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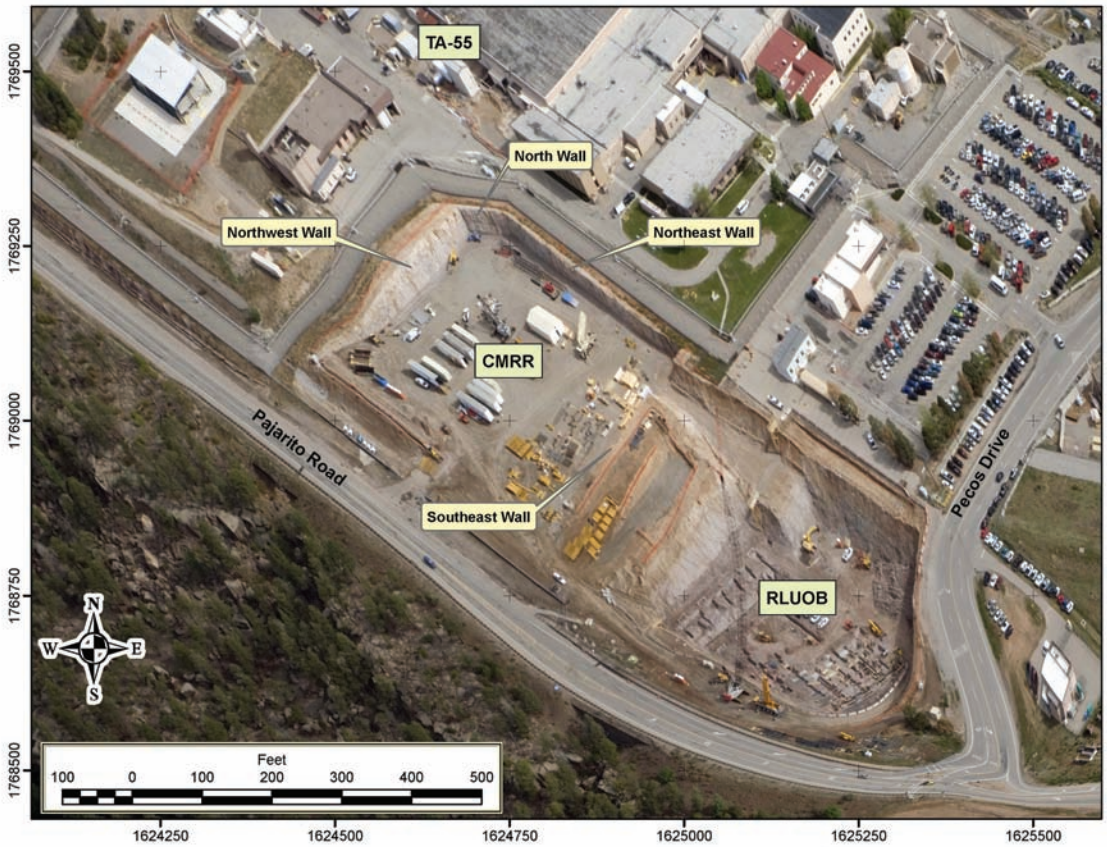
Geology and Structure of the Chemistry and Metallurgy Research Facility Replacement Site, Los Alamos National Laboratory, New Mexico



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About the cover: Orthorectified oblique aerial photograph of the CMRR site. The Phase B excavation walls, as well as the site of active construction (RLUOB) are labeled. See Figure 3c for a more detailed description.

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TABLE OF CONTENTS

ABSTRACT 1
1. INTRODUCTION AND BACKGROUND 2
2. THE CMRR SEISMIC PIT 5
3. SOME NOTES ON TERMINOLOGY 5
4. STRATIGRAPHY 8
4.1 Qbt_3 9
4.2 Qbt_s 9
4.3 Qbt_4 9
5. PETROGRAPHY AND GEOCHEMISTRY OF FISSURES/FUMAROLES 10
6. STRUCTURE 11
6.1 General Fracture Characterization 12
6.1.1 Northwest Wall 12
6.1.2 North Wall 14
6.1.3 Northeast Wall 14
6.1.4 Southeast Wall 14
6.1.5 Southeast Temporary Wall 18
6.1.6 Southwest Temporary Wall 18
6.1.7 Site-wide Fracture Analysis Summary 18
6.2 TOS- and BOS-Faults 23
6.3 Classic Faults 23
7. DISCUSSION 26
7.1 Fissures, Fumaroles, Faults, and Fractures 26
7.2 Lateral Continuity of Faults 26
8. CONCLUSIONS 29
ACKNOWLEDGEMENTS 29
REFERENCES 30
APPENDIX A Description of Numbered Features 33
APPENDIX B Petrographic Sample Descriptions X-Ray Diffraction (XRD) and X-Ray Fluorescence (XRF) Data 113
APPENDIX C Methods 113
APPENDIX D Survey Data, Grouped by Excavation Wall 123
APPENDIX E Structural Data 269

LIST OF FIGURES

Figure 1. Map of the Rio Grande rift in northern New Mexico 3
Figure 2. Map of Los Alamos vicinity showing major elements of the Pajarito fault system 4
Figure 3a. Aerial photograph of the CMRR site taken before excavation 6
Figure 3b. Same aerial photograph as Figure 3a showing the area of the Phase-B excavation 7
Figure 3c. Vertically rectified, oblique aerial photograph of the excavated CMRR seismic pit and the neighboring RLUOB construction site. 8
Figure 4. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the NW Wall 13
Figure 5. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the N Wall 15
Figure 6. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the NE Wall 16
Figure 7. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the SE Wall 17
Figure 8. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the SET Wall. 19
Figure 9. Equal-area stereoplots of poles to fracture planes (left) and the Rose diagrams showing the density of strike orientations (right) of fractures exposed in the SWT Wall 20
Figure 10. Equal-area stereoplot of poles to fracture planes (top) and the Rose diagram showing the density of strike orientations (bottom) of all measured fractures at the CMRR seismic pit 21
Figure 11. Equal-area stereoplot of poles to fracture planes (left) and the Rose diagram showing the density of strike orientations (right) of all measured and identified faults at the CMRR seismic pit. 22
Figure 12. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) for fractures within only a single Tshirege Member subunit 24
Figure 13. Equal-area stereoplots of poles to fracture planes (left) and the Rose diagrams showing the density of strike orientations (right) for all fractures in parallel walls 25
Figure 14. Map of the CMRR seismic pit showing pit walls, defined by surveyed points, and strike lines of features described in Appendix A or discussed in the text. 28

GEOLOGY AND STRUCTURE OF THE CHEMISTRY AND METALLURGY RESEARCH FACILITY REPLACEMENT SITE, LOS ALAMOS NATIONAL LABORATORY, NEW MEXICO

by

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ABSTRACT

This report presents the data and results of a detailed study of the geology and structure exposed on the walls of a large pit, excavated at the proposed site of the Chemistry and Metallurgy Research Facility Replacement building (CMRR). The main purpose of this study is to evaluate the potential for seismic surface rupture at the proposed site. Thus, understanding the origins and the timing of development of faults identified at the site are of utmost importance to this study. The study, completed under NQA-1 using approved procedures and processes, included detailed logging of geologic and structural relations, with the use of a total station surveying instrument, of about 32,000 ft^2 exposed in the pit walls. Structural attitudes were determined in the field for 1,204 features. Ensuing petrographic, X-ray diffraction, and X-ray fluorescence laboratory studies of selected samples were done to establish the link between large, filled fissures in the walls of the pit with fossil fumarolic activity in the tuff bedrock.

Geologic units exposed in the pit were three units of the Tshirege Member of the Bandelier Tuff. This portion of the Bandelier Tuff was erupted at 1.25 Ma. The CMRR pit exposes a sequence of ash-flow tuff, pyroclastic surge, and a capping ash-flow tuff. These units are known as, in stratigraphic sequence, Qbt_3, Qbt_s, and Qbt_4. Overlying the pyroclastic deposits is a variety of anthropogenic deposits, such as fill or debris, and, as such, there are no direct constraints on the ages of structures at the site other than the age of the Bandelier Tuff. Detailed structural analyses of all data show no convincing relationship between the structures at the site and the Pajarito fault system, the closest part of which is approximately 4,000 ft to the west, or to the Rio Grande rift. Instead, the patterns that emerge from the analysis indicate structure development during cooling of the tuff. In more detail, structures in the pit fall into several categories: faults that displace only the top or bottom contact of the surge deposit (Qbt_s) (TOS- and BOS-faults; “top of surge” and “bottom of surge,” respectively); classic faults, including those that lack vertical continuity; and, fissures/fossil fumaroles. TOS- and BOS-faults are clearly created during cooling and compaction of the tuff, in particular, compaction of Qbt_s and the top of Qbt_3; faults, also, are best related to the settling of blocks of the cooling tuff; and, the fissure/fumaroles are related to cooling and degassing of the tuff. The largest displacement of the Bandelier Tuff is 2 ft since 1.25 Ma. Only one fault can be correlated between two walls, but cannot be found along strike on the third wall. These relations indicate that the fault may be longer than 150 ft, but shorter than 300 ft. Thus, given site-structure relations to cooling and compaction of the tuff, lack of lateral continuity, and lack of relations to seismogenic structures, we conclude that the structures at the proposed CMRR site originated from fumarolic activity and shortly post-depositional cooling and compaction, and pose no independent seismic surface rupture hazard.

1. INTRODUCTION AND BACKGROUND

Los Alamos National Laboratory (LANL or "the Laboratory") lies within an active continental rift. Named the Rio Grande rift, this is a major tectonic feature along which the North American continent is slowly, but inexorably, being torn apart in a dominantly east-west direction (Figure 1). The western boundary of the Laboratory is also the local western boundary of the Rio Grande rift. It is defined by the Pajarito fault system, which is composed locally of three named fault zones and numerous smaller faults (Figure 2). All faults of the Pajarito fault system are potentially seismogenic (Gardner et al., 1999; Gardner et al., 2003), and as such, the fault system presents a significant seismic hazard to the Laboratory with respect to seismic ground motion and seismic surface rupture (Wong et al., 2007). The rift as a whole is the site of current seismicity and magmatism (Sanford et al., 1991; Baldridge et al., 1995; Wolff and Gardner, 1995; Machette et al. 1998; Steck et al., 1998), and consequently, consideration of natural phenomena hazards must be given for the safety of hazardous facilities that are being placed within the rift.

Technical Area 55 (TA-55) (Figure 2) at Los Alamos National Laboratory is the site of existing nuclear facilities as well as the site of planned future nuclear facilities. One of these planned facilities is the Chemistry and Metallurgy Research Facility Replacement (CMRR). The original Chemistry and Metallurgy Research (CMR) building is located in Technical Area 3 (TA-3) (Figure 2) of the Laboratory. Demographically, TA-3 has become the work site of a significant proportion of the Laboratory's workforce, with nearly 45% of all LANL employees and the Laboratory's main administrative functions in residence there. These considerations alone may indicate operation of a nuclear facility in TA-3 is no longer a good idea. In addition, CMR is burdened with 1950s' design and infrastructure, and it was recently discovered that one wing of the building overlies a splay of the Rendija Canyon fault, one of the three named elements of the Pajarito fault system (Krier et al., 1998; Gardner et al., 1999). Thus, a modern replacement facility is planned to be built at TA-55.

It was once speculated that the Rendija Canyon fault might continue south of the Los Alamos town site on a north-south strike (e.g., Gardner and House, 1987; Wong et al., 1995), although regional geologic maps (e.g., Smith et al., 1970) show the southern termination of the fault around Bayo Canyon, north of the Los Alamos town site (Figure 2). If the Rendija Canyon fault did continue on a north-south strike as speculated, it would run through TA-55. Understandable concerns about the possibilities of seismic surface rupture prompted a detailed study of the stratigraphy and structural geology from TA-55 to TA-3 (Gardner et al., 1998, 1999). Gardner et al. (1999) showed that, in fact, the Rendija Canyon fault does continue south from Bayo Canyon, but it changes strike and bends to the southwest, running through TA-3 (Figure 2), ultimately connecting with the Pajarito fault. The few faults that Gardner et al. (1999) found in the general vicinity of TA-55 were very small (less than three feet of displacement on the Bandelier Tuff) and lacked lateral continuity (less than 500 ft in length).

Lavine et al. (2005) examined core taken from a series of geotechnical holes at the proposed CMRR site. They noted a number of anomalies in contact relations within the geologic units at the site, but could not identify any significant faults. Although Lavine et al. (2005) could attribute some of the relations found in the core to nonplanar contacts and the pinch and swell of geologic units, uncertainties remained that could only be addressed with excavation.

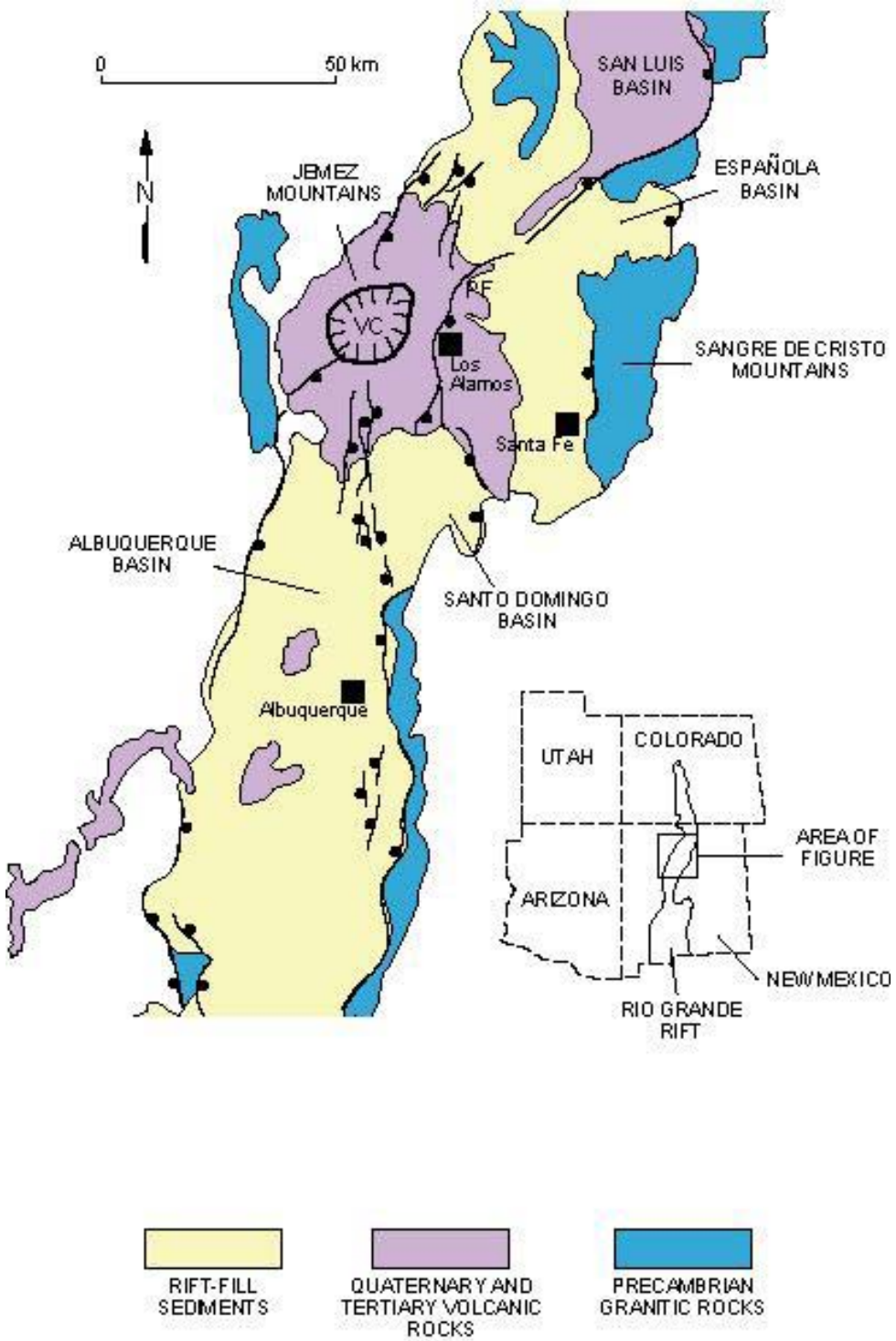


Figure 1. Map of the Rio Grande rift in northern New Mexico. The major fault systems are shown schematically. PF is the Pajarito fault system, near Los Alamos, and VC is the Valles caldera, the source of the Bandelier Tuff (modified from Gardner and Goff, 1984).

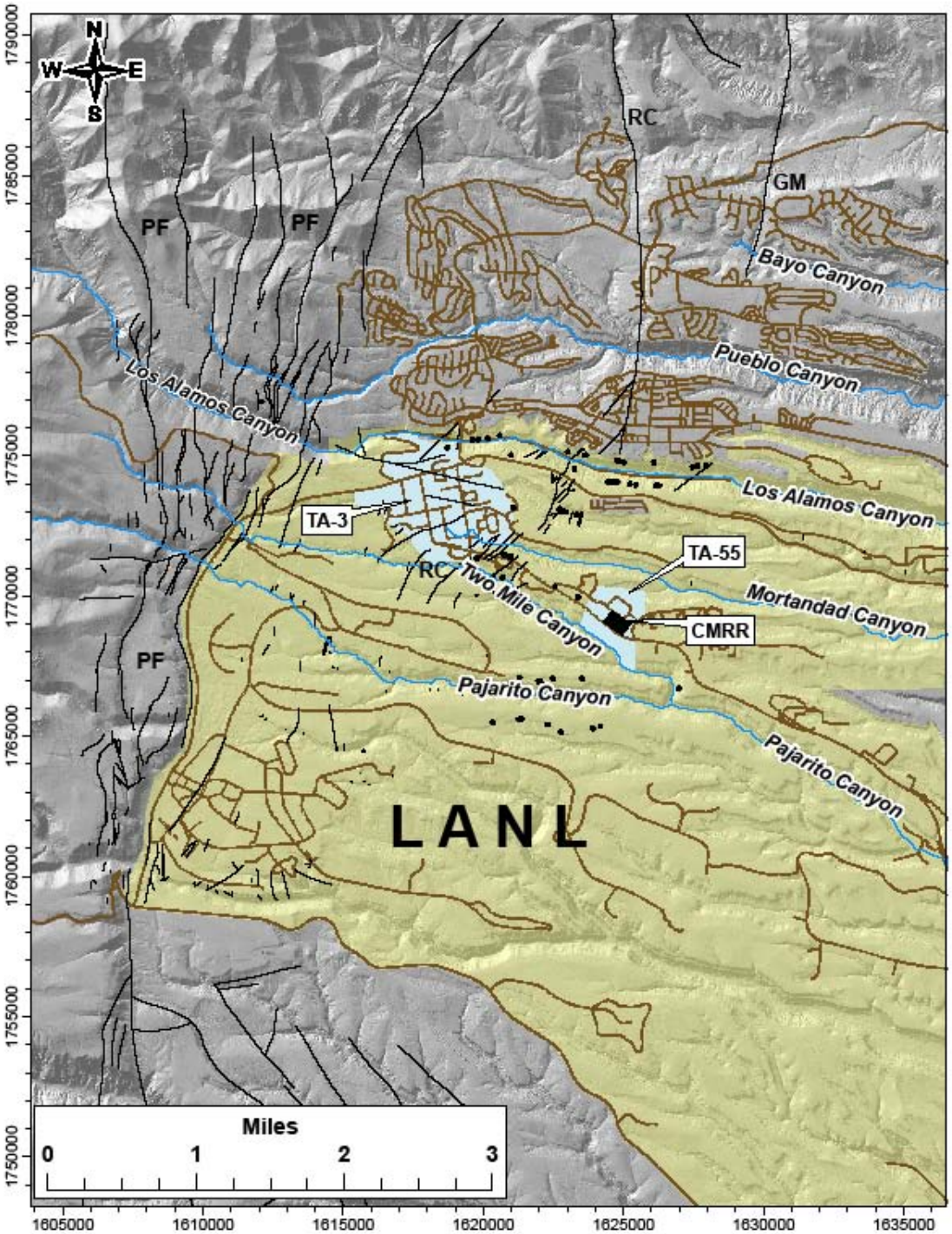


Figure 2. Map of Los Alamos vicinity showing major elements of the Pajarito fault system (PF=Pajarito fault, RC=Rendija Canyon fault, and GM=Guaje Mountain fault) and their relation to the Laboratory (LANL, shaded green). Roads are shown in brown. TA-3, TA-55, and the CMRR site are also shown. Los Alamos town site is north of LANL.

Discussions began among the CMRR project staff and the Laboratory's Seismic Geology Team to develop an appropriate approach to excavations for seismic surface rupture studies at the proposed site for CMRR. At that location, the excavations would need to be at least 25 feet deep to expose enough stratigraphy to be of use for the evaluation of faulting. This depth, 25 feet, is about at the limit of what can be safely achieved with conventional trenches. Additionally, the footprint of the proposed CMRR is large, a rectangle about 300 feet on each side, and to put in a network of trenches to adequately evaluate faulting and fault continuity over such an area would have been prohibitive for cost, safety, schedule, and numbers of available, qualified personnel to do the work. It was decided, therefore, that a pit would be excavated for the seismic surface rupture studies that might then be deepened for construction of the foundations for CMRR. Additionally, while providing the geology team access to the walls, the pit would be used as a lay-down yard and staging area for the neighboring construction of the Radiological Laboratory, Utility, and Office Building (RLUOB). Thus, excavation of the "seismic pit" at the proposed footprint for CMRR would provide affordable, safe exposures of the geology adequate to evaluate the seismic surface rupture hazard and would greatly facilitate the RLUOB construction currently underway.

2. THE CMRR SEISMIC PIT

Excavation of the CMRR seismic pit was done in two phases (Figure 3). Phase A began in late September, 2006. The Phase-A pit exposed what would be the permanent northwest and north walls, the northwest portion of what would be the permanent northeast wall, and two temporary walls, designated Southeast Temporary (SET) and Southwest Temporary (SWT). Because they were to be temporary, geologic work immediately following the Phase-A excavation was focused on the SET and SWT walls. SET was about 215 feet long and about 20–25 feet high. SWT was about 150 feet long and about 20 feet high. Logs for these temporary walls provide invaluable three-dimensional control on structure and stratigraphy. Phase-B excavation began in late January, 2007, and involved expansion of the Phase-A pit, removing the temporary walls. Phase-B excavation resulted in the four permanent walls, designated Northwest (NW), North (N), Northeast (NE), and Southeast (SE). The NW wall is 260 feet long and from 15–35 feet high. The N wall is 85 feet long and about 30 feet high. The longest wall is the NE wall at 320 feet long and 20–30 feet high. The SE wall is 275 feet long and about 20 feet high; a 100-foot-section of the SE wall was removed for construction purposes, after we had completed logging and field peer review, and can no longer be examined. Thus, the walls of the CMRR seismic pit exposed about 32,000 ft^2 of geologic relations that were logged, forming the basis for this study (see Plates 1 to 6).

3. SOME NOTES ON TERMINOLOGY

Geologic rock units are designated Qbt_3, Qbt_s, and Qbt_4 (see "Stratigraphy") on the logs and in discussions. These designations are shorthand, as follows: Q for Quaternary, the broad geologic age of the unit; bt for Bandelier Tuff, the formation name; and, 3, s, or 4 for unit 3, pyroclastic surge, or unit 4, respectively.

Most noteworthy features, including faults, which deserve some discussion or description, are numbered on the logs (Plates 1 to 6). These numbers are of the form, for example, SET-10, indicating that the feature is on the southeast temporary wall, and is the tenth numbered feature selected for description from the left-hand end of the log. Detailed descriptions of these noteworthy features can be found in Appendix A. Additionally, all logs have equal vertical and horizontal scales. The vertical scale is the elevation in feet above sea level. The horizontal scale, also in feet, starts from zero at the left-hand end of the log. Thus, features not otherwise numbered as described above can be uniquely located by a scale reference such as SET123H, 7280V, which in this example describes the location of a feature on the southeast temporary wall, at 123 feet on the horizontal scale and 7,280 feet elevation on the vertical scale.

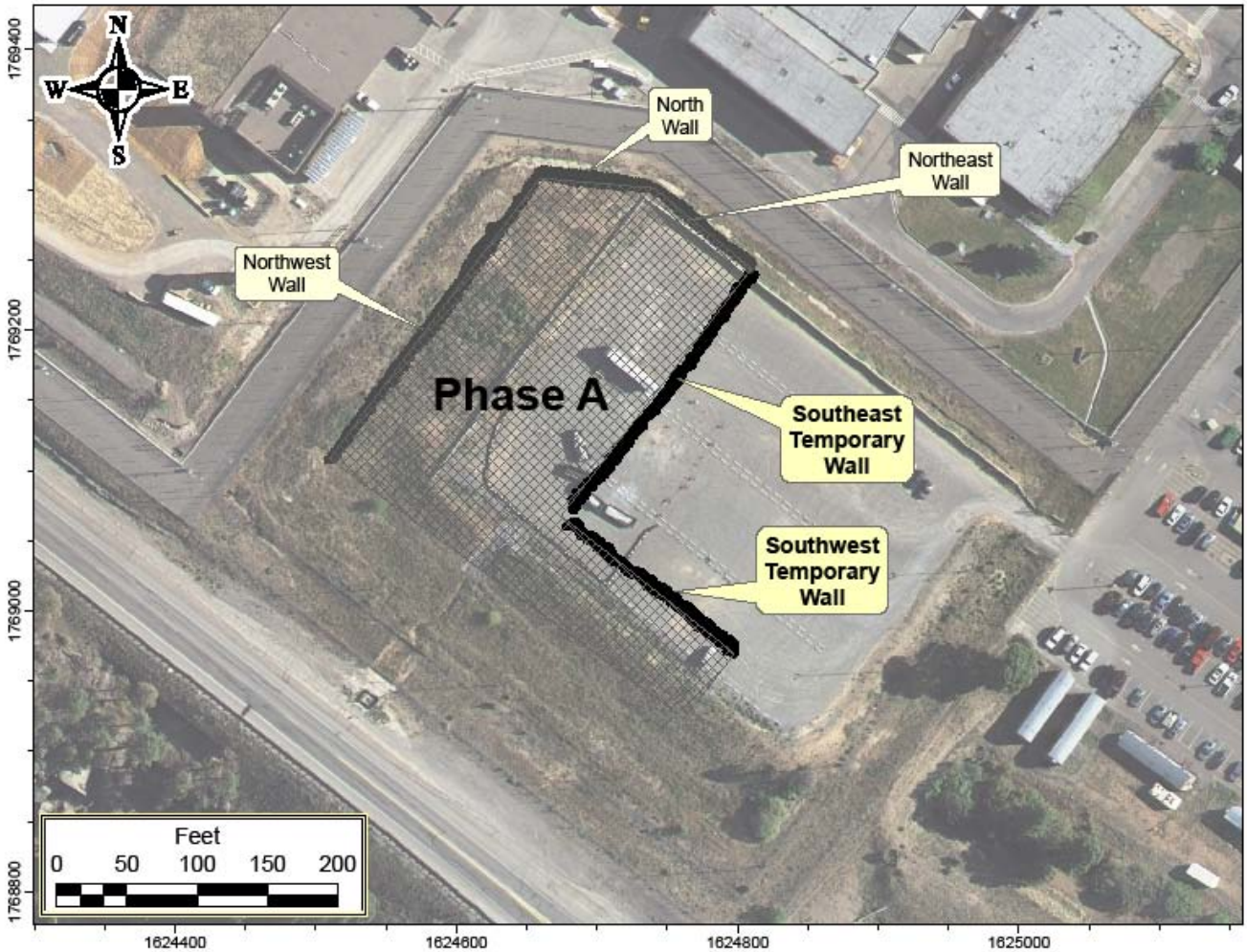


Figure 3a. Aerial photograph of the CMRR site taken before excavation. The area excavated in Phase A is shown in cross-hatch. The black and grey lines defining the excavation walls are the myriad surveyed points on the walls. The black lines emphasize the priority walls for logging and study following the Phase-A excavation.

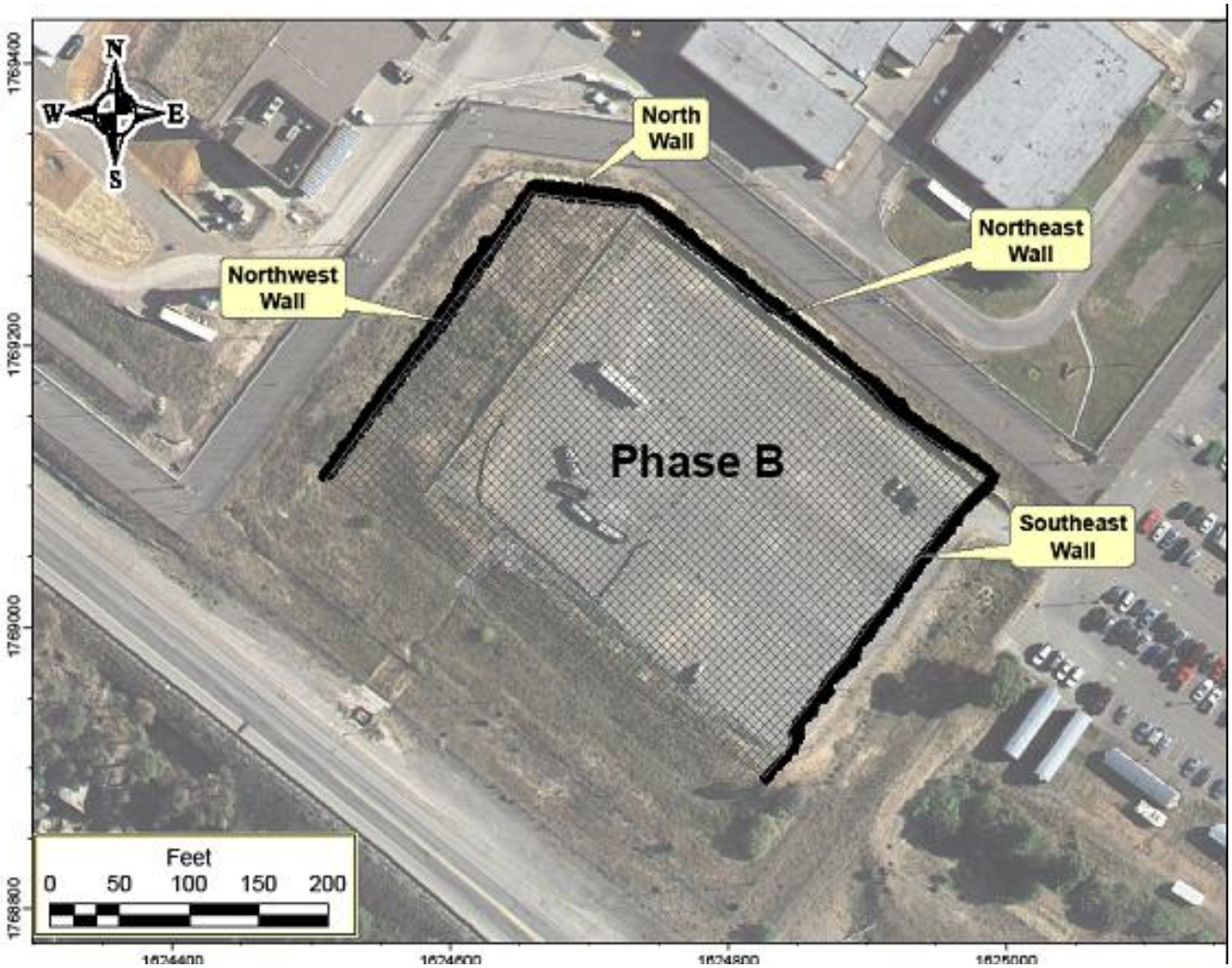


Figure 3b. Same aerial photograph as Figure 3a showing the area of the Phase-B excavation. The symbols are the same as in Figure 3a.

Figure 3c. Vertically rectified, oblique aerial photograph of the excavated CMRR seismic pit and the neighboring RLUOB construction site. The blue and yellow equipment against the north wall and the northeast end of the northwest wall are the Seismic Geology Team's boom lifts.

Geologic structures at the CMRR pit present some unusual relationships that have led us to adhere to strict definitions of geologic terms. A classic fault is defined as a fracture along which demonstrable displacement has occurred. The term "fault" is used in this document as a routine descriptive term of geologic deformation, without genetic implications. Thus, "fault" refers to a structure that displaces both the top and bottom contacts of the surge deposit with a similar sense, or one that displaces the Qbt_3-Qbt_4 contact. If a fault exhibits displacement only on the top contact of the surge deposit, we call it a TOS ("top of surge") -fault; similarly, if the fault displaces only the bottom contact of the surge, we call it a BOS ("bottom of surge") -fault. Most structures in the CMRR pit lack vertical continuity. Commonly, a structure can be traced downward through Qbt_4 and the surge, but it cannot be traced much farther than a few feet in the upper part of Qbt_3. We refer to such structures as "rootless."

4. STRATIGRAPHY

The dominant rock unit of the CMRR seismic pit is the Tshirege Member of the Bandelier Tuff, which has been recently dated by modern radiometric methods at 1.25 Ma (Phillips, 2004). The exposed Tshirege Member is subdivided into three units consistent with the usage of Gardner et al. (1999) who mapped the surrounding area. Overlying the Tshirege Member in places around the CMRR pit are

various anthropogenic deposits such as fill or debris. The only natural post-Bandelier Tuff unit exposed is a sequence of colluvial deposits with a weak pedogenic overprint at the southwest end of the NW wall. These deposits were so localized (running less than 35 feet along the wall) that they were of no use in constraining the timing of deformational events. The Bandelier Tuff units exposed in the pit are, from oldest to youngest: Qbt_3, Qbt_s, and Qbt_4. Contacts among all the Bandelier Tuff units are sharp. The Qbt_3 and Qbt_4 units were originally defined by Broxton and Reneau (1995) as distinct cooling units of the tuff in the central and eastern parts of the Laboratory area. As such, each unit was emplaced with a sufficient time interval between them to allow their independent cooling. The following are brief field descriptions of the units. More detailed petrographic information can be found in Appendix B and in Lewis et al. (2005).

4.1 Qbt_3

The maximum exposed thickness of Qbt_3 is 15 feet, but the base of Qbt_3 is not exposed in the CMRR pit; based on drill-hole data, Lavine et al. (2005) show that Qbt_3 is a total of about 110–120 ft thick at the CMRR site. Qbt_3 is a nonwelded tuff and is extremely friable. The tuff contains about 30% phenocrysts of quartz and sanidine set in an ashy matrix. Fairly distinctive of the phenocryst population of Qbt_3 is the relatively coarse crystal size, with most phenocrysts 4–6 mm in size. Qbt_3 is relatively pumice rich with about 30% pumice lapilli. Locally, pumice swarms, with individual pumice lapilli up to 8 inches long and constituting up to 60% of the deposit, occur in Qbt_3. Accidental lithic fragments are characteristic of Qbt_3 and range up to 5%. The unit contains many fossil fumaroles, which are commonly fines-depleted pipes that flare upward with a fan shape. These fumaroles were the focus of additional petrographic and geochemical studies, discussed below, because they appear to be associated with the larger structures, including faults, exposed in the pit. Qbt_3 had considerable topography developed on its top before the eruption of Qbt_s and Qbt_4. In one area exposed on the NE wall (NE-3), ash and pumice lapilli at the top of Qbt_3 were reworked into a channel.

4.2 Qbt_s

Qbt_s is 0–4 ft thick; Qbt_s is a pyroclastic surge deposit that Gardner et al. (1999) showed to be widespread. It exhibits dramatic pinch and swell characteristics within a distance of a few horizontal feet (see Plates 1 to 6). The top and bottom contacts are not planar and have abrupt irregularities that cannot be related to structure. Many of these irregularities are noted in “Feature Descriptions” (for example, SWT-3, SE-1, SE-4, SE-15, NW-16, N-1, and N-2; Appendix A). TOS- and BOS-faults clearly indicate that Qbt_s continued to experience compaction after emplacement of Qbt_4 and after sufficient cooling of Qbt_4 for it to be lithified and deform in a brittle fashion. The surge is extremely crystal rich, consisting of sand-sized grains of mostly quartz, sanidine, and lithic fragments with generally less than 10% ash. Qbt_s commonly exhibits plane beds or cross beds. Data indicate that Qbt_s is geochemically similar to Qbt_4 (Gardner et al., 1999), implying a rapid succession of surge and pyroclastic flow emplacement.

4.3 Qbt_4

Qbt_s is 3–16 feet thick; Qbt_4 is the local uppermost unit of the Tshirege Member of the Bandelier Tuff. The thinnest exposure of the unit occurs at the southwesternmost corner of the seismic pit where it has been eroded and covered with colluvium. Most commonly, the unit is about 12 feet thick in all of the walls of the pit. Gardner et al. (1999) mapped Qbt_4 as pinching out, from west to east, in the vicinity of what is now the CMRR pit, but their efforts mapping the unit were hampered in this area by poor exposures and anthropogenic disturbances of the rock and soil. Qbt_4 must pinch out just east of this study area because it is clearly absent from the mesa top less than 500 feet to the east, and Gardner et al. (1999) showed that the unit thickens to the west. Qbt_4 is slightly welded and has 15%–20% phenocrysts of mainly sanidine and quartz with rare pyroxene and amphibole, in a matrix of ash. The phenocrysts are

generally 2–3 mm in length. The unit is relatively pumice poor with less than 5% pumice lapilli. Accidental lithic fragments are rare. Minor, discontinuous pyroclastic surge layers are interbedded with the ignimbrite.

5. PETROGRAPHY AND GEOCHEMISTRY OF FISSURES/FUMAROLES

Distinct rubble-filled fissures, or pipes, occur in the Bandelier Tuff units at the CMRR pit. These fissures, most clearly defined in Qbt3, range in width from fractions of an inch to several feet. The fissures exhibit zones of fines depletion, indurated wall structures, upward flaring geometry to the top of unit Qbt3 (similar to classic diatreme structures), and fissure-filling blocks of the host unit as well as rubble derived from overlying Bandelier Tuff units. Units Qbts and Qbt4 are commonly intensely fractured over rubble-filled fissures in unit Qbt3. Additionally, the fissures appear to be regularly spaced at about 15 or 25 feet apart along the NW wall. All of these characteristics are indicative of fumarolic activity in unit Qbt3 (Smith, 1960) that additionally affected overlying units Qbts and Qbt4. Fumarolic pipes, such as these, have been described by Crowe et al. (1978) elsewhere on the Pajarito Plateau. Additionally, these features have been described for fossil fumarolic pipes at the Valley of Ten Thousand Smokes, Alaska (Keith, 1991; Papike et al., 1991) and Bishop Tuff, California (Sheridan, 1970). However, because these fissures commonly are associated with faults at the CMRR pit, and may, therefore, provide some timing constraints on deformation, we performed petrographic and geochemical studies on samples from them to firmly establish the link to fumarolic activity. Petrographic descriptions, X-ray diffraction (XRD) data, and X-ray fluorescence (XRF) data for the 49 field samples collected for this purpose can be found in Appendix B. Analytical methods can be found in Appendix C. Samples in a given unit taken in areas a minimum of several feet away from the pipes were used to establish “background” petrography and geochemistry of each unit, for use in comparison to samples taken from pipe walls and centers in Qbt_3 as well as samples from the overlying disrupted portions of units Qbt_s and Qbt_4. It should be noted, however, that, given the limited scope of this portion of our study, we could not do an exhaustive study to establish true background conditions. Thus, in these discussions, enrichments or depletions are only locally relative, and cannot be taken as absolute. Seven sampled zones around and including the fissures (pipes 1–7) are located on the NW wall, and two more rubblized zones sampled (pipes 8 and 9) are located on the SE wall of the pit. Sample locations and numbered pipes are shown on Plates 1 and 4. Other pipe structures are exposed in the CMRR pit, but were not sampled.

All rock samples contain the following phenocrysts: quartz, potassium feldspar, clinopyroxene, and Fe-oxides, with unit Qbt_3 having a higher overall abundance of phenocrysts. Clay and Mn-oxides are common in some samples. Unit Qbt_3 samples are devitrified, and all samples show vapor-phase crystallization. In thin section, these are illustrated by axiolitic minerals, cristobalite and alkali feldspar, in shards and pumice lapilli. These same phases have also grown into pumice voids. In samples from locations away from the fissures, tridymite is relatively rare. The Qbt_3 pipe wall and pipe center samples have mineralogies that are enriched in tridymite and potassium feldspar. These minerals fill the groundmass void spaces of the pipe wall rocks, imparting the indurated nature. Tridymite and potassium feldspar also have grown into void spaces in pumice. The Qbt_3 pipes thus exhibit mineralogy and paragenesis indicative of late-stage fumarolic gas-phase deposition. Another mineralogic indicator of fumarolic gas-phase deposition is the presence of scapolite in at least one pipe-center sample (CMRR-017B). Scapolite occurs in the Bishop Tuff fumarolic pipes (Sheridan, 1970) and in fossil fumaroles elsewhere in the Bandelier Tuff (Smith and Dickson, 1965). Additionally, clinopyroxenes in the overlying rubble zones of unit Qbt_4 have red-brown oxidized rims. This is indicative of highly oxidizing gases emanating from the fumarolic pipes in unit Qbt_3. The majority of alkali feldspar phenocrysts in the pipe center samples of unit Qbt_3 exhibit feathery overgrowth rims that are in optical continuity, additionally indicating late-stage feldspar deposition from fumarolic gases. Thus,

petrographic data indicate that although some vapor alteration is widespread in Qbt_3, the fissures represent sites of more focused and intense fumarolic activity.

Quantitative X-ray diffraction (XRD) analyses (Appendix B) of unit Qbt_3 samples provide no insight into the occurrence of the fossil fumarolic pipes. Within the XRD analyses, there is no consistent enrichment or depletion of mineral phases in the pipe wall or pipe center relative to the background unit Qbt_3 samples, as compared to petrographic analyses that did indicate enrichments of tridymite and potassium feldspars in those areas. This may be due to the fact that the silica and alkali feldspar phases have very similar diffraction peaks causing difficulty in discerning small abundance changes. However, XRD analyses of unit Qbt_4 rubble zones show decreased cristobalite and feldspar percentages (and increased clay contents) in samples from above the pipes *versus* background Qbt_4 samples. Cristobalite generally decreases by 4 wt%, while feldspars decrease by an average of approximately 9 wt%. Increases in clay content in these same samples are 12 to 26 wt%. This change from feldspar and cristobalite to clay may be suggesting an acidic nature of gases from the underlying fumarolic pipes.

X-ray fluorescence (XRF) analyses (Appendix B) show trends in bulk chemistry that are consistent with fumarolic data from both the Valley of Ten Thousand Smokes, Alaska (Keith, 1991; Papike et al., 1991) and the Bishop Tuff, California (Sheridan, 1970). Sheridan (1970) in particular describes silica depletion and iron and aluminum enrichment within fumarolic pipes. This is the trend for both the pipe wall rock and pipe centers of Qbt_3 in pipe numbers 6, 7, 8, and 9 in the SE Wall (Appendix B, Table B7). Sheridan (1970) and Keith (1991) also observed K_2O depletion; however, in the CMRR samples, K_2O values were constant between the pipe and background samples of unit Qbt_3. In unit Qbt_4 rubble zones, TiO_2, Al_2O_3, Fe_2O_3, and MgO show enrichment relative to background samples, while rubble zone samples exhibit SiO_2, Na_2O, and K_2O depletion relative to background. These major element chemical trends in the rubble zone of unit Qbt_4 closely follow those described by Sheridan (1970) and Papike et al. (1991). The XRF trace-element analyses indicate slight Ba and Zr enrichment in the Qbt_3 pipe wall rock and pipe centers. In the rubble zone of Qbt_4, there is evidence of slight Ba and Zr depletion, and Rb and Y enrichment relative to Qbt_4 background analyses. These trends are not clearly seen in the work of Papike et al. (1991). It should be noted that these trace element enrichments and depletions are subtle and that the amounts are close to analytical uncertainties. Thus, the trace-element enrichments and depletions are extremely sensitive to the choice of “background” values. Regardless, the data indicate that there have been systematic changes in the geochemistry of the fissures readily attributable to the action of fumarolic gases.

Therefore, field relations (e.g., funnel-shaped pipes, rubble zones in overlying units, and apparent regular spacing of features), petrography (tridymite/sanidine enrichment, oxidized clinopyroxene rims, scapolite, and feathery-rim overgrowths on feldspars), XRD (Qbt_4 cristobalite and feldspar loss, and clay production), and XRF major and trace elements all indicate that the filled fissures are fossil fumarolic pipes. Fumarolic activity, established after the deposition of Qbt_3, must have continued after the emplacement and induration of Qbt_s and Qbt_4.

6. STRUCTURE

For discussion, we divide the structures exposed and studied in the CMRR seismic pit into several categories. These categories are as follows: all fractures, TOS- and BOS-faults, faults, and fissures/fumaroles. We link fissures and fossil fumaroles because of the petrographic and geochemical evidence presented above, and structurally they appear to be intimately related, as discussed below. In this discussion of structure, we begin with a general characterization of all fractures and structural features so as to develop an overall understanding of the origins of these features. We then move to a discussion of the other categories of structures with an emphasis on implications for potential seismic surface rupture.

6.1 General Fracture Characterization

The detailed fracture characterization study that follows for each of the six exposed walls at the seismic pit helps us understand the nature of fracture development at the CMRR site. In the field, we identified and mapped over 2,000 fractures, using total station surveying (for methods, see Appendix C; for data, see Appendix D) and conventional structural-geology attitude measurement techniques (for methods, see Appendix C). We acquired orientation data on 1,204 fractures and faults across the site. Most of the structural data are from fractures and faults in Qbt_4 and the nonwelded upper portion of Qbt_3. Although some data are from Qbt_s, structural orientations within this unit were challenging to obtain because Qbt_s is generally too unconsolidated to preserve a fracture plane along which both strike and dip could be measured. Data are compiled in Appendix E. This analysis includes all fractures for which we had structural attitude data.

Fracture data discussed within this section are visually depicted as poles to fracture planes (points) in lower-hemisphere stereoplots, and as Rose diagrams. Both plots incorporate measured structural orientations for a particular area or geologic unit, and illustrate data density and clustering patterns (or lack thereof). As a generalization, points plotted on a stereoplot that are located near or along the great circle (boundary circle) represent data with high or near-vertical dips, and points plotting near the center of the stereoplot have shallow to horizontal dips. Where sufficient data were present (>10 data points), predominant strike directions and resultant vectors were statistically calculated. For smaller data populations, data are plotted and discussed in terms of general visual trends or patterns; calculating statistics, such as resultant vectors and eigenvectors for these smaller populations, do not provide meaningful data. The discussions of fracture characteristics for each wall and for the entire site unfold in the context of three separate fracture populations, the number of fractures for which structural orientations were obtained, the number of TOS- or BOS-faults, and faults.

6.1.1 Northwest Wall (Figure 4)

The greatest in height of all walls within the CMRR seismic pit, the northwest (NW) wall (Plate 1) provided excellent exposure of both Qbt_4 and Qbt_3. In some regions of the NW wall, as much as 12-15 ft of Qbt_3 were exposed. This wall also provided the greatest density of identified fossil fumaroles, many of which correspond to faults. Our team measured 246 fractures along the NW wall. Data clustering as shown in the point-density plot (contoured stereoplot) in Figure 4a is weak, with a majority of fractures exhibiting steep to vertical dips but also showing a greater number of less-steeply-dipping fractures as compared to the SET and SWT walls. There is a broad range of fracture strikes. The overall predominant strike direction (or resultant vector) for all fractures as shown in the Rose diagram in Figure 4a is 298˚ (N62W) with a minor peak at approximately 345˚ (N15W). Nine fractures with displacement were observed and measured; all of these features were moderate to steeply dipping. Of these nine fractures, six are TOS- or BOS-faults and three are classic faults. All of the faults have steep dips but strike directions vary. The three faults shown in Figure 4c appear to define a conjugate set of fractures. Conjugate fracture sets are known to be generated as a result of tuff cooling and compaction.

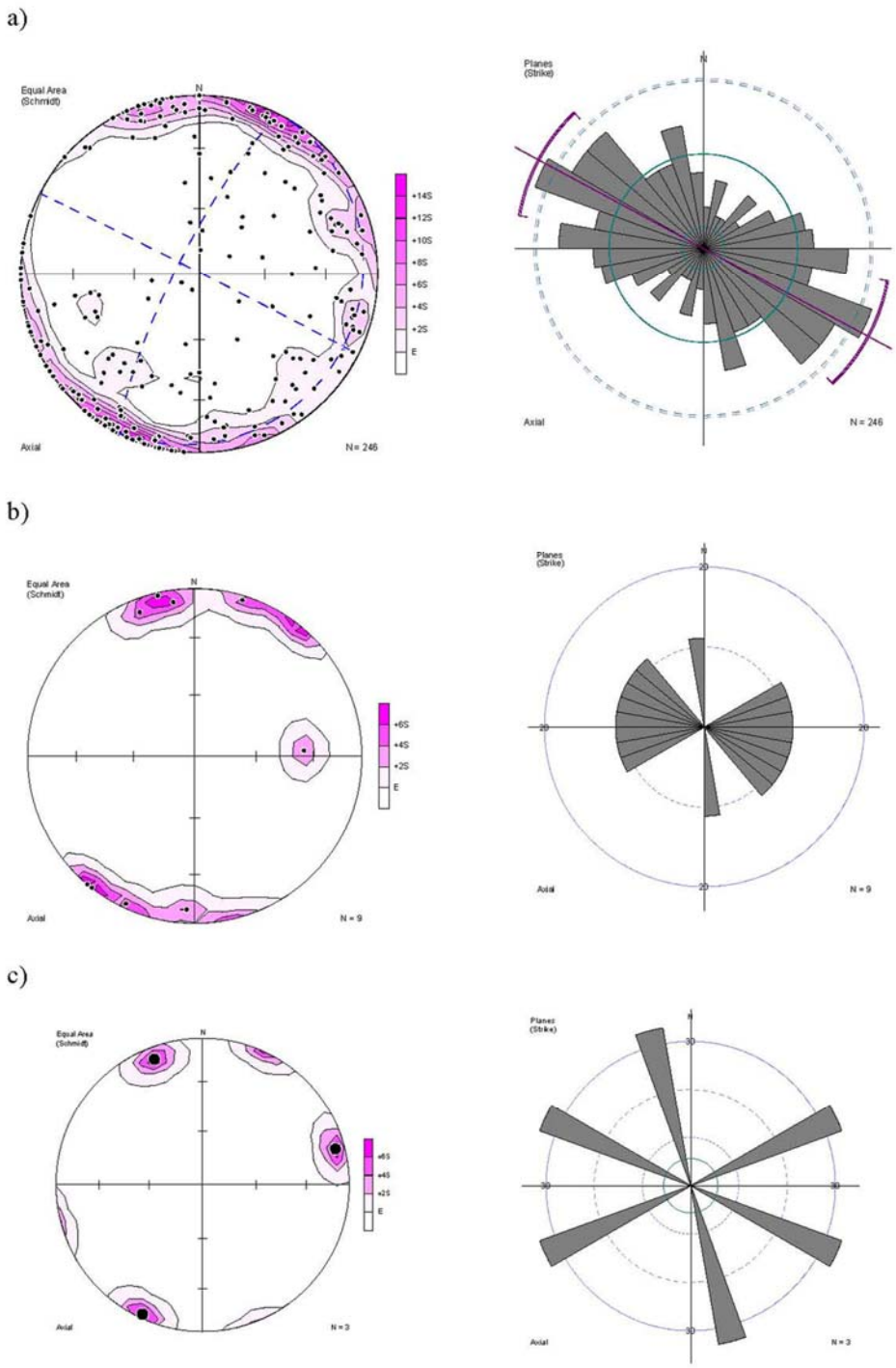


Figure 4.

Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the NW Wall. (a) All fractures exposed within the NW Wall; 246 total. The stereonet c125ontour intervals (left; shades of pink) for this figure and subsequent stereoplots are calculated using Gaussian methods and are equal to $E + 2s$, $E + 4s$, etc., where E is the number of points expected to be found in the counting circle if the points were extracted randomly from a uniform population, and s is the standard deviation. See Appendix C for methods for stereoplot and Rose-diagram generation and statistical analyses. Stereoplot eigenvectors: 1 = 301˚, 80˚; 2 = 117˚, 10˚; 3 = 207˚, 1˚.

The Rose diagrams presented herein represent groupings of fracture-strike orientations, shown in 10° bins. The labeled great circles represent the percentage of total data included within a particular bin; thus, a bin extending to a particular great circle indicates that a certain percentage of all the data within the subset are included within that bin.

The resultant vectors (purple arrows) are shown with 95% confidence angles (purple arcs). The Rose diagram resultant vector: 298˚ ± 23˚. The outermost great circle represents 10% of the data population. (b) Fractures with displacement exposed within the NW Wall; 9 total. The outermost great circle represents 20% of the data population. (c) Faults exposed within the NW Wall; 3 total. The outermost great circle represents 30% of the data population.

6.1.2 North Wall (Figure 5)

The north (N) wall is the shortest wall in the CMRR pit, and it revealed 133 measurable fractures with a wide range of structural orientations (Plate 2). Unlike other walls, the majority of fractures exposed in the N wall do not cluster at high-angle dips; rather, the stereoplot of poles to fracture planes for all fractures in the N wall (Figure 5a) shows moderate clustering of approximately 45˚ southerly dips on roughly east-west striking fractures. A smaller data cluster shows steep easterly dips on roughly north-south striking fractures. The Rose diagram (Figure 5a) confirms the broad clustering of fracture strikes around the north-south and east-west axes. Although four fractures with displacement were identified in the N wall, only three fractures had identifiable planes from which to obtain structural data. All four fractures with displacement were either TOS- or BOS-faults; none displaced both the top and bottom contacts of Qbt_s.

6.1.3 Northeast Wall (Figure 6)

This wall trends parallel to the SWT wall and is by far the longest excavation wall within the CMRR seismic pit. The size of the wall allowed us to collect a robust structural dataset. There are data for 546 fractures on the northeast (NE) wall (Plate 3). Data clustering as shown in the stereoplot in Figure 6a is weak to moderate, representing steep northwesterly and southeasterly dips on primarily northeast-trending fractures. There is also a minor cluster of data representing northwesterly trending structures with moderate (between 30˚-70˚) southwest dips. The overall predominant strike direction for all measured fractures in the NE Wall is 61˚, and the Rose diagram in Figure 6a shows distinct peaks at approximately 80˚ (N80E) and 5˚ (N05E). Twelve fractures with displacement were identified. Seven of these features were TOS- or BOS-faults, and five fractures displaced the geologic contacts within the NE wall and were characterized as classic faults. These features have a resultant vector of 53˚ ±41˚ and cluster at high-angle dips. Figure 6c has three data peaks that appear to represent a conjugate set, roughly similar to that seen in exposed faults of the NW Wall.

6.1.4 Southeast Wall (Figure 7)

Among all fractures identified and mapped along the southeast (SE) wall (Plate 4), we measured structural orientations on 152 fractures. The stereoplot of poles to fracture planes shown in Figure 7a shows moderate clustering of data at the edges of the stereoplots and in the north-northwesterly and west-southwesterly regions of the plot, representing poles to two predominant fracture planes that have roughly northerly and east-west strikes and near-vertical dips towards the northwest and southwest. Of the population of 152 total measured fractures, twelve fractures exhibited some sort of displacement. This subpopulation of fractures has a predominant strike direction of 287˚ (N73W) and a clustering of data indicating steep north to northeast dips. Eight fractures exposed in the SE Wall were identified as classic faults. These identified faults appear to have steep dips and a rough northwesterly strike trend.

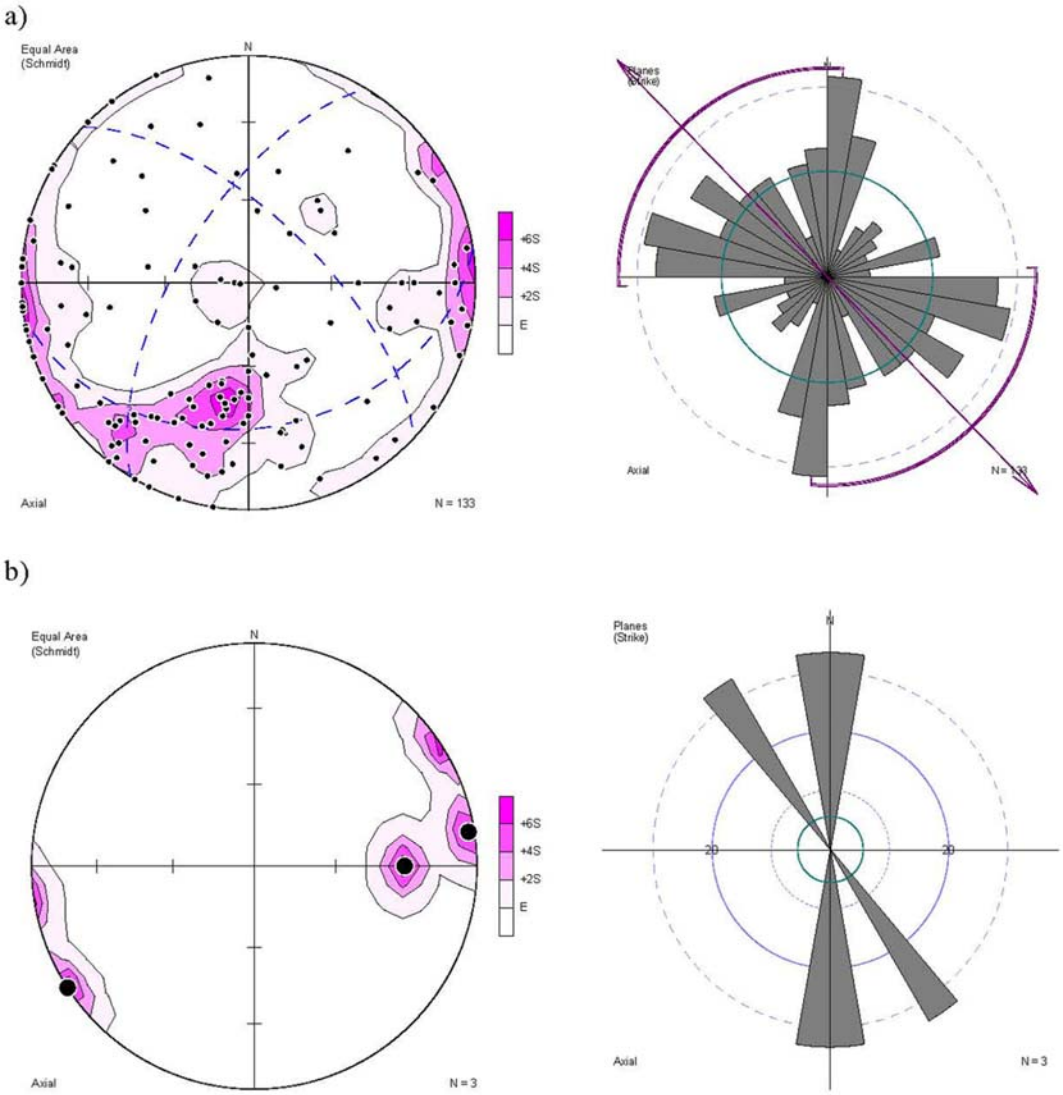


Figure 5. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the N Wall. (a) All fractures exposed within the N Wall; 133 total. The stereoplot eigenvectors: 1 = 351˚, 54˚; 2 = 121˚, 25˚; 3 = 223˚, 24˚. The Rose diagram resultant vector: 316˚ ± 55˚. The outermost great circle represents 10% of the data population. (b) Faults with displacement exposed within the N Wall; 3 total. The outermost great circle represents 25% of the data population.

