

THE WEEKLY

February 21, 2014



Cayman International School's Newsletter CURRENT

Vol. 1, Ed. 25

CIS EXPANSION ANNOUNCEMENT

CIS is happy to announce it has reached an agreement with Dart to expand the school's facilities. Cayman International School began as an



educational institution ten years ago, and has quickly established itself as a premier school of excellence in the Caribbean. Since its inception, student enrollment has significantly increased each year; CIS currently serves 505 students ages 2-18, and space for growth is extremely limited. Over the past year, CIS, International Schools Services (owner and manager of CIS), and DART have engaged in collaborative discussions with the intention of expanding the CIS facility. In February of 2014, these parties made a collective decision to move forward with the school expansion. There is still finalization and work and planning to be completed regarding many aspects of the expansion, but this is a milestone moment in the life of Cayman International School as the campus facility develops, capacity and programming increases, and CIS is able to offer educational excellence to more of Cayman's children. A community meeting will take place in the next 6-8 weeks for the purpose of sharing project details, asking questions about the expansion, and helping us plan for our future. Stay tuned to future newsletters for updates regarding the school expansion.

Events

- Feb 25 Grade 6 Parent Night, Kaibo Trip, 5:30-6:30pm
- Feb 25 EC Parent Series, Literacy, 6:00-7:15pm
- Feb 26, 27, 28 Lunch orders and ticket sales, 7:00-8:30am
- Feb 27 ES Assembly, (ARC), 9:00am
- Feb 26 Adventures in Motion, (ARC) 7:00-8:00pm
- Feb 28 Secondary Track Meet
- Mar 3, 4 Faculty In-Service Days, no School for students
- Mar 5 Public Holiday, Ash Wednesday, No School
- Mar 6, 7 Mid-Term Break, No School
- Mar 11 Secondary Parent Night, Cyber Bully Awareness, 5:30-6:30pm
- Mar 12 Science Fair, ARC, 3:30-5:30pm
- Mar 13 Secondary Coed Volleyball, CIS vs CCC, (ARC), 3:45-5:30pm
- Mar 14 Afterschool Activities Session 2 Ends
- Mar 14 MS Dodgeball, (ARC), 6:00-8:00pm
- Mar 15 Open Library Morning, 9-11:30am

Cayman International School Performing Arts Department Presents

Wednesday 26 February

@ 7pm in the ARC

Adventures Feet of Flames in Motion

CIS Google Calendar link:
http://www.google.com/calendar/embed?src=cayintschool.edu.ky_ov62hbdem2gnqt5ijm8dc1tmvk%40group.calendar.google.com&ctz=America/Chicago

**AFTER SCHOOL GANG
(ASG) LOCATION IS IN B2
FOR FEBRUARY**



Cayman International School

P.O. Box 31364, Grand Cayman, KY1-1206

Phone: 345.945.4664 | Fax: 345.945.4650 | Email: cis@cayintschool.ky

CIS COMMUNITY NEWS

Adventures Feet of Flames In Motion

This performance will involve the following students:

- **All Grade 6,7 & 8 drama students** (who should wear their required black trousers and t-shirt) and it is part of their semester performance grade.
- **Our PK3&4 students** (who should wear their khaki school bottoms and white polo shirt –or plain white T)
- **K-G2 Drama group** – who need to attend in their black trousers and black t-shirts (if they are also dancing, they should wear their leotard underneath their pants instead of needing a black t-shirt).
- **All our K-Grade 12 ballet students** (who should wear regulation black leotard, pink tights and pink ballet shoes)
- **All our K-Grade 12 dance team students** (who should wear regulation black leotard, black jazz pants and black jazz shoes)

All students are asked to attend with their hair tied securely off their face and jewelry should be left at home for reasons of safety.

All drama and mime and movement students will be performing with bare feet.

We ask that students arrive at 6:30 and meet back stage. The performance will commence at 7:00pm, and is expected to last about an hour.

PLEASE NOTE: There will be no dance team and drama clubs on Wednesday February 26 as the same kids are involved in *Adventures in Motion* that evening and so they need the time to get a meal, and do homework before the performance.

