



# Picky About Ponds :

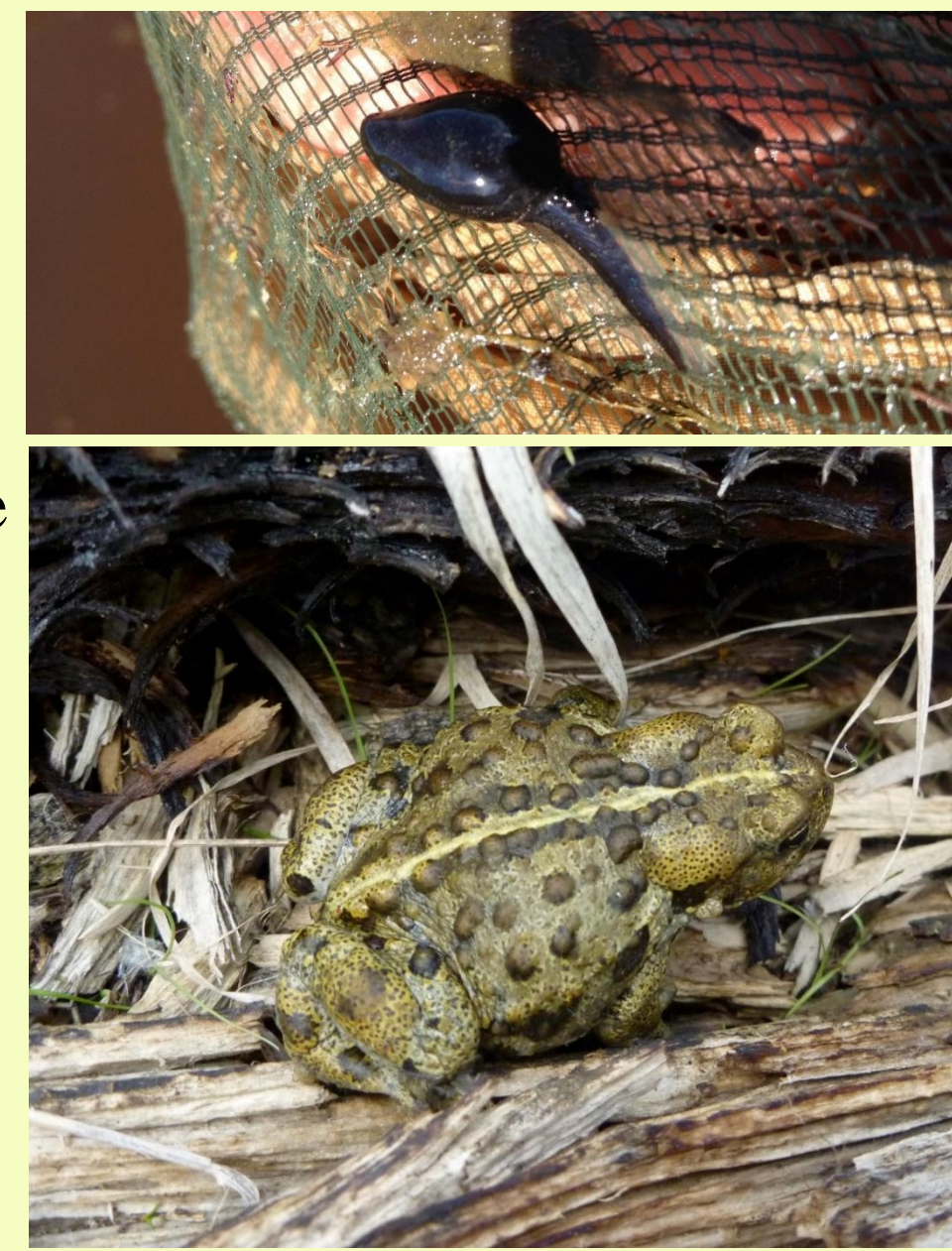
## Determining the Presence of Western Toads on Disturbed and Natural Sites