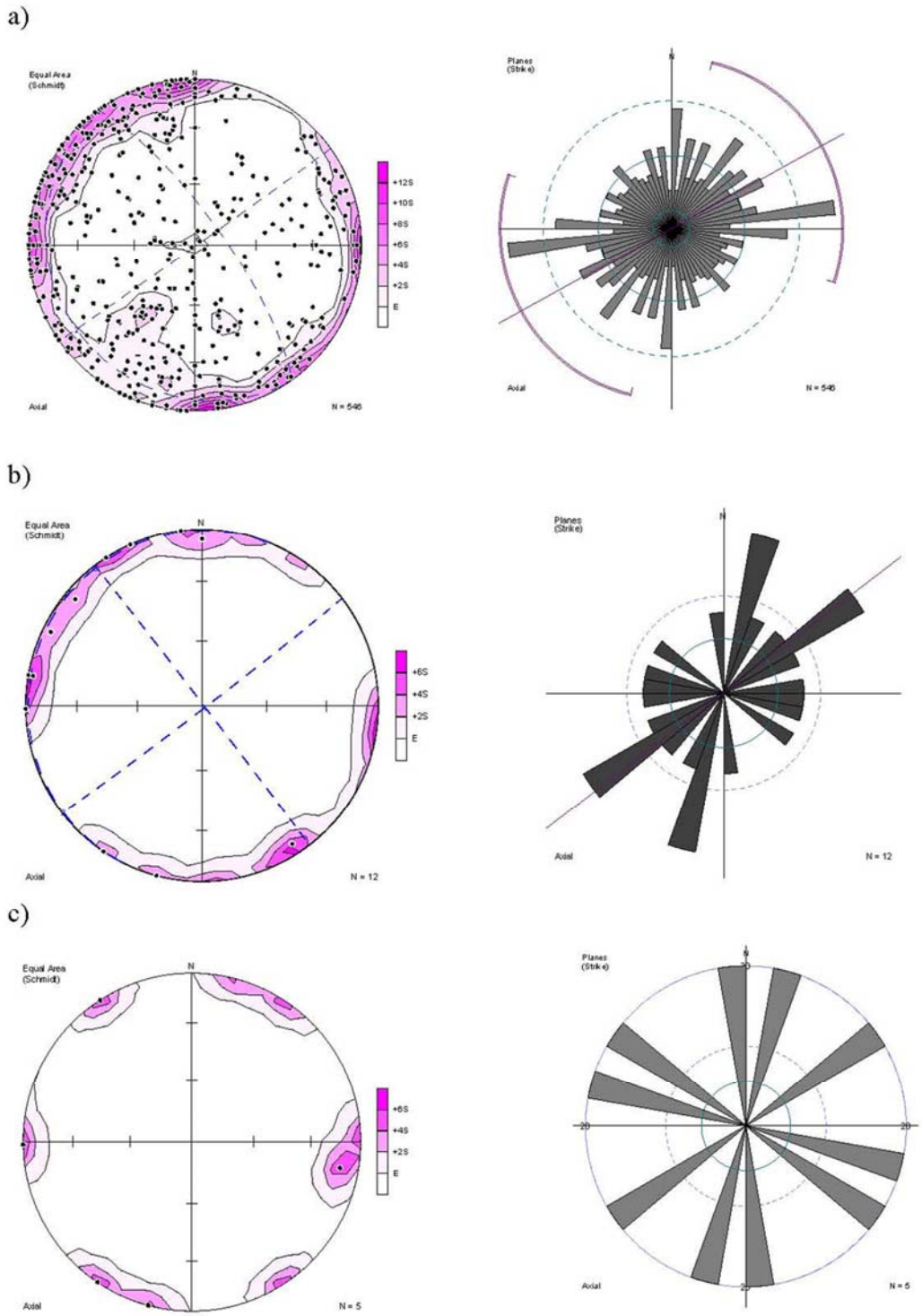


Figure 6. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the NE Wall. (a). All fractures exposed within the NE Wall; 546 total. The stereoplot eigenvectors: 1 = 57˚, 76˚; 2 = 234˚, 14˚; 3 = 325˚, 1˚. The Rose diagram resultant vector: 61˚ ±45˚. The outermost great circle represents 10% of the data population. (b). Fractures with displacement exposed within the NE Wall; 12 total. The stereoplot eigenvectors: 1 = 117˚, 88˚; 2 = 233˚, 1˚; 3 = 323˚, 1˚.The Rose diagram resultant vector: 53˚ ±41˚. The outermost great circle represents 10% of the data population. (c). Faults exposed within the NE Wall; 5 total. The outermost great circle represents 20% of the data population.

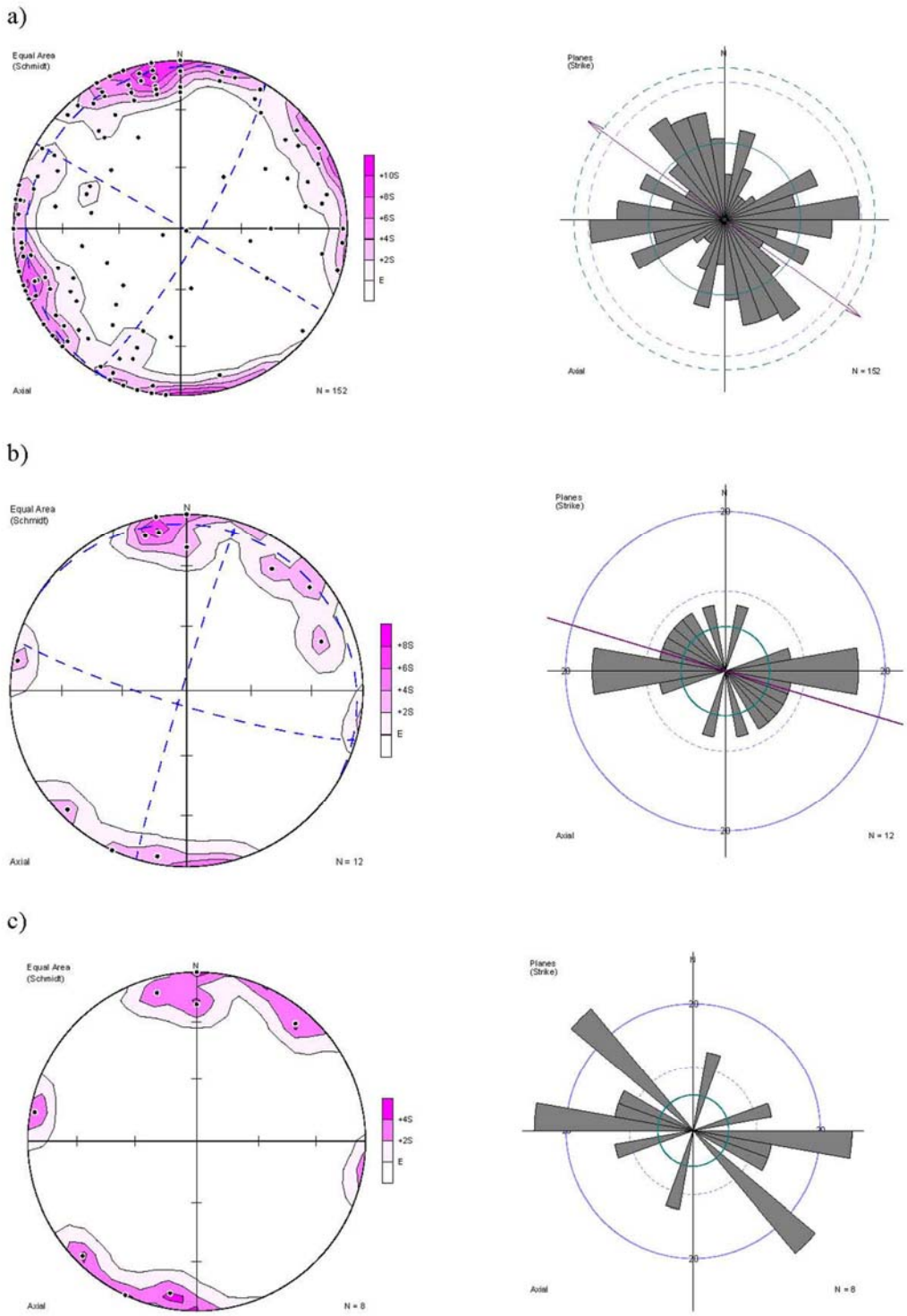


Figure 7. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the SE Wall. (a). All fractures exposed within the SE Wall; 152 total. The stereoplot eigenvectors: 1 = 116˚, 81˚; 2 = 300˚, 9˚; 3 = 210˚, 1˚.The Rose diagram resultant vector: 126˚ ± 26˚. The outermost great circle represents 10% of the data population. (b). Fractures with displacement exposed within NE Wall; 12 total. The Stereoplot eigenvectors: 1 = 213˚, 83˚; 2 = 107˚, 2˚; 3 = 16˚, 7˚. The Rose diagram resultant vector: 287˚ ± 35˚. The outermost great circle represents 20% of the data population. (c). Faults exposed within SE Wall; 8 total. The outermost great circle represents 20% of the data population.

6.1.5 Southeast Temporary Wall (Figure 8)

A total of 77 structural attitudes were measured along the southeast temporary (SET) wall (Plate 5). The stereoplot of poles to fracture planes shown in Figure 8a shows a moderate clustering of data near the northern and southern poles and the edges of the stereoplots, representing poles to fracture planes that have roughly east-west strike and near-vertical dips. Of the population of 77 fractures on this wall, 14 fractures exhibited some sort of displacement across the Qbt_3-Qbt_4 contact (and Qbt_s, where present). These faults mimic the characteristics of the overall measured fracture population of the SET wall, with a resultant vector of 271˚ (N89W) and a clustering of data indicating steep dips, generally northerly. Of these 14 fractures, 10 are TOS- or BOS-faults, and four are classic faults.

6.1.6 Southwest Temporary Wall (Figure 9)

The southwest temporary (SWT) wall (Plate 6) yielded 48 measurable fractures. The stereoplot of Figure 9 depicts extremely weak data clustering among poles to fracture planes of all measured fractures, showing that fractures generally span a wide array of orientations and do not exhibit a clear trend or fabric. The majority of fractures are steeply dipping or vertical. The overall predominant strike direction for all fractures as shown in the Rose diagram in Figure 9a is 36˚ (N36E), with a minor clustering of fracture strikes at approximately 275˚ (N85W). Nine fractures with displacement were identified in the SWT wall. All of these features have strike directions within the northeasterly quadrant and prevailing steep northwesterly dips. Of these nine fractures, two are TOS- or BOS-faults, and seven are characterized as classic faults.

6.1.7 Site-wide Fracture Analysis Summary

A plot of poles to all fracture planes (Figure 10) shows data scatter and demonstrates that although fractures vary widely in dip, most are high-angle (>70°). The overall fracture set has a statistically significant west-northwest preferred orientation (mean strike direction of 289° [N71W] ± 31°; Figure 10) that is parallel to the direction of rift extension (approximately WNW) and roughly perpendicular to the strike of the vast majority of mapped faults at LANL (Gardner et al., 1999; Gardner et al., 2001; Lewis et al., 2002). The fractures, therefore, do not appear to be tectonic features related to rifting. Visually, the fractures do not demonstrate local clustering or greater density in any specific location, with one exception: fractures do appear to be most prominent, both in terms of apparent localized fracture density as well as the presence of through-going fractures (e.g., a single fracture plane cuts both Qbt_4 and Qbt_3), in the immediate vicinity of areas identified as fossil fumaroles.

A cumulative examination of the entire subset of faults exposed at the CMRR seismic pit reveals a principal east-west strike (Figure 11). Of 27 faults that displace both TOS and BOS along one fracture plane, 26 have dips steeper than 60˚, and the majority of faults dip towards the south-southwest. In the context of the detailed mapping of the Pajarito fault system in the vicinity of LANL (e.g., Gardner et al., 1999, 2001; Lewis et al., 2002; Lewis et al., in press), the east-west striking structures exposed in the CMRR seismic pit do not correlate with tectonically generated features of the Rio Grande rift or the Pajarito fault system. These faults within the CMRR seismic pit are perpendicular to the regional structural trend.

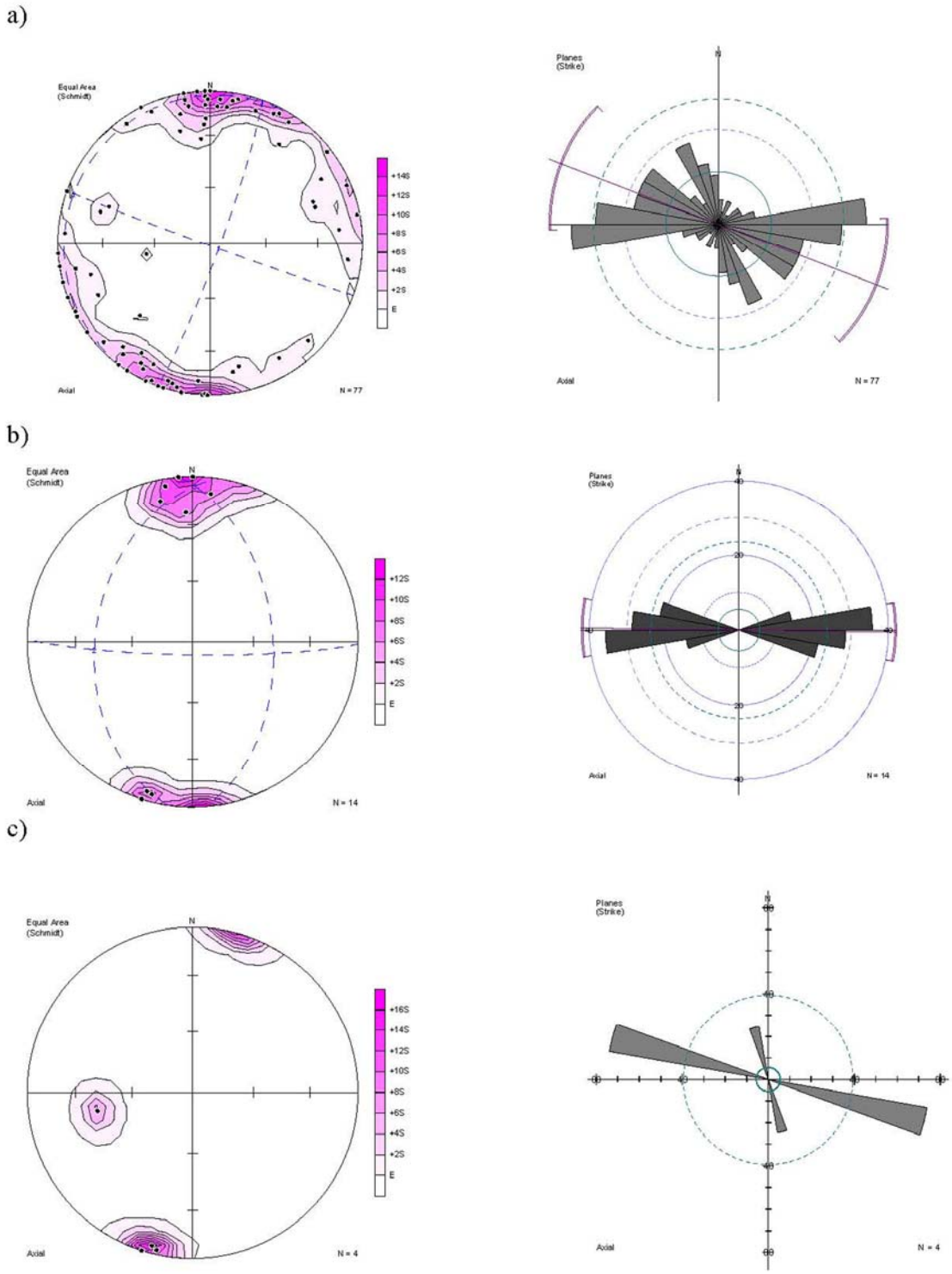


Figure 8. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) of fractures exposed in the SET Wall. (a). All fractures exposed within the SET Wall; 77 total. The stereoplot eigenvectors: 1 = 124˚, 85˚; 2 = 290˚, 5˚; 3 = 20˚, 1˚. The Rose diagram resultant vector: 291˚ ± 20˚. The outermost great circle represents 10% of the data population. (b). Fractures with displacement exposed within the SET Wall; 14 total. The stereoplot eigenvectors: 1 = 98˚, 49˚; 2 = 265˚, 40˚; 3 = 1˚, 6˚. The Rose diagram resultant vector: 271˚ ± 11˚. The outermost great circle represents 20% of the data population. (c). Faults exposed within the SET Wall; 4 total. The outermost great circle represents 40% of the data population.

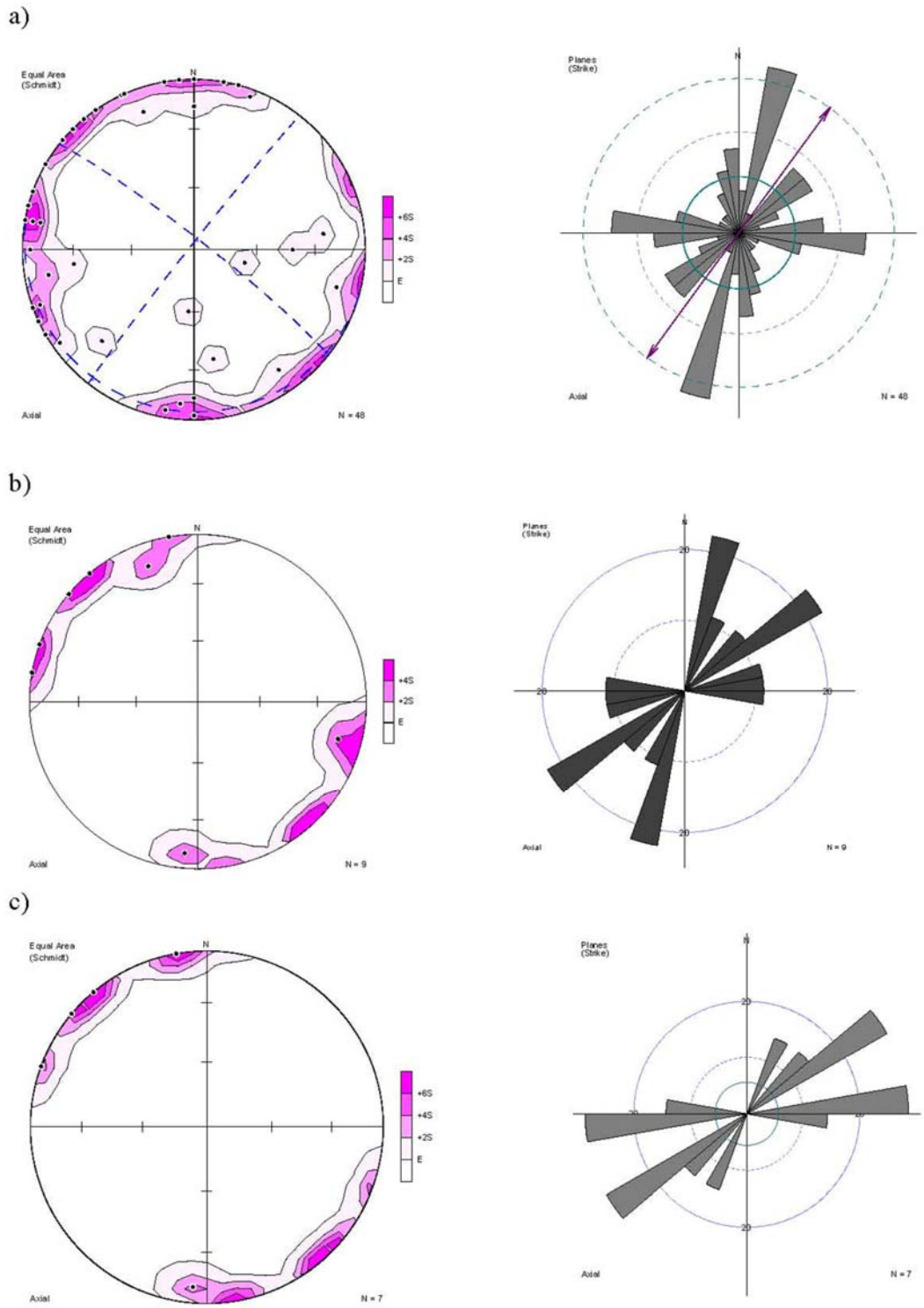
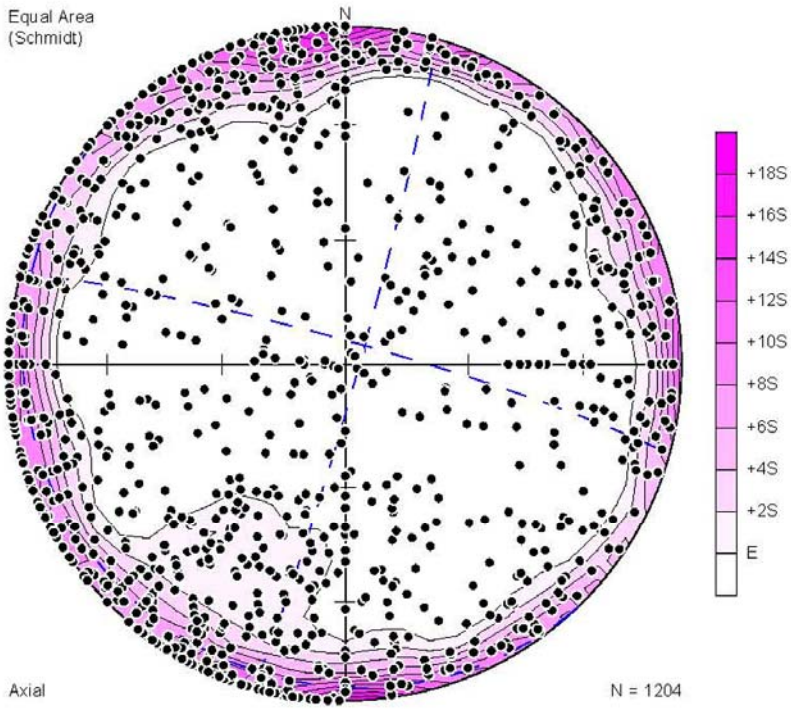


Figure 9. Equal-area stereoplots of poles to fracture planes (left) and the Rose diagrams showing the density of strike orientations (right) of fractures exposed in the SWT Wall. (a). All fractures exposed within the SWT Wall; 48 total. The stereoplot eigenvectors: 1 = 15˚, 84˚; 2 = 218˚, 5˚; 3 = 128˚, 2˚. The Rose diagram resultant vector: 36˚ ± 23˚. The outermost great circle represents 10% of the data population. (b). The fractures with displacement exposed within the SWT Wall; 9 total. The outermost great circle represents 20% of the data population. (c). Faults exposed within the SWT Wall; 7 total. The outermost great circle represents 20% of the data population.



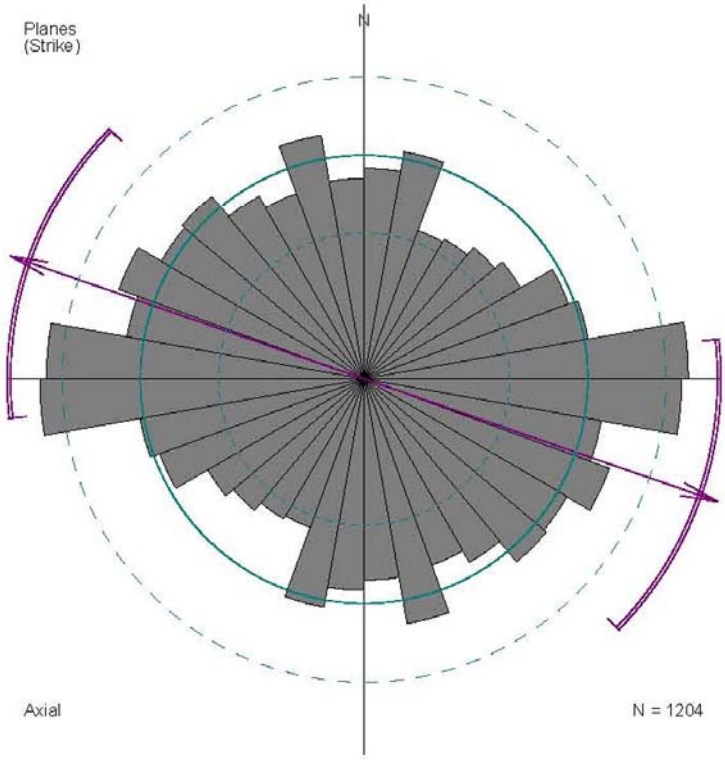


Figure 10. Equal-area stereoplot of poles to fracture planes (top) and the Rose diagram showing the density of strike orientations (bottom) of all measured fractures at the CMRR seismic pit. All fractures identified and measured total 1,204. The stereoplot eigenvectors: 1 = 46˚, 84˚; 2 = 286˚, 3˚; 3 = 195˚, 6˚. The Rose diagram resultant vector: 289˚ ± 26˚. The outermost great circle represents 10% of the data population.

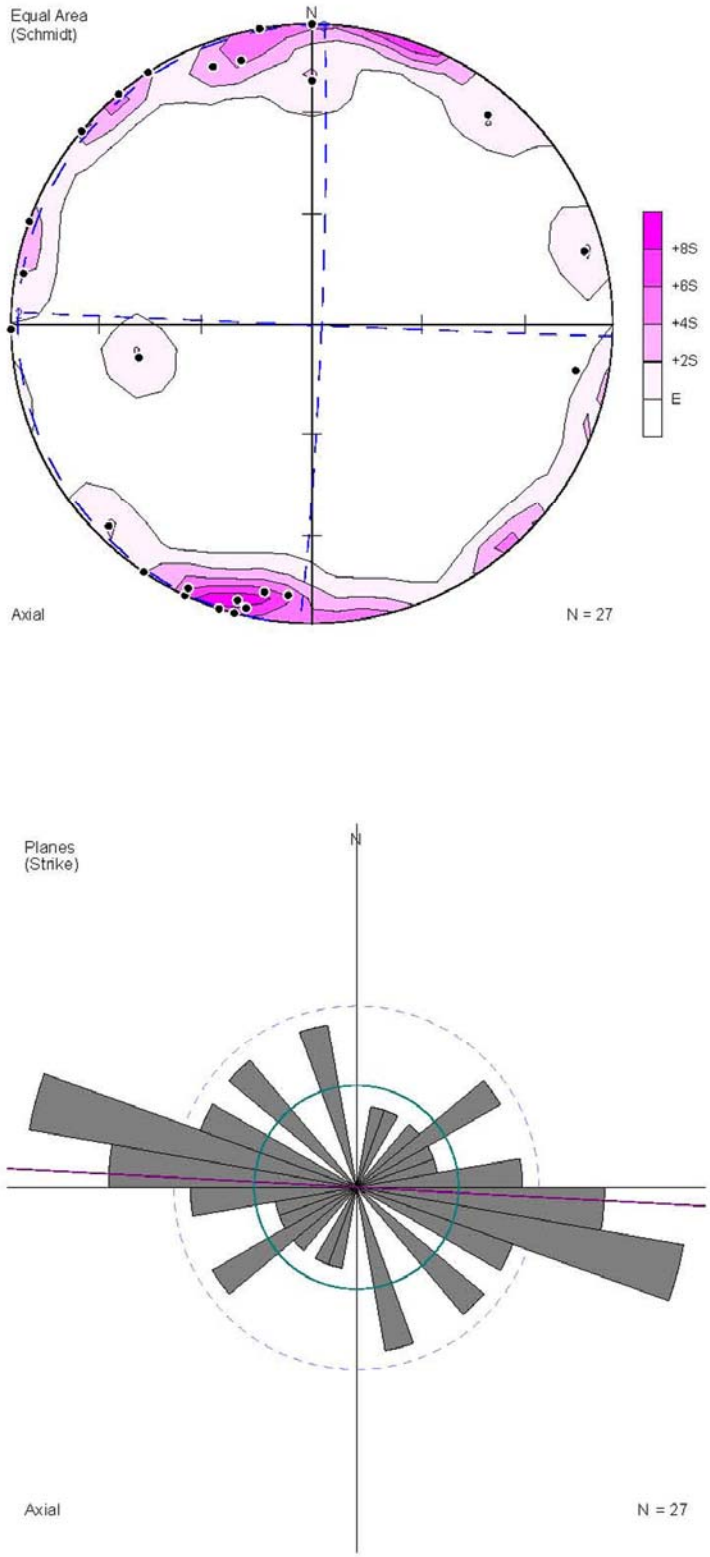


Figure 11. Equal-area stereoplot of poles to fracture planes (left) and the Rose diagram showing the density of strike orientations (right) of all measured and identified faults at the CMRR seismic pit. All faults identified total 27. The stereoplot eigenvectors: 1 = 98˚, 87˚; 2 = 272˚, 3˚; 3 = 2˚, 0˚. The Rose diagram resultant vector: 273˚ ± 23˚. The outermost great circle represents 10% of the data population.

For additional analysis, we have further subdivided the total fracture population in the CMRR seismic pit into fractures that affect only a single Tshirege Member subunit, either Qbt_3 or Qbt_4. These stereoplots and Rose diagrams are shown in Figure 12. Fractures only within Qbt_3 have a predominant strike direction of 308˚ ±31˚ (N52W) and poles to fracture planes cluster at high-angle dips towards the west and southwest. Fractures only within Qbt_4 have a predominant strike direction of 286˚ ±35˚ (N74W), and poles to fracture planes exhibit extremely weak clustering. Within statistical uncertainties, predominant strike directions in both subunits of the Tshirege Member are similar. Fractures within Qbt_4 show a wide range of dips with most being high-angle towards either the north or south. An overwhelming majority of measured fractures at the CMRR seismic pit occur only within Qbt_4—over 70%.

An interesting result of this fracture analysis is the obvious data bias, on a given wall, to fractures striking more perpendicular to the wall. As an example, the majority of measured fractures along the NE wall (which trends northwest-southeast; see Figure 13) strike towards the northeast. These observations underscore the need for obtaining data from all the walls of the pit so as to overcome the orientation-based bias.

Walls such as the NW, N, and NE were valuable for providing a well-exposed thickness of Qbt_3 in which to identify fractures. These walls helped to show that most fractures exposed within Qbt_3 appear to be rootless, dying out approximately 1–3 ft below the contact with Qbt_4 or Qbt_s. Qbt_3 is very friable and pumice rich, and it is possible that the physical properties may mute the visible expression of discrete fracture planes.

Conjugate sets of structural orientation are seen in the fault datasets of the NE and NW Walls (Figures 4c and 6c). The presence of conjugate fracture sets in other locations of the Pajarito Plateau, namely in nearby Mortandad and Los Alamos Canyons as identified by Wohletz (2004, 2006), has been attributed to cooling and compaction of the tuff very shortly after eruption and emplacement at 1.25 Ma, and the formation of columnar jointing. Considering that a vast majority of mapped and measured fractures are limited in lateral continuity by the margins of the Tshirege Member subunit in which they formed, and the presence of fractures that exhibit variable displacement across the geologic contacts, it is likely that many of these fractures are remnant cooling features not formed through tectonic processes.

6.2 TOS- and BOS-Faults

One category of structures in the CMRR seismic pit is a suite of fractures that displace only the top contact of Qbt_s (“TOS” for “top of surge”) or the bottom contact of Qbt_s (“BOS” for “bottom of surge”). About 35 fractures fall into this category, and more than 75% of these are TOS-faults. In spite of some sort of demonstrable displacement, they are clearly not through-going. The TOS-faults are cooling fractures in Qbt_4 along which compaction of the top of Qbt_s occurred. Similarly, the BOS-faults are cooling fractures in Qbt_3 along which differential compaction of Qbt_s and the top of Qbt_3 occurred. Keating and Valentine (1998) describe similar compaction-related faults in tuffs in western New Mexico. Displacements on TOS- and BOS-faults are small, generally less than 0.5 ft; however, one TOS-fault exhibited 1.1 ft of displacement. See Appendix A for a key to these features on the logs (Plates 1–6).

6.3 Classic Faults

Faults are those fractures along which there is demonstrable displacement of both the top and bottom contacts of Qbt_s, or the Qbt_3-Qbt_4 contact where the surge is absent. Included in this category are “rootless” faults that cannot be traced more than a few feet downward in Qbt_3. Although likely the same sort of feature as TOS- and BOS-faults, we include them as faults in acknowledgement of the possibility that the rheological behavior of Qbt_3 could mask the failure surface. Also included in this category are other faults that could not be traced vertically. We identified 23 faults, of which about 40% lack vertical

continuity in the pit wall exposures. The largest displacement, about 2 ft, is on SWT-1, but most faults exhibit less than a foot of displacement. One fault, SE-14, has a pronounced curving failure surface; at the top of Qbt_4 SE-14 is a reverse fault, and in the lower part of Qbt_4 it becomes a normal fault. Most faults are vertical, or have normal displacements, but about 30% of the faults have a reverse sense of movement. Curving failure surfaces and the mix of normal and reverse faults imply that these faults are accommodating the settling and compaction of blocks of tuff. Appendix A provides a key for these features on the logs (Plates 1-6).

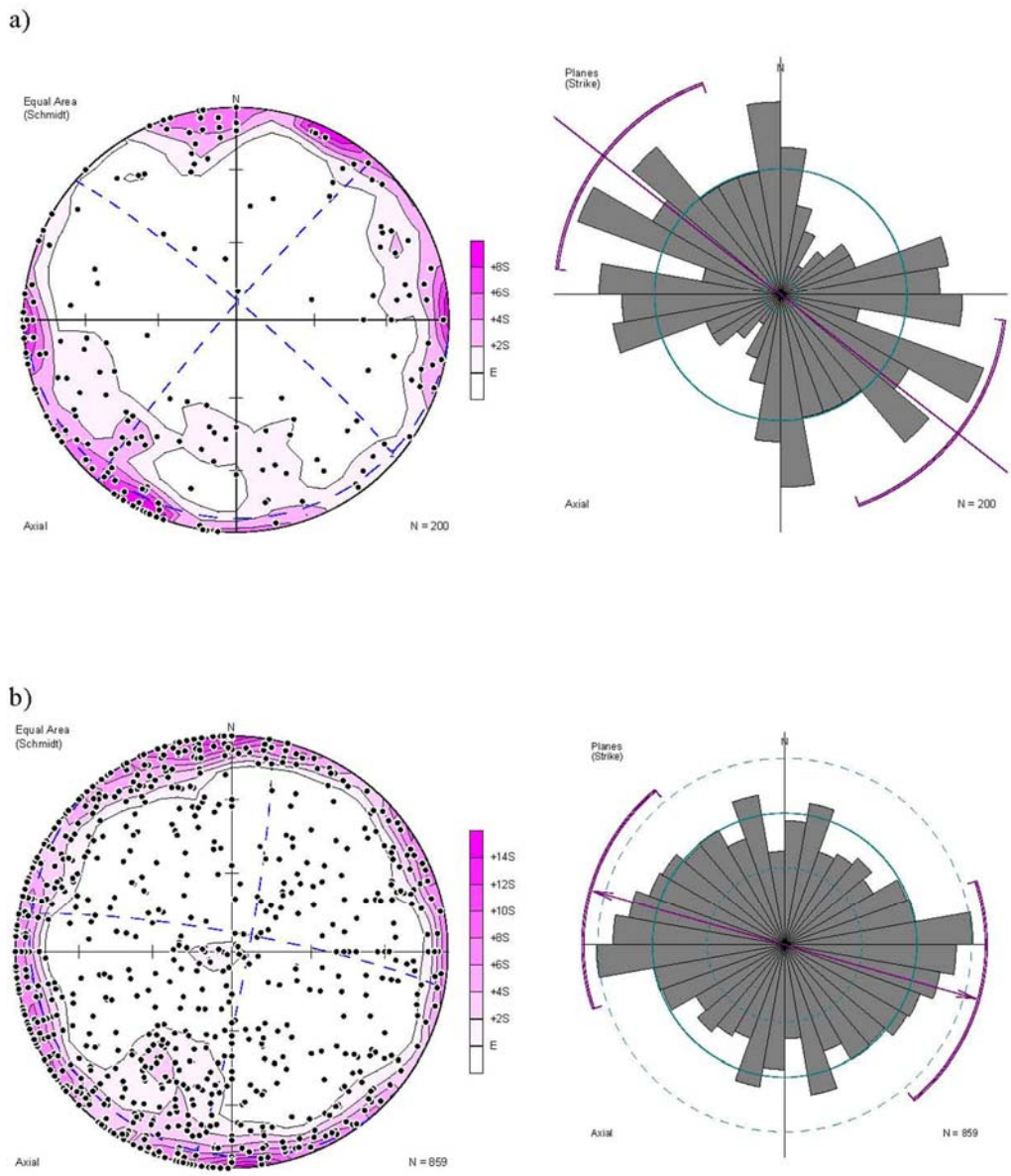
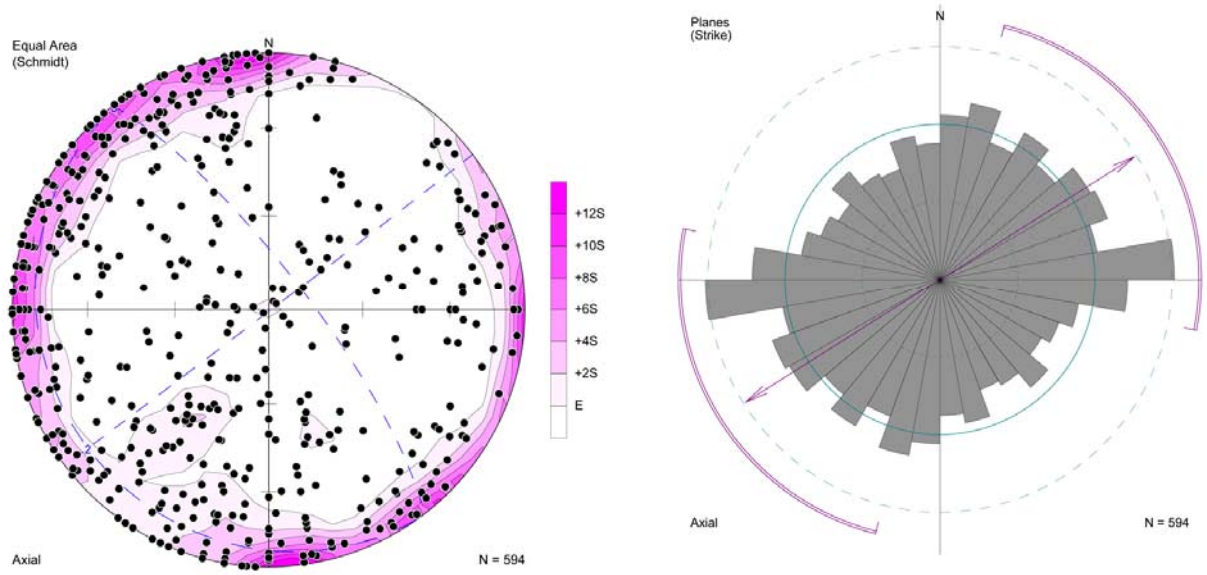


Figure 12. Equal-area stereoplots of poles to fracture planes (left) and Rose diagrams showing the density of strike orientations (right) for fractures within only a single Tshirege Member subunit. (a). All fractures contained only within **Qbt_3**; 200 total. The stereoplot eigenvectors: 1 = 6˚, 83˚; 2 = 131˚, 4˚; 3 = 221˚, 6˚. The Rose diagram resultant vector: 308˚ ± 31˚. The outermost great circle represents 10% of the data population. (b). All fractures contained only within **Qbt4**; 859 total. The stereoplot eigenvectors: 1 = 51˚, 80˚; 2 = 281˚, 6˚; 3 = 190˚, 7˚. The Rose diagram resultant vector: 286˚ ± 35˚. The outermost great circle represents 15% of the data population.

a)



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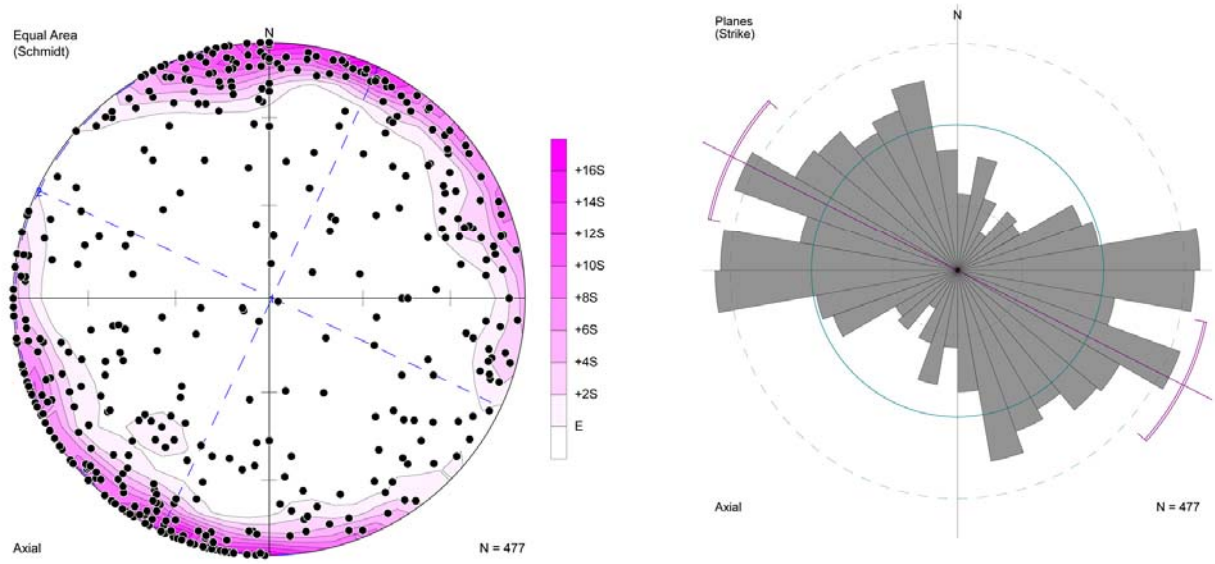

Figure 13. Equal-area stereoplots of poles to fracture planes (left) and the Rose diagrams showing the density of strike orientations (right) for all fractures in parallel walls. (a). All fractures in northwest-striking walls (NE, SWT); 594 total. The stereoplot eigenvectors: 1 = 55˚, 78˚; 2 = 233˚, 12˚; 3 = 323˚, 0˚. The Rose diagram resultant vector: 58˚ ± 45˚. The outermost great circle represents 15% of the data population. (b). All fractures in northeast-striking walls (NW, SET, SE); 477 total. The stereoplot eigenvectors: 1 = 83˚, 89˚; 2 = 295˚, 1˚; 3 = 205˚, 0˚. The Rose diagram resultant vector: 297˚ ± 10˚. The outermost great circle represents 15% of the data population.

7. DISCUSSION

7.1 Fissures, Fumaroles, Faults, and Fractures

Based on petrography, XRD, and XRF, a strong case has been made linking a large group of fissures and fossil fumaroles. The fissures are commonly funnel shaped, flaring upwards to the top contact of Qbt_3. Some fissures have the characteristic fines-depleted textures characteristics of fossil fumaroles, but others are filled with rubble. A number of the fissures have blocks of the overlying units (Qbt_s and/or Qbt_4) that appear to have tumbled into a partially open fissure. The overlying Qbt_4 is intensely fractured in all cases, and Qbt_s and Qbt_4 over the fissures show evidence of fumarolic alteration. Most fissures have no net displacement of the unit contacts across them (e.g., SWT-5, SET-16, SET-17, SE-9, SE-19, NW-1, NW-2, NW-6, NW-8, NW-9, NW-10, NW-12, NW-14, NE-5, NE-12, NE-4, NE-6, NE-7, and NE-8). Some, however, exhibit up to about 1.2 ft displacement (e.g., NW-11 and SET-13).

All data, including field relations, indicate that Qbt_3 was degassing following emplacement and some cooling. Then, emplacement of Qbt_s and Qbt_4 sealed the underlying fumarolic pipes. Localized overpressuring, and perhaps some small-scale phreatic explosive activity, occurred, causing partial opening of the pipe and disrupting the interiors of the pipes and the overlying units. Interestingly, relations require that all of the units had to be sufficiently cooled to deform in a brittle manner. Regardless, the sites of this fumarolic and related activity provided weaker spots in the cooling tuff that accommodated differential settling of the deposits.

Some inferences as to the timing of these deformational events can be drawn, however, from studies of degassing, welding, and compaction of other tuffs. Degassing of volatiles present at the deposition of ash-flow tuffs occurs within days to at least weeks (Riehle et al., 1995). Compaction continues for weeks up to several years, unless halted by devitrification. The earliest-formed fractures are associated with gas-escape structures such as fumaroles, which occur with observable alteration and mineralization (e.g., Sheridan, 1970; Keith, 1991). Additionally, fractures form through cooling-induced contraction of the tuff. Compaction and welding in the Tiva Canyon Tuff (100 m thick; Southwest Nevada Volcanic Field) likely ceased 1–10 years after deposition (Dunne et al., 2003). Cooling of Qbt_4 to temperatures allowing brittle failure probably took only weeks to months because Qbt_4 is only 5–10 m thick at the CMRR site. Thus, the fissures, fumaroles, and structures observed in the CMRR excavation all likely formed in the first 10 years after the deposition of Qbt_3 and Qbt_4.

Regional structures forming the local active western margin of the Rio Grande rift, including the Pajarito, Rendija Canyon, and Guaje Mountain faults (Figure 1) generally have north-south to northeast-southwest strikes and nearly vertical dips, as identified through geologic mapping and contact relationships (e.g., Lewis et al., in press). The overall trend of measured fractures at the site of the planned CMRR facility is west-northwest. Additionally, although many measured fractures at the CMRR pit had vertical dips (24% of all measured fractures), over 30% of measured fractures had dips shallower than 70°. The subset of all mapped faults reveals a similar trend in strike, with slightly more east-west dominance in strike direction. If fracturing at the site of the proposed CMRR facility was controlled by tectonics, a majority of field measurements would reveal orientations similar to that of regional structures (trending north to northeast), and such correlation is not seen at this location. The overall predominant west-northwesterly strike of most fractures at the site, along with the broad range of measured fracture dips, supports cooling and compaction of the tuff as the mechanism for fracture generation.

7.2 Lateral Continuity of Faults

Figure 14 is a map view of the CMRR study site showing the surveyed points on the walls (black dots) and strike lines of all faults and fissures. With the exception of NW-11 and SET-13, none of these

structures has enough lateral continuity to correlate between two walls. Providing the exception, NW-11 and SET-13 have the same strike, project toward each other, and have the same sense and magnitude of displacement (about 1.2–1.3 ft down to the southwest). Thus, it is likely that these two features are the same fault. It is interesting to note that NW-11 is a fault bounding a fossil fumarole. Although we can make the case that this fault has at least 150 ft of lateral continuity, the fault cannot be correlated along strike to any structure on the SE wall. Thus, this fault may continue for more than 150 ft, but it does not cut the entire length of the CMRR footprint (300 ft). Additionally, Gardner et al. (1999) did not map this fault where its along-strike continuation would intersect natural exposure of the Qbt_3-Qbt_4 contact about 250 ft west of the NW wall.

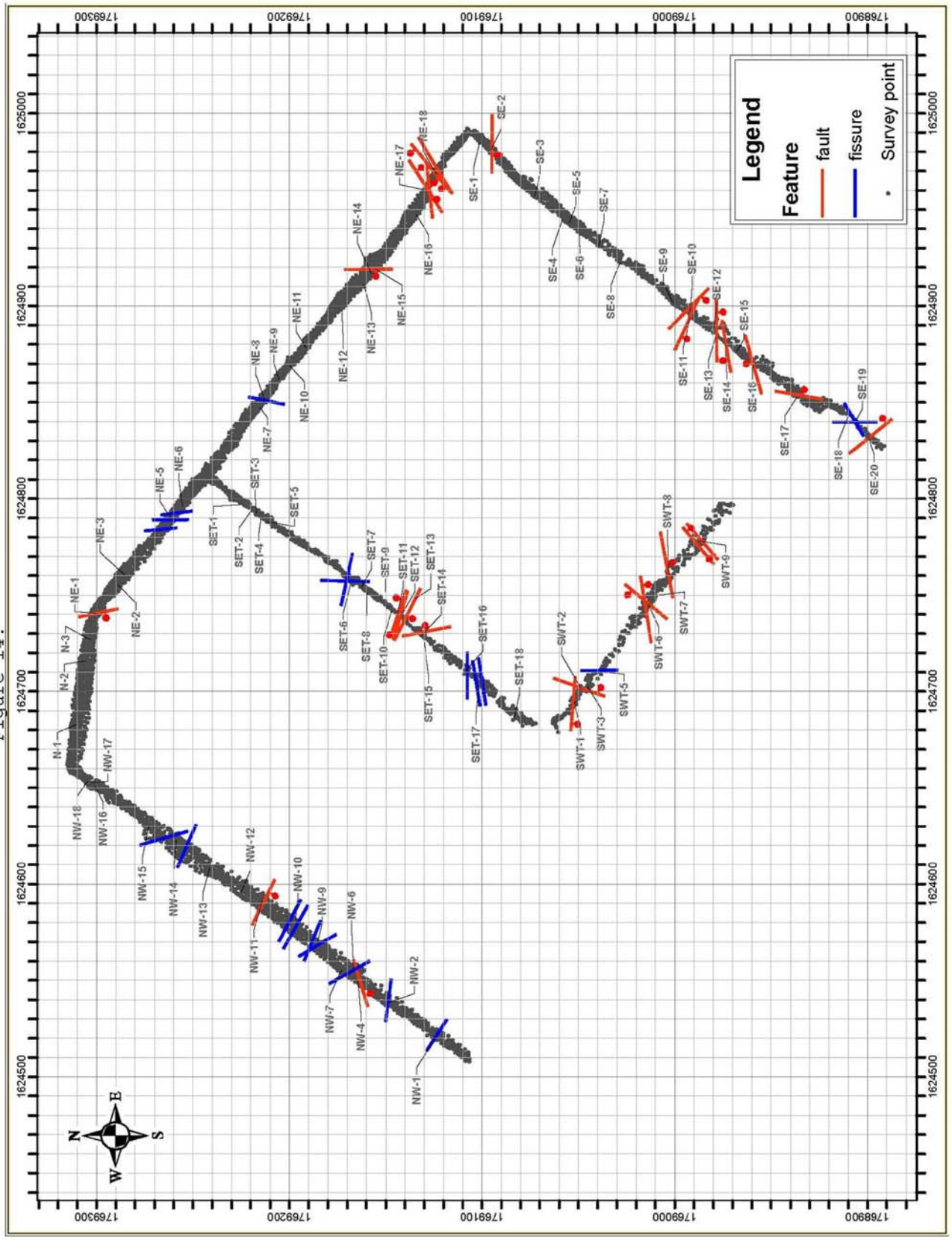

Figure 14. Map of the CMRR seismic pit showing pit walls, defined by surveyed points, and strike lines of features described in Appendix A or discussed in the text.

8. CONCLUSIONS

1. Sites of fossil fumarolic activity were the focus of brittle deformation while degassing of the tuff deposits continued.
2. Detailed fracture characterization of all structural data from the CMRR seismic pit, with stereonet and Rose diagram analyses, shows no convincing relationship between the structures at the site and the Pajarito fault system or the Rio Grande rift.
3. Detailed fracture characterization of all structural data shows a dominant pattern of west-northwest and north-northwest strikes, implying conjugate sets that were most probably created during the cooling of the Bandelier Tuff.
4. Structures in the pit fall into several categories: fractures that displace only the top or bottom contact of the surge deposit (Qbt_s) (TOS- and BOS-faults); classic faults, including those that lack vertical continuity; and, fissures/fossil fumaroles.
5. TOS- and BOS-faults were created during cooling and compaction of the tuff; faults, also, are best related to the settling of blocks of the cooling tuff; and, the fissure/fumaroles are related to cooling and degassing of the tuff.
6. Only one fault can be correlated between two walls, but cannot be found along strike on the third wall. These relations indicate that the fault may be longer than 150 ft, but it does not cut the entire length of the CMRR footprint (300 ft). Additionally, Gardner et al. (1999) did not map this fault where its along-strike continuation would intersect natural exposures of the Qbt_3-Qbt_4 contact about 250 ft west of wall NW.
7. The largest displacement of the Bandelier Tuff, identified by offset of the Qbt_3-Qbt_4 contact on the NE Wall, is 2 ft. In that all structures in the CMRR pit appear to have formed during cooling, compaction, degassing, and settling of the tuff deposits, their age is probably 10 years post-tuff-deposition at 1.25 Ma.
8. Thus, given site structure relations to cooling and compaction of the tuff, lack of lateral continuity, and lack of relations to seismogenic structures, we conclude that the structures at the proposed CMRR site were formed shortly post-deposition and pose no independent seismic surface rupture hazard.

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REFERENCES

Baldridge W.S., Keller, G.R., Haak, V., Wendlandt, E., Jiracek, G.R., and Olsen, K.H., 1995, The Rio Grande rift; in *Continental Rifts: Evolution, Structure, Tectonics*, K.H. Olsen, ed.; Elsevier, Amsterdam, Holland, 233–275.

Broxton, D.E., and Reneau, S.L., 1995, Stratigraphic nomenclature of the Bandelier Tuff for the Environmental Restoration Project at Los Alamos National Laboratory; Los Alamos National Laboratory report LA-13010-MS, 21 pp.

Chung, F.H., 1974, Quantitative Interpretations of X-ray Diffraction Patterns of Mixtures. I. Matrix Flushing Method for Quantitative Multicomponent Analysis; *Journal of Applied Crystallography* **7**, 519–525.

Crowe, G.M., Linn, G.W., Heiken, G., and Bevier, M.I., 1978, Stratigraphy of the Bandelier Tuff in the Pajarito Plateau; Applications to Waste Management; Los Alamos National Laboratory report LA-7225-MS, 57 pp.

Dunne, W.M., Ferrill, D.A., Crider, J.G., Hill, B.E., Waiting, D.J., La Femina, P.C., and Morris, A.P., 2003, Orthogonal jointing during coeval igneous degassing and normal faulting, Yucca Mountain, Nevada; *Geological Society of America Bulletin* **115**, 1492–1509.

Gardner, J.N., and Goff, F., 1984, Potassium-argon dates from the Jemez volcanic field: Implications for tectonic activity in the north-central Rio Grande rift; *New Mexico Geological Society Guidebook* **35**, 75–81.

Gardner, J.N., and House, L., 1987, Seismic hazard investigations at Los Alamos National Laboratory, 1984-1985; Los Alamos National Laboratory report LA-11072-MS, 76 pp.

Gardner, J.N., Lavine, A., Vaniman, D. and WoldeGabriel, G., 1998, High-precision geologic mapping to evaluate the potential for seismic surface rupture at TA-55, Los Alamos National Laboratory; Los Alamos National Laboratory report LA-13456-MS, 13 pp.

Gardner, J.N., Lavine, A., WoldeGabriel, G., Krier, D., Vaniman, D., Caporuscio, F. Lewis, C. Reneau, S., Kluk, E., and Snow, M., 1999, Structural geology of the northwestern portion of Los Alamos National Laboratory, Rio Grande rift, New Mexico: Implications for seismic surface rupture potential from TA-3 to TA-55; Los Alamos National Laboratory report LA-13589-MS, 112 pp.

Gardner, J.N., Reneau, S.L., Krier, D.J., Lavine, A., Lewis, C., WoldeGabriel, G., and Guthrie, G., 2001, Geology of the Pajarito fault zone in the vicinity of S-site (TA-16), Rio Grande rift, New Mexico; Los Alamos National Laboratory report LA-13831-MS, 86 pp.