AFTER SCHOOL SESSION 2 ACTIVITIES UPDATE

Please note:

After School Swim Clubs missed by Kindergarten— Grade 2 and Grade 3-5 on Thursday, 13 February 2014 due to the smoke day will be made up on Thursday, 20 March 2014 at their normally scheduled time.

Yoga and Tennis Clubs missed by Kindergarten-Grade 2 and Grade 3-5 on Thursday 13 February 2014 will be made up on Thursday 20 March 2014.

Ballet, Dance Team and Musical Theatre/Drama clubs offered by Ms. Annarie finish their session on 8 April – with exams being held on 9,10,11 April. They do not end with the rest of the activities in Session 2 on 14 March.

CIS IDOL is Back!



ATTENTION ALL STUDENTS GRADES 3 & UP!

The Eighth Annual CIS Idol Talent Show is coming up on Friday, March 21st. Auditions will take place February 25th-27th during lunch in the music room. Please submit any last minute applications to Ms. Simoni at the front office or to Ms. Anna in A3 by Monday, February 24th.

(Application forms are attached to the newsletter).

Get your act together!

CIS COMMUNITY NEWS CON'T



TumbleBooks

CIS is excited to announce that we now have access to an excellent ebook and audiobook platform called Tumblebooks. The site has books suitable for early childhood and elementary students and can be accessed on computer and iPad from home and school. The link is on the library homepage or can be accessed here: www.tumblebooks.com/library/. Please see Ms. Ashley in the library or a Classroom teacher for the username and password. We look forward to hearing how you are using this resource at home!

EXPONENTIAL FUN AT FAMILY MATH NIGHT!

Family Math Night was a huge success with 80 students participating with their parents and even some grandparents! This event helps highlight many of the games students play with the math curriculum while applying problem solving skills and establishing numeracy proficiency. The February IB learner profile "Thinker" was used by everyone attending this event.



Hydrogen Sulphide Monitoring at Cayman International School (CIS)

Studies recently completed by Dart looked at air quality in the vicinity of the Cayman International School. The study considered odour impacts from operations at the Waste Water Treatment Plant and the George Town Landfill. It did not measure smoke impacts from the recent fire.

The study did not uncover any potential health concerns for the school, but it did find some higher than expected hydrogen sulphide (H₂S) levels related to operations at the Waste Water Treatment Plant. Several jurisdictions have standards and regulations concerning ambient air H₂S concentrations in order to limit odour impacts and most of these regulated levels of H₂S were exceeded during the CIS monitoring period.

The odour threshold for H₂S, defined as the minimum concentration at which 50 per cent of the general population is able to detect the odour, is 5 ppb. In order to limit the severity of odour impacts, regulations generally set the upper limit of ambient H₂S concentrations at about 30 ppb. However, health impacts related to H₂S exposure are only manifested when the concentration in air exceeds 2,000 ppb. The highest single H₂S measurement at the CIS was 240 ppb, well below concentrations at which the most sensitive individuals, such as asthma sufferers, may be impacted.

The Dart study concluded that operations at the Waste Water Treatment Plant, while not presenting a health risk, are resulting in ambient air concentrations of H₂S in the community that exceed the allowable standards in many jurisdictions. There are no regulations or standards regarding ambient air concentrations of H₂S in the Cayman Islands.

For a more detailed understanding of the study and its findings related to both the waste water plant and the George Town Landfill, please see attached.

Cayman Reading Week

Cayman Reading Week will be taking place March 17th-22nd. All schools on island are invited to partake in this week-long celebration. CIS will be joined by award-winning children's author and illustrator, Janan Cain. CIS students will also be partaking in a reading fair. Please look for more information in the next newsletter.

CIS COMMUNITY NEWS CON'T

IB LEARNER PROFILE "THINKER" IN ACTION

The "Thinker" In Performing Arts

Our students in dance and drama had an exciting thinking opportunity during the past few weeks as they were presented with a challenge by the choreographers who visited us from Julliard. They were divided into groups and given a spark point thought and had to develop movement to demonstrate this idea to an audience. Everyone had some fabulous thoughts and the best part of the project was when the students were able to link their thoughts into dance pieces to be performed by the group.



The Thinker In Science....

When investigating the differences between plant and animal cells in science class, students are thinkers in action. The 11th grade biology class taught Mr. Matt's 4th grade class how to deduce if a cell is from a plant or animal by looking at it through a microscope.