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### Introduction

- Secure Energy Services operates a Class II industrial landfill (containing hydrocarbon contaminated soil) in the area of Fox Creek, Alberta.
- In June of 2013, Western Toads (*Anaxyrus boreas*) were observed in a surface-water collection pond at the Secure site, along with approximately 40 000 tadpoles.
- Nationally, Western Toads are considered to be a "Species of Special Concern". Consequently, their presence and successful reproduction at the Secure landfill prompted an investigation into the use of the landfill facility by breeding toads.



### Purpose

This study looks at the Western Toads' use of various ponds around the Secure area, including ponds at Secure landfill sites, inundated well pad sites, natural, and naturalized sites. Our research examines if toads have a preferred wetland environment for breeding.

### Methods

- Fifteen automated recorders were set up at different sites around the Secure landfill area. The recorders took four minute long sound clips every twenty minutes.
- We identified amphibian and common wetland bird calls using sonograms (Figure 1) created with Song Scope 4.1.3A (Wildlife Acoustics, Inc) from six sites over ten days in early to late May 2015 (sites consisted of two Secure sites, two constructed sites, and two natural sites – see Figures 3-6).
- Using sonograms allowed for audio as well as visual identification of the calls of Western Toads.
- Only records from 10pm to 2am were analysed as this period is the optimum time to detect toads; toad calling activity is more nocturnal as a result of them being less visible to predators.



#### CALLING CODES

CC of 1: 1-4 individuals.  
CC of 2: 5-10 individuals.  
CC of 3: Too many to count.

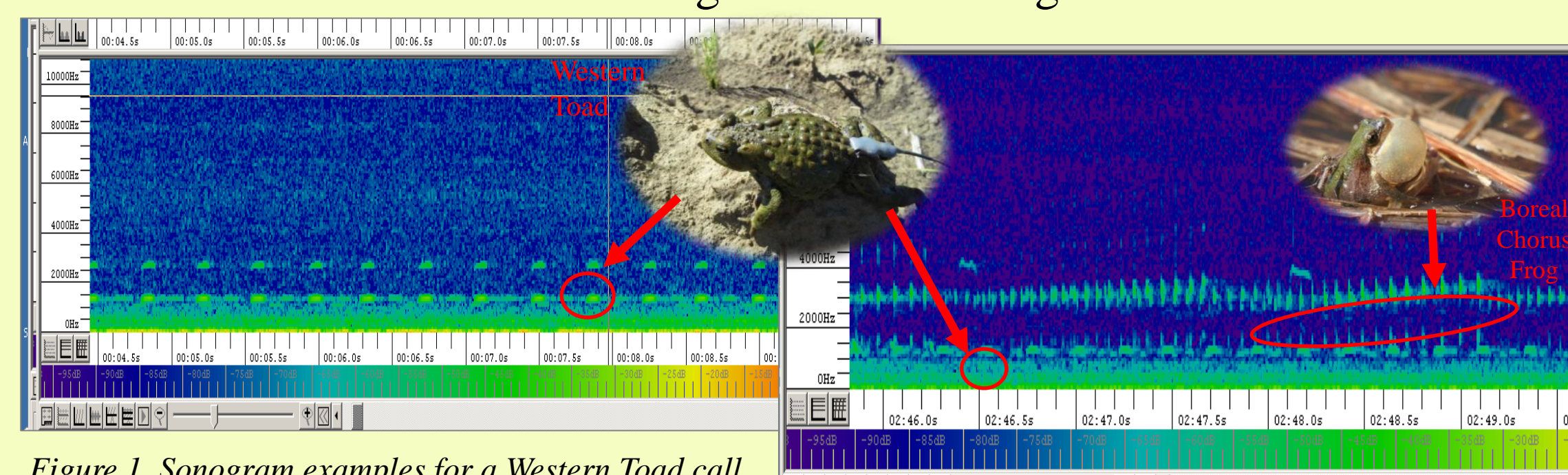


Figure 1. Sonogram examples for a Western Toad call.

