

**WASTE EVALUATION & ENFORCEMENT BRANCH CHIEF  
ACTION REQUEST**

**To:** Georgianne Turner, Branch Chief  
Waste Evaluation and Enforcement Branch



**From:** Paulina Lawrence, Section Manager  
Solid Waste Enforcement Section

**Prepared By:** Cathy Blair, Solid Waste Enforcement Section  
Jon Whitehill, Supervisor Unit B Solid Waste Enforcement Section

**Request Date:** September 20, 2016

**Action By:** September 30, 2016

**Decision Subject:** Consideration of an Extension to the Compliance Schedule Due Date for a Facility included on the Inventory of Solid Waste Facilities Which Violate State Minimum Standards (Inventory), West Central Landfill, Facility No. 45-AA-0043, Shasta County

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**SUMMARY**

On May 6, 2016, CalRecycle approved a *fifth* extension request for the compliance schedule submitted by the Shasta County LEA on March 30, 2016. In the letter of approval, CalRecycle grants the extension of the compliance schedule for six months until August 25, 2016.

For more background information and a list of tasks completed prior to May 2016, see the attached RFA memo dated April 1, 2016 and extension request approval letter dated May 6, 2016

The LEA is now requesting *a sixth extension to the compliance due date to August 25, 2017*. The LEA has determined that the operator continues to make a good faith effort due in part to a substantial decrease in methane concentrations in the two remaining out of compliance wells, MP-4 and MP-11, which continue to demonstrate a downward trend.

**OPTIONS**

1. Approve a one-year extension for the proposed compliance due date to August 25, 2017 as requested by LEA, on the condition that LEA require the operator increase monitoring frequency of non-compliant perimeter monitoring probes from quarterly to monthly.
2. Approve a six month extension for the proposed compliance due date to February 25, 2017.
3. Deny the extension request to the compliance due date.

**FINDINGS**

Since the operator installed an additional 18 infill gas extraction wells in November 2014, there has been a significant reduction in the methane concentration in the two remaining non-compliant probes (MP-11 and MP-4). However, the operator is currently only monitoring non-compliant perimeter monitoring probes on a quarterly basis which will make evaluating compliance more difficult as methane levels approach 5%.

Since the fifth compliance extension request, the methane concentration levels in perimeter monitoring wells MP-4 and MP-11 continue to statistically demonstrate a downward trend (see Figures 1 and 2 below), notwithstanding some minor

## WASTE EVALUATION & ENFORCEMENT BRANCH CHIEF ACTION REQUEST

upticks in June. In addition, the operator has reaffirmed its conclusion that there is no threat to public health and safety. Therefore, the operator's updated remediation plan, dated August 2016 does not propose any further corrective actions at this time.