SECONDARY HEADLINES



Ms. Katie had the chance to have a cup of coffee and chat with Moses E. (CIS 2012 graduate) at University of Tampa while on the Florida Five University tour!! If parents want to know more about Eckerd, Rollins, University of Tampa, Florida Tech, or Ringling she is now very familiar with these programs!

DEBATE CLUB

The CIS debate team participated in Round Two of the Fred Speirs Inter-School Debates against St. Ignatius on Wednesday, February 19th, hosted by St. Ignatius. We were opposed to the moot "Social media is the main cause of bullying." Our speakers were Kirsten E., Thomas W., and Arin B., who presented a unified argument backed up with extensive research, managing to win the debate!

Supporting teammates were Hallie E. and Hayleigh G., and the team is coached by Ms. Lindsay and Mr. Ian Whan Tong. The final round will either be against Cayman Prep or John Gray, and the date is to be announced.



SECONDARY HEADLINES

Second Quarter 2013-2014 Academic Honor Roll

CIS Honor Roll is for secondary students who meet the following standards: no grade lower than an 80 (B-) in any class, and an average core subject GPA as follows:

Gold: 3.7-4.0

Silver: 3.4-3.6

Honorable Mention: 3.1-3.3

	Gold		Silver		Honorable Mention
Grade 6	Laney B. Grace B. Ethan C. Mikayla C. Arielle F. William G. Ava H. Olivia L.	Jack M. Raegan R. Lauryn S. Luke S. Erica S. Zoe S. Agustina T. Valentina T.	Stewart D. Kyler D. Nikolas G. Lea R. Pierre-Louis S. Jaxon S. Arabella S.		
Grade 7	Nicole G. Madison I. Alexia L.	Karinya L. Julia P. Jeremy W.	Nina R. Charles-Antoine S.		Conor C. Jude E. Amanda E.
Grade 8	Zoe B. Kalie B. Kabir C. Megan E. Olivia F.	Nuala P. Jonah P. Leanna S. Matthew S. Wray S.	Justin D. Kavanagh L.		Athanasios B. Katherine B. Sydney C.
Grade 9	Karl Erik B. Arin B. Sunya C. Ceridwn F. Jacqueline L. Drew L. Sophie M.	Daniel N. Camila P. Dani S. Kathryn S. Patrick T. Valerie T.	Samantha C. Hallie E. Grace G. Cory H.		Katie K. Jacob P.
Grade 10	Natalie F. Paula G. Hannah G.		Aisha D. Sarah F.	Tsin Zan G. Gannon R.	Felicity S,
Grade 11	Josiah D. Hannah E. David L. Blakely M.	Sebastian P. Jordan P. Sabrina S.	Jagger H.		
Grade 12	Kirsten E. Jack G. Caelan M. Katie T. Thomas W.		Robert "Trey" T.		

Congratulations Honor Roll Students!

SECONDARY HEADLINES CON'T



Honorable Mention

HONOR ROLL STUDENTS



Silver Honor Roll



Gold Honor Roll

CONGRATULATIONS STEPHEN S.

for receiving the
'OUTSTANDING
IB STUDENT
ACHIEVEMENT
AWARD!'



CIS OUT AND ABOUT



The 'Smoke Day' resulting in no school last Friday didn't stop the Elementary bake sale. Cade and Lauren C. sold their cupcakes and also snowcones on their street and made CI30 for Elementary Student leadership. Great demonstration of resilience!!

Congratulations to Natalie S. (Gr. 9) for scoring the winning goal for Sunset Women FC on the semi final of the president's cup. Well done Natalie!



Congratulations to the CIS Dane and Drama students who practiced with Julliard Instructors and performed entertaining numbers at the Harquail Theatre last Friday as part of the Cayman Arts Festival!



Congratulations to Flynn H. and Kavanagh L. who made CARIFTA times in the 100 fly, this morning! They swam so well and the two fought for every 10th of a second. Both girls obtained personal bests!



GOOD SPORTS



CIS CAMPUS A BUZZ OF ACTIVITY

Today the CIS Campus was buzzing with activity on the field and at the pool. CIS hosted the PSA 7-A- Side Football Tournament again this year. 17 teams from 7 private schools from around the island participated along with CIS for a day full of good sportsmanship and fun. Stay tuned for more photos and results in next week's newsletter.