### Results

- Western Toads were detected at all sites across the study area. However, toads used the created ponds by the Secure landfill throughout the entire breeding period, while breeding occurred later at natural ponds and varied amongst the constructed sites.

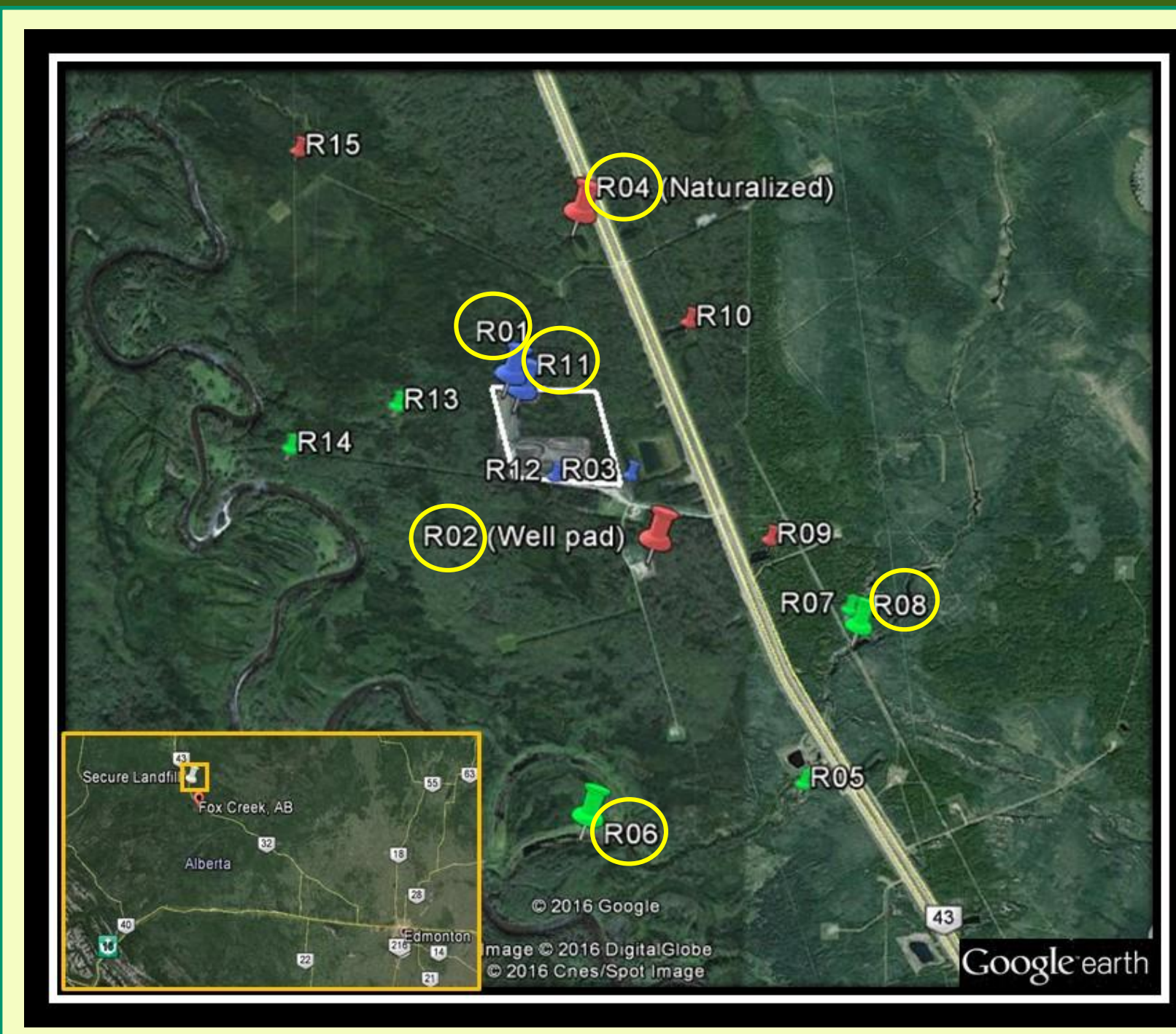


Figure 2. Locations of automated recorders placed at the Secure sites, well pad site, naturalized and natural wetland sites near Fox Creek, Alberta.