Gardner, J.N., Reneau, S.L., Lavine, A., Lewis, C.J., Katzman, D., McDonald, E.V., Lepper, K., Kelson, K.I., and Wilson, C., 2003, Paleoseismic trenching in the Guaje Mountain fault zone, Pajarito fault system, Rio Grande rift, New Mexico; Los Alamos National Laboratory report LA-14087-MS, 68 pp.

Keating, G.N., and Valentine, G.A., 1998, Proximal stratigraphy and syn-eruptive faulting in rhyolitic Grants Ridge Tuff, New Mexico, USA; *Journal of Volcanology and Geothermal Research* **81**, 37–49.

Keith, T.E.C., (1991), Fossil and active fumaroles in the 1912 eruptive deposits, Valley of Ten Thousand Smokes, Alaska; *Journal of Volcanology and Geothermal Research* **45**, 227-254.

Krier, D., Caporuscio, F., Gardner, J.N., and Lavine, A., 1998, Stratigraphy and geologic structure at the Chemistry and Metallurgy (CMR) building, Technical Area 3, Los Alamos National Laboratory; Los Alamos National Laboratory report LA-13522-MS, 32 pp.

Lavine, A., Gardner, J.N., and Schultz, E., 2005, Evaluation of faulting at the Chemistry and Metallurgy Research Facility Replacement (CMRR) site based on examination of core from geotechnical drilling studies, TA-55, Los Alamos National Laboratory; Los Alamos National Laboratory report LA-14170, 21 pp.

Lewis, C.J., Lavine, A., Reneau, S.L., Gardner, J.N., Channell, R., and Criswell, C.W., 2002, Geology of the western part of Los Alamos National Laboratory (TA-3 to TA-16), Rio Grande rift, New Mexico; Los Alamos National Laboratory report LA-13960-MS, 98 pp.

Lewis, C.J., Warren, R.G., Gardner, J.N., Chipera, S., and Lavine, A., 2005, Petrographic and geochemical analyses of Bandelier Tuff unit Qbt_3 from boreholes at the Chemistry and Metallurgy Research Replacement site and nearby outcrops, Los Alamos National Laboratory, New Mexico; Los Alamos National Laboratory report LA-UR-05-3841, 63 pp.

Machette, M.N., Personius, S.F., Kelson, K.I., Haller, K.M., and Dart, R.L., 1998, Map and data for Quaternary faults and folds in New Mexico; *U. S. Geological Survey Open-file Report* **98–521**, 443 pp., scale 1:750,000.

Papike, J.J., Keith, T.E.C., Spilde, M.N., Shearer, C.K., Galbreath, K.C., and Laul, J.C., 1991, Major and Trace Element Mass Flux in Fumarolic Deposits, Valley of Ten Thousand Smokes, Alaska:, Rhyolitic Protolith; *Geophysical Research Letters* **18**, 1545-1548.

Phillips, E.H., 2004, Collapse and resurgence of the Valles caldera, Jemez Mountains, New Mexico: 40Ar/39Ar age constraints on the timing and duration of resurgence and ages of megabreccia blocks; M.S. thesis, New Mexico Institute of Mining and Technology, Socorro, New Mexico, 200 pp.

Riehle, J.R., Miller, T.F., and Bailey, R.A., 1995, Cooling, degassing, and compaction of rhyolitic ash flow tuffs: A computational model; *Bulletin of Volcanology* **57**, 319–336.

Sanford, A.R., Jaksha, L.H., and Cash, D.J., 1991, Seismicity in the Rio Grande rift; in *Neotectonics of North America, Decade Map Volume 1*, D.B. Slemmons, E.R. Engdahl, M.D. Zoback, and D.D. Blackwell, eds.; Geological Society of America, Denver, Colorado, 229–244.

Sheridan, M.F., 1970, Fumarolic Mounds and Ridges of the Bishop Tuff, California; *Geological Society of America Bulletin* **81**, 851–868.

Smith, R.L. 1960, Zones and Zonal Variations in Welded Ash Flows; *U.S. Geological Survey Prof. Paper*, **354-F**, 55 pp.

Smith, R.L., and Dickson, K.O. 1965, Scapolite related to Chlorine Release in Bandelier Tuff, New Mexico; *U.S. Geological Survey Prof. Paper*, **525-A**, A149.

Smith, R.L., Bailey, R.A., and Ross, C.S., 1970, Geologic map of the Jemez Mountains, New Mexico; *U. S. Geological Survey Misc. Geological Field Investigations Map* **I-571**, scale 1:125,000.

Steck, L.K., Thurber, C.H., Fehler, M.C., Lutter, W.J., Roberts, P.M., Baldridge, W.S., Stafford, D.G., and Sessions, R., 1998, Crust and upper mantle P wave velocity structure beneath Valles caldera, New Mexico: Results from the Jemez teleseismic tomography experiment; *Journal of Geophysical Research* **103**, 24301–24320.

Wohletz, K.H., 2004, Tuff fracture characterization along Mortandad Canyon between OU-1114 and OU-1129; Los Alamos National Laboratory report LA-UR-04-8337, 28 pp.

Wohletz, K.H., 2006, Fractures in welded tuff; *Geological Society of America Special Paper* **408**, 17–31.

Wolff, J.A., and Gardner, J.N., 1995, Is the Valles caldera entering a new cycle of activity?; *Geology*, **23**, 411-414.

Wong, I., Kelson, K., Olig, S., Kolbe, T., Hemphill-Haley, M., Bott, J., Green, R., Kanakari, H., Sawyer, J., Silva, W., Stark, C., Haraden, C., Fenton, C., Unruh, J., Gardner, J., Reneau, S., and House, L., 1995, Seismic hazards evaluation of the Los Alamos National Laboratory; unpublished consulting report prepared for Los Alamos National Laboratory by Woodward-Clyde Federal Services, Oakland, California, 3 volumes.

Wong, I., Silva, W., Olig, S., Dober, M., Gregor, N., Gardner, J., Lewis, C., Terra, F., Zachariasen, J., Stokoe, K., Thomas, P., and Upadhyahya, S., 2007, Update of the probabilistic seismic hazard analysis and development of the seismic design ground motions at the Los Alamos National Laboratory; unpublished consulting report prepared for Los Alamos National Laboratory by URS Corporation, Oakland, California, 1 volume.

APPENDIX A.

DESCRIPTIONS OF NUMBERED FEATURES

APPENDIX A. DESCRIPTIONS OF NUMBERED FEATURES BY WALL (see Table A-1 for groupings by type of feature)

NORTHWEST WALL (NW; PLATE 1)

NW-1: fissure that flares up to the upper contact of Qbt_3. Most is essentially in-place Qbt_3, but upper part is rubblized Qbt_3; likely a fossil fumarole; at top, SW margin N57W, 86N; NE margin N58W, 90.

NW-2: zones of upward flaring fissures; mostly in-place Qbt_3, but parts rubblized; likely a fossil fumarole; NE margin of the southwesternmost zone N82-85W, 80SE to 90.

NW-3: 0.2 ft DTSW step on base of surge on fracture; fracture has no continuity up or down; no displacement on upper contact of the surge.

NW-4: fault with 0.25 ft on top and 0.4 ft on base of surge, DTS; fault disappears downward in Qbt_3 about 3 ft below surge; N77E, 88SE; N69E, 81S; N68W, 68S.

NW-5: fracture with no significant continuity exhibits 0.3 ft DTN step on base of surge; no displacement on top of surge; N3W, 55W.

NW-6: upward flaring zone of rubblized Qbt_3; SW margin N35W, 83NE; fossil fumarole; "Pipe 7" in Appendix X; NE margin N27W, 65SW; [samples 032, 033, 034].

NW-7: two fractures with steps on top of surge; SW one N52W, 90 with 0.3 ft DTS; NE one N87W, 81N with 0.15 DTS; neither fracture continues downward past the Qbt_s-Qbt_3 contact, nor displaces the lower contact of the surge.

NW-8: N11W, 79W; N19E, 76W; open fissure with aperture of 0.4 to 0.5 ft.

NW-9: upward flaring zone of fractures and rubblized Qbt_3; top of bowl-shaped portion beneath the surge is brown and silicified (?); fossil fumarole; "Pipe 6" in Appendix X; SW margin N31W, 90; NE margin N68W, 90; overlying Qbt3-Qbt4 contact is irregular, but not displaced; [samples 028, 029, 030, 031].

NW-10: upward flaring fissure filled with rubble; SW margin N62W, 80N; NE margin N62W, 87N; fissure is 1.1 ft wide at top and contains blocks up to 0.8 ft; fossil fumarole; "Pipe 5" in Appendix X [samples 026, 027].

NW-11: fault bounding SW margin of upward flaring zone of deformation; N65W, 87N with 1.2 ft DTS on Qbt_3-Qbt_4 contact; fault has cataclastic breccia up to 0.5 ft wide; fossil fumarole; "Pipe 4" in Appendix X [samples 022, 023, 024].

NW-12: open fissure about 4 ft long with aperture up to 0.5 ft.

NW-13: two DTN steps on top of surge, each about 0.5 ft; it appears solid blocks of Qbt_4 settled into Qbt_s; no displacement on base of surge.

NW-14: upward flaring fissure filled with rubble of Qbt_3, out of place blocks of surge, and out of place blocks of Qbt_4; overlying Qbt_4 highly fractured; no net displacement across feature; SW margin N67W, 83N; NE margin N15W, 83SW; at excavation floor fissure is 0.2 ft wide, but flares upward to 5 ft wide; fossil fumarole; "Pipe 2" in Appendix X [samples 012, 013, 014, 015, 016, 017].

NW-15: 0.6 ft step DTS on top of surge at fracture N73W, 87S; no displacement on basal contact of surge.

NW-16: 0.5 ft DTS step on base of surge; no associated fracture and no displacement on top of surge.

NW-17: 0.4 ft DTS step on base of surge on fracture N50W, 90; fracture comes up through Qbt_3, but does not penetrate the surge.

NW-18: 0.3 ft DTS step on top of surge; fracture comes down through Qbt_4 and Qbt_s but stops at top of Qbt_3.

NORTH WALL (N; PLATE 2)

N-1: lobe of surge base that "intrudes" top of Qbt_3 0.4 ft; no associated structure.

N-2: abrupt edge on surge of 0.3 ft DTW coincident with a fracture; no displacement evident.

N-3: fossil fumarole exhibiting extreme fines depletion, leaving coarse sand; deformation on surge over fumarole is on three structures, from west to east: 0.3 ft DTE, 0.3 ft DTE, and 0.1 ft DTW all on basal surge contact; top not used because surge is thickening from west to east; fractures with displacement can't be traced into fumarole.

NORTHEAST WALL (NE; PLATE 3)

NE-1: 0.5 ft DTW on contact at zone of cataclastic breccia; failure surface in Qbt_4 can be traced through the top 2 ft of the breccia, but does not continue downward and can not be traced in Qbt_3; N10W, 90 to N-S, 90; rootless feature (i.e. lacks vertical continuity).

NE-2: fracture with 0.15 ft DTS on top contact of surge; no displacement on basal contact; N57E, 83N.

NE-3: channel of reworked Qbt_3; coarser material in channel axis and finer material at channel margins; apparent stratification parallels channel outline and must be secondary laminations caused by ground water; maximum thickness 2 ft.

NE-4: fossil fumarole with upward flaring fan-shaped fracture pattern; fracture at base N5W, 90.

NE-5: fossil fumarole with crudely upward fanning fractures surrounding rubblized altered (?) Qbt_3; N margin of lower part of fan N-S, 85E; S side N5W, 85E.

NE-6: fossil fumarole with zone of extreme fines depletion; rock is texturally a medium sandstone.

NE-7: fossil fumarole with upward flaring zone of fines depletion with medium sand texture; there is 0.3 ft of relief on the base of the surge with undulation topography over a large pumice on top of the fumarole.

NE-8: fossil fumarole with small upward flaring zone of fines depletion with medium sand texture; fracture at SE side N10E, 87E with 0.15 ft DTSE on top of surge; no displacement of base of surge.

NE-9: fracture with 0.15 ft DTN on base of surge; N5E, 85SE; no displacement on top of surge.

NE-10: 0.3 ft DTS on top of surge; no displacement on base; fracture E-W, 84S does not continue downward through the surge.

NE-11: fracture with 0.15 ft DTN step on top contact of surge; penetrates through the surge to basal contact, but no displacement on basal contact; N40E, 83N.

NE-12: large fissure filled with soft-sediment-deformed blocks of Qbt_s; overlying Qbt_4 is graben-like block downdropped into Qbt_s; Qbt_s is deformed by graben block with squeeze-ups into a fracture; no net displacement across fissure; failure surfaces cannot be traced below surge.

NE-13: 0.1 ft DTSE step on top of surge; no associated fracture; no displacement on base.

NE-14: 0.3 ft DTNW on Qbt_4-Qbt_3 contact; N56W, 90; intersects/joins NE-15.

NE-15: 0.2 ft DTNW on Qbt_3-Qbt_4 contact; N1W, 90.

NE-16: 0.2 ft DTN on top of surge; structure does not penetrate downward through the surge and there is no displacement on the base; N83E, 90.

NE-17: fault with zone of cataclastic breccia; 1.5 ft DTSE on the Qbt_3-Qbt_4 contact; N57E, 90 (just above the contact) to N85E, 90.

NE-18: 0.5 ft DTN on base of Qbt_4; some horizontal component necessary to accommodate N side of structure Qbt_3-Qbt_4 contact, south side 0.6 ft of surge; then to SE

contact is buried for about 5 ft at which point there is no surge; N60E, 72SE and N51E, 82SE.

SOUTHEAST WALL (SE; PLATE 4)

SE-1: abrupt step of about 1 ft DTN on basal contact of surge; no associated structure identified and top of surge displays no displacement.

SE-2: E-W, 90; normal fault with 1.1 ft DTSW and associated large fracture fill; clasts in fracture fill up to 0.8 ft and appear to be all Qbt_4; fault disappears downward about 1 ft into Qbt_3; rootless structure.

SE-3: N10E, 90; rootless fracture fill with block of slightly out of place surge; fracture can't be traced upward into Qbt_4 more than two feet, and it does not penetrate Qbt_3; possible displacement 0.9 ft DTS, but displacement not required due to dip of surge and orientation of fracture with respect to orientation of wall.

SE-4: abrupt step on contact about 1 ft DTN; no associated structure.

SE-5: N80E, 80S (within surge) and N20W, 70SW in lower Qbt_4); DTN step on top contact of surge of 0.5 ft on a fracture; base of surge is not displaced and fracture does not continue down into Qbt_3.

SE-6: N80E, 70S; DTN reverse displacement of 0.6 ft on top contact of surge; failure surface's dip shallows in middle of thick surge and disappears into bedding.

SE-7: N55W, 73S; 0.4 ft DTS normal displacement on top contact of surge; no displacement on basal contact of surge.

SE-8: N80E, 90; small clay fill and rubble zone that cuts from just above top surge contact to bottom surge contact with apparent 0.3 ft DTS normal displacement of top contact; no displacement on bottom contact of surge.

SE-9: N60E, 90; fissure with out of place blocks (up to 0.6 ft) of surge and Qbt_4 in a matrix of rubble and fissure-fill clay; no displacement of contacts across fissure.

SE-10: N45W, 85 NE; fault bifurcates at top of surge with 0.4 ft DTS reverse movement on top of surge and possibly 0.2 ft DTS reverse, cumulative displacement across the two strands on base of surge.

SE-11: N65W, 90; vertically discontinuous fault with 0.5 ft DTS normal displacement on top of surge and 0.7 ft DTS normal displacement on bottom contact of surge.

SE-12: (no attitude); step of 0.3 ft DTS on top of surge on fracture; no displacement on base of surge.

SE-13: E-W, 70S; vertically discontinuous fault with 0.5 ft DTS normal displacement on both contacts of the surge.

SE-14: N80E, 73S (upper) and N80W, 85N (lower); fault with pronounced curving failure surface, implying vertical rotations of large blocks of tuff; fault is high angle reverse in upper part of Qbt_4 and is normal in lower Qbt_4 and Qbt_3; 1.2 ft DTN on Qbt_4-Qbt_3 contact; pink oxidation and cataclastic breccia occur along failure surface.

SE-15: (no attitude); 0.2 ft DTS step on basal contact of surge; no associated structure and no displacement on top of surge.

SE-16: N75E, 80S; reverse fault with 0.4 ft DTN on top of surge and 0.55 ft DTN on base of surge; pink oxidation on failure surface.

SE-17: N10E, 87E; 0.5 ft DTE normal displacement of the Qbt_3-Qbt_4 contact; pink oxidation on nearby fractures; failure surface has clay, with faint vertical striations, and root mats.

SE-18: N50W, 75NE; base of surge makes 0.5 ft DTS step on small, discontinuous fracture; can not evaluate top contact because fracture does not continue to that height.

SE-19: N-S, 83W (south side, high), N5E, 87E (south side low), N60E, 90 (north side); large zone of rubblized Qbt_4 and surge that flares upward to the ground surface; top and bottom contacts of the surge are not displaced across the fissure.

SE-20: N40W, 80SW; reverse fault with 0.2 ft DTN on top contact of surge and 0.3 ft DTN on basal contact of the surge.

SOUTHEAST TEMPORARY WALL (SET; PLATE 5)

SET-1: N62W, 83N; 0.4 ft DTN on top of surge, but no displacement on bottom.

SET-2: N4W, 90; small graben-like feature with top of surge displaced 0.3 ft on north side and 0.1 on south side, but no displacement on the bottom contact.

SET-3: no attitude measured; 0.1 ft DTS on top, but no displacement on base.

SET-4: N85E, 90; 0.5 ft on top of surge, but no displacement on base.

SET-5: N77E, 76S; 0.1 ft on top of surge, but no displacement on base.

SET-6: N77W, 87N and N4E, 85E bound intensely fractured and/or rubble-filled fissure; displacement of 1.2 ft on top and bottom of surge DTS; zone below surge is rubble filled with blocks of Qbt_4 and rotated/tilted blocks of surge; zone above surge did not open and is simply rubblized or fractured tuff. Normal displacement.

SET-7: no attitude measured; 0.3 ft on base of surge, but fracture does not penetrate to the top of the surge, and top is not displaced.

SET-8: N29W, 90; 0.2 ft DTS on base of surge, but none on top.

SET-9: N87E, 67S; normal displacement of top 0.7 ft DTS, but no displacement of base.

SET-10: N83W, 79S; 0.4 ft normal DTS on top of surge, no displacement of base.

SET-11: N72W, 90; normal 0.4 ft DTN on Qbt_3-Qbt_4 contact.

SET-12: N75W, 85N; normal 0.1 ft DTN on Qbt_3-Qbt_4 contact, but fracture disappears in Qbt_3.

SET-13: N64W, 84S; normal displacement of 1.3 ft DTS on Qbt_3-Qbt_4 contact.

SET-14: N11W, 79N; normal DTN 0.2 ft on top of surge with surge's thickness changing.

SET15: N73W, 84N to N58W, 74N; 0.2 ft on top of surge DTN, no displacement of base.

SET-16: E-W, 90; open rubble-filled fracture with no displacement of top of surge; irregularity on bottom of surge does not appear structural.

SET-17: N80E, 85S; N80E, 85S; 0.6 normal displacement DTS; 4.7 to 1.5 ft wide rubble-filled fissure in upper Qbt_3 and surge, with blocks of surge and Qbt_4 tumbled into it; above lowest foot or so of Qbt_4 there is no open fracture, just rubblized or fractured, in-place Qbt_4; very similar to SET-6.

SET-18: N65W, 77N; 0.3 ft normal displacement DTN on top of surge, no displacement on base.

SOUTHWEST TEMPORARY WALL (SWT; PLATE 6)

SWT-1: N85W, 80N; 2 ft DTS on top and bottom contacts of surge. High angle reverse fault.

SWT-2: N20E, 90; 1.2 ft DTE on top contact and 0.7 ft on basal contact due to irregular (non-planar/non-horizontal) basal contact. Normal fault. Fault disappears about 2 ft downwards into Qbt_3.

SWT-3: basal contact and, to a lesser degree, the top contact exhibit about 1 ft of dramatic irregular undulation; no relation to structure.

SWT-4: N10E, 90; top contact of surge steps DTW 1.1 ft at fracture, but fracture does not displace basal contact and terminates at Qbt_3-surge contact.

SWT-5: N-S, 85E; large fissure with fill of coarse rubble, blocks of Qbt_4 to 2.3 ft, and sand and clay above the Qbt_3-surge contact; below Qbt_3-surge contact is finer fissure fill in lower, narrower part of fissure with sandy clayey matrix and angular chunks 0.5 to 1 inch. If there is displacement, the basal contact of the surge is displaced 0.3 ft DTE and the top contact is displaced 1.4 ft DTW! Very similar to SET-6 and SET-17.

SWT-6: N80E, 90 (west side) and N40E, 90 (east side); small graben; west side 0.5 ft on top of surge and 0.3 ft on bottom; east side 0.6 ft on top and bottom of surge; SWT-6 connects with SWT-7; west side disappears about 2 ft downwards into Qbt_3.

SWT-7: N10E, 85W; displacement only on base of surge 0.4 ft; tiny graben-like feature.

SWT-8: N80E, 90; normal fault with 0.5 ft on top of surge and 0.7 ft on base, DTS.

SWT-9: small graben with N50E, 90 on both faults with 0.1 ft on top and bottom of surge; faults cannot be traced more than 4 ft downwards into Qbt_3.

Table A-1. Key to structure categories and numbered features on the logs (Plates 1-6). Numbers in parentheses following feature designation show amount of displacement (in feet) on geologic contacts, where present and measurable.

TOS- AND BOS-FAULTS

TOS Only:

SWT-4(1.1)
SET-1 (0.4) SET-2 (0.3), SET-3 (0.1), SET-4 (0.5), SET-5 (0.1), SET-9 (0.7), SET-10 (0.4), SET-14 (0.2), SET-15 (0.2), SET-18 (0.3)
SE-5 (0.5), SE-6 (0.6), SE-7 (0.4), SE-8 (0.3), SE-12 (0.3)
NW-7 (0.3), NW-7 (0.15), NW-13 (0.5), NW-13 (0.5), NW-15 (0.6), NW-18 (0.3)
NE-2 (0.15), NE-10 (0.3), NE-11 (0.15), NE-13 (0.1), NE-16 (0.2)

BOS Only:

SWT-7 (0.4)
SET-7 (0.3), SET-8 (0.2)
SE-18 (0.5)
NW-3 (0.2), NW-5 (0.3), NW-17 (0.4)
NE-9 (0.15)

FAULTS

SWT-1 (2.0), SWT-8 (0.8)
SE-10 (0.4?), SE-14 (1.2), SE-16 (0.5), SE-17 (0.5), SE-20 (0.2)
SET-11 (0.4), SET-13 (1.3)
NE-14 (0.3), NE-15 (0.2), NE-17 (1.5), NE-18 (0.5)

FAULTS LACKING VERTICAL CONTINUITY

SWT-2 (1.2), SWT-6 (0.6), SWT-9 (0.1)
SET-12 (0.1)
SE-2 (1.1), SE-11 (0.7), SE-13 (0.5)
NW-4 (0.4)
NE-1 (0.5).

FISSURES / FUMAROLES

SWT-5
SET-6 (1.2), SET-16, SET-17 (0.6)
SE-3 (0.9?), SE-9, SE-19
NW-1, NW-2 NW-6, NW-8, NW-9, NW-10, NW-11 (1.2), NW-12, NW-14
NE-4, NE-5, NE-6, NE-7, NE-8, NE-12
N-3 (0.5)

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APPENDIX B.

PETROGRAPHIC SAMPLE DESCRIPTIONS
X-RAY DIFFRACTION (XRD) AND X-RAY FLUORESCENCE (XRF) DATA

PETROGRAPHIC SAMPLE DESCRIPTIONS AND NOTES

Pipe #1 – NW wall

CMRR-002B

FIELD NOTES

NW wall, gas escape pipe #1, Qbt_3, beyond margins of rubblized zone of pipe #1, taken as undisturbed sample (background).

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Both quartz and alkali feldspar occur in subequal amounts (total of approximately 25-30 vol. %). Mostly euhedral shapes, with the largest grains up to 2-3 mm. Simple twins observed in the feldspars. The feldspars rarely exhibit feathery overgrowths. The rim overgrowths are in optical continuity with the main grain.

SHARDS – These are fully inflated and show no deformation due to welding. The shards are devitrified and exhibit axiolitic textures consisting of cristobalite and alkali feldspar.

PUMICE – These are vapor phase (VP) altered, with a thin axiolitic type of outer wall texture. This component of the ignimbrite has many open voids within the lapilli. However, late stage tridymite is observed as small, twinned, wedge shaped crystals growing into the voids of the lapilli.

CMRR-003B

FIELD NOTES

NW wall, gas escape pipe #1, Qbt_3, north margin of pipe #1, very silicified.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Similar to CMRR-002B, quartz and alkali feldspar are the predominant phenocrysts, with feldspar approximately 2x the volume of quartz. Rare occurrences of both clinopyroxene and altered olivine (?). Fe-oxides are present at approximately 1 vol. %. Again there is evidence of feathery rim overgrowths on the feldspars. These patchy overgrowths are in optical continuity with the main crystal; however the original rim edge of the phenocryst is still intact.

SHARDS – These are fully inflated and show no deformation due to welding. The shards are devitrified and exhibit axiolitic textures consisting of cristobalite and alkali feldspar. The shards are clear, with a much lighter color than the surrounding groundmass.

PUMICE – The lapilli are open and undeformed in nature. The pumices are VP altered in previously glassy regions with spherulites rarely observed. In addition, in the inner most open regions tridymite wedges are now common as are secondary, clear sanidine feldspars.

GROUNDMASS – Devitrified, with a slightly grey brown color.

CMRR-006B

FIELD NOTES

NW wall, gas escape pipe #1, Qbt_3, south side of pipe #1. Not so silicified, beyond margins of rubblized main pipe area.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Very high volume amount (40-45%) in this thin section (TS). Apparent abundance perhaps due to fines depletion. Quartz and alkali feldspar are the predominant phenocrysts, in overall 1:2 ratio. Clinopyroxene rare but present. Fe-oxides are present at approximately 1 vol. %. Again there is evidence of feathery rim overgrowths on the feldspars. These patchy overgrowths are in optical continuity with the main crystal; however the original rim edge of the phenocryst is still intact. These overgrowths are still observed on the feldspars, however less common that the last three TS Some phenocrysts attain a size of 5 mm on edge.

PUMICE – Original tubes now encrusted by multiple wedge shaped tridymite and sanidine infilling in lapilli as euhedral phases. However there is slightly more open space left in the pumice than in the previous three TS (CMRR-003, -004, -005B). Some spherulitic textures are also observed within the center of this lapilli.

SHARDS – These are fully inflated and show no deformation due to welding. The shards are devitrified and exhibit axiolitic textures consisting of cristobalite and alkali feldspar. The shards are clear, with a much lighter color than the surrounding groundmass.

GROUNDMASS – Devitrified, with a light brown to olive brown color. Perhaps due to TS thickening.

CMRR-007B

FIELD NOTES

NW wall, gas escape pipe #1, Qbt_3, approximately 3m above pit floor. Within pipe #1, near south side of pipe. Friable and rubblized. Uppermost Qbt_3.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Very high volume amount (50%) in this TS. Apparent abundance perhaps due to fines depletion. Quartz and alkali feldspar are the predominant phenocrysts, in overall 1:2 ratio. Clinopyroxene rare but present. Fe-oxides are present at approximately 1 vol. %. Again there is evidence of feathery rim overgrowths on the feldspars. Phenocrysts in this TS are large (up to 7 mm) by comparison with other samples. Both quartz and alkali feldspars are commonly internally shattered (concoidal and cleavage fractures, respectively) and / or stressed.

PUMICE – Original tubes now encrusted by multiple wedge shaped tridymite and elongate sanidine crystals. There is a high amount of tridymite and sanidine infilling in lapilli as euhedral phases. Similar to the previous four TS (CMRR-003, -004, -005, 006B). Some spherulitic textures are also observed within the center of this lapilli.

SHARDS – These are fully inflated and show no deformation due to welding. The shards are devitrified and exhibit axiolitic textures consisting of cristobalite and alkali feldspar. The shards are tan brown.
GROUNDMASS – Very little observed relative to other thin sections so far**.**

CMRR-008B
FIELD NOTES

NW wall, gas escape pipe #1, Qbt_3, approximately 3m above pit floor. Center of pipe #1, 2 feet below surge. Rubblized and friable, cobbles collected.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Apparent abundance back to normal (30 vol. %) in this TS**.** Quartz and alkali feldspar are the predominant phenocrysts, in overall 1:2 ratio. Clinopyroxene rare but present. Fe-oxides are present at approximately 1 vol. %. Again there is evidence of feathery rim overgrowths on the feldspars. Phenocrysts in this TS are normal size (up to 3 mm).
PUMICE – Original tubes now encrusted by multiple wedge shaped tridymite and elongate sanidine crystals. There is a high amount of tridymite and sanidine infilling in lapilli as euhedral phases. Similar to the previous thin sections. Some spherulitic textures are also observed within the center of this lapilli.
SHARDS – These are fully inflated and show no deformation due to welding. The shards are devitrified and exhibit axiolitic textures consisting of cristobalite and alkali feldspar. The shards are tan brown.
GROUNDMASS – Now common again, at approximately 10 - 15 vol. %.

CMRR-009B
FIELD NOTES

NW wall, gas escape pipe #1, upper Qbt_3, north side of pipe #1. Approximately 3m above pit floor.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Approximately 35-40 vol. %**.** Quartz and alkali feldspar are the predominant phenocrysts, in subequal amounts. Clinopyroxene rare but present. Fe-oxides are present at approximately 1 vol. %. Again there is evidence of feathery rim overgrowths on the feldspars. These patchy overgrowths are in optical continuity with the main crystal; however the original rim edge of the phenocryst is still intact. These overgrowths are still observed on the feldspars, however less common than the last three TS. Some phenocrysts attain a size of 5 mm on edge. Many phenocrysts are internally shattered (concoidal and cleavage fractures, respectively) and / or stressed.
PUMICE – Abundant VP alteration is observed. Original tubes heavily encrusted by multiple wedge shaped tridymite and elongate sanidine crystals. There is a high amount of tridymite and sanidine infilling in lapilli as euhedral phases. Some spherulitic textures are also observed within the center of this lapilli. May be extremely high VP crystallization due to siliceous gases from the fumarolic pipe.

SHARDS – These are fully inflated and show no deformation due to welding. The shards are devitrified and exhibit axiolitic textures consisting of cristobalite and alkali feldspar. The shards are light lemon color.
GROUNDMASS – Devitrified, with a light brown to tan color. Composed of ash, crystal fragments and silicic gas material (tridymite, sanidine) in previously open spaces.

CMRR-010B
FIELD NOTES
NW wall, gas escape pipe #1, Qbt_s, approximately 4m above pit floor. Within pipe #1 in center, slightly indurated.

PETROGRAPHIC DESCRIPTION
PHENOCRYSTS – Perhaps 60 -65 % by volume. Many large euhedral crystals present, however a large percentage of crystal fragments also observed. The crystals are predominantly quartz and alkali feldspar, but mafic minerals (clinopyroxene and Fe-Oxides) are up to approximately 5% by volume in this section. Overgrowths of two types noted here: 1) full rims with multiple inclusions, seemingly due to overlap of groundmass on crystal rims, and 2) feathery, patchy growths seen on phenocryst which seem indicative of silicic gas deposition of feldspar material.
PUMICE – Rare, but have growth of tridymite and sanidine in open void spaces. Within the lapilli, rare clays intermingle with the VP material. Clays commonly rim the border of the lapilli in this sample.
SHARDS – Rare, but the shards are devitrified and exhibit axiolitic textures consisting of cristobalite and alkali feldspar. The shards are clear to light tan in color.
GROUNDMASS – This material amounts for 20 -25 % of the volume. Color is yellow brown with many patches of clay present. Clay makes up approximately 5 -10 % of groundmass.
NOTES – Slight to moderate orientation of crystals in this sample.

<u>Pipe #2 – NW wall</u>

CMRR-011B
FIELD NOTES
NW wall, gas escape pipe #2, Qbt_4, north side of pipe #2. 2.5 ft north of disrupted zone in Qbt_4. Background.

PETROGRAPHIC DESCRIPTION
PHENOCRYSTS –Mostly small, shattered fragments. A few intact (euhedral) up to 2 mm. Once again, the phenocrysts are primarily quartz and alkali feldspar, with minor clinopyroxene. Three types of overgrowth features are observed: 1) very mottled rims, caused by shards / groundmass overlapping onto phenocrysts; 2) rim overgrowths formed in magma chamber, pre-eruption (rare); 3) feathery overgrowths, caused by VP gases, also rare in this sample.

PUMICE – Infill material in voids of lapilli radically different from all Qbt_3 samples so far. Lapilli are rare and small. Infill material is dominantly spherulitic, as both full spheres and partial sprays. Material is acicular, fibrous and interlocking. Appears to be intergrown cristobalite and feldspar due to normal devitrification.
SHARDS – Yellow tan color, fully inflated, with axiolitic texture. Original bubble walls complete.
GROUNGMASS – Medium brown color, devitrified material composed of quartz and alkali feldspar.
NOTES – Large lithic fragment with mafic composition. Lots of dark spherules of material in this section (small size, high relief, probably polishing material from TS production).

CMRR-012B
FIELD NOTES

NW wall, gas escape pipe #2, Qbt_4, directly above pipe #2, rubblized. Approximately 11 ft above pit floor. Clay in fractures around sample.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Mostly small, shattered fragments. A few intact euhedral up to 2 mm. Once again, the phenocrysts are primarily quartz and alkali feldspar, with minor clinopyroxene. Majority of crystal rims are either sharp (no overgrowth) or mottled due to overlap by shards / groundmass.
PUMICE – Similar to CMRR-011B, now with obvious clays within lapilli. Often indicates (possibly separates) spherulite boundaries and alteration of tube walls. Along with spherulites of cristobalite and feldspar, there is late stage crystallization of tridymite in remaining void spaces of the lapilli. (This was not seen in the CMRR-011B lapilli).
SHARDS – Same as CMRR-011B, sometimes bounded by groundmass clays.
GROUNDMASS – Darker brown color than previous sections (i.e. moderate brown).
NOTES – Clays now approximately 10 vol. % overall in TS. Mn / Fe oxides now approximately 10 -20 % overall in TS.

CMRR-013B
FIELD NOTES

NW wall, gas escape pipe #2, Qbt_4 (background). 2 ft outside disrupted zone (south side). Might be affected by pipe #2.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major phases present are quartz, alkali feldspar, clinopyroxene, Fe-oxides. Many small fragments of larger crystals. Remaining large crystals often internally broken and / or crazed. All three types of overgrowths observed: 1) very mottled rims, caused by shards / groundmass overlapping onto phenocrysts; 2) rim overgrowths formed in magma chamber,

pre-eruption (rare); 3) feathery overgrowths, caused by VP gases, also rare in this sample.

PUMICE – One very large (2 cm) lapilli observed at edge of thin section. Direct devitrification observed as cristobalite / feldspar spherulites and partial sprays. Late stage tridymite crystallizing in remaining void spaces.

SHARDS - Abundant, fully inflated (i.e. not deformed) lemon yellow, axiolitic texture.

GROUNDMASS – Tan color, abundant, no clays observed.

CMRR-014B

FIELD NOTES

NW wall, gas escape pipe #2, Qbt_s base. Approximately 3 ft from south side of pipe #2; approximately 9 ft above pit floor.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Occupy approximately 70 -75 % by volume of TS. Many large euhedral crystals present, however a large percentage of crystal fragments also observed. The crystals are predominantly quartz and alkali feldspar, but mafic minerals (clinopyroxene and Fe-Oxides) are up to approximately 5% by volume in this section. Overgrowths of two types noted here but are rare: 1) full rims with multiple inclusions, possibly due to overlap of groundmass on crystal rims (this overgrowth dominates), and 2) rare, feathery, patchy growths seen on phenocrysts, which seem indicative of silicic gas deposition of feldspar material.

PUMICE - Rare, but have growth of tridymite and sanidine in open void spaces. Within the lapilli, rare clays intermingle with the VP material. Clays commonly rim the border of the lapilli in this sample.

SHARDS – Extremely rare (< 1%), axiolitic texture due to devitrification, medium brown color.

GROUNDMASS – Volume is approximately 15 -20 %, color is yellow brown. Minor amounts of tridymite and sanidine observed in open spaces. Clays common (10-15 volume %) as darker yellow brown patches in matrix of groundmass.

NOTE – Crystals oriented in this TS.

CMRR-015B

FIELD NOTES

NW wall, gas escape pipe #2, Qbt_s, out of place. Imbricated, within pipe #2. Approximately 9 ft above pit floor.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Occupy approximately 70 -75 % by volume of TS. Many large euhedral crystals present, however a large percentage of crystal fragments also observed. The crystals are predominantly quartz and alkali feldspar, but mafic minerals (clinopyroxene and Fe-oxides) are up to approximately 7% by volume in this section. Overgrowths of two types noted here but are rare: 1) full rims with multiple inclusions, possibly due to overlap of groundmass on crystal

rims (this overgrowth dominates), and 2) rare, feathery, patchy growths seen on phenocrysts, which seem indicative of silicic gas deposition of feldspar material.
PUMICE – Rare, but have growth of tridymite and sanidine in open void spaces. Within the lapilli, rare clays intermingle with the VP material. Clays commonly rim the border of the lapilli in this sample.
SHARDS – Now up to about 3-5 vol. %, axiolitic texture due to devitrification, medium brown color.
GROUNDMASS – Volume is approximately 30 %, color is yellow brown. Minor amounts of tridymite and sanidine observed in open spaces. Clays common (10 vol. %) as darker yellow brown patches in matrix of groundmass.

CMRR-016B
FIELD NOTES

NW wall, gas escape pipe #2, Qbt_3, silicified north side wall of pipe #2. Approximately 10.5 ft above pit floor.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Approximately 25% large, intact phenocrysts, 20% fragments. Three overgrowth types observed: 1) feathery overgrowths, optically aligned with the major crystal, due to siliceous VP late stage fumarolic gases (predominantly seen on feldspars); 2) Magmatic rim overgrowths, whose ragged appearance may indicate partial resorption; 3) Very mottled rims, due to overlap of shards / groundmass.
PUMICE – Almost totally included by tridymite / sanidine. Both euhedral and spherulitic patterns observed.
SHARDS – Clear to light yellow color, predominant axiolitic textures.
GROUNDMASS – Fine grained, light tan color. Literally choked with euhedral tridymite / sanidine fumarolic originated VP.
NOTE – late-stage crystals in groundmass may be cause of induration.

CMRR-017B
FIELD NOTES

NW wall, gas escape pipe #2, Qbt_3, center of pipe #2, rubblized zone. Approximately 10 ft above pit floor.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Approximately 25% large, intact phenocrysts, 20% fragments. Three overgrowth types observed: 1) feathery overgrowths, optically aligned with the major crystal, due to siliceous VP late stage fumarolic gases (predominantly seen on feldspars); 2) Magmatic rim overgrowths, whose ragged appearance may indicate partial resorption; 3) Very mottled rims, due to overlap of shards / groundmass.
PUMICE – large void spaces observed. Very common to see growths of tridymite and sanidine. Mostly euhedral silicic gas formed crystals. In one pumice

vug, unknown minerals occur as needle-like acicular sprays. This could well be scapolite, as described by both Sheridan (1970) and Smith (1965).
SHARDS – Yellow-moderate brown color with axiolitic texture.
GROUNDMASS – Fine grained, light tan color. Voids in groundmass partially filled with euhedral tridymite / sanidine fumarolic gas crystals.
NOTE – scapolite potentially present as fumarolic gas precipitate.

CMRR-018B
FIELD NOTES

NW wall, gas escape pipe #2, Qbt_3, approximately 5 ft south of pipe. Background. 3.1 ft south of closest fracture.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Higher proportion of large (up to 1 mm) euhedral phenocrysts. Many are cracked / crazed. Overgrowths (especially feathery growth) still common.
PUMICE – Outer edges show axiolitic texture (like most previous TS). Tube openings have high abundance of euhedral tridymite /sanidine growing into open spaces. The lapilli are chock full of VP minerals caused by silicic gas vapors.
SHARDS – Light lemon yellow color with axiolitic texture.
GROUNDMASS – Fine grained, light tan color.
NOTE – This background sample has been affected by fumarolic gases.

<u>Pipe #3 – NW wall</u>

CMRR-019B
FIELD NOTES

NW wall, gas escape pipe #3, Qbt_3, large rubble zone. Phenocryst-rich (approx. 40%) due to fines depletion. Taken from center of pipe, approximately 8 ft above pit floor.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene (3%), and Fe-oxides (2%). Quartz and alkali feldspar are in subequal amounts for a total of 35% by volume. Therefore, phenocryst total is approximately 40 vol. %. Euhedral crystals have less abundance than anhedral fragments. These fragments also infill spaces between large phenocrysts, indicating response to fines depletion. All three overgrowth types occur: 1) rims created in magma chamber, 2) groundmass / shards overlapping onto phenocrysts, and 3) feathery, patchy overgrowths that are optically continuous with major crystals. This overgrowth type is due to VP silicic gases.
PUMICE – Open voids (i.e. tubes) are partially filled with tridymite / sanidine. Rare spherulites observed. Outer edge exhibits axiolitic texture.

SHARDS – Light lemon yellow color. Fully open structure with remnant lapilli vesicle textures observed. Outer edges exhibit axiolitic texture. Nonwelded. Shards look suspended in air.
GROUNDMASS – Very little observed. Indicative of fines depletion.
NOTE – Fines depleted.

CMRR-020B
FIELD NOTES

NW wall, gas escape pipe #3, Qbt_3, just south of pipe #3 main rubble zone. Phenocrysts 25-30% (Check for potential alteration beyond pipe).

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Very similar to CMRR-019B. Therefore, major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. However, phenocryst total is now lower at approximately 25 -30 vol. %. Euhedral crystals have less abundance than anhedral fragments. All three overgrowth types occur: 1) rims created in magma chamber, 2) groundmass / shards overlapping onto phenocrysts, and 3) feathery, patchy overgrowths that are optically continuous with major crystals. This overgrowth type is due to VP silicic gases.
PUMICE – Open voids (i.e. tubes) are partially filled with tridymite / sanidine. Rare spherulites observed. Outer edge exhibits axiolitic texture.
SHARDS – Similar to CMRR-019B, except now embedded in groundmass.
GROUNDMASS – Moderate brown color. Void spaces now choked with fumarolic silicic gas tridymite / sanidine.

CMRR-021B
FIELD NOTES

NW wall, gas escape pipe #3, Qbt_3, 10 ft south of CMRR-20B. Background (clean).

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Very similar to CMRR- 019B. Therefore, major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. However, phenocryst total is now lower at approximately 25 -30% volume. Euhedral crystals have less abundance than anhedral fragments. All three overgrowth types occur: 1) rims created in magma chamber, 2) groundmass / shards overlapping onto phenocrysts, and 3) feathery, patchy overgrowths that are optically continuous with major crystals. This overgrowth type is due to VP silicic gases.
PUMICE – Similar to sample CMRR-09B, except tridymite rosettes are commonly seen as opposed to large euhedral crystals growing into the voids.
SHARDS - Light lemon yellow color. Fully open structure with remnant lapilli vesicle textures observed. Outer edges exhibit axiolitic texture. Non welded.
GROUNDMASS – Color is moderate to dark brown. Fumarolic gas deposited sanidine / tridymite not common growing into groundmass voids. Mostly very fine grained devitrification silicates (cristobalite, alkali feldspar) have replaced glass.

Pipe #4 – NW wall

CMRR-022B

FIELD NOTES

NW wall, gas escape pipe #4, Qbt_3, center of pipe #4, located on fault. Does not appear fines-depleted, approximately 7 ft above pit floor.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major crystals are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Phenocryst total is now at approximately 25 -30% volume. Same three textural overgrowth types as described previously occur: 1) rims created in magma chamber, 2) groundmass / shards overlapping onto phenocrysts, and 3) feathery, patchy overgrowths that are optically continuous with major crystals. This feathery overgrowth type is most common of the three in this sample and is due to fumarolic silicic gases. Two quartz phenocrysts are shattered and slightly elongated (post deposition?) with the open spaces infilled by tridymite / sanidine grains.

PUMICE – Edges have axiolitic texture. Previous void spaces now infilled by euhedral tridymite / sanidine with very late stage clays mantling the fumarolic silicate phases.

SHARDS – Axiolitic textures common, often with outer edge mantled by groundmass clays. Larger shards have tridymite filling inner gaps in the shards.

GROUNDMASS – Void spaces infilled with sanidine, tridymite, and clays. Dark color.

NOTES – Clay rich in both pumice and groundmass (somehow connected to fault; possible gouge?). Dark blebs may be Mn-rich globs.

CMRR-023B

FIELD NOTES

NW wall, gas escape pipe #4, Qbt_3, center of pipe #4, approximately 7 ft above pit floor. Pumice-rich, pumices are vapor phase altered.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major crystals are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Phenocryst total is now at approximately 25 -30 vol. %. Same three textural overgrowth types as described previously occur: 1) rims created in magma chamber, 2) groundmass / shards overlapping onto phenocrysts, and 3) feathery, patchy overgrowths that are optically continuous with major crystals. This feathery overgrowth type is most common of the three in this sample and is due to fumarolic silicic gases.

PUMICE – Edges have axiolitic texture. Previous void spaces now infilled by euhedral tridymite / sanidine. Tridymite rosettes common in interior of lapilli, as are distinct larger twinned sanidine crystals. No clays observed.

SHARDS – Axiolitic textures common, no clay borders present. Larger shards have tridymite filling inner gaps in the shards.

GROUNDMASS – Void spaces infilled with sanidine and tridymite. Light color. Some minor regions of fines depletion.

CMRR-024B

FIELD NOTES

NW wall, gas escape pipe #4, Qbt_4, rubblized, directly above pipe #4. Obvious Mn oxide and clays on surfaces. Approximately 12 ft above pit floor.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major crystals are quartz, alkali feldspar, clinopyroxene, Fe-oxides and minor amphibole. The phenocrysts are less abundant than in Qbt_3 and the crystal size is on average smaller than in Qbt_3. Many more partial fragments than euhedral crystals. Examples of complex twinning observed in feldspars. The proportion of clinopyroxene is greater in Qbt_4. Magmatic overgrowth rims are more common than normal.

PUMICE – Very rare (or obscured by dark groundmass color). Lapilli are clay rimmed and infilled by very low birefringent VP material (assumed to be tridymite / sanidine).

SHARDS – Axiolitic texture which is often interspersed with clays. Some are totally replaced by Mn-oxides.

GROUNDMASS – Material wholly replaced by VP silicates, clays and Mn-oxides. This imparts a dark brown color to the matrix.

NOTE – Very dark color due to clay / Mn-oxide infusion.

CMRR-025B

FIELD NOTES

NW wall, gas escape pipe #4, Qbt_3, background. 9.2 ft south of fault and 9.2 ft north of pipe #5.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS –Similar to CMRR-019B in that major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Quartz and alkali feldspar are in subequal amounts for a total of 25% by volume. [Therefore phenocryst total is approximately 30% volume.] Euhedral crystals have less abundance than anhedral fragments. All three overgrowth types occur: 1) rims created in magma chamber, 2) groundmass / shards overlapping onto phenocrysts, and 3) feathery, patchy overgrowths that are optically continuous with major crystals. This overgrowth type is due to VP silicic gases; however, feathery overgrowths are less common in this sample.

PUMICE – Open voids (i.e. tubes) are partially filled with tridymite / sanidine. Spherulitic texture commonly observed in this sample. Outer edge exhibits axiolitic texture.

SHARDS - Light lemon yellow color. Fully open structure with remnant lapilli vesicle textures observed. Outer edges exhibit axiolitic texture. Nonwelded.

GROUNDMASS – Light brown to tan color. Glass fully replaced by VP silicates. Many dark blebs observed (possibly grinding compound from TS production?)

Pipe #5 – NW wall

CMRR-026B
FIELD NOTES

NW wall, gas escape pipe #5, Qbt_3, fines-depleted (phenocrysts approx. 40 %). Taken from center of pipe.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. High phenocryst content at approximately 40 % by volume. Clinopyroxene appears to be 5 volume %, perhaps an affect of fines depletion. All three overgrowth types are present. The feathery overgrowths on alkali feldspar, due to silicic vapor, are common in this TS. Magmatic overgrowths are rare. The apparent overgrowths due to groundmass overlap are fairly common.
PUMICE – Axiolitic texture on outer edges of lapilli. Multiple gas phase deposition minerals (tridymite, sanidine) textures observed. These include spherulites, rosettes, large euhedral crystals and plumose structures. Large open regions observed in the lapilli (possibly disaggregated during gas streaming).
SHARDS – Tan color, fully inflated, axiolitic texture.
GROUNDMASS – Missing in many places. Where present, it is a light brown color. Composed of very fine grained devitrified silicate phases +/- VP products.
NOTE – Fines depleted.

CMRR-027B
FIELD NOTES

NW wall, gas escape pipe #5, Qbt_3. Wall material from north side of pipe #5; detached from wall by secondary fracture. Phenocrysts normal (25-30%).

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Phenocryst content at approximately 25-30 % by volume. All three overgrowth types are present. The feathery overgrowths on alkali feldspar, due to silicic vapor, are common in this TS Magmatic overgrowths are rare. The apparent overgrowths due to groundmass overlap are fairly common.
PUMICE – Axiolitic texture on outer edges of lapilli. Multiple gas phase deposition minerals (tridymite, sanidine) textures observed. These include spherulites, rosettes, large euhedral crystals and plumose structures. Many open voids still exist in the lapilli, but have euhedral, terminated, silicic gas deposition phases terminating in voids.
SHARDS – Tan color, fully inflated, axiolitic texture.
GROUNDMASS – Present in all cases between shards and other components, where it is a light brown color. Composed of very fine grained devitrified silicate phases +/- VP products.

Pipe #6 – NW wall

CMRR-028B

FIELD NOTES

NW wall, gas escape pipe #6, Qbt_3, center of pipe #6. Heavily rubblized.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Clinopyroxene consistently show oxidation / alteration rims. Three types of overgrowths present. 1) Feathery overgrowths produced by fumarolic silicic gases. 2) Overgrowth rims produced in magma chamber (not optically continuous). 3) Overgrowth image produced by overlap of groundmass material (rare in this TS).

PUMICE – Heavily affected by VP alteration. Outer edge appears to have axiolitic texture, then a mix of spherulites, plumose structures, and euhedral crystals of tridymite / sanidine.

SHARDS – Tan color, fully inflated with bubble structures intact. Axiolitic texture within shards.

GROUNDMASS – Virtually missing in some portions of the thin section. In other portions of the thin section, void spaces in the groundmass have been infilled by fumarolic tridymite / sanidine.

NOTES – Fines depleted in selective regions, clinopyroxenes have oxidized rims.

CMRR-029B

FIELD NOTES

NW wall, gas escape pipe #6, Qbt_3 near surge contact, w/in pipe #6. Brown Mn oxide and clay coatings on surfaces, altered pumices, silicified.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Although rare, the clinopyroxene consistently show oxidation / alteration rims. Three types of overgrowths present. 1) Feathery overgrowths produced by fumarolic silicic gases. 2) Overgrowth rims produced in magma chamber (not optically continuous). 3) Overgrowth image produced by overlap of groundmass material (rare in this TS).

PUMICE – Similar to CMRR-028B sample, except most open voids now filled by "large" euhedral crystals and / or plumose fumarolic deposited tridymite / sanidine. Clays intermixed throughout lapilli.

SHARDS – Moderate brown color, fully inflated with bubble structures intact. Axiolitic texture within shards.

GROUNDMASS – Choked with clays and Mn-oxides. Any previous open pores are now filled by late stage fumarolic silicic gas deposited silicate phases (cause of silicification). Oft times these late-stage fumarolic minerals (or Mn- oxide clots) are rimmed by clays.

NOTES – Clay rich, Mn-oxide rich, pore spaces filled by late stage fumarolic minerals.

CMRR-030B

FIELD NOTES

NW wall, gas escape pipe #6, Qbt_3, north side wall rock from pipe #6, heavily silicified.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Clinopyroxenes more common in this sample (3%) and consistently show oxidation / alteration rims. Three types of overgrowths present. 1) Feathery overgrowths produced by fumarolic silicic gases. 2) Overgrowth rims produced in magma chamber (not optically continuous). 3) Overgrowth image produced by overlap of groundmass material (rare in this TS).

PUMICE – The lapilli are heavily altered by fumarolic gases, with most open voids now filled by euhedral crystals and / or plumose fumarolic deposited tridymite / sanidine. Clays intermixed throughout lapilli.

SHARDS – Moderate brown color, fully inflated with bubble structures intact. Axiolitic texture within shards.

GROUNDMASS – Choked with clays and Mn-oxides. Any previous open pores are now filled by late stage fumarolic silicic gas deposited silicate phases (cause of silicification). Oft times these late-stage fumarolic minerals (or Mn- oxide clots) are rimmed by clays.

NOTES – Clay rich, Mn-oxide rich, pore spaces filled by late stage fumarolic minerals.

CMRR-031B

FIELD NOTES

NW wall, gas escape pipe #6), Qbt_4, heavily rubblized, coatings of clays and Mn oxides on small particles. Bounded by NE-SW cooling fracture.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Lower total phenocryst abundance (approximately 15 vol. %) than in unit Qbt3. Crystal size is both much smaller than in Qbt3 and more often anhedral. Only two overgrowth forms observed. 1) Magmatic rims are very rarely observed. 2) Groundmass overlap on phenocrysts gives the appearance of rim overgrowth. No feathery overgrowths seen.

PUMICE – All lapilli are rimmed by clays. Late stage fumarolic silicates imposed by siliceous gases pervasive. Speculates and plumose structures are very rare. Euhedral crystals and bowtie (sheaf) structures common to interior of lapilli. Many fine grained crystals surrounded by clays.

SHARDS – Tan color, axiolitic textures common.

GROUNDMASS – Rich in clays, surrounding very late stage vapor phase minerals (tridymite / sanidine) and Mn-oxides. The above mentioned vapor phase minerals fill previous void space of groundmass.

NOTES – This sample is rich in clays and Mn-oxides.

Pipe #7 – NW wall

CMRR-032B
FIELD NOTES

NW wall, gas escape pipe #7, Qbt_s, rubblized, extremely friable from pipe #7.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, Fe-oxides and very rare amphibole. These crystals are euhedral to angular, with no rounding observed. There are no feathery overgrowths observed on the phenocrysts. Magmatic and groundmass (apparent) overgrowths are present but very modest.
PUMICE – Present but very rare. Fumarolic vapor minerals present as fine grained masses, sheafs, and euhedral crystals growing into voids.
SHARDS – Almost nonexistent, however those present have axiolitic texture.
GROUNDMASS – All fine material now devitrified. Some open voids now crystallized with euhedral tridymite and sanidine. Many open void space still exist (approximately 30 % of groundmass). Clays observed throughout in minor amounts (approximately 5 to 7 vol. %).

CMRR-033B
FIELD NOTES

NW wall, gas escape pipe #7, Qbt_3, center of pipe #7. Fines depleted, extremely friable.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Clinopyroxene consistently show oxidation / alteration rims. Three types of overgrowths present. 1) Feathery overgrowths produced by fumarolic silicic gases. 2) Overgrowth rims produced in magma chamber (not optically continuous). 3) Overgrowth image produced by overlap of groundmass material (rare in this TS).
PUMICE – Heavily affected by Vapor Phase alteration. Outer edge appears to have axiolitic texture, then a mix of spherulites, plumose structures, and euhedral crystals of tridymite / sanidine.
SHARDS – Tan color, fully inflated with bubble structures intact. Axiolitic texture within shards. Often masked by clays.
GROUNDMASS – This sample is fines depleted in some portions of the thin section. In other regions, the void spaces in the groundmass have been infilled by fumarolic tridymite / sanidine. Although patchy in distribution, clays are locally abundant. Approximately 8 – 10 vol. % clays overall.
NOTES – Fines depleted, Clay in this sample, at approximately 8 – 10 vol. %.

CMRR-034B
FIELD NOTES

NW wall, gas escape pipe #7, Qbt_3, south side of pipe #7. Indurated.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Clinopyroxene consistently show oxidation / alteration rims. Three types of overgrowths present. 1) Feathery overgrowths produced by fumarolic silicic gases. 2) Overgrowth rims produced in magma chamber (not optically continuous). 3) Overgrowth image produced by overlap of groundmass material (rare in this TS).

PUMICE – Lapilli are rare in this sample. Heavily affected by VP alteration. Outer edge appears to have axiolitic texture, then a mix of spherulites, plumose structures, and euhedral crystals of tridymite / sanidine.

SHARDS – Tan color, fully inflated with bubble structures intact. Axiolitic texture within shards. Often masked by clays.

GROUNDMASS – Throughout the thin section, void spaces in the groundmass have been infilled by fumarolic tridymite / sanidine.

NOTES – Clay rich in this sample, at approximately 15 – 20 volume %

<u>SE wall -BACKGROUND</u>

CMRR-035B

FIELD NOTES

SE wall, Qbt_3, approximately 1 ft below Qbt_s contact, extremely friable. Background, approx. 12 ft north of closest possible pipe.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Clinopyroxene consistently show oxidation / alteration rims. Three types of overgrowths present. 1) Feathery overgrowths produced by fumarolic silicic gases. 2) Overgrowth rims produced in magma chamber (not optically continuous). 3) Overgrowth image produced by overlap of groundmass material (rare in this TS).

PUMICE – Heavily affected by VP alteration. Outer edge appears to have axiolitic texture, then a mix of spherulites, plumose structures, and euhedral crystals of tridymite / sanidine. All lapilli are mantled by clays.

SHARDS – Tan color, fully inflated with bubble structures intact. Axiolitic texture within shards.

