Location	Parameter	Units	A DAME TO BE
1.22	States and states		11-Sep-13
E10	CH₄	ppm	160
	H₂S	ppm	0
	0 ₂	% (v/v)	20.9
E10A	CH₄	ppm	210
	H ₂ S	ppm	0
	O2	% (v/v)	20.9
E11	CH₄	ppm	280
	H ₂ S	ppm	0
	Oz	% (v/v)	20.9
E12	CH₄	ppm	1200
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
E13	CH4	ррт	310
	H ₂ S	ppm	0
	0 ₂	% (v/v)	20.9
E14	CH ₄	ppm	NM
	H ₂ S	-	NM
	0 ₂	ppm	NM
544		% (v/v)	
E14	CH₄	ppm	NM
South Left	H₂S	ppm	NM
	O ₂	% (v/v)	NM
E14	CH₄	ppm	NM
South Right	H₂S	ppm	NM
	O ₂	% (v/v)	NM
E15	CH₄	ppm	310
	H₂S	ppm	0
	O ₂	% (v/v)	20.9
E15	CH₄	ppm	850
North	H ₂ S	ppm	0
	02	% (v/v)	20.9
E16	CH₄	ppm	310
	H ₂ S	ppm	0
	0 ₂		20.9
E16 North	CH ₄	% (v/v)	270
	H ₂ S	ppm ppm	0
	0 ₂	% (v/v)	20.9
17	CH	ppm	450
	H ₂ S	ppm	077
	O ₂	% (v/v)	20.9
18	CH₄	ppm	210
	H₂S	ppm	0
	O ₂	% (v/v)	20,9
19	CH4	ppm	310
	H ₂ S	ppm	0
	O ₂	% (v/v)	20,9
20	CH4	ppm	100
eft	H ₂ S	ppm	0
	02	% (V/V)	20.9
20		pom	160
ight	H ₂ S O ₂	ppni	20,9
21		% (V/V)	100
21 eft		pom .	100
air	the second se	20m % (v/v)	20.9
21			100
z i ight		ppm ppm	0
0.1		% (v/v)	20.9
22	- Constant and a second s	ppm	NM
əft	H ₂ S	ppm	NM
	the second se	% (v/v)	NM
22		ppm	NM
ght		ppm	NM
		% (v/v)	NM
23		opm	30
ft	H ₂ S	opm	0
		% (v/v)	20.9
23	the second se	nqq	30
ght		opm	0
	02	% (v/v)	20.9

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Runaway Bay Former Landfill: Landfill Gas Monitoring for Runaway Bay Sport and Leadership Excellence Centre TABLE 3: Sub -Surface Structure Emissions

Runaway Bay SSC gas results, Ambient- Structures

25/09/2013

Runaway Bay Former Landfill: Landfill Gas Monitoring for Runaway Bay Sport and Leadership Excellence Cen	tre
TABLE 3: Sub -Surface Structure Emissions	

Location	Parameter	Units	11-Sep-13
E24	CH₄	ppm	1650
Left	H ₂ S	ppm	0
3260 IV.	O ₂	% (v/v)	15.8
E24	CH₄	ppm	1400
Right	H ₂ S	ppm	0
	O ₂	% (v/v)	16.5
E25	CH₄	ppm	3900
	H₂S	ppm	0
	O ₂	% (v/v)	20.1
E26	CH₄	ppm	310
	H₂S	ppm	0
	O ₂	% (v/v)	20.9
E27	CH₄	ppm	210
	H ₂ S	ррт	0
	O ₂	% (v/v)	20,9
E28	CH₄	ppm	NM
	H ₂ S	ppm	NM
	02	% (v/v)	NM
E29	CH₄	ppm	210
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
E30	CH₄	ppm	210
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
E31	CH₄	ppm	6500
	H₂S	ppm	0
	Oz	% (v/v)	20.7
West Car park	CH₄	ppm	200
NE Comer	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
West Car park	CH₄	ppm	200
Left NE Corner	H₂S	ppm	0
	02	% (v/v)	20.9
Nest Car park	CH₄	ppm	850
Right NW Corner	H ₂ S	ppm	0
	02	% (v/v)	20.9
Nest Car park	CH₄	ppm	270
W Corner	H₂S	ppm	0
	O ₂	% (v/v)	20.9
West Car park	CH₄	ppm	270
W Edge	H₂S	ppm	0
	02	% (v/v)	20.9
Central Light Pole	CH₄	ppm	200
	H ₂ S	ppm	0
	02	% (v/v)	20,9
coreboard light	CH₄	ppm	270
Pole	H ₂ S	ppm	0
	O ₂	% (v/v)	20,0
g pip adj Lodge 9	CH₄	ppm	NM
	H₂S	ppm	NM 4
	O ₂	% (v/v)	NM /
1	CH4	ppm	NM
	H₂S	ppm	NM
		% (v/v)	NM
2		ppin	NM
	H ₂ S	ppm	/ NM
	O ₂	% (v/v)	INM
3	CH₄	ppm	210
	H _z S	ppm	0
	02	% (v/v)	20.9
4	CH₄	ppm	NM
	H ₂ S	ppm	NM
	O ₂	% (v/v)	NM
5		ppm	100
		ppm	0
		% (v/v)	20.9
3		ppm	100
		ppm	0
		% (v/v)	20.9
7		ppm	100
		ppm	0

Runaway Bay SSC gas results, Ambient- Structures

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25/09/2013

Location	Parameter	Units	11-Sep-13
S8	CH₄	mqq	100
00	H ₂ S	ppm	0
	0 ₂	% (v/v)	20.9
S9	CH₄	ppm	100
	H _z S	ppm	0
	O ₂	% (v/v)	20.9
S10	CH₄	ppm	120
	H ₂ S	ppm	0
	O ₂	% (v/v)	20,9
S11	CH₄	ppm	60
	H₂S	ppm	0
	02	% (v/v)	20.9
S12	CH₄	ppm	210
	H₂S	ppm	0
	O ₂	% (v/v)	20,9
S12A	CH₄	ppm	210
	H₂S	ppm	0
	0 ₂	% (v/v)	20.9
S12B	CH₄	ppm	210
	H₂S	ppm	0
	O ₂	% (v/v)	20,9
512C	CH₄	ppm	210
	H ₂ S	ppm	0
	O ₂	% (v/v)	20,9
\$12D	CH₄	ppm	210
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
313	CH₄	ppm	200
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
614	CH4	ppm	100
	H ₂ S	ppm	0
	O ₂	% (v/v)	20,9
315	CH₄	ppm	100
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
\$16	CH4	ppm	160
	H ₂ S	ppm	0
	O2	% (v/v)	20.9
17	CH₄	ppm	210
	H ₂ S	ppm	0
	O ₂	% (v/v)	20,9
18	CH₄	ppm	210
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
19	CH₄	ppm	200
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
20	CH₄	ppm	2:10
	H ₂ S	ppm	0
	0 ₂	% (v/v)	20,9
20A	CH4	ppm	210
	H ₂ S	ppm	0
	and the second s	% (v/v)	20.9
21	CH4	rpri	210
	H ₂ S	pom	0
	O2	% (v/v)	20,9
22	CH4	ppm	130
419.	H ₂ S	ppm	0
	O ₂	% (v/v)	20,9
23		ррт	200
		ppm	0
		% (v/v)	20.9
24		ppm	200
		ppm	0
		% (v/v)	20,9
25		ppm	200
-		ppm	0
		% (v/v)	20.9
6			200
		ppm ppm	0

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Runaway Bay Former Landfill: Landfill Gas Monitoring for Runaway Bay Sport and Leadership Excellence Centre TABLE 3: Sub -Surface Structure Emissions

Runaway Bay SSC gas results, Ambient- Structures

25/09/2013

Runaway Bay Former Landfill: Landfill Gas Monitoring for Runaway Bay Sport and Leadership Excellence C	entre
TABLE 3: Sub -Surface Structure Emissions	

Location	Parameter	Units	
March 1920 S			11-Sep-13
L7	CH ₄	ppm	210
	H₂S O₂	ppm % (v/v)	0 20.9
L8	CH ₄		20.9
LO	H ₂ S	ppm ppm	0
	O ₂	% (v/v)	20.9
L9	CH ₄	ppm	210
LU	H ₂ S	ppm	0
	0 ₂	% (v/v)	20.9
L10	CH4	ppm	210
	H₂S	ppm	0
	O ₂	% (v/v)	20.9
L11	CH₄	ppm	210
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
L12	CH₄	ppm	210
	H₂S	ppm	0
	02	% (v/v)	20.9
L13	CH₄	ppm	210
	H₂S	ppm	0
	02	% (v/v)	20.9
_14	CH ₄	ppm	210
	H ₂ S O ₂	ppm % (v/v)	0
	O₂ CH₄	% (v/v)	20,9
Nestern Carpark Central Stairs	H ₂ S	ррт ррт	0
	O2	% (v/v)	20.9
	CH ₄	ppm	NM
Storage Containers	11.0	ppm	NM
western carpark	0 ₂	% (v/v)	NM
W-Beach	CH₄	ррт	200
Volleyball	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
	CH₄	ppm	NM
Starage Containers	H ₂ S	ppm	NM
behind lodges	02	% (v/v)	NM
	CH₄	ppm	NM
Storage shed	H ₂ S	ppm	NM
outhern end track		% (v/v)	NM
W1	CH₄	ppm	240
	H ₂ S	ppm	0
110	O ₂	% (v/v)	20.9
W2	CH₄	ppm	240
	H ₂ S O ₂	ppm % (u(u)	0 20.9
14/3		% (v/v)	
W3	CH₄ H₂S	ppm	200
	O ₂	ppm % (v/v)	20.9
W4	CH₄	ppm	200
	H ₂ S	ppm	0
	O ₂	% (v/v)	20.9
N5	CH₄	ppm	200
	H ₂ S	ppm	0
		% (v/v)	20.9
N6		rpm	200
		psin	770
		% (1/1)	20.9
N7	A	ppin	240
	H₂S	ppm	0
		% (v/v)	20,9
N/8		ppm	240
		ppm	0
	O2	% (v/v)	20.9



 Notes:

 Methane Trigger Level = 1.25 % v/v or 12,500 ppm (Environmental Guidelines: Solid Waste Landfills, NSW EPA, 1996)

 Shading indicates exceedance of trigger level.

 NM = location not monitored (restricted acess or not located)

 E = Electrical pit

 S= Stormwater drain

 Sw = Sewer manhole

 L - Light pole

Runaway Bay SSC gas results, Ambient- Structures

25/09/2013

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Attachment 3: Calibration Certificates and Specification Sheet for Landfill Gas Meters

RENTALS

This	Gas Meter has been perform	nance checl	ked / calibra	ited* as follov	/S:			
Gas	Channel	Cal Value			name.	Read	ting	Pass?
CH4	Check Only	0 % LEL		0.0		% LEL	Ø,	
	A AND A A		50 % LEL		50.		% LEi.	Ľ,
02 0	heck Only		0.0 % vol		Ð	C	> % vol	
		18.0 % vol		19.00		D % vol	I	
coc	heck Only	100 ppm			90		ppm	Ø
125 (Check Only	25.0 ppm			25.1		1 100	10
	Electrical Safety Tag attach	ned (AS/NZ	S 3760)	Tag No: N	IA	\sum	Valid to:	
7	Alkaline Batteries	Ø	Inline Fill	ter Check		I	Cleaned	
5	Low alarm set at 10% LEL (5,000ppm)	High alarm set at 50 (25,000ppm)			6 LEL	Ø	Battery Status:	6.1
' Calib	ration gas traceability informatic	on is availabl	e upon reque	ist.		12		
Date:	5191	13	Cł	necked by:		ST	stir	
Signe					\wedge	-	\bigtriangledown	

Equipment Report - Eagle Multi-Gas Monitor

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
\Box'_{\prime}		Eagle Multi Gas detector Ops check,
۲,		Liquid Inhibiting Probe with In-Line Filter
Ľ,		Carry Strap
ď,		Spare Aikaline Batteries Qty
ø		Operating Manual
$\mathbf{d}_{\mathbf{z}}$		Quick Guide
ď,		Carry Case
I		Battery Status 6. 2V
	D -	Check to confirm electrical safety (tag must be valid)

Processors Signature/ Initials

TFS Quote Reference		Condition on return
Customer Ref		
Equipment ID	EAGBB	
Equipment serial no.	E2A813	
Return Date & Time	1 1	

Phone: (Free Call) 1	300 735 295	Environmental Assessment Technolog	les	Fax: (Free	a Call) 1800 675 123
Melbourne Branch 5 Caribbeen Drive, Scoresby 3179 Emeli: Rental's EnviroVIC@thermofisher.com	Sydney Branch Level 1, 4 Talevera Road, North Ryde 2113 Email: RentaisErviroNSW@thermofishe	Adelaide Branch 27 Boulah Road, Norwood, South Australia 5087 Frait: Rentals:EnviroSAgethemobelies.com	Brisbane Brai Unit 2/5 Roas Newsland 40 Email: Rental	nch St	Perth Branch 121 Beringstra Ave Malege WA 6090 Emsil: RentalsEnviroWA@thermofisher.com
Issue 4		Oct 10			G0538

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Thermo Fisher s c 1 E N T I F I C

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RENTALS

Equipment Report - GEOTECHNICAL INSTRUMENTS GA2000

This Gas Meter has been performance checked / calibrated* as follows:

Calibration		Cal Value		Reading	Cal Value		Reading	Pass?	
CH4			60% vol		60%	0.0	0% vol	00%	Ø
CH4 -check only			2.5%CH4		2.5%			6	۲Ż
H2s			25ppm		D ppm	0 ppm		ppm	Ø
02		-	20.9% vol	0	ED-07 %	0.0	oo% vol	59.00%	
00			100ppm	d) co ppm	The second se			Ø
002	The second second second	****	40% vol		40%	ppm Oppm			
Operations Check	in the second se					5			
1	Tag attached (AS/	NZS 3	3760)	Ta	ag No:	5	1	valid to:	
Cleaned/checked		RI	In line Fill	1		17		Status @1 0%	
Calibration gas traceal		<u> </u>							
inimum \$20 cleaning / led for at the full repla Sent Returned	cement cost. Item Sampling Prol 1m of Samplin Carry Strap Battery Charg Operating Qui Manual behind Spare Inlina F Carry case Data Cabie an	be with ng Tub er and ick Gu d <u>icara</u> ilters (h in-Line F AC/DC P ida <u>behinc</u> son lid of (Qty (Q).	iiter owen l foar case	Supply n on l'a of case "	dama.	ged items	 Items not returned 	i will be
	Instrument Ba Well cap Quid Check to confi	k conn	ect Stting	~	ag must be valid)				
Processors Signature/ Initials		25							
TFS Quote Reference		Ŷ	Cond	lition	on return			······	
Customer Ref						-			
Equipment ID	GA2000BE	-							
Equipment serial no.	12665/10							مر میں	
Return Date	1 1							-	
Return Time									

"We do more than give you great equipment ... We give you great solutions!"

Phone: (Free Call) 1	300 735 295	Environmental Assessment Technologies Fax: (Free		Call) 1800 675 123	
Melbourne Branch 5 Carlobean Onive, Scoreby 3179 Email: RantalsEnviroVIC@thermolisher.com	Sydney Branch Level 1, 4 Tolavara Road, North Ryde 2113 Email: RestalsEnviroNDW@themoofi	Adeleride Branch 27 Bestah Rosel, Norwood, Bouth Australia 5007 Emait: RentalsEndroSA@memolisher.com	Bristene Br Unit 2/5 Ro Newsteed 4 Emelt Rent	45 ST.	Perth Branch 121 Berlosma Ave Melege WA 0090 Email: RantalsEnvirdWA@thermolisher.com
Issue 5		Oct 10			G0540

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Memorandum



23 May 2013

То	Runaway Bay Sport and Leadership Excellence Centre					
Copy to	Fbees1@eq.edu.au		(73)			
From	Belinda Oberia	Tei	(07) 3316 3954			
Subject	Landfill Gas Monitoring Round 22 April 2013	Job no.	41/26317			
		A	Doc No: 41/26317/448440			

1 Introduction

GHD was commissioned by The Runaway Bay Sport and Leadership Excellence Centre (RBSLEC) to undertake a round of landfill gas monitoring at the former landfill site, new operating as the RBSLEC, located at the corner of Morala Avenue and Sports Drive, RUNAWAY BAY, Queensland (hereafter referred to as the site).

This round of monitoring was conducted on 22 April 2013 and incorporated structure locations nominated within the Landfill Gas Monitoring Map (Brisbane City Council, 2001). A copy of this site map is provided as Attachment 1.

2 Methodology

Landfill gas monitoring was undertaken on 22 April 2013 using a calibrated portable field measurement unit to obtain instantaneous measurements of the methane, oxygen, carbon monoxide and hydrogen sulphide concentrations. For this monitoring round an Eagle landfill gas meter was utilised. The specifications and calibration certificates for the monitoring equipment used during the 22 April 2013 monitoring round are included in Attachment 3. This meter was selected based on the results of the previous June 2010 and December 2010 monitoring rounds.

The monitoring undertaken during this round included determining concentrations of methane within:

- 4 Soil Atmosphere Gas monitoring well's located along the eastern boundary of the site (Morala Avenue); and
- 112 structures locations (including subsurface electrical pits, light poles, stormwater pits and some site buildings).