Secure wetlands (Figure 3) consistently had the highest number of toads calling within any recording during the 10pm-2am period.

Of the constructed sites, the inundated well pad (Site 2) was most like the Secure sites, demonstrating a fairly elevated amount of calling. The naturalized site in comparison had very limited activity.

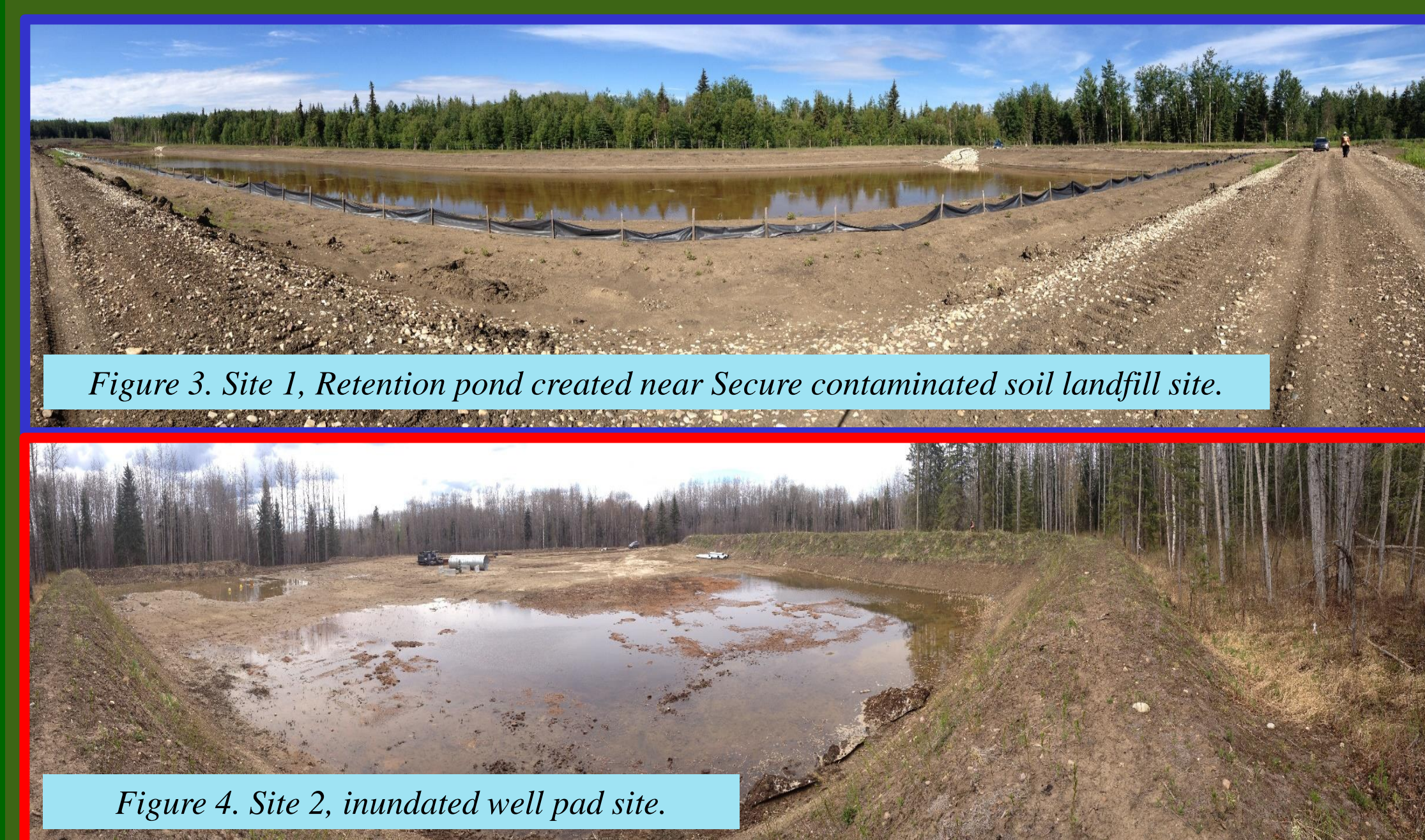


Figure 3. Site 1, Retention pond created near Secure contaminated soil landfill site.

Figure 4. Site 2, inundated well pad site.

The natural wetlands, like the swamp (Figure 6), had very reduced calling. Only one pond had activity in the early May period, with fewer than two toads calling.