GROUNDMASS – Choked with clay. Any previous open pores are now filled by late stage fumarolic silicic gas deposited silicate phases. Oft times these late-stage fumarolic minerals are rimmed by clays.

NOTES – Clay rich, groundmass pore spaces partially filled by late stage fumarolic minerals.

CMRR-036B

FIELD NOTES

SE wall, Qbt_s, approximately 1.5 ft above CMRR-035B, background sample. Taken directly on fracture.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, Fe-oxides and very rare amphibole. Appears to be a high clinopyroxene content at approximately 5 volume %. These crystals are euhedral to angular, with no rounding observed. There are no feathery overgrowths observed on the phenocrysts. Magmatic and groundmass (apparent) overgrowths are present but very modest.

PUMICE – Present but very rare. Fumarolic vapor minerals present as fine grained masses, sheafs, and euhedral crystals growing into voids.

SHARDS – Low at approximately 3 volume %; however those present have axiolitic texture.

GROUNDMASS – All fine material now devitrified. Previous open voids now crystallized with euhedral tridymite and sanidine. Remaining open void space at less than 1 vol. %. Clays observed throughout at approximately 10 vol. %.

CMRR-037B

FIELD NOTES

SE wall, Qbt_4, background, (isolated from fractures, approximately 9 ft north of closest pipe).

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Clinopyroxenes exhibit oxidation, alteration rims. Lower total phenocryst abundance (approximately 15 - 18 vol. %) than in unit Qbt_3. Crystal size is both much smaller than in Qbt_3 and more often anhedral. Only two overgrowth forms observed. 1) Magmatic rims are very rarely observed. 2) Groundmass overlap on phenocrysts gives the appearance of rim overgrowth. No feathery overgrowths seen.

PUMICE – Heavily affected by VP alteration. Outer edge appears to have axiolitic texture, then a mix of spherulites, plumose structures, and euhedral crystals of tridymite / sanidine.

SHARDS – Dark tan color, fully inflated with bubble structures intact. Axiolitic texture within shards.

GROUNDMASS – Minor fines depletion in some portions of the thin section. In other portions of the thin section, void spaces in the groundmass are either still open or have been infilled by late stage vapor phase tridymite / sanidine.

NOTES – No clays.

<u>Pipe #8 – SE wall</u>

CMRR-038B

FIELD NOTES

SE wall, gas escape pipe #8, Qbt_3, near (underneath) pipe# 8. Altered brown color, brecciated, clay and Mn oxide coatings.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, and Fe-oxides. Clinopyroxene consistently show oxidation / alteration rims. High phenocryst content at approximately 30 volume %. Three types of overgrowths present. 1) Feathery overgrowths produced by fumarolic silicic gases. 2) Overgrowth rims produced in magma chamber (not optically continuous). 3) Overgrowth image produced by overlap of groundmass material (rare in this TS).

PUMICE – Heavily affected by VP alteration. Outer edge appears to have axiolitic texture, then a mix of spherulites, plumose structures, and euhedral crystals of tridymite / sanidine. This sample is similar to sample CMRR-028B except clays fill remaining void spaces in most cases.

SHARDS – Tan color, fully inflated with bubble structures intact. Axiolitic texture within shards.

GROUNDMASS – Choked with clays. Any previous open pores are now filled by late stage fumarolic silicic gas deposited silicate phases (cause of silicification). Oft times these late-stage fumarolic minerals are rimmed by clays.

NOTES – Clay rich (approximately 25 % overall), Mn-oxide poor, no sign of internal brecciation.

CMRR-039B

FIELD NOTES

SE wall, gas escape pipe #8, Qbt_s, out of place within pipe #8, appears altered. Moderate brown color throughout.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, Fe-oxides and very rare amphibole. These crystals are euhedral to angular, with no rounding observed. Phenocrysts are very high in volume at approximately 70 %. Magmatic, feathery overgrowths and groundmass (apparent) overgrowths are present in these relative proportions.

PUMICE – Present but very rare. Fumarolic vapor minerals present as fine grained masses, sheafs, and euhedral crystals growing into voids.

SHARDS – Almost nonexistent, however those present have axiolitic texture.

GROUNDMASS – Clays are extremely rich in this sample at 20 – 25 vol. %. All fine material now devitrified. Some open voids now crystallized with euhedral tridymite and sanidine. Residual open void space is very low at less than 1 vol. %. Mn-oxides abundant at 3-5 vol. %.

NOTES – Crystal and clay rich, appreciable Mn-oxides.

CMRR-040B

FIELD NOTES

SE wall, gas escape pipe #8, Qbt_4, out of place, down dropped into pipe #8. Fracture surfaces coated with clays and Mn oxides.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene (rare and oxidized), and Fe-oxides (exhibiting oxidation rims). Phenocrysts only constitute 10-15 vol. % of the sample. Overgrowths observed are: 1) groundmass overlap (apparent) overgrowths, 2) magmatic rims, and 3) rare feathery overgrowths.
PUMICE – Vapor phase altered where radial sprays (+/- plumose growths) dominate. Euhedral tridymite and sanidine crystals still common projecting into open voids. Last material deposited into the voids is a blanket of clays.
SHARDS – Tan color with axiolitic texture. Inner most cores rarely filled with clays, more commonly by Mn-oxides.
GROUNDMASS – Moderate brown color, Mn-oxides relatively common (approximately 7 vol. %), while clays are more rare at approximately 2 vol. %. Many previous void spaces are filled by vapor phase silicates.
NOTES – Low total phenocryst content (15 vol. %). Clays primarily in pumice. Mn-oxides common in groundmass and sometimes replace shards.

CMRR-041B
FIELD NOTES

SE wall, gas escape pipe #8, breccia matrix with small chunks of Qbt_4. Breccia is within pipe #8.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene (rare and oxidized), and Fe-oxides (exhibiting oxidation rims). Phenocrysts only constitute 10-15 vol. % of the sample. Overgrowths observed are: 1) groundmass overlap (apparent) overgrowths, 2) magmatic rims, and 3) rare feathery overgrowths.
PUMICE – VP altered where radial sprays (+/- plumose growths) dominate. Euhedral tridymite and sanidine crystals still common projecting into open voids. Last material deposited into the voids is a blanket of clays.
SHARDS – Tan color with axiolitic texture. Previously open voids in axiolitic textures now filled by Mn-oxides.
GROUNDMASS – Moderate brown color, many previous void spaces are filled by vapor phase silicates. Similar to CMRR-040B, except that Mn-oxides and clays have totally invaded the groundmass. Mn-oxides are at approximately 10 vol. % while clays are at 10-15 vol. %.
NOTE – Outer edge of this breccia clast of Qbt_4 is coated by clays.

CATACLASTIC MATERIAL

CMRR-042B
FIELD NOTES

Pink, altered, cataclastic breccia from curved fault. Includes chunks of Qbt_4.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene (rare and oxidized), and Fe-oxides (exhibiting oxidation rims). Phenocrysts only constitute 10-15 vol. % of the sample. Overgrowths observed are: 1) groundmass overlap (apparent) overgrowths, 2) magmatic rims, and 3) rare feathery overgrowths.
PUMICE – VP altered where radial sprays (+/- plumose growths) dominate. Euhedral tridymite and sanidine crystals still common projecting into open voids. Last material deposited into the voids is a blanket of clays.
SHARDS – Tan color with axiolitic texture. Previously open voids in axiolitic textures now filled by Mn-oxides.
GROUNDMASS – Moderate brown color, many previous void spaces are filled by vapor phase silicates. Similar to CMRR-040B, except that Mn-oxides and clays have totally invaded the groundmass. Mn-oxides are at approximately 10 vol. % while clays are at 10-15 vol. %.
NOTE- Outer edge of this cataclastic breccia clast of Qbt_4 is not coated by clays.

<u>Pipe #9 – SE wall</u>

CMRR-043B
FIELD NOTES
SE wall, gas escape pipe #9, Qbt_3. Wall of pipe #9, northeast side.

PETROGRAPHIC DESCRIPTION
This thin section is composed of two major components: 1) a major proportion of fines depleted, clay rich, Mn-oxide rich sample of Qbt_3 (i.e., matrix), and 2) a clast of devitrified, vapor phase rich Qbt_3 with minor clays but a higher percentage of Mn-oxides. The clast is a darker red brown in color.
The matrix (major component of sample) is especially fines depleted around the clast. Open groundmass has been partially infilled by euhedral crystals of tridymite / sanidine and then finally by clays.
The clast has much less open void space. The groundmass of the clast has replacement of tridymite / sanidine VP material in most places.

PHENOCRYSTS – Although minor variation throughout this sample, generally normal compositions and textures for Qbt_3.
PUMICE – Typical vapor phase silicate growth observed within pipe altered zones.
SHARDS – Axiolitic textures common, color difference between matrix (light brown) and clast (darker brown).
GROUNDMASS – Matrix: open void space, very high clay content, and high Mn-oxide content. **Clast:** No void space observed, low clay content, very high Mn-oxide content.

CMRR-044B
FIELD NOTES

SE wall, gas escape pipe #9, matrix of fissure (pipe) fill at horizon where top of Qbt_s would be if not disrupted.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene (rare and oxidized), and Fe-oxides (exhibiting oxidation rims). Phenocrysts only constitute 10-15 vol. % of the sample. Overgrowths observed are: 1) groundmass overlap (apparent) overgrowths, 2) magmatic rims, and 3) feathery overgrowths. However, the feathery overgrowths are now common on the plagioclase phenocrysts.

PUMICE – VP altered where radial sprays (+/- plumose growths) dominate. Euhedral tridymite and sanidine crystals still common projecting into open voids. Last material deposited into the voids is a blanket of clays.

SHARDS – Tan color with axiolitic texture which has open centers.

GROUNDMASS – Moderate brown color, Mn-oxides relatively common (approximately 7 vol. %), while clays are more rare at approximately 2 vol. %. Many previous void spaces are filled by VP silicates.

NOTES – Very similar overall to CMRR-040B sample

CMRR-045B

FIELD NOTES

SE wall, gas escape pipe #9, brown altered Qbt_s forming NE wall of pipe #9.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene, Fe-oxides and very rare amphibole. These crystals are euhedral to angular, with no rounding observed. Phenocrysts are very high in volume at approximately 60 %. Feathery overgrowths, magmatic rims, and groundmass (apparent) overgrowths are present in these relative proportions.

PUMICE – Present but very rare. Fumarolic vapor minerals present as fine grained masses, sheafs, and euhedral crystals growing into voids.

SHARDS – Almost nonexistent, however those present have axiolitic texture and a brown color.

GROUNDMASS – Color is moderate brown and overall groundmass proportion is approximately 35-40 vol. %. Clays are extremely rich in this sample at 20 – 25 vol %. All fine material now devitrified. Some open voids now crystallized with euhedral tridymite and sanidine. Residual open void space is very low at less than 1 vol. %. Mn-oxides abundant at 3-5 vol. %.

NOTES – Crystal and clay rich, appreciable Mn-oxides.

CMRR-046B

FIELD NOTES

SE wall, gas escape pipe #9, chunks of Qbt_4 from position in pipe stratigraphically within Qbt_4. 1.4 ft above surge.

PETROGRAPHIC DESCRIPTION

PHENOCRYSTS – Major components are quartz, alkali feldspar, clinopyroxene (rare and oxidized), and Fe-oxides (exhibiting oxidation rims). Phenocrysts only constitute 10-15 vol. % of the sample. Overgrowths observed are: 1) groundmass overlap (apparent) overgrowths, 2) magmatic rims, and 3) rare feathery overgrowths.

PUMICE – Vapor phase altered where radial sprays (+/- plumose growths) dominate. Euhedral tridymite and sanidine crystals still common projecting into open voids. Last material deposited into the voids is a blanket of clays.

SHARDS – Tan color with axiolitic texture. Inner most cores rarely filled with clays, more commonly by Mn-oxides.

GROUNDMASS – All fine grained Fe-oxides dispersed in groundmass are now altered to rutile, indicating a very high oxidation state. Moderate brown color, Mn-oxides relatively common (approximately 7 vol. %), while clays are more rare at approximately 2 vol. %. Many previous void spaces are filled by vapor phase silicates.

NOTES – Low total phenocryst content (15 vol. %).

- Clays primarily in pumice
- Mn-oxides common in groundmass and sometimes replace shards.
- High oxidation state, as indicated by rutile needles in groundmass.

<u>Large Collapse Structure on NE wall</u>

CMRR-047B

FIELD NOTES

Western end of NE wall, large collapse structure, Qbt_3. Sample taken from upper eastern limb. Finely banded, crystal-rich, pumice-poor, matrix seems glassy. For XRF, XRD analysis only, no petrographic description.

CMRR-048B

FIELD NOTES

Western end of NE wall, large collapse structure, Qbt_3. Sample taken from center of collapse structure just above base. Coarsely banded, crystal- and pumice-rich. Matrix seems glassy. Orientation = Trending NE, Plunge of 17° at bottom center of structure. For XRF, XRD analysis only, no petrographic description.

<u>Pipe # 10 N Wall</u>

CMRR-049B

FIELD NOTES

Fines depleted zone of pipe within Qbt_3. Eastern most portion of N wall. Very friable, unconsolidated. Phenocryst-rich. For XRF, XRD analysis only, no petrographic description.

<u>Large Pumice from Qbt3, NE wall</u>

CMRR-050B

FIELD NOTES

Sample collected from pumice swarm (Qbt_3) at base of collapse structure near sample CMRR-047. One single, large (6cm) lapilli, white grey in color. For XRF, XRD analysis only, no petrographic description.

TABLE B-1.
CMRR XRD DATA (BY SAMPLE NUMBER)

SAMPLE	UNIT	QUARTZ	TRIDYMITE	CRISTOBALITE	sum SiO_2	Ratio Qtz/Trid	Alkali Feld	CLAY	TOTAL
CMRR-002B	Qbt_3 (B)	18	20.5	4.1	42.6	0.88	62.2		104.8
CMRR-003B	Qbt_3	19.6	28	3.1	50.7	0.7	52.9		103.6
CMRR-004B	Qbt_3	14	23	3.1	40.1	0.61	57.7		97.8
CMRR-005B	Qbt_3	17.7	22.8	2	42.5	0.78	57.6		100.1
CMRR-006B	Qbt_3	14.5	26.8	2.8	44.1	0.54	52.9		97
CMRR-007B	Qbt_3	15.8	28.5	3.2	47.5	0.55	58.2		105.7
CMRR-008B	Qbt_3	18.7	25.1	3.5	47.3	0.75	57.8		105.1
CMRR-009B	Qbt_3	19.5	25	3.6	48.1	0.78	57.2		105.3
CMRR-010B	Qbt_s	14.9	25.7	3	43.6	0.58	61.4		105
CMRR-011B	Qbt_4 (B)	6.2	21.5	9	36.7	0.29	61.4		98.1
CMRR-012B	Qbt_4	4.6	20.8	8.3	33.7	0.22	49.7	18.6	102
CMRR-013B	Qbt_4 (B)	5.8	24.4	8.9	39.1	0.24	62.9		102
CMRR-014B	Qbt_s	23.3	14.3	3.3	40.9	1.63	62.5		103.4
CMRR-015B	Qbt_s	30.6	9.2	2.6	42.4	3.33	62.7		105.1
CMRR-016B	Qbt_3	17.3	22.6	3.5	43.4	0.77	59		102.4
CMRR-017B	Qbt_3	11	29.9	2.3	43.2	0.37	56.8		100
CMRR-018B	Qbt_3 (B)	15.4	24.8	2.7	42.9	0.62	45.5	10.1	98.5
CMRR-019B	Qbt_3	20	17.9	2.1	40	1.12	60		100
CMRR-020B	Qbt_3	16	28.7	3.1	47.8	0.56	55.3		103.1
CMRR-021B	Qbt_3 (B)	19.9	20	2.8	42.7	1	59.6		102.3
CMRR-022B	Qbt_3	20.7	23.2	3.6	47.5	0.89	56.1		103.6
CMRR-023B	Qbt_3	14.1	27.6	2.4	44.1	0.51	58.2		102.3
CMRR-024B	Qbt_4	5	18.9	7.8	31.7	0.26	50.3	16.9	98.9
CMRR-025B	Qbt_3 (B)	22.3	19.4	3.6	45.3	1.15	53.4		98.7
CMRR-026B	Qbt_3	19.1	20.9	3.6	43.6	0.91	50.5		94.1
CMRR-027B	Qbt_3	18.6	23.6	3.1	45.3	0.79	54.7		100
CMRR-028B	Qbt_3	14.9	26.7	8	49.6	0.56	52.7		102.3
CMRR-029B	Qbt_3	15.7	20.6	8.3	44.6	0.76	45	9.3	98.9
CMRR-030B	Qbt_3	15.9	20.7	5	41.6	0.77	48.5	5	95.1
CMRR-031B	Qbt_4	6	14.8	14.7	35.5	0.41	52.2	12.4	100.1
CMRR-032B	Qbt_s	29.4	12.6	3.3	45.3	2.33	54		99.3
CMRR-033B	Qbt_3	18.9	22.6	4.6	46.1	0.84	54.5		100.6
CMRR-034B	Qbt_3	13.4	27.8	3	44.2	0.48	53.7		97.9
CMRR-035B	Qbt_3 (B)	14.7	26.3	7.8	48.8	0.56	51.2		100
CMRR-036B	Qbt_s	13.5	17.5	3.8	34.8	0.77	63.6		98.4
CMRR-037B	Qbt_4 (B)	5.4	19.4	16.5	41.3	0.28	57		98.3
CMRR-038B	Qbt_3	9.9	19.3	3.7	32.9	0.51	46.1	17.1	96.1
CMRR-039B	Qbt_s	17.2	9.5	3.7	30.4	1.81	48.4	18.9	97.7
CMRR-040B	Qbt_4	4.8	21.9	8.2	34.9	0.22	47.1	14.1	96.1

SAMPLE	UNIT	QUARTZ	TRIDYMITE	CRISTOBALITE	sum SiO_2	Ratio Qtz/Trid	Alkali Feld	CLAY	TOTAL
CMRR-041B	Qbt_4	3	19.5	5.6	28.1	0.15	42.9	26.5	97.5
CMRR-042B	Qbt_4	5.1	28.9	6.2	40.2	0.18	60.9		101.1
CMRR-043B	Qbt_3	17.8	21.6	2.1	41.5	0.82	55.8		97.3
CMRR-044B	Qbt_4	5	29.8	5.8	40.6	0.17	58.5		99.1
CMRR-045B	Qbt_s	29	13	3.6	45.6	2.23	52.7		98.3
CMRR-046B	Qbt_4	7.2	27.8	8.3	43.3	0.26	59.2		102.5
CMRR-047B	Qbt_3	12.2	22.7	5	39.9	0.54	50.4	11.6	102
CMRR-048B	Qbt_3	20.6	26.9	7.1	54.6	0.77	48.4	1	104
CMRR-049B	Qbt_3	25.4	17.8	1.9	45.1	1.43	54		99.1
CMRR-050B	Qbt_3 pumice	11	31.4	3.3	45.7	0.35	51.6		97.3

TABLE B-2.
CMRR XRD DATA (BY SUBUNIT)

SAMPLE	UNIT	LOCATION INFO	QUARTZ	TRIDYMITE	CRISTOBALITE	sum SiO_2	Ratio Qtz/Trid	Alkali Feld	CLAY	TOTAL
BACKGROUND Qbt3										
CMRR-002B	Qbt_3 (B)	Pipe #1, bkgrd	18	20.5	4.1	42.6	0.88	62.2		104.8
CMRR-018B	Qbt_3 (B)	Pipe #2, bkgrd	15.4	24.8	2.7	42.9	0.62	45.5	10.1	98.5
CMRR-021B	Qbt_3 (B)	Pipe #3, bkgrd	19.9	20	2.8	42.7	1	59.6		102.3
CMRR-025B	Qbt_3 (B)	Pipe #4, bkgrd	22.3	19.4	3.6	45.3	1.15	53.4		98.7
CMRR-035B	Qbt_3 (B)	SE wall	14.7	26.3	7.8	48.8	0.56	51.2		100
CMRR-050B	Qbt_3 pumice	NE wall	11	31.4	3.3	45.7	0.35	51.6		97.3
AVERAGE			**16.88**	**23.73**	**4.05**	**44.67**	**0.76**	**53.92**		**100.27**
Qbt_3										
CMRR-003B	Qbt_3	Pipe #1, N side	19.6	28	3.1	50.7	0.7	52.9		103.6
CMRR-004B	Qbt_3	Pipe #1, center	14	23	3.1	40.1	0.61	57.7		97.8
CMRR-005B	Qbt_3	Pipe #1, S side	17.7	22.8	2	42.5	0.78	57.6		100.1
CMRR-006B	Qbt_3	Pipe #1, S side	14.5	26.8	2.8	44.1	0.54	52.9		97
CMRR-007B	Qbt_3	Pipe #1, w/in,near S side	15.8	28.5	3.2	47.5	0.55	58.2		105.7
CMRR-008B	Qbt_3	Pipe #1, center	18.7	25.1	3.5	47.3	0.75	57.8		105.1
CMRR-009B	Qbt_3	Pipe #1, N side	19.5	25	3.6	48.1	0.78	57.2		105.3
CMRR-016B	Qbt_3	Pipe #2, N side	17.3	22.6	3.5	43.4	0.77	59		102.4
CMRR-017B	Qbt_3	Pipe #2, center	11	29.9	2.3	43.2	0.37	56.8		100
CMRR-019B	Qbt_3	Pipe #3, center	20	17.9	2.1	40	1.12	60		100
CMRR-020B	Qbt_3	Pipe #3, S side	16	28.7	3.1	47.8	0.56	55.3		103.1
CMRR-022B	Qbt_3	Pipe #4, center	20.7	23.2	3.6	47.5	0.89	56.1		103.6
CMRR-023B	Qbt_3	Pipe #4, center	14.1	27.6	2.4	44.1	0.51	58.2		102.3
CMRR-026B	Qbt_3	Pipe #5, center	19.1	20.9	3.6	43.6	0.91	50.5		94.1
CMRR-027B	Qbt_3	Pipe #5, N side	18.6	23.6	3.1	45.3	0.79	54.7		100
CMRR-028B	Qbt_3	Pipe #6, center	14.9	26.7	8	49.6	0.56	52.7		102.3
CMRR-029B	Qbt_3	Pipe #6, near surge	15.7	20.6	8.3	44.6	0.76	45	9.3	98.9
CMRR-030B	Qbt_3	Pipe #6, N side	15.9	20.7	5	41.6	0.77	48.5	5	95.1
CMRR-033B	Qbt_3	Pipe #7, center	18.9	22.6	4.6	46.1	0.84	54.5		100.6
CMRR-034B	Qbt_3	Pipe #7 S side	13.4	27.8	3	44.2	0.48	53.7		97.9
CMRR-038B	Qbt_3	Near Pipe #8	9.9	19.3	3.7	32.9	0.51	46.1	17.1	96.1
CMRR-043B	Qbt_3	Pipe #9 NE side	17.8	21.6	2.1	41.5	0.82	55.8		97.3
CMRR-047B	Qbt_3	NE wall, collapse feat.	12.2	22.7	5	39.9	0.54	50.4	11.6	102
CMRR-048B	Qbt_3	NE wall, collapse feat.	20.6	26.9	7.1	54.6	0.77	48.4	1	104
CMRR-049B	Qbt_3	NE wall, collapse feat.	25.4	17.8	1.9	45.1	1.43	54		99.1
AVERAGE			**16.85**	**24.01**	**3.75**	**44.61**	**0.72**	**54.16**		**100.54**
SURGE										
CMRR-010B	Qbt_s	Pipe #1 center	14.9	25.7	3	43.6	0.58	61.4		105
CMRR-014B	Qbt_s	Pipe #2, S side	23.3	14.3	3.3	40.9	1.63	62.5		103.4
CMRR-015B	Qbt_s	Pipe #2, center	30.6	9.2	2.6	42.4	3.33	62.7		105.1
CMRR-032B	Qbt_s	Pipe #7, center	29.4	12.6	3.3	45.3	2.33	54		99.3
CMRR-036B	Qbt_s	SE wall	13.5	17.5	3.8	34.8	0.77	63.6		98.4
CMRR-039B	Qbt_s	Pipe #8 center	17.2	9.5	3.7	30.4	1.81	48.4	18.9	97.7
CMRR-045B	Qbt_s	Pipe #9 center	29	13	3.6	45.6	2.23	52.7		98.3
AVERAGE			**22.56**	**14.54**	**3.33**	**40.43**	**1.81**	**57.90**		**101.03**

SAMPLE	UNIT	LOCATION INFO	QUARTZ	TRIDYMITE	CRISTOBALITE	sum SiO_2	Ratio Qtz/Trid	Alkali Feld	CLAY	TOTAL
BACKGROUND Qbt4										
CMRR-011B	Qbt_4 (B)	Pipe #1, bkgrd	6.2	21.5	9	36.7	0.29	61.4		98.1
CMRR-013B	Qbt_4 (B)	Pipe #2, bkgrd	5.8	24.4	8.9	39.1	0.24	62.9		102
CMRR-037B	Qbt_4 (B)	SE wall	5.4	19.4	16.5	41.3	0.28	57		98.3
AVERAGE			**5.80**	**21.77**	**11.47**	**39.03**	**0.27**	**60.43**		**99.47**
Qbt_4										
CMRR-012B	Qbt_4	Pipe #2 center	4.6	20.8	8.3	33.7	0.22	49.7	18.6	102
CMRR-024B	Qbt_4	Pipe #4 center	5	18.9	7.8	31.7	0.26	50.3	16.9	98.9
CMRR-031B	Qbt_4	Pipe #6 center	6	14.8	14.7	35.5	0.41	52.2	12.4	100.1
CMRR-040B	Qbt_4	Pipe #8 center	4.8	21.9	8.2	34.9	0.22	47.1	14.1	96.1
CMRR-041B	Qbt_4	Pipe #8 brecciated	3	19.5	5.6	28.1	0.15	42.9	26.5	97.5
CMRR-042B	Qbt_4	cataclastic	5.1	28.9	6.2	40.2	0.18	60.9		101.1
CMRR-044B	Qbt_4	Pipe #9,center	5	29.8	5.8	40.6	0.17	58.5		99.1
CMRR-046B	Qbt_4	Pipe #9,center	7.2	27.8	8.3	43.3	0.26	59.2		102.5
AVERAGE			**5.09**	**22.80**	**8.11**	**36.00**	**0.23**	**52.60**		**99.66**

TABLE B-3.

CMRR XRD DATA MAJOR MINERAL DIFFERENTIATION Qbt3 (background vs pipe walls, pipe centers) and Qbt4 (background vs rubble zone above pipes)

SAMPLE		QUARTZ	TRIDYMITE	CRISTOBALITE	sum SiO_2	Ratio Qtz/Trid	Alkali Feld	CLAY	TOTAL
BACKGROUND Qbt$_3$[1]		**16.88**	**23.73**	**4.05**	**44.67**	**0.76**	**53.92**		**100.27**
WALL OF PIPE									
Pipe #1, *wall*	Avg[2]	17.42	26.22	2.94	46.58	0.67	55.76		102.34
CMRR-003,005,006,007,009	diff.[3]	0.54	2.49	-1.11	1.91	-0.09	1.84		2.07
Pipe #2, *wall*		17.3	22.6	3.5	43.4	0.77	59		102.4
CMRR-016	diff	0.42	-1.13	-0.45	-1.27	0.01	5.08		2.23
Pipe #3, *wall*		16	28.7	3.1	47.8	0.56	55.3		103.1
CMRR-020	diff	-0.88	4.97	-0.95	3.17	-0.2	1.38		2.83
Pipe #5, *wall*		18.6	23.6	3.1	45.3	0.79	54.7		100
CMRR-027	diff	1.72	-0.13	-0.95	0.63	0.03	0.78		-0.27
Pipe #6, *wall*		15.9	20.7	5	41.6	0.77	48.5	5	95.1
CMRR-030	diff	-0.98	-3.03	0.95	-3.07	0.01	-5.42		-5.17
Pipe #7, *wall*		13.4	27.8	3	44.2	0.48	53.7		97.9
CMRR-034	diff	-3.48	4.07	-1.05	-0.47	-0.28	-0.22		-2.37
Pipe #8, *wall??*		9.9	19.3	3.7	32.9	0.51	46.1	17.1	96.1
CMRR-038	diff	-6.98	-4.43	-0.37	-11.77	-0.25	-7.82		-4.17
Pipe #9, *wall*		17.8	21.6	2.1	41.5	0.82	55.8		97.3
CMRR-043	diff	0.92	-2.13	-1.85	-3.17	0.06	1.98		-2.97
OVERALL AVG (all samples)		15.79	23.82	3.31	42.91	0.67	53.61		99.28
BACKGROUND Qbt$_3$		**16.88**	**23.73**	**4.05**	**44.67**	**0.76**	**53.92**		**100.27**

SAMPLE		QUARTZ	TRIDYMITE	CRISTOBALITE	sum SiO_2	Ratio Qtz/Trid	Alkali Feld	CLAY	TOTAL
BACKGROUND Qbt$_3$		**16.88**	**23.73**	**4.05**	**44.67**	**0.76**	**53.92**		**100.27**
CENTER OF PIPE									
Pipe #1, *center*	Avg.	16.35	24.05	3.3	43.7	0.68	57.75		101.45
CMRR-004,008	diff	-0.53	0.32	-0.75	-0.93	-0.08	3.83		1.18
Pipe #2, *center*		11	29.9	2.3	43.2	0.37	56.8		100
CMRR-017	diff	-5.88	6.17	-1.75	-1.47	-0.39	2.88		-0.27
Pipe #3, *center*		20	17.9	2.1	40	1.12	60		100
CMRR-019	diff	3.12	-5.83	-1.95	-4.67	0.36	4.08		-0.27
Pipe #4, *center*	Avg.	17.4	25.4	3	45.8	0.7	57.15		102.95
CMRR-022,023	diff	0.52	1.67	-1.05	1.13	-0.06	3.23		2.68

SAMPLE		QUARTZ	TRIDYMITE	CRISTOBALITE	sum SiO_2	Ratio Qtz/Trid	Alkali Feld	CLAY	TOTAL
Pipe #5, *center*		19.1	20.9	3.6	43.6	0.91	50.5		94.1
CMRR-026	diff	2.22	-3.83	-0.45	-1.07	0.15	-3.42		-6.17
Pipe #6, *center*		14.9	26.7	8	49.6	0.56	52.7		102.3
CMRR-028	diff	-1.98	2.97	3.95	4.93	-0.2	-1.22		2.03
Pipe # 6, *center near surge*		15.7	20.6	8.3	44.6	0.76	45	9.3	98.9
CMRR-029	diff	-1.18	-3.13	4.25	-0.07	0	-8.92		-1.37
Pipe #7, *center*		18.9	22.6	4.6	46.1	0.84	54.5		100.6
CMRR--33	diff	2.02	-1.13	0.55	1.43	0.08	0.58		0.33
OVERALL AVG (all samples)		16.67	23.51	4.40	44.58	0.74	54.30		100.0375
BACKGROUND Qbt_3		**16.88**	**23.73**	**4.05**	**44.67**	**0.76**	**53.92**		**100.27**

SAMPLE		QUARTZ	TRIDYMITE	CRISTOBALITE	sum SiO_2	Ratio Qtz/Trid	Alkali Feld	CLAY	TOTAL
BACKGROUND Qbt_4		**5.8**	**21.77**	**11.47**	**39.03**	**0.27**	**60.43**		**99.47**
Rubble zone above pipe									
Pipe #2 *center*		4.6	20.8	8.3	33.7	0.22	49.7	18.6	102
CMRR-012	diff	-1.2	-0.97	-3.17	-5.33	-0.05	-10.73		2.53
Pipe #4 *center*		5	18.9	7.8	31.7	0.26	50.3	16.9	98.9
CMRR-024	diff	-0.8	-2.87	-3.67	-7.33	-0.01	-10.13		-0.57
Pipe #6 *center*		6	14.8	14.7	35.5	0.41	52.2	12.4	100.1
CMRR-031	diff	0.2	-6.97	3.23	-3.53	0.14	-8.23		0.63
Pipe #8 *center*		4.8	21.9	8.2	34.9	0.22	47.1	14.1	96.1
CMRR-040	diff	-1	0.13	-3.27	-4.13	-0.05	-13.33		-3.37
Pipe #8 *breccia*		3	19.5	5.6	28.1	0.15	42.9	26.5	97.5
CMRR-041	diff	-2.8	-2.27	-5.87	-10.93	-0.12	-17.53		-1.93
Pipe #8 *cataclastic material*		5.1	28.9	6.2	40.2	0.18	60.9		101.1
CMRR-042	diff	-0.7	7.13	-5.27	1.17	-0.09	0.47		1.63
Pipe #9,*center*	Avg.	6.1	28.8	7.05	41.95	0.22	58.85		100.8
CMRR-044, 046	diff	0.3	7.03	-4.42	2.92	0.05	-1.58		1.33
OVERALL AVG (all samples)		4.94	21.94	8.26	35.15	0.24	51.71		99.5
BACKGROUND Qbt_4		**5.8**	**21.77**	**11.47**	**39.03**	**0.27**	**60.43**		**99.47**

Color Key:

= depleted

= enriched

= slightly depleted

SAMPLE	QUARTZ	TRIDYMITE	CRISTOBALITE	sum SiO_2	Ratio Qtz/Trid	Alkali Feld	CLAY	TOTAL

= slightly enriched

Notes:

[1] Upper highlighted row in each sample category lists the background geochemistry of the Qbt subunit against which other samples in the specific location will be compared.

[2] Where present, values to right represent a calculated average of multiple samples.

[3] Calculated difference between measured value for sample and measured value for background.

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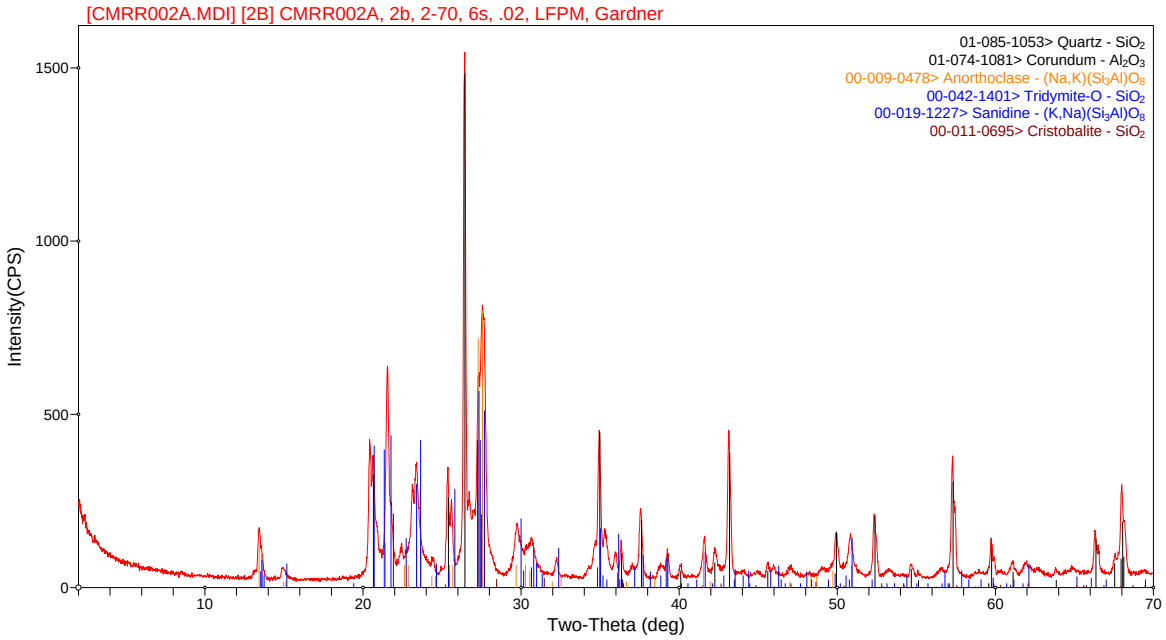
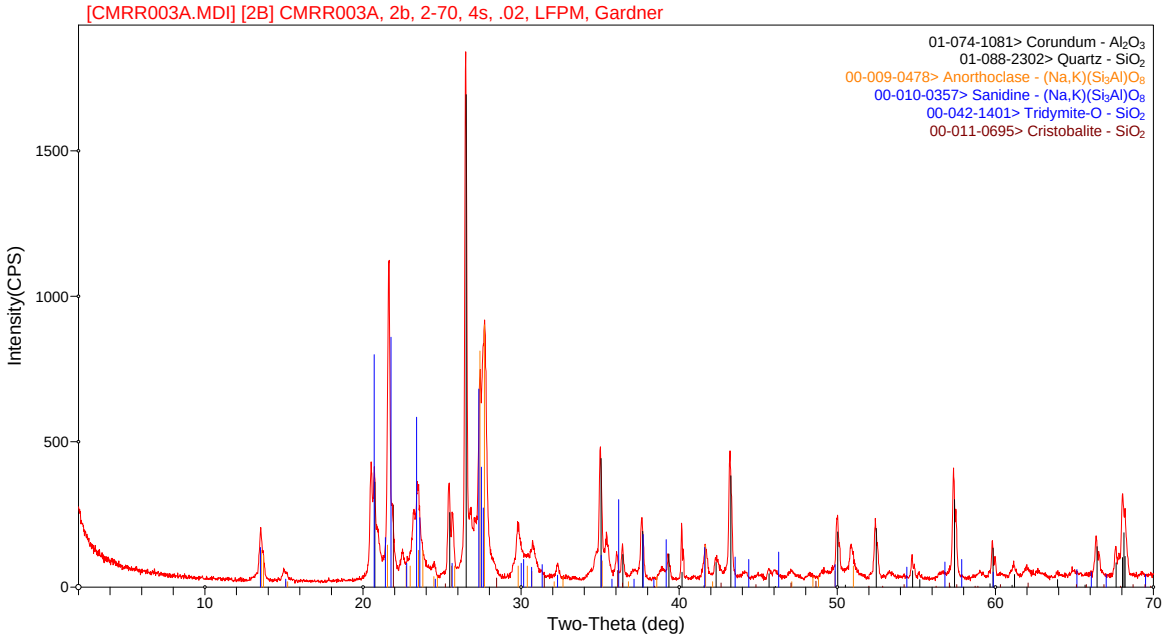
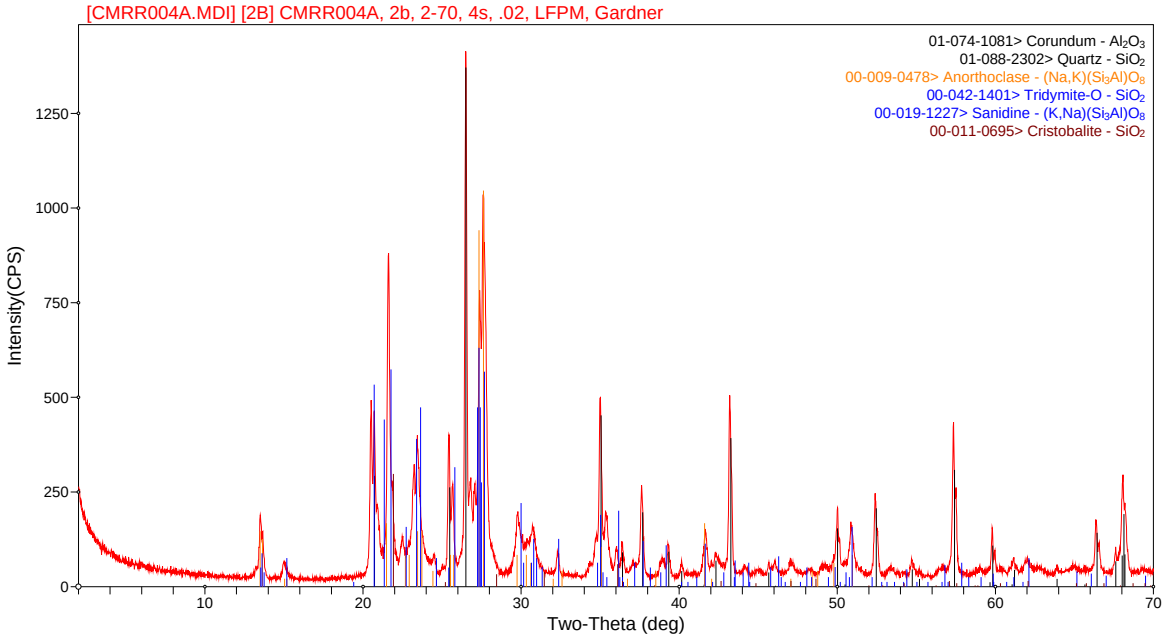
CMRR XRD TWO-THETA (2θ) SPECTRA (BY SAMPLE NUMBER)



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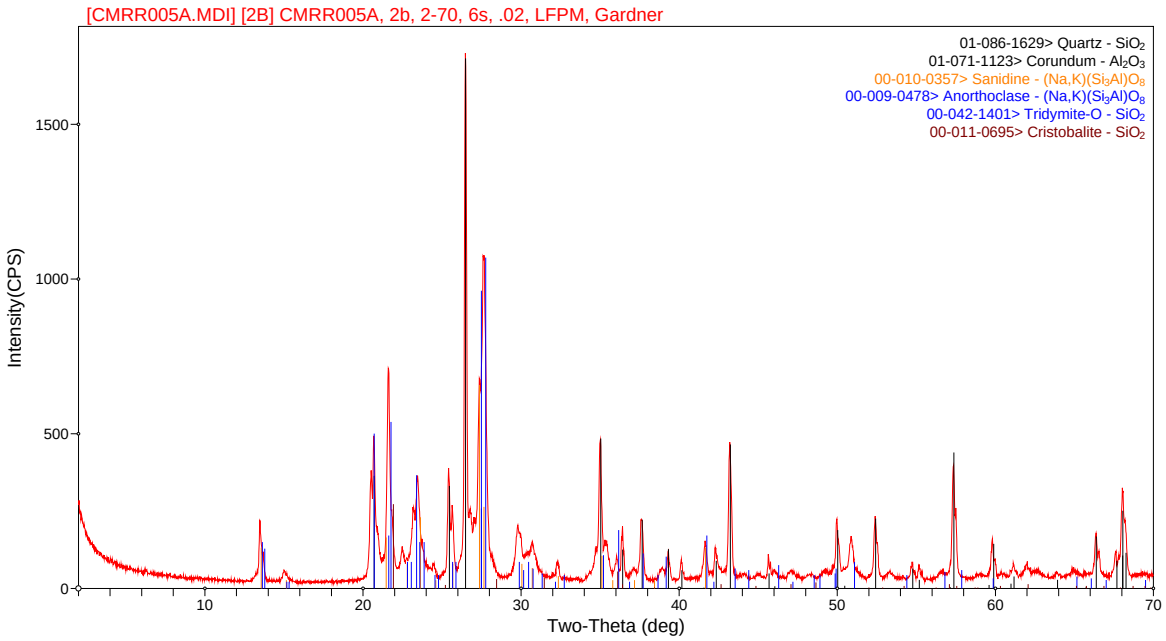
01-074-1081> Corundum - Al_2O_3
01-088-2302> Quartz - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-019-1227> Sanidine - $(K,Na)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)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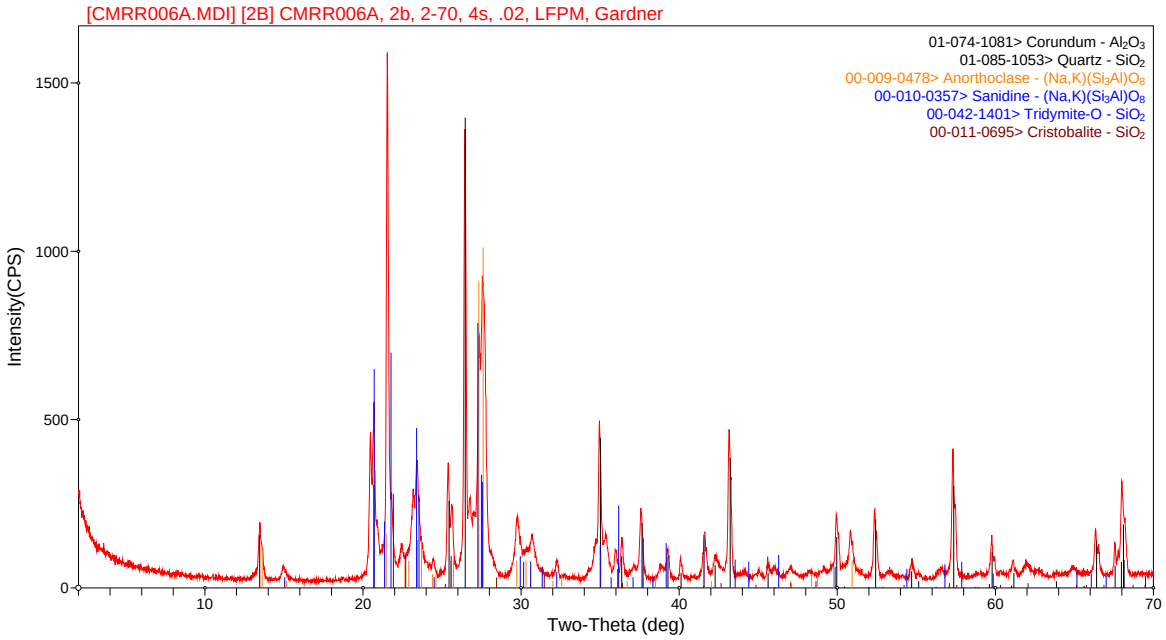
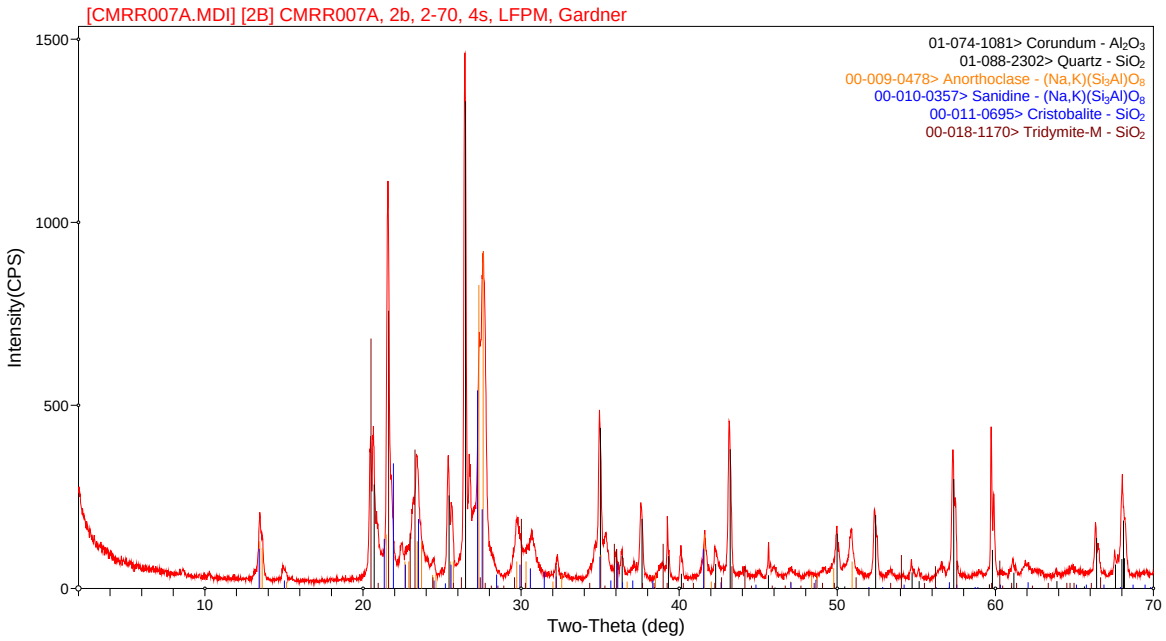
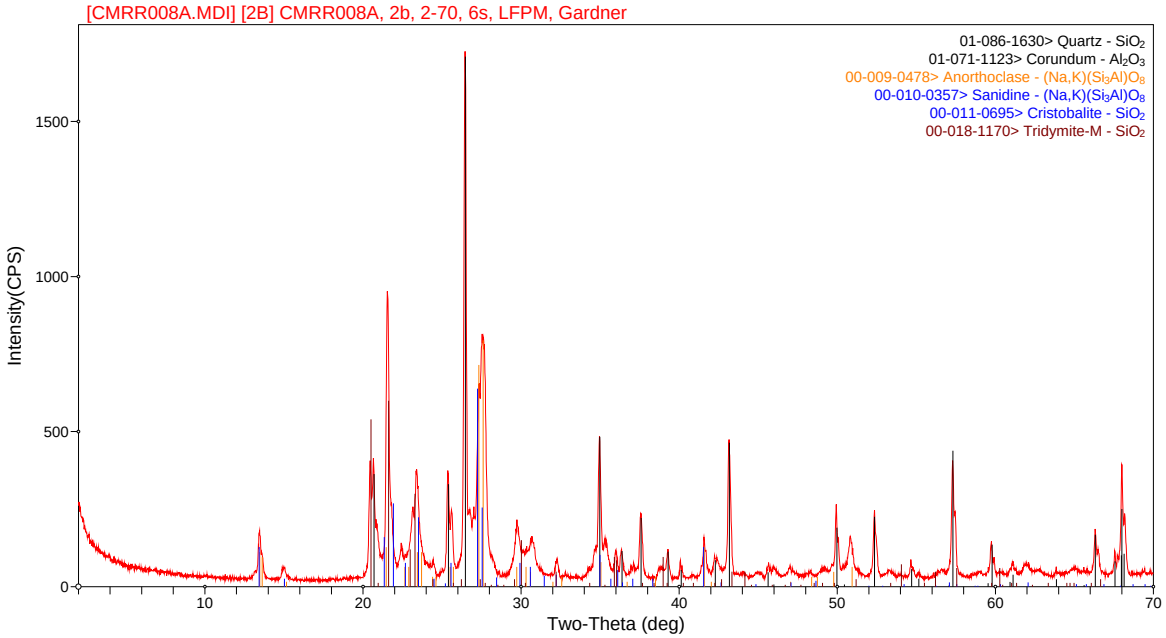
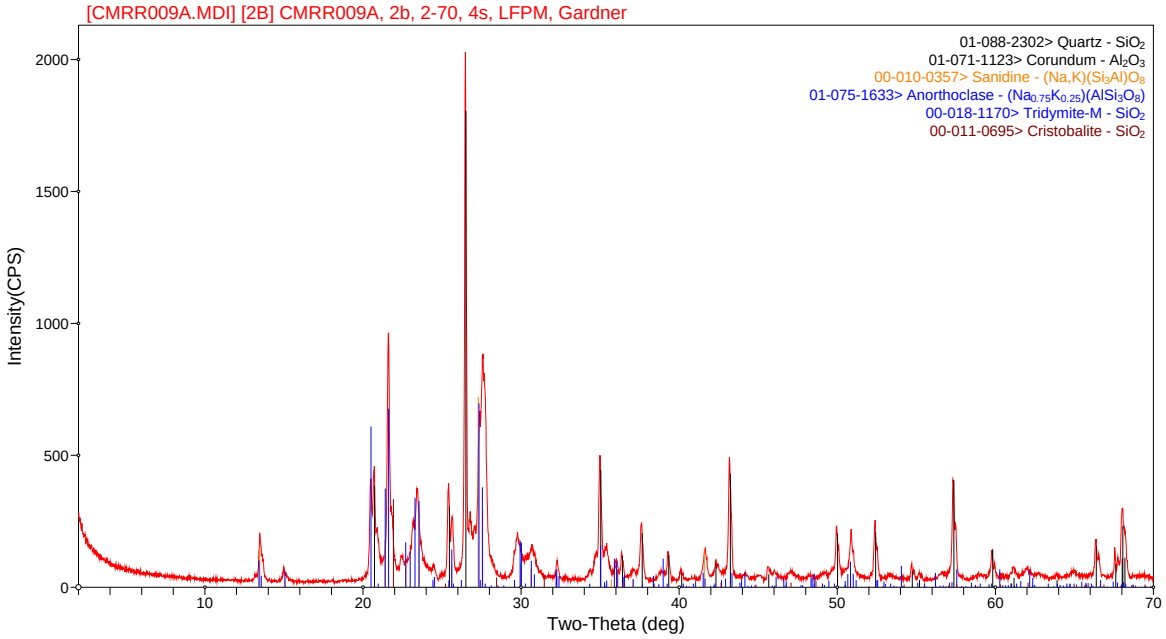
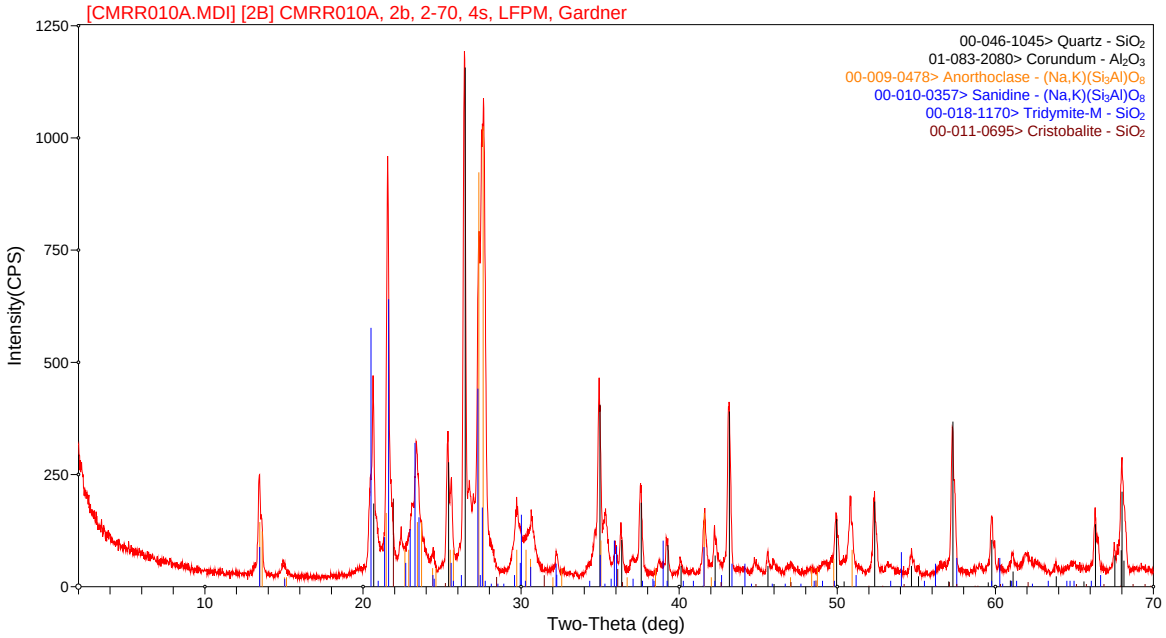
01-071-1123> Corundum - Al_2O_3
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

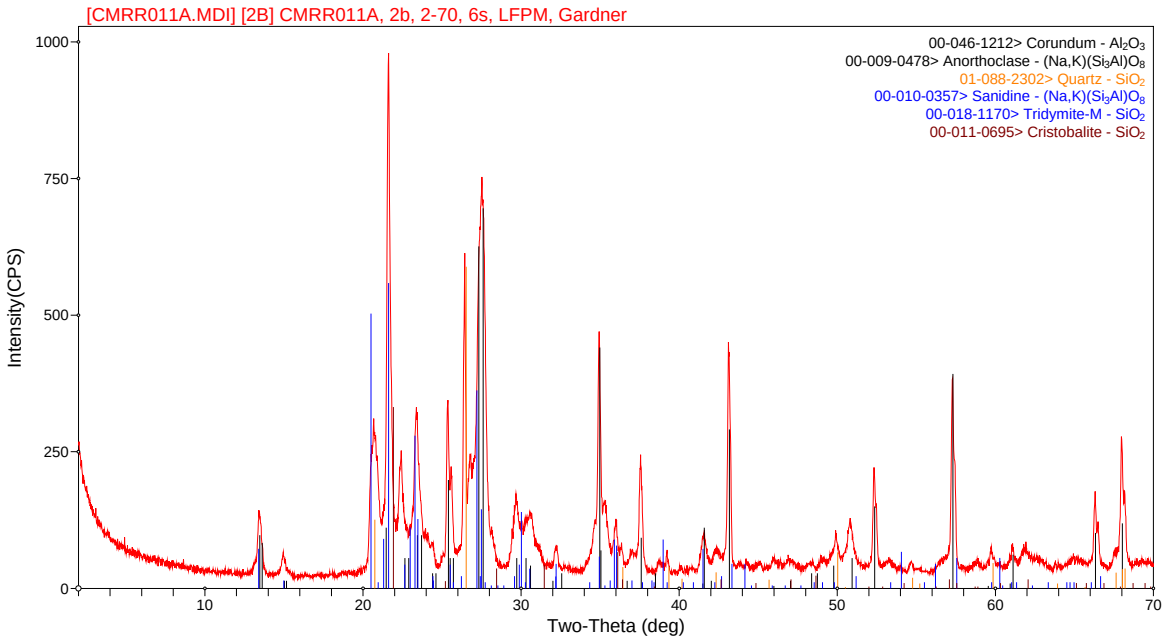

[CMRR006A.MDI] [2B] CMRR006A, 2b, 2-70, 4s, .02, LFPM, Gardner
01-074-1081> Corundum - Al_2O_3
01-085-1053> Quartz - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

