

A Secure Site for Research in Thanatology (SSRT): The First Canadian Human Decomposition Research Facility

Emily Peci, BSc¹, Frank Crispino, PhD^{2,3,4}, Gilles Bronchti, PhD¹, Shari Forbes, PhD^{2,3,4}.

1. Department of Anatomy, Université du Québec à Trois-Rivières
2. Department of Chemistry, Biochemistry and Physics, Université du Québec à Trois-Rivières
3. Laboratoire de Recherche en Criminologique (LRC), Université du Québec à Trois-Rivières
4. International Center for Comparative Criminology (ICCC)



What is the SSRT?

- The SSRT is a **high security outdoor research facility** dedicated to the physical, chemical and biological **study of human decomposition**.
 - Purpose** – To provide a secure facility where human decomposition research and related trainings can legally and ethically be conducted.
 - Impact** – The activities of the SSRT will ultimately contribute to the enhancement of forensic techniques that are used to search, locate, recover and identify victim remains, as well as improving methods for evidence collection and time since death estimation.
- The SSRT is the **first facility of its kind in Canada**, and has been modeled on facilities established in the USA, Australia and the Netherlands.
- The SSRT will be located on 600m² wooded lot in the *Parc industriel et portuaire de Bécancour*, about 25 km from Trois-Rivières, Québec (Figure 1).