These locations were spread across the site and were identified from the site map provided as Attachment 1. Surrace emission monitoring was not conducted under this scope of work.

Measurements were collected by placing a length of tubing (connected to the meter) within the structure and noting the range of measurements over a 1 minute period (or until a peak reading was achieved). In line with previous monitoring rounds conducted at the site, a trigger level of 12,500 ppm methane (25% of the LEL of methane) was adopted for this monitoring round. Results tables for this round are provided in Attachment 4.

41/26317/448440

GHD 145 Ann Street Brisbane QLD 4000 GPO Box 668 Brisbane QLD 4001 Australía T 61 7 3316 3000 F 61 7 3316 3333 E bhemail@ghd.com W www.ghd.com



3 Results

Results tables for this round are provided in Attachment 4. Table 1 provides details on general observations made on the day and Tables 2 and Table 3) outline the results for the monitored gas wells and structures.

On the day of monitoring, the weather was fine with 2/8 cloud cover and a light NW breeze. The weather in the preceding week had been mostly fine with one day of rainfall (32 mm). At the time of monitoring, the ground surface was dry. Atmospheric pressure recorded at nearby Bureau of Meteorology Weather station number 40764 (Gold Coast Seaway) was 1014.3 hPa and falling during the course of the day. The recorded temperature was 22.1°C.

Concentrations of oxygen, carbon monoxide and hydrogen sulphide at all locations monitored were as follows:

- Oxygen: 20.9% v/v;
- Carbon monoxide: 0 ppm; and
- Hydrogen sulphide: 0 ppm.
- These results meet the adopted trigger guide/ines of Oxygen (20.9% v/v), Carbon monoxide (0 ppm); and Hydrogen sulphide (0 ppm).

Methane concentrations detected at all monitored locations on 22 April 2013 were less than the relevant adopted trigger level (12,500 ppm methane) during this round of monitoring, with the exception of

Structure E3 at > 50,000 ppm methane.

E3 is an electrical service pit located to the north-west of the beach volley ball court and is in close vicinity of other service pits and buildings that are regularly in use

The methane concentration within structure location E3 was greater than the adopted trigger level (12,500 ppm methane, ie.1.25% v/v methane) and the lower explosive limit of methane (50,000 ppm i.e. 5% v/v). The actual methane concentration in E3 was unable to be accurately determined as the detected concentration was greater than the Eagle gas meter's detection limit of 50,000 ppm. As this methane concentration represented an explosion risk if any potential ignition sources were to be introduced to the area, a second round of monitoring was conducted on the pit after one hour to confirm this methane concentration. Details of these results are provided in Table 4 attached. Methane concentrations greater than 50,000 ppm were detected at this location during this second round of monitoring. These results were immediately reported to you (Frank Beeson) verbally and followed up by an email on 23 April 2013.

GHD further notes that although not in excess of the nominated Trigger Level, a number of other service pit locations identified methane concentrations > 1000 ppm indicating that methane is entering and accumulating within these structures. This included:

- E25 (an electrical pit located in the northern end of the west car park) at 9,500 ppm methane;
- E12 (an electrical pit located in the northern end of the west car park) at 1,050 ppm methane; and
- Location West Carpark, Right NW corner (an electrical pit located in the west car park) at 1,150
 ppm methane.

Nominated monitoring locations that were unable to be accessed on 22 April 2013 included four soil gas monitoring wells along Morala Avenue which were unable to be located (due to being grassed over), Electrical pits E20 and 21 along the boundary of the carpark on the eastern site boundary (blocked



access holes unable to be cleared), electrical pits E14, E27, E28 and stormwater pit S21 within the west car park (unable to be located, covered in soil, debris and shipping containers), and stormwater pits S1, S2 and S4 behind the accommodation blocks (unable to be located or completely covered in debris and leaves).

Additional locations not previously on the scope of works, but monitored this round include a storage shed at the southern end of the track and shipping containers within the western carpark (unable to be opened so reading taken from points (holes) where the meter tube could be inserted).

Follow up discussions with Frank Beeson on 22 April 2013 regarding the elevated methane concentrations within electrical pit E3 indicated the following:

- A sink hole of up to 300mm depth had developed between E2 and E3 to the west of the beach volley ball court and had been backfilled with gravel within the last three years (since GHD's previous landfill gas monitoring round at that location during June 2010);
- E3 was suspected of being the electrical pit access point to the planned accommodation blocks identified as 11, 12 and 13 (however these were not built with the other accommodation blocks numbered 1-9 in 2001). No "as built" plans for trenches and outfalls associated with the electrical connections are available; and
- The E3 pit (and adjacent communications pit) was constructed on a poly-plastic base with a concrete cover. These were thought to be constructed in accordance with the Site Management Plan (SMP) in a manner which maintains an intact clay capping layer.

4 Conclusions

Based on the results of the 22 April monitoring round, GHD made the following conclusions:

- The landfill is still generating landfill gas including methane;
- Methane is entering and accumulating within electrical pits at the site (particularly E3, located to the north-west of the beach volley ball court and is in close vicinity of other service pits and buildings that are regularly in use, and also several electrical pits within the west car park);
- Methane levels less than the adopted trigger level (12,500 ppm methane) were detected within all other structure locations included in this round of monitoring;
- Monitoring of site structures was not exhaustive and was limited to those locations detailed within Section 2 and included within the attached results tables;
- Need for immediate action and further investigation of location E3, and
- Certain locations could not be accessed for monitoring (including the four soil gas monitoring wells located along Morata Avenue).

5 Interim Recommendations

Based upon the conclusions contained in Section 2.3 above, GHD recommended the following (via email on 23 April 2013):

- 1. Place barricades around the electrical pit, include signage for no smoking and authorised entry only;
- 2. If the electrical connections are "alive" within this electrical pit to consider isolating the connection to the pit until further gas testing is conducted;



- RBSLEC to advise the site's owner of the situation and for the site owner to notify The Department of Environment, Heritage and Protection, the local Council and the utility pit owner (if not Gold Coast City Council) of the situation and works to be completed to further investigate;
- 4. Re-monitoring of the utility pit is recommended immediately (ideally within 48 hours) using a portable GA 2000 gas meter. This meter is capable of measuring higher levels of methane than the Eagle detection meter used on 22/4/13. Following this second round of monitoring, the pit should be vented (if required) to allow accumulated gas to dissipate. Appropriate considerations should be made to prevent water ingress into the pit. If re-monitoring cannot be completed within 48 hours, then the utility pit lid should be carefully removed (so as to avoid any potential sparking) or the pit should be purged with air prior to removal of the lid (if possible) so as to dilute any accumulated gas to acceptable concentrations (i.e <12,500 ppm), until such a time as the second monitoring round can occur. A maximum of 24 hours prior to GHD completing the second monitoring round, GHD recommend that the lid be replaced on the utility pit to allow gas to accumulate within the utility pit for a limited period of time prior to repeat confirmation gas monitoring occurring. Following the initial monitoring, the pit lid should be removed / the pit purged to allow the accumulated gas (if any) to dissipate. Once this is done, the rate of recovery of the gas should be monitored regularly (possibly hourly). It is also recommended that GHD conduct landfill gas monitoring within the nearby site buildings (and also recheck the other nearby underground service pits) to confirm landfill gas is not accumulating within these structures. The connection point for electricity into these buildings should also be monitored for landfill gas if it feeds from this or nearby service pits.
- 5. GHD can assist the Sports Centre to identify / consider other potential sources of the detected gas (diesel, petrol, decaying vegetation, the nearby sewer pit etc.) based on readily available information and on-site observations. It would be beneficial if the Sports Centre could provide to GHD any information that is available regarding the installation and construction of this electrical pit and nearby underground services(including if the pits were designed to prevent landfill gas intrusion, if the pit and connections trenches are enclosed or installed within gravel/sand only, what the pit connects to, and if there has been any maintenance activities on that structure since the last GHD gas monitoring round in December 2010). If no plans or information is available, GHD can attempt a search for Dial Before you Dig records.
- 6. For GHD to review the information to be gathered from completing items 3 and 5 and make further recommendations (if required) for management of the methane accumulating within the E3 electrical pit.

Memo Prepared By:

Kollilla

Belinda Oberia

Environmental Scientist

Approved for Issue

Adam Major Senior Environmental Engineer (07) 3316 3587

GHD Pty Ltd

(07) 3316 3954

GHD Pty Ltd

Memorandum



27 May 2013

То	Runaway Bay Sport and Leadership Excellence C	Centre	
Copy to	Fbees1@eq.edu.au		(73)
From	Belinda Oberia	Tel	(07) 3316 3954
Subject	Landfill Gas Monitoring Round 30 April 2013	Job no.	41/26317,
		A	Doc No: 41/26317/448548

1 Introduction

Based on the results of the 22 April monitoring round, GHD was commissioned by The Runaway Bay Sport and Leadership Excellence Centre (RBSLEC) to undertake a follow up round of landfill gas monitoring at the former landfill site, now operating as the RBSLEC.

This round of monitoring was conducted on 30 April 2013 and included electrical pit E3 and the buildings and underground service pits nearby to E3. A copy of this site map is provided as Attachment 1.

2 Methodology

A second landfill gas monitoring round of electrical pit E3 and the buildings and underground service pits nearby to E3 was undertaken by GFID on 30 April 2013 using two calibrated portable field measurement units (an Eagle Gas meter and a GA2000 landfill gas meter). The specifications and calibration certificates for the monitoring equipment used during the 30 April 2013 monitoring round are included as Attachment 2.

The monitoring undertaken during this round included

- An initial gas reading was taken within and immediately above the E3 pit at 10 am representing 24 hours potential accumulation. The electrical pit was then opened and vented until the methane level was consistent with the 10 am ambient atmospheric reading. This took less than 10 minutes. The pit cover was then replaced and hourly potential accumulation readings were recorded within E3 (between 11 am and 3 pm).
- One round of gas monitoring was conducted within the nine, two storey accommodation blocks and two, one storey grounds buildings in the vicinity. Rooms on both lower and upper levels and service connections into and within the buildings were targeted. Landfill gas levels were also checked within the underground services pit adjacent to E3 and the accommodation blocks intermittently between 11 am and 3 pm. A sketch of additional service pits observed (and monitored) on April 22 and 30 are included as Attachment 3.

RBSLEC advised that they were not aware of any updated service pit/ site construction drawings being available for the review (beyond Figure 1 attached). Therefore GHD completed a Dial before You Dig (DBYD) search request which confirmed the presence of Energex electricity connections along the northern and eastern boundaries of the site, and the presence of Telstra cables along the eastern boundary of the site. Details of on-site connections could not be assessed beyond site observation (based on the visual identification of underground service pits and connections boxes located on the walls of the accommodation blocks). A copy of these plans is provided in Attachment 5.

41/26317/448548

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Memorandum



27 May 2013

То	Runaway Bay Sport and Leadership Excellence Centre		
Copy to	Fbees1@eq.edu.au		(73)
From	Belinda Oberia	Tel	(07) 3316 3954
Subject	Landfill Gas Monitoring Round 9 May 2013	Job no.	41/26317
			Doc No: 41/26317/448567

1 Introduction

Based on the results of the 22 April and 30 April monitoring rounds, GHD was commissioned by The Runaway Bay Sport and Leadership Excellence Centre (RBSLEC) to undertake a second follow up round of landfill gas monitoring at the former landfill site, new operating as the RBSLEC.

This round of monitoring was conducted on 9 May 2013 and included electrical pit E3 and the underground service pits in the immediate vicinity to E3. A copy of this site map is provided as Attachment 1.

2 Methodology

A follow up landfill gas monitoring round of E3 and the buildings and underground service pits nearby to E3 was undertaken by GHD on 9 May 2013 using two calibrated portable field measurement units (an Eagle Gas meter and a GA2000 (andfill gas meter). The specifications and calibration certificates for the monitoring equipment used during the 9 May 2013 monitoring round are included as Attachment 3.

As per the recommendations following the 30 April round, a two staged approach was adopted on 9 May 2013. Initially, landfill gas menitoring to assess one week potential gas accumulation was conducted within E3, as well as the ambient atmospheric level immediately above E3, and within other underground service pits in the immediate vicinity. Based on the low methane levels measured and discussion with RBSLEC, an additional stage of monitoring did not proceed (that proposed to repeat the conduct landfill gas monitoring within the nearby site buildings and also to repeat monitoring on other nearby underground structures.

3 Results

Results tables for this round are provided in Attachment 4. Table 1 provides details on general observations made on the day and Tables 2 and Table 3) outline the results for the monitored gas wells and structures.

On the day of monitoring, the weather was fine with 4/8 cloud cover and a light S breeze. There had been some light showers in the preceding week including the evening prior to monitoring. At the time of monitoring, the ground surface was slightly moist on the grassed surface, but quickly dried out. Atmospheric pressure recorded on nearby Bureau of Meteorology Weather station number 40764 (Gold Coast Seaway) was 1028.6 hPa and falling during the course of the day. The recorded temperature was 20.3^oC.

The barricaded exclusion zone of approximately 2 m noted on 30 April remained in place around the E3

41/26317/448567

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electrical pit. There were multiple site visitors (high school students) playing and sitting in the vicinity, including within 10m of the E3 pit.

GHD was advised that the electrical pit identified as E3 had remained closed since the last monitoring round on 30 April.

The accumulated methane concentration detected after 9 days of E3 being closed was 460 ppm. This methane level was more than 1000 ppm lower than when left by GHD on 30 April 2013. As it was unexpected for the methane concentration to decrease to a concentration (ower than detected following 2 hours accumulation (1,850 ppm) and 24 hours accumulation (1,250 ppm), it was confirmed with RBSLEC staff that the pit had not been vented since 30 April. This may be due to site specific and climatic conditions. RBSLEC staff confirmed the pit had remained closed between monitoring rounds.

The maximum methane level detected in the atmosphere immediately above and in the vicinity of E3 was 15 ppm.

The maximum methane level detected within nearby service pits (immediately adjacent to E3) was 80 ppm.

These methane concentrations are taken from the Eagle landfill gas meter result recorded. All locations monitored on 9 May had methane levels less than the detection limit of the CA2000 meter. For all locations monitored, oxygen levels (O_2) were 20.9% v/v, and carbon monoxide (CO) and hydrogen sulfide levels was not detected (0 ppm).

The methane concentrations within all structures monitored or 9 May were less than the adopted trigger level (12,500 ppm).

4 Conclusions

Based on the results of the 9 May monitoring round, GHD made the following conclusions:

- Methane is confirmed to be entering electrical pits (particularly E3). Accumulated methane concentrations appear to fluctuate with time. This may be a result of the effect of changing atmospheric pressure and the ability for some passive venting through the pit cover openings.
- Further investigation or site management is recommended to check methane accumulation within E3.

5 Recommendations

Based upon the conclusions contained in Section 4 above, GHD recommends the following:

- It is recommended that a follow up round of monitoring be conducted within the next two weeks (to check the potential methane accumulation levels after one month of leaving the cover in place). This can be in a staged approach as follows. Stage 1 Monitoring of the E3 electrical pits, the ambient level immediately above the E3 pit, and also other underground service pits in the immediate vicinity. If results of E3 are greater than 10,000 ppm then continue to Stage 2 conduct landfill gas monitoring within the nearby site buildings (and also recheck the other nearby underground service pits) to confirm landfill gas is not accumulating within these structures.
- It is also recommended that the barricades currently in place be extended to the edge of the canopy (3-5m from pit) if possible until the next monitoring event. Hot works (ie. works with any source of ignition) should be excluded from the area unless monitoring is conducted prior to and during the activity.



- 3. RBSLEC to regularly vent the E3 pit or consider installation of other passive venting systems. (GHD can provide further guidance if required).
- 4. A full round of landfill gas monitoring within 3 months (of all nominated structures across the site including accommodation blocks and maintenance sheds in the vicinity of E3) to confirm that the elevated methane levels detected within E3 are not expanding to other nearby structures, and also to confirm if an increase in methane levels is occurring within E25 (in the west carpark) that may progress to greater than the adopted trigger level (12,500 ppm).
- 5. A more detailed gas assessment should be undertaken if methane results continue to exceed adopted trigger levels or an increase in methane concentration continues. This investigation should assist to identify migration paths for methane and sensitive receptors.

Memo Prepared By:

Relli

Belinda Oberia Environmental Scientist (07) 3316 3954

GHD Pty Ltd.

Approved for Issue

Adam Major Senior Environmental Engineer (07) 3316 3587

GHD Pty Ltd

BEESON, Frank

85.2

From:	WESTON	Vivien	[vxwes0@eq.edu.au]
-------	--------	--------	--------------------

Sent: Wednesday, 5 June 2013 11:53 AM

To: aramsay@goldcoast.qld.gov.au

Cc: dmoir3@eq.edu.au; fbees1@eq.edu.au

Subject: FW: Methane level in Electrical Pit - RBSLEC

Good morning Anita,

Further to the above issue, I now advise as follows;

Further landfill gas monitoring events were undertaken on 22 April 2013, 30 April 2013 and 9 May 2013 by a suitably qualified Environmental Scientist engaged by GHD. Subsequent to those testings a report has been generated that included the following recommendations;

• Continued use of the barricades currently in place. These are to be extended to the edge of the canopy (3-5m from pit) if possible until the next monitoring event. Hot works (ie. works with any source of ignition) should be excluded from the area unless gas monitoring is conducted prior to and during the activity

• It is recommended that a follow up round of monitoring be conducted within the next two weeks (to check the potential methane accumulation levels after one month of leaving the cover in place). This can be in a staged approach as previous.