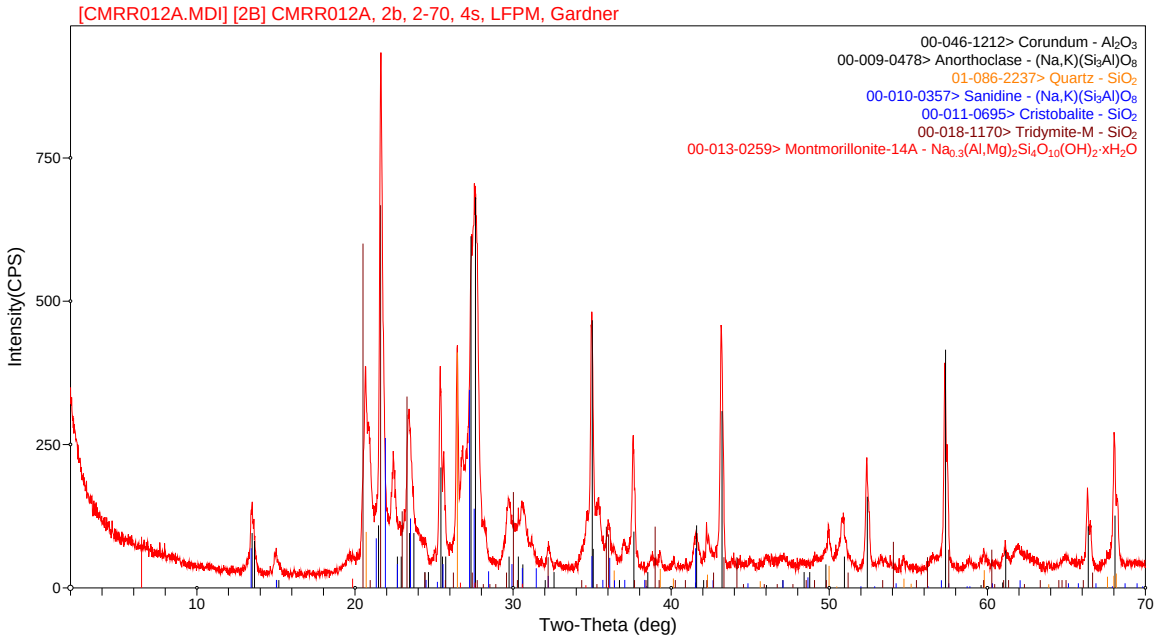

[CMRR007A.MDI] [2B] CMRR007A, 2b, 2-70, 4s, LFPM, Gardner
01-074-1081> Corundum - Al_2O_3
01-088-2302> Quartz - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
00-018-1170> Tridymite-M - SiO_2
Intensity(CPS)
Two-Theta (deg)

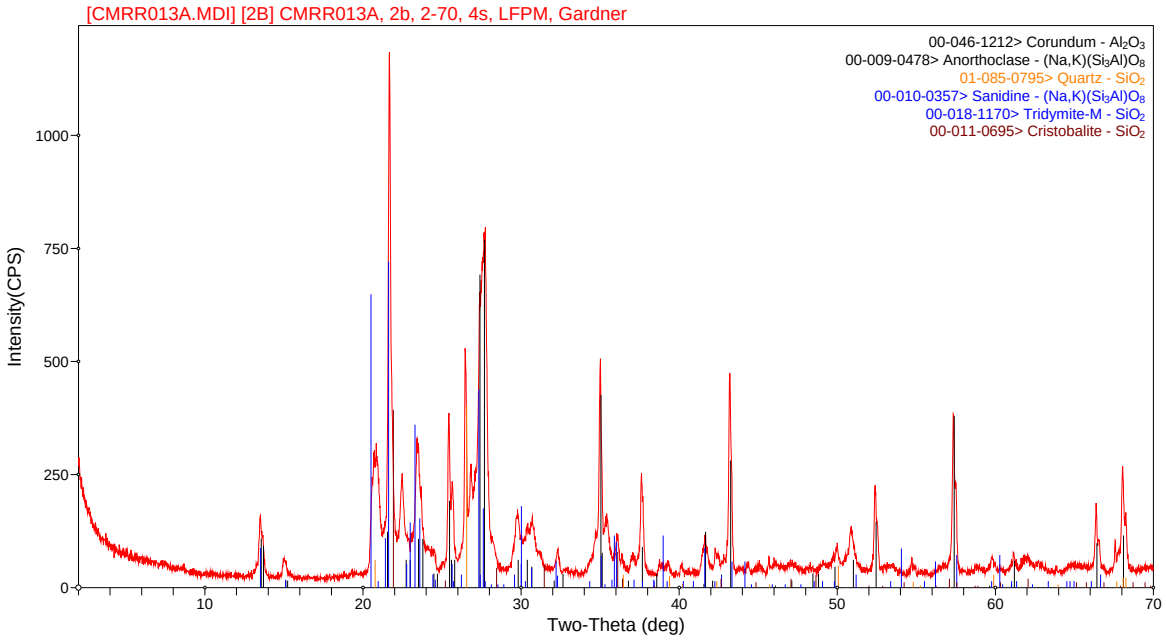

[CMRR008A.MDI] [2B] CMRR008A, 2b, 2-70, 6s, LFPM, Gardner
01-086-1630> Quartz - SiO_2
01-071-1123> Corundum - Al_2O_3
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
00-018-1170> Tridymite-M - SiO_2
Intensity(CPS)
Two-Theta (deg)

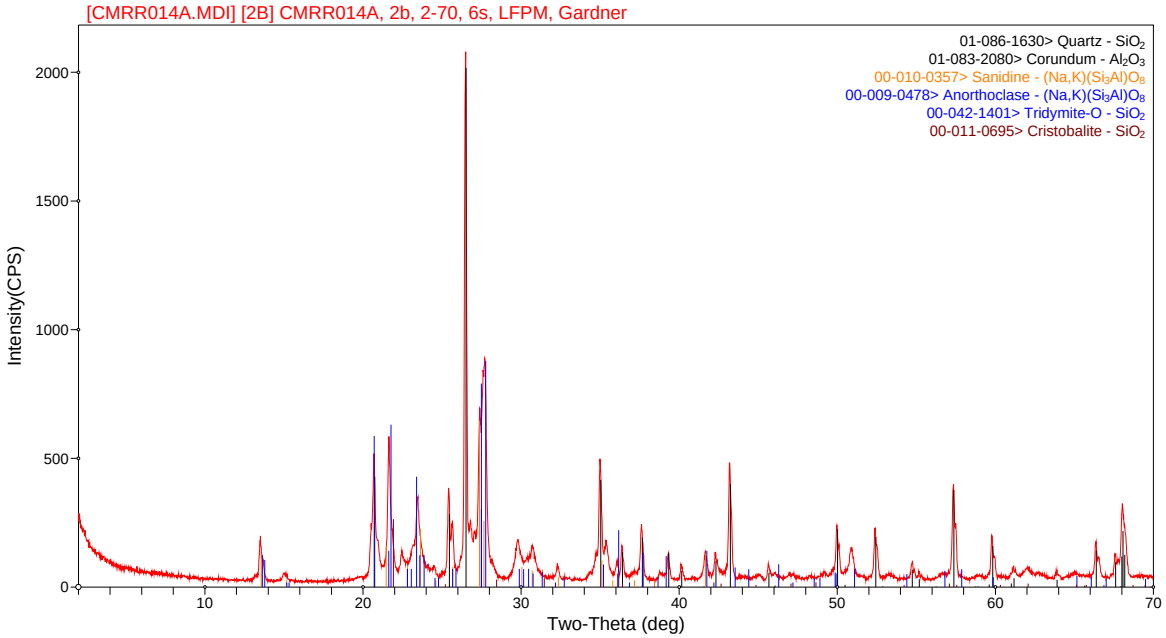

[CMRR009A.MDI] [2B] CMRR009A, 2b, 2-70, 4s, LFPM, Gardner
01-088-2302> Quartz - SiO_2
01-071-1123> Corundum - Al_2O_3
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
01-075-1633> Anorthoclase - $(Na_{0.75}K_{0.25})(AlSi_3O_8)$
00-018-1170> Tridymite-M - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

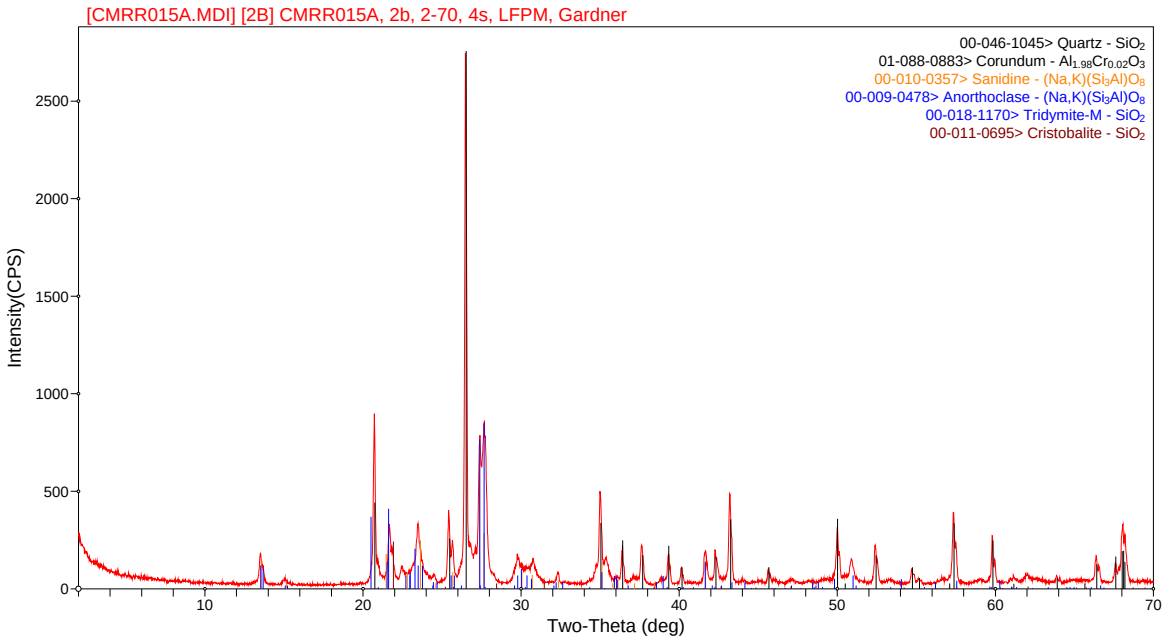

[CMRR010A.MDI] [2B] CMRR010A, 2b, 2-70, 4s, LFPM, Gardner
00-046-1045> Quartz - SiO2
01-083-2080> Corundum - Al2O3
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
00-018-1170> Tridymite-M - SiO2
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
Two-Theta (deg)

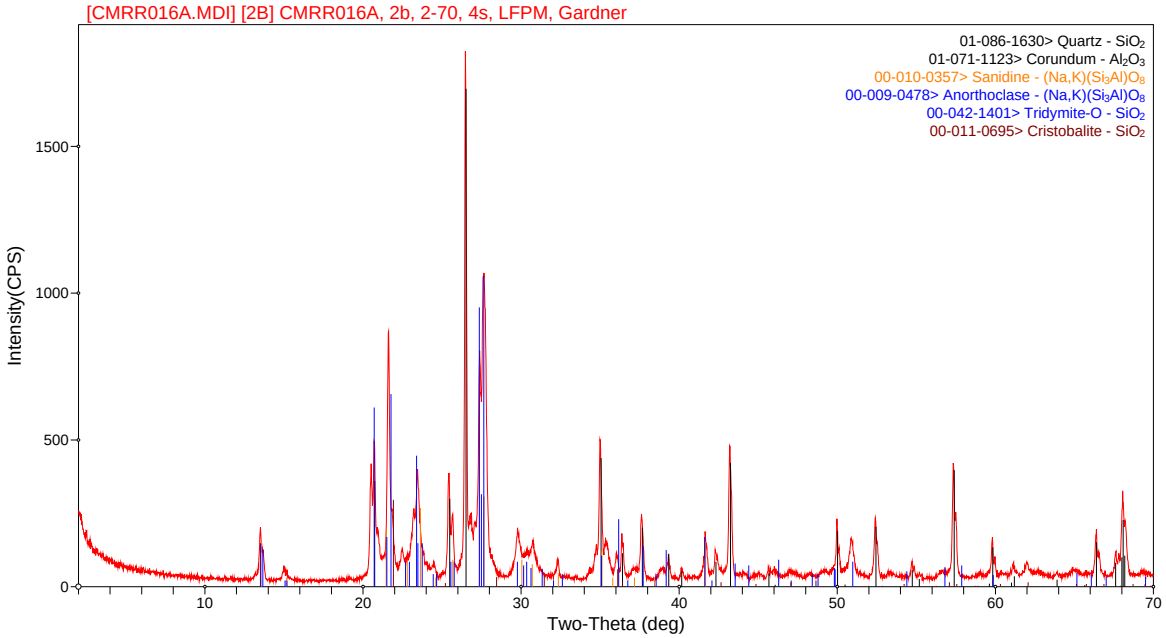

[CMRR011A.MDI] [2B] CMRR011A, 2b, 2-70, 6s, LFPM, Gardner
00-046-1212> Corundum - Al2O3
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
01-088-2302> Quartz - SiO2
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
00-018-1170> Tridymite-M - SiO2
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
Two-Theta (deg)

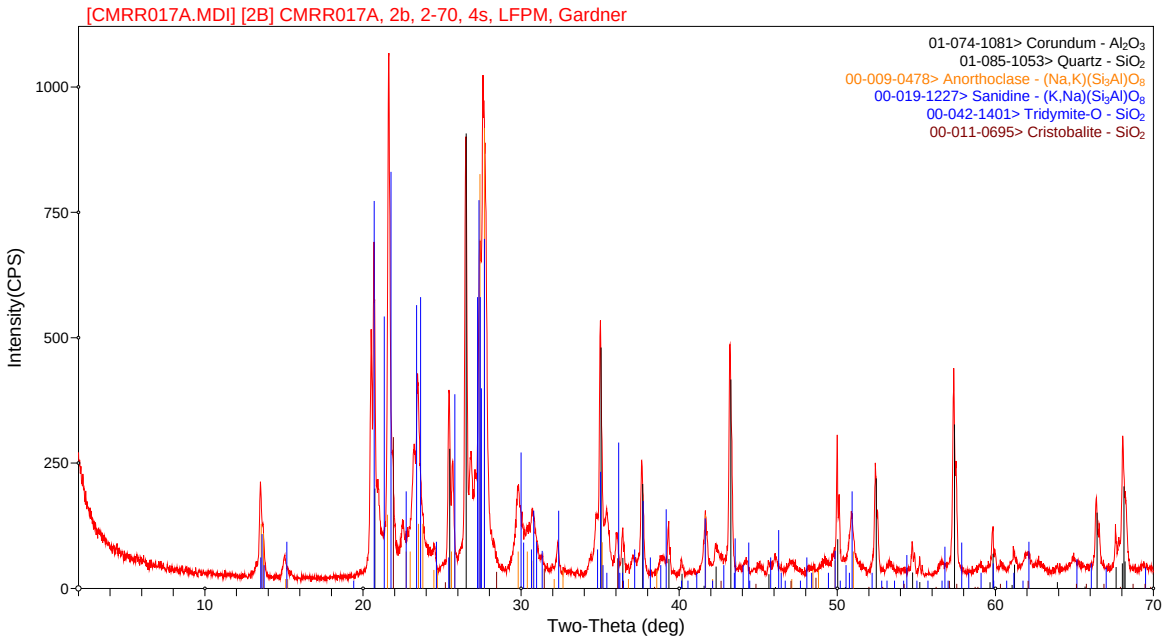

[CMRR012A.MDI] [2B] CMRR012A, 2b, 2-70, 4s, LFPM, Gardner
00-046-1212> Corundum - Al_2O_3
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
01-086-2237> Quartz - SiO_2
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
00-018-1170> Tridymite-M - SiO_2
00-013-0259> Montmorillonite-14A - $Na_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2 \cdot xH_2O$
Intensity(CPS)
0
250
500
750
10
20
30
40
50
60
70
Two-Theta (deg)

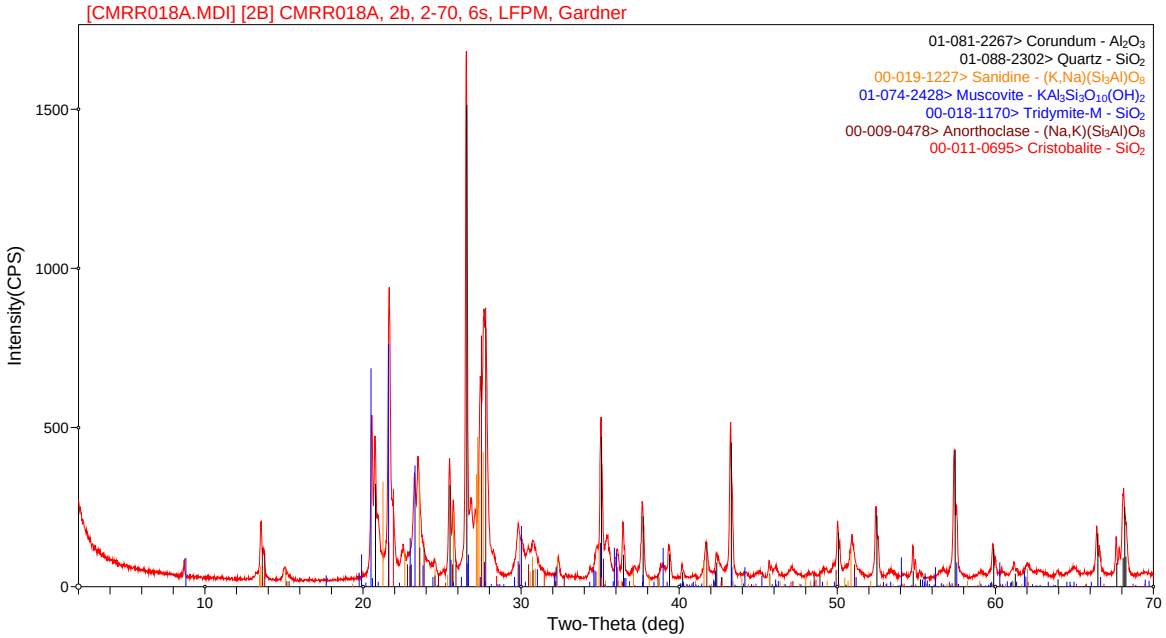

[CMRR013A.MDI] [2B] CMRR013A, 2b, 2-70, 4s, LFPM, Gardner
00-046-1212> Corundum - Al_2O_3
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
01-085-0795> Quartz - SiO_2
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-018-1170> Tridymite-M - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
0
250
500
750
1000
10
20
30
40
50
60
70
Two-Theta (deg)

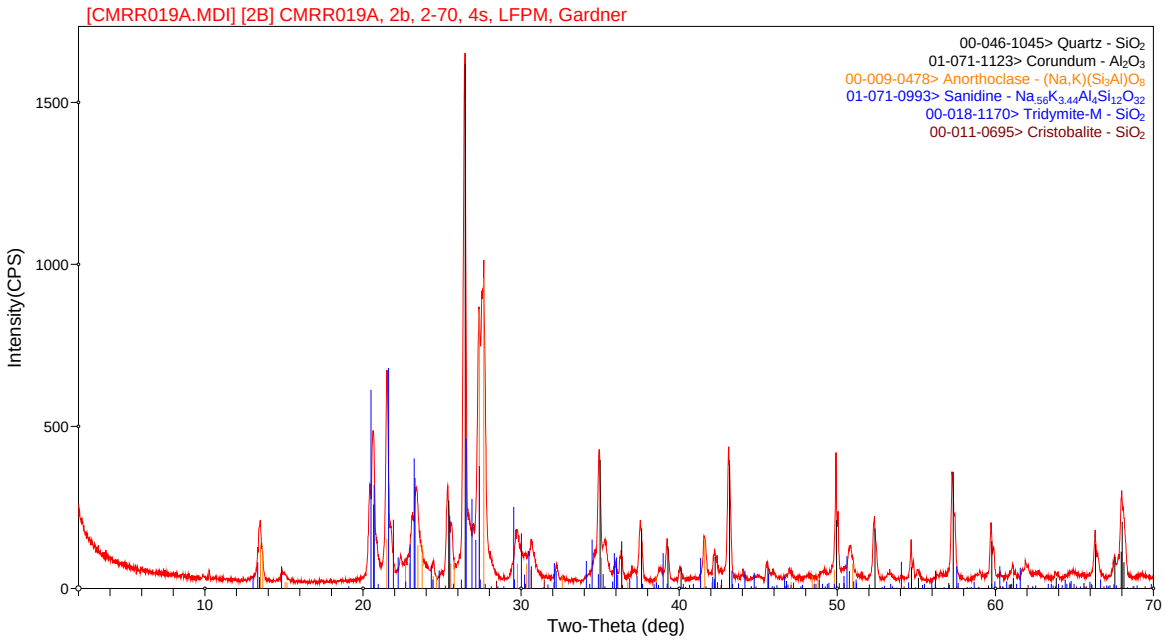

[CMRR014A.MDI] [2B] CMRR014A, 2b, 2-70, 6s, LFPM, Gardner
01-086-1630> Quartz - SiO_2
01-083-2080> Corundum - Al_2O_3
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

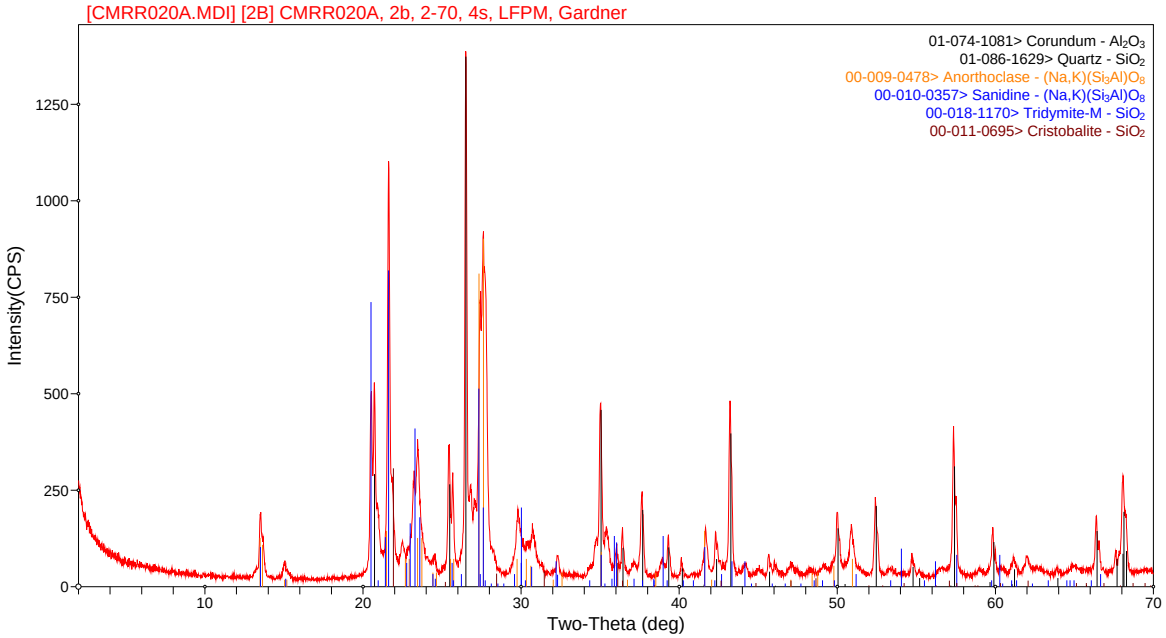

[CMRR015A.MDI] [2B] CMRR015A, 2b, 2-70, 4s, LFPM, Gardner
00-046-1045> Quartz - SiO_2
01-088-0883> Corundum - $Al_{1.98}Cr_{0.02}O_3$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-018-1170> Tridymite-M - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

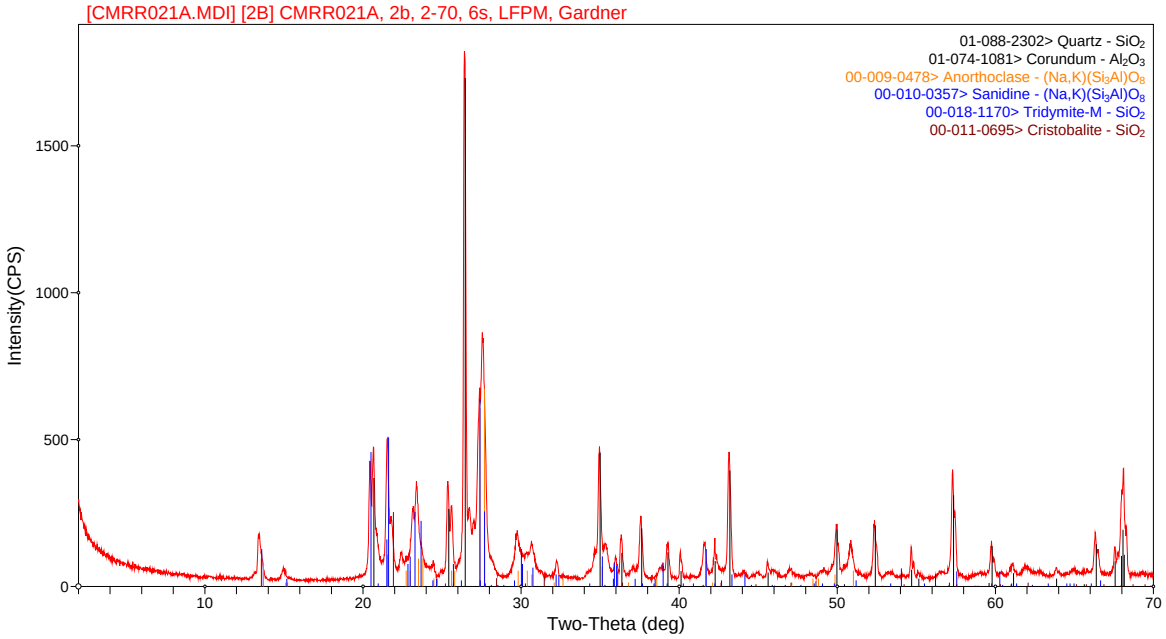

[CMRR016A.MDI] [2B] CMRR016A, 2b, 2-70, 4s, LFPM, Gardner
01-086-1630> Quartz - SiO2
01-071-1123> Corundum - Al2O3
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
00-042-1401> Tridymite-O - SiO2
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
Two-Theta (deg)

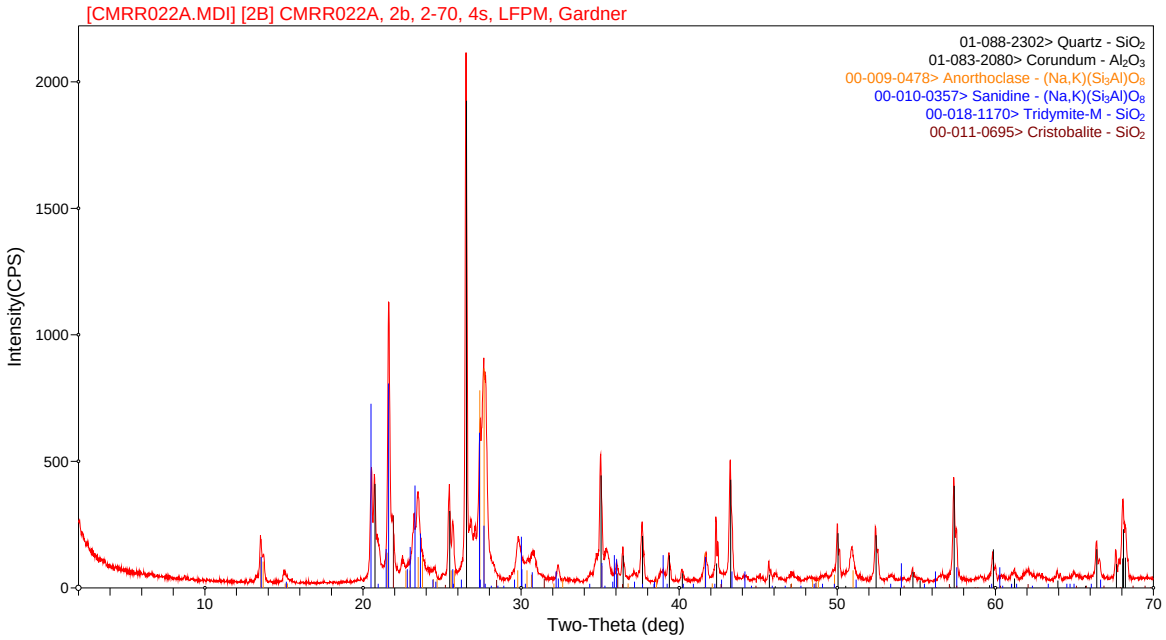

[CMRR017A.MDI] [2B] CMRR017A, 2b, 2-70, 4s, LFPM, Gardner
01-074-1081> Corundum - Al2O3
01-085-1053> Quartz - SiO2
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
00-019-1227> Sanidine - (K,Na)(Si3Al)O8
00-042-1401> Tridymite-O - SiO2
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
Two-Theta (deg)

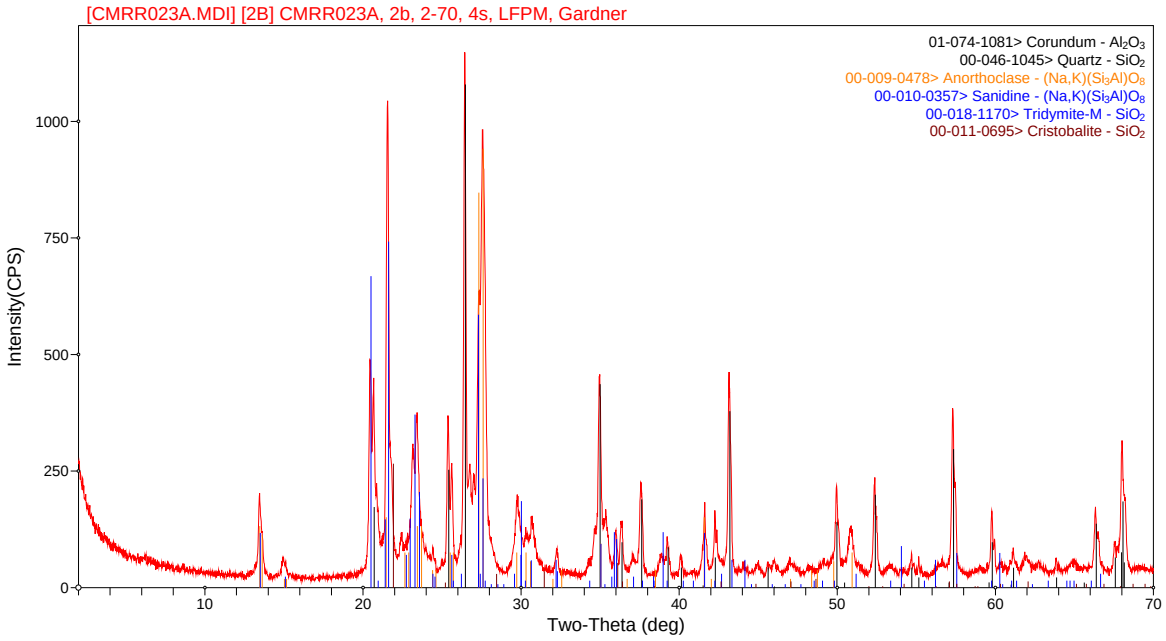

[CMRR018A.MDI] [2B] CMRR018A, 2b, 2-70, 6s, LFPM, Gardner
01-081-2267> Corundum - Al_2O_3
01-088-2302> Quartz - SiO_2
00-019-1227> Sanidine - $(K,Na)(Si_3Al)O_8$
01-074-2428> Muscovite - $KAl_3Si_3O_{10}(OH)_2$
00-018-1170> Tridymite-M - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
0
500
1000
1500
10
20
30
40
50
60
70
Two-Theta (deg)

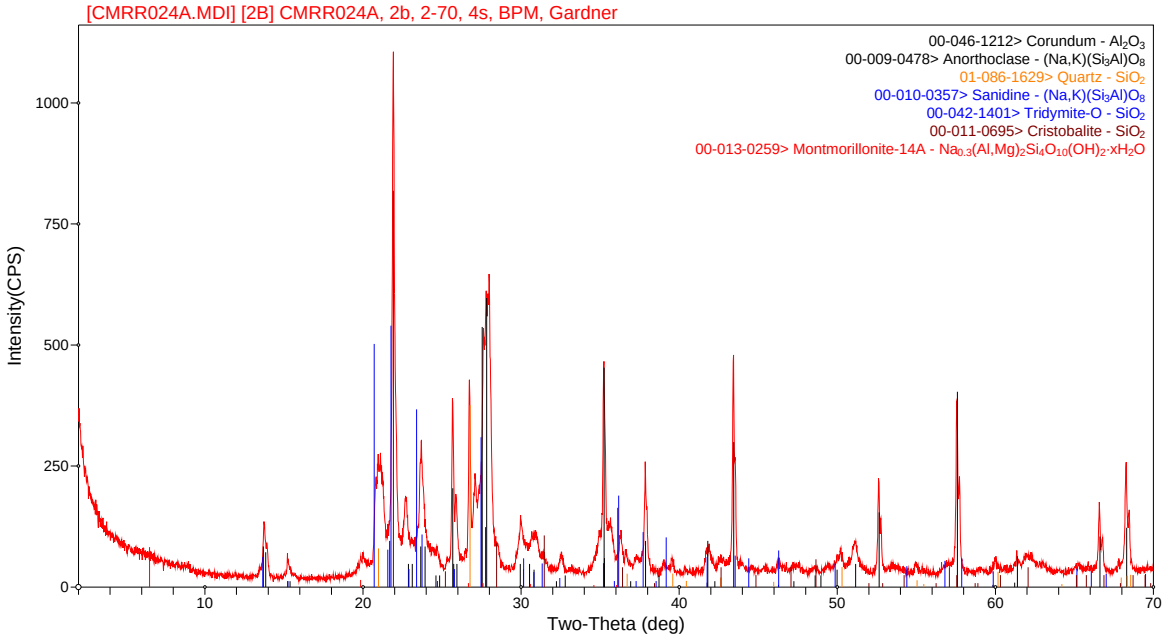

[CMRR019A.MDI] [2B] CMRR019A, 2b, 2-70, 4s, LFPM, Gardner
00-046-1045> Quartz - SiO_2
01-071-1123> Corundum - Al_2O_3
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
01-071-0993> Sanidine - $Na_{.56}K_{3.44}Al_4Si_{12}O_{32}$
00-018-1170> Tridymite-M - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
0
500
1000
1500
10
20
30
40
50
60
70
Two-Theta (deg)

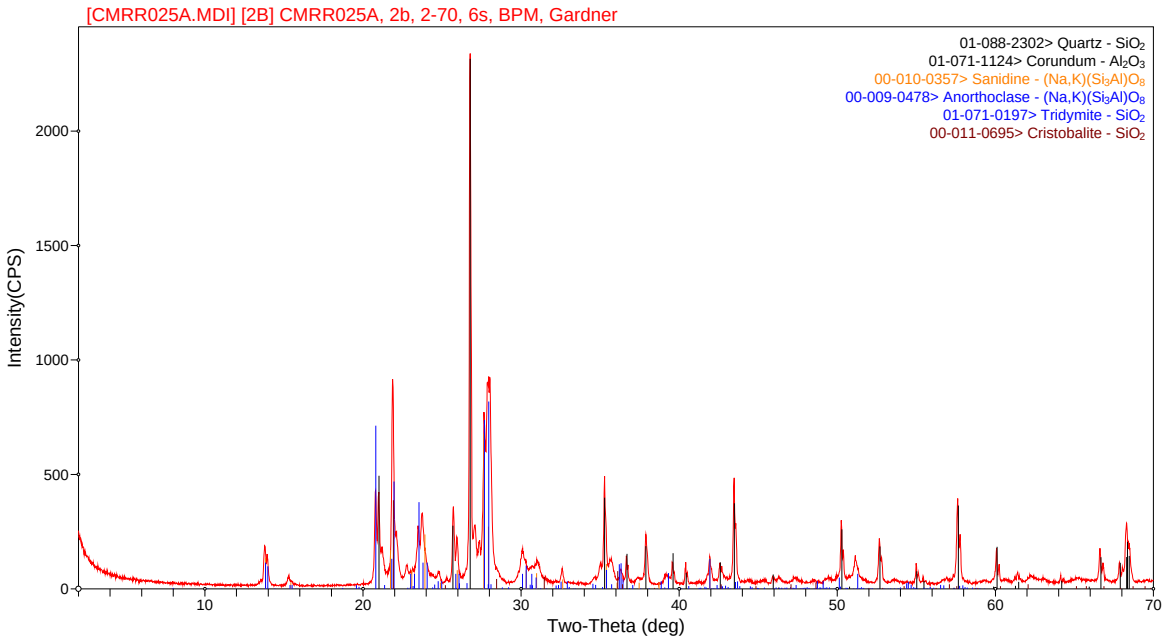

[CMRR020A.MDI] [2B] CMRR020A, 2b, 2-70, 4s, LFPM, Gardner
01-074-1081> Corundum - Al_2O_3
01-086-1629> Quartz - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-018-1170> Tridymite-M - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

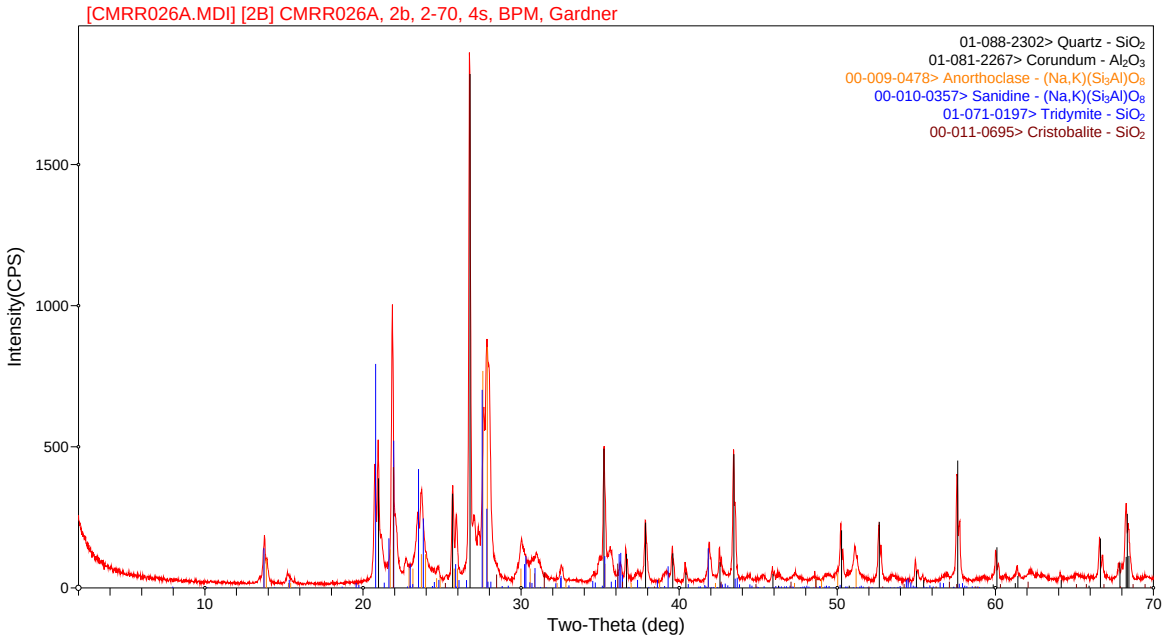

[CMRR021A.MDI] [2B] CMRR021A, 2b, 2-70, 6s, LFPM, Gardner
01-088-2302> Quartz - SiO_2
01-074-1081> Corundum - Al_2O_3
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-018-1170> Tridymite-M - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

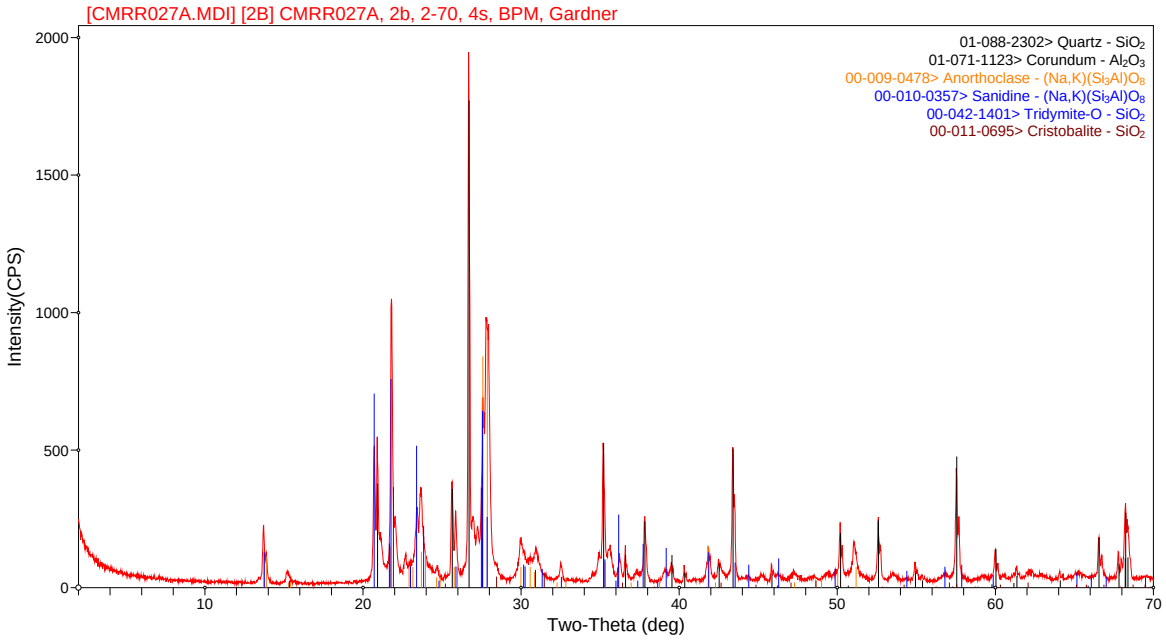

[CMRR022A.MDI] [2B] CMRR022A, 2b, 2-70, 4s, LFPM, Gardner
01-088-2302> Quartz - SiO_2
01-083-2080> Corundum - Al_2O_3
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-018-1170> Tridymite-M - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

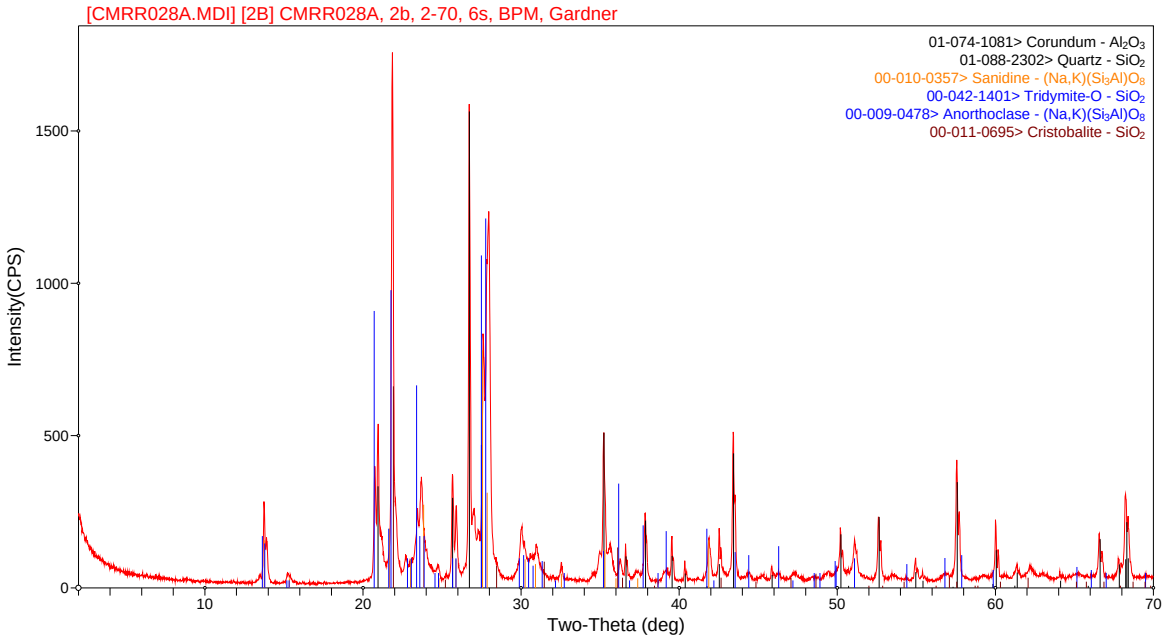

[CMRR023A.MDI] [2B] CMRR023A, 2b, 2-70, 4s, LFPM, Gardner
01-074-1081> Corundum - Al_2O_3
00-046-1045> Quartz - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-018-1170> Tridymite-M - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

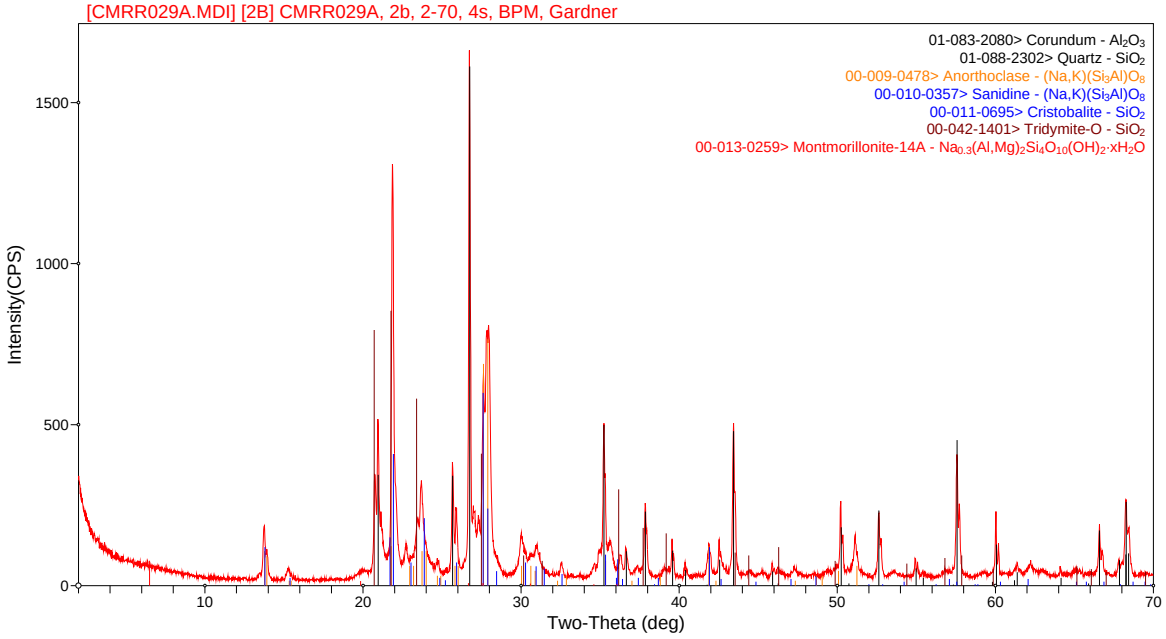

[CMRR024A.MDI] [2B] CMRR024A, 2b, 2-70, 4s, BPM, Gardner
00-046-1212> Corundum - Al_2O_3
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
01-086-1629> Quartz - SiO_2
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
00-013-0259> Montmorillonite-14A - $Na_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2 \cdot xH_2O$
Intensity(CPS)
0
250
500
750
1000
10
20
30
40
50
60
70
Two-Theta (deg)

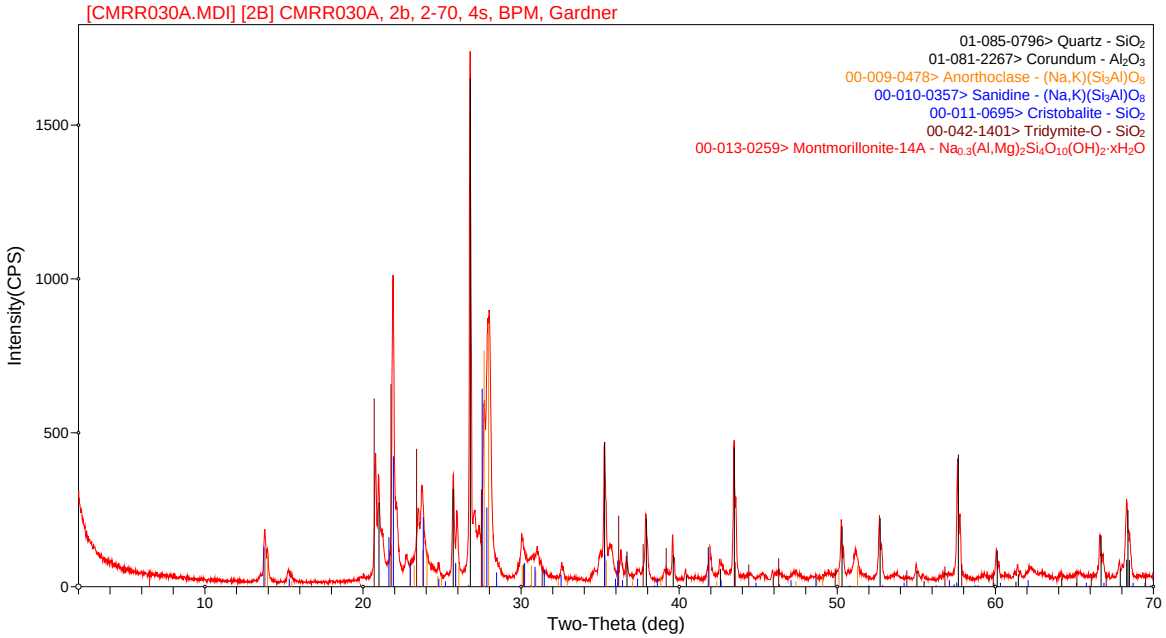

[CMRR025A.MDI] [2B] CMRR025A, 2b, 2-70, 6s, BPM, Gardner
01-088-2302> Quartz - SiO_2
01-071-1124> Corundum - Al_2O_3
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
01-071-0197> Tridymite - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
0
500
1000
1500
2000
10
20
30
40
50
60
70
Two-Theta (deg)

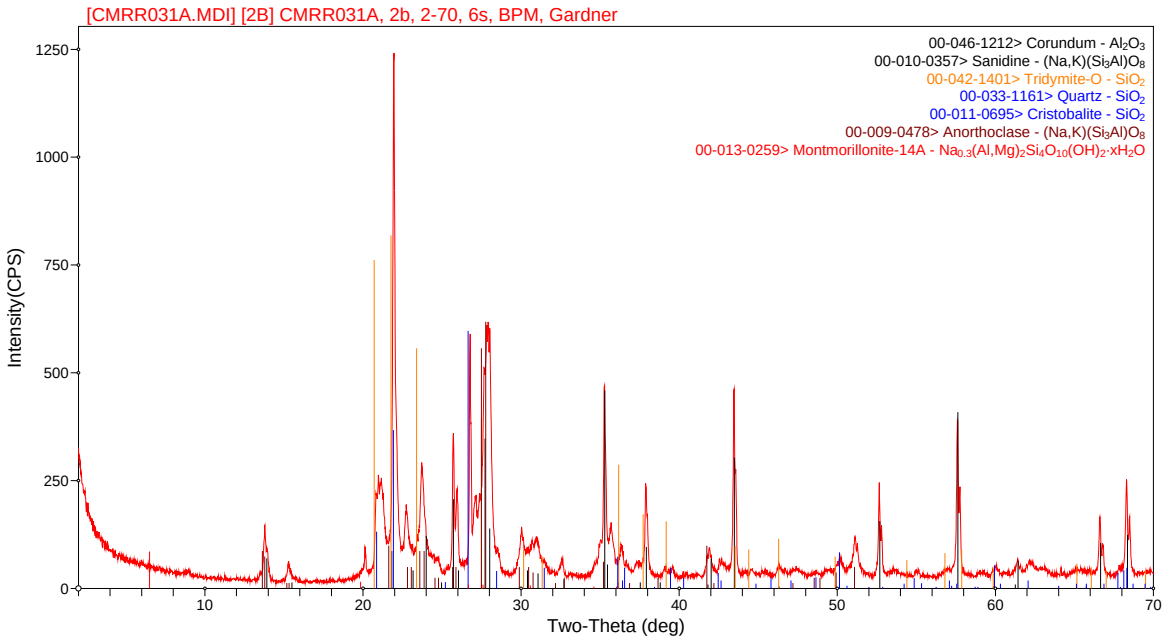

[CMRR026A.MDI] [2B] CMRR026A, 2b, 2-70, 4s, BPM, Gardner
01-088-2302> Quartz - SiO2
01-081-2267> Corundum - Al2O3
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
01-071-0197> Tridymite - SiO2
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
0
500
1000
1500
10
20
30
40
50
60
70
Two-Theta (deg)

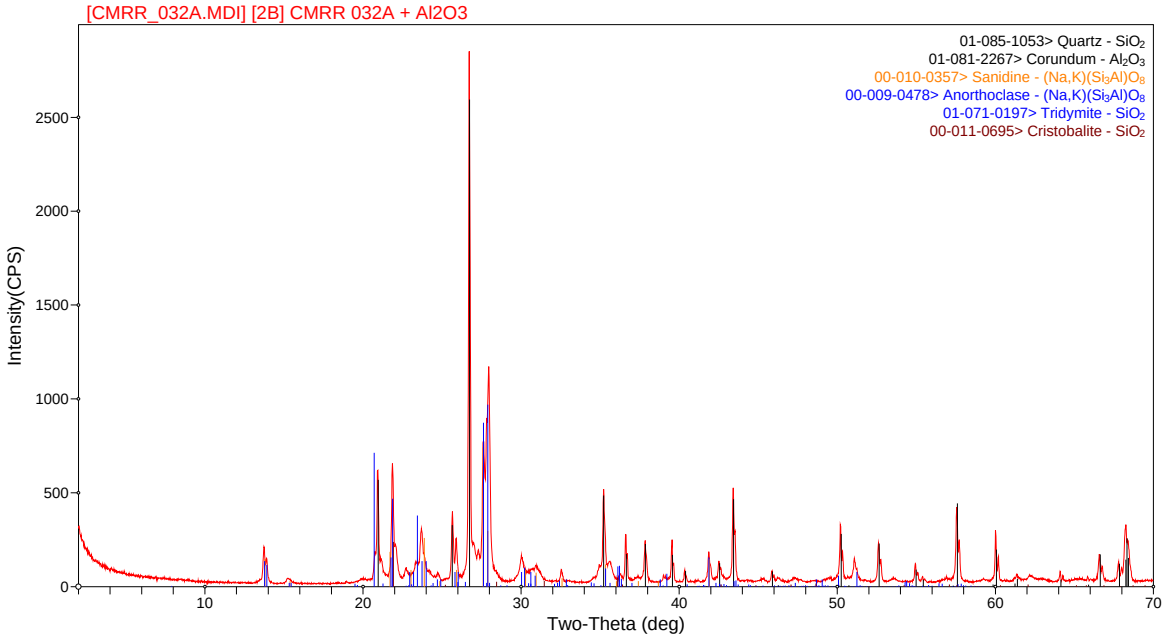

[CMRR027A.MDI] [2B] CMRR027A, 2b, 2-70, 4s, BPM, Gardner
01-088-2302> Quartz - SiO2
01-071-1123> Corundum - Al2O3
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
00-042-1401> Tridymite-O - SiO2
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
0
500
1000
1500
2000
10
20
30
40
50
60
70
Two-Theta (deg)

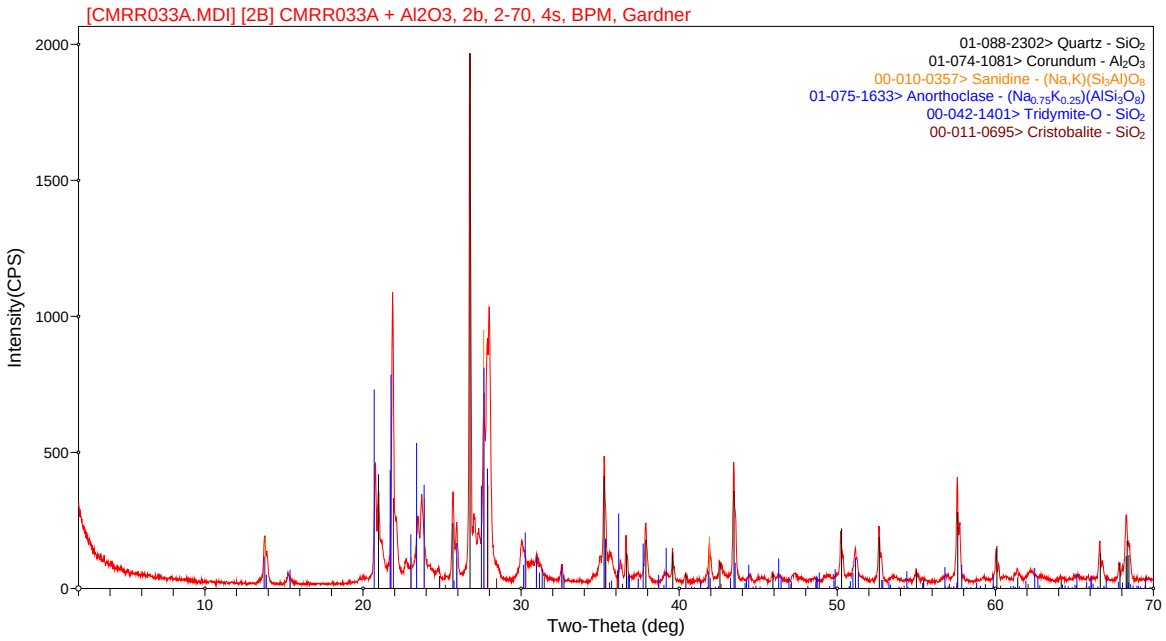

[CMRR028A.MDI] [2B] CMRR028A, 2b, 2-70, 6s, BPM, Gardner
01-074-1081> Corundum - Al_2O_3
01-088-2302> Quartz - SiO_2
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
0
500
1000
1500
10
20
30
40
50
60
70
Two-Theta (deg)