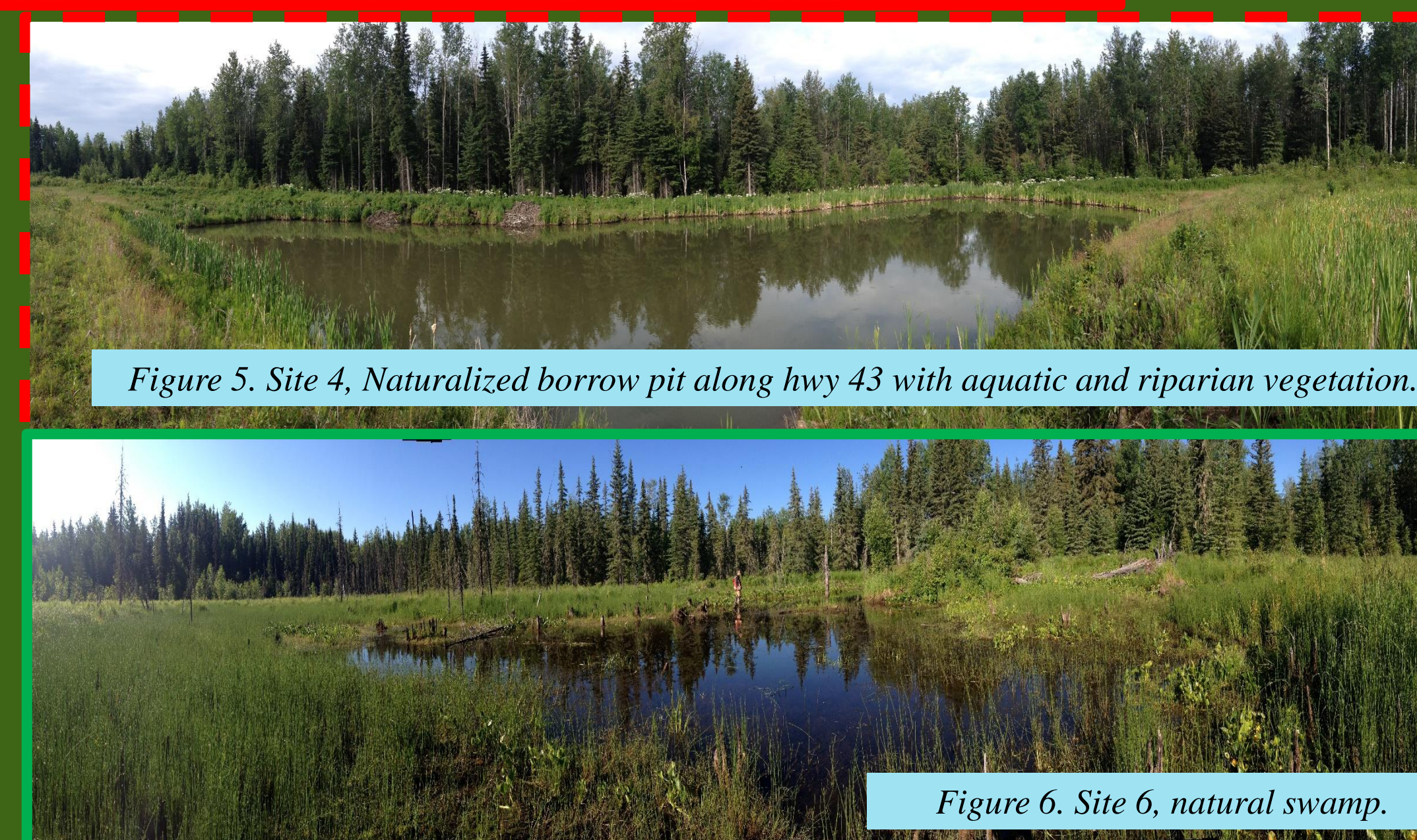


Figure 5. Site 4, Naturalized borrow pit along hwy 43 with aquatic and riparian vegetation.

Figure 6. Site 6, natural swamp.