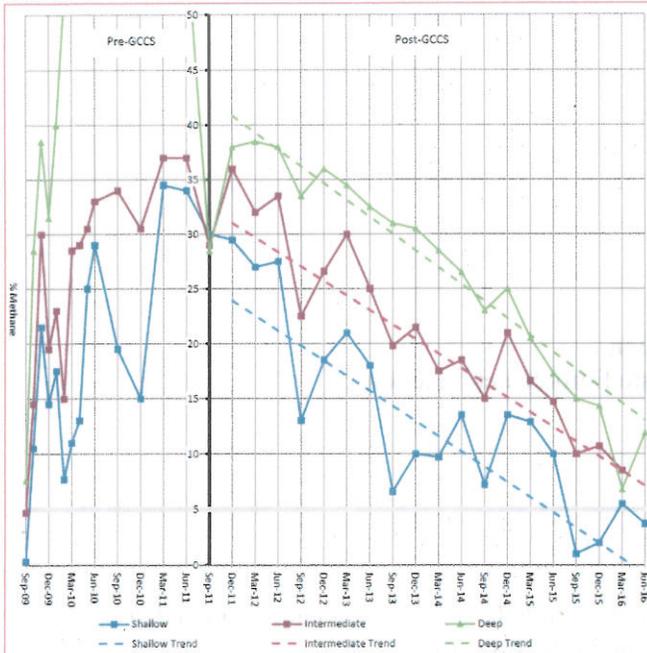


Figure 1 MP-4

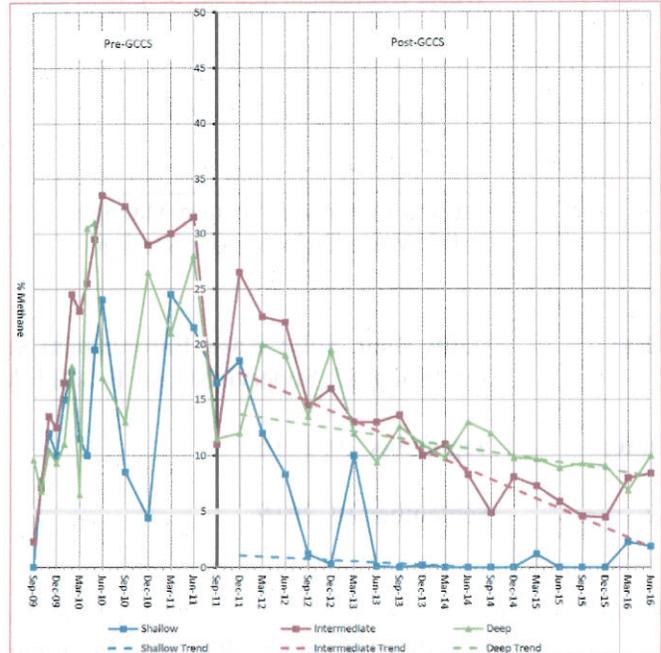


Figure 2 MP-11

### RECOMMENDATION

Due to the demonstrated continued downward trend in perimeter methane levels, CalRecycle staff recommends that the facility be granted an extension to August 25, 2017. However, staff also recommends that as a condition of approval, the LEA should require the operator increase monitoring frequency of non-compliant perimeter monitoring probes from quarterly to monthly.

### BRANCH CHIEF ACTION

On the basis of the information in this Request for Action, I hereby issue, pursuant to 14 CCR, Section 18365(b), approval of a one-year extension to the operator of the West Central Landfill, Facility No. 45-AA-0043, to August 25, 2017.

Dated: Oct 9, 2016

Georgianne Turner  
Branch Chief  
Waste Evaluation and Enforcement Branch

### Attachments:

- LEA Extension Request Letter dated August 22, 2016
- Operator Extension Request Letter and Updated Remediation Plan dated August 16, 2016

### Background:

- April 2016 CalRecycle RFA
- May 2016 CalRecycle Approval Letter



# Shasta County

DEPARTMENT OF RESOURCE MANAGEMENT  
1855 Placer Street, Redding, CA 96001

Richard W. Simon, AICP  
Director

Dale J. Fletcher, CBO  
Assistant Director

August 22, 2016

Georgianne Turner, Branch Chief  
Waste Evaluation and Enforcement Branch  
California Department of Resources, Recycling and Recovery  
P.O. Box 4025 Mail Stop 10A-17  
Sacramento, CA 95812

## CORRECTIVE ACTION SCHEDULE EXTENSION REQUEST FOR THE WEST CENTRAL LANDFILL PERIMETER GAS MONITORING SYSTEM, SHASTA COUNTY, SWIS # 45-AA-0043

The Shasta County Environmental Health Division (SCEHD) received an extension request on August 16, 2016, from the Shasta County Department of Public Works (Operator) for the Corrective Action Schedule in the Notice and Order (Order) for the West Central Landfill which was originally issued by SCEHD on April 12, 2010. The Order to comply contained specific time frames for compliance which either have been met or extended. Number five was extended to achieve compliance with regulatory maximum levels of methane at all probes in the approved perimeter monitoring network by August 25, 2016, in compliance with 27CCR, Section 20921.