- RBSLEC to regularly vent the E3 pit or consider installation of other passive venting systems.
- A full round of landfill gas monitoring within 3 months to confirm that the elevated methane levels detected within E3 are not expanding to other nearby structures.

• A more detailed gas assessment should be undertaken if methane results continue to exceed adopted trigger levels or an increase in methane concentration continues.

• An assessment of the capping should also be considered in the areas of subsidence.

Runaway Bay Sport and Leadership excellence centre will adhere to the above recommendations and support further testing as required.

Kind regards

Vivien Weston

A/Senior Financial Accountant P:(07) 5500 9970 | F:(07) 5500 9913 | vxwes0@eq.edu.au Runaway Bay Sport & Leadership Excellence Centre Cnr Sports Drive & Morala Ave, Runaway Bay Qld Australia 4216 PO Box 294 Runaway Bay Qld 4216

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From: WESTON Vivien [mailto:vxwes0@eq.edu.au] Sent: Thursday, 2 May 2013 9:30 AM To: 'RAMSAY Anita' Cc: dmoir3@eq.edu.au

Subject: RE: Methane level in Electrical Pit - RBSLEC

Good morning Anita

An electrician attended site on Monday 29/4/13 and ascertained that the connections in the electrical pit were not Live.

GHD attended site on Tuesday 30/4/13 to re- test the pit after the covers had been removed and gas had dissipated.

GHD recommended that they return to the site in 2 weeks to re-test. No other action has been recommended at this stage.

I will keep you informed.

Regards

Vivien Weston

A/Senior Financial Accountant P:(07) 5500 9970 | F:(07) 5500 9918 |

vxwes0@eq.edu.au

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From: RAMSAY Anita [mailto:ARAMSAY@goldcoast.qld.gov.au] Sent: Monday, 29 April 2013 11:40 AM To: 'WESTON Vivien' Subject: RE: Methane level in Electrical Pit - RBSLEC

Vivien

I have advised DNRM and the Environmental Section on the below. The electricity pit would have formed part of the overall development of the site.

Please keep Council informed as testing continues.

regards

Anita Ramsay Senior Property Officer (Acquisitions, Divestment & Leasing) Property Services City of Gold Coast

T: 07 5581 6441 F: 07 5581 6445 PO Box 5042 Gold Coast Mail Centre Qld 9729 cityofgoldcoast.com.au

GOLDCOAST.

From: WESTON Vivien [mailto:vxwes0@eq.edu.au] Sent: Friday, 26 April 2013 12:50 PM To: RAMSAY Anita Cc: fbees1@eq.edu.au Subject: Methane level in Electrical Pit - RBSLEC Importance: High

Good afternoon Anita,

Please be advised that a routine pit inspection revealed a high methane level within the underground electrical pit to the north west of the beach volleyball court (identified as <u>53</u> on the site map attached). I have also attached a photo for your reference. The testing was done by GHD and their report to us recommended a course of action which included advising the site's owner of the situation and for the site owner to notify DERM, the local Council and the utility pit owner (if not GCCC) of the situation and works to be completed to further investigate, hence this email to you.

In line with their recommendation we have barricaded and signed the affected area, engaged the services of an Electrician to determine whether or not the electrical connections are live and removed the pit lid to allow the accumulated gas to dissipate. GHD are returning to our site on Monday to re-test and make a further recommendation for management of this issue if required.

Please contact Frank Beeson, our Chief Engineer on 55009824 if you require further information.

Kind regards

Vivien Weston Senior Financial Accountant P:(07) 5500 9970 | F:(07) 5500 9918 | vxwes0@eq.edu.au Runaway Bay Sport & Leadership Excellence Centre Cnr Sports Drive & Morala Ave. Runaway Bay Qld Australia 4216 PO Box 294 Runaway Bay Qld 4216

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BEESON, Frank

From: WESTON Vivien [vxwes0@eq.edu.au]

Sent: Wednesday, 5 June 2013 11:53 AM

To: aramsay@goldcoast.qld.gov.au

Cc: dmoir3@eq.edu.au; fbees1@eq.edu.au

Subject: FW: Methane level in Electrical Pit - RBSLEC

Good morning Anita,

Further to the above issue, I now advise as follows;

Further landfill gas monitoring events were undertaken on 22 April 2013, 30 April 2013 and 9 May 2013 by a suitably qualified Environmental Scientist engaged by GHD. Subsequent to those testings a report has been generated that included the following recommendations;

• Continued use of the barricades currently in place. These are to be extended to the edge of the canopy (3-5m from pit) if possible until the next monitoring event. Hot works (ie. works with any source of ignition) should be excluded from the area unless gas monitoring is conducted prior to and during the activity

• It is recommended that a follow up round of monitoring be conducted within the next two weeks (to check the potential methane accumulation levels after one month of leaving the cover in place). This can be in a staged approach as previous.

RBSLEC to regularly vent the E3 pit or consider installation of other passive venting systems.

• A full round of landfill gas monitoring within 3 months to confirm that the elevated

methane levels detected within E3 are not expanding to other nearby structures.

• A more detailed gas assessment should be undertaken if methane results continue to exceed adopted trigger levels or an increase in methane concentration continues.

• An assessment of the capping should also be considered in the areas of subsidence.

Runaway Bay Sport and Leadership excellence centre will adhere to the above recommendations and support further testing as required.

Kind regards

Vivien Weston

A/Senior Financial Accountant

P:(07) 5500 9970 | F:(07) 5500 9918 |

vxwes0@eq.edu.au

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From: WESTON Vivien [mailto:vxwes0@eq.edu.au] Sent: Thursday, 2 May 2013 9:30 AM To: 'RAMSAY Anita' Cc: dmoir3@eq.edu.au

Subject: RE: Methane level in Electrical Pit - RBSLEC

Good morning Anita

An electrician attended site on Monday 29/4/13 and ascertained that the connections in the electrical pit were not Live.

GHD attended site on Tuesday 30/4/13 to re- test the pit after the covers had been removed and gas had dissipated.

GHD recommended that they return to the site in 2 weeks to re-test. No other action has been recommended at this stage.

I will keep you informed.

Regards

Vivien Weston **A/Senior Financial Accountant** P:(07) 5500 9970 | F:(07) 5500 9918 |

vxwes0@eq.edu.au

Runaway Bay Sport & Leadership Excellence Centre

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From: RAMSAY Anita [mailto:ARAMSAY@geldceast.qld.gov.au] Sent: Monday, 29 April 2013 11:40 AM To: 'WESTON Vivien' Subject: RE: Methane level in Electrical Pit RBSLEC

Vivien

I have advised DNRM and the Environmental Section on the below. The electricity pit would have formed part of the overall development of the site.

Please keep Council informed as testing continues.

regards

Anita Ramsay Senior Property Officer (Acquisitions, Divestment & Leasing) Property Services City of Gold Coast

T: 07 5581 6441 F: 07 5581 6445 PO Box 5042 Gold Coast Mail Centre Qld 9729 cityofgoldcoast.com.au

GOLDCOAST.

From: WESTON Vivien [mailto:vxwes0@eq.edu.au] Sent: Friday, 26 April 2013 12:50 PM To: RAMSAY Anita Cc: fbees1@eq.edu.au Subject: Methane level in Electrical Pit - RBSLEC Importance: High

Good afternoon Anita,

Please be advised that a routine pit inspection revealed a high methane level within the underground electrical pit to the north west of the beach volleyball court (identified as E3 on the site map attached). I have also attached a photo for your reference. The testing was done by GHD and their report to us recommended a course of action which included advising the site's owner of the situation and for the site owner to notify DERM, the local Council and the utility pit owner (if not GCCC) of the situation and works to be completed to further investigate, hence this email to you.

In line with their recommendation we have barricaded and signed the affected area, engaged the services of an Electrician to determine whether or not the electrical connections are live and removed the pit lid to allow the accumulated gas to dissipate. GHD are returning to our site on Monday to re-test and make a further recommendation for management of this issue if required.

Please contact Frank Beeson, our Chief Engineer on 55009824 if you require further information.

Kind regards

Vivien Weston Senior Financial Accountant P:(07) 5500 9970 | F:(07) 5500 9918 | vxwes0@eq.edu.au Runaway Bay Sport & Leadership Excellence Centre Cnr Sports Drive & Morala Ave. Runaway Bay Qld Australia 4216 PO Box 294 Runaway Bay Qld 4216

Love our ocean beaches? Have your say and visit www.goldcoastcity.com.au/oceanbeachesstrategy before 3 May.

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DETE R1/application 340/5/3308 - File B: Runaway Bay Sport and Leadership Excellence Centre - Document

BEESON, Frank

 From:
 Belinda Oberia [Belinda.Oberia@ghd.com]

 Sent:
 Tuesday, 7 May 2013 10:58 AM

 To:
 fbees1@eq.edu.au

Cc: Adam Maior

CC: Adam Majo

Subject: GHD to visit May 9th for follow up monitoring.

Hi Frank,

As per our brief phone discussion this morning, I am confirming I will return to site during the morning of Thursday May 9th. During this site visit I will conduct a round of landfill gas monitoring around the E3 electrical pit as detailed in my email dated May 2nd (below). Any queries please call. Kind Regards

Belinda Oberia

Environmental Scientist

GHD

T: +61 7 3316 3954 [V: 413954] M: +61 415 996 433 [F: +61 7 3316 3333] E: belinda.oberia@ghd.com 145 Ann Street Brisbane QLD 4000 Australia | GPD Box 668 Brisbane QLD 4001 | www.ghd.com WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

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From: Belinda Oberia Sent: Thursday, 2 May 2013 4:52 PM To: fbees1@eq.edu.au Cc: Adam Major Subject: Proposed return visit next week

Hi Frank,

Based on the results of the landfill gas monitoring during my 2nd visit to the Sports Centre on Tuesday (30/4/13), it is recommended that a follow up round of monitoring be conducted <u>within the next week</u> (to check the potential methane accumulation levels after one week of leaving the cover in place). This can be in a staged approach so as to reduce your costs as much as possible. Stage 1 – Monitoring of the E3 electrical pits, the arbient level immediately above the E3 pit, and also other underground service pits in the immediate vicinity. If results of E3 are greater than 10,000 ppm then continue to Stage 2 – conduct landfill gas monitoring within the nearby site buildings (and also recheck the other nearby underground service pits) to confirm landfill gas is not accumulating within these structures.

It is also recommended that the barricades currently in place be expanded to the edge of the canopy (3-5m from pit) if possible until the next monitoring event. Hot works (ie. works with any source of ignition) should be excluded from the area unless monitoring is conducted prior to and during the activity.

These recommendation is based on the following summary of results (more details are provided at the erid of this ernail):

- Elevated methane readings seemed to dissipate when the electrical pit was vented;
- 2) Methane appears to take longer than 24 hours to build up to greater than the lower explosive limit of methane (50,000 pr/m);
- 3) Methane appears to take 1 to 2 hours to build up greater than 1000 ppm.

Variations requested for your purchase order (PO ref 38946) are as follows:

Anticipated costs (ex GST) for GHD to conduct Stage 1 monitoring is \$1,950. Stage 2 would cost an additional \$600. These costs would include an email report of the interim results for that round of monitoring. Please contact me to confirm that you would like GHD to proceed with this next monitoring round. The costs of GHD's visit on 30/4/13 will be \$2,550 (ex GST).

Please do not hesitate to contact me for any queries relating to this amaii. Kind Regards

Kind Regards

Belinda Oberia Environmental Scientist

GHD

TI +61 7 3316 3954 | V: 413954 | M: +61 415 996 433 | F: +61 7 3346 3233 | C: beiinda.oberta@ghd.com 145 Ann Street Brishane QLD 4000 Australia | GPO Box 668 Brishane QLD 4001 | <u>www.ghd.com</u> WATER | ENERGY.& RESOURCES | ENVIRONMENT | PROPERTY.& BUILLOWIS | TKANSPORTATION

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Interim results (for your record)

Gas readings for electrical pit E3 conducted on 30/4/13 were as follows:

	Initial rending - 40am . (24 hours closed l/d accumulation)	Vented reading – 10.10am	11am	12pm	3pm
Methane - CH4 (1 = eagle, 2 = GA2000}	(1) 1250 ppm, (2) below meter detection	(1) 100 ppm, (2) below meter detection	(1) 880 ppm, (2) below meter detection	(1) 1850 ppm, (2) below meter detection	(1) 1250 ppm, (2)below meterdetection
Oxygen - O2	20.9 %vo!	20.9 %vol	20.9 %vol	20.9 %vol	20.9 %vol
Carbon Monoxide - CO	0 ppm	0 ppni	0 ppm	0 ppm	0 ppm
Hydrogen Sulfide - H2S	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm
Balance (GA2000)	79.3%	79.0%	79.0%	79.0%	79.0%
Air Pressure (GA2000)	1022 hPa	1022 hPa	1022 hPa	1021 hPa	1020 hPa
BOM Wind data	SSE, 20 km/hr				SE, 22 km/hr
BOM Temp data	24.7 °C				24.8 °C
Notes	Pit had been vented by site personnel in the period between initial monitoring (22/4/13) and 12 pm 29/4/13.	Lid opened and vented, reading after 10 mins consistent with ambient readings at 10 am. Lid replaced 10.10 am	1 hour accumulated reading	2 hour accumulated reading	5 hour accumulated reading

Notes

BOM station Gold Coast Seaway (040764).

Amblent monitoring and nearby buildings were max 55 ppm CH4, nearby service pits max 180 ppm CH4 during course of the day.

• Following an initial reading at 10 am, the pit was vented and closed again then hourly readings over 5 hours were conducted (I have only included the 11 am, 12pm and 3

pm readings in this email to show range, but also have 1 pm and 2pm readings).

Two separate portable gas meters were utilised (An Eagle meter, and a GA 2000 meter)

DETE RT application 340/5/3308 - File B: Runaway Bay Sport and Leadership Excellence Centre - Document 294 of 323

Previous readings for electrical plt E3 conducted on 22/4/13 were as follows: (CH4 = >50,000 ppm eagle detection limit):

	Initial reading @ 12.30pm.	Ambient immediately above and around pit @ 12.30pm	Immediately adjacent services pit @ 12.30pm	Second reading @1.30pm	Ambient Immediately above and around pit@ 1.30pm	Immediatel services pit
Methane - CH4 (eagle meter)	>50,000 ppm	150 ppm	180 ppm	>50,000 ppm	150 ppm	450 ppm
Oxygen - O2	9.6 %vol	20.9 %vol	20.3 % vol	10.2 %vol	20.9 %vol	20.9 % vol
Carbon Monoxide - CO	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm
Hydrogen Sulfide - H2S	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm
BOM Wind data (3pm)				N, 26 km/hr		
BOM Pressure data				1010.1 hPa (falling)		-
BOM Temp data				25,4 °C		

Notes

BOM station Gold Coast Seaway (040764). Nearby service pits max 450 ppm CH4 during course of the day.

Details of the full round of monitoring conducted on 22/4/13 will be included in a letter report (pending).

From: Belinda Oberla Sent: Monday, 29 April 2013 12:39 PM To: 'fbees1@eq.edu.au' Subject: Return site visit scheduled 30/4/13 Importance: High

Hi Frank,

Just confirming that I have secured an appropriate gas meter and am available to attend site again tomorrow - 30/4/13.

I will pick up the gas meter in the morning and make my way to your site by late morning (approx. 11am). As you have advised this morning that the pit has been vented/opened over the weekend, could you please instruct your site team to carefully replace the lid on the utility pit this afternoon (and note the time they do this) so that I may check how much accumulation potentially occurs overnight. It would be appreciated if you could organise for someone at your site to assist me with removal/replacement of the lid whilst I am onsite tomorrow.

I will also require access to the nearby buildings if you would like those to be included within this round of monitoring. Kind Regards

Belinda Oberia

Environmental Scientist

GHD

T: +61 7 316 3954 | V: 413954 | M: +61 415 996 433 | F: +61 7 3316 333 | E: belinda, belinda,

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From: Belinda Oberia Sent: Tuesday, 23 April 2013 4:29 PM To: fbees1@eq.edu.au

Cc: Adam Major Subject: Urgent Follow up regarding gas in service plt Importance: High

Hi Frank,

Just following up from our meeting yesterday afternoon following where I notified you that during my site visit yesterday I measured very high methane levels within the underground electrical pit to the north west of the beach volleyball court (identified as E3 on the site map attached). I have also attached a photo for your reference.

I checked this pit at both 12.30 pm and again at 1.30 pm on 22/4/13. The methane level was ascessed as being greater than the lower explosive limit of methane (50,000 ppm), and requires your immediate attention. Please note the actual methane level was unable to be accurately determined as the methane level within the pit was higher than the gas meters detection limit of 50,000 ppm (and this represents an explosion risk if any potential ignition sources are introduced to the area). Methane levels were equal to or less than 350 ppm within the atmosphere immediately above the electrical pit, indicating that your immediate focus should be on managing the methane within the electrical service pit indicated.

I trust that you have now placed barricades around the pit and are restricting any potential initiation sources (Including smoking and maintenance activities) from the immediate area.