### Results

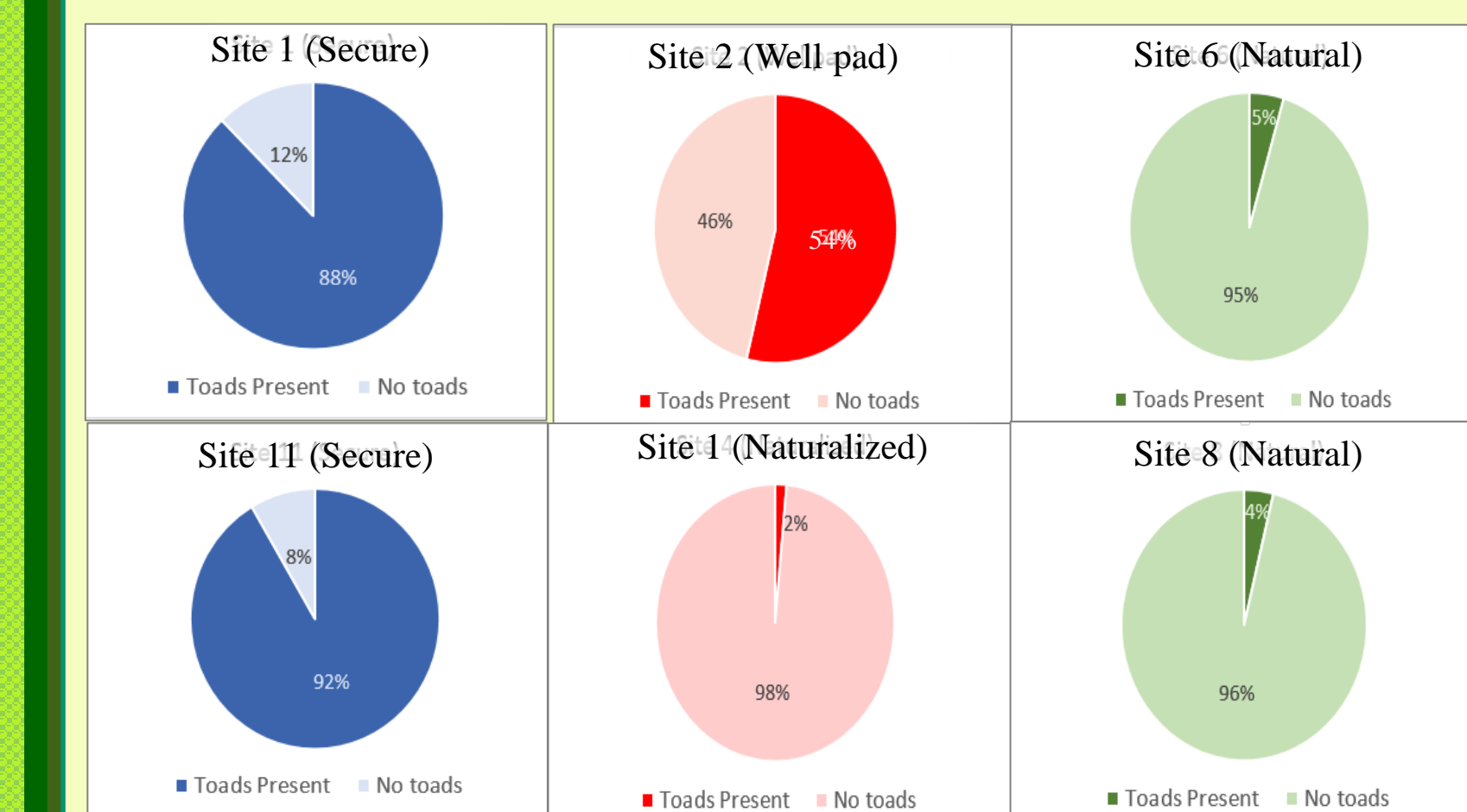


Figure 7: Percent of recordings with toads calling.