As detailed in the enclosed letter, the operator has taken significant steps to reduce methane concentrations in the perimeter monitoring well network. These accomplishments include:

- The installation of a gas collection and control system, including 43 gas extraction wells and a 1500 scfm flare;
- The acquisition of 160 acres of BLM land to use as buffer east of perimeter well MP2;
- Revision of the permitted facility boundary to include the 160 acres acquired from BLM;
- The installation of two new perimeter monitoring wells, where methane concentrations have been non-detect since their installation; and
- Most importantly, a substantial decrease in methane concentrations in the two remaining out of compliance wells.

The LEA again asserts that the Operator has made a good faith effort over the last several years to come into compliance with the long-term gas violation. The Operator has made significant progress during each extension period towards eliminating the gas violations. To verify the Operator's progress, one must only look at the methane concentrations in perimeter monitoring wells. Where once three perimeter monitoring wells exceeded the methane concentration limits, only two wells remain above the limit.

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Georgianne Turner, Branch Chief  
Page 2  
August 22, 2016

Of the two remaining out of compliance wells, both have significantly reduced their methane concentrations, achieving an approximate threefold decrease in monitoring well MP-4 and an approximate fivefold decrease in monitoring well MP-11. It is quite possible that both wells will sample below five percent by volume methane during the requested compliance schedule extension.

SCEHD is requesting that your agency approve an extension request until August 25, 2017, to allow perimeter monitoring wells MP-4 and MP-11 to continue their trend downward below the compliance threshold of five percent by volume of methane.

Thank you for your consideration. Please contact me should you have any questions or need additional information.

Sincerely,



Ken Henderson, REHS  
Waste Management Specialist

KRH/pw  
GTAUG22-16.WD

Enclosure

- c: Jon Whitehill, CalRecycle  
Reinhard Hohlwien, CalRecycle  
Paul Clemens, City of Redding Solid Waste Utility  
John Heath, Shasta County Department of Public Works  
Catherine Blair, CalRecycle  
Kate Burger, California Regional Water Quality Control Board  
Lindsey Welch, Shasta County Air Quality Management District



# Shasta County

## DEPARTMENT OF PUBLIC WORKS

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**PATRICK J. MINTURN, DIRECTOR**  
C. TROY BARTOLOMEI, DEPUTY  
SCOTT G. WAHL, DEPUTY

FWS 070319

August 16, 2016

Carla Serio  
Environmental Health Division Manager  
Shasta County Department of Resource Management  
1855 Placer Street  
Redding, CA 96001

Subject: West Central Landfill Gas Migration Compliance

Dear Carla:

With regards to the April 2010 Notice and Order concerning migration of methane beyond the West Central Landfill alternate compliance boundary, data collected in June 2016 shows that wells MP-4 and MP-11 still have methane concentrations in excess of the 5% by volume compliance limit. The compliance deadline is August 25, 2016.

As detailed herein, the County has completed all of the previously proposed corrective actions and is requesting a one-year extension of the compliance deadline to August 25, 2017. As wells MP-4 and MP-11 are trending toward compliance, we are proposing no further corrective action during the extension period.

To recap, the County has completed the following corrective actions since the detection of methane above the compliance limit in September 2009:

- South Water Main Migration Barrier, January 2010: A monitoring probe and bentonite migration barrier were installed to monitor for and prevent gas migration along a water main serving the adjacent Northern California Veteran's Cemetery.
- Gas Collection and Control System, October 2011: Installation of a gas collection and control system (GCCS) with 25 gas extraction wells and a 1500 scfm flare.
- Buffer Area, July 2013: 160-acres of BLM land west of MP-2 was acquired to serve as a buffer to the landfill. Subsequent to the acquisition, the Solid Waste Facility Permit was modified to reflect incorporation of the buffer area into the Permitted Facility Boundary.
- Expanded Gas Collection System, November 2014: Installation of 18 additional gas extraction wells, eight of which served as infill wells within the existing wellfield and ten of which served to expand the wellfield coverage area.
- Revised Alternative Compliance Boundary, October 2015: The installation of two new monitoring wells, MP-2A and MP-2B, created a new alternate compliance boundary extending beyond MP-2.