As I indicated I would yesterday, I have now followed up with some senior landfill gas specialists within GHD and the following is recommended:

- 1. Place barricades around the electrical pit, include signage for no smoking and authorised entry only;
- 2. If the electrical connections are "alive" within this electrical pit to consider isolating the connection to the pit until further gas testing is conducted;
- 3. The Sports Centre to advise the site's owner of the situation and for the site owner to notify DERM, the local Council and the utility pit owner (if not GCCC) of the situation and works to be completed to further investigate;
- 4. Re-monitoring of the utility pit is recommended immediately (ideally within 48 hours) using a portable GA 2000 gas meter. This meter is capable of measuring higher levels of methane than the Fagle detection meter used or 22/4/13. Following this second round of monitoring, the pit should be vented (if required) to allow accumulated gas to dissipate. Appropriate considerations should be made to prevent water ingress into the pit. If re-monitoring cannot be completed within 48 hours, then the utility pit lid should be carefully removed (so as to avoid any potential sparking) or the pit should be purged with air prior to removal of the lid (if possible) so as to dilute any accumulated gas to acceptable concentrations, until such a time as the second monitoring round can occur. A maximum of 24 hours prior to GHD completing the second monitoring round, GHD recommend that the lid be replaced on the utility pit to allow gas to accumulate within the utility pit for a limited period of time prior to repeat confirmation gas monitoring occurring. Following the initial monitoring, the pit lid should be removed / the pit purged to allow the accumulated gas (if any) to dissipate. Once this is done, the rate of recovery of the gas should be monitored regularly (possibly hourly). It is also recommended that GHD conduct landfill gas monitoring within the nearby site buildings (and also recheck the other nearby underground service pits) to confirm landfill gas is not accumulating within these structures. The connection point for electricity into these buildings should also be monitored for landfill gas if it feeds from this or nearby service pits.
- 5. GHD can assist the Sports Center to identify / consider other potential sources of the detected gas (diesel, petrol, decaying vegetation, the nearby sewer manhole etc.) based on readily available information and on-site observations. It would be beneficial if the Sports Centre could provide to GHD any information that is available regarding the installation and construction of this electrical pit and nearby underground services (including if the pits were designed to prevent landfill gas intrusion, if the pit and connections trenches are enclosed or installed within gravel/sand only, what the pit connects to, and if there has been any maintenance activities on that structure since the last GHD gas monitoring round in December 2010). If no plans or information is available, GHD can attempt a search for Dial Before you Dig records.
- 6. For GHD to review the information to be gathered from completing items 3 and 5 and make further recommendations (if required) for management of the methane accumulating within the E3 electrical pit.

Please note that GHDs assistance with items 3 - 6 would constitute a variation to the current scope of works and will incur additional fees. Please call me to discuss. Kind Regards

Belinda Oberia Environmental Scientist

DETE RTPappileation 340/5/3308 - File B: Runaway Bay Sport and Leadership Excellence Centre - Document 295 of 323

GHD T: +61 7 3316 3954 | V: 413954 | M: +61 415 996 433 | F: +61 7 3316 3333 | E: belinda.oberta@ghd.com 145 Ann Street Brisbane QLD 4000 Australia | GPO 80x 668 Brisbane QLD 4001 | <u>www.ghd.com</u> WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION Please consider our environment before printing this email

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BEESON, Frank

 From:
 Belinda Oberia [Belinda, Oberia@ghd.com]

 Sent:
 Thursday, 2 May 2013 4:52 PM

 To:
 fbees1@eq.edu.au

 Cc:
 Adam Major

 Subject:
 Proposed return visit next week

HI Frank,

Based on the results of the landfill gas monitoring during my 2nd visit to the Sports Centre on Tuesday (30/4/13), it is recommended that a follow up round of monitoring be conducted within the next week (to check the potential methane accumulation levels after one week of leaving the cover in place). This can be in a staged approach so as to reduce your costs as much as possible. Stage 1 – Monitoring of the E3 electrical pits, the ambient level immediately above the E3 pit, and also other underground service pits in the immediate vicinity. If results of E3 are greater than 10,000 ppm then continue to Stage 2 – conduct landfill gas monitoring within the nearby site buildings (and also recheck the other nearby underground service pits) to confirm landfill gas is not accumulating within these structures.

It is also recommended that the barricades currently in place be expanded to the edge of the canopy (3-5m from pit) if possible until the next monitoring event. Hot works (ie. works with any source of ignition) should be excluded from the area unless monitoring is conducted prior to and during the activity.

These recommendation is based on the following summary of results (more details are provided at the end of this email):

- 1) Elevated methane readings seemed to dissipate when the electrical pit was vented;
- 2) Methane appears to take longer than 24 hours to build up to greater than the lower explosive limit of methane (50,000 ppm);
- Methane appears to take 1 to 2 hours to build up greater than 1000 ppm.

Variations requested for your purchase order (PO ref 38946) are as follows:

Anticipated costs (ex GST) for GHD to conduct Stage 1 monitoring is \$1,950. Stage 2 would cost an additional \$600. These costs would include an email report of the interim results for that round of monitoring. Please contact me to confirm that you would like GHD to proceed with this next monitoring round. The costs of GHD's visit on 30/4/13 will be \$2,550 (ex GST).

Please do not hesitate to contact me for any queries relating to this email. Kind Regards

Belinda Oberia

Environmental Scientist

GHD

T: +61, 7 3316 3954 | V: 413954 | M: +61 415 996 433 | F: +61 7 3316 3333 | E: belinda.oberin@glut.com 145 Ann Street Brisbane QLD 4000 Australia | GPO Box 660 Brisbane QLD 4001 | <u>www.ghd.com</u> WATER | ENERGY, B.RESOURCES | ENVIRONMENT | PROPERTY, B.BUILDINGS | TRANSPORTATION

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Interim results (for your record)

Gas readings for electrical pit E3 conducted on 30/4/13 were as follows:

	Initial reading – 10am . (24 hours closed lid accumulation)	Vented reading – 10.10am	liam	12pm	3pm
Methane - CH4 (1 = eagle, 2 = GA2000)	(1) 1250 ppm, (2) below meter detection	(1) 100 ppm, (2) below n eter detection	(1) 880 ppm, (2) below meter detection	(1) 1850 ppm, (2) below meter detection	(1) 1250 ppm, (2) below meter detection
Oxygen - O2	20.9 %vol	20.9 %vol	20.9 %vol	20.9 %vol	20.9 %vol
Carbon Monoxide - CO	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm
Hydrogen Sulfide - H2S	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm
Balance (GA2000)	79.3%	79.0%	79.0%	79.0%	79.0%
Air Pressure (GA2000)	1022 hPa	1022 hPa	1022 hPa	1021 hPa	1020 hPa
BOM Wind data	SSE, 20 km/hr	PI			SE, 22 km/hr
BOM Temp data	24.7 °C	6.			24.8 °C
Notes	Pit had been vented by site personnel in the period between initial monitoring (22/4/13) and 12 pm 29/4/13.	Lid opened and vented, reading after 10 mins consistent with ambient readings at 10 am. Lid replaced 10.10 am	1 hour accumulated reading	2 hour accumulated reading	5 hour accumulated reading

Notes

BOM station Gold Coast Seaway (040764).

Ambient monitoring and nearby buildings were max 55 ppm CH4, nearby service pits max 180 ppm CH4 during course of the day.

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Two separate portable gas meters were utilised (Ari Eagle meter, and a GA 2000 meter)

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Methane - CH4 (eagle meter)	>50,000 ppm	150 ppm	180 ppm	>50,000 ppm	150 ppm	450 ppm
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Notes

BOM station Gold Coast Seaway (040764). Nearby service pits max 450 ppm CH4 during course of the day.

Details of the full round of monitoring conducted on 22/4/13 will be included in a letter report (pending).

From: Belinda Oberia

DETE RTI application 340/5/3308 - File B: Runaway Bay Sport and Leadership Excellence Centre - Document 297 of 323

Sent: Monday, 29 April 2013 12:39 PM To: 'fbees1@eq.edu.au' Subject: Return site visit scheduled 30/4/13 Importance: High

Hi Frank,

Just confirming that I have secured an appropriate gas meter and am available to attend site again tomorrow - 30/4/13.

I will pick up the gas meter in the morning and make my way to your site by late morning (approx. 11am).

As you have advised this morning that the pit has been vented/opened over the weekend, could you please instruct your site team to carefully replace the lid on the utility pit this afternoon (and note the time they do this) so that I may check how much accumulation potentially occurs overnight. It would be appreciated if you could organise for someone at your site to assist me with removal/replacement of the lid whilst I am onsite tomorrow.

I will also require access to the nearby buildings if you would like those to be included within this round of monitoring.

Belinda Oberia

Environmental Scientist

Kind Regards

GHD

T: +61 7 3316 3954 | V: 413954 | M: +61 415 995 433 | F: +61 7 3316 3333 | E: belinda.oberia@shd.com 145 Ann Street Brisbane QLD 4000 Australia | GPO Box 660 Brisbane QLD 4001 | www.dbd.com WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

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From: Belinda Oberia Sent: Tuesday, 23 April 2013 4:29 PM To: fbees1@eq.edu.au Cc: Adam Major Subject: Urgent Follow up regarding gas in service pit Importance: High

Hi Frank,

Just following up from our meeting yesterday afternoon following where I notified you that during my site visit yesterday I measured very high methane levels within the underground electrical pit to the north west of the beach volleyball court (identified as E3 on the site map attached). I have also attached a photo for your reference.

I checked this pit at both 12.30 pm and again at 1.30 pm on 22/4/13. The methane level was assessed as being greater than the lower explosive limit of methane (50,000 ppm), and requires your immediate attention. Please note the actual methane level was unable to be accurately determined as the methane level within the pit was higher than the gas meters detection limit of 50,000 ppm (and this represents an explosion risk if any potential ignition sources are introduced to the area). Methane levels were equal to or less than 350 ppm in nearby electrical and communication underground service pits and at 150 ppm within the atmosphere inmediately above the electrical pit, indicating that your immediate focus should be on managing the methane within the electrical service pit indicated.

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- 1. Place barricades around the electrical pit, include signage for no smoking and authorised entry only;
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Belinda Oberia

Environmental Scientist

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BEESON, Frank

From:	Belinda Oberia [Belinda.Oberia@ghd.com]
Sent:	Monday, 29 April 2013 12:39 PM
То:	fbees1@eq.edu.au
Subject:	Return site visit scheduled 30/4/13
Importance:	High

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GHD

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From: Belinda Oberia

Sent: Tuesday, 23 April 2013 4:29 PM To: fbees1@eq.edu.au Cc: Adam Major Subject: Urgent Follow up regarding gas in service pit Importance: High

Hi Frank,

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Belinda Oberia Environmental Scientist

GHD

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BEESON, Frank

From:	KINGSTON, Peter [Peter.KINGSTON@dete.qld.gov.au]
Sent:	Friday, 26 April 2013 12:21 PM
To:	'BEESON Frank'; 'WESTON Vivien'
Cc:	'dmoir3@eq.edu.au'; VAN WANROOY, Megan
Subject	: RE: Urgent Follow up regarding gas in service pit

Thanks Frank!

Peter Kingston

Regional Facilities Manager - South East Region Department of Education, Training and Employment <u>peter.kingston@dete.qld.gov.au</u> Phone: (07) 55834466 Mobile: 0418 876 687 Fax: (07) 55834462 Mail: PO Box 557 Robina DC Q 4226

From: BEESON Frank [mailto:fbees1@eq.edu.au] Sent: Friday, April 26, 2013 12:15 PM To: KINGSTON, Peter; 'WESTON Vivien' Cc: dmoir3@eq.edu.au; VAN WANROOY, Megan Subject: RE: Urgent Follow up regarding gas in service pit

Peter,

I spoke to Belinda (GHD) this morning, her suggestion regarding this electrical bit was to open the pit and to let it vent, I have done this and also the adjoining comms. pit

Later this afternoon I will replace the lids to these pits and at Belinda's request leave closed over the weekend, and see if there is a build up on Monday's re-testing, and if needed make the necessary adjustments

I have attached some photo's to give you a better idea what we are dealing with visually

Hope this helps Frank

FRANK BEESON Chief Engineer Runaway Bay Sport and Leadership Excellence Centre Cnr Sports Drive & Morala Ave. Runaway Bay Queensiand Australia 4216 PO Box 294 Runaway Bay Qld 4216 P:(07) 5500 9824 / F:5500 9989 / M: 0414 791263

From: KINGSTON, Peter [mailto: Peter KINGSTON@dete.old.gov.au] Sent: Friday, 26 April 2013 7:22 AM To: 'WESTON Vivien' Cc: 'dmoir3@eq.edu.au', VAN WANROOY, Megan; 'fbees1@eq.edu.au' Subject: RE: Urgent Follow up regarding gas in service pit

Hi Viv,

Thanks for forwarding the email and for the photo of the barricade around the pit.

I think our best course of action is to ask GHD for assistance in implementing their advice, including advice on notifications to DERM (now Environment and Heritage Protection <u>http://www.ehp.qld.gov.au/</u>) and GCCC.

Maintenance funding is available to cover the cost of all the urgent work.

We'll seek advice from our colleagues in environmental management, maintenance and real estate.

Thanks very much, Pete

Peter Kingston

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Regional Facilities Manager - South East Region Department of Education, Training and Employment peter.kingston@dete.qld.gov.au Phone: (07) 55834466 Mobile: 0418 876 687 Fax: (07) 55834462 Mail: PO Box 557 Robina DC Q 4226

From: WESTON Vivien [mailto:vxwes0@eq.edu.au] Sent: Wednesday, April 24, 2013 5:49 PM To: KINGSTON, Peter Cc: dmoir3@eq.edu.au Subject: FW: Urgent Follow up regarding gas in service pit Importance: High

Hi Pete

Further to our earlier conversation here is the email received in relation to the high level of methane in the electrical pit detailed above.

As mentioned we have taken action to place barricades around the electrical pit and erected signage for no smoking and authorised entry only. Photo attached

Frank has since contacted an electrician to come and check whether the electrical connections are live and he should visit the site on Friday.

I would very much appreciate if you could assist us in relation to how we proceed with this and whether or not we have access to funds from Emergency allocation to ensure that the problem is rectified as scon as possible.

Should you require any further information please contact Frank Beeson on 5500 9824 or myself.

Regards and thanks

Viv Vivien Weston A/Senior Financial Accountant P:(07) 5500 9970 | F:(07) 5500 9918 | vxwes0@eq.edu.au Runaway Bay Sport & Leadership Excellence Centre Cnr Sports Drive & Morala Ave. Runaway Bay Qld Australia 4216

PO Box 294 Runaway Bay Qld 4216

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From: BEESON, Frank [mailto:fbees1@eq.edu.au] Sent: Wednesday, 24 April 2013 4:47 PM To: 'WESTON Vivien' Subject: FW: Urgent Follow up regarding gas in service pit Importance: High

FRANK BEESON Chief Engineer Runaway Bay Sport and Leadership Excellence Centre Cnr Sports Drive & Morala Ave. Runaway Bay Queensland Australia 4216 PO Box 294 Runaway Bay Qld 4216 P:(07) 5500 9824 / F:5500 9989 / M: 0414 791263

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From: Belinda Oberia [mailto:Belinda.Oberia@ghd.com] Sent: Tuesday, 23 April 2013 4:29 PM To: fbees1@eq.edu.au Cc: Adam Major Subject: Urgent Follow up regarding gas in service pit Importance: High

Hi Frank,

Just following up from our meeting yesterday afternoon following where I notified you that during my size visit yesterday I measured very high methane levels within the underground electrical pit to the north west of the beach volleyball court (identified as <u>E3</u> on the site map attached). I have also attached a photo for your reference.

I checked this pit at both 12.30 pm and again at 1.30 pm on 22/4/13. The methane level was assessed as being greater than the lower explosive limit of methane (50,000 ppm), and requires your immediate attention. Please note the actual methane level was unable to be accurately determined as the methane level within the pit was higher than the gas meters detection limit of 50,000 ppm (and this represents an explosion risk if any potential ignition sources are introduced to the area). Methane levels were equal to or less than 350 ppm in nearby electrical and communication underground service pits and at 150 ppm within the atmosphere immediately above the electrical pit, indicating that your immediate focus should be on managing the methane within the electrical service pit indicated.

I trust that you have now placed barricades around the pit and are restricting any potential initiation sources (including smoking and maintenance activities) from the immediate area.