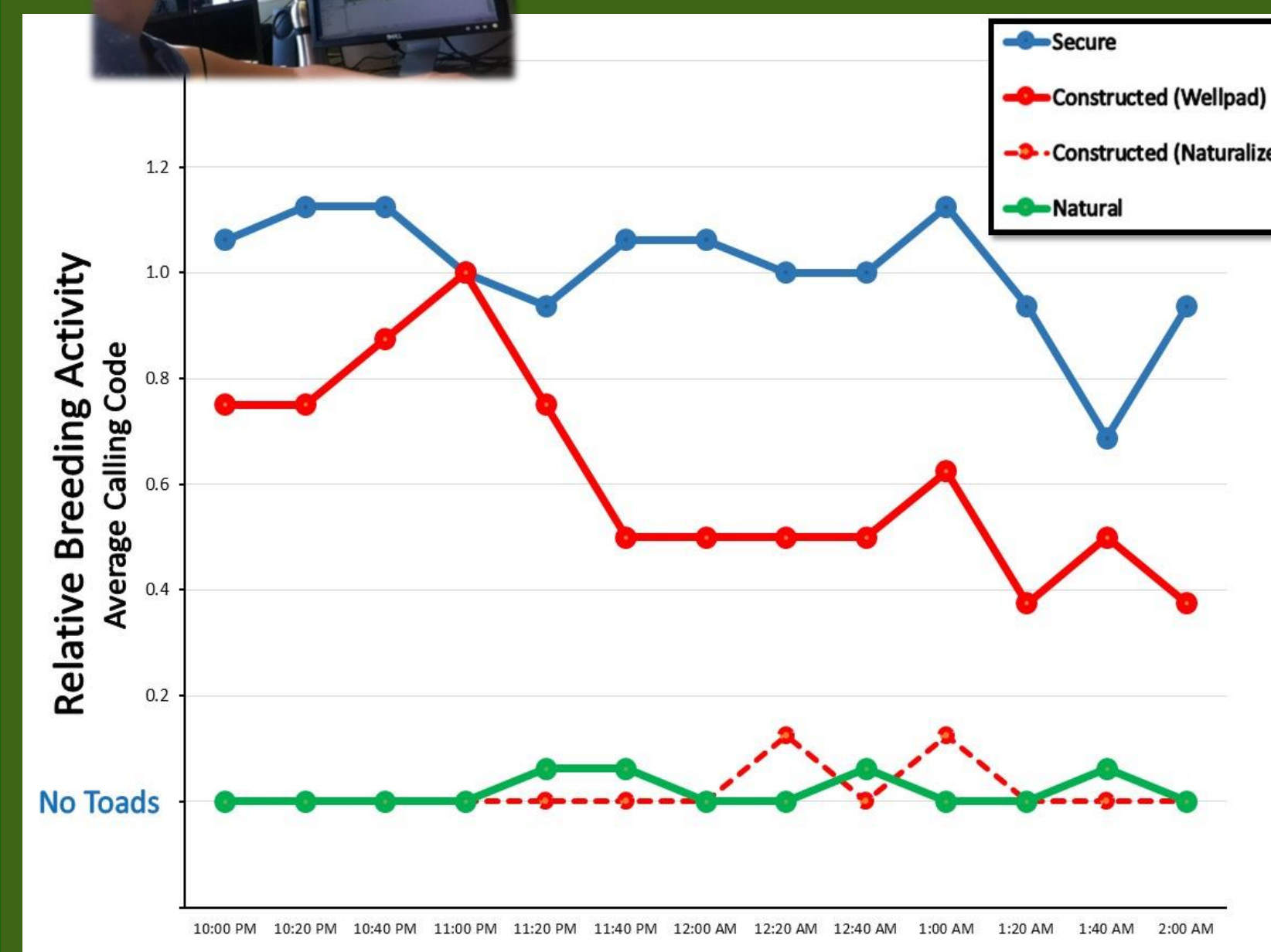
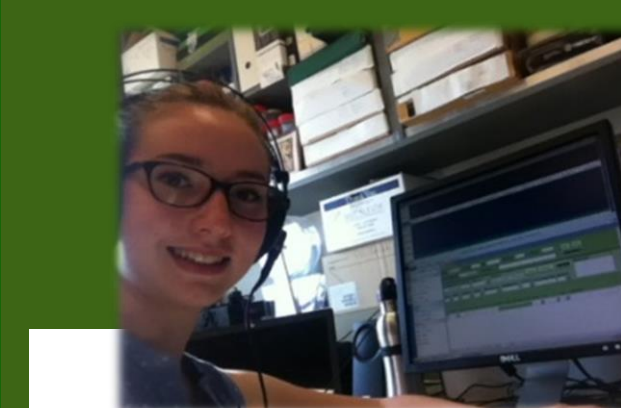