Also on campus at the pool, the Cayman Islands Amateur Swimming Association is holding its first ever Cayman National Swimming

Championships for athletes of all ages. The event began Thursday and will run through the weekend. The purpose of the championships are to recognize national swimmers and



it will also be used as a selection meet and preparation for several International competitions held in 2014 including CARIFTA. Swimmers were from around the island including CIS students!

MS/HS BASKETBALL

CIS played their last basketball game of the regular season on Thursday, and those who attended enjoyed an intense game against St. Ignatius. It took a while for the Blue Iguanas to get warmed up, but the second half of the game brought out the team's fire. David L. had a strong performance, and Jagger H. banked in a three as the Iguanas tried to make up ground down the stretch. Unfortunately it was a little too late, and St. Ignatius won the game 37-28. So it is back to the gym to prepare for the PSA tournament at Kings Sports Centre on March 19. Thanks so much for the Spirit Squad for their encouraging performance during the game.



SEEN ON CAMPUS



CIS Mission Statement:

Cayman International School endeavors to provide each of our students the opportunity to achieve his/her academic and personal best within a U.S./International educational environment that encourages and inspires leadership, character, and community service while embracing cultural diversity.





Eighth Annual CIS Idol

Talent Show Application

Application Form Due: Friday February 21st

Talent Show Date: Friday March 21st, 2014 (6:30pm)

Mandatory Rehearsal Date: Thursday March 20th (3:30pm-5:30pm)

Please print. An application form should be filled out for **each** child participating in CIS Idol. Please pass completed forms to either Mrs. Simoni at the front office or Miss Anna in A3 no later than Friday February 22nd.

Last Name: _____ **First Name:** _____

Individual Act

Group Act

Grade Level: _____ **Homeroom Teacher:** _____

Please briefly describe your talent:

Describe the instruments, music, props and costumes that you will be using. Please note that a copy of the music must be left at the audition.

Please tick which audition time you would like to attend:

Tuesday February 25th (Grades 6-12) – 11:55am – 12:35pm

Wednesday February 26th (Grades 3 -5) – 11:05am – 11:55am

Thursday February 27th (Grades 3-5) – 11:05am – 11:55am

The parent and student signatures below indicate that the student has permission and will attend the mandatory rehearsal on Thursday, 20th March from 3:30pm – 5:30pm and the evening performance on Friday, March 21st from 6:30pm – 8:30pm.

Name of Student (please print): _____

Name of Parent/Guardian (please print): _____

Signature of Student: _____

Signature of Parent/Guardian: _____

Date: _____

TTRG'S

Lunch Talk!



No matter how you celebrate it or in what language you say it, the holidays are always a fun and joyous time to be spent with family and friends.

So this month, from our family to yours, we wish everyone a fun, safe and memorable holiday season!

TTRG Update on School Lunch

As we continue to enhance our offerings, thru input from: Students, Parents, Healthy School Committee, Teachers & Staff.

New this month:

- ~ Three Cheese & Veggie Quesadilla with Small House Salad
- ~ Added Whole Cut Fruit as a Dessert Option
- ~ Added Whole Fruit Juices

Booklet Sales!

February 26th, 27th, 28th & March 10th
7:00am-8:30am

“EMERGENCY TICKETS”
will NO LONGER be available
at the Front Office

Special Lunch Days!

- Monday March 10th** - Oven Roasted Turkey with Mash Potatoes, Mixed Veggies & Gravy
Wednesday March 12th - Sheppard's Pie!
Wednesday March 19th - Turkey Hot Dog with Potato Salad!
Friday March 21st - Grilled Cheese with Tomato & Cucumber Salad or Baked Fries!
Tuesday March 25th - Beef Stir Fry with Steamed White Rice
Wednesday March 26th - Three Cheese & Veggie Quesadilla with Small House Salad

Dates where Salad is offered:

10th, 11th, 12th, 17th, 18th, 19th, 20th, 21st, 24th, 25th, 27th, 28th & 31st March 2014

CIS March Calendar 2014

NAME - _____

GRADE - _____

PARENT'S
EMAIL _____

NURSERY TO GRADE 2

Please circle date and selections and turn in at "Drop off"
on February 26th, 27th, 28th and March 10th

Grade 3 – 12

Ticket Books sold at "Drop-off" on February 26th, 27th, 28th &
March 10th

Please make cheques payable to TROPICAL TRADER COMPANY
If paying in US\$, please convert at CI\$1.00 = US\$1.25



3rd
Teacher Day!
Teacher Day!