As I indicated I would yesterday, I have now followed up with some senior landfill gas specialists within GHD and the following is recommended:

- 1. Place barricades around the electrical pit, include signage for no smoking and authorised entry only;
- 2. If the electrical connections are "alive" within this electrical pit to consider isolating the connection to the pit until further gas testing is conducted;
- The Sports Centre to advise the site's owner of the situation and for the site owner to notify DERM, the local Council and the utility pit owner (if not GCCC) of the situation and works to be completed to further investigate;
- 4. Re-monitoring of the utility pit is recommended immediately (ideally within 48 hours) using a portable GA 2000 gas meter. This meter is capable of measuring higher ievels of imethane than the Eagle detection meter used on 22/4/13. Following this second round of monitoring, the pit should be vented (if required) to allow accumulated gas to dissipate. Appropriate considerations should be made to prevent water ingress into the pit. If re-monitoring cannot be completed within 48 hours, then the utility pit lid should be carefully removed (so as to avoid any potential sparking) or the pit should be purged with air prior to removal of the lid (if possible) so as to dilute any accumulated gas to acceptable concentrations, until such a time as the second monitoring round can occur. A maximum of 24 hours prior to GHD completing the second monitoring round, GHD recommend that the lid be replaced on the utility pit to allow gas to accumulate within the utility pit for a limited period of time prior to repeat confirmation gas monitoring occurring. Following the initial monitoring, the pit lid should be removed / the pit purged to allow the accumulated gas (if any) to dissipate. Once this is done, the rate of recovery of the gas should be monitored regularly (possibly hourly). It is also recommended that GHD conduct landfill gas is not accumulating within these structures. The connection point for electricity into these buildings should also be monitored for landfill gas if it feeds from this or nearby service pits.
- 5. GHD can assist the Sports Center to identify / consider other potential sources of the detected gas (diesel, petrol, decaying vegetation, the nearby sewer manhole etc.) based on readily available information and on-site observations. It would be beneficial if the Sports Centre could provide to GHD any information that is available regarding the installation and construction of this electrical pit and nearby underground services(including if the pits were designed to prevent landfill gas intrusion, if the pit and connections trenches are enclosed or installed within gravel/sand only, what the pit connects to, and if there has been any maintenance activities on that structure since the last GHD gas monitoring round in December 2010). If no plans or information is available, GHD can attempt a search for Dial Before you Dig records.
- 6. For GHD to review the information to be gathered from completing items 3 and 5 and make further recommendations (if required) for management of the methane accumulating within the E3 electrical pit.

Please note that GHDs assistance with items 3 – 6 would constitute a variation to the current scope of works and will incur additional fees. Please call me to discuss. Kind Regards

Belinda Oberia Environmental Scientist

GHD

T: +61 7 3316 3954 | V: 413954 | M: +61 415 996 433 | F: +61 7 3316 3333 | E: belinda.oberia@ghd.com 145 Ann Street Brisbane QLD 4000 Australia | GPO Box 668 Brisbane QLD 4001 | www.ghd.com WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

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BEESON, Frank

From:	Belinda Oberia [Belinda.Oberia@ghd.com]
Sent:	Tuesday, 23 April 2013 4:29 PM
То:	fbees1@eq.edu.au
Cc:	Adam Major
Subject:	Urgent Follow up regarding gas in service pit
Importance:	High
Attachments	E3 electrical pit Runaway Bay Sports Centre 22 04 2013.JPG; site monitoring map 22 04 2013.pdf

Hi Frank,

Just following up from our meeting yesterday afternoon following where I notified you that during my site visit yesterday I measured very high methane levels within the underground electrical pit to the north west of the beach volleyball court (identified as <u>E3</u> on the site map attached). Thave also attached a photo for your reference.

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- buildings (and also recheck the other nearby underground service pits) to confirm landfill gas is not accumulating within these structures. The connection point for electricity into these buildings should also be monitored for landfill gas if it feeds from this or nearby service pits.
- 5. GHD can assist the Sports Center to identify / consider other potential sources of the detected gas (diesel, petrol, decaying vegetation, the nearby sewer manhole etc.) based on readily available information and on-site observations. It would be beneficial if the Sports Centre could provide to GHD any information that is available regarding the installation and construction of this electrical pit and nearby underground services(including if the pits were designed to prevent landfill gas intrusion, if the pit and connections trenches are enclosed or installed within gravel/sand only, what the pit connects to, and if there has been any maintenance activities on that structure since the last GHD gas monitoring round in December 2010). If no plans or information is available, GHD can attempt a search for Dial Before you Dig records.
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Belinda Oberia Environmental Scientist

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At call willinger for for which is all willinger for Source for Source 11 and Januart to Source CLIENTS PEOPLE PE 2 February 20

David Morgan Sport Super Centre Cnr Sports Drive and Morala Avenue RUNAWAY BAY QLD 4216

Dear David,

Landfill Gas Monitoring December 2010 Report

As requested, GHD attended the Sports Super Centre site on the 16 December 2010 to undertake landfill gas monitoring. Following the recommendations from the previous monitoring round, a selection of locations (as listed below), were monitored during this round. Table 1 attached, provides details on general observations made on the day and Table 3 outlines the results for the selected structures monitoring locations.

Locations monitored December 2010

E10, E12, E21, E24 Left, E24 Right, E25, E26, West Car Park NE Corner, West Car Park NE Corner, West Car Park Right NW Corner, West Car Park NW Corner, Storeroom 1 and Storeroom 2.

All locations were compliant with the relevant adopted trigger level (12,500 ppm methane) during this round of monitoring; however detectable levels of methane were recorded at the following locations.

Location E26 (and electrical pit located at the southern boundary to the west car park) returned results of 1000 ppm methane for the second consecutive monitoring round. Although this methane level is below the relevant adopted trigger level of 12,500 ppm methane, it represents an increase in concentration at this location since the December 2009 monitoring round.

Location E25 (an electrical pit) located in the northern end of the west car park, returned a result of 1000 ppm methane. This is an increase in methane concentration when compared to the previous June 2010 round of monitoring (500 ppm).

Location E10 (an electrical pit located on the north-eastern side of the running track) returned a result of 500 ppm methane this round which is the first instance of a detectable level of methane recorded when compared to the historical dataset for this location. Due to this detection, additional electrical pits on the northern and southern edges of the running track (towards the scoreboard end) were also monitored. Methane levels of 5000 ppm and 2000 ppm were detected at these respective additional locations. These locations were not previously included in the monitoring program, however are recommended to be included in future visits (and have been assigned as monitoring locations E9A and E10A for the northern and southern pits respectively).

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Our ref: Your ref: 41/20337/415677



Methane was not able to be detected within Storerooms 1 and 2 during this monitoring round. As these locations recorded results of 1000 ppm methane and 500 ppm methane respectively in June 2010, any trends in methane levels at these locations will continue to be assessed in future monitoring events.

Based upon this information, it is recommended that:

- Biannual monitoring (as a minimum) be scheduled at the selected locations detailed above to continue assessing trends in gas conditions for the site. A full assessment (monitoring of all site locations) is recommended on an annual basis (with the next monitoring round to be undertaken in June 2010).
- 2. Additional monitoring locations E9A and E10A (electrical pits on the northern and southern edges of the running track towards the scoreboard end) be included in future partial and full gas assessments at the site.
- 3. Storerooms 1 and 2 continue to be regularly opened to allow any potential methane build up to dissipate.

If you have any questions or require any further details, please don't hesitate to contact Adam Major or myself.

nda. Oberrag GHD. Com Udate Plan g. Ground water testing.

Yours sincerely,

Bellu

Belinda Oberia Environmental Scientist (07) 3316 3954

41/20337/415677

Runaway Bay Former Landfill: Spots Super Centre - Landfill Gas Management Strategy

TABLE 1: General Weather Conditions and Site Observations

Cate	Atmosph	eric Pressure	Wind Speed	Wind Direction (degrees)	Temp.	Weat	ter Conditions	Raintall Over Preceding Week	Provide State	
1229	(hPa)	Rising/Falling	(km/h)	(address)	rei	Current	Preceding Week	(mm)	Conturnents	Triff.Jaini
26-Jun-08	1023,1	Faling	17	315	16.3	Fine conditions, cool a.m. warming and dry with ligh breeze,	Predominantly line conditions with only light showers.	20	Monitoring locations clearly visible with genrally good access. Some piblidrains hot as per map, some on site not shown etc. Gas equipment measures CH4 >500ppm only	ТК
26-Sep-08	1020.2	Falling	20	o	23.9	Light early showers, then fine. Light S to SE winds	Predominately fine conditions	1,4	Site access good, map locations approximate only. Gas equipment measures CH4 >500ppm only. Gas like odour in south west carpark.	BO
15-Dec-08	1006,2	Rising	22	270	26.8	Fine and sunny with light breeze.	Some showers.	20.6	54e acess good, map incations approximate only, Gas equipment measures CH4 >500ppm only. Some water observed in electrical pits in west carpark.	во
26-Mar-09	1021.7	Falling	22	155	26,7	Fine and sunny with light preeze.	Predominantly Sne conditions with light showers.	6.8	Partial assessment only (9 locations), Recent addition of work at NE corner of west carpork. Gas equipment measures CH4 >500ppm only.	50
5-Jun-09	1015.3	Falling	7	292.5	24.4	Overcast with showers. Slight WNW breeze	Some showers,	19.6	Site access good, map locations approximatic only. Case equipment measures CH4 >500ppin only. Some water observes in all otrical pits in west corparie.	BQ
25-Sep-09	1017.3	Falling	7	90	23,5	Overcest with showers, Slight WNW breeze	Predominantly line and sunny	0.6	Fartial cuses ment only (10 to: Vonay, Goor's te acess, White cuses of effectively, Gas equipment measures (244 > SOOppen only,	50
19-Dec-09	1015,5	Failing	17	22.5	26,1	Cloudy and overcast. 7/8 cloud cover, Light bresze. Storms predicted	Mostly fre, with light shower:	32	Partial assessment only (10 locations), Good sur ace ts, yen's opersing effectively, Class equipment measures CF/4 >5U0ppm only.	P.J
4-Jun-10	1012.6	Falling	17	315	16.5	Fine and surary with light breaze.	Sorix showers,	140.22	Full site as resamer 2. Good site acess, voris operating effectively, Gas equipment measures CH4 >500ppm only.	BO
16-Dec-10	1007.7	Falling	20	3:5	25	Lioudy and overcast. 7/8 bud cover, intermittent breeze. Storms predicted	Some showers plus 45.8mm raintail in one day (4 days prior to monitoring)	47,6	Partial assessment. Good site acess, vents operating effectively. Gas equipment measures CH4 >500ppm only.	BO

Notes

Atmospheric pressure, wind speed/ direction, 'empiritative and delay manifall data to be obtained from the Bureau of Meteorology. Gold Coast Seaway Station (No 40764.)

Runaway Bay SSC gas results.xts, General Info

TABLE 2: Boundary Soll Atmosphere Gas Monitoring Wells

Location	Parameter	Units	Contraction of the	an all a mart	1	2-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	Samplithg Date		ALC: NOT THE REAL PROPERTY OF		
-Focusoa	A MEMORY .	- unio	28-Jun-08	26-546-08	15-Des-08	26-Mar-00	5.34509	25-844-09	13-Dec-09	4.300-10 0 0 20.9 0 0 20.2 3934 NM 944 0 0 20.5	16-Dec-11
(Boundary Wells										
MW1	CH.	16 (16)	0	0	0	NM	0	73M	104	0	1ML
	H ₂ S	apm	0	0	0	100	0	NM	NOM	0	MN.
	01	\$ (10)	20 Đ	20.9	20.0	2254	20.9	hM.	10A	20.9	1214
WW2	CH	96 (MM)	0	0	0	FAM	0	P\$M	124	0	184
	H.S	ppm	0	0	0	PUM	0	HPM .	NM	0	1614
	0;	34 (WA)	19.4	20.9	19	1444	20.1	NM	NM	20.2	101
CWN	CIL	\$ 0N	0	104	NM	NM	10M	544	NA	PUM	7154
	HIS	99m	0	FIM	NOV.	101	104	2484	NM	NM	NM
	0,	\$ 6147	10.7	NM	NM	NM	Paha	NM	184	100	PINA:
1W4	CH	54 (WW)	0	0	0	104	soll fas	NM	NM	0	104
	H ₁ 5	ppm	0	0	0	NM	0	NM	FOM .	0	NM
	O ₃	\$ (11)	20.1	20.9	20.5	244	20.5	104	134	20.5	1054

ntal Guidelines: Solid Waste Landfills, NSW EPA, 1996)

Notas: Methane Trigger Level = 1.25 % v/v (Environn Shading indicates exceedance of trigger level Bold Indicates detection of methane NM = Parameter not menhaned this round

3

Runaway Bay SSC gas results.ids, Soil Gas Welts

J

Location	Parameter	Units	28-Jun-08	26-Sap-08	15-Dec-08	26-Mar-09	5-Jun-09	25-Sep-09	19-0ec-09	4-Jun-10	16-Dec-10	Maximum CH, Reading
1	CH4	ppm	< 500	< 500	≪ 500		< 500			< 500		0
	H ₂ S	ppm	0	0	0	1	0			0		0
	02	% (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
E2	CH4	ppm	< 500	₹ 500	< 500	1	≪ 500			< 500		0
	H ₂ S	ppm	0	0	0	-	0			0		0
**	02	% (v/v)	20.9	20,9	20.9		20.9			20.9		20.9
E3	CH4	ppm	< 500 0	< 500 0	< 500		< 500 0			< 500 0		0
	H ₂ S O ₂	ppm % (v/v)	20.9	20.9	0 20.9		20.9			20.9		20.9
E4	CH4		\$ 500	≤ 500	≤ 500		* 500		-	< 500		20,9
E-4	H ₂ S	ppm ppm	0	0	0		0		-	0		0
	0;	% (v/v)	20.9	20.9	20,9	-	20,9		-	20,9		20.9
65	CH4	ppm	< 500	< 500	< 500		₹ 500			₹ 500		0
	H ₂ S		0	0	0		0			0		0
	02	ppm % (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
EØ	CH4	ppm	< 500	< 500	€ 500		₹ 500			< 500		0
	H ₂ S	ppm	0	0	0	1	0	-		0		0
	02	% (v/v)	20.9	20.9	20,9		20.9	-		20.9		20.9
E7	CH,	ppm	<500	<500	<500		<500			<500		0
L.	Has	ppm	0	0	0		0			0		0
	02	% (v/v)	20,9	20.9	20.9		20.9			20.9	<u>A</u>	20.9
E8	CH4	ppm	<500	<500	<500		<500			<500		0
	H ₂ S	ppm	0	0	0		0	1		2	/	0
	0 ₂	% (v/v)	20.9	20.9	20.9		20,9			20.9		20.9
EØ	CH4	ppm	<500	<500	<500		<500			<300	1	0
	H2S	ppm	0	0	0		0			0		0
	02	% (v/v)	20.9	20.9	20.9		20.9			27.9		20.9
E9A	CH,	ppm		_0,0		1			1		2000	2000
	H ₂ S	ppm ppm				-				7	0	0
	0 ₂	% (v/v)									:9.6	20.9
10	CH4	ppm	<500	<500	<500	<500	<500	< 500	< 500	<500	5/,0	500
The second se	H ₂ S	ppm	0	0	0	0	0	0	1 0	0		0
	0 ₂	% (v/v)	20,9	20,9	20.9	20.9	20,9	20.9	20.9	20.9	29.0	20.9
10A	CH4	opm	20,0	20,0	200	20.0	1010	10.0			5000	5000
	H ₂ S	ppm							<u></u>		0	0
	02	% (v/v)				-				7.5	17.8	20.9
11	CH4	ppm	<500	<500	<500		<500	272		<030		0
	H ₂ S	ppm	0	0	0		0			0		0
	02	% (v/v)	20.9	20.9	20,9		20.9			20.9		20,9
12	CH4	ppm	1000	<500	<500	500	1000	\$ 500	< 500	1005	< 500	1000
	H ₂ S	ppm	0	0	0	0	c	0	0	0	0	0
		% (v/v)	20.7	20.9	20.5	20.9	22 9	20.9	20.9	20.9	20.6	20,9
513		ppm	< 500	<500	<500		500			<500		0
	H ₂ S	ppm	0	0	0		70			0		0
		% (v/v)	20.9	20,9	20.6		20.9			20.9		20.9
14		ppm	< 500	<500	<500	1	<500			<500		0
	-	opm	0	0	0	1	0	1		0		0
		% (viv)	20.9	20.9	20.9	1 A	20.3			20.9		20.9
		ppm	≤ 500	<500	<500		<500		77	<500		0
	H ₂ S	nprin	0	0	0	27	0			0		0
		% (v/v)	20.9	20,9	20.9	17	20.9			20.9		20.9
		ppm	< 500	<500	<500		<500	777		<500		0
		npm	0	0	0		0	<u> </u>		0		0
		% (v/v)	20.9	20.9	20.9	1	20.9	1		20.9		20.9
		ppm	< 500	<500	<500	77	<500			<500		0
		ppm ppm	0	0	0	$ \rightarrow $	0			0		0
		% (v/v)	20.9	20.9	20.9		20.9	~		20.9		20.9
		opm	€ 500	<500	<5.00		<500/			<500		0
arth	H ₂ S	mag	0	0	0		0		-	0		0
		is (ww)	20.9	20,9	20.9		20.9			20.9		20.9
		pm	<500	<500	-500		<500			<500		0
		opm	0	0	0		0		4 1	0		0
		% (v/v)	20.9	20.9	20.9	11	20.5			20.9		20.9
6 North	CH,	apm .	<500	<500	<500		<500			<500		0
	H ₂ S	pm	0	077	0		0	1		0		0
	0, 1	6 (v/v)	20.9	23.9	20.9	<u></u>	20.9			20,9		20.9
7	CH, F	pm	<500	<500	<500		<500			<500		0
		pm	0	0	0		0			0		0
		6 (v/V)	20.9	20.3	37,9		20.9			20.9		20.9
	CH, p	mq	<5/.0	420	450(-		<500			<500	-	0
		pm	20.9	0 20.9	0		20.9			20.9		0 20.9
		i (vivi	<500	<500	<20.9		20.9 <500			<500		0 20.9
		pm	0	0	0		0			0		0
k		6 (v/v)	20,9	20.9	20.9		20.9			20.9		20.9
		pm	< 500	<500	<500		<500			<500		0
p.	H _I S p	pm	0	0	0		0			0		0
K	0, 9	i (VIV)	20.9	20.9	20.9		20.9			20.9		20.9
0 0	CH, ID	pm	< 500	<500	4.7		<500			<500		0
		pm	0	0	0		0			0		0
t		(v/v)	20,9	20.9	20.9		20.9			20.9		20.9
	J2 14											
C	CH4 PI	pm pm	< 500	<500 0	<500 0		<500 0			<500		0