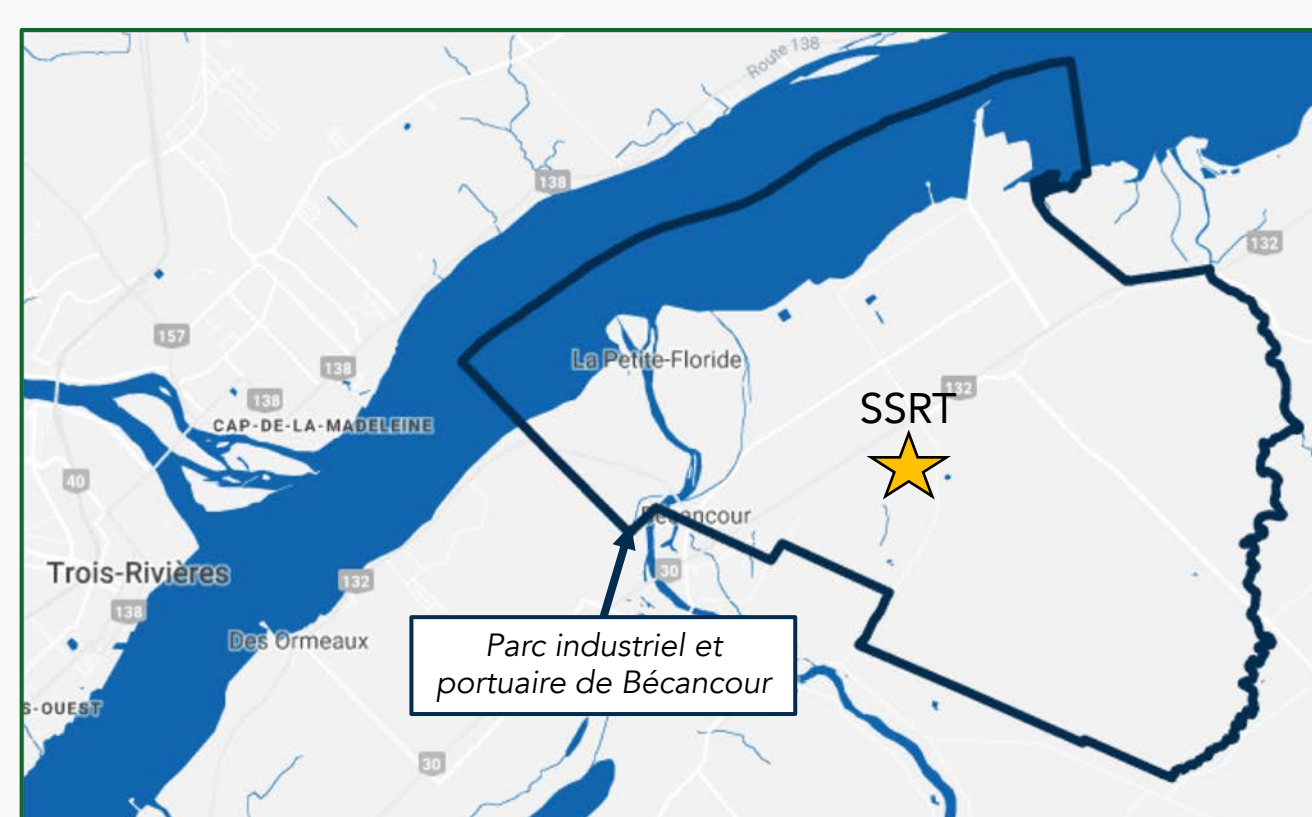


Figure 1: Location of the SSRT within the Parc Industriel et portuaire de Bécancour.

The facility is expected to open Fall 2019.

Why is the SSRT Needed?

- Decomposition** is a highly dynamic process that is **influenced by various environmental factors**, such as temperature, humidity, scavengers and geology.
- Due to the regional variation in climate, fauna and flora, **data from pre-existing sites cannot be extrapolated** to other geographical regions.
 - This has resulted in a **lack of knowledge and understanding of human decomposition in continental northern latitudes**.
- Studies conducted at the SSRT will help to partially resolve this issue by producing data that is relevant to the local Quebec environment & landscape.

Activities

The SSRT will host a range of multisectorial activities that will be highly beneficial to a spectrum of experts, professionals and students. These activities include but are not limited to:

Scientific Research – The SSRT will host scientific research projects with the following applications:

- Characterizing the **odor of decomposition** to better understand how cadaver detection dogs locate victims (**analytical chemistry**);
- Using the post-mortem microbiome and insect activity as tools to **estimate time since death** (**microbiology, entomology**);
- Understand how local **scavengers** influence decomposition (**ecology**);
- The use of surface vegetation and soil characteristics as indicators of **clandestine graves** (**ecology, botany, environmental science**);
- Characterizing the **impact of decomposition** on bone and other hard tissues (**anthropology, odontology, archaeology**).

The Humanities – The SSRT will also act as a catalyst for the **philosophical, anthropological, historical, social and artistic** exploration of topics such as death, dying, decay, body donation and the post-mortem cadaver. Experts in the humanities will also contribute to evaluating the social acceptability and the public's perception of the SSRT.

Training – In addition to research, the SSRT will also function as a **training center for students and professionals** whose work involves human remains.

- Forensic scientists, pathologists, anthropologists & archeologists;
- Police, fire investigators, and the military;
- Cadaver detection dogs and their handlers;
- Emergency search and rescue teams;
- Disaster victim recovery teams