4th
Teacher Day!
Teacher Day!

5th
Ash Wednesday!

6th
No School!

7th
No School!

10th **Oven Roasted Turkey**
Mash Potatoes, Mixed Veg & Gravy
or
Chicken Salad Whole Wheat Wrap OR **Meat Lovers Sandwich** w/ Chips or [House Salad with Grilled Chicken](#)

Whole Fruit or **Sponge Cake**
Choc Milk Juice Bot. Water Milk

11th **Pizza Day!**
w/Corn & Black Bean Salad 
or
Conch Chowder
or
Warm Jerk Chicken Warp or [House Salad with Jerk Chicken](#)
Whole Cut Fruit or **Jell-O**
Choc Milk Juice Bot. Water Milk

12th **Sheppard's Pie**
or
Chicken Noodle Soup
or
[House Salad with Grilled Fish](#)

Fruit Cup or **Banana Bread**
Choc Milk Juice Bot. Water Milk

13th **BBQ CHICKEN** w/
 Washed Potatoes & Sautéed Carrots
or
Vegetable Soup
or
Chicken Salad Wrap or Meat Lovers Sandwich
Whole Fruit or **Chocolate Pudding**
Choc Milk Juice Bot. Water Milk

14th **Baked Fish**
Steamed Brown Rice & Mixed Vegetables
or
Chunky Chicken Noodle Soup
or
Cheese Sandwich or [Whole Wheat Tuna Salad Wrap](#)

Whole Cut Fruit or **Brownie**
Choc Milk Juice Bot. Water Milk

17th **Mini Burgers** or **A Big Burger**
w/ Oven Baked Fries or Caesar Salad
or
Chunky Garden Vegetable Soup
or
Ham & Cheese or [Caesar Salad with Jerk Chicken](#)


Whole Fruit or **Jell-O**
Choc Milk Juice
Bot. Water Milk

18th **Chicken Tenders**
Mixed Veggies & Baked Fries
or
Chunky Chicken Noodle Soup
or
Whole Wheat Tuna Salad Wrap or [House Salad with Grilled Fish](#)
Fruit Cup or **Cookie**
Choc Milk Juice Bot. Water Milk

19th **Turkey Hot Dog**
w/Potato Salad
or
Chunky Chicken Noodle Soup 
or
Whole Wheat Tuna Salad Wrap or [Caesar Salad with Grilled Chicken](#)
Whole Cut Fruit or **Brownie**
Choc Milk Juice Bot. Water Milk

20th **Rotisserie Chicken** w/
Wild Rice & Tarragon Carrots
or
Hearty Vegetable Soup
or
Chicken Salad Wrap or [House Salad with Grilled Chicken](#)
Whole Fruit or **Strawberry & Oat Parfait**
Choc Milk Juice Bot. Water Milk

21st **GRILLED CHEESE**
Tomato & Cucumber Salad or **Baked Fries**
or
Open Faced Pizza Sandwich
or **Club Sandwich**
or
[Caesar Salad with Grilled Fish](#)
Whole Cut Fruit or **Apple Sauce**
Choc Milk Juice Bot. Water Milk

24th **Creamy Chicken Alfredo**
W/ Peas & Cheesy Toast
or
Chunky Chicken Noodle Soup
or
[House Sales with Jerk Chicken](#)
Whole Cut Fruit or **Banana Bread**
Choc Milk Juice Bot. Water Milk

25th **Beef Stir Fry**
Steamed White Rice
or
Turkey Sandwich or [Caesar Salad with Grilled Fish](#) 

Whole Fruit or **Fruit & Oat Bar**
Choc Milk Juice Bot. Water Milk

26th **Three Cheese & Veggie Quesadilla** w/
Small House Salad
or **Chunky Chicken Noodle Soup**
or
Whole Wheat Tuna Salad Wrap or [House Salad with Jerk Chicken](#)
Whole Cut Fruit or **Fruit Cup**
Choc Milk Juice Bot. Water Milk