Carla Serio, Environmental Health Division Manager  
August 16, 2016  
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A review of the monitoring data from wells MP-4 and MP-11 reveals:

- The shallow zone in MP-4 has been in compliance with the 5% limit since June 2013.
- The shallow zone in MP-11 has been in compliance with the 5% limit since September 2015, except for March 2016 when methane was detected at a concentration of 5.5%.
- The intermediate zone in MP-4 was below the compliance limit during the September 2015 and December 2015 monitoring events before slipping back above the limit during the March and June 2016 monitoring events.
- Despite a small uptick in methane concentrations in several of the monitoring zones from March 2016 to June 2016, the statistically-verified downward trends in methane concentration have continued in both wells. We attribute the uptick to normal variation in the monitoring data.

A monitoring data review with details of the statistical trend analysis is included with this compliance extension request.

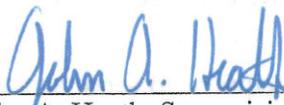
Given the encouraging data from MP-4 and MP-11, the County feels that the already implemented corrective actions are suitably addressing the migration of landfill gas and that it is only a matter of time until compliance is achieved. With that, we are proposing no further corrective actions.

In making this compliance extension request, the County reaffirms its conclusion that the existing migration offers no threat to public health and safety.

Thank you for your consideration in this matter. If you have any questions or comments please contact me at (530) 245-6596 or [jheath@co.shasta.ca.us](mailto:jheath@co.shasta.ca.us).

Sincerely,

Patrick J. Minturn, Director

By   
John A. Heath, Supervising Engineer  
Solid Waste Division

JAH/dlw  
Attachment

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**WEST CENTRAL LANDFILL**

SWIS No. 45-AA-0043

14095 Clear Creek Road, Igo, California

**LANDFILL GAS MIGRATION  
REMEDIATION PLAN  
Monitoring Data Review**



PREPARED BY:

**SHASTA COUNTY  
DEPARTMENT OF PUBLIC WORKS**

August 2016

In order to assess the effectiveness of corrective actions in mitigating landfill migration at West Central Landfill, methane concentrations from the affected wells was analyzed using standard statistical methods. Specifically, the analysis utilized the Mann-Kendall Test for Trends to determine if statistically significant decreasing trends were present in the post-corrective action methane concentrations. If a trend was detected, the data was further analyzed using the Sen's Slope Estimation procedure to estimate the slope (change over time) of the trend. These methods are further described below:

- **Mann-Kendall Test for Trends:** In the Mann-Kendall analysis the difference between all possible pairs of measurements is computed. Following comparison, the number of positive and negative differences is tallied. If the difference between the positive and negative tallies (the *S* statistic) is positive and meets the criteria for the chosen significance level, a positive trend is indicated. If the *S* statistic is negative and meets the criteria for the chosen significance level, a negative trend is indicated. If either result fails to meet the criteria for the chosen significance level, the conclusion is that there is not enough evidence to make the determination of a trend. A significance level of 95% was used (i.e. 5% chance for a false result) for this analysis.
- **Sen's Slope Estimation:** In the Sen's Slope Estimation procedure the difference in methane concentration per time period (i.e. the slope or change over time) is computed for all possible pairs of measurements and the median value of these individual differences is used as an estimate of the overall rate of change in the concentration.