Figure 8. Western Toad breeding call activity comparison among pond types between May 1-10. Calling codes represent activity during intervals averaged across days and ponds for Secure sites, natural sites (n = 2 ponds) and the two constructed ponds (n = 1 pond).

- For the Secure sites, greater than 85% of records examined had toad calling activity (Figure 7). Calling Codes of 1 were most commonly found, as well as a few CC of 2.
- Among the modified sites, a large difference in calling activity was seen:
  - The flooded well pad site had calling activity more than 50% of the time (Figure 7), but had fewer individuals calling during any recording compared to the Secure sites (Figure 8).
  - The naturalized borrow pit, had the lowest percentage of time with toad calling activity with only 2 recordings out of 130 records showing toad calling activity.
- At the natural sites, calling activity increased during the late May period, but remained much lower than at Secure wetlands.

### Conclusions

- Western Toads are taking advantage of human activity.
- Western Toads are likely attracted to the Secure sites due to the sparse vegetation and shallow water, creating a warm environment that favours egg development.
- However, it is possible that the Secure sites could act as population sinks (sites that are attractive to the toads, but could result in a population decline). The effect that the contaminated soil in the landfill has on the toads is still unknown.
- Although the well pad and Secure sites seemed to be the preferred breeding environment for Western Toads, further study is needed to determine the impact of these locations on the toad and other amphibian populations.

### Acknowledgements

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References: <http://www.secure-energy.com/your-community/health-safety-environment/some-toads-jumped-one-our-run-ponds>; Long, Paszkowski, Sentes, 2014, Habitat Use of the Western Toad At Secure Energy Services Inc. Fox Creek Class II Industrial Landfill, Final Report.