27th **JERK CHICKEN** w/
Rice & Beans & Sautéed Carrots
Or
Vegetable Soup
Or
[Caesar Salad with Jerk Chicken](#) or
Meat Lovers Sandwich

Whole Fruit or **Cookie**
Choc Milk Juice Bot. Water, Milk

28th **Baked Fish with Cayman Style Sauce**
Steamed Brown Rice & Mixed Vegetables
or
Chunky Chicken Noodle Soup
Or **Club Sandwich** or [Caesar Salad with Baked Fish](#)
Whole Cut Fruit or **Jell-o**
Choc Milk Juice Bot. Water Milk

31st Savory Meat Lasagna

w/ Cooked Carrots
or Creamy Conch Chowder
or [Chicken Caesar Wrap](#) or
[Caesar Salad with Grilled Chicken](#)

Whole Fruit or [Apple Streusel Cake](#)
Choc Milk Juice Bot. Water Milk

CIS March Calendar2014

NAME - _____

GRADE - _____

PARENT'S
EMAIL _____

NURSERY TO GRADE 2

Please circle date and selections
and turn in at "Drop off"
**on February 26th, 27th, 28th and
March 10th**

Grade 3 – 12

Ticket Books sold at "Drop-off" on
**February 26th, 27th, 28th &
March 10th**
Please make cheques payable to
TROPICAL TRADER COMPANY
**If paying in US\$, please convert at
CIS\$1.00 = US\$1.25**

Hydrogen Sulphide Monitoring at Cayman International School (CIS)

Studies commissioned by Dart in 2007 and 2008, looked at the quality of ambient air in the vicinity of the Cayman International School. This study did not uncover any air quality issues but did find some higher than expected hydrogen sulphide (H₂S) levels. It was recommended that this be further investigated.

The air quality in the area around the George Town Landfill (GTLF) and the Waste Water Treatment Plant (WWTP) is significantly impacted by odour that is emanating from these two facilities. The previous air quality studies and the odour detected near the WWTP and GTLF prompted Dart to initiate a study to ascertain the nature of the air quality impacts and to determine what if any air quality issues may persist if the GTLF is remediated by closing and capping the site.

The study included a lengthy monitoring period for H₂S at the Cayman International School. Figure 1 shows the monitoring location at CIS and Figure 2 is a photo of the instrument.

FIGURE 1



FIGURE 2



Odour from landfills is mostly caused by two potential sources. First, is odour of raw garbage that is being discharged from trucks at the tipping area. The strength of this odour is determined by the state, type, and volume of garbage being disposed and the efficiency at which odorous loads of waste are compacted and covered. Second is the odour caused by the emission of landfill gas resulting from the anaerobic biodegradation of the buried waste. The amount of odour that is created by this emission is related to the size of the landfill, the types of waste buried, and the conditions inside the waste mound.

The tipping area at the GTLF is not managed according to best practice standards and so the emission of odour from this area is exacerbated through lack of proper waste placement, compaction and cover

procedures. In prevailing winds the resulting garbage odour is noticeable along the Esterly Tibbetts bypass, along West Bay Road and everywhere in between. During the relatively rare occasion of southerly winds, the odour is detectable at CIS and further north to Camana Bay. If the GTLF is closed and capped this odour source would be eliminated.

Landfill gas is about 50% methane. The low methane levels monitored around the GTLF demonstrates that the ambient air around the site is not significantly impacted by landfill gas emissions.

Although landfill fires were not specifically addressed in the odour assessment tipping area management and lack of cover at the GTLF also exacerbates the potential for and persistence of landfill fires. Unlike the previously mentioned odour issues, fumes from landfill fires (including tyre fires) are toxic in nature. As such, inhalation of these fumes should be avoided.

Odour from the WWTP is due mostly to hydrogen sulphide (H₂S) emissions. This naturally occurring gas, also referred to as swamp gas or sewer gas, is a particularly odorous compound that smells like rotten eggs. The amount of H₂S emitted by the WWTP is very significant and is resulting in odour impacts to the neighboring community. It is likely that other odorous compounds are emitted from the WWTP but H₂S is most certainly the main odour causing agent.

