

March 8, 2013

Brownstein/Hyatt/Faber/Schreck, LLP  
410 Seventeenth Street  
Suite 2200  
Denver, Colorado 80202

Attention: Greg Vallin

Subject: Limited Surface Screening for Radiation Levels  
Candelas Development, Filing 3  
Arvada, Colorado  
Project No. DN45,663.001-235

CTL | Thompson, Inc. (CTL) completed a field survey of surface readings for naturally occurring radioactive material of Filing 3 in the Candelas development in Arvada, Colorado as requested by Brownstein/Hyatt/Faber/ Schreck, LLP.

### Introduction

Naturally Occurring Radioactive Material (NORM) is defined by the Environmental Protection Agency (EPA) as “materials which may contain any of the primordial radionuclides or radioactive elements as they occur in nature, such as radium, uranium, thorium, potassium, and their radioactive decay products, that are undisturbed as a result of human activities.” Radiation levels emitted by NORMs are referred to as “background” levels. Geologic factors play a role in the concentration of NORMs at a given location. For example, clays contain higher levels of NORMs than shales or sandstones based on their physical nature. Our screening was performed in an attempt to determine if there were elevated readings, which could suggest source areas (e.g. historical wind dispersion from Rocky Flats) which cause readings above background levels.

This survey was conducted to address potential concerns regarding historical radiation at the former Rocky Flats facility, now known as the Rocky Flats Wildlife Refuge. In addition to the field survey, this letter briefly summarizes limited historical soil sampling that was performed at the site in the 1990s.

### Field Survey

Our Mr. Trevor Truett and Mr. Josh Sieger walked Filing 3 of the Candelas development on February 8, 2013. Using Ludlum 19 Micro-R Meters, we took gamma radiation readings throughout the portion of Filing 3 where earth moving



activity was taking place, including the northern boundary which borders Rocky Flats. In the southwestern portion of the site, enough site grading had occurred, so it was possible to determine the location of specific blocks. This was not possible in other portions of the project, where there were no survey references. At the time of our site visit, there were various phases of earth moving activities taking place. Site grading on the southwest portion of the site appeared to be at or near completion, the southeast portion of the site was an active fill area, and the remainder of the site was in various phases of soil removal or fill placement. We attempted to traverse the property in approximately 100 to 200-foot wide paths, traversing back and forth across the site as topography allowed. We obtained readings and GPS coordinates at select locations. Our readings and approximate locations are summarized in Figure 1.

Background readings were collected in previously developed areas within a 0.5 mile to 2 mile distance from the site; this included the very eastern portion of the former Rocky Flats facility, immediately west of Indiana Street, as well as communities across from Candelas, on the east side of Indiana Street. In addition, we collected readings within the Candelas development in 2011. Background readings in the area ranged from 7 to 18 micro-roentgens per hour (uR/hr). During our field survey of the site, readings were found to be at background levels. We believe the field readings taken from the site indicate that uR/hr emissions are generally similar to background levels in the area. It should also be noted that readings from the site and surrounding area are generally the same or lower than others collected by CTL in the Denver Metro area; specifically the Highlands Ranch area, where 19 uR/hr has been established as the background.

### Summary of Historical On-site Sampling

The U.S. Department of Energy (DOE) performed a Baseline Risk Assessment and Environmental Risk Assessment of Operable Unit 3 (OU3). The results of these investigations were presented in the *RCRA Facility Investigation/Remedial Investigation (RFI/RI) Report, Operable Unit 3 (Offsite Areas), June 1996*. As part of this study of ground water, soil, and sediment, two samples of surficial soil were obtained from the land now known as Candelas. The samples, taken between 1991 and 1995, were composited from 10-acre plots. Sample PT13192 was obtained approximately on portions of PDP#1 and PDP#2. Sample PT12792 was obtained approximately one mile farther west, on PDP#3. The samples were found to not exceed background levels.

The DOE concluded that no action is appropriate for (OU3). The DOE report concluded that “All Individual Hazardous Substance Sites (IHSSs) within OU3 are already in a state protective of human health and the environment.” The report goes on to state “Therefore, no remedial action regarding OU3 or any of its constituent IHSSs is warranted.”



As part of our document review, CTL reviewed the document *U.S. Department of Energy (DOE) prepared Corrective Action Decision/Record of Decision for Operable Unit 3, The Offsite Areas, Rocky Flats Technology Site, April 1997*. In this document, the finding of the DOE was approved by the Colorado Department of Public Health and Environment (CDPHE) as well as the Environmental Protection Agency (EPA).

### Conclusion

Based on the information presented in the DOE Corrective Action Decision/Record Decision for OU3, we concluded that residential development of the site is an appropriate land use. Our readings of radioactive decay at Candelas Filing 3 also indicate that radioactive activity appears to be at background levels. We do not believe further action is needed with regard to this issue.

### Limitations

We believe this investigation was conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the locality of the project. No other warranty, express or implied, is made.

If we can be of further service in discussing the contents of this report, please call.

Sincerely,

CTL | THOMPSON, INC.

Reviewed by:

Trevor Truett  
Environmental Staff Scientist

Matthew L. Wardlow, P.E.  
Environmental Department Manager

TT:MLW/tt/nt  
(3 copies)

Via e-mail: [GVallin@bhfs.com](mailto:GVallin@bhfs.com)