HELECTRICAL PIT. NITH EAST SIDE OF RUNNING TRA

(NEW) LOCATIONS

Runaway Bay SSC gas results xls, Ambient- Structures

TABLE 3: Sub -Surface Structure Emissions

Location	Parameter	Units	26.1	28-506	15.0++02	28.0100	5.V=00	26.8-0.00	10-Dec-09	4-Jun-10	16-Dec-10	Maximum Cl Reading
C24	Cu.	-	28-349-08	28-Sep-08	15-Dec-08	26-Mar-09	6-Jun-09	25-Sep-09	and the second second second			500
E21	CH. H ₂ S	ppm ppm	< 500	<500	<500 0		500	< 500	< 500 0	<500	< 500 0	500
	02	56 (WV)	20.9	20.9	20.9		20.9	20.9	20.9	20.9	20,3	20.9
E21	CH.	ppm	< 500	<500	<500		<500			<500		0
.eft	H25	ppm	0	0	0		0			0		0
	02	16 (WW)	20.9	20.9	20.9		20.9			20,9		20,9
E21	CH4	ppm	< 500	<500	<500		<500			<500		0
Right	H ₂ S	ppm	0	0	0		0			0		0
	0;	56 (v/v)	20.9	20.9	20,9		20,9			20,9		20.9
E22	CH4	ppm	<\$00	<500	<500		<500			<500		0
	H ₂ S O ₂	ppm % (v/v)	0 20.9	0 20.9	0 20.9		0 20.9			20.9		20.9
E22	CH.		<500	<500	<500		<500			<500		0
Left	H ₁ S	ppm ppm	0	0	0		0			0		0
.611	02	% (v/v)	20,9	20.9	20.9		20.9			20.9		20.9
22	CH4	ppm	<500	<500	<500		<500			<500		0
Right	H2S	ppm	0	0	0		0			0		0
	01	% (w/v)	20.9	20.9	20.9		20.9			20.9		20.9
23	CH.	ppm	<500	<500	<\$00		<500			<500		0
	H ₂ S	ppm	0	0	0		0			0		0
	02	% (v/v)	20.9	20.9	20.9		20 9			20.9		20.9
23	CH4	ppm	<500	<500	<500		<500			002>		0
eft	HjS	ppm	0	0	0		0			0	A	0
	02	% (w/v)	20.9	20.9	20.9		20,9			20.9		20.9
23	CH4	ppm	< 500	<500	<500		<500			<500	/	0
light	H ₂ S O ₇	ppm % (v/v)	0 20.9	20.9	0 20.9		0 20.9			20.9		20.9
24	CH.		< 500	<500	<500		<500			<502		0
	H ₂ S	ppm ppm	0	000	0		0			0		0
	0,	% (v/v)	20.9	20.9	20.9		20.9			77.1		20.9
24	CH4	ppm	< 500	<500	500	<500	500	< 500	6.503	<500	2 500	500
eft	Has	ppm	0	0	0	0	0	0	0	0	0	0
	02	% (v/v)	20,9	20,9	20,9	20.9	20.9	20.9	20,9	20.9	70.9	20.9
24	CH4	ppm	< 500	<500	<500	<500	<500	< 500	< 500	<500	<f.00< td=""><td>0</td></f.00<>	0
ight	HIS	opm	0	0	0	0	0	0	0	0	0	0
	0,	% (u/v)	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
25	CH4	ppm	< 500	<500	1000	500	1000	< 500	1000	500	560	1000
	H ₂ S	ppm	0	0	0	0	0	0	0	0	0	0
	0,	% (viv)	20.9	20.9	20.9	20.9	20.7	2).9	20.9	20.1	20.9	20.9
28	CH4	ppm	< 500	<500	<\$00	<500	<500	< 500	500	1000	1000	1000
	H ₂ S	ppm	0	0	0	0	0	0	0	8	0	0
	0;	% (w/v)	20.9	20.9	20.9	20.9	20.9	279	20.9	19.1	20.9	20.9
27	CH,	ppm	<500	<500	<500		<500 0					0
	H ₂ S O ₂	opm % (v/v)	20.9	0 20.9	0 20.9		20.5			20.9		20.9
28	CH4		<500	<500	<500		400					0
20	HIS	ppm ppm	0	0	0		0	\rightarrow		0		0
	H ₂ S O ₂	14 (v/v)	20.9	20,9	20.9	·	20.9		\leftarrow	20.9		20.9
29	CH4	ppm	<500	<500	<500		-500	0		<500		0
	H ₂ S	ppm	0	0	0		0			0		0
	0,	% (v/v)	20.9	20.9	20.6		200			20.6		20,9
30	CH4	ppm	<500	<500	<500		45.0	(i		<500		0
	H ₂ S	ppm	0	0	0		0			0		0
	O ₂	% (v/v)	20,9	20.9	20.9		20.9			20.9		20.9
31	CH₄	ppm	<500	<500	<500		<500	1		<500		0
	H _i s	ppm	0	0	0	LAN	0			0		0
	0,	15 (viv)	20.9	20.9	20.3		20.3	(20,3		20.9
est Car park	CH.	ppm	<500	0	3500	1000	1500	€ 500	< 500	500	< 500	21000
E Corner	H,S	mqq	0	0	0	0	0	0	0	0	0	0
	0,	% (v/v)	20,9	20.9	20.9	16.1	20.9	20.9	20.9	20.4	20.9 <500	20.9
est Car park	CH.	mqq	<500	<500	<50K	<u> </u>	<500			<500 0	<500	0
ft NE Comer	H25 O2	opm % (v/v)	20.9	20.9	20.3		20.9			20.9	20.9	20.9
ant Car and	CH4		4000	<500		1000	<500	< 500	1000	<500	<500	4000
est Car park ght NW Corner	H.S	ppm ppm	4000	<500	- OUP	0	0	0	0	0	0	0000
		% (v/v)	15.6	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
est Car park		ppm	<500	<500	0	<500	<500	< 500	₹ 500	<500	< 500	0
		pprn	0	0	0	0	0	0	0	0	0	0
		% (v/v)	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
		opin	<500	<500	0	11	(30)			<500		Û
		ppm	0	0	0		0			0		0
		% (w/v)	20.9	20.9	20,4		20.4			20.4		50.8
		ppm	<500	<f.00< td=""><td><500</td><td></td><td><500</td><td></td><td></td><td><500</td><td></td><td>0</td></f.00<>	<500		<500			<500		0
		ppm	0	0	0		0			0		0
		\$ (11)	20.9	20.0	20.9	i i	20.9			20.9		20.9
high breadero					- 77							
		mqq	<500	<50%	* 500		<500			<500		0
		pm	<u> </u>	0	0		0			0		0
	02	% (WV)	5/19	20.9	29.9		20.9			20,9		20.9
pip adj Lodge 9	CH,	ppm I	NM	NM	NM	\geq	NM			NM		0
		apm	NM	NM	NM		NM			NM		0
		% (v/v)	NM	NM 1	NM		NM			NM		0.0

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TABLE 3: Sub -Surface Structure Emissions

Runaway Bay SSC gas results xis, Ambient- Structures

Location	Parameter	Units	28-Jun-08	28-540-08	15-Dec-08	28-Mar-09	5-Jun-09	25-Sep-09	19-Dec-09	4-Jun-10	16-Dec-10	Maximum Cla Reading
31	Сн.	ppm	< 500	<500	<500	20-100-50	<500	sonationa	10-00003	<500	10-040-15	0
9C	HJS	ppm	0	0	0	1	0			0		0
	0;	16 (viv)	20.9	20.9	20.9		20.9			20.9		20.9
32	CH.	ppm	< 500	<500	<500		<500		-	<500		0
	H1S	ppm	0	0	0		0			0		Ö
	02	96 (v/v)	20.9	20.9	20.9		20.9			20.9		20,9
\$3	CH.	opm	< 500	<500	<500	1	<500			<500		0
	H ₂ S	çışırış	0	0	0	-	0			0		0
	02	% (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
64	CH4	ppim	< 500	<500	<500		<500			<500		0
	H ₂ S	ppm	0	0	0		0			0		0
	02	% (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
35	CH.	ppm	< 500	<500 0	<500		<500			<500 0		0
	H ₂ S 0 ₂	ppm % (v/v)	20.9	20.9	0 20.8	-	20.9			20.9		20.9
38	CH4	ppmi	<500	<500	<500		<500			<500		0
20	H ₂ S	ppm	0	0	0		0			0		0
	02	36 (v/v)	20.9	20,9	20.9		20.9			20.9		20.9
37	CH.	ppm	<500	<500	<500		<500			<500		0
51	H ₂ S	ppm	0	0	0	-	0			0		0
	01	56 (viv)	20.9	20.9	20.9		20.9			20.0		20.9
88	CH.	ppm	<500	<500	<500		<500			<500		0
10	H ₂ S	ppm	0	0	0	-	0		-	0		0
	02	55 (viv)	20.9	20.7	20.9	-	20.9			20.9	1	20.9
9	CH.	ppm	<500	<500	<500		<500			-500		0
	H ₁ S	ppm	0	0	0		0		7	0	1	0
	02	% (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
510	CH4	ppm	<500	<500	<500		<500			4503		0
		ppm	0	0	0		0		1	0		0
	H ₂ S O ₂	% (v/v)	20.9	20,9	20.9		20.9			20.9		20.9
511	сн,	ppm	< 500	<500	<500		<\$00			<500	77	0
	H ₂ S	ppm ppm	0	0	0		0			0	1/ 1	0
	07	90 (v/v)	20.9	20.9	20.9		20.9			20.9	1/-/	20.9
12	CH.	ppm	< 500	<500	<500		<500			<500		0
112	Has	ppm	0	0	0		0			0		0
	O ₂	% (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
12A	CH4	ppm	< 500	<500	<500		<500			<500		0
125	H ₂ S	ppm	0	0	0		0			0		0
	01	% (v/v)	20.9	20.9	20.9		20.9		(20.9		20.9
128	CH4	ppm	<500	<500	<500		<500			<500		0
120	H ₂ S	ppm	0	0	0		0		//	3		0
	01	% (v/v)	20.9	20.9	20.9		20.9			719		20.9
12C		ppm	< 500	<500	<500		<500		\leftarrow	<500		0
		øpm	0	0	0		0			0		0
11	0,	% (w/v)	20.9	20.9	20.9		20,9			20.9		20.9
		ppm	0	<500	<500		<500			470		0
	His	ppm	ő	0	0		0			0		0
		% (v/v)	20.9	20.9	20.9		20.9		<u> </u>	20.9	1	20.9
		ppm	NM	NM	NM		NM			<500	-	0
		ppm	NM	NM	NM		NM			0		0
		% (who)	NM	NM	NM		NW			20.9		20.9
		ppm	<500	<500	<500		- (X)			<500		0
		ppm	0	0	0		C			0		0
		96 (W/V)	20.9	20.9	20.0	7	20.9			20.9		20.9
		ppm	< 500	<500	<500		<500			<500		0
		ppm	0	0	0	7-7-	0			0		0
1	02	% (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
		ppm	< 500	<500	<500		<500			<500		0
		opm	0	0	0		0	\rightarrow		0		0
		% (u/v)	20.9	20.9	20.9		20.9			20.9		20.9
		mqu	< 500	<500	<501	77	<600			<500		0
		opm	0	0	0	\rightarrow	0	- V		0		0
		% (w/v)	20.9	20.9	20.9		20.9			20.9		20.9
		m	<500	<500	145520		<500			<500		0
		apres	0	0	0		0			0		0
		% (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
	24	pm	≪ 500	<500	<',00		<500			<500		0
5		apmi -	0	0	0		0			0		0
1		il (viv)	20.9	20.5	20,9		20.9			20.9		20.9
		pm	<500	<500	<500	10	49.0			<500		0
		pm	0	0	0		0			0		0
le le	0, 1	6 (v/v)	20.9	20 3	20.9		20.9			20.9		20.9
		Ind	< 500	-50%	<500		<500			<500		0
		pm	0		0		0			0		0
la	21 3	6 (v/v)	20.9	20.0	20.9		20.9			20.9		20.9
1		¢m	<500	<500	<500		<500			<500		0
		pm	0	0	0		0			0		0
		6 (v/v)	101	20.9	20.9		20.9			20.9		20.9
		pm	< 500	<500	<500		<500			<500		0
-	45		0 1	0	0		0			0		0
5.15		pm	20,9	20.9	20.9		20.9			20.9		20,9
		5 (V ² V) C/T	<500	<500	<500		<500			<500		20,9
		soft s 1/	1000	~500	NOU		1000			1000		
c c		past	U	0	0		0			0		0

TABLE 3: Sub -Surface Structure Emissions

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Runaway Bay SSC gas results xls, Amblent- Structures

Location	Parameter	Units	28-Jun 08	28-540-08	15-Dao-08	20-Mar-09	5-Jun-09	25-Sep-09	18-Deo-09	4-Jun-10	16-Dec-10	Maximum CH Reading
SW Outside	CH,	ppm	< 500	<500	<500	59.010.04 L	<500		74.855.77	<500	The served of the	0
eception	H ₂ S	ppm	0	0	0		0			0		0
	02	% (w/v)	20.9	20,6	20,9		20.9			20.9		20.9
W Main Carpark	CH,	ppm	< 500	<500	<00		<\$00			<500		0
	H ₂ S	ppm	0	0	0		0			0		0
	02	% (v/v)	20,9	20.6	20.9		20.9			20.9		20.9
W Adjaceni	CH4	ppm	NM	<500	<500		<500			<500		0
seniloqma	HIE	ppm	NM	0	0		0			0		0
	0 ₂	% (v/v)	NM	20.9	20.9		20.9			20.9		20,9
Store Room 1	CH4	ppm	<500	<500	<500		<500			1000	<500	1000
	H ₂ S O ₂	pprtt % (v/v)	0	0 20.9	0 20.9		20.9			20.9	20,9	20.9
itore Room 2	CH.		< 500	<500	<500		<500			500	<500	500
	HIS	ppm	0	0	0		0			0	0	0
	0,	54 (v/v)	20.9	20.9	20.9		20.9			20.9	20.9	20.9
Aens toilet main	CH.	ppm	< 500	<500	<500		<500			<500		0
intrance	H ₂ S	ppm	0	0	0		0	-		0		0
	02	% (w/v)	20.9	20.9	20.9		20.9			20.9		20.9
lectrical pit Beach	CH,	ppm	< 500	<500	<500		<500			<500		0
olleyball	H ₂ S	ppm	0	0	0	-	0			0		0
	02	% (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
lewatering Sump	CH4	ppm	< 500	<500	<500		<500			*300		0
	H,S	ppm	0	0	0		0			6.77	A	0
	0 ₂	% (WV)	20.9	20.9	20.9		20,9			20.9		20.9
onlined Space	CH4	ррл	<500	<500	<600		<500			1500	/	0
	H ₂ S	ppm	0	0	0		0			0		0
	0,	% (w/v)	20.9	20.9	20.9	-	20.9			20.9		20,9
lanhole	CH4	ppm	< 500	<500	<500		<500			<500		0
	HS	ppm	0	0	0		0			0		0
	0,	% (V/V)	20.9	20.9	20.9		20.9			73.9		20.9
1	CH.	ppm	<500	<500	<500		<500			*500	72 1	0
	H ₂ S	ppm	0	0	0		0			0		0
	0 ₂	% (v/v)	20,9	20,9	20.9		20.9		~	20.9	777	20.9
	CH.	ppen	< 500	<500	<500		<500	1	~	<500		0
	H2S	ppm	0	0	0	·	0	1		0		0
	02	% (v/v)	20.9	20.9	20.9		20.9			20.9		20.9
	CH4	ppm	<500	<500	<500		<500			500		0
	HIS	ppm	0	0	0		0	07		- 9		0
	0,	% (v/v)	20.9	20,9	20.9		20.9			20,9		20.9
	CH,	ppm	< 500	<500	<500		<500	1		<500		0
	His	ppm	Ó	0	0		0		/	0		0
	02	14 (w/v)	20.9	20.9	20.9		20.9		/-	20.9		20.9
	CH4	ppm	< 500	<500	<500		<500			<500		0
	HJS	ppm	0	0	0		0			0		0
	ō,	% (v/v)	20.9	20.9	20.9		20.0			20.9		20.9
		ppm	< 500	<500	<500		<00	1		4570		0
		ppm.	0	0	0		0		77	0		0
		14 (v/v)	20.9	20.9	20.9		22.9			20,9		20.9
		ppm	< 500	<500	<500		500			<500		0
	H _I S	ppm	0	0	0	-	0		°	0		0
	02	% (v/v)	20,9	20.9	20.9		20.9			20.9		20.9
	CH.	ppm	<500	<500	<500		<5.0	1		<500		0
		ppm	Ö	0	0	1	0	1		0		0
		% (v/v)	20.9	20,9	20,9	7	20.9			20.9		20.9
		opm	< 500	<500	<500	1	<500			<500		0
l.	H ₂ S	ppm	Q	0	0		0		ST.	0		0
		95 (V/V)	20.9	20.9	20.9		20.9			20,9		20.9
		ppm	<500	<500	<500		<500			<500	i	0
Į.	H ₂ S	ppm	0	0	0		0			0	()	0
		36 (v/v)	20.9	20.9	20.9	1. 1. 1.	20.9	2		20.9		20.9
		mqq	< 500	<500	<500	77	<500			<500		0
Ē	4,5	ppm	0	0	0		0			0		0
		% (v/v)	20.9	20.9	20.3	1	20.9			20.9		20 9
2 0		opm	<500	<500	<502		<500	27		<500		0
		mag	0	0	0		0			Ó		0
		% (w/v)	20.9	20.9	729		20.9			20.9		20.9
3 0	SH4	ipin	< 600	<500	+500	0	<500			<500		0
l.	H ₂ S	pm	0	0	0		0			0		0
la la		% (v/v)	20,9	20.9	20.9		20.9			20.9	1	20.9
		pm	<500	<500			<500			<500		0
		ipm	0	0	0					0		0
		6 (WV)	20.9	20.5	20.9	<u> </u>	20.9			20.9		20.9
		¢m	< 500	7.00	<\$00		<500			<500		0
		mqq	0		0		0			0		0
		4 (viV)	20.9	20.0	20.9		20.9			20.9		20.9
		pm	<500	<500	<5.00		<500			<500		0
Beach Volleyball		ipm	0	0	0		0			0		0
		6 (viv)	2).9	20.9	20.9		20.9			20.9		20.9
		pm					<500			<500		0
rage Containers		pm /					0			0		0
		201				_	20.9			20.9		20.9

Notes: Methan Trigger Level = 1.25 % Wv or 12.500 pp:n (Environmental Guideline's Said Wrste Landfills, NSW EPA, 1996) Shading indicates exceedence of Vigger level NM # Scation net markhand * Parkit Imnohising round completed March 2009 E = Electrical pit S Stormwater drain L=Ligith role

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TABLE 3: Sub -Surface Structure Emissions

Runaway Bay SSC gas results xls, Ambient- Structures



21 June 2010

Mr Nick Pye Sports Super Centre Cnr Sports Drive and Morala Avenue RUNAWAY BAY QLD 4216 Our ref: 41/2033 Your ref:

41/20337/406167

Dear Nick,

Landfill Gas Monitoring June 2010 Report

As requested, GHD attended the Sports Super Centre site on the 4 June 2010 to undertake a full round of landfill gas monitoring (monitoring of all site locations). Table 1 attached, provides details on general observations made on the day and Table 3 outlines the results for the selected structures monitoring locations.