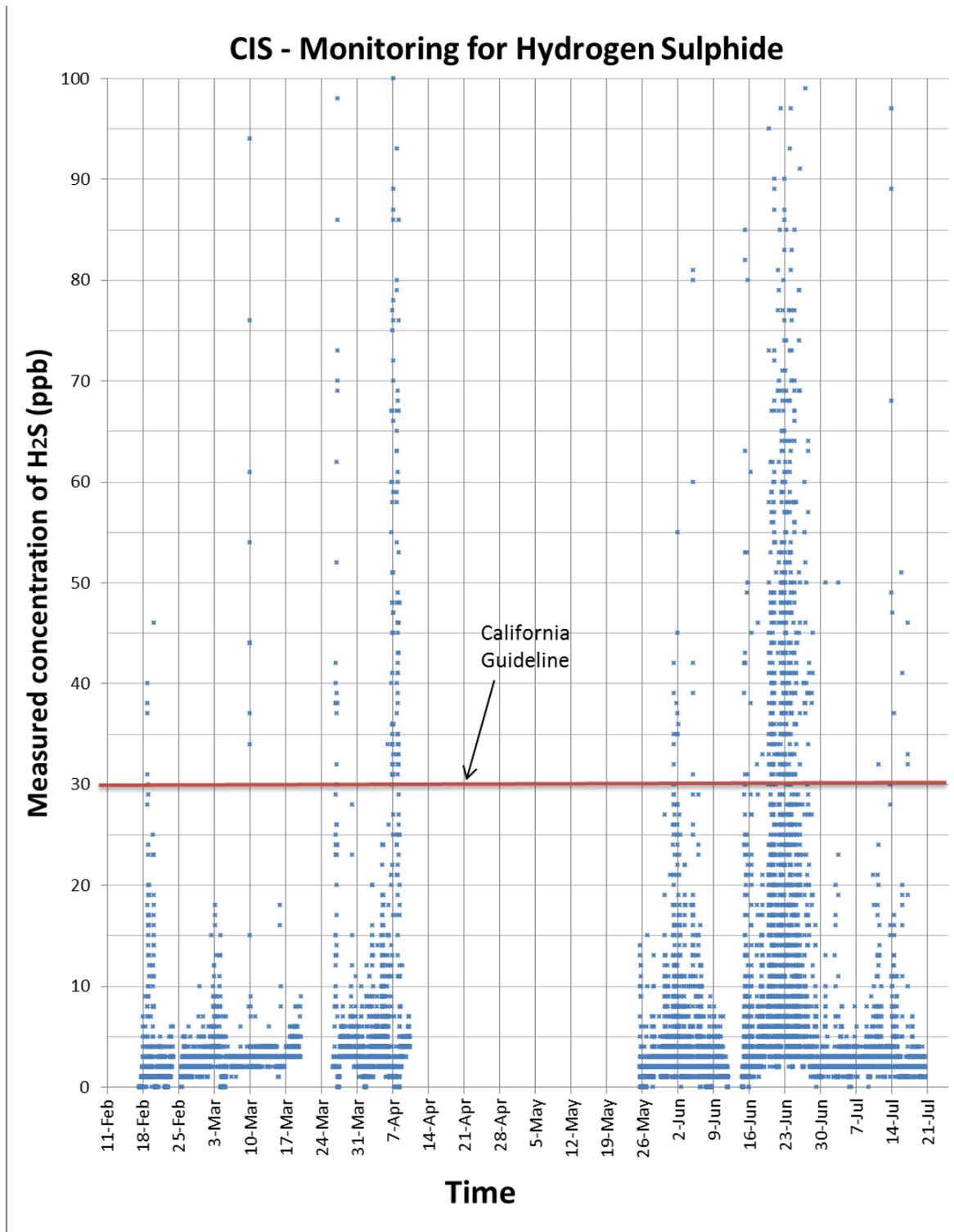
Since best management practices and appropriate closure and capping would eliminate further odour emissions from the GTLF, and because the landfill emits only very small quantities of H₂S compared to the WWTP, it is possible to determine the air quality impacts resulting from only the WWTP by measuring the ambient air concentrations of H₂S. The instrument (Jerome 631-X with onboard data logger) installed at the CIS measures and records the concentration of H₂S in ambient air down to the low parts per billion level (ppb).