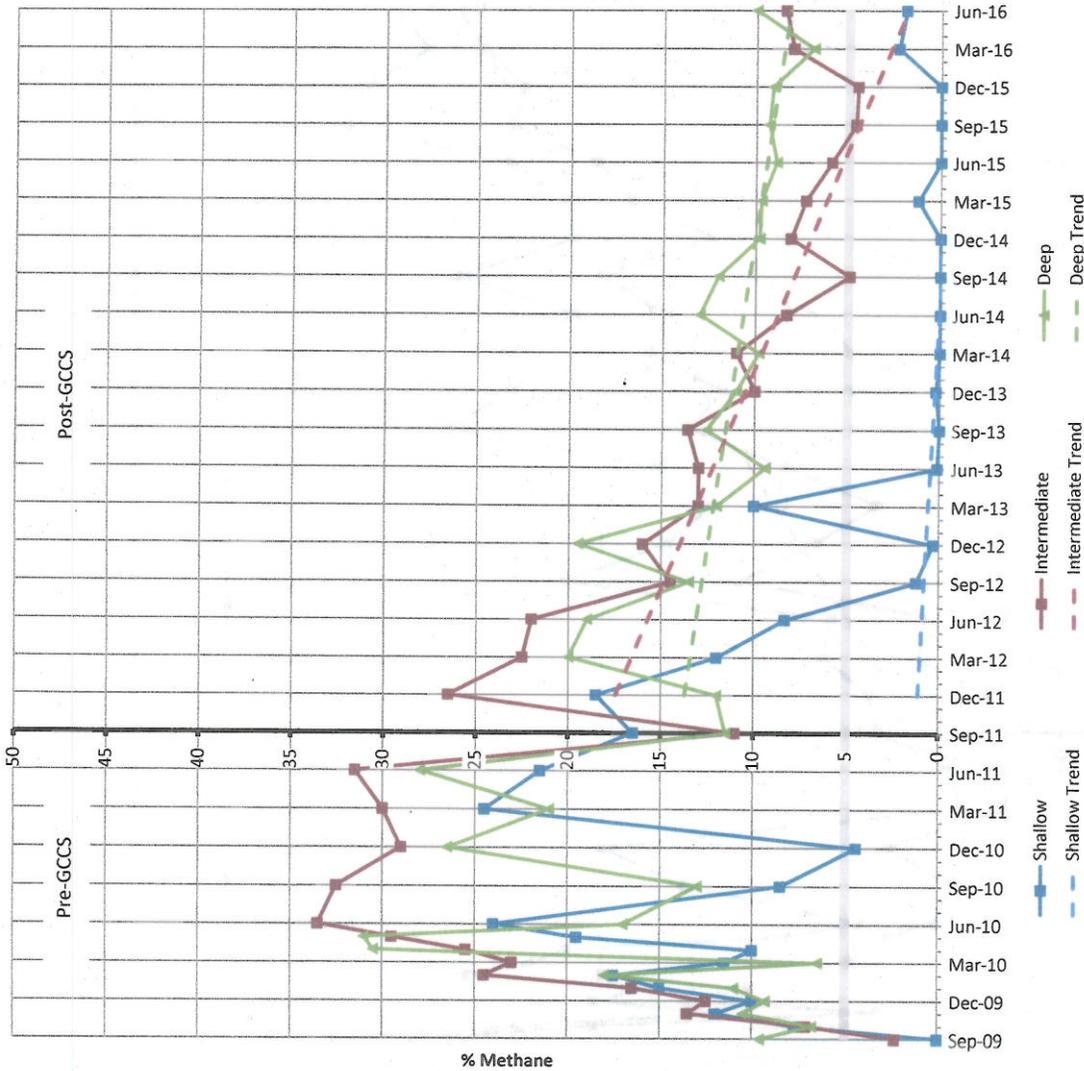
Analysis of the data, which is presented on the accompanying pages, revealed:

- **MP-4:** Statistically significant decreasing trends continue to be detected in the intermediate and deep monitoring zones of well MP-4. The shallow monitoring zone was not analyzed as this zone has been in compliance with the 5% methane concentration limit since June 2013. The Sen's Slope Estimation for the intermediate and deep monitoring zones returned median changes in percent methane concentration of -0.87 and -0.31 per monitoring period, respectively. These results represent a slight decrease in magnitude of the trend in both monitoring zones.
- **MP-11:** Statistically significant decreasing trends continue to be detected in the intermediate and deep monitoring zones of well MP-11. The shallow monitoring zone was not analyzed as this zone was in compliance with the 5% methane concentration limit during the June 2016 monitoring event. The Sen's Slope Estimation revealed median slopes of -1.33 and -1.55% methane per monitoring period, respectively. These results represent a slight decrease in magnitude for the intermediate monitoring zone and a slight increase in magnitude for the deep monitoring zone.

