation.

At any time, if you have any additional questions concerning this matter, please contact Charles Aldred, at (415) 972-3986, or me, at (415) 972-3924.

Sincerely,

Brian P. Riedel
Assistant Regional Counsel

cc: Catherine Redmond, SJVAPCD (via e-mail)
Sylvia Quast (via e-mail)
Charles Aldred, EPA (via e-mail)