The instrument was installed for a two periods totaling 75.9 days between February 17 and September 6 2012. During the two periods the instrument sampled the ambient air every 10 minutes and recorded the H₂S concentration in ppb. The results of these 18,968 discrete measurements are shown in the graph below (Figure 3) and are summarized in Table 1.

TABLE 1

Monitoring Location	CIS
Monitoring Period (s)	Feb 17 - April 10 May 25 - Sept 6 2012
Duration monitored (days)	75.9
Number of Readings	18968
Average (ppb)	5.59
High (ppb)	240
High 1 Hr Average (ppb)	140
per cent of measurements > 5 ppb	17.0%
per cent of measurements > 30 ppb	3.5%

FIGURE 3



Measured H₂S concentrations at a specific location varies from time to time due to the changing conditions at the source, weather conditions including wind direction, wind speed, and atmospheric stability. Wind and solar activity generally dissipate odours and hence, in the evenings when there are often lower wind speeds, odours tend to collect. This explains why the odour is often most severe in the early morning hours, just before sunrise. Wind directions dictate which areas are most impacted and in the case of the CIS it is fortunate that the prevailing winds usually direct the odorous emissions westward and not towards the CIS.

Several jurisdictions have developed standards and regulations concerning ambient air H₂S concentrations in order to limit the odour impacts that may result from facilities that generate H₂S. The odour threshold for H₂S, defined as the minimum concentration at which 50 per cent of the general population is able to detect the odour, is 5 ppb. Examples of regulations from several jurisdictions are provided in Table 2.

TABLE 2

Reference and Year	Type of Constraint	Concentration * $\mu\text{g}/\text{m}^3$ (PPB)	Averaging Period	Reason	Source
World Health Organization (WHO 2000)	Recommendation	7	30 minute	odour	http://www.euro.who.int/_data/assets/pdf_file/0019/
		150	24 hour	health (eye irritation)	
New Zealand (2002)	Guideline	7	1 hour	odour	http://www.ivhnh.org/
California (1984)	Ambient Air Quality Guideline	(30)	1 hour	odour	http://www.arb.ca.gov/research/
Montana (1996)	Air Quality Regulation	(50) not to be exceeded more than once per year	1 hour	odour	http://www.mtrules.org/gateway/
New York (state)	Ambient Air Quality Standard	(10)	1 hour	odour	http://www.dec.ny.gov/regs/
Main (2006)	Ambient Air Quality Guideline	(30)	1/2 hour	health	http://www.maine.gov/dep/waste/publications/documents/
		(1)	1 year	health	
Ontario (2013)	Ambient Air Quality Standard	13	10 minute	odour	http://www.ene.gov.on.ca/environment/en/resources/
		7	24 hour	health	
		10	30 minute	health & odour	
Alberta (1975)	Ambient Air Quality Objective	10	1 hour	odour	http://environment.gov.ab.ca/info/library/
		3	24 hour	odour	
Nova Scotia (1994-5)	Regulated Max Permissible	42	1 hour	not specified	http://novascotia.ca/just/regulations/regs/
		8	24 hour	not specified	

* note: for H₂S $1 \mu\text{g}/\text{m}^3 = 0.717 \text{ ppb}$ at (20° C and 1 ATP)

It is noteworthy that the standards listed are in the form of maximum permissible concentrations (in ppb or in micrograms per cubic metre) usually averaged over given time periods, most often one hour in duration. Most of the regulated levels of H₂S for various jurisdictions as shown in Table 2, are exceeded during the 75.9 day CIS monitoring period.

Health impacts related to H₂S exposure are manifested when the concentration in air exceeds 2,000 ppb. At concentrations above this level it is possible for individuals that are sensitive to air contaminants such as those suffering from asthma, to notice some discomfort. The highest single H₂S measurement at the CIS was 240 ppb, nearly an order of magnitude below concentrations at which the most sensitive individuals may be impacted.

There are no regulations or standards regarding ambient air concentrations of H₂S in the Cayman Islands.

The Dart study concludes that the operation on the WWTP is resulting in ambient air concentrations of H₂S in the community that exceed the allowable standards in many jurisdictions. This impact on air quality will persist after the GTLF is remediated unless steps are taken at the WWTP to mitigate this emission.