All locations were compliant with the relevant adopted (rigger level (12,500 ppm methane) during the June round of monitoring; however detectable levels of methane were recorded at the following locations.

Location E12 (an electrical pit located in the northern end of the west car park adjacent the oval), and location E26 (and electrical pit located at the southern boundary to the west car park) returned results of 1000 ppm methane. Although this methane level is below the relevant adopted trigger level of 12,500 ppm methane, it represents an increase in concentration at both locations since the last monitoring round in December 2009.

Location E25 (an electrical pit) located in northern end of the west car park, returned a result of 500 ppm methane. This is a decrease in methane concentration when compared to the previous December 2009 round of monitoring (1000 ppm).

Location West car park NE corner returned a result of 500 ppm methane this round which is within the lower end of the range of historical results for this location.

Storerooms 1 and 2 recorded results of 1000 ppm methane and 500 ppm methane respectively. This appears to be the first time a detectable result has occurred in either of these locations. It is noted that after approximately 5 minutes, the store rooms were monitored again, with no detectable levels of methane recorded, indicating that any build up of methane quickly dissipated. It is recommended that these two locations be added to the next round of monitoring.

Based upon this information, it is recommended that:

- Storerooms 1 and 2 be regularly opened and vented to allow any potential methane build up to dissipate. Future monitoring events will be used to determine methane concentration trends at these locations, and whether any further action is required to manage the accumulation of methane at these locations.
- 2. Biannual monitoring (as a minimum) be scheduled at the selected locations detailed below to continue assessing trends in gas conditions for the site. It is recommended that another partial round

GHD Pty Ltd ABN 39 008 488 373 201 Charlotte Street Brisbane QLD 4000 GPO Box 668 Brisbane QLD 4001 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com.au W www.ghd.com.au



of monitoring be undertaken in December 2010, for the selected locations, with the addition of Storerooms 1 and 2. A full assessment (monitoring of all site locations) is recommended to continue on an annual basis.

Locations that should remain on a 6 monthly monitoring schedule

E10, E12, E21, E24 Left, E24 Right, E25, E26, West Car Park NE Corner, West Car Park NE Corner, West Car Park Right NW Corner, West Car Park NW Corner, Storeroom 1 and Storeroom 2.

If you have any questions or require any further details, please don't hesitate to contact Adam Major or myself.

Yours sincerely,

Bellin

Belinda Oberia Environmental Scientist (07) 3316 3954

41/20337/406167

Runaway Bay Former Landfill: Spots Super Centre - Landfill Gas Management Strategy

TABLE 1: General Weather Conditions and Site Observations

Date	Atmosph	eric Pressure	Wind Speed	Mind Direction (degrees)	Temp.	Weat	ner Conditions	Rainfall Over Preceding Week		-
Section of the	(hPa)	Rising/Falling	(km/h)	(degrees)	(**)	Current	Preceding Week	(mm)	Comments	Initials
26-Jun-08	1023.1	Falling	17	315	16.3	Fine conditions, cool a.m. warming and dry with light breeze.	Predominantly fine conditions with only light showers.	20	Monitoring locations clearly visible with genrally good access. Some pits/drains not as per map, some on site not shown etc. Gas equipment measures CH4 >500ppm only	Initials TK
26-Sep-08	1020.2	Falling	20	O	23.9	Light early showers, then fine, Light S to SE winds	Predominately fine conditions	1.4	Site acess good, map locations approximate only. Gas equipment measurcs CH4 >500ppm only. Gas ike odour in south west carpark	во
15-Dec-08	1006.2	Rising	22	270	26.8	Fine and sunny with light breeze.	Some showers,	20,6	Site acess good, map locations approximate only. Gas equilyment measures CH3 >000pam cnly. Some water observed in electrical pits in wast carpark.	во
26-Mar-09	1021.7	Falling	22	155	26.7	Fine and sunny with light breeze.	Predominantly fine conditions with light showers.	6.8	Portial assessment only (9 locations). Recent addition of vent at NE conner of west carpark. Sas squipment mecures CH4 > 500ppm city.	во
5-Jun-09	1016.3	Falling	7	292.5	24.4	Overcast with showers. Slight WNW breeze	Gome shovers	19.6	Site aces: good, map locations approximate only. Gas equipment measures CH4 >300ppm only. Some water observed in electrical pits in west carpark.	BO
25-Sep-09	1017,3	Falling	7	90	23.5	Overcast with showers. Slight WNW breeze	Predominantly fine and sunny	0.6	Partial assessment only (10 locations). Good site acess, vents operating effectively. Gas equipment measures CH4 >500ppm only.	во
19-Dec-09	1015.5	Falling	17	22.5	26.1	Cloudy and overcast. 7/8 cloud cover. Light breeze. Storms predicted	Mostly fine with light showers	3.2	Partial assessment only (10 locations). Good site acess, vents operating effectively. Gas equipment measures CH4 >500ppm only.	во
4-Jun-10	1012.6	Felling	17	315	16.5	Fine and sunny with light breeze.	Some showers.	140.22	Full site assessment. Good site acess, vents operating effectively. Gas equipment measures CH4 >500ppm only.	во

Atmospheric pressure, wind speed/ direction, temperature and daily rainfall data to be obtained from the Bureau of Meteorology, Gold Coast Seaway Station (No 40764.)

Runaway Bay SSC gas results_1.xls, General Info

DETE RTI application 340/5/3308 - File B: Runaway Bay Sport and Leadership Excellence Centre - Document 318 of 323

Location	Parameter	Units		and the second		Sampling			Autor Anna	Contraction of
LOCATION	T AF OLIVELET	UNDS -	25-JUN-08	20-510-03	15-Diro-08	25-114-09	5-JUN-09	25-540-09	19-Dec-09	4-Jun-10
	Boundary Wells									
MW1	CH.	% (WV)	0	0	0	NM	0	NM	NM	0
	H2S	ppm	0	0	0	NM	0	NM	NM	0
	02	% (v/v)	20.9	20.9	20.9	NM	20.9	NM	NM	20,9
MW2	CH4	% (v/v)	0	0	0	NM	0	NM	NM	0
	H ₂ S	ppm	0	0	0	NM	0	NM	NM	0
	0,	% (VM)	19,4	20.9	19	NM	20.1	NM	NM	20.2
WW3	CH4	% (W/V)	0	NM	NM	NM	NM	NM	NM	NM
	H ₂ 8	ppm	0	NM	NM	NM	NM	NM	NM	NM
	02	% (w/v)	18,7	NM	NM	NM	NM	NM	NM	NM
WW4	CH,	% (wV)	0	0	0	NM	sei lioa	NM	NM	0
	H ₂ S	ppm	0	0	0	NM	Ø	NM	NM	0
	02	% (v/v)	20.1	20.9	20.5	NM	20.5	NM	NM	20.5

TABLE 2: Boundary Soil Atmosphere Gas Monitoring Wells

Notes:

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Methane Trigger Level = 1.25 % v/v (Environmental Guidelines: Solid Waste Landfille, NSW EPA, 1998) Shading indicates exceedance of bigger level

Bold Indicates detection of methane

NM = Parameter not monitored this round

Runaway Bay SSC gas results_1.xls, Soil Gas Wells

21/08/2010

DETE RTI application 340/5/3308 - File B: Runaway Bay Sport and Leadership Excellence Centre - Document 319 of 323

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Location	Parameter	Units	-	States and the second	1	1	1	1	-		Maximum Ch
T4	and the second second	The second second	26-Jun-08	26-Sep-08	15-Dec-08	28-Mar-09	5-Jun-09	25-Sep-09	19-Dec-09	4-Jun-10	Reading
E1	CH4	ppm	< 500	< 500	< 500		< 500			< 500	0
	H ₂ S O ₂	ppm % (v/v)	0 20.9	0 20.9	0 20.9		0 20.9	-		0 20.9	0 20.9
F0	CH4			-							
E2	and the second s	ppm	< 500	< 500	< 500		< 500			< 500	0
	H ₂ S	ppm	0	0	0		0			0	0
	0,	% (v/v)	20.9	20,9	20,9		20.9			20.9	20,9
E3	CH4	ppm	< 500	< 500	< 500		< 500			< 500	0
	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20,9	20.9		20,9			20.9	20.9
E4	CH4	ppm	< 500	< 500	< 500		< 500			< 500	0
	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20.9			20.9	20,9
E5	CH4	ppm	< 500	< 500	< 500	-	< 500			< 500	0
	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20,9			20,9	20.9
E6	CH,	ppm	< 500	< 500	< 500		< 500			< 500	0
	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20.9			20,9	20,9
	-			_							
E7	CH4	ppm	<500	<500	<500		<500			<500	0
	H ₂ S	ppm	0	0	0		0		$\Delta \Delta D$	0	0
	02	% (v/v)	20.9	20,9	20,9		20,9			20.9	20.9
E8	CHe	ppm	<500	<500	<500		<500			<500	0
	HIS	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20.9		5	20,9	20.9
E9	CH4	ppm	<500	<500	<500		<500	12.5		<500	0
	H ₂ S	ppm	0	0	0		0		1 - 1 1	0	0
	02	% (v/v)	20,9	20,9	20.9		20,9	1	1.	20.5	20,9
E10	CH4	ppm	<500	<500	<500	<500	<500	< 500	< 500	<60C	0
	H ₂ S	ppm	0	0	0	0	0	0	0	<u> </u>	0
	02	% (v/v)	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20,9	20,9
11	CH,		<500	<500	<500	20.0	<500			<500	0
	H ₂ S	ppm									
	0,	ppm	0	0	0		0	<u> </u>		20.9	0
	-	% (v/v)	20.9	20.9	20.9		20,5				20.9
12	CH4	ppm	1000	<500	<500	500	1000	< 500	< 500	1000	1000
	H ₂ S	ppm	0	0	0	0	•	0	0	0	0
	02	% (v/v)	20.7	20.9	20.5	20.9	20,5	20.9	20.9	20.9	20.9
13	CH4	ppm	< 500	<500	<500		-500			<500	0
	H ₂ S	ppm	0	0	0		0	$\langle \rangle$		0	0
	02	% (v/v)	20.9	20.9	20.6		20,9		/	20.9	20,9
14	CH.	ppm	< 500	<500	<500	2 6	<500			<500	0
	H ₂ S	ppm	0	0	0	M	0			0	0
	0,	% (v/v)	20.9	20.9	20.9		20.9			20.9	20,9
14	CH.	ppm	< 500	<500	< 500		<500			<500	0
outh Left	HIS	ppm	0	0	0		0	2		0	0
Out Leit	02	% (v/v)	20,9	20.9	20.9	1	20,9			20,9	20.9
						1					
14	CH.	ppm	< 500	<500	<(500	1	.:500	~		<500	0
outh Right	HIS	ppm	0	0	2	í	0			0	0
	02	% (v/v)	20.9	20,9	20.9		20,9			20,9	20,9
15	CH4	ppm	< 500	<500	<50.)		<500			<500	0
	H ₂ S	ppm	0	0	0	2.	0			0	0
	02	% (v/v)	20,9	20,5	20.9		20,9			20.9	20,9
15	CH4	ppm	< 500	<500	<500		<500			<500	0
orth	H ₂ S	ppm	0	0	0		0	21		0	0
	02	% (v/v)	20.9	20.9	20.9		20.9			20,9	20,9
16	CH4	ppm	<500		<500		<500			<500	0
	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20,9	20,9	20.9	×/	20.9			20,9	20.9
16 North	CH4	ppm	<500	<5,00	<500	<u> </u>	<500			<500	0
	H ₂ S	ppm	0	0	<500		<500			<500	0
	01	% (v/v)	20.9	20.9	20,9		20.9			20.9	20.9
7	CH4	ppm	<500	<500	<503		<500			<500	0
	H ₂ S	ppm	0	0	0		0			0	0
	01	% (v/v)	20.9	20.0	20.9		20.9			20.9	20.9
8		pr.m	<500	<500	<500		<500			<500	0
	HIS	opri	0	0	0		0			0	0
		16 1.50	20.9	20.9	20.9		20.9			20,9	20.9
		ppin	<500	\$500	<500		<500			<500	0
	H2S	ppm	0	0	0		0			0	0
3	02	% (v/v)	20.9	20.5	20.9		20.9			20,9	20,9
	CH4	ppm	< 500	<500	<500		<500			<500	0
	H ₂ S	ppm	0	0	0		0			0	0
		% (v/v)	20.9	20,9	20.9		20.9			20.9	20,9
		ppm	< 500	<500	<500		<500			<500	0
		ppm	0	0	0		0			0	0
		% (v/v)	20.9	20.9	20,9		20,9			20,9	20.9
		ppm	< 500	<500	<500		<500			<500	0
		ppm	0	0	0	1	0			0	0
		% (v/v)	20.9	20.9	20.9		20.9			20.9	20.9