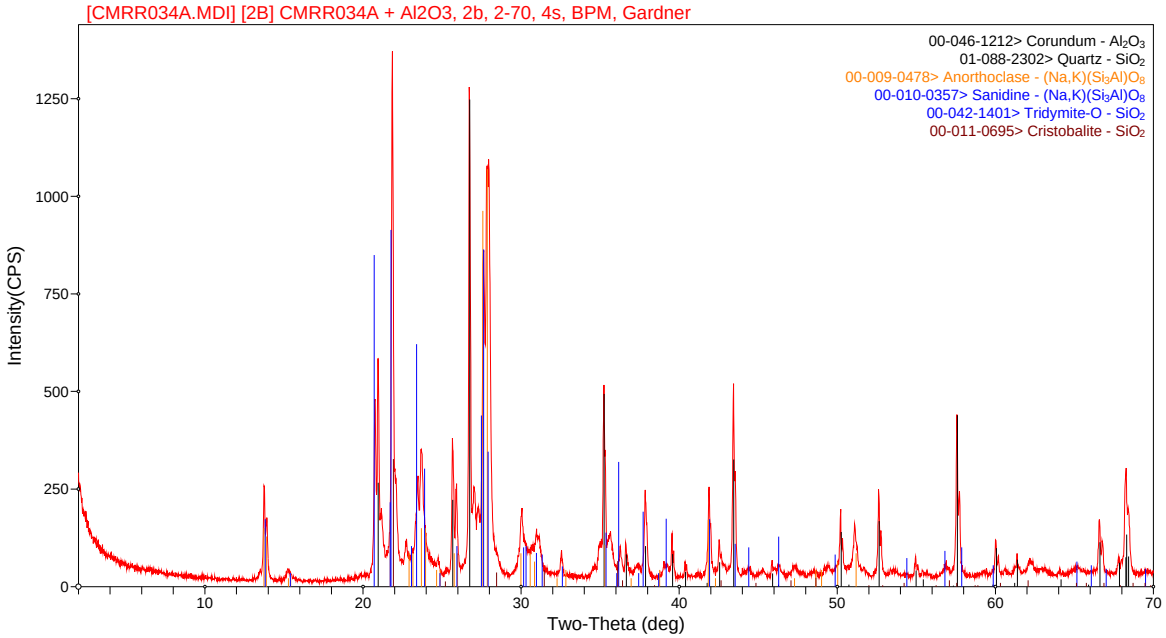

[CMRR029A.MDI] [2B] CMRR029A, 2b, 2-70, 4s, BPM, Gardner
01-083-2080> Corundum - Al_2O_3
01-088-2302> Quartz - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
00-042-1401> Tridymite-O - SiO_2
00-013-0259> Montmorillonite-14A - $Na_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2 \cdot xH_2O$
Intensity(CPS)
0
500
1000
1500
10
20
30
40
50
60
70
Two-Theta (deg)

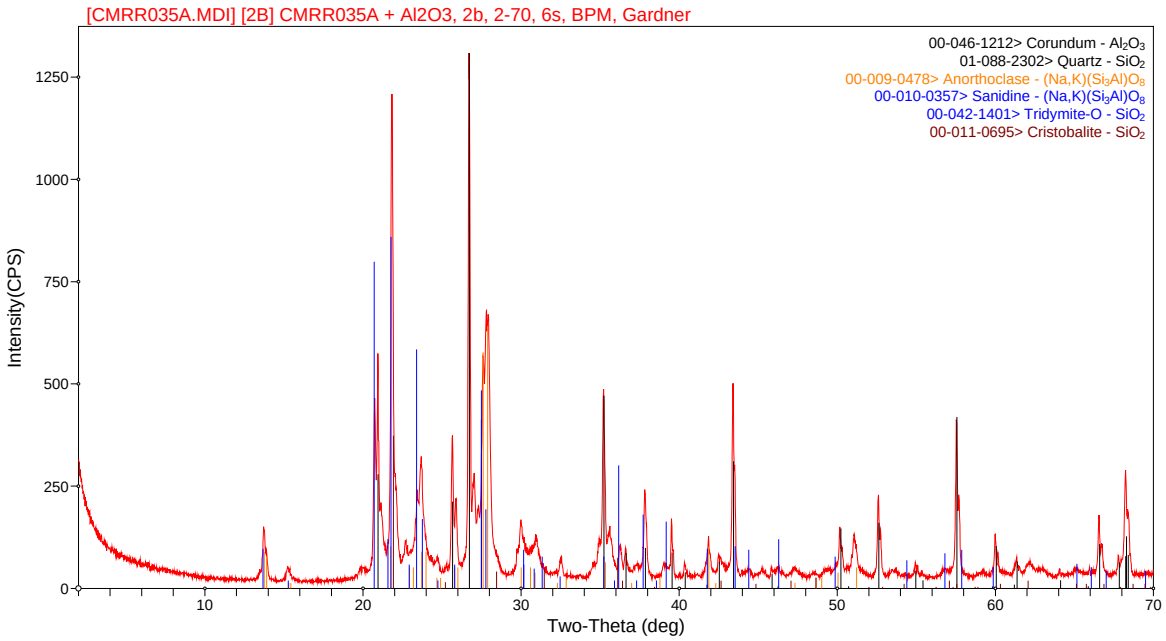

[CMRR030A.MDI] [2B] CMRR030A, 2b, 2-70, 4s, BPM, Gardner
01-085-0796> Quartz - SiO2
01-081-2267> Corundum - Al2O3
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
00-011-0695> Cristobalite - SiO2
00-042-1401> Tridymite-O - SiO2
00-013-0259> Montmorillonite-14A - Na0.3(Al,Mg)2Si4O10(OH)2·xH2O
Intensity(CPS)
Two-Theta (deg)

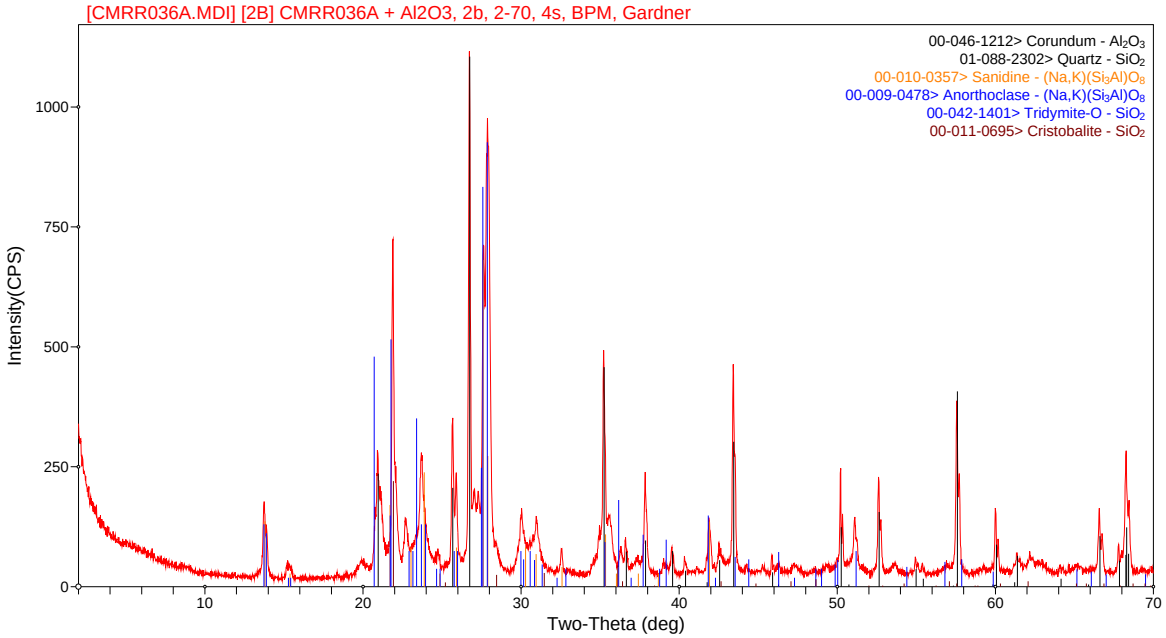

[CMRR031A.MDI] [2B] CMRR031A, 2b, 2-70, 6s, BPM, Gardner
00-046-1212> Corundum - Al2O3
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
00-042-1401> Tridymite-O - SiO2
00-033-1161> Quartz - SiO2
00-011-0695> Cristobalite - SiO2
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
00-013-0259> Montmorillonite-14A - Na0.3(Al,Mg)2Si4O10(OH)2·xH2O
Intensity(CPS)
Two-Theta (deg)

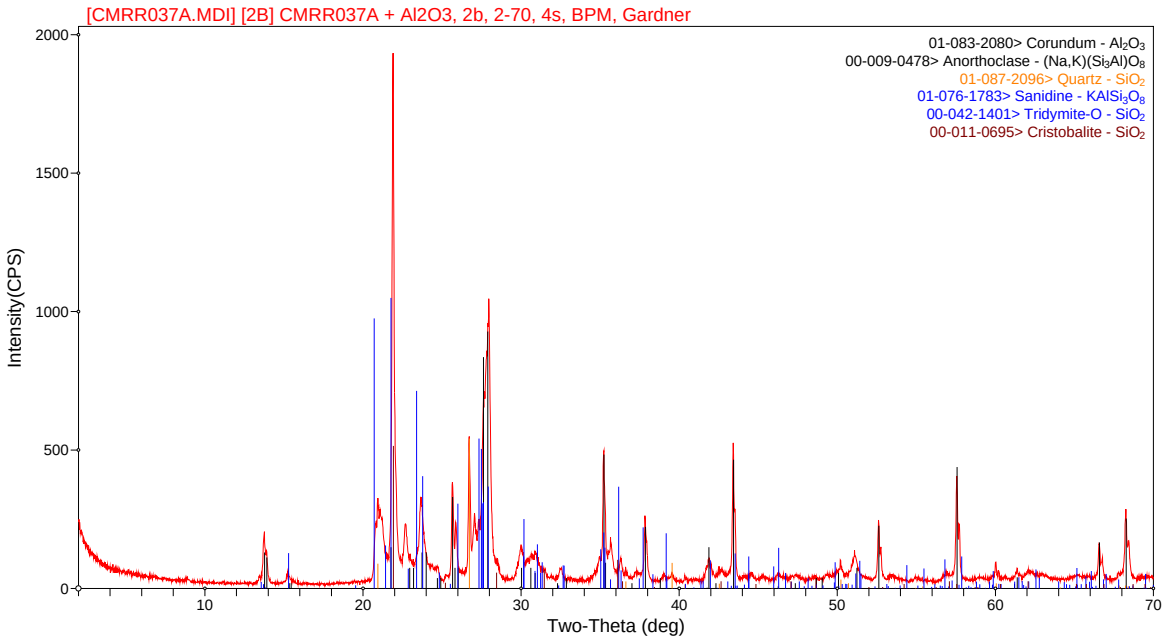

[CMRR_032A.MDI] [2B] CMRR 032A + Al2O3
01-085-1053> Quartz - SiO2
01-081-2267> Corundum - Al2O3
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
01-071-0197> Tridymite - SiO2
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
Two-Theta (deg)

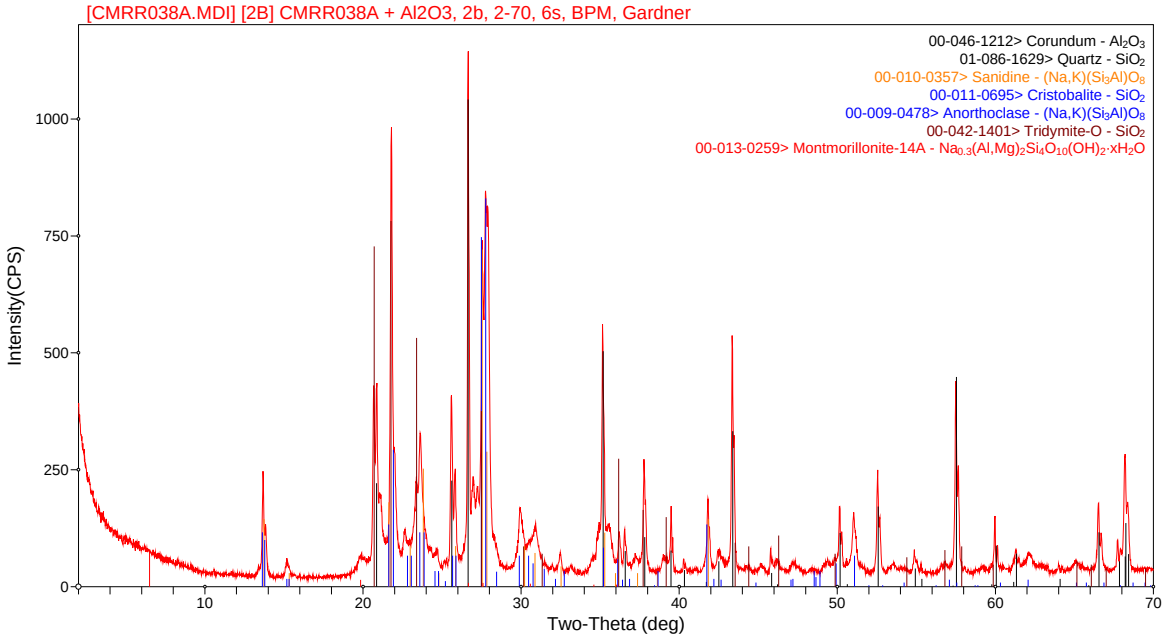

[CMRR033A.MDI] [2B] CMRR033A + Al2O3, 2b, 2-70, 4s, BPM, Gardner
01-088-2302> Quartz - SiO2
01-074-1081> Corundum - Al2O3
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
01-075-1633> Anorthoclase - (Na0.75K0.25)(AlSi3O8)
00-042-1401> Tridymite-O - SiO2
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
Two-Theta (deg)

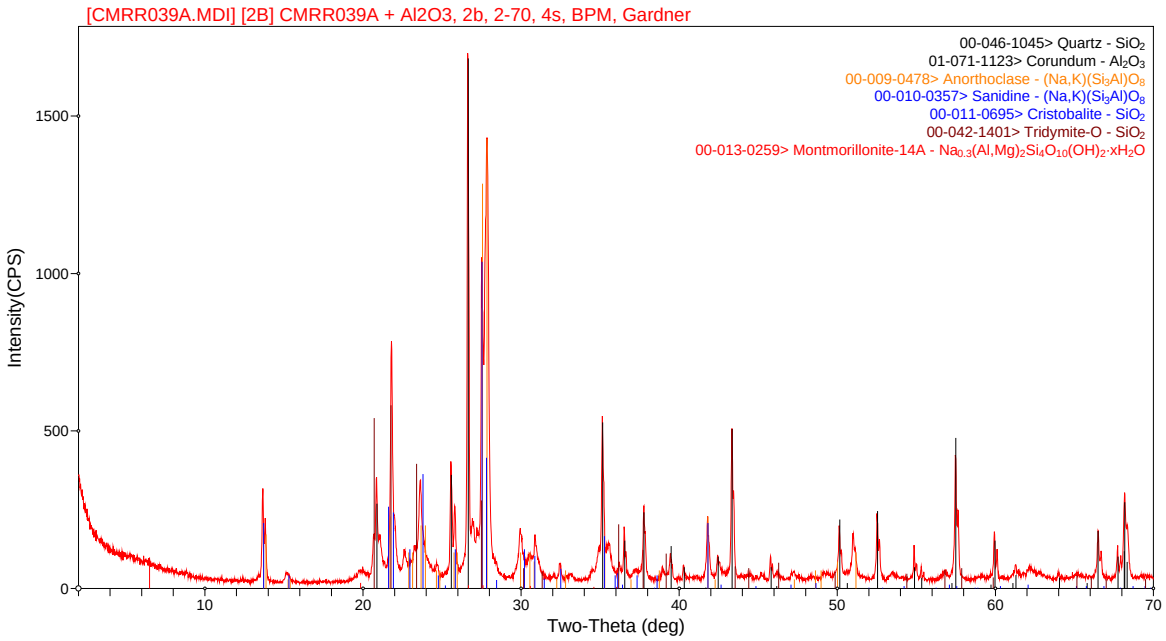

[CMRR034A.MDI] [2B] CMRR034A + Al2O3, 2b, 2-70, 4s, BPM, Gardner
00-046-1212> Corundum - Al_2O_3
01-088-2302> Quartz - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

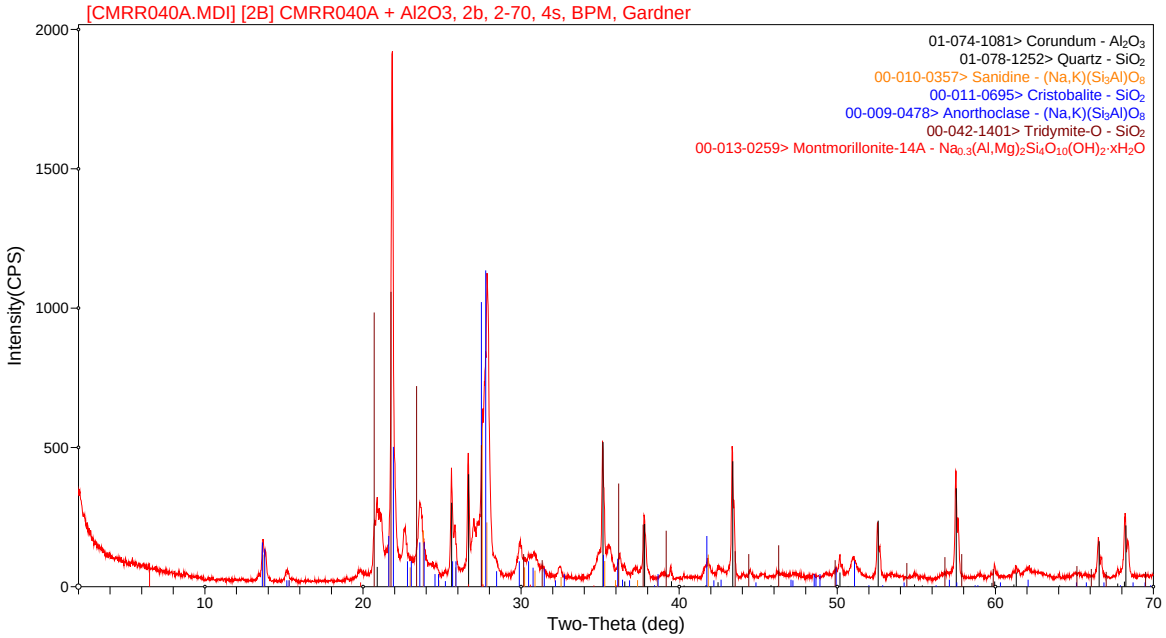

[CMRR035A.MDI] [2B] CMRR035A + Al2O3, 2b, 2-70, 6s, BPM, Gardner
00-046-1212> Corundum - Al_2O_3
01-088-2302> Quartz - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

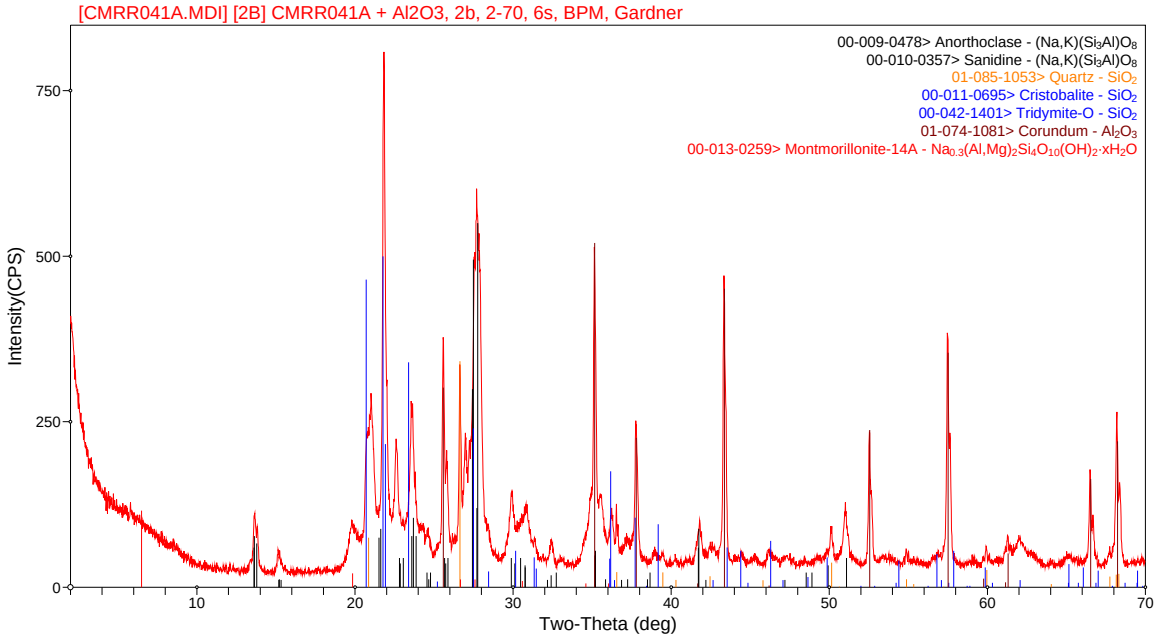

[CMRR036A.MDI] [2B] CMRR036A + Al2O3, 2b, 2-70, 4s, BPM, Gardner
00-046-1212> Corundum - Al_2O_3
01-088-2302> Quartz - SiO_2
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

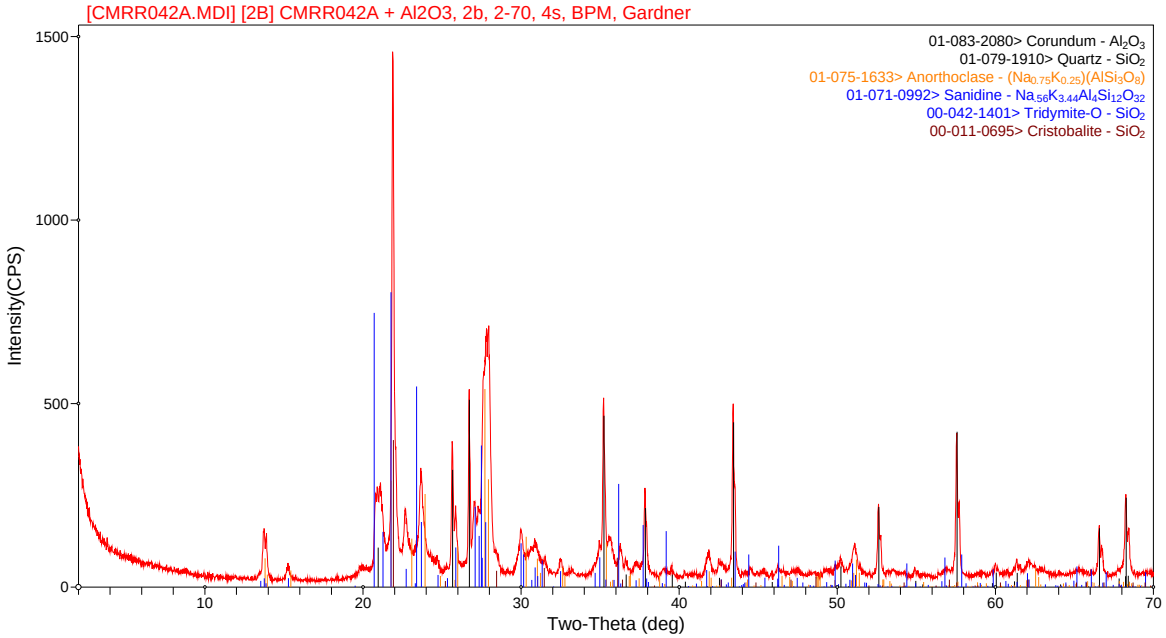

[CMRR037A.MDI] [2B] CMRR037A + Al2O3, 2b, 2-70, 4s, BPM, Gardner
01-083-2080> Corundum - Al_2O_3
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
01-087-2096> Quartz - SiO_2
01-076-1783> Sanidine - $KAlSi_3O_8$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

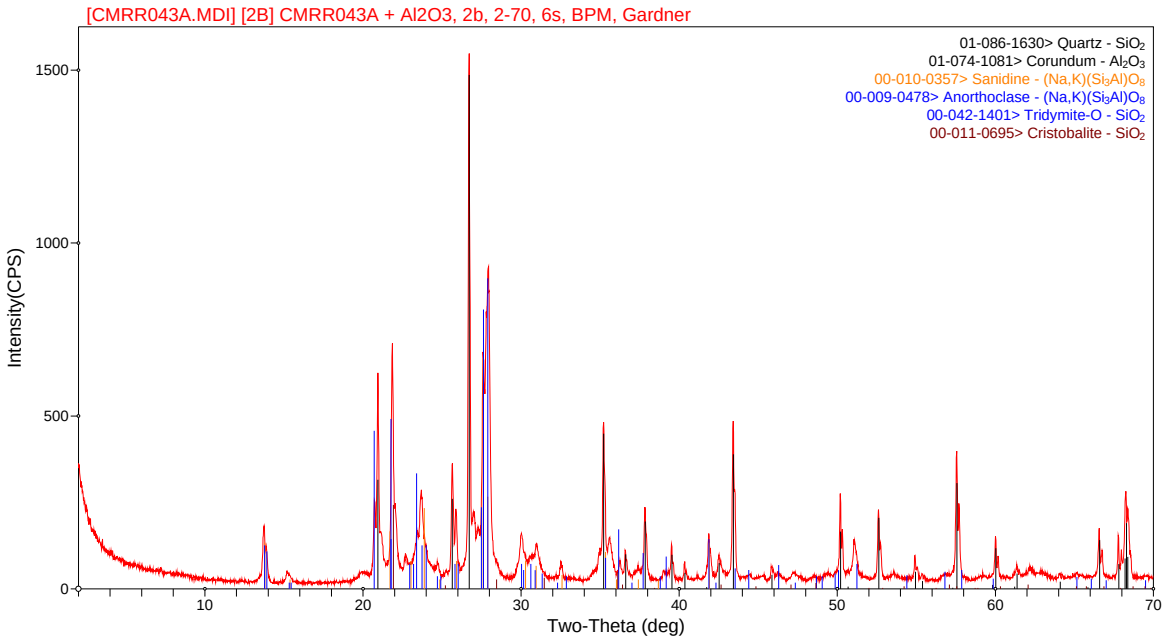

[CMRR038A.MDI] [2B] CMRR038A + Al2O3, 2b, 2-70, 6s, BPM, Gardner
00-046-1212> Corundum - Al_2O_3
01-086-1629> Quartz - SiO_2
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-013-0259> Montmorillonite-14A - $Na_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2 \cdot xH_2O$
Intensity(CPS)
0
250
500
750
1000
10
20
30
40
50
60
70
Two-Theta (deg)

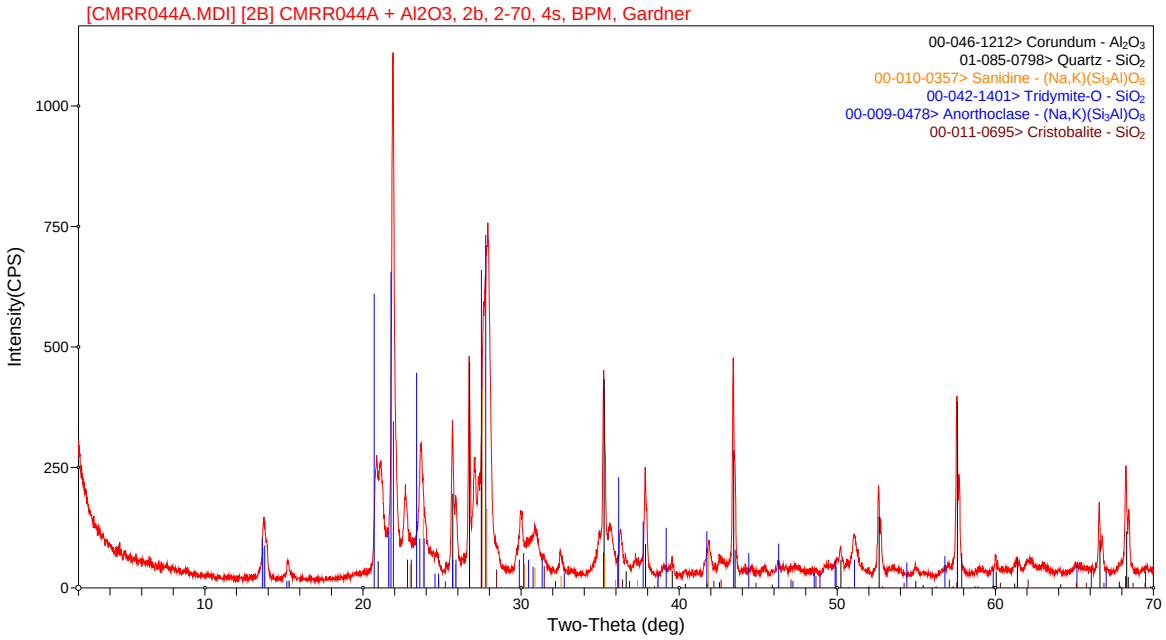

[CMRR039A.MDI] [2B] CMRR039A + Al2O3, 2b, 2-70, 4s, BPM, Gardner
00-046-1045> Quartz - SiO_2
01-071-1123> Corundum - Al_2O_3
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
00-042-1401> Tridymite-O - SiO_2
00-013-0259> Montmorillonite-14A - $Na_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2 \cdot xH_2O$
Intensity(CPS)
0
500
1000
1500
10
20
30
40
50
60
70
Two-Theta (deg)

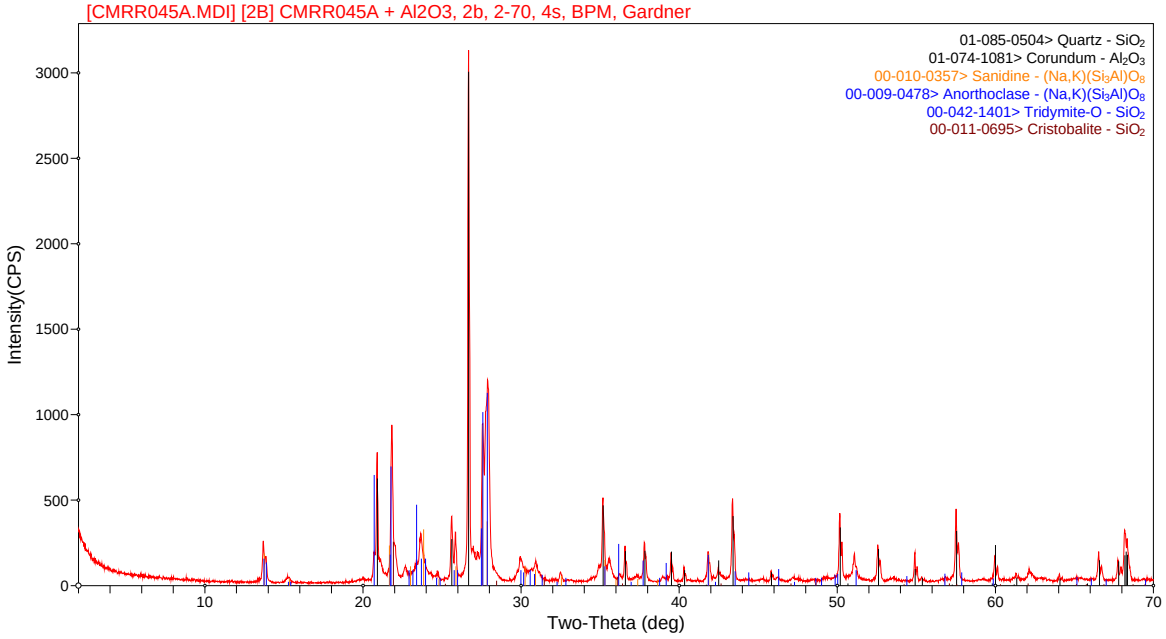

[CMRR040A.MDI] [2B] CMRR040A + Al2O3, 2b, 2-70, 4s, BPM, Gardner
01-074-1081> Corundum - Al_2O_3
01-078-1252> Quartz - SiO_2
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-011-0695> Cristobalite - SiO_2
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-013-0259> Montmorillonite-14A - $Na_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2 \cdot xH_2O$
Intensity(CPS)
Two-Theta (deg)

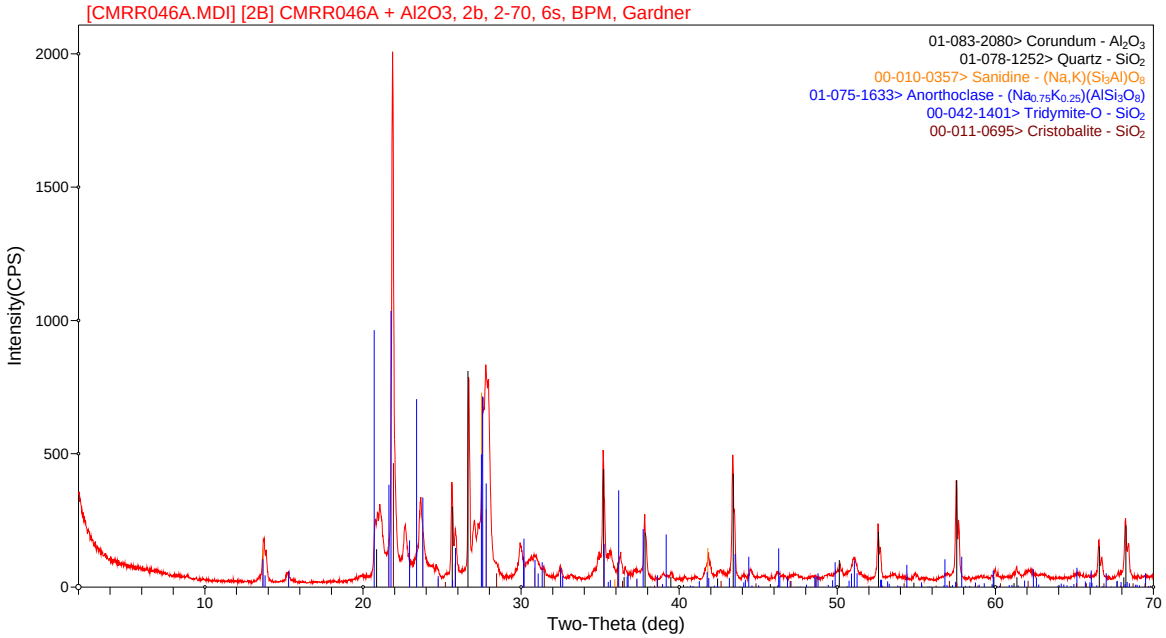

[CMRR041A.MDI] [2B] CMRR041A + Al2O3, 2b, 2-70, 6s, BPM, Gardner
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
01-085-1053> Quartz - SiO_2
00-011-0695> Cristobalite - SiO_2
00-042-1401> Tridymite-O - SiO_2
01-074-1081> Corundum - Al_2O_3
00-013-0259> Montmorillonite-14A - $Na_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2 \cdot xH_2O$
Intensity(CPS)
Two-Theta (deg)

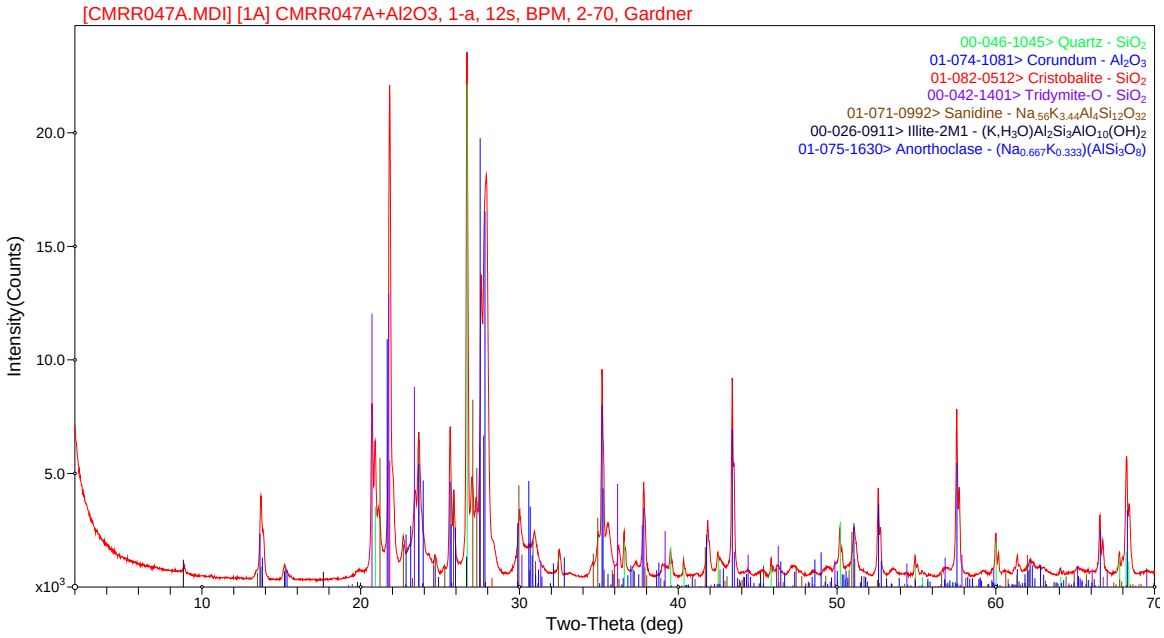

[CMRR042A.MDI] [2B] CMRR042A + Al2O3, 2b, 2-70, 4s, BPM, Gardner
01-083-2080> Corundum - Al_2O_3
01-079-1910> Quartz - SiO_2
01-075-1633> Anorthoclase - $(Na_{0.75}K_{0.25})(AlSi_3O_8)$
01-071-0992> Sanidine - $Na_{.56}K_{3.44}Al_4Si_{12}O_{32}$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

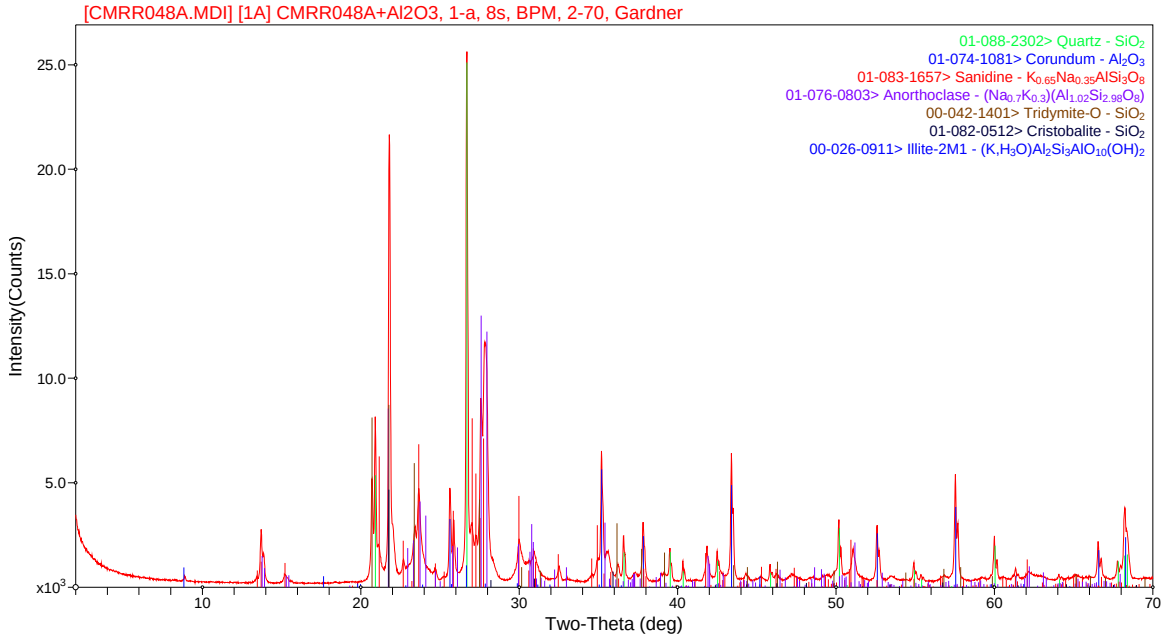

[CMRR043A.MDI] [2B] CMRR043A + Al2O3, 2b, 2-70, 6s, BPM, Gardner
01-086-1630> Quartz - SiO_2
01-074-1081> Corundum - Al_2O_3
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
00-009-0478> Anorthoclase - $(Na,K)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)

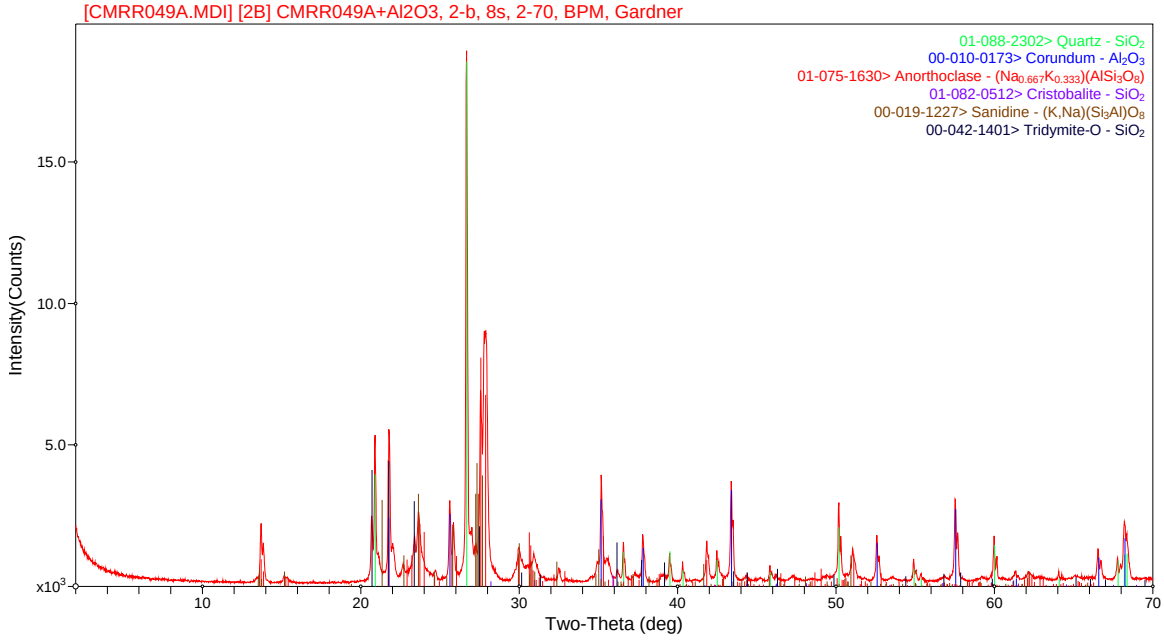

[CMRR044A.MDI] [2B] CMRR044A + Al2O3, 2b, 2-70, 4s, BPM, Gardner
00-046-1212> Corundum - Al2O3
01-085-0798> Quartz - SiO2
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
00-042-1401> Tridymite-O - SiO2
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
Two-Theta (deg)


[CMRR045A.MDI] [2B] CMRR045A + Al2O3, 2b, 2-70, 4s, BPM, Gardner
01-085-0504> Quartz - SiO2
01-074-1081> Corundum - Al2O3
00-010-0357> Sanidine - (Na,K)(Si3Al)O8
00-009-0478> Anorthoclase - (Na,K)(Si3Al)O8
00-042-1401> Tridymite-O - SiO2
00-011-0695> Cristobalite - SiO2
Intensity(CPS)
Two-Theta (deg)


[CMRR046A.MDI] [2B] CMRR046A + Al2O3, 2b, 2-70, 6s, BPM, Gardner
01-083-2080> Corundum - Al_2O_3
01-078-1252> Quartz - SiO_2
00-010-0357> Sanidine - $(Na,K)(Si_3Al)O_8$
01-075-1633> Anorthoclase - $(Na_{0.75}K_{0.25})(AlSi_3O_8)$
00-042-1401> Tridymite-O - SiO_2
00-011-0695> Cristobalite - SiO_2
Intensity(CPS)
Two-Theta (deg)


[CMRR047A.MDI] [1A] CMRR047A+Al2O3, 1-a, 12s, BPM, 2-70, Gardner
00-046-1045> Quartz - SiO_2
01-074-1081> Corundum - Al_2O_3
01-082-0512> Cristobalite - SiO_2
00-042-1401> Tridymite-O - SiO_2
01-071-0992> Sanidine - $Na_{.56}K_{3.44}Al_4Si_{12}O_{32}$
00-026-0911> Illite-2M1 - $(K,H_3O)Al_2Si_3AlO_{10}(OH)_2$
01-075-1630> Anorthoclase - $(Na_{0.667}K_{0.333})(AlSi_3O_8)$
Intensity(Counts)
x10^3
Two-Theta (deg)


[CMRR048A.MDI] [1A] CMRR048A+Al2O3, 1-a, 8s, BPM, 2-70, Gardner
01-088-2302> Quartz - SiO_2
01-074-1081> Corundum - Al_2O_3
01-083-1657> Sanidine - $K_{0.65}Na_{0.35}AlSi_3O_8$
01-076-0803> Anorthoclase - $(Na_{0.7}K_{0.3})(Al_{1.02}Si_{2.98}O_8)$
00-042-1401> Tridymite-O - SiO_2
01-082-0512> Cristobalite - SiO_2
00-026-0911> Illite-2M1 - $(K,H_3O)Al_2Si_3AlO_{10}(OH)_2$
Intensity(Counts)
x10^3
25.0
20.0
15.0
10.0
5.0
10
20
30
40
50
60
70
Two-Theta (deg)


[CMRR049A.MDI] [2B] CMRR049A+Al2O3, 2-b, 8s, 2-70, BPM, Gardner
01-088-2302> Quartz - SiO_2
00-010-0173> Corundum - Al_2O_3
01-075-1630> Anorthoclase - $(Na_{0.667}K_{0.333})(AlSi_3O_8)$
01-082-0512> Cristobalite - SiO_2
00-019-1227> Sanidine - $(K,Na)(Si_3Al)O_8$
00-042-1401> Tridymite-O - SiO_2
Intensity(Counts)
x10^3
15.0
10.0
5.0
10
20
30
40
50
60
70
Two-Theta (deg)

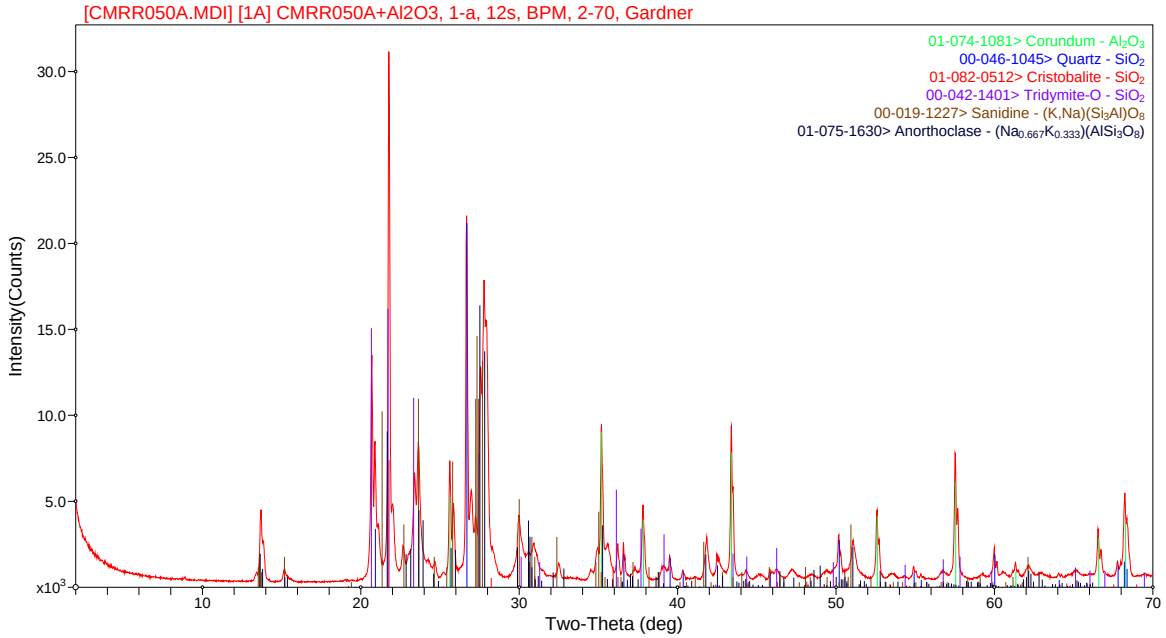

[CMRR050A.MDI] [1A] CMRR050A+Al2O3, 1-a, 12s, BPM, 2-70, Gardner
01-074-1081> Corundum - Al_2O_3
00-046-1045> Quartz - SiO_2
01-082-0512> Cristobalite - SiO_2
00-042-1401> Tridymite-O - SiO_2
00-019-1227> Sanidine - $(K,Na)(Si_3Al)O_8$
01-075-1630> Anorthoclase - $(Na_{0.667}K_{0.333})(AlSi_3O_8)$
Intensity(Counts)
x10^3
30.0
25.0
20.0
15.0
10.0
5.0
10
20
30
40
50
60
70
Two-Theta (deg)

TABLE B-4.
CMRR XRF DATA
WHOLE ROCK MAJOR ELEMENTS (BY SAMPLE NUMBER)

SAMPLE	UNIT	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	LOI	Total
CMRR-002B	Qbt_3 (B)	76.67	0.126	11.98	1.68	0.040	0.06	0.32	4.17	4.44	0.009	0.35	99.49
CMRR-003B	Qbt_3	77.41	0.114	11.58	1.43	0.051	0.06	0.32	3.96	4.34	0.008	0.30	99.27
CMRR-004B	Qbt_3	77.55	0.121	11.74	1.53	0.055	0.06	0.35	4.04	4.35	0.008	0.29	99.81
CMRR-005B	Qbt_3	78.12	0.111	11.44	1.41	0.047	0.06	0.31	4.00	4.24	0.009	0.22	99.75
CMRR-006B	Qbt_3	76.72	0.113	11.89	1.47	0.050	0.06	0.32	4.17	4.39	-0.008	0.23	99.18
CMRR-007B	Qbt_3	77.03	0.132	11.99	1.67	0.062	0.12	0.46	4.17	4.42	0.021	0.19	100.07
CMRR-008B	Qbt_3	76.45	0.124	12.10	1.57	0.058	0.07	0.40	4.25	4.48	0.010	0.24	99.51
CMRR-009B	Qbt_3	76.74	0.120	12.08	1.52	0.051	0.07	0.35	4.15	4.49	0.011	0.24	99.58
CMRR-010B	Qbt_s	74.10	0.212	13.05	2.36	0.062	0.22	0.57	4.12	4.26	0.023	0.89	98.98
CMRR-011B	Qbt_4 (B)	74.28	0.239	13.02	2.13	0.066	0.17	0.64	4.29	4.52	0.038	0.33	99.40
CMRR-012B	Qbt_4	71.98	0.255	13.95	2.63	0.067	0.33	0.64	3.98	4.32	0.043	1.75	98.19
CMRR-013B	Qbt_4 (B)	74.10	0.235	12.88	2.52	0.050	0.17	0.62	4.41	4.51	0.039	0.55	99.53
CMRR-014B	Qbt_s	75.45	0.182	12.58	2.12	0.061	0.21	0.55	3.91	4.15	0.024	0.85	99.24
CMRR-015B	Qbt_s	76.78	0.226	11.52	2.36	0.086	0.29	0.81	3.98	3.86	0.043	0.15	99.95
CMRR-016B	Qbt_3	77.96	0.117	11.95	1.47	0.049	0.07	0.37	4.04	4.41	0.010	0.16	100.44
CMRR-017B	Qbt_3	76.76	0.120	12.55	1.61	0.052	0.07	0.38	4.30	4.61	0.010	0.23	100.45
CMRR-018B	Qbt_3 (B)	77.11	0.114	11.95	1.52	0.046	0.06	0.29	4.14	4.42	0.009	0.21	99.67
CMRR-019B	Qbt_3	77.17	0.136	11.40	1.65	0.060	0.11	0.50	4.02	4.18	0.013	0.10	99.23
CMRR-020B	Qbt_3	76.85	0.111	11.85	1.46	0.051	0.06	0.34	4.06	4.36	0.008	0.20	99.14
CMRR-021B	Qbt_3 (B)	77.59	0.120	11.66	1.57	0.049	0.09	0.31	3.89	4.20	0.010	0.51	99.49
CMRR-022B	Qbt_3	77.04	0.115	11.79	1.45	0.037	0.08	0.25	3.97	4.33	0.008	0.35	99.05
CMRR-023B	Qbt_3	76.19	0.126	11.95	1.65	0.037	0.09	0.26	4.04	4.34	0.008	0.50	98.70
CMRR-024B	Qbt_4	70.57	0.276	14.18	3.03	0.052	0.48	0.61	3.72	4.18	0.040	2.28	97.14
CMRR-025B	Qbt_3 (B)	77.15	0.123	11.60	1.58	0.051	0.06	0.31	4.03	4.26	-0.008	0.13	99.17
CMRR-026B	Qbt_3	77.49	0.118	11.71	1.52	0.053	0.06	0.34	4.01	4.40	0.008	0.13	99.71
CMRR-027B	Qbt_3	77.26	0.110	11.77	1.44	0.047	0.06	0.31	4.12	4.40	-0.008	0.13	99.51
CMRR-028B	Qbt_3	77.40	0.134	11.87	1.61	0.054	0.08	0.34	4.06	4.43	0.011	0.14	99.98
CMRR-029B	Qbt_3	74.74	0.143	12.99	2.06	0.034	0.27	0.36	3.82	4.14	0.012	1.49	98.59
CMRR-030B	Qbt_3	75.48	0.135	12.48	1.78	0.055	0.14	0.33	4.02	4.30	0.012	0.73	98.74
CMRR-031B	Qbt_4	72.04	0.250	14.10	2.81	0.050	0.31	0.58	4.00	4.39	0.037	1.63	98.56
CMRR-032B	Qbt_s	75.39	0.168	12.39	2.16	0.062	0.25	0.53	3.74	3.87	0.027	1.20	98.59
CMRR-033B	Qbt_3	75.10	0.135	13.03	1.92	0.038	0.16	0.36	3.84	4.28	0.014	1.18	98.88
CMRR-034B	Qbt_3	76.75	0.125	12.40	1.70	0.047	0.09	0.32	4.00	4.43	0.011	0.49	99.87
CMRR-035B	Qbt_3 (B)	74.69	0.154	13.00	2.13	0.053	0.25	0.44	3.72	4.09	0.017	1.61	98.52
CMRR-036B	Qbt_s	71.15	0.260	13.92	3.15	0.066	0.49	0.70	3.94	4.17	0.032	2.04	97.88
CMRR-037B	Qbt_4 (B)	74.32	0.237	12.91	2.19	0.065	0.18	0.59	4.38	4.60	0.037	0.33	99.51

CMRR-038B	Qbt_3	72.27	0.162	13.83	2.39	0.043	0.38	0.47	3.63	4.13	0.017	2.40	97.33
CMRR-039B	Qbt_s	71.27	0.271	13.97	3.17	0.053	0.41	0.62	4.05	4.12	0.033	2.07	97.96
CMRR-040B	Qbt_4	71.69	0.260	13.71	2.74	0.043	0.39	0.65	4.00	4.41	0.045	1.63	97.94
CMRR-041B	Qbt_4	68.47	0.277	15.15	3.43	0.048	0.82	0.77	3.35	4.02	0.041	3.93	96.38
CMRR-042B	Qbt_4	71.14	0.255	14.31	2.87	0.045	0.40	0.64	3.83	4.17	0.042	2.08	97.69
CMRR-043B	Qbt_3	72.19	0.213	13.44	2.93	0.073	0.33	0.51	3.83	4.11	0.022	1.68	97.65
CMRR-044B	Qbt_4	72.54	0.237	12.87	3.71	0.049	0.28	0.54	4.03	4.53	0.037	1.16	98.82
CMRR-045B	Qbt_s	74.19	0.195	12.47	2.51	0.062	0.24	0.54	3.85	3.95	0.028	1.06	98.04
CMRR-046B	Qbt_4	72.23	0.244	13.03	3.53	0.033	0.31	0.49	3.94	4.43	0.035	1.56	98.27
CMRR-047B	Qbt_3	73.43	0.206	13.13	2.50	0.072	0.27	0.60	4.03	4.26	0.019	1.31	98.50
CMRR-048B	Qbt_3	77.16	0.130	11.84	1.62	0.058	0.09	0.44	4.08	4.29	0.014	0.21	99.71
CMRR-049B	Qbt_3	77.69	0.119	11.63	1.38	0.046	0.08	0.36	3.98	4.25	0.012	0.19	99.54
CMRR-050B	Qbt_3 pumice	78.46	0.072	11.77	1.08	0.026	-0.04	0.26	3.86	4.63	-0.008	0.18	100.16

TABLE B-5.
CMRR XRF DATA
WHOLE ROCK TRACE ELEMENTS (BY SAMPLE NUMBER)