Date	Methane Concentrations (% vol)		
	Shallow	Intermediate	Deep
Sep-09	0.0	2.3	9.6
Oct-09	7.7	7.1	6.8
Nov-09	12.0	13.5	10.5
Dec-09	10.0	12.5	9.3
Jan-10	15.0	16.5	11.0
Feb-10	17.5	24.5	18.0
Mar-10	11.5	23.0	6.5
Apr-10	10.0	25.5	30.5
May-10	19.5	29.5	31.0
Jun-10	24.0	33.5	17.0
Sep-10	8.5	32.5	13.0
Dec-10	4.4	29.0	26.5
Mar-11	24.5	30.0	21.0
Jun-11	21.5	31.5	28.0
Sep-11	16.5	11.0	11.5
Dec-11	18.5	26.5	12.0
Mar-12	12.0	22.5	20.0
Jun-12	8.3	22.0	19.0
Sep-12	1.2	14.5	13.5
Dec-12	0.3	16.0	19.5
Mar-13	10.0	13.0	12.0
Jun-13	0.1	13.0	9.4
Sep-13	0.0	13.6	12.6
Dec-13	0.2	10.0	11.0
Mar-14	0.0	11.0	9.8
Jun-14	0.0	8.3	13.0
Sep-14	0.0	4.9	12.0
Dec-14	0.0	8.1	9.8
Mar-15	1.2	7.3	9.7
Jun-15	0.0	5.9	8.9
Sep-15	0.0	4.6	9.3
Dec-15	0.0	4.5	9.1
Mar-16	2.3	8.0	6.9
Jun-16	1.9	8.4	10.0

Pre-GCCS

Post-GCCS



Trends shown as line through median post-gccs methane concentration with slope as indicated by Sen's Slope value

1. Mann-Kendall Trend Analysis, 95% confidence

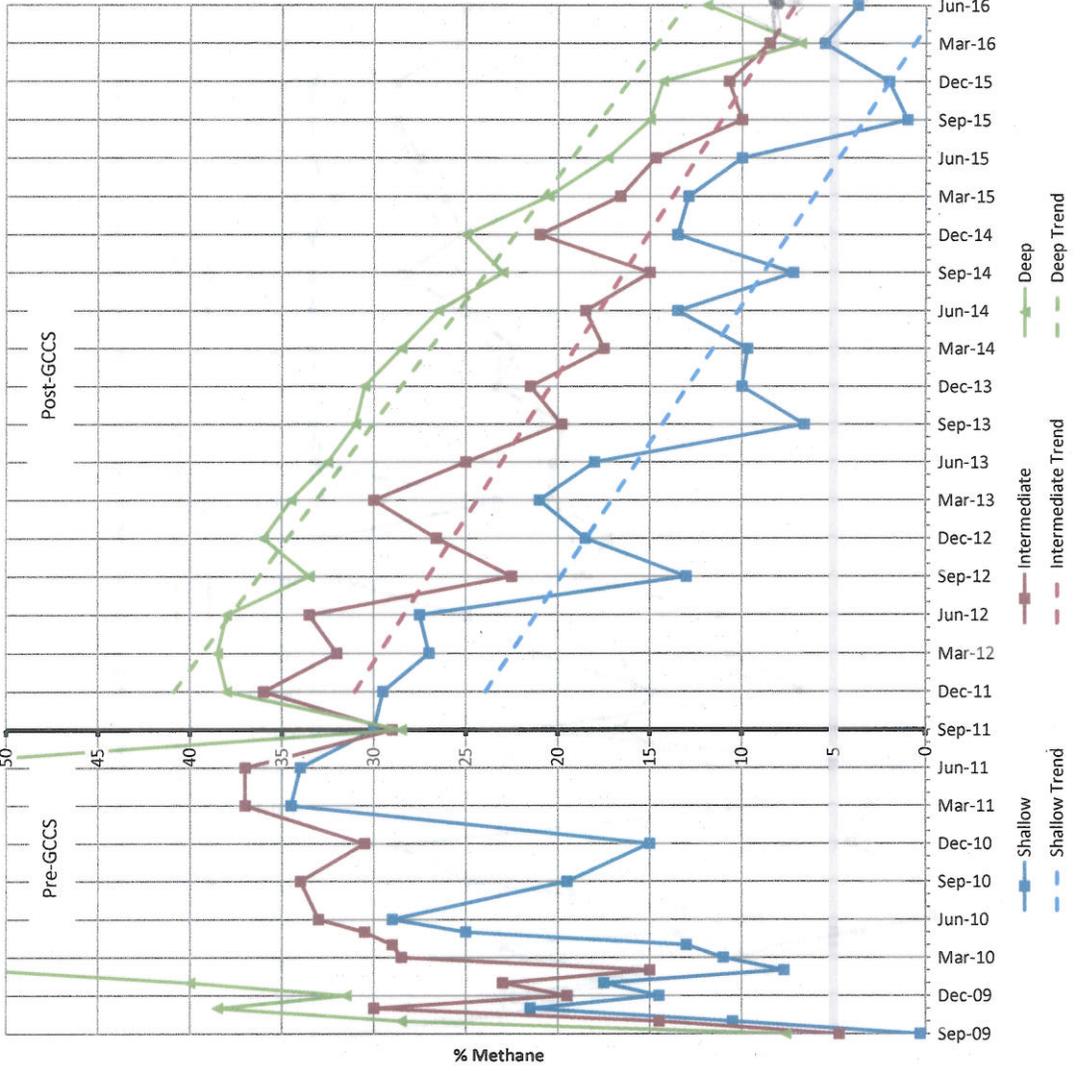
2. Sen's Slope, expressed as methane concentration change per quarter