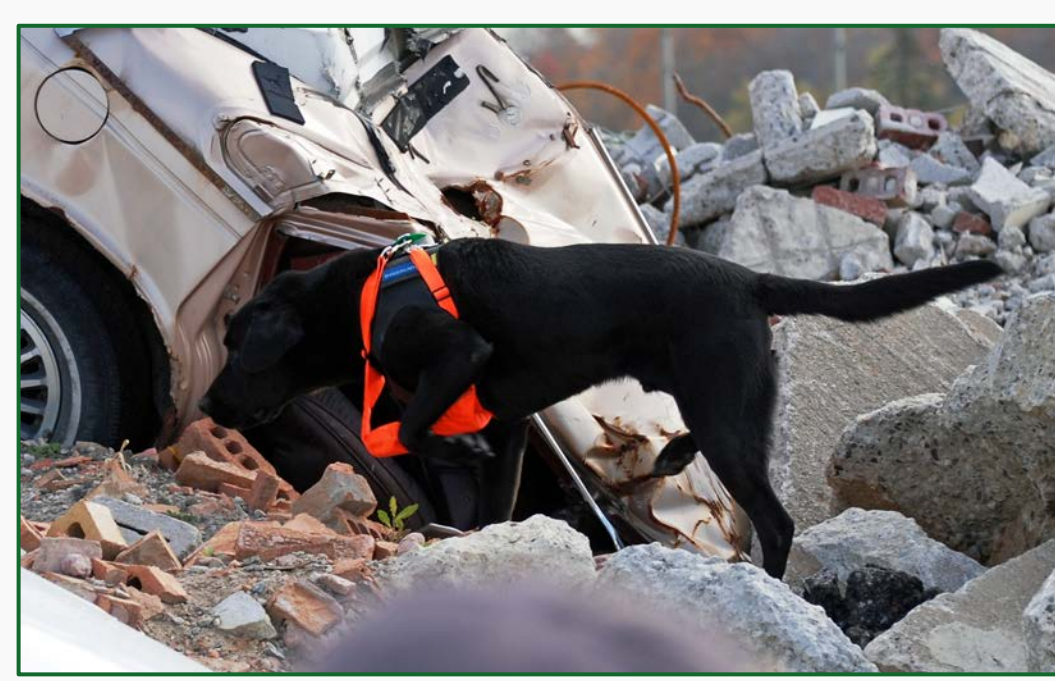


Figure 2: A cadaver detection dog searching through rubble for possible victims.

Specifications & Features

The Facility – The physical facility of the SSRT will include several features to facilitate research and inhibit intrusions by humans and scavengers (Figure 3).

- High security fence:** The facility will be surrounded by a 2.5m high fence that will be buried a minimum of 0.6m underground in order to deter burrowing animals. The fence will have anti-climb properties and will be equipped with a view obstructing shade cloth and horizontal barbed wire.
- Surveillance cameras:** Surveillance cameras will be placed strategically around the perimeter of the facility. These cameras will be housed in a heated casing to ensure their function is maintained during the winter. The footage will be relayed to the security office of the *Parc industriel et portuaire de Bécancour*.
- LED lighting:** Lights will be installed in order for research to be carried out at night
- Electrical fence:** An agricultural style electric fence will be installed along the perimeter of the facility in an effort to deter large animals.
- Analog site:** A secondary site will be established adjacent to the SSRT to compare the use of pig carcasses as human analogs in decomposition studies.