SAMPLE	UNIT	V	Cr	Ni	Zn	Rb	Sr	Y	Zr	Nb	Ba	Trace total	Total + trace	Total + LOI
CMRR-002B	Qbt_3 (B)	-12.7	-9.7	-4.6	65.1	100.0	26.5	32.7	243.0	45.6	184.9	0.09	99.57	99.93
CMRR-003B	Qbt_3	-12.6	-9.7	-4.6	57.8	96.4	24.7	35.6	234.3	53.9	173.1	0.08	99.35	99.65
CMRR-004B	Qbt_3	-12.6	-9.7	-4.6	79.1	99.0	24.0	43.8	249.0	52.5	172.7	0.09	99.89	100.18
CMRR-005B	Qbt_3	-12.7	-9.7	-6.1	61.6	92.5	25.2	41.4	216.0	45.1	171.6	0.08	99.83	100.05
CMRR-006B	Qbt_3	-12.6	-9.7	-4.6	69.6	97.1	23.7	35.8	225.8	50.7	178.3	0.08	99.26	99.50
CMRR-007B	Qbt_3	13.5	-9.7	-6.0	83.9	102.2	30.4	41.1	241.5	46.2	169.5	0.09	100.16	100.35
CMRR-008B	Qbt_3	-12.6	-9.7	-4.5	77.2	99.0	30.9	37.9	240.5	54.8	175.7	0.09	99.60	99.84
CMRR-009B	Qbt_3	14.4	-9.8	-4.5	66.1	90.6	27.8	40.5	252.9	58.9	164.6	0.09	99.67	99.91
CMRR-010B	Qbt_s	23.8	-9.7	-6.7	86.6	83.8	44.9	45.7	298.3	39.6	273.7	0.11	99.09	99.98
CMRR-011B	Qbt_4 (B)	-13.0	-9.7	-4.5	69.4	88.1	55.5	33.1	371.9	45.7	302.7	0.12	99.52	99.85
CMRR-012B	Qbt_4	25.9	13.6	8.4	86.3	92.1	56.0	35.9	340.9	47.2	304.0	0.13	98.31	100.07
CMRR-013B	Qbt_4 (B)	-13.0	12.6	-4.5	84.8	84.0	61.6	38.5	355.8	37.8	328.7	0.12	99.66	100.20
CMRR-014B	Qbt_s	17.9	-9.8	-4.6	116.1	73.8	42.6	38.5	243.4	26.4	239.5	0.10	99.34	100.19
CMRR-015B	Qbt_s	18.7	-9.7	-6.0	119.6	48.8	75.4	21.6	243.6	29.0	359.3	0.11	100.06	100.21
CMRR-016B	Qbt_3	-12.6	-9.7	-4.6	73.0	99.3	29.1	37.3	234.5	46.2	205.2	0.09	100.53	100.68
CMRR-017B	Qbt_3	15.1	-9.7	7.1	76.0	108.6	26.2	48.8	259.9	46.1	165.8	0.09	100.54	100.77
CMRR-018B	Qbt_3 (B)	-12.6	-9.7	-6.0	90.4	101.3	24.6	43.5	232.6	47.4	161.5	0.09	99.75	99.96
CMRR-019B	Qbt_3	-12.6	-9.7	-4.5	108.7	83.2	34.0	35.5	242.1	41.5	201.5	0.09	99.32	99.42
CMRR-020B	Qbt_3	-12.6	-9.7	6.7	78.5	95.2	26.5	35.8	226.3	58.6	175.4	0.09	99.23	99.43
CMRR-021B	Qbt_3 (B)	14.3	-9.8	4.8	87.0	94.0	24.8	45.8	228.3	51.7	181.1	0.09	99.58	100.09
CMRR-022B	Qbt_3	-12.6	-9.6	4.9	56.0	104.4	28.5	40.5	219.8	52.2	155.1	0.08	99.14	99.49
CMRR-023B	Qbt_3	-12.6	13.6	-4.6	77.1	111.7	26.8	30.3	251.5	51.4	158.4	0.09	98.79	99.29
CMRR-024B	Qbt_4	25.6	10.4	8.3	97.4	97.0	57.8	50.8	304.2	41.8	296.5	0.12	97.26	99.55
CMRR-025B	Qbt_3 (B)	-12.6	-9.7	-6.1	84.1	84.9	31.9	39.5	232.7	47.0	158.4	0.08	99.26	99.39
CMRR-026B	Qbt_3	-12.6	-9.8	-6.0	76.2	92.3	31.2	37.9	218.1	46.0	183.8	0.08	99.79	99.92
CMRR-027B	Qbt_3	-12.5	-9.7	5.4	76.5	99.0	24.7	38.9	232.7	50.6	167.5	0.09	99.60	99.73
CMRR-028B	Qbt_3	14.8	-9.7	-4.6	76.1	94.4	26.6	37.5	261.3	58.9	180.4	0.09	100.07	100.22
CMRR-029B	Qbt_3	15.3	10.6	7.7	84.6	100.9	26.1	36.8	228.0	52.6	175.2	0.09	98.68	100.17
CMRR-030B	Qbt_3	15.9	-9.7	9.9	82.5	90.3	30.5	31.6	223.0	41.2	226.5	0.09	98.83	99.57
CMRR-031B	Qbt_4	-13.0	16.1	7.3	92.9	104.6	54.7	45.9	319.8	36.5	301.8	0.12	98.68	100.31
CMRR-032B	Qbt_s	20.1	-9.8	4.7	89.5	66.7	44.9	28.9	212.9	26.7	276.4	0.09	98.68	99.88
CMRR-033B	Qbt_3	-12.7	-9.7	-6.0	70.7	99.6	29.2	47.9	228.3	46.4	156.6	0.08	98.97	100.14
CMRR-034B	Qbt_3	-12.6	-9.7	4.8	50.6	92.9	24.7	49.8	245.6	60.2	158.0	0.09	99.96	100.45
CMRR-035B	Qbt_3 (B)	27.3	14.3	9.0	75.7	106.3	29.8	48.6	232.4	50.7	174.8	0.10	98.62	100.23
CMRR-036B	Qbt_s	22.1	14.2	8.5	136.8	86.2	52.9	35.3	287.4	26.7	260.9	0.12	97.99	100.03
CMRR-037B	Qbt_4 (B)	-13.0	-9.7	-6.0	103.3	90.1	57.8	35.6	336.8	39.5	307.4	0.12	99.63	99.96
CMRR-038B	Qbt_3	20.6	-9.8	12.4	80.2	102.3	34.6	45.3	203.3	48.3	188.9	0.09	97.42	99.81
CMRR-039B	Qbt_s	25.3	10.1	10.7	108.9	82.2	55.5	41.3	282.1	30.3	285.3	0.12	98.08	100.15
CMRR-040B	Qbt_4	27.0	10.9	7.0	117.0	102.6	61.7	49.4	320.4	39.0	297.8	0.13	98.06	99.69
CMRR-041B	Qbt_4	28.0	25.3	18.6	106.0	105.9	62.8	40.0	276.0	29.9	286.1	0.12	96.50	100.43
CMRR-042B	Qbt_4	33.9	14.9	9.8	92.9	103.7	62.2	35.9	289.0	35.7	301.1	0.12	97.81	99.90
CMRR-043B	Qbt_3	22.3	-9.8	7.3	124.6	89.7	43.6	26.2	256.9	35.0	257.0	0.11	97.75	99.43
CMRR-044B	Qbt_4	18.6	-9.7	-6.0	104.3	87.3	59.5	30.9	343.8	56.5	319.7	0.13	98.95	100.10
CMRR-045B	Qbt_s	18.2	-9.7	11.6	88.4	71.1	44.8	28.8	214.4	42.7	266.6	0.10	98.13	99.20

CMRR-046B	Qbt_4	24.0	-9.8	6.5	76.2	90.2	63.1	44.5	336.9	57.1	273.3	0.12	98.39	99.95
CMRR-047B	Qbt_3	-12.8	-9.7	-6.0	120.4	102.2	32.5	57.9	310.6	45.3	199.7	0.11	98.61	99.92
CMRR-048B	Qbt_3	-12.6	-9.7	-6.0	90.3	83.3	32.3	34.6	241.9	50.0	212.6	0.09	99.80	100.01
CMRR-049B	Qbt_3	-12.5	-9.7	-4.5	66.0	76.3	28.4	15.7	204.2	36.3	216.0	0.08	99.61	99.81
CMRR-050B	Qbt_3 pumice	-12.5	-9.6	-6.0	53.7	117.4	-6.7	50.1	177.9	68.5	70.0	0.07	100.22	100.40

Trace elements in ppm

TABLE B-6.
CMRR XRF DATA
MAJOR ELEMENTS (BY SUBUNIT)

SAMPLE	UNIT	LOCATION INFO	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	LOI	Total
BACKGROUND Qbt_3														
CMRR-002B	Qbt_3 (B)	Pipe #1, bkgrd	76.67	0.126	11.98	1.68	0.040	0.06	0.32	4.17	4.44	0.009	0.35	99.49
CMRR-018B	Qbt_3 (B)	Pipe #2, bkgrd	77.11	0.114	11.95	1.52	0.046	0.06	0.29	4.14	4.42	0.009	0.21	99.67
CMRR-021B	Qbt_3 (B)	Pipe #3, bkgrd	77.59	0.120	11.66	1.57	0.049	0.09	0.31	3.89	4.20	0.010	0.51	99.49
CMRR-025B	Qbt_3 (B)	Pipe #4, bkgrd	77.15	0.123	11.60	1.58	0.051	0.06	0.31	4.03	4.26	0.000	0.13	99.17
CMRR-035B	Qbt_3 (B)	SE wall	74.69	0.154	13.00	2.13	0.053	0.25	0.44	3.72	4.09	0.017	1.61	98.52
CMRR-050B	Qbt_3 pumice	NE wall	78.46	0.072	11.77	1.08	0.026	nd	0.26	3.86	4.63	0.000	0.18	100.16
AVERAGE			**76.94**	**0.118**	**11.99**	**1.59**	**0.044**	**0.10**	**0.32**	**3.97**	**4.34**	**0.007**	**0.50**	**99.42**
Qbt_3														
CMRR-003B	Qbt_3	Pipe #1, N side	77.41	0.114	11.58	1.43	0.051	0.06	0.32	3.96	4.34	0.008	0.30	99.27
CMRR-004B	Qbt_3	Pipe #1, center	77.55	0.121	11.74	1.53	0.055	0.06	0.35	4.04	4.35	0.008	0.29	99.81
CMRR-005B	Qbt_3	Pipe #1, S side	78.12	0.111	11.44	1.41	0.047	0.06	0.31	4.00	4.24	0.009	0.22	99.75
CMRR-006B	Qbt_3	Pipe #1, S side	76.72	0.113	11.89	1.47	0.050	0.06	0.32	4.17	4.39	nd	0.23	99.18
CMRR-007B	Qbt_3	Pipe #1, w/in,near s side	77.03	0.132	11.99	1.67	0.062	0.12	0.46	4.17	4.42	0.021	0.19	100.07
CMRR-008B	Qbt_3	Pipe #1, center	76.45	0.124	12.10	1.57	0.058	0.07	0.40	4.25	4.48	0.010	0.24	99.51
CMRR-009B	Qbt_3	Pipe #1, N side	76.74	0.120	12.08	1.52	0.051	0.07	0.35	4.15	4.49	0.011	0.24	99.58
CMRR-016B	Qbt_3	Pipe #2, N side	77.96	0.117	11.95	1.47	0.049	0.07	0.37	4.04	4.41	0.010	0.16	100.44
CMRR-017B	Qbt_3	Pipe #2, center	76.76	0.120	12.55	1.61	0.052	0.07	0.38	4.30	4.61	0.010	0.23	100.45
CMRR-019B	Qbt_3	Pipe #3, center	77.17	0.136	11.40	1.65	0.060	0.11	0.50	4.02	4.18	0.013	0.10	99.23
CMRR-020B	Qbt_3	Pipe #3, S side	76.85	0.111	11.85	1.46	0.051	0.06	0.34	4.06	4.36	0.008	0.20	99.14
CMRR-022B	Qbt_3	Pipe #4, center	77.04	0.115	11.79	1.45	0.037	0.08	0.25	3.97	4.33	0.008	0.35	99.05
CMRR-023B	Qbt_3	Pipe #4, center	76.19	0.126	11.95	1.65	0.037	0.09	0.26	4.04	4.34	0.008	0.50	98.70
CMRR-026B	Qbt_3	Pipe #5, center	77.49	0.118	11.71	1.52	0.053	0.06	0.34	4.01	4.40	0.008	0.13	99.71
CMRR-027B	Qbt_3	Pipe #5, N side	77.26	0.110	11.77	1.44	0.047	0.06	0.31	4.12	4.40	nd	0.13	99.51
CMRR-028B	Qbt_3	Pipe #6, center	77.40	0.134	11.87	1.61	0.054	0.08	0.34	4.06	4.43	0.011	0.14	99.98
CMRR-029B	Qbt_3	Pipe #6, near surge	74.74	0.143	12.99	2.06	0.034	0.27	0.36	3.82	4.14	0.012	1.49	98.59
CMRR-030B	Qbt_3	Pipe #6, N side	75.48	0.135	12.48	1.78	0.055	0.14	0.33	4.02	4.30	0.012	0.73	98.74
CMRR-033B	Qbt_3	Pipe #7, center	75.10	0.135	13.03	1.92	0.038	0.16	0.36	3.84	4.28	0.014	1.18	98.88
CMRR-034B	Qbt_3	Pipe #7 S side	76.75	0.125	12.40	1.70	0.047	0.09	0.32	4.00	4.43	0.011	0.49	99.87
CMRR-038B	Qbt_3	Near Pipe #8	72.27	0.162	13.83	2.39	0.043	0.38	0.47	3.63	4.13	0.017	2.40	97.33
CMRR-043B	Qbt_3	Pipe #9 NE side	72.19	0.213	13.44	2.93	0.073	0.33	0.51	3.83	4.11	0.022	1.68	97.65
CMRR-047B	Qbt_3	NE wall, collapse feat.	73.43	0.206	13.13	2.50	0.072	0.27	0.60	4.03	4.26	0.019	1.31	98.50
CMRR-048B	Qbt_3	NE wall, collapse feat.	77.16	0.130	11.84	1.62	0.058	0.09	0.44	4.08	4.29	0.014	0.21	99.71
CMRR-049B	Qbt_3	NE wall, collapse feat.	77.69	0.119	11.63	1.38	0.046	0.08	0.36	3.98	4.25	0.012	0.19	99.54
AVERAGE			**76.36**	**0.132**	**12.18**	**1.71**	**0.051**	**0.12**	**0.37**	**4.02**	**4.33**	**0.012**	**0.53**	**99.29**
SURGE														
CMRR-010B	Qbt_5	Pipe #1 center	74.10	0.212	13.05	2.36	0.062	0.22	0.57	4.12	4.26	0.023	0.89	98.98
CMRR-014B	Qbt_5	Pipe #2,s side	75.45	0.182	12.58	2.12	0.061	0.21	0.55	3.91	4.15	0.024	0.85	99.24
CMRR-015B	Qbt_5	Pipe #2, center	76.78	0.226	11.52	2.36	0.086	0.29	0.81	3.98	3.86	0.043	0.15	99.95
CMRR-032B	Qbt_5	Pipe #7, center	75.39	0.168	12.39	2.16	0.062	0.25	0.53	3.74	3.87	0.027	1.20	98.59
CMRR-036B	Qbt_5	SE wall	71.15	0.260	13.92	3.15	0.066	0.49	0.70	3.94	4.17	0.032	2.04	97.88
CMRR-039B	Qbt_5	Pipe #8 center	71.27	0.271	13.97	3.17	0.053	0.41	0.62	4.05	4.12	0.033	2.07	97.96
CMRR-045B	Qbt_5	Pipe #9 center	74.19	0.195	12.47	2.51	0.062	0.24	0.54	3.85	3.95	0.028	1.06	98.04
AVERAGE			**74.05**	**0.216**	**12.84**	**2.55**	**0.064**	**0.30**	**0.62**	**3.94**	**4.05**	**0.030**	**1.18**	**98.66**
BACKGROUND Qbt_4														

CMRR-011B	Qbt_4 (B)	Pipe #1, bkgrd	74.28	0.239	13.02	2.13	0.066	0.17	0.64	4.29	4.52	0.038	0.33	99.40
CMRR-013B	Qbt_4 (B)	Pipe #2, bkgrd	74.10	0.235	12.88	2.52	0.050	0.17	0.62	4.41	4.51	0.039	0.55	99.53
CMRR-037B	Qbt_4 (B)	SE wall	74.32	0.237	12.91	2.19	0.065	0.18	0.59	4.38	4.60	0.037	0.33	99.51
AVERAGE			**74.24**	**0.237**	**12.93**	**2.28**	**0.060**	**0.18**	**0.61**	**4.36**	**4.54**	**0.038**	**0.40**	**99.48**
Qbt_4														
CMRR-012B	Qbt_4	Pipe #2 center	71.98	0.255	13.95	2.63	0.067	0.33	0.64	3.98	4.32	0.043	1.75	98.19
CMRR-024B	Qbt_4	Pipe #4 center	70.57	0.276	14.18	3.03	0.052	0.48	0.61	3.72	4.18	0.040	2.28	97.14
CMRR-031B	Qbt_4	Pipe #6 center	72.04	0.250	14.10	2.81	0.050	0.31	0.58	4.00	4.39	0.037	1.63	98.56
CMRR-040B	Qbt_4	Pipe #8 center	71.69	0.260	13.71	2.74	0.043	0.39	0.65	4.00	4.41	0.045	1.63	97.94
CMRR-041B	Qbt_4	Pipe #8 brecciated	68.47	0.277	15.15	3.43	0.048	0.82	0.77	3.35	4.02	0.041	3.93	96.38
CMRR-042B	Qbt_4	cataclastic	71.14	0.255	14.31	2.87	0.045	0.40	0.64	3.83	4.17	0.042	2.08	97.69
CMRR-044B	Qbt_4	Pipe #9,center	72.54	0.237	12.87	3.71	0.049	0.28	0.54	4.03	4.53	0.037	1.16	98.82
CMRR-046B	Qbt_4	Pipe #9,center	72.23	0.244	13.03	3.53	0.033	0.31	0.49	3.94	4.43	0.035	1.56	98.27
AVERAGE			**71.33**	**0.257**	**13.91**	**3.09**	**0.048**	**0.41**	**0.62**	**3.86**	**4.31**	**0.040**	**2.00**	**97.87**

TABLE B-7.
CMRR XRF DATA
WHOLE ROCK TRACE ELEMENTS (BY SUBUNIT)

SAMPLE	UNIT	LOCATION INFO	Zn	Rb	Sr	Y	Zr	Nb	Ba	Trace total	Total + trace	Total + LOI	Total
BACKGROUND Qbt_3													
CMRR-002B	Qbt_3 (B)	Pipe #1, bkgrd	65.1	100.0	26.5	32.7	243.0	45.6	184.9	0.09	99.57	99.93	99.49
CMRR-018B	Qbt_3 (B)	Pipe #2, bkgrd	90.4	101.3	24.6	43.5	232.6	47.4	161.5	0.09	99.75	99.96	99.67
CMRR-021B	Qbt_3 (B)	Pipe #3, bkgrd	87.0	94.0	24.8	45.8	228.3	51.7	181.1	0.09	99.58	100.09	99.49
CMRR-025B	Qbt_3 (B)	Pipe #4, bkgrd	84.1	84.9	31.9	39.5	232.7	47.0	158.4	0.08	99.26	99.39	99.17
CMRR-035B	Qbt_3 (B)	SE wall	75.7	106.3	29.8	48.6	232.4	50.7	174.8	0.10	98.62	100.23	98.52
CMRR-050B	Qbt_3 pumice	NE wall	53.7	117.4	nd	50.1	177.9	68.5	70.0	0.07	100.22	100.40	100.16
AVERAGE			**76.0**	**100.7**	**27.5**	**43.4**	**224.5**	**51.8**	**155.1**	**0.09**	**99.50**	**100.00**	**99.42**
Qbt_3													
CMRR-003B	Qbt_3	Pipe #1, N side	57.8	96.4	24.7	35.6	234.3	53.9	173.1	0.08	99.35	99.65	99.27
CMRR-004B	Qbt_3	Pipe #1, center	79.1	99.0	24.0	43.8	249.0	52.5	172.7	0.09	99.89	100.18	99.81
CMRR-005B	Qbt_3	Pipe #1, S side	61.6	92.5	25.2	41.4	216.0	45.1	171.6	0.08	99.83	100.05	99.75
CMRR-006B	Qbt_3	Pipe #1, S side	69.6	97.1	23.7	35.8	225.8	50.7	178.3	0.08	99.26	99.50	99.18
CMRR-007B	Qbt_3	Pipe #1, w/in,near s side	83.9	102.2	30.4	41.1	241.5	46.2	169.5	0.09	100.16	100.35	100.07
CMRR-008B	Qbt_3	Pipe #1, center	77.2	99.0	30.9	37.9	240.5	54.8	175.7	0.09	99.60	99.84	99.51
CMRR-009B	Qbt_3	Pipe #1, N side	66.1	90.6	27.8	40.5	252.9	58.9	164.6	0.09	99.67	99.91	99.58
CMRR-016B	Qbt_3	Pipe #2, N side	73.0	99.3	29.1	37.3	234.5	46.2	205.2	0.09	100.53	100.68	100.44
CMRR-017B	Qbt_3	Pipe #2, center	76.0	108.6	26.2	48.8	259.9	46.1	165.8	0.09	100.54	100.77	100.45
CMRR-019B	Qbt_3	Pipe #3, center	108.7	83.2	34.0	35.5	242.1	41.5	201.5	0.09	99.32	99.42	99.23
CMRR-020B	Qbt_3	Pipe #3, S side	78.5	95.2	26.5	35.8	226.3	58.6	175.4	0.09	99.23	99.43	99.14
CMRR-022B	Qbt_3	Pipe #4, center	56.0	104.4	28.5	40.5	219.8	52.2	155.1	0.08	99.14	99.49	99.05
CMRR-023B	Qbt_3	Pipe #4, center	77.1	111.7	26.8	30.3	251.5	51.4	158.4	0.09	98.79	99.29	98.70
CMRR-026B	Qbt_3	Pipe #5, center	76.2	92.3	31.2	37.9	218.1	46.0	183.8	0.08	99.79	99.92	99.71
CMRR-027B	Qbt_3	Pipe #5, N side	76.5	99.0	24.7	38.9	232.7	50.6	167.5	0.09	99.60	99.73	99.51
CMRR-028B	Qbt_3	Pipe #6, center	76.1	94.4	26.6	37.5	261.3	58.9	180.4	0.09	100.07	100.22	99.98
CMRR-029B	Qbt_3	Pipe #6, near surge	84.6	100.9	26.1	36.8	228.0	52.6	175.2	0.09	98.68	100.17	98.59
CMRR-030B	Qbt_3	Pipe #6, N side	82.5	90.3	30.5	31.6	223.0	41.2	226.5	0.09	98.83	99.57	98.74
CMRR-033B	Qbt_3	Pipe #7, center	70.7	99.6	29.2	47.9	228.3	46.4	156.6	0.08	98.97	100.14	98.88
CMRR-034B	Qbt_3	Pipe #7 S side	50.6	92.9	24.7	49.8	245.6	60.2	158.0	0.09	99.96	100.45	99.87
CMRR-038B	Qbt_3	Near Pipe #8	80.2	102.3	34.6	45.3	203.3	48.3	188.9	0.09	97.42	99.81	97.33
CMRR-043B	Qbt_3	Pipe #9 NE side	124.6	89.7	43.6	26.2	256.9	35.0	257.0	0.11	97.75	99.43	97.65
CMRR-047B	Qbt_3	NE wall, collapse feat.	120.4	102.2	32.5	57.9	310.6	45.3	199.7	0.11	98.61	99.92	98.50
CMRR-048B	Qbt_3	NE wall, collapse feat.	90.3	83.3	32.3	34.6	241.9	50.0	212.6	0.09	99.80	100.01	99.71
CMRR-049B	Qbt_3	NE wall, collapse feat.	66.0	76.3	28.4	15.7	204.2	36.3	216.0	0.08	99.61	99.81	99.54
AVERAGE			**78.5**	**96.1**	**28.9**	**38.6**	**237.9**	**49.2**	**183.6**	**0.09**	**99.38**	**99.91**	**99.29**
SURGE													
CMRR-010B	Qbt_s	Pipe #1 center	86.6	83.8	44.9	45.7	298.3	39.6	273.7	0.11	99.09	99.98	98.98
CMRR-014B	Qbt_s	Pipe #2,s side	116.1	73.8	42.6	38.5	243.4	26.4	239.5	0.10	99.34	100.19	99.24
CMRR-015B	Qbt_s	Pipe #2, center	119.6	48.8	75.4	21.6	243.6	29.0	359.3	0.11	100.06	100.21	99.95
CMRR-032B	Qbt_s	Pipe #7, center	89.5	66.7	44.9	28.9	212.9	26.7	276.4	0.09	98.68	99.88	98.59
CMRR-036B	Qbt_s	SE wall	136.8	86.2	52.9	35.3	287.4	26.7	260.9	0.12	97.99	100.03	97.88
CMRR-039B	Qbt_s	Pipe #8 center	108.9	82.2	55.5	41.3	282.1	30.3	285.3	0.12	98.08	100.15	97.96

SAMPLE	UNIT	LOCATION INFO	Zn	Rb	Sr	Y	Zr	Nb	Ba	Trace total	Total + trace	Total + LOI	Total
CMRR-045B	Qbt_s	Pipe #9 center	88.4	71.1	44.8	28.8	214.4	42.7	266.6	0.10	98.13	99.20	98.04
AVERAGE			**106.6**	**73.2**	**51.6**	**34.3**	**254.6**	**31.6**	**280.3**	**0.11**	**98.77**	**99.95**	**98.66**
BACKGROUND Qbt_4													
CMRR-011B	Qbt_4 (B)	Pipe #1, bkgrd	69.4	88.1	55.5	33.1	371.9	45.7	302.7	0.12	99.52	99.85	99.40
CMRR-013B	Qbt_4 (B)	Pipe #2, bkgrd	84.8	84.0	61.6	38.5	355.8	37.8	328.7	0.12	99.66	100.20	99.53
CMRR-037B	Qbt_4 (B)	SE wall	103.3	90.1	57.8	35.6	336.8	39.5	307.4	0.12	99.63	99.96	99.51
AVERAGE			**85.8**	**87.4**	**58.3**	**35.7**	**354.8**	**41.0**	**312.9**	**0.12**	**99.60**	**100.01**	**99.48**
Qbt_4													
CMRR-012B	Qbt_4	Pipe #2 center	86.3	92.1	56.0	35.9	340.9	47.2	304.0	0.13	98.31	100.07	98.19
CMRR-024B	Qbt_4	Pipe #4 center	97.4	97.0	57.8	50.8	304.2	41.8	296.5	0.12	97.26	99.55	97.14
CMRR-031B	Qbt_4	Pipe #6 center	92.9	104.6	54.7	45.9	319.8	36.5	301.8	0.12	98.68	100.31	98.56
CMRR-040B	Qbt_4	Pipe #8 center	117.0	102.6	61.7	49.4	320.4	39.0	297.8	0.13	98.06	99.69	97.94
CMRR-041B	Qbt_4	Pipe #8 brecciated	106.0	105.9	62.8	40.0	276.0	29.9	286.1	0.12	96.50	100.43	96.38
CMRR-042B	Qbt_4	cataclastic	92.9	103.7	62.2	35.9	289.0	35.7	301.1	0.12	97.81	99.90	97.69
CMRR-044B	Qbt_4	Pipe #9,center	104.3	87.3	59.5	30.9	343.8	56.5	319.7	0.13	98.95	100.10	98.82
CMRR-046B	Qbt_4	Pipe #9,center	76.2	90.2	63.1	44.5	336.9	57.1	273.3	0.12	98.39	99.95	98.27
AVERAGE			**96.6**	**97.9**	**59.7**	**41.7**	**316.4**	**42.9**	**297.5**	**0.12**	**98.00**	**100.00**	**97.87**

TABLE B-8.
CMRR XRF DATA
NORMALIZED MAJOR ELEMENT DIFFERENTIATION
Qbt_3 (background vs pipe walls, pipe centers) AND Qbt_4 (background vs rubble zone above pipes)

SAMPLE		SiO_2	TiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5
BACKGROUND Qbt_3 [1]		**77.39**	**0.119**	**12.07**	**1.61**	**0.044**	**0.10**	**0.32**	**3.99**	**4.36**	**0.008**
Background Qbt_3 σ		**0.90**	**0.027**	**0.57**	**0.35**	**0.010**	**0.08**	**0.06**	**0.17**	**0.17**	**0.007**
WALL OF PIPE		**SiO_2**	**TiO_2**	**Al_2O_3**	**Fe_2O_3**	**MnO**	**MgO**	**CaO**	**Na_2O**	**K_2O**	**P_2O_5**
Pipe #1	*Avg.* [2]	77.54	0.119	11.85	1.51	0.052	0.07	0.35	4.11	4.40	0.010
CMRR-003,005,006,007,009	*Diff.* [3]	0.15	0.000	-0.22	-0.10	0.008	-0.03	0.03	0.12	0.03	0.002
Pipe #2		77.62	0.117	11.90	1.47	0.049	0.07	0.36	4.02	4.39	0.010
CMRR-016	*Diff.*	0.23	-0.002	-0.17	-0.14	0.004	-0.03	0.04	0.03	0.02	0.003
Pipe #3		77.51	0.112	11.95	1.48	0.052	0.06	0.34	4.09	4.40	0.008
CMRR-020	*Diff.*	0.12	-0.007	-0.12	-0.13	0.007	-0.04	0.02	0.10	0.03	0.000
Pipe #5	*Avg.*	77.64	0.111	11.83	1.45	0.047	0.06	0.31	4.14	4.42	nd
CMRR-027	*Diff.*	0.25	-0.008	-0.23	-0.16	0.002	-0.05	-0.01	0.15	0.05	---
Pipe #6		76.45	0.137	12.64	1.80	0.056	0.14	0.34	4.07	4.36	0.012
CMRR-030	*Diff.*	-0.94	0.018	0.57	0.20	0.011	0.03	0.01	0.08	-0.01	0.005
Pipe #7		76.85	0.125	12.41	1.71	0.047	0.09	0.32	4.00	4.43	0.011
CMRR-034	*Diff.*	-0.54	0.006	0.35	0.10	0.002	-0.01	0.00	0.01	0.07	0.004
Pipe #8		74.25	0.166	14.21	2.46	0.044	0.39	0.49	3.73	4.24	0.017
CMRR-038	*Diff.*	-3.14	0.047	2.14	0.85	0.000	0.29	0.16	-0.26	-0.13	0.010
Pipe #9		73.93	0.218	13.76	3.00	0.074	0.33	0.52	3.93	4.21	0.023
CMRR-043	*Diff.*	-3.46	0.099	1.70	1.39	0.030	0.23	0.20	-0.07	-0.15	0.015
OVERALL AVG (all samples)		**76.47**	**0.138**	**12.57**	**1.86**	**0.053**	**0.15**	**0.38**	**4.01**	**4.35**	**0.013**
σ [4]		**1.53**	**0.037**	**0.93**	**0.57**	**0.010**	**0.13**	**0.08**	**0.13**	**0.08**	**0.005**
BACKGROUND Qbt_3		**77.39**	**0.119**	**12.07**	**1.61**	**0.044**	**0.10**	**0.32**	**3.99**	**4.36**	**0.008**
Δ [5]		**-0.92**	**0.019**	**0.50**	**0.25**	**0.008**	**0.05**	**0.06**	**0.02**	**-0.01**	**0.006**

SAMPLE		SiO_2	TiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5
BACKGROUND Qbt_3		**77.39**	**0.119**	**12.07**	**1.61**	**0.044**	**0.10**	**0.32**	**3.99**	**4.36**	**0.008**
Background Qbt_3 σ		**0.90**	**0.027**	**0.57**	**0.35**	**0.010**	**0.08**	**0.06**	**0.17**	**0.17**	**0.007**
CENTER OF PIPE		**SiO_2**	**TiO_2**	**Al_2O_3**	**Fe_2O_3**	**MnO**	**MgO**	**CaO**	**Na_2O**	**K_2O**	**P_2O_5**
Pipe #1	*Avg.*	77.26	0.123	11.96	1.55	0.057	0.07	0.38	4.16	4.43	0.009
CMRR-004,008	*Diff.*	-0.13	0.004	-0.11	-0.05	0.012	-0.04	0.05	0.17	0.07	0.002
Pipe #2		76.41	0.119	12.50	1.60	0.052	0.07	0.38	4.28	4.59	0.009
CMRR-017	*Diff.*	-0.98	0.000	0.43	-0.01	0.008	-0.04	0.05	0.29	0.22	0.002
Pipe #3		77.76	0.137	11.49	1.66	0.061	0.11	0.50	4.05	4.22	0.013
CMRR-019	*Diff.*	0.37	0.018	-0.58	0.06	0.016	0.01	0.18	0.06	-0.15	0.005
Pipe #4	*Avg.*	77.49	0.122	12.00	1.57	0.037	0.09	0.26	4.05	4.39	0.008
CMRR-022,023	*Diff.*	0.09	0.003	-0.06	-0.04	-0.007	-0.02	-0.07	0.06	0.02	0.001
Pipe #5		77.72	0.118	11.74	1.52	0.053	0.06	0.34	4.02	4.41	0.008
CMRR-026	*Diff.*	0.33	-0.001	-0.33	-0.08	0.009	-0.04	0.01	0.03	0.05	0.001
Pipe #6		77.41	0.134	11.88	1.61	0.054	0.08	0.34	4.06	4.43	0.011

SAMPLE		SiO_2	TiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5
CMRR-028	*Diff.*	0.02	0.015	-0.19	0.00	0.009	-0.02	0.01	0.07	0.07	0.004
Pipe # 6		75.81	0.145	13.18	2.09	0.035	0.28	0.37	3.88	4.20	0.012
CMRR-029	*Diff.*	-1.58	0.026	1.11	0.49	-0.010	0.18	0.04	-0.11	-0.16	0.004
Pipe #7		75.94	0.137	13.18	1.95	0.039	0.16	0.36	3.89	4.33	0.014
CMRR-33	*Diff.*	-1.45	0.018	1.12	0.34	-0.006	0.06	0.04	-0.10	-0.04	0.007
OVERALL AVG (all samples)		**77.08**	**0.128**	**12.19**	**1.67**	**0.046**	**0.11**	**0.34**	**4.05**	**4.38**	**0.010**
σ		**0.70**	**0.009**	**0.54**	**0.19**	**0.010**	**0.06**	**0.07**	**0.12**	**0.11**	**0.002**
BACKGROUND Qbt$_3$		**77.39**	**0.119**	**12.07**	**1.61**	**0.044**	**0.10**	**0.32**	**3.99**	**4.36**	**0.008**
Δ		**-0.31**	**0.009**	**0.13**	**0.06**	**0.002**	**0.01**	**0.02**	**0.06**	**0.01**	**0.003**

SAMPLE		SiO_2	TiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5
BACKGROUND Qbt$_4$		**74.62**	**0.238**	**13.00**	**2.29**	**0.061**	**0.18**	**0.62**	**4.38**	**4.57**	**0.038**
Background Qbt$_4$ σ		**0.15**	**0.002**	**0.08**	**0.21**	**0.009**	**0.01**	**0.03**	**0.06**	**0.05**	**0.001**
RUBBLE ZONE ABOVE PIPE		**SiO_2**	**TiO_2**	**Al_2O_3**	**Fe_2O_3**	**MnO**	**MgO**	**CaO**	**Na_2O**	**K_2O**	**P_2O_5**
Pipe #2		73.31	0.260	14.21	2.68	0.068	0.34	0.65	4.05	4.40	0.044
CMRR-012B	*Diff.*	-1.32	0.022	1.21	0.38	0.007	0.16	0.03	-0.33	-0.17	0.006
Pipe #4		72.65	0.284	14.60	3.12	0.054	0.50	0.63	3.83	4.30	0.041
CMRR-024B	*Diff.*	-1.98	0.046	1.59	0.82	-0.007	0.32	0.01	-0.55	-0.26	0.003
Pipe #6		73.09	0.254	14.30	2.85	0.050	0.31	0.59	4.06	4.46	0.038
CMRR-031B	*Diff.*	-1.53	0.015	1.30	0.56	-0.010	0.13	-0.03	-0.32	-0.11	0.000
Pipe #8		73.20	0.265	14.00	2.80	0.044	0.40	0.67	4.08	4.50	0.046
CMRR-040B	*Diff.*	-1.42	0.027	1.00	0.50	-0.017	0.22	0.05	-0.30	-0.07	0.008
Pipe #8		71.04	0.287	15.72	3.56	0.050	0.85	0.80	3.48	4.17	0.042
CMRR-041B	*Diff.*	-3.58	0.049	2.72	1.26	-0.011	0.68	0.19	-0.91	-0.40	0.004
Pipe #8		72.82	0.261	14.64	2.94	0.046	0.41	0.66	3.92	4.27	0.043
CMRR-042B	*Diff.*	-1.81	0.023	1.64	0.65	-0.014	0.23	0.04	-0.46	-0.30	0.004
Pipe #9	*Avg.*	73.45	0.244	13.14	3.67	0.042	0.30	0.52	4.04	4.55	0.037
CMRR-044, 046B	*Diff.*	-1.17	0.006	0.14	1.38	-0.019	0.12	-0.10	-0.34	-0.02	-0.002
OVERALL AVG (all samples)		**72.94**	**0.262**	**14.22**	**3.16**	**0.049**	**0.43**	**0.63**	**3.94**	**4.40**	**0.041**
σ		**0.72**	**0.016**	**0.82**	**0.40**	**0.009**	**0.17**	**0.09**	**0.18**	**0.13**	**0.003**
BACKGROUND Qbt$_4$		**74.62**	**0.238**	**13.00**	**2.29**	**0.061**	**0.18**	**0.62**	**4.38**	**4.57**	**0.038**
Δ		**-1.68**	**0.024**	**1.22**	**0.87**	**-0.011**	**0.25**	**0.01**	**-0.45**	**-0.17**	**0.003**
% Δ		**-2**	**10**	**9**	**38**	**-19**	**141**	**2**	**-10**	**-4**	**7**

Color Key:

= depletion

= enrichment

Notes:

[1] Upper highlighted row in each sample category lists the background geochemistry of the Qbt subunit against which other samples in the specific location will be compared.

[2] Where present, values to right represent a calculated average of multiple samples.

[3] Calculated difference between measured value for sample and measured value for background.

[4] Standard deviation (Greek letter sigma).

[5] Difference between the overall average of all samples and the respective Qbt subunit background value (Greek capital letter delta).

TABLE B-9.
CMRR XRF DATA
NORMALIZED TRACE ELEMENT DIFFERENTIATION
Qbt_3 (background vs pipe walls, pipe centers) AND Qbt_4 (background vs rubble zone above pipes)

SAMPLE		Zn	Rb	Sr	Y	Zr	Nb	Ba
BACKGROUND Qbt_3 [1]		**76.5**	**101.2**	**23.1**	**43.6**	**225.9**	**52.1**	**156.2**
Background Qbt_3 σ		**14.4**	**10.9**	**11.7**	**6.5**	**24.1**	**8.4**	**43.6**

WALL OF PIPE		Zn	Rb	Sr	Y	Zr	Nb	Ba
Pipe #1	*Avg.* [2]	68.1	96.2	26.5	39.0	235.1	51.2	172.2
CMRR-003,005,006,007,009	*Diff.* [3]	-8.4	-5.1	3.4	-4.6	9.2	-0.9	16.0
Pipe #2		72.7	98.9	29.0	37.2	233.5	46.0	204.3
CMRR-016	*Diff.*	-3.8	-2.3	5.9	-6.4	7.7	-6.1	48.2
Pipe #3		79.2	96.0	26.7	36.1	228.3	59.1	176.9
CMRR-020	*Diff.*	2.7	-5.2	3.6	-7.5	2.4	7.0	20.7
Pipe #5		76.8	99.5	24.9	39.1	233.9	50.9	168.4
CMRR-027	*Diff.*	0.4	-1.8	1.8	-4.5	8.0	-1.2	12.2
Pipe #6		83.6	91.5	30.9	32.0	225.9	41.8	229.4
CMRR-030	*Diff.*	7.1	-9.8	7.7	-11.6	0.0	-10.3	73.3
Pipe #7		50.7	93.0	24.7	49.9	245.9	60.3	158.2
CMRR-034	*Diff.*	-25.8	-8.2	1.6	6.3	20.1	8.2	2.1
Pipe #8		82.4	105.1	35.5	46.5	208.8	49.6	194.1
CMRR-038	*Diff.*	6.0	3.9	12.4	2.9	-17.0	-2.5	37.9
Pipe #9		127.6	91.9	44.7	26.9	263.1	35.8	263.2
CMRR-043	*Diff.*	51.1	-9.3	21.6	-16.7	37.3	-16.3	107.0
OVERALL AVG (all samples)		**80.1**	**96.5**	**30.4**	**38.3**	**234.3**	**49.3**	**195.8**
σ [4]		**33.6**	**32.5**	**12.0**	**14.5**	**79.5**	**18.1**	**73.2**
BACKGROUND Qbt_3 [1]		**76.5**	**101.2**	**23.1**	**43.6**	**225.9**	**52.1**	**156.2**
Δ [5]		**3.7**	**-4.7**	**7.2**	**-5.3**	**8.5**	**-2.8**	**39.7**

SAMPLE		Zn	Rb	Sr	Y	Zr	Nb	Ba
BACKGROUND Qbt_3 [1]		**76.5**	**101.2**	**23.1**	**43.6**	**225.9**	**52.1**	**156.2**
Background Qbt_3 σ		**14.4**	**10.9**	**11.7**	**6.5**	**24.1**	**8.4**	**43.6**

CENTER OF PIPE		Zn	Rb	Sr	Y	Zr	Nb	Ba
Pipe #1	*Avg.*	78.4	99.3	27.6	41.0	245.6	53.8	174.8
CMRR-004,008	*Diff.*	2.0	-1.9	4.4	-2.6	19.7	1.7	18.6
Pipe #2		75.7	108.1	26.1	48.6	258.8	45.9	165.0
CMRR-017	*Diff.*	-0.8	6.8	3.0	4.9	32.9	-6.2	8.9
Pipe #3		109.5	83.9	34.3	35.8	244.0	41.8	203.1
CMRR-019	*Diff.*	33.1	-17.4	11.2	-7.9	18.2	-10.3	46.9
Pipe #4	*Avg.*	67.3	109.3	28.0	35.8	238.4	52.4	158.5
CMRR-022,023	*Diff.*	-9.2	8.1	4.9	-7.8	12.5	0.3	2.4
Pipe #5		76.5	92.6	31.3	38.0	218.8	46.2	184.4
CMRR-026	*Diff.*	0.0	-8.6	8.2	-5.6	-7.1	-5.9	28.2
Pipe #6		76.1	94.4	26.6	37.5	261.4	58.9	180.4
CMRR-028	*Diff.*	-0.4	-6.8	3.5	-6.1	35.5	6.8	24.3
Pipe # 6		85.8	102.3	26.4	37.3	231.3	53.3	177.7

SAMPLE		Zn	Rb	Sr	Y	Zr	Nb	Ba
CMRR-029	*Diff.*	9.4	1.1	3.3	-6.3	5.5	1.2	21.6
Pipe #7		71.5	100.7	29.6	48.5	230.9	47.0	158.3
CMRR-33	*Diff.*	-4.9	-0.5	6.5	4.9	5.1	-5.1	2.2
OVERALL AVG (all samples)		**80.1**	**98.8**	**28.7**	**40.3**	**241.1**	**49.9**	**175.3**
σ		**29.3**	**33.9**	**9.9**	**14.3**	**81.5**	**17.4**	**60.1**
BACKGROUND Qbt$_3$ [1]		**76.5**	**101.2**	**23.1**	**43.6**	**225.9**	**52.1**	**156.2**
Δ		**3.6**	**-2.4**	**5.6**	**-3.3**	**15.3**	**-2.2**	**19.1**

SAMPLE	Zn	Rb	Sr	Y	Zr	Nb	Ba
BACKGROUND Qbt$_4$	**86.3**	**87.9**	**58.6**	**35.9**	**356.6**	**41.2**	**314.5**
Background Qbt$_4$ σ	**17.1**	**3.1**	**3.1**	**2.7**	**17.6**	**4.1**	**13.9**

RUBBLE ZONE ABOVE PIPE		Zn	Rb	Sr	Y	Zr	Nb	Ba
Pipe #2		88.8	94.8	57.6	37.0	350.9	48.6	313.0
CMRR-012B	*Diff.*	2.6	6.9	-1.0	1.1	-5.6	7.4	-1.5
Pipe #4		98.8	98.5	58.6	51.5	308.6	42.4	300.8
CMRR-024B	*Diff.*	12.6	10.6	0.0	15.6	-47.9	1.2	-13.6
Pipe #6		94.9	106.8	55.9	46.8	326.5	37.3	308.1
CMRR-031B	*Diff.*	8.6	19.0	-2.7	10.9	-30.1	-3.9	-6.3
Pipe #8		121.4	106.5	64.0	51.3	332.5	40.5	309.0
CMRR-040B	*Diff.*	35.2	18.6	5.4	15.4	-24.1	-0.7	-5.5
Pipe #8		108.5	108.4	64.3	41.0	282.5	30.6	292.9
CMRR-041B	*Diff.*	22.2	20.6	5.7	5.1	-74.0	-10.6	-21.6
Pipe #8		94.0	104.9	62.9	36.4	292.5	36.1	304.7
CMRR-042B	*Diff.*	7.8	17.1	4.3	0.5	-64.1	-5.1	-9.8
Pipe #9	*Avg.*	92.0	90.5	62.5	38.5	347.1	57.9	302.3
CMRR-044, 046B	*Diff.*	5.7	2.6	3.9	2.6	-9.5	16.7	-12.2
OVERALL AVG (all samples)		**99.8**	**101.5**	**60.8**	**43.2**	**320.1**	**41.9**	**304.4**
σ		**11.4**	**6.9**	**3.4**	**6.6**	**26.4**	**9.0**	**6.6**
BACKGROUND Qbt$_4$		**86.3**	**87.9**	**58.6**	**35.9**	**356.6**	**41.2**	**314.5**
Δ		**13.5**	**13.6**	**2.2**	**7.3**	**-36.5**	**0.7**	**-10.1**
% Δ		**16**	**16**	**4**	**20**	**-10**	**2**	**-3**

Color Key:

= depletion

= enrichment

Notes:

[1] Upper highlighted row in each sample category lists the background geochemistry of the Qbt subunit against which other samples in the specific location will be compared.

[2] Where present, values to right represent a calculated average of multiple samples.

[3] Calculated difference between measured value for sample and measured value for background.

[4] Standard deviation (Greek letter sigma).

[5] Difference between the overall average of all samples and the respective Qbt subunit background value (Greek capital letter delta).

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APPENDIX C.

METHODS

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Excavation Logging

We obtained detailed geologic information from the excavation walls at the CMRR seismic pit using a procedure called Excavation Logging. We developed and followed a quality assurance procedure (CMRR-WI-0501, R0, Excavation Logging) to prepare the excavation walls, to map the excavated geologic exposures, and to collect pertinent samples and data for the CMRR Seismic Investigation. For this study, the terms "mapping" and "logging" are used interchangeably.

The excavation was opened in two phases (Figure 3). Phase A exposed the two temporary walls (SWT and SET), as well as the NW, N, and part of the NE wall. Phase A investigations focused solely on mapping the SWT and SET walls, since they would be removed during the Phase 2 excavation. Phase A seismic investigations began on 27 November 2006 and concluded on 16 January 2007. Phase B expanded the CMRR excavation to its present state. This phase removed the temporary walls and fully exposed the SE, NW, N, and NE walls. The excavation doubled as the materials laydown and inspection yard for construction of the neighboring RLUOB facility. We began our Phase B investigations on 5 March 2007 and concluded our field campaign on 2 October 2007 (Figure C-1).

Logging the walls of the CMRR seismic pit involved a multi-step approach. Due to the height (avg. 30-ft high) and geometry (75° slope) of the excavation walls, our team had foremost responsibility to ensure worker safety by first removing loose rock and debris from each wall. After loose material was safely removed, our team demarcated geologic contact relationships and structures (e.g., fractures and faults) using color-coded flagged nails. Other marked locations included sample sites, and large (> 20 ft^2) regions of no geologic features or contact relationships (this served as a digital orthorectification aid). The nails were a reference grid for mapping and for high-precision geodetic surveying.

Once the color-coded nails were installed, the wall was photographed using a high-resolution (> 3 megapixel) digital camera. Requirements for acceptable photographs included images shot 1) as orthogonal to the exposure face as possible to minimize parallax distortion, 2) at an appropriate distance from the wall as to include the full height of the wall in a single shot, and 3) at an appropriately high resolution and in acceptable sunlight such that individual color-coded flags could be distinguished and the full wall was illuminated with equal brightness (e.g., no large shadowed regions). The photos were then downloaded, printed in 16 in x 20 in panels, sequentially numbered, and used as base maps for geologic mapping. At this stage, a team member could map the exposure by documenting the detailed geologic information exposed in the excavation wall on the base map using the color-coded nails as references.

A high-precision geodetic survey of the color-coded nails in the excavation wall typically occurred simultaneously with logging. The survey was performed using a Spectra Precision® total station, a computerized theodolite that measures angles and distances to

a prism and records these data electronically, and completed within the scope of CMRR QA procedure CMRR-WI-0506, Geodetic Surveys. When the total station is accurately located in reference to known control points or benchmarks, these data can be directly converted into 1983 North American Datum (NAD 83) coordinate system and directly input into a Geographic Information System (GIS). A single survey instrument operator was used during the course of our seismic study to ensure consistency. During daily initial setup of the total station using established benchmarks, the surveyor verified acceptable instrument accuracy. For purposes of the CMRR investigation, accuracy of ≤ 0.1 ft in the horizontal and vertical was required. After completion of field surveying, the survey data were downloaded from the total station survey controller to a desktop computer using the software platform Terramodel (© Spectra Precision). Terramodel converts survey data from Geodimeter File Editor format to Microsoft Excel (.xls) format, allowing for direct importation to ArcGIS. At this stage, an additional quality assurance/control check is performed on the surveyed points within ArcGIS by plotting them on maps or digital photographs and comparing their locations with preexisting surveyed points, benchmarks, or other features (e.g., roads, buildings, fences). To be acceptable, the survey data had to be internally consistent (all surveyed points in correct location relative to each other) and consistent with other features (e.g., established benchmarks). All surveys completed by Seismic Hazards Geology Team personnel for purposes of this study fulfilled these obligations.

Once logging was completed and survey data for a wall was obtained, Seismic Hazards Geology Team GIS specialists began photo correlation and orthorectification. The survey data for a single wall were imported into ArcGIS and rotated to best-fit with an *x*- or *y*-axis to create a cross-section. Since the excavation walls were not oriented in cardinal directions, they were rotated to an *x*-*z* or *y*-*z* plane to create a cross-sectional dataset that preserved line length and relative positions of the survey points. The data were then projected from plan (map) view to cross-sectional view, where the *x*-axis represents absolute distance from a predetermined point near a wall's edge and the *y*-axis represents elevation (*z*). Then the survey data were used to orthorectify the photos.

Our team GIS specialists moved the photos within the ArcGIS program to correlate them with the properly associated survey points. Since the survey data have no spatial distortion, and the photographs incur minor parallax distortion, we applied a spline fit rectification script to the photo within the ArcGIS program to precisely correlate the photos with the associated survey data. Spline fit rectification incurs a smaller error than linear interpolation and was the preferred method for orthorectifying the digital photos. Once the orthorectification was completed, our GIS specialists converted the hand-drawn logged geologic features into electronically georeferenced features. Thus a composite, electronic log was created from a mosaic of many hand-drawn logs and a vast amount of survey data. Given the amount of visual matching incorporated into this process to ensure precise photo orthorectification, as well as the labor-intensive nature of electronically replicating the mapped features, the GIS component of the excavation logging procedure took several months to complete, and overlapped with active fieldwork.

Structural Analyses

We performed a detailed fracture analysis at the CMRR seismic pit, taking advantage of nearly 100% accessible geologic exposure, which included units Qbt_4, the upper portion of Qbt_3, and the variably-interbedded Qbt_s. Our team located, mapped, and measured 1204 fractures and faults along the six excavation walls. Not all mapped fractures could have structural data collected from them, while some fractures have multiple structural measurements; thus, the total number of mapped fractures likely nears 2000. Fractures were mapped at a scale of 1:10 on printed digital photos. The printed photos were then digitized, orthorectified, georeferenced, and electronically stitched together at a scale of 1:36 to create a composite view of each wall. After mapping, the team collected orientation data on measurable fractures. Fracture strike and dip were measured to an accuracy of ± 2° using a Brunton transit compass adjusted 9.5° E for local magnetic declination. For planar geologic features not reachable from the ground, orientation measurements were collected using two methods: 1) moving to a location at least 20 ft from the wall and sighting the feature, or 2) using a boom-lift with an aluminum work platform and safety railing to access and measure the feature without magnetic interference. During Phase A, sighting measurements were easily obtained. Using a boom-lift was the sole option for acquiring structural data during Phase B due to dramatically increased construction activities and restriction of the seismic work zone to 20 ft from the excavation walls.

Each measurement was noted on the corresponding photolog at the location where it was taken (see Appendix E). Other data, including aperture, fracture fill material, and characteristics of the fracture terminations, were collected on fractures that deformed contacts with other geologic units exposed in the excavation.

We performed a geometric analysis using the structure data, identifying preferred orientations with a common method of stereoplot and Rose diagram generation. We used the computer program SpheriStat (© Pangaea Scientific) to determine preferred orientations using Gaussian counting methods (Robin and Jowett 1986), which allows determination of the principal directions of the strain ellipse with 2*s* uncertainties. Point density is estimated by counting the number of data points (poles to fracture planes) within a certain angular distance of the particular direction at which the point density is being measured. We used a Gaussian counting function where counting is weighted according to angular distance from the counting station. Specifically, we used the Fisher function, $w = e^{k(\cos\theta - 1)}$, where θ is the angular value and k is the kurtosis. The value of k determines the rate at which the weighting function decreases with angular distance; in other words, it is a description of the peakedness of a distribution. We chose a k value that produces a result equivalent to the Starkey method, which adjusts the size of the counting circle according to sample size, resulting in statistically significant density estimates (Starkey 1977). Stereonet contour intervals, shown as shades of pink in Figures 4 through 13, are equal to $E + 2s$, $E + 4s$, etc., where E is the number of points expected to be found in the counting circle if the points were extracted randomly from a uniform population, and s is the standard deviation.

In addition to making graphical plots of contour density distributions, we also calculated principal directions (eigenvectors), which show the average clustering of the whole sample. The difference between the point density distribution and the principal directions is similar to the difference between the mode (most frequent) and the mean (overall average), respectively. The smallest eigenvector points in the direction of the normal to the best-fitting plane through the set of poles to fracture planes. The largest eigenvector is in the direction of the statistically greatest clustering. Quantitative comparison can be made of eigenvectors and uncertainties for different data sets, whereas only graphical comparison can be made of contoured point densities.

As an additional method of illustrating preferred orientations, we plotted rose diagrams of fracture strikes in 10° classes and calculated mean strikes with 95% confidence intervals. Labeled great circles represent percentage of total data included within a particular bin. Rose diagrams bear the advantage of being directly comparable to the results of fracture analyses in other parts of the Laboratory (e.g., Wohletz 1995; Vaniman and Chipera 1995; Lewis et al. 2002).

X-Ray Diffraction (XRD)

X-ray diffraction (XRD) analyses of the 49 tuff samples were used to determine quantitative mineral compositions of bulk ash flow tuff samples. Each sample was ground and mixed with corundum powders in a weight ratio sample: Al_2O_3 = 80: 20. The addition of the standard corundum allows for quantitative XRD analysis of the bulk rock using the internal-standard method of Chung (1974). XRD measurements were conducted with a Siemens D500 theta-theta or theta-two theta diffractometer using CuKα radiation. Data were collected from 2 to 70º 2θ in step scan mode with steps of 0.02º and count times of 8 or 12 s per step. Quantitative phase analyses were performed with the FullPat program.

X-Ray Fluorescence (XRF)

X-ray fluorescence (XRF) analyses were performed at 9:1 dilution for 49 samples to obtain both major and trace elements of the tuff. These samples were pulverized in a ballmill using tungsten carbide containers. To guarantee proper sample dissolution, the samples were fused with two separate iterations. The first was for 45 minutes at 1100°C followed by a second fusion for 1 hour at 1150°C.

In addition to certified standards, internal standards are analyzed with each XRF data set to safeguard against crucible and sample preparation contamination. One of each twenty crucibles are assessed for contamination by analyzing either reagent SiO_2 or quartz sand that have undetectable trace elements to provide some assurance that the batch of crucibles used for each data set are not contaminated. Additional internal standards are pulverized and analyzed together with each data set, primarily to safeguard against problems that relate to sample preparation.

Loss on Ignition (LOI) is a vital parameter in the data reduction process and is therefore routinely determined. The loss of volatiles changes the flux to sample ratio, which affects X-ray absorption and fluorescence in a non-linear fashion. Failure to address the LOI leads to increasingly high results with increasing LOI. LOI has been determined and used in the data reduction for this data set.

Accuracy of results for unknowns is determined by evaluating the analytical total, which equals the total of all concentrations, including trace elements as oxides, plus the LOI. Acceptable analytical totals must fall between 100+/-1.5%. Analyses slightly outside this range may be acceptable under certain circumstances, for example, low totals for samples that probably contain high concentrations of elements that are not analyzed or high totals for samples with high Fe contents, which are reported as FeIII. The totals for this data set are acceptable.

Long-term stability of the XRF system is ensured by comparing analyses of standards analyzed as unknowns with the average analyses for the same standards. A summary of this comparison shows excellent consistency for all elements.