PERIMETER GAS MONITORING DATA: WELL MP-4

Date	Methane Concentrations (% vol)		
	Shallow	Intermediate	Deep
Sep-09	0.3	4.7	7.6
Oct-09	10.5	14.5	28.5
Nov-09	21.5	30.0	38.5
Dec-09	14.5	19.5	31.5
Jan-10	17.5	23.0	40.0
Feb-10	7.7	15.0	51.0
Mar-10	11.0	28.5	51.0
Apr-10	13.0	29.0	55.0
May-10	25.0	30.5	53.0
Jun-10	29.0	33.0	56.0
Sep-10	19.5	34.0	54.0
Dec-10	15.0	30.5	51.0
Mar-11	34.5	37.0	59.0
Jun-11	34.0	37.0	58.0
Sep-11	30.0	29.0	28.5
Dec-11	29.5	36.0	38.0
Mar-12	27.0	32.0	38.5
Jun-12	27.5	33.5	38.0
Sep-12	13.0	22.5	33.5
Dec-12	18.5	26.6	36.0
Mar-13	21.0	30.0	34.5
Jun-13	18.0	25.0	32.5
Sep-13	6.6	19.8	31.0
Dec-13	10.0	21.5	30.5
Mar-14	9.7	17.5	28.5
Jun-14	13.5	18.5	26.5
Sep-14	7.2	15.0	23.0
Dec-14	13.5	21.0	25.0
Mar-15	12.9	16.6	20.5
Jun-15	10.0	14.7	17.3
Sep-15	1.0	10.0	15.0
Dec-15	2.0	10.7	14.3
Mar-16	5.5	8.5	6.8
Jun-16	3.7	8.4	11.9

Pre-GCCS

Post-GCCS



Trends shown as line through median post-gccs methane concentration with slope as indicated by Sen's Slope value

1. Mann-Kendall Trend Analysis, 95% confidence
2. Sen's Slope, expressed as methane concentration change per quarter

PERIMETER GAS MONITORING DATA: WELL MP-11

In Compliance

Decreasing Trend<sup>1</sup>

2016 Slope of Trend<sup>2</sup>

Yes Yes -1.33 -1.55