Runaway Bay SSC gas results_1.xls, Ambient- Structures

21/06/2010

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Location	Parameter	Units	1.5-17-01-0	and the second	A STATE OF A STATE	The card a family	and the second	The state of the	ALM THE	All states	Maximum CH
accuson.			25-Jun-08	26-Sep-08	15-Dec-08	26-Mar-09	6-Jun-09	25-Sep-09	19-Dec-09	4-Jun-10	Reading
E21	CH4	ppm	< 500	<500	<500		500	< 500	< 500	<500	500
	H ₂ S	ppm	0	0	0		0	0	0	0	0
	0,	% (v/v)	20.9	20.9	20,9		20.9	20.9	20.9	20,9	20.9
E21	CH4	ppm	< 500	<500	<500		<500			<500	0
Left	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/V)	20,9	20.9	20.9		20,9			20,9	20,9
E21	CH4	ppm	< 500	<500	<500		<500			<500	0
Right	H ₂ S	ppm	0	0 20.9	0 20.9		0			0 20.9	0
200	0,	% (v/v)	20.9				20,9				20,9
E22	CH4	ppm	<500	<500	<500		<500 0			<500	0
	H ₂ S O ₂	ppm % (v/v)	20,9	20.9	20.9		20.9			20,9	20.9
E22	CH4	_	<500	<500	<500		<500			<500	0
Loft	H ₂ S	ppm ppm	<500	0	0		0			0	0
Lon	0,	% (v/v)	20,9	20,9	20.9		20.9			20.9	20.9
E22	CH4	ppm	<500	<500	<500		<500		-	<500	0
Right	H ₂ S	ppm	0	0	0		0			0	0
A. S. L.	02	% (v/v)	20.9	20.9	20.9		20,9			20.9	20.9
E23	CH4	ppm	<500	<500	<500		<500			<500	0
22.0	H ₂ S	_	0	0	0		0			0	0
	02	ppm % (v/v)	20,9	20,9	20.9		20.9			20.9	20.9
	- Contraction of the Contraction										
23	CH4	ppm	<500	<500	<500		<500			<500	0
.eft	H ₂ S	ppm P/ (v/v)	0	0	0		0			0	0
22	02	% (v/v)	20.9	20,9	20.9		20.9			20.9	20.9
23	CH4	ppm	< 500	<500	<500		<500	- <u>_</u>		<500	0
tight	HJS	ppm	0	0	0		0			0	0
	02	% (v/v)	20,9	20.9	20.9		20.9	223		20.9	20,9
24	CH4	ppm	< 500	<500	<500	-	<500	1	<u> </u>	<500	0
	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20,9			17.1	20.9
24	CH4	ppm	< 500	<500	500	<500	500	< 500	< 500	<500	500
eft	H ₂ S	ppm	0	0	0	0	0	0	0	0	0
	02	% (v/v)	20.9	20.9	20.9	20.9	20,9	20.9	2.0.9	20.9	20.9
24	CH4	ppm	< 500	<500	<500	<500	<5'00	500	< 502	<500	0
light	H ₂ S	ppm	0	0	0	0	<u> </u>	0	2	0	0
	02	% (v/v)	20.9	20,9	20,9	20.9	20.9	20.9	20.9	20.9	20.9
25	CH4	ppm	< 500	<500	1000	500	1002	< 500	1000	500	1000
	H ₂ S	ppm	0	0	0	0	C S	0	0	0	0
	02	% (v/v)	20.9	20.9	20.9	20.9	20.7	20,9	2'J.9	20.1	20,9
26	CH4	ppm	< 500	<500	<500	<500	<500	< 500	500	1000	1000
	HIS	ppm	0	0	0	0	0	0	0	0	0
	02	% (v/v)	20,9	20,9	20,9	20.9	20,9	20.9	20.9	19,1	20.9
27	CH4	ppm	<500	<500	<500		<500			<500	0
	H ₂ S	ppm	0	0	0	177	0			0	0
	02	% (v/v)	20.9	20.9	20.9	2-12	20.9			20,9	20.9
28	CH4	ppm	<500	<500	<500		<500			<500	0
	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20,9			20.9	20,9
29	CH4	ppm	<500	<500	<500		<5(-0			<500	0
	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.6	1.7	20.5			20.6	20.9
30	CH4	ppm	<500	<500	<500	·	<500			<500	0
	H ₂ S	ppm	0	0	2		0			0	0
	02	% (v/v)	20.9	20.9	20,9		20.9			20,9	20,9
31	CH4	ppm	<500	<500	<500		<500			<500	0
741	H ₂ S	ppm	0	0	0		0			0	0
	0,	% (v/v)	20.9	20.8	20.3		20.3			20.3	20.9
lest Car park	CH4	ppm	<500	0	3500	21000	1500	< 500	< 500	500	21000
E Comer	H2S	ppm	0	0	0	0	0	0	0	0	0
	0,	% (v/v)	20.9	20.9	20.9	16,1	20.9	20.9	20.9	20.4	20.9
est Gar park	CH,	ppm	<500	<300	<500		<500			<500	0
It NE Corner	HIS	ppm	0		0		0			0	0
	02	% (v/v)	20.9	30.9	20.9	777	20.9			20,9	20.9
est Car park	CH		4000	<500	500	1000	<500	< 500	1000	<500	4000
ight NW Comer	H ₂ S	ppm	4000	0	0	0	0	0	0	<i>σ</i>	4000
With 1444 Comer	01	% (v/v)	15.6	20.9	20.9	20.9	20.9	20.9	20,9	20.9	20.9
last Catanat							<500	< 500	< 500	<500	0
est Car park	CH4	ppm	<500	<500	0	<500		< 500	< 500	<500	0
N Comer	H ₂ S	ppm	0	0	2	0	0				
	02	% (v/v)	2'J.9	20.9	20.9	20.9	20,9	20.9	20.9	20,9	20.9
est Car park	CH4	ppm	<500	<500	0		<500			<500	0
N Edge	H ₂ S	prm	0	0	0		0			0	0
	02	% f./v)	20.9	20.9	20.4		20.4			20.4	20.9
entral Light Pole	CH4	pp;ч	<500	<500	<500		<500			<500	0
	H ₂ S	ppm <	0	0	0		0			0	0
	02	% (V/v)	20.9	20.9	20.9		20,9			20,9	20.9
oreboard light	-										
lo	CH4	ppm	<500	<500	<500		<500			<500	0
	H ₂ S	ppm	0	0	0		0			0	0
	0,	% (v/v)	20.9	20,9	20.9		20.9		Contraction of	20,9	20,9
ala add a t											
pip adj Lodge 9		ppm	NM	NM	NM		NM			NM	0
1.		ppm	NM	NM	NM		NM			NM	0
	01	% (v/v)	NM	NM	NM		NM			NM	0.0

Runaway Bay SSC gas results_1.xts, Amblent- Structures

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Runaway Bay Former Landfill - Sports Super Centre

Location	Parameter	Units		1 - 12 - 12 - 12 - 12 - 12 - 12 - 12 -	1 Shile"		ALL DUPLE	T Participant		1	Maximum CH
		a server of	26+Jun-08	26-Sep-08	15-Dec-08	26-Mar-09	5-Jun-09	25-Sep-09	19-Dec-09	4-Jun-10	Reading
S1	CH4	ppm	< 500	<500	<500		<500			<500	0
	H ₂ S O ₂	ppm	20.9	0	0 20.9		0 20.9		-	0 20.9	0
32	CH4	% (v/v)		20,9			-				20.9
52		ppm	< 500	<500	<500		<500			<500	0
	H ₂ S O ₂	ppm	0 20.9	20,9	0 20.9		0 20.9			0 20.9	0
		% (v/v)									20.9
93	CH4	ppm	< 500	<500	<500		<500			<500	0
	H2S	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20,9		20.9			20,9	20.9
S4	CH4	ppm	< 500	<500	<500		<500			<500	0
	H ₂ S	ppm	0	0	0		0			0	0
	01	% (v/v)	20.9	20.9	20,9		20.9			20,9	20.9
S5	CH4	ppm	< 500	<500	<500		<500			<500	0
	H2S	ppm	0	0	0		0			0	0
	02	% (v/v)	20,9	20.9	20.9		20.9			20.9	20,9
\$6	CH4	ppm -	<500	<500	<500		<500			<500	0
	HIS	mqq	0	0	0		0		+=	0	0
	02	% (v/v)	20.9	20.9	20,9		20.9		1	20.9	20,9
97	CH4	ppm	<500	<500	<500		<500			<500	0
	HIS	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20.9		1074	20.9	20.9
88	CH4	ppm	<500	<500	<500		<500			<500	0
	H,S	ppm	0	0	0		0		100	0	0
	0,	% (v/v)	20.9	20.7	20.9		20,9		1	20.9	20.9
9	CH,	ppm	<500	<500	<500		<500			<500	0
	H ₂ S		0	0	<500		0			0	0
	01	ppm % (v/v)	20,9	20,9	20.9		20.9			20.9	20.9
10	CH4										
510	H ₂ S	ppm	<500	<500	<500		<500		<u>A</u>	<500	0
	H25 O2	ppm	0	0	0		0		/	0	0
		% (v/v)	20.9	20.9	20.9		20,9	4		20.9	20,9
11	CH4	ppm	< 500	<500	<500		<500			<550	0
	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20,9			29.9	20,9
12	CH	ppm	< 500	<500	<500		<500	VA Y	LAN_	<500	0
	H ₂ S	ppm	0	0	0		0		$\langle \langle \rangle \rangle$	0	0
	02	% (v/v)	20.9	20.9	20.9		20.9		∇	20.9	20,9
12A	CH4	ppm	< 500	<500	<500		<500			<500	0
	H ₂ S	ppm	0	0	0		0	14	17 A	0	0
	02	% (v/v)	20.9	20.9	20.9		20,9		1.7.7.7.7.	20.9	20,9
128	CH	opm	<500	<500	<500		<500			<500	0
	H ₂ S	ppm	0	0	0		0			0	0
	O2	% (v/v)	20.9	20.9	20.9	710	23,9	77		20.9	20.9
120	CH4	ppm	< 500	<500	<500		<500	<u> </u>		<500	0
	H ₂ S	opm	0	0	0		0		7	0	0
	02	% (v/v)	20,9	20.9	20.9		20.9			20.9	20.9
12D	CH4	ppm	0	<500	<500		<500			<500	0
120	HIS	ppm	0	0	0		0			0	0
	0;	% (v/v)	20.9	20.9	20.5		20.9			20.9	20.9
10										11	
13	CH4	ppm	NM	NM	Nh		NM			<500	0
	H ₂ S	ppm	NM	NM	NM		NM		1	0	0
	02	% (v/v)	NM	NM	NM		NM			20,9	20,9
14	CH4	ppm	<500	<500	<5(10		<:00	1		<500	0
	H2S	ppm	0	0	U		0	ru		0	0
	02	% (v/v)	20.9	20.9	20.9		20.3	1		20.9	20.9
15	CH4	ppm	< 500	<500	<:60C		<500			<500	0
	H ₂ S	ppm	0	0	0		0	· · · · · · · · · · · · · · · · · · ·		0	0
	02	% (v/v)	20.9	20.9	20.9		20.9			20,9	20.9
16	CH4	ppm	< 500	<500	<500		<500			<500	0
	NAME OF TAXABLE PARTY.	ppm	0	0	0		0			0	0
	02	% (v/v)	20,9	20.9	20,9		20.9			20.9	20.9
17	CH.	ppm	< 500	<5'J0	<500		<500			<500	0
	H ₂ S	ppm	0	0	0		0			0	0
		% (v/v)	20.9	20.9	20.9	77-	20.9			20.9	20.9
8		ppm	<500		<500		<500			<500	0
	and the second sec	ppm	2	0	0		0			0	0
	01	ppm % (v/v)	20.9	20.9	20.9	<u> </u>	20.9			20.9	20.9
		the second s				V					
		ppm	< 500	<500	<500		<500			<500	0
	H ₁ S	ppm	0	0	0		0			0	0
		% (v/v)	20.9	20.9	20.9		20.9			20,9	20.9
		ppm	~500	<500	<500		<500			<500	0
		ppr/	0	0	0		0			0	0
		%e (V'v)	20.9	20.9	20.9		20.9			20.9	20.9
		ppn:	< 5′00	<'00	<500		<500			<500	0
	H ₂ S	pp.m (Ő	0 1	0		0			0	0
		% (v/v)	20.9	20.9	20.9		20,9			20.9	20.9
		ppm	<500	<500	<500		<500			<500	0
	and the second s	ppm	0	0	0		0			0	0
		% (v/v)	20.9	20.9	20.9		20.9			20,9	20.9
				<500						<500	
		ppm	< 500		<500		<500				0
		ppm	0	0	0		0			0	0
		% (v/v)	20.9	20.9	20.9		20.9			20.9	20.9
	CH4	ppm	<500	<500	<500		<500			<500	0
1	H ₂ S	ppm	0	0	0		0	1	an an an an an	0	0
	07	% (v/v)	20.9	20.9	20.9		20.9			20,9	20.9

Runaway Bay SSC gas results_1.xle, Ambient- Structures

21/06/2010

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Location	Parameter	Units		The second	NE DOUND		A State of the second	1	1		Maximum C)
THE DECEMBER	of the set of the set of the	a contract	25-Jun-08	26-Sep-08	15-Dec-08	26-Mar-09	5-Jun-09	25-Sep-09	19-Dec-09	4-Jun-10	Reading
SW Outside	CH4	ppm	< 500	<500	<500		<500			<500	0
reception	H ₂ S O ₂	ppm	0	0	0		0			0	0
SW Main Carpark		% (v/v)	20.9	20.6	20,9		20.9			20.9	20.9
ova waan carpara		ppm	< 500 0	<500	<500 0		<500			<500	0
	H ₂ S O ₂	ppm % (v/v)	20.9	20.6	20.9		20.9			20,9	20.9
Charles and a start of the second	CH.	ppm	NM	<500	<500		<500			<500	0
SW Adjacent trampolines	H2S	ppm	NM	0	0		0			0	0
anifolinea	02	% (v/v)	NM	20.9	20,9		20.9			20,9	20.9
Store Room 1	CH.	ppm	<500	<500	<500		<500			1000	1000
otore riounn i	H ₂ S	ppm	0	0	0		0			0	0
	0,	% (v/v)	20.9	20.9	20.9		20.9			20.9	20,9
Store Room 2	CH4	ppm	< 500	<500	<500		<500		-	500	500
	HIS	ppm	0	0	0		0			0	0
	0,	% (V/V)	20.9	20.9	20.9		20,9		-	20,9	20.9
Mens toilet main	CH,	ppm	< 500	<500	<500		<500			<500	0
intrance	H ₂ S	ppm	0	0	0		0			0	0
	02	% (v/v)	20,9	20.9	20,9		20.9			20.9	20.9
Electrical pit Beach		ppm	< 500	<500	<500		<500			<500	0
/olicybali	H ₂ S	ppm	0	0	0		0			0	0
	0,	% (v/v)	20.9	20.9	20.9		20.9		101	20,9	20.9
Dewatering Sump	CH4	ppm	< 500	<500	<500		<500			<500	0
and sources of the second	HJS	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20.9			20.9	20.9
Confined Space	CH4	opm	<500	<500	<500		<500	1-272	1	<500	0
	H ₂ S	ppm	0	0	0		0			0	0
	0,	% (v/v)	20.9	20.9	20.9		20.9	777		20.9	20,9
Aanhole	CH.	ppm	< 500	<500	<500		<500	5		<500	0
	HIS	opm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.9		20,9		17	20.9	20.9
1	CH4	ppm	<500	<500	<500		<500	<u> </u>		<500	0
	HIS	ppm	0	0	0		0		15	0	0
	02	% (v/v)	20,9	20.9	20.9		20.9	1		20.9	20.9
2	CH4	ppm	< 500	<500	<500		<50.0			<500	0
	H ₂ S	ppm	0	0	0		0 77		775	0	0
	02	% (v/v)	20.9	20.9	20.9		20,3		2000	20.9	20.9
3	CH4	ppm	<500	<500	<500		<500			<500	0
	HIS	ppm	0	0	0	<	U U		77 ~	0	0
	02	% (v/v)	20,9	20.9	20.9		20.9		777	20,9	20.9
4	CH4	ppm	< 500	<500	<500		<500			<500	0
	HzS	ppm	0	0	0		0			0	0
	0,	% (v/v)	20.9	20,9	20.9	AC	20.9	77	<u> </u>	20.9	20.9
5	CH4	ppm	< 500	<500	<500		<500			<500	0
	HyS	ppm	0	0	0		0		7	0	0
	02	% (v/v)	20.9	20.9	20,9		20.9			20,9	20.9
6	CH4	ppm	< 500	<500	<500		<500			<500	0
·	HIS	ppm	0	0	0		0			0	0
	02	% (v/v)	20.9	20.9	20.3		20.9			20.9	20,9
7	CH4	ppm	< 500	<500	<520		<501			<500	0
	HS	ppm	0	0	0		n			0	0
	02	% (v/v)	20.9	20,9	20.9		20.9			20.9	20.9
3	CH4	ppm	<500	<500	<500		- 500			<500	0
5	H ₂ S	ppm	0	0	3	/	0			0	0
	0;	% (w/v)	20.9	20.9	20.9		20.9			20.9	20,9
)	CH.	ppm	< 500	<500			<500			<500	0
e .	HIS	ppm	0	0	0		0	1		0	0
1	02	% (v/v)	20.9	20.9	20.9		20.9			20.9	20,9
0	CH4	ppm	<500	<501	<500		<500			<500	0
	and the second s	ppm	0	0	0		0			0	0
		% (v/v)	20.9	20.9	20.9	\rightarrow	20.9			20,9	20.9
1		ppm	< 500	<f.00< td=""><td><500</td><td></td><td><500</td><td></td><td></td><td><500</td><td>0</td></f.00<>	<500		<500			<500	0
	H ₂ S	ppm	0		0		0			0	0
		% (v/v)	20.9	20.9	20.9		20.9			20.9	20.9
2		ppm	<500	-000	<500		<500			<500	0
	the second s	ppm	0		0		0			0	0
19		% (v/v)	20.9	20.9	20,9	<u> </u>	20.9	1	1	20.9	20.9
		ppm	< 502	<500	<500	V	<500			<500	0
		ppm	0	0			0			0	0
		% (v/v)	20.9	20.9	20.9		20,9	1		20.9	20,9
		ppm	<500	<500	<500		<500			<500	0
	and the second design of the s	ppm ppra	0	0	0		0			0	0
		P/4 (V/V)	20.9	20.9	20.9		20.9			20,9	20.9
			< 500							<500	
		ppm			<500		<500				0
ntral Stairs		ppm	0	0	0		0			0	0
		% (v/v)	20,9	20.9	20.9		20.9			20.9	20.9
		ppm	<500	<500	<500		<500			<500	0
Beach Volleyball		ppm	0	0	0		0			0	0
		% (v/v)	20,9	20.9	20,9		20.9			20,9	20,9
		mqq					<500			<500	0
arage Containers	H ₂ S	ppm					0			0	0
behind lodges	02	% (v/v)					20.9			20.9	20.9

 Notes:
 Methane Trigger Level = 1.25 % v/v or 12,500 ppm (Environmental Guidelines: Solid Waste Landfilis, NSW EPA, 1996)

 Shading Indicates exceedance of brigger level.
 NM = location not monitored.

 NM = location not monitored.
 Partial monitoring round completed March 2009

 E = Electrical pit
 S Stormwater drain

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