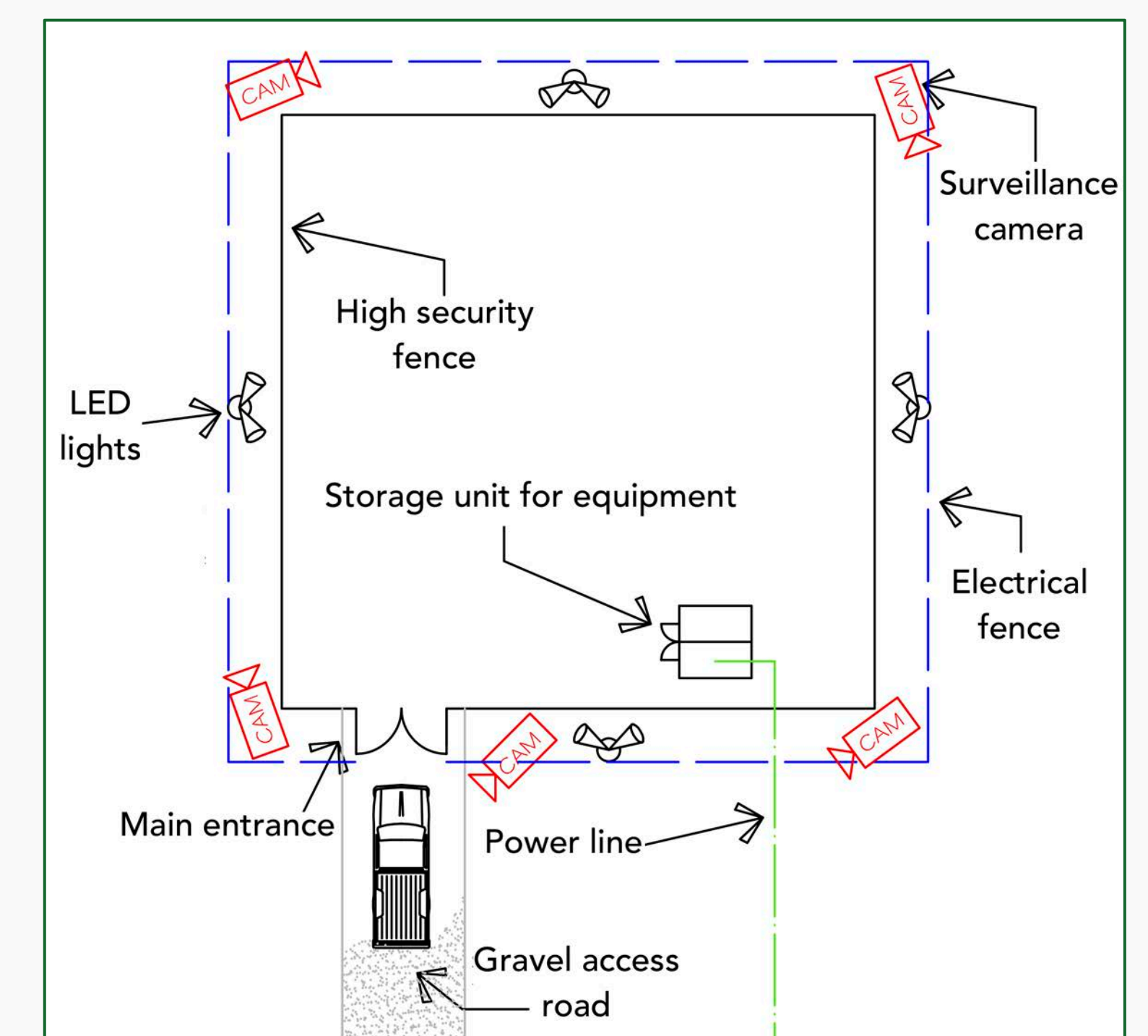


Figure 3: Schematic of the SSRT facility and its security features.

Body Donation – Cadavers of **willed body donors** and **domesticated pigs** (human analogs) are to be **surface deposited or buried in shallow graves** throughout the sites for study. Every donor will be individually placed in an anti-scavenging cage in order to prevent scavenging by vertebrates. Pigs will only be placed in cages if needed by a study.

- All consenting body donors will be acquired through the UQTR **Department of Anatomy** willed body donation program.
- Donors will have **consented** to having their remains used for research and training purposes at the SSRT
- All domesticated pigs will be procured from a **slaughterhouse**.



Figure 4: Researchers working over caged donors at the Australian Facility for Taphonomic Experimental Research (AFTER)

A Future Network

- Since human decomposition is regionally specific, a **national network** of research facilities is needed in order to gain an in-depth understanding of decomposition processes across Canada.
- Due to its novelty, the SSRT will be addressing many unique **legal, logistical and social issues** for the first time.
- The SSRT will not only act as a proof of concept that such a facility can be established in Canada, but it will also serve as an opportunity to elaborate **guidelines** on how to establish a human decomposition research facility.
- The guidelines will be based on the processes, decisions, events and obstacles experienced throughout the conception and creation of the SSRT.
 - The guidelines will provide a roadmap on the steps and considerations that should be taken during the establishment of future research facilities.
 - The guidelines will ultimately help accelerate the formation of a **Canada-wide human decomposition research and training network**.

The SSRT was made possible thanks to the city of Bécancour, the Parc industriel et portuaire de Bécancour, our affiliates and all contributing financial foundations.

www.uqtr.ca/ssrt