Petrographic Sample Analysis

Petrographic analyses of Tsherige Member subunits Qbt3 & Qbt4 is extremely valuable in this study, since chemical variations within and between the two units are subtle. This is especially the case for delineating any overprints imparted by fumarolic pipe gas depositional mineral phases. The petrographic descriptions and field notes of samples CMRR-002B to CMRR-046B are described in full detail within Appendix B. Ash flow tuff samples were examined using a Nikon polarizing microscope with both transmitted and reflected light capability.

Six background samples of Qbt_3 were collected at least two feet away from rubble zones and the bordering fumarolic pipe walls. All six samples are devitrified and non-welded, with quartz and alkali feldspar phenocrysts occurring in sub equal amounts for a total of 25-30 volume %. Minor amounts of clinopyroxene and Fe-oxides (< 2 % each) are present. Phenocrysts are predominantly euhedral. Simple twins are observed in the feldspars. Shards are devitrified and exhibit axiolitic textures consisting of cristobalite and alkali feldspar. The shard structures are fully inflated and show no deformation due to welding. Pumice lapilli are vapor phase altered, with a thin axiolitic texture at the outer wall. The lapilli have many open voids. However, sparse late stage tridymite is observed as small, twinned, wedge shaped crystals growing into small portions of the voids of the lapilli. Groundmass is clear (i.e. no clays), devitrified to cristobalite and alkali feldspar, and contains approximately 5-10 volume % open void space.

Twelve fumarolic pipe wall samples were examined in Qbt_3. Phenocrysts are virtually the same as background samples in phenocryst types (quartz, alkali feldspar, clinopyroxene, Fe-oxides) and abundances. However, the feldspars in samples from the pipes commonly display alkali feldspar overgrowths. Three overgrowth types are observed: 1) feathery overgrowths, optically aligned with the host crystal, present due to late stage fumarolic gases; 2) magmatic rim overgrowths, whose ragged appearance may indicate rapid

growth or partial resorption; and 3) very mottled rims, due to overlap of shards / groundmass. In addition, both mafic phenocryst types display minor oxidation / alteration rims. Pumice lapilli from samples in the pipes display further infill of previous void space by silicic minerals. The original tubes structures of the pumice are heavily encrusted by multiple wedge shaped tridymite and elongate sanidine crystals. There is a high amount of tridymite and sanidine infilling in lapilli as euhedral phases. Some spherulitic textures are also observed within the centers of these lapilli. This high amount of vapor phase mineralogy crystallization within the lapilli is likely due to gases from the fumarolic pipe. The pumice exhibit thin axiolitic textures at the outer walls of the lapilli. Shards in the wall samples are fully inflated and show no deformation due to welding. The shards are devitrified and exhibit axiolitic textures consisting of cristobalite and alkali feldspar. The shards are light lemon color. The groundmass is fine grained and varies from moderate brown to light tan color. The open void space of the groundmass, noted in the background samples, is literally choked with euhedral, fine grained tridymite / sanidine crystals in samples from the pipes. These very late stage crystals in the groundmass may be the cause of induration observed in the field. The paragenesis of these late stage phases is indicative of emplacement from fumarolic gas phase deposition. Samples CMRR-30B, -38B, and -43B all have significant amounts (10 -25 volume %) of clay. Minor amounts of Mn-oxides are also present in these samples. These minerals were the last phases deposited in the samples, filling the centers of pumice and draping fumarolic gas-emplaced tridymite and sanidine.

A total of ten field samples from the centers of fumarolic pipes within Qbt_3 were examined in thin section. These samples are highly variable in texture, especially concerning the appearance (or lack thereof) of fines depletion due to streaming of gases and removal of groundmass. There is also high variability of late stage clay and Mn-oxide occurrence in these Qbt_3 rubble zone samples. These two factors may be due to the very local nature of upward gas streaming and later downward infiltration of surface water, respectively. The major phenocryst components are quartz, alkali feldspar, clinopyroxene (3%), and Fe-oxides (2%). Quartz and alkali feldspar are in subequal amounts for a total of 25%. Therefore total phenocryst content is approximately 30%. Euhedral crystals have less abundance than anhedral fragments. These fragments also infill spaces between large phenocrysts, indicating a potential late stage response to fines depletion episodes. All three overgrowth types described in Qbt_3 wall samples occur here as well. Once again these are: 1) feathery, patchy overgrowths that are optically continuous with major crystals, 2) continuous rims created in magma chamber, and 3) groundmass / shards overlapping onto phenocrysts. The feathery overgrowth type is most common of the three in this sample and is due to fumarolic gases. Shards in pipe center samples are often a light lemon yellow color. They exhibit fully open structure indicative of a nonwelded state. Outer edges exhibit axiolitic texture. Observations of pumice indicate axiolitic texture on outer edges of lapilli. Multiple gas phase deposition textures with tridymite and sanidine are observed. These include spherulites, rosettes, large euhedral crystals and plumose structures. Open spaces are rarely observed in the lapilli and may possibly be due to disaggregation during gas streaming. Groundmass is absent in some samples, indicative of a fines depletion mechanism such as gas streaming. In other samples, all groundmass void space is completely infilled by very late stage

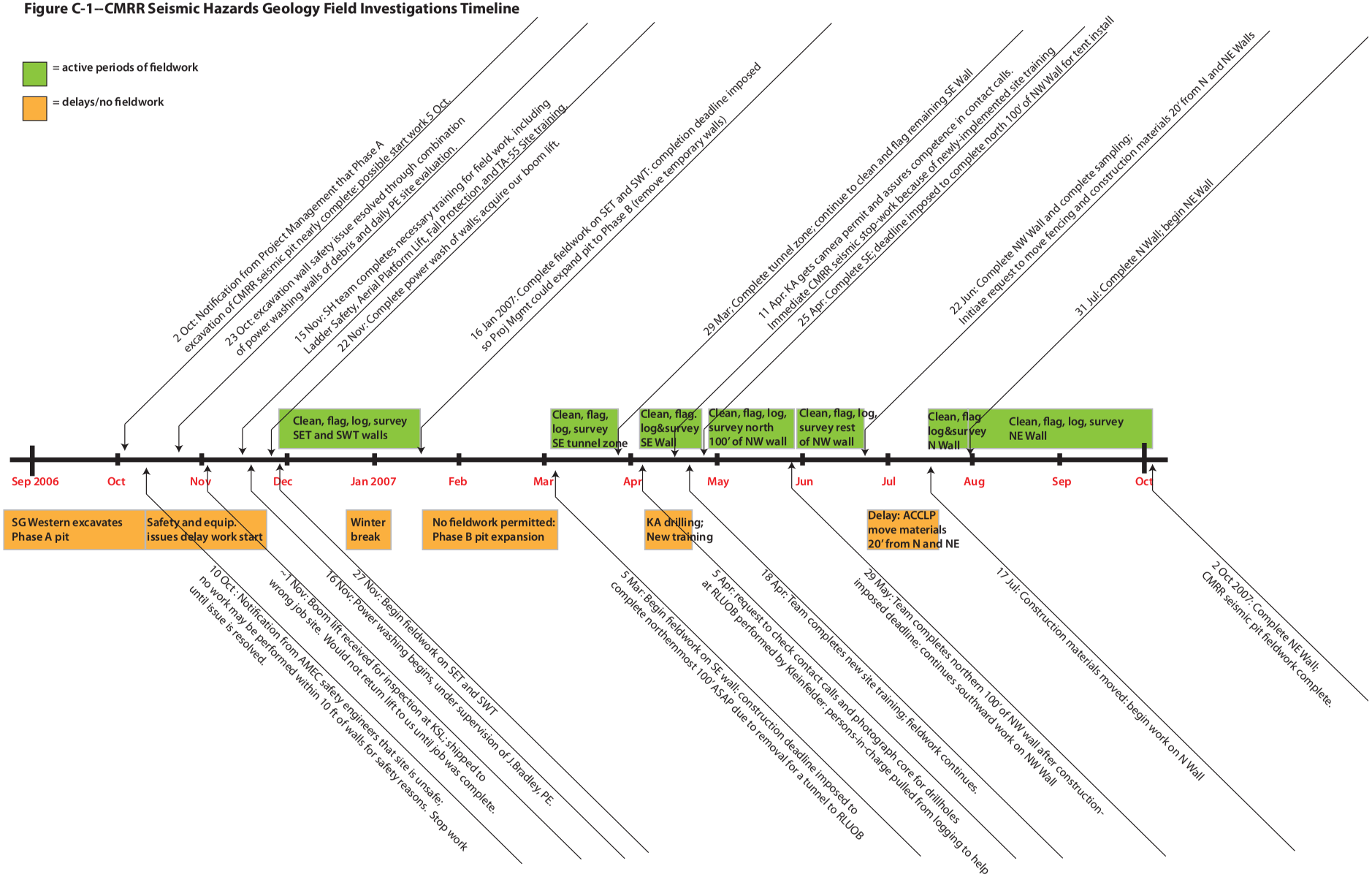
tridymite / sanidine crystals. In samples CMRR-29B and CMRR-33B there is approximately 10 % clays / Mn-oxides as late stage infill material produced by fumarolic gas alteration. Fibrous sprays of scapolite were identified within pumice and groundmass voids of sample CMRR-17B.

Seven samples of Qbt_s, stratigraphically located between Qbt_3 and Qbt_4 were collected and examined. Due to the depositional nature of surges, there are wide variations in percentages of phenocrysts (60 – 75%), shards (<1 – 5%), pumice (2-5%) and fine matrix (20-40%). Clay content within the matrix also varies from 0 to 25 volume %. As a general rule phenocrysts have the following characteristics: typically, they are approximately 70 % by volume; large euhedral crystals are present, but a large percentage are crystal fragments; the crystals are predominantly quartz and alkali feldspar, but mafic minerals (clinopyroxene and Fe-oxides) are present up to approximately 7% with rare altered amphiboles. Overgrowths of two types are noted in the Qbt_s samples, but are rare: 1) full rims with multiple inclusions, seemingly due to overlap of groundmass on crystal rims (this overgrowth dominates), and 2) feathery, patchy growths seen on phenocrysts that appear indicative of silicic gas deposition of feldspar material. Pumice lapilli are rare, but have growth of tridymite and sanidine in open void spaces. Fumarolic vapor minerals present as fine grained masses, sheaves, and euhedral crystals growing into lapilli voids. Within the lapilli, rare clays intermingle with the vapor phase material. Clays commonly rim the border of the lapilli in these samples. Shards display axiolitic texture due to devitrification, and have medium brown color. Groundmass volume is typically 30 %, and the color is yellow brown. Previous open voids in groundmass are now crystallized with euhedral tridymite and sanidine. Clays commonly occur at 10 volume % as darker yellow brown patches in matrix of groundmass. In two samples (CMRR-39B, -45B) there are also appreciable Mn-oxides present within the groundmass.

Three background samples of Qbt_4 were examined for this study. Major crystal components are quartz and alkali feldspar, with sparse clinopyroxene and Fe-oxides. Clinopyroxenes exhibit thin oxidized alteration rims. Only two overgrowth forms are commonly observed: 1) very mottled rims, caused by shards / groundmass overlapping onto larger crystals, and 2) rare rim overgrowths formed pre-eruption in the magma chamber. Feathery overgrowths caused by vapor phase gases are extremely rare in these Qbt_4 background samples. Infill materials in voids of pumice lapilli are distinctly different from all Qbt_3 samples. Lapilli are rare and small, with infill material of spherulites, as both full spheres and partial sprays. The spherulites are composed of material that is acicular, fiberous and interlocking, and appears to be intergrown cristobalite and feldspar from devitrification. Shards in these samples are yellow-tan to light brown in color, slightly deformed due to incipient welding, with axiolitic textures apparent. Original bubble walls complete while shard fragments are slightly deformed. Shard deformation and the fact that matrix void space is extremely low compared to Qbt_3 samples indicate that Qbt_4 is slightly welded. Matrix in Qbt_4 is slightly darker color that the shard component, and is composed of extremely fine grained devitrification products, cristobalite, and alkali feldspar.

A series of eight Qbt_4 samples were obtained directly above the rubblized pipe centers of Qbt_3. Major crystals are quartz, alkali feldspar, clinopyroxene, Fe-oxides and minor amphibole. The phenocrysts are less abundant than in Qbt_3 and the crystal size is (on average) smaller than in Qbt_3. There are many more crystal fragments than euhedra. Feldspars have complex twinning. The proportion of clinopyroxene is greater in Qbt_4 than in Qbt_3. Furthermore, both the clinopyroxene and Fe-oxides display oxidation rims in these rubblized samples. All pumice lapilli are rimmed by clays. Late stage fumarolic silicates (tridymite / sanidine) imposed by siliceous gases are pervasive. Euhedral crystals and bowtie (sheaf) structures are common in lapilli. Many fine grained crystals are surrounded by clays. Shards are tan colored, devitrified to cristobalite and alkali feldspar in axiolitic textures. Some shards have been wholly replaced by Mn-oxides. The groundmass of the Qbt_4 rubblized specimens sampled directly above the pipes of Qbt_3 are rich in clays that are surrounding very late stage vapor phase minerals (tridymite / sanidine) and Mn-oxides. The above mentioned vapor phase minerals fill previous void space of groundmass. The combined clays and Mn-oxides of these samples range from 10 (CMRR-44B, -46B) to 25 volume percent (CMRR-12B,-41B,-42B).

Figure C-1--CMRR Seismic Hazards Geology Field Investigations Timeline



APPENDIX D.

SURVEY DATA, GROUPED BY EXCAVATION WALL

CMRR Geologic Investigations
Southeast Temporary Wall Surveying January 2007

Point Codes (Pcode):

BS	backshot (to benchmark)
FR	fracture
TOS	top of surge (Qbt_4-Qbt_s contact)
BOS	bottom of surge (Qbt_s-Qbt_3 contact)
C34	Qbt_3-Qbt_4 contact
STC	soil-tuff contact
CP	control point
FF	fossil fumarole
FTC	fill-tuff contact
OOP	out-of-place block

***Note: where prism is listed as horizontal, rod length (horiz. distance from wall) is 0.9 ft unless otherwise noted.

Point#	Northing	Easting	Elevation	Pcode	Notes
7001	1768959.745	1624395.42	7267.455	BS	Poor quality backshot; redo station setup
7001	1768959.555	1624395.34	7267.71	BS	Backshot; start survey 8 January 2007
7005	1769110.21	1624513.59	7272.57	BM	
7006	1769253.425	1624796.965	7277.635	BM	
2000	1769072.435	1624683.48	7287.19	FR	
2001	1769073.38	1624683.49	7285.49	FR	
2002	1769074.275	1624684.075	7285.56	FR	
2003	1769074.55	1624684.45	7286.945	FR	
2004	1769075.185	1624685.54	7288.715	FR	
2005	1769075.605	1624684.775	7286.15	FR	
2006	1769074.805	1624683.745	7284.48	FR	
2007	1769075.875	1624683.955	7283.865	FR	
2008	1769076.5	1624684.01	7283.07	TOS	
2009	1769077.035	1624683.42	7281.85	BOS	
2010	1769074.145	1624682.805	7282.98	TOS	
2011	1769079.265	1624682.355	7278.025	FR	
2012	1769080.13	1624684.295	7279.82	FR	
2013	1769078.75	1624684.685	7281.845	BOS	
2014	1769080.81	1624685.405	7281.575	BOS	
2015	1769081.04	1624685.805	7281.745	BOS	
2016	1769080.27	1624686.185	7283.03	TOS	
2017	1769078.815	1624685.41	7283.095	TOS	
2018	1769079.12	1624685.785	7283.275	FR	
2019	1769077.845	1624685.51	7284.7	FR	
2020	1769077.06	1624685.445	7285.405	FR	
2021	1769077.085	1624685.755	7286.45	FR	
2022	1769077.825	1624686.165	7286.7	FR	
2023	1769078.69	1624686.96	7285.945	FR	
2024	1769079.45	1624687.73	7287.73	FR	
2025	1769079.45	1624687.775	7286.655	FR	
2026	1769079.97	1624689.145	7289.465	FR	
2027	1769082.525	1624688.535	7284.715	FR	
2028	1769082.56	1624687.89	7283.665	FR	
2029	1769082.015	1624687.56	7283.64	FR	
2030	1769082.35	1624687.245	7282.48	FR	
2031	1769081.895	1624686.665	7281.99	FR	
2032	1769081.44	1624685.895	7281.275	FR	
2033	1769081.145	1624685.87	7281.77	BOS	
2034	1769082.955	1624687.935	7281.905	BOS	
2035	1769082.805	1624688.35	7282.5	TOS	
2036	1769082.89	1624686.345	7280.07	FR	
2037	1769084.015	1624685.285	7276.56	FR	
2038	1769085.28	1624688.18	7277.585	FR	
2039	1769086.2	1624689.565	7278.31	FR	
2040	1769085.885	1624688.815	7279.21	FR	
2041	1769086.615	1624689.745	7279.76	FR	
2042	1769085.685	1624689.83	7281.945	BOS	
2043	1769086.555	1624690.825	7282.5	TOS	
2044	1769086.44	1624690.885	7282.83	FR	
2045	1769085.105	1624689.79	7282.52	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2046	1769084.475	1624689.095	7282.58	FR	
2047	1769085.965	1624690.885	7283.7	FR	
2048	1769083.89	1624689.54	7283.415	FR	
2049	1769084.925	1624690.805	7284.64	FR	
2050	1769082.85	1624689.72	7286.615	FR	
2051	1769083.795	1624691.015	7287.6	FR	
2052	1769083.6	1624691.155	7288.005	FR	
2053	1769082.3	1624690.2	7287.625	FR	
2054	1769082.465	1624690.975	7289.385	FR	
2055	1769084.125	1624692.13	7288.825	FR	
2056	1769084.385	1624692.485	7288.745	FR	
2057	1769084.005	1624692.165	7289.565	FR	
2058	1769084.07	1624692.59	7290.335	FR	
2059	1769092.22	1624694.685	7280.235	FR	
2060	1769091.025	1624694.245	7280.415	FR	
2061	1769091.3	1624694.19	7280.165	FR	
2062	1769090.55	1624693.525	7279.7	FR	
2063	1769091.17	1624692.79	7277.93	FR	
2064	1769090.875	1624693.115	7278.425	FR	
2065	1769089.76	1624692.3	7278.565	FR	
2066	1769087.675	1624690.48	7279.155	FR	
2067	1769088.89	1624691.645	7278.9	FR	
2068	1769087.295	1624690.78	7280.71	FR	
2069	1769088.92	1624692.315	7280.795	FR	
2070	1769091.435	1624695.325	7282.17	C34	
2071	1769090.435	1624693.89	7282.085	C34	
2072	1769089.195	1624693.21	7282.06	BOS	
2073	1769087.395	1624691.28	7282.145	BOS	
2074	1769088.905	1624693.46	7284.125	FR	
2075	1769089.4	1624695.105	7286.105	FR	
2076	1769090.46	1624696.195	7286.495	FR	
2077	1769090.515	1624696.265	7286.68	FR	
2078	1769090.025	1624696.985	7289.155	FR	
2079	1769088.745	1624696.715	7289.565	FR	
2080	1769090.845	1624695.89	7283.93	FR	
2081	1769096.25	1624698.48	7280.565	FR	
2082	1769097.66	1624699.985	7280.82	FR	
2083	1769095.16	1624698.22	7281.83	C34	
2084	1769095.8	1624698.675	7281.815	TOS	
2085	1769096.055	1624698.975	7281.535	BOS	
2086	1769095.99	1624700.02	7283.705	FR	
2087	1769094.81	1624698.625	7284.255	FR	
2088	1769094.11	1624697.595	7283.405	FR	
2089	1769094.985	1624699.31	7284.965	FR	
2090	1769093.115	1624700.545	7289.955	FR	
2091	1769094.38	1624701.56	7289.44	FR	
2092	1769094.285	1624701.335	7287.605	FR	
2093	1769093.33	1624699.71	7287.63	FR	
2094	1769093.465	1624699.07	7286.505	FR	
2095	1769093.86	1624699.595	7286.58	FR	
2096	1769101.38	1624703.415	7279.605	OP	
2097	1769100.265	1624702.305	7279.25	OP	
2098	1769100.045	1624702.495	7279.63	OP	
2099	1769100.975	1624703.845	7279.9	OP	
2100	1769100.415	1624703.78	7280.8	OP	
2101	1769099.39	1624702.42	7280.99	OP	
2102	1769099.325	1624701.86	7279.99	FR	
2103	1769102.015	1624704.435	7280.925	FR	
2104	1769101.25	1624704.57	7281.85	FR	
2105	1769101.955	1624705.345	7282.845	TOS	
2106	1769102.035	1624705.005	7281.75	BOS	
2107	1769098.34	1624700.87	7279.88	FR	
2108	1769098.235	1624701.09	7281.51	TOS	
2109	1769097.91	1624700.765	7281.4	BOS	
2110	1769095.375	1624703.03	7290.72	FR	
2111	1769096.62	1624703.945	7290.59	FR	
2112	1769095.325	1624702.46	7289.435	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2113	1769095.59	1624702.1	7287.97	FR	
2114	1769096.035	1624702.31	7287.475	FR	
2115	1769096.725	1624703.645	7289.145	FR	
2116	1769097.865	1624702.64	7285.86	FR	
2117	1769097.17	1624702.53	7285.36	FR	
2118	1769098.335	1624703.225	7284.515	FR	
2119	1769099.135	1624705.48	7291.28	FR	
2120	1769097.335	1624705.065	7291.165	FR	
2121	1769097.765	1624704.76	7288.19	FR	
2122	1769099.89	1624706.08	7287.415	FR	
2123	1769099.325	1624705.16	7286.085	FR	
2124	1769101.385	1624705.56	7283.845	FR	
2125	1769100.485	1624705.615	7285.12	FR	
2126	1769099.975	1624704.26	7283.84	FR	
2127	1769102.395	1624707.68	7286.505	FR	
2128	1769100.37	1624706.86	7290.19	FR	
2129	1769100.785	1624707.675	7291.05	FR	
2130	1769102.13	1624708.675	7292.225	FR	
2131	1769102.96	1624709.34	7291.83	FR	
2132	1769103.41	1624708.265	7286.07	FR	
2133	1769103.175	1624708.025	7284.69	FR	
2134	1769102.785	1624707.565	7283.815	FR	
2135	1769104.13	1624708.21	7283.275	FR	
2136	1769103.465	1624707.33	7283.05	TOS	
2137	1769104.7	1624708.35	7283.185	TOS	
2138	1769103.74	1624706.56	7281.805	BOS	
2139	1769105.21	1624707.635	7281.51	BOS	
2140	1769105.985	1624708.45	7281.43	BOS	
2141	1769105.905	1624709.18	7282.985	TOS	
2142	1769106.735	1624708.88	7281.15	BOS	
2143	1769107.43	1624709.095	7280.88	BOS	
2144	1769106.8	1624712.22	7291.635	FR	
2145	1769107.275	1624712.82	7292.175	FR	
2146	1769108.495	1624713.785	7292.37	FR	
2147	1769108.03	1624712.535	7289.045	FR	
2148	1769107.08	1624711.56	7288.385	FR	
2149	1769107.695	1624711.905	7287.735	FR	
2150	1769107.075	1624711.015	7286.24	FR	
2151	1769107.57	1624711.45	7286.225	FR	
2152	1769108.055	1624711.785	7285.515	FR	
2153	1769106.875	1624709.79	7282.88	TOS	
2154	1769107.33	1624710.325	7282.58	FR	
2155	1769107.875	1624710.935	7282.565	FR	
2156	1769108.045	1624711.145	7283.06	TOS	
2157	1769107.47	1624709.105	7280.785	BOS	
2158	1769108.42	1624709.725	7280.5	BOS	
2159	1769108.8	1624710.335	7281.15	BOS	
2160	1769109.22	1624710.99	7281.355	BOS	
2161	1769109.535	1624709.345	7279.09	FR	
2162	1769111.15	1624715.505	7291.24	FR	
2163	1769111.14	1624714.5	7287.16	FR	
2164	1769111.695	1624715.2	7287.055	FR	
2165	1769111.17	1624715.095	7286.24	FR	
2166	1769112.13	1624714.445	7284.12	FR	
2167	1769111.315	1624713.58	7283.45	FR	
2168	1769111.53	1624713.375	7283.03	TOS	
2169	1769112.87	1624714.625	7282.66	TOS	
2170	1769111.645	1624712.645	7281.485	BOS	
2171	1769113.1	1624714.16	7281.545	BOS	
2172	1769112.575	1624716.535	7291.92	FR	
2173	1769114.145	1624717.51	7291.57	FR	
2174	1769114.41	1624718.06	7292.61	FR	
2175	1769114.97	1624717.95	7291.16	FR	
2176	1769113.47	1624716.565	7288.24	FR	
2177	1769116.3	1624719.12	7292.035	FR	
2178	1769116.45	1624718.75	7289.03	FR	
2179	1769117.03	1624719.285	7290.495	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2180	1769117.75	1624719.73	7291.34	FR	
2181	1769118.56	1624720.035	7290.135	FR	
2182	1769116.065	1624717.805	7287.155	FR	End survey 8 January 2007
7002	1768666.905	1624752.7	7266.59	BS	Backshot; start survey 9 January 2007
2186	1769114.885	1624715.515	7281.925	TOS	
2187	1769114.965	1624715.5	7281.51	BOS	
2188	1769115.355	1624716.09	7281.75	C34	
2189	1769117.37	1624717.205	7281.64	C34	
2190	1769116.65	1624714.64	7277.955	FR	
2191	1769117.705	1624716.285	7279.065	FR	
2192	1769119.18	1624717.625	7279.015	FR	
2193	1769119.64	1624717.675	7278.475	FR	
2194	1769112.47	1624715.315	7285.045	FR	
2195	1769113.92	1624716.77	7285.685	FR	
2196	1769115.965	1624717.935	7287.09	FR	
2197	1769116.215	1624719.275	7291.93	FR	
2198	1769117.51	1624720.37	7292.63	FR	
2199	1769119.025	1624721.66	7292.945	FR	
2200	1769119.61	1624722.765	7293.155	FR	
2201	1769119.195	1624721.02	7290.74	FR	
2202	1769119.29	1624720.595	7288.175	FR	
2203	1769120.04	1624720.84	7286.635	FR	
2204	1769120.28	1624720.385	7284.76	FR	
2205	1769121.34	1624721.325	7285.12	FR	
2206	1769120.94	1624720.745	7282.98	FR	
2207	1769119.2	1624718.68	7281.68	C34	
2208	1769121.175	1624720.445	7281.525	C34	
2209	1769119.25	1624717.655	7279.055	FR	
2210	1769119.73	1624717.74	7278.455	FR	
2211	1769122.53	1624721.73	7281.595	FR	
2212	1769124.53	1624722.715	7281.695	FR	
2213	1769123	1624721.04	7279.21	FR	
2214	1769123.025	1624721.595	7281.135	C34	
2215	1769124.425	1624721.645	7277.605	FR	
2216	1769124.615	1624722.345	7279.18	FR	
2217	1769124.985	1624723.045	7281.565	C34	
2218	1769120.67	1624723.435	7293	FR	
2219	1769122.59	1624723.915	7291.34	FR	
2220	1769123.025	1624723.65	7289.54	FR	
2221	1769124.2	1624723.17	7284.24	FR	
2222	1769125.135	1624725.9	7292.515	FR	
2223	1769127.115	1624727.405	7289.295	FR	
2224	1769128.03	1624727.48	7288.835	FR	
2225	1769128.685	1624727.735	7288.365	FR	
2226	1769129.235	1624728	7286.985	FR	
2227	1769126.83	1624725.935	7285.725	FR	
2228	1769128.01	1624726.925	7284.295	FR	
2229	1769126.665	1624725.13	7281.605	FR	
2230	1769127.155	1624725.855	7281.67	FR	
2231	1769126.435	1624724.76	7281.295	C34	
2232	1769127.67	1624726.52	7281.305	C34	
2233	1769129.67	1624729.86	7291.54	FR	
2234	1769131.35	1624731.095	7291.69	FR	
2235	1769130.275	1624729.55	7289.815	FR	
2236	1769132.6	1624731.515	7289.48	FR	
2237	1769130.82	1624729.07	7285.74	FR	
2238	1769130.105	1624728.07	7282.97	FR	
2239	1769129.735	1624727.515	7281.425	C34	
2240	1769130.19	1624727.985	7281.52	TOS	
2241	1769130.25	1624728.1	7281.365	TOS	
2242	1769130.275	1624728.125	7281.17	BOS	
2243	1769130.44	1624728.29	7280.64	FR	
2244	1769131.07	1624728.845	7281.325	TOS	
2245	1769130.97	1624729.38	7281.85	FR	
2246	1769132.145	1624729.705	7281.685	FR	
2247	1769131.99	1624729.555	7281.12	BOS	
2248	1769130.835	1624728.8	7278.7	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2249	1769131.905	1624729.69	7279.805	FR	
2250	1769133.17	1624730.4	7278.52	FR	
2251	1769134.3	1624731.14	7278.285	FR	
2252	1769134.605	1624731.62	7281.06	C34	
2253	1769135.43	1624732.245	7281.06	C34	
2254	1769132.31	1624732.915	7293.38	FR	
2255	1769133.49	1624733.14	7292.925	FR	
2256	1769134.195	1624732.88	7290.48	FR	
2257	1769135.52	1624732.965	7284.915	FR	
2258	1769135.835	1624732.77	7281.165	FR	
2259	1769136.155	1624732.875	7278.955	FR	
2260	1769137.435	1624734.255	7279.21	FR	
2261	1769138.68	1624735.34	7280.92	BOS	
2262	1769139.015	1624735.725	7281.06	TOS	
2263	1769139.39	1624736.135	7281.105	FR	
2264	1769140.585	1624736.785	7277.97	FR	
2265	1769140.325	1624736.765	7279.445	FR	
2266	1769140.64	1624736.995	7279.665	FR	
2267	1769140.22	1624736.76	7280.245	FR	
2268	1769140.665	1624737.12	7280.525	FR	
2269	1769139.485	1624736.755	7283.96	FR	
2270	1769140.03	1624737.395	7285.265	FR	
2271	1769139.3	1624736.89	7288.675	FR	
2272	1769140.22	1624737.81	7289.39	FR	
2273	1769140.97	1624738.66	7288.78	FR	
2274	1769140.295	1624738.24	7291.755	FR	
2275	1769139.3	1624737.315	7291.75	FR	
2276	1769141.895	1624739.79	7293.885	FR	
2277	1769141.815	1624739.34	7292.115	FR	
2278	1769142.215	1624739.36	7289.63	FR	
2279	1769143.535	1624739.985	7289.185	FR	
2280	1769141.05	1624738.495	7285.68	FR	
2281	1769142.255	1624739.08	7285.89	FR	
2282	1769143.485	1624739.635	7286.005	FR	
2283	1769141.005	1624738.07	7283.005	FR	
2284	1769143.545	1624739.545	7283.06	FR	
2285	1769142.315	1624738.955	7284.235	FR	
2286	1769141.645	1624738.63	7282.245	C34	
2287	1769142.385	1624739.015	7282.165	BOS	
2288	1769142.885	1624739.435	7282.135	TOS	
2289	1769143.45	1624739.735	7282.15	TOS	
2290	1769143.315	1624739.71	7281.435	FR	
2291	1769142.855	1624739.795	7279.91	FR	
2292	1769143.28	1624739.78	7281.185	BOS	
2293	1769143.705	1624740.085	7280.695	BOS	
2294	1769143.755	1624740.005	7280.915	BOS	
2295	1769143.955	1624740.1	7280.935	BOS	
2296	1769143.9	1624740.13	7280.76	BOS	
2297	1769143.315	1624739.725	7277.975	FR	
2298	1769143.71	1624739.105	7276.805	FR	2.0' horizontal prism
2299	1769143.27	1624741.54	7294.15	FR	
2300	1769147.88	1624744.645	7294.045	FR	
2301	1769148.46	1624745.01	7292.81	FR	
2302	1769147.395	1624743.94	7290.775	FR	
2303	1769147.185	1624743.075	7288.04	FR	
2304	1769146.99	1624742.71	7286.61	FR	
2305	1769148.43	1624744.24	7287.21	FR	
2306	1769146.705	1624742.105	7284.46	FR	
2307	1769149.335	1624744.005	7284.12	FR	
2308	1769148.835	1624743.745	7282.915	TOS	
2309	1769149.825	1624745.045	7283.2	TOS	
2310	1769148.335	1624743.725	7282.185	TOS	
2311	1769147.215	1624742.915	7281.86	TOS	
2312	1769148.135	1624743.645	7281.58	BOS	
2313	1769147.715	1624743.235	7281.38	FR	
2314	1769147.15	1624743.15	7281.07	BOS	
2315	1769146.49	1624742.63	7280.955	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
2316	1769146.13	1624742.39	7281.77	TOS	
2317	1769145.99	1624742.1	7281.24	TOS	
2318	1769145.62	1624741.855	7281.28	TOS	
2319	1769145.05	1624741.18	7281.205	TOS	
2320	1769145.03	1624741.26	7280.46	BOS	
2321	1769145.8	1624741.89	7280.85	BOS	
2322	1769145.92	1624742.19	7281.53	FR	
2323	1769146.025	1624741.99	7281.08	FR	
2324	1769145.64	1624741.91	7280.395	FR	
2325	1769146.66	1624742.62	7279.21	FR	
2326	1769145.71	1624741.875	7279.11	FR	
2327	1769145.16	1624741.505	7277.88	FR	
2328	1769150.845	1624747.095	7293.685	FR	
2329	1769150.27	1624746.11	7291.845	FR	
2330	1769152.245	1624747.365	7291.82	FR	
2331	1769152.09	1624747.255	7291.11	FR	
2332	1769151.99	1624747.03	7290.225	FR	
2333	1769151.925	1624746.66	7289.065	FR	
2334	1769151.36	1624746.275	7289.105	FR	
2335	1769152.125	1624746.85	7288.615	FR	
2336	1769151.345	1624746.345	7288.31	FR	
2337	1769152.16	1624747.02	7287.215	FR	
2338	1769152.69	1624747.085	7286.415	FR	
2339	1769150.44	1624745.175	7286.75	FR	
2340	1769150.195	1624745.16	7285.32	FR	
2341	1769150.51	1624746.02	7282.92	TOS	
2342	1769150.77	1624745.645	7281.255	BOS	
2343	1769153.015	1624749.53	7295.085	FR	
2344	1769152.925	1624749.07	7292.76	FR	
2345	1769152.93	1624748.57	7292.165	FR	
2346	1769153.17	1624748.475	7291.06	FR	
2347	1769154.965	1624750.585	7293.215	FR	
2348	1769155.25	1624750.66	7292.61	FR	
2349	1769155.045	1624750.085	7291.55	FR	
2350	1769153.295	1624747.945	7290.32	FR	
2351	1769154.35	1624748.97	7290.21	FR	
2352	1769155.925	1624750.535	7291.74	FR	
2353	1769155.805	1624750.015	7289.825	FR	
2354	1769156.185	1624750.265	7289.56	FR	
2355	1769156.1	1624750.05	7289.29	FR	
2356	1769155.14	1624749.215	7289.09	FR	
2357	1769153.605	1624748.085	7288.725	FR	
2358	1769153.34	1624747.815	7288.01	FR	
2359	1769153.925	1624747.905	7287.715	FR	
2360	1769153.385	1624747.195	7285.62	FR	
2361	1769155.42	1624748.56	7284.005	FR	
2362	1769153.805	1624747.62	7282.535	TOS	
2363	1769154	1624747.665	7282.525	TOS	
2364	1769154.315	1624747.4	7281.135	BOS	
2365	1769154.595	1624747.58	7281.395	FR	
2366	1769153.965	1624747.63	7283.565	FR	
2367	1769153.915	1624747.615	7284.69	FR	
2368	1769156.11	1624751.365	7293.73	FR	
2369	1769156.57	1624751.37	7292.69	FR	
2370	1769157.62	1624752.525	7294.9	FR	
2371	1769157.4	1624752.29	7294.465	FR	
2372	1769157.475	1624751.98	7292.685	FR	
2373	1769158.07	1624751.755	7289.65	FR	
2374	1769157.095	1624750.475	7288.425	FR	
2375	1769158.15	1624751.36	7286.39	FR	
2376	1769158.505	1624751.535	7284.975	FR	
2377	1769155.665	1624748.57	7280.675	FR	
2378	1769156.36	1624749.31	7280.38	FR	
2379	1769156.795	1624749.725	7281.325	BOS	
2380	1769158.43	1624751.075	7282.84	FR	
2381	1769158.08	1624750.92	7281.965	FR	
2382	1769159.01	1624751.445	7282.58	TOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
2383	1769159.43	1624752.105	7282.245	FR	
2384	1769159.195	1624751.91	7281.82	FR	
2385	1769158.96	1624751.955	7280.945	FR	
2386	1769158.21	1624751.115	7280.86	BOS	
2387	1769157.605	1624750.6	7281.2	BOS	
2388	1769157.755	1624750.73	7280.895	FR	
2389	1769157.075	1624750.015	7279.765	FR	
2390	1769158	1624750.84	7279.27	FR	
2391	1769158.17	1624751.075	7279.835	FR	
2392	1769158.73	1624751.965	7279.365	FR	
2393	1769158.425	1624751.39	7278.655	FR	
2394	1769159.41	1624751.355	7277.875	FR	2.0' horizontal prism
2395	1769158.86	1624753.22	7294.655	FR	
2396	1769159.915	1624753.69	7293.74	FR	
2397	1769159.255	1624753.455	7293.82	FR	
2398	1769160.98	1624754.725	7294.355	FR	
2399	1769160.925	1624754.3	7293.15	FR	
2400	1769161.265	1624754.61	7292.655	FR	
2401	1769158.265	1624752.42	7292.325	FR	
2402	1769158.515	1624753.02	7292.815	FR	
2403	1769159.655	1624753.41	7292.455	FR	
2404	1769159	1624752.965	7291.77	FR	
2405	1769160.185	1624753.31	7291.385	FR	
2406	1769158.9	1624752.64	7290.94	FR	
2407	1769160.16	1624753.69	7292.56	FR	
2408	1769160.975	1624754.045	7291.91	FR	
2409	1769161.215	1624753.78	7290.12	FR	
2410	1769160.57	1624753.375	7290.445	FR	
2411	1769160.09	1624753.045	7289.71	FR	
2412	1769160.495	1624753.23	7289.135	FR	
2413	1769159.15	1624752.635	7290.025	FR	
2414	1769159.145	1624752.785	7288.77	FR	
2415	1769159.58	1624752.85	7288.9	FR	
2416	1769160.1	1624752.89	7288.62	FR	
2417	1769159.39	1624752.78	7286.97	FR	
2418	1769159.47	1624752.44	7285.38	FR	
2419	1769161.275	1624753.35	7287.505	FR	
2420	1769161.765	1624753.745	7286.21	FR	
2421	1769161.765	1624753.815	7285.155	FR	
2422	1769160.015	1624752.62	7283.56	FR	
2423	1769159.825	1624752.6	7282.825	FR	
2424	1769160.885	1624753	7282.745	TOS	
2425	1769160.135	1624752.335	7280.745	BOS	
2426	1769161.53	1624753.785	7281.92	FR	
2427	1769162.065	1624754.03	7281.295	FR	
2428	1769163.015	1624754.87	7282.265	TOS	
2429	1769162.32	1624754.3	7280.865	BOS	
2430	1769162.685	1624754.455	7280.555	BOS	
2431	1769162.88	1624754.52	7280.425	FR	
2432	1769162.385	1624754.3	7279.94	FR	
2433	1769161.965	1624753.965	7279.105	FR	
2434	1769161.495	1624753.14	7279.11	FR	
2435	1769161.72	1624753.415	7278.42	FR	
2436	1769160.96	1624752.53	7278.265	FR	
2437	1769163.275	1624754.525	7278.1	FR	
2438	1769161.975	1624755.78	7294.46	FR	
2439	1769162.545	1624755.97	7293.81	FR	
2440	1769162.79	1624756.335	7292.555	FR	
2441	1769164.725	1624759.25	7295.21	FR	
2442	1769164.045	1624758.59	7295.185	FR	
2443	1769165.48	1624759.31	7293.85	FR	
2444	1769164.37	1624756.805	7292.005	FR	2.0' horizontal prism
2445	1769163.76	1624756.165	7290.005	FR	
2446	1769163.86	1624756.1	7289.07	FR	
2447	1769166.15	1624759.05	7291.27	FR	
2448	1769166.785	1624758.98	7292.935	FR	
2449	1769165.77	1624758.51	7291.185	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2450	1769167.165	1624759.265	7291.755	FR	
2451	1769167.135	1624759.13	7290.615	FR	
2452	1769166.32	1624758.75	7290.125	FR	End survey 9 January 2007
7005	1769110.12	1624513.69	7272.505	BS	Poor quality backshot; redo station setup
7005	1769110.195	1624513.585	7272.565	BS	Backshot; start survey 10 January 2007
2453	1769165.38	1624756.315	7290.795	FR	
2454	1769165.685	1624756.42	7289.72	FR	
2455	1769168.375	1624758.23	7289.325	FR	
2456	1769167.15	1624757.585	7288.88	FR	
2457	1769166	1624756.525	7288.765	FR	
2458	1769169.07	1624758.9	7288.655	FR	
2459	1769168.405	1624758.35	7287.495	FR	
2460	1769166.21	1624756.48	7287.47	FR	
2461	1769168.75	1624758.48	7287.075	FR	
2462	1769166.56	1624756.57	7286.395	FR	
2463	1769166.835	1624757.795	7286.32	FR	
2464	1769167.04	1624756.61	7284.73	FR	
2465	1769168.64	1624758.39	7284.92	FR	
2466	1769168.84	1624758.31	7285.05	FR	
2467	1769168.78	1624758.155	7283.965	FR	
2468	1769169.24	1624758.435	7284.145	FR	
2469	1769167.04	1624755.495	7282.565	FR	
2470	1769168.745	1624757.175	7282.755	FR	
2471	1769168.73	1624757.09	7282.05	FR	
2472	1769166.795	1624756.02	7281.995	TOS	
2473	1769168.645	1624757.315	7283.165	TOS	
2474	1769168.87	1624757.255	7282.085	BOS	
2475	1769169.715	1624758.075	7282.315	BOS	
2476	1769167.735	1624758.095	7281.73	FR	
2477	1769167.38	1624757.975	7280.675	FR	
2478	1769167.065	1624757.455	7279.29	FR	
2479	1769165.66	1624756.445	7281.4	FR	
2480	1769165.415	1624756.355	7280.645	BOS	
2481	1769167.775	1624759.27	7293.81	FR	
2482	1769168.53	1624759.535	7292.88	FR	
2483	1769169.215	1624760.54	7292.465	FR	
2484	1769168.815	1624759.355	7290.985	FR	
2485	1769169.125	1624759.925	7291.475	FR	
2486	1769169.155	1624760.48	7292.35	FR	
2487	1769170.53	1624761.1	7292.29	FR	
2488	1769170.525	1624761.16	7291.49	FR	
2489	1769170.845	1624761.165	7291.73	FR	
2490	1769171.305	1624761.45	7290.86	FR	
2491	1769170.655	1624761.17	7290.595	FR	
2492	1769169.615	1624759.83	7288.885	FR	
2493	1769171.765	1624761.075	7289.09	FR	
2494	1769170.59	1624760.54	7287.92	FR	
2495	1769169.91	1624760.16	7287.7	FR	
2496	1769172.35	1624761.06	7285.31	FR	
2497	1769170.405	1624760.015	7285.12	FR	
2498	1769170.18	1624759.235	7284.675	FR	
2499	1769172.305	1624760.555	7282.67	FR	
2500	1769171.665	1624760.21	7283.245	FR	
2501	1769170.73	1624759.355	7283.535	FR	
2502	1769170.365	1624758.96	7283.13	FR	
2503	1769170.825	1624759.205	7282.865	TOS	
2504	1769171.42	1624759.57	7282.79	TOS	
2505	1769171.75	1624759.845	7282.405	TOS	
2506	1769172.515	1624760.78	7282.42	TOS	
2507	1769169.925	1624759.81	7282.36	BOS	
2508	1769171.16	1624760.745	7282.335	BOS	
2509	1769171.57	1624761.195	7282.265	BOS	
2510	1769172.4	1624761.78	7282.24	C34	
2511	1769176.47	1624764.585	7281.745	BOS	
2512	1769174.825	1624763.76	7281.745	BOS	
2513	1769173.55	1624762.935	7281.86	BOS	
2514	1769172.945	1624762.78	7281.985	TOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
2515	1769173.455	1624763.19	7282.505	TOS	
2516	1769174.18	1624763.43	7282.315	TOS	
2517	1769176.185	1624764.41	7282.41	TOS	
2518	1769175.77	1624764.215	7282.645	FR	
2519	1769175.335	1624764.02	7282.405	FR	
2520	1769173.8	1624763.33	7282.535	FR	
2521	1769174.005	1624763.36	7283.26	FR	
2522	1769172.985	1624762.64	7282.475	FR	
2523	1769172.965	1624762.88	7283.48	FR	
2524	1769173.975	1624763.385	7284.49	FR	
2525	1769173.525	1624762.96	7284.425	FR	
2526	1769172.785	1624762.635	7284.07	FR	
2527	1769172.525	1624762.385	7284.055	FR	
2528	1769174.1	1624763.51	7285.305	FR	
2529	1769173.7	1624763.37	7286.18	FR	
2530	1769174.03	1624763.835	7287.435	FR	
2531	1769173.625	1624763.235	7287.89	FR	
2532	1769172.69	1624762.6	7286.965	FR	
2533	1769174.36	1624764.915	7293.04	FR	
2534	1769174.905	1624764.69	7289.12	FR	
2535	1769176.26	1624764.93	7282.52	TOS	
2536	1769177.265	1624765.6	7282.425	TOS	
2537	1769178.565	1624766.7	7282.47	TOS	
2538	1769178.205	1624766.305	7282.195	BOS	
2539	1769176.95	1624765.51	7281.81	BOS	
2540	1769177.51	1624765.695	7282.43	FR	
2541	1769176.315	1624764.975	7282.795	FR	
2542	1769176.975	1624765.74	7283.665	FR	
2543	1769176.8	1624765.68	7284.92	FR	
2544	1769176.22	1624766.235	7286.55	FR	
2545	1769175.545	1624765.115	7285.935	FR	
2546	1769175.97	1624766.055	7288.705	FR	
2547	1769175.895	1624765.9	7287.25	FR	
2548	1769175.375	1624765.65	7287.98	FR	
2549	1769175.25	1624764.435	7287.285	FR	
2550	1769175.7	1624767.83	7295.745	FR	
2551	1769177.065	1624767.88	7295.46	FR	
2552	1769177.585	1624767.845	7292.83	FR	
2553	1769177.685	1624767.26	7288.15	FR	
2554	1769178.43	1624767.23	7287.04	FR	
2555	1769178.23	1624767.445	7285.35	FR	
2556	1769179.6	1624766.455	7282.6	FR	
2557	1769180.16	1624769.895	7295.955	FR	
2558	1769180.725	1624769.14	7292.22	FR	
2559	1769180.175	1624769.43	7289.415	FR	
2560	1769183.655	1624770.88	7289.3	FR	
2561	1769183.185	1624770.845	7287.78	FR	
2562	1769181.765	1624770.2	7286.995	FR	
2563	1769180.315	1624767.695	7282.31	BOS	
2564	1769182.215	1624769.605	7282.335	BOS	
2565	1769182.665	1624770.65	7283.295	TOS	
2566	1769181.99	1624769.66	7283.11	TOS	
2567	1769181.66	1624769.455	7283.215	TOS	
2568	1769181.615	1624769.36	7282.93	TOS	
2569	1769181.11	1624768.68	7282.925	TOS	
2570	1769180.155	1624767.445	7281.78	FR	
2571	1769180.6	1624767.26	7280.635	FR	
2572	1769181.56	1624768.325	7279.61	FR	
2573	1769181	1624767.585	7279.425	FR	
2574	1769180.185	1624766.985	7278.98	FR	
2575	1769186.53	1624771.995	7281.935	BOS	
2576	1769184.705	1624770.88	7281.825	BOS	
2577	1769184.815	1624771.225	7283.32	TOS	
2578	1769183.34	1624770.91	7283.425	TOS	
2579	1769185.48	1624771.61	7284.685	FR	
2580	1769183.775	1624771.435	7284.28	FR	
2581	1769187.155	1624772.345	7283.07	TOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
2582	1769186.36	1624771.825	7283.235	FR	
2583	1769186.2	1624771.87	7284.325	FR	
2584	1769186.49	1624772.3	7284.945	FR	
2585	1769188.13	1624773.055	7284.715	FR	
2586	1769188.275	1624773.21	7287.12	FR	
2587	1769186.415	1624772.585	7287.245	FR	
2588	1769185.325	1624772.195	7286.985	FR	
2589	1769184.995	1624772.15	7285.86	FR	
2590	1769188.27	1624773.23	7288.12	FR	
2591	1769186.145	1624772.625	7288.815	FR	
2592	1769185.31	1624772.24	7288.775	FR	
2593	1769185.315	1624772.135	7289.955	FR	
2594	1769188.18	1624773.48	7289.95	FR	
2595	1769188.155	1624773.375	7290.425	FR	
2596	1769185.705	1624772.4	7290.31	FR	
2597	1769186.94	1624773.325	7293.265	FR	
2598	1769185.165	1624772.13	7292.585	FR	
2599	1769184.775	1624772.315	7293.995	FR	
2600	1769185.615	1624773.23	7294.64	FR	
2601	1769186.76	1624773.905	7295.055	FR	
2602	1769188.315	1624772.9	7282.7	TOS	
2603	1769190.61	1624773.885	7282.255	TOS	
2604	1769188.465	1624772.905	7281.875	BOS	
2605	1769190.945	1624774.225	7281.63	BOS	
2606	1769190.73	1624774.225	7284.415	FR	
2607	1769190.68	1624774.24	7285.555	FR	
2608	1769189.29	1624773.485	7284.615	FR	
2609	1769192.205	1624775.605	7286.775	FR	
2610	1769191.17	1624774.87	7285.975	FR	
2611	1769189.545	1624773.845	7286.955	FR	
2612	1769191.425	1624775.39	7287.505	FR	
2613	1769190.475	1624774.775	7288.75	FR	
2614	1769190.81	1624775.23	7289.13	FR	
2615	1769190.655	1624774.96	7289.535	FR	
2616	1769192.135	1624775.78	7290.365	FR	
2617	1769190.985	1624775.7	7291.575	FR	
2618	1769192.69	1624777.605	7293.565	FR	
2619	1769191.945	1624776.88	7293.115	FR	
2620	1769191.765	1624776.94	7293.725	FR	
2621	1769191.32	1624776.84	7293.845	FR	
2622	1769190.975	1624776.905	7295.205	FR	
2623	1769192.73	1624777.78	7294.86	FR	
2624	1769192.235	1624776.255	7291.295	FR	
2625	1769192.98	1624777.145	7291.145	FR	
2626	1769192.82	1624776.335	7290.425	FR	
2627	1769193.77	1624777.035	7289.555	FR	
2628	1769193.325	1624776.615	7289.29	FR	
2629	1769193.375	1624776.625	7289.065	FR	
2630	1769193.8	1624776.64	7287.75	FR	
2631	1769192.335	1624775.955	7288.38	FR	
2632	1769194.305	1624776.84	7285.82	FR	
2633	1769192.635	1624775.79	7284.92	FR	
2634	1769195.045	1624777.235	7284.475	FR	
2635	1769194.66	1624776.755	7284.015	FR	
2636	1769194.995	1624776.995	7283.275	FR	
2637	1769192.68	1624775.41	7283.955	FR	
2638	1769193.66	1624776.12	7282.015	FR	
2639	1769192.685	1624775.38	7282.13	TOS	
2640	1769195.14	1624776.475	7282.005	TOS	
2641	1769194.725	1624776.36	7281.68	BOS	
2642	1769193.2	1624775.565	7281.64	BOS	
2643	1769191.645	1624775.01	7281.795	BOS	
2644	1769193.735	1624778.2	7293.72	FR	
2645	1769194.51	1624778.355	7293.03	FR	
2646	1769195.15	1624779.745	7294.185	FR	
2647	1769195.875	1624779.865	7293.74	FR	
2648	1769192.785	1624778.215	7295.145	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2649	1769192.915	1624778.1	7294.285	FR	
2650	1769196.32	1624779.425	7291.515	FR	
2651	1769195.24	1624778.22	7290.195	FR	
2652	1769194.325	1624778.105	7290.115	FR	
2653	1769195.145	1624778.055	7289.235	FR	
2654	1769196.6	1624778.665	7288.87	FR	
2655	1769197.875	1624779.84	7286.335	FR	
2656	1769197.505	1624779.105	7284.16	FR	
2657	1769197.76	1624778.4	7282.505	FR	
2658	1769196.865	1624777.705	7281.82	BOS	
2659	1769198.965	1624778.99	7281.83	BOS	
2660	1769198.495	1624778.76	7282.38	TOS	
2661	1769196.69	1624777.57	7282.095	TOS	
2662	1769197.735	1624778.395	7282.42	FR	
2663	1769199.025	1624782.755	7295.7	FR	
2664	1769198.87	1624781.51	7293.235	FR	
2665	1769198.455	1624781.115	7290.585	FR	
2666	1769198.035	1624780.26	7287.345	FR	
2667	1769202.96	1624784.405	7294.82	FR	
2668	1769202.885	1624784.275	7293.89	FR	
2669	1769200.905	1624783.08	7293.455	FR	
2670	1769202.295	1624783.25	7290.57	FR	
2671	1769203.56	1624784.395	7290.405	FR	
2672	1769202.77	1624783.8	7289.805	FR	
2673	1769201.88	1624782.88	7288.32	FR	
2674	1769201.655	1624781.765	7284.95	FR	
2675	1769204.365	1624783.515	7284.22	FR	
2676	1769204.955	1624784.055	7284.935	FR	
2677	1769204.53	1624783.145	7282.58	FR	
2678	1769205.355	1624783.475	7282.525	TOS	
2679	1769203.31	1624782.345	7282.965	TOS	
2680	1769201.385	1624780.665	7282.755	TOS	
2681	1769201.84	1624781.42	7282.63	OP	
2682	1769201.585	1624781.05	7282.6	OP	
2683	1769201.38	1624780.94	7281.79	BOS	
2684	1769203.24	1624782.325	7282.11	BOS	
2685	1769205.57	1624783.36	7281.8	BOS	
2686	1769204.52	1624785.33	7293.88	FR	
2687	1769207.555	1624787.645	7295.085	FR	
2688	1769209.29	1624788.295	7291.83	FR	
2689	1769205.905	1624785.86	7290.63	FR	
2690	1769207.615	1624786.745	7288.06	FR	
2691	1769206.9	1624785.95	7286.99	FR	
2692	1769206.08	1624785.56	7288.21	FR	
2693	1769205.905	1624785.455	7288.42	FR	
2694	1769205.515	1624785.51	7288.18	FR	
2695	1769205.5	1624785.585	7286.27	FR	
2696	1769205.82	1624784.915	7285.87	FR	
2697	1769207.275	1624785.655	7283.965	FR	
2698	1769207.75	1624786.21	7283.51	FR	
2699	1769207.49	1624785.25	7281.48	BOS	
2700	1769207.635	1624785.785	7282.165	TOS	
2701	1769209.635	1624787.06	7282.045	TOS	
2702	1769209.27	1624785.515	7279.24	FR	
2703	1769209.19	1624789.995	7297.55	FR	
2704	1769209.565	1624790.445	7297.765	FR	
2705	1769210.515	1624790.765	7297.38	FR	
2706	1769210.36	1624789.975	7295.58	FR	
2707	1769211.47	1624791.685	7297.57	FR	
2708	1769210.985	1624790.11	7294.95	FR	
2709	1769209.85	1624789.075	7294.225	FR	
2710	1769214.03	1624791.665	7292.87	FR	
2711	1769211.285	1624789.77	7292.06	FR	
2712	1769215.205	1624792.615	7289.8	FR	
2713	1769214.89	1624792.24	7288.745	FR	
2714	1769213.74	1624791.06	7289.415	FR	
2715	1769213.055	1624790.385	7288.275	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2716	1769215.89	1624792.615	7286.285	FR	
2717	1769214.84	1624791.585	7285.9	FR	
2718	1769213.35	1624790.425	7285.515	FR	
2719	1769214.96	1624791.545	7284.28	FR	
2720	1769213.31	1624790.035	7284.2	FR	
2721	1769215.48	1624791.935	7283.77	FR	
2722	1769215.655	1624791.6	7281.99	FR	
2723	1769214.65	1624791.045	7282.215	FR	
2724	1769213.355	1624789.71	7282.6	FR	
2725	1769213.31	1624789.585	7282.425	TOS	
2726	1769213.67	1624789.94	7282.11	TOS	
2727	1769215.225	1624791.31	7281.925	TOS	
2728	1769215.98	1624791.795	7281.535	BOS	
2729	1769215.565	1624791.39	7281.275	BOS	
2730	1769214.48	1624790.595	7280.795	BOS	
2731	1769214.65	1624790.995	7281.475	OOP	
2732	1769215.78	1624791.67	7281.565	OOP	
2733	1769215.93	1624791.67	7280.42	FR	
2734	1769214.305	1624790.49	7280.71	FR	
2735	1769213.615	1624789.77	7280.645	FR	
2736	1769210.805	1624789.01	7287.2	FR	
2737	1769210.335	1624788.51	7283.89	FR	
2738	1769211.58	1624788.34	7282.36	TOS	
2739	1769211.415	1624788.135	7280.6	BOS	
2740	1769211.94	1624788.305	7280.565	FR	
2741	1769211.955	1624788.25	7279.52	FR	
2742	1769214.285	1624792.705	7295.85	FR	
2743	1769216.09	1624794.045	7295.715	FR	
2744	1769216.98	1624794.175	7293.13	FR	
2745	1769213.725	1624791.445	7290.64	FR	
2746	1769218.33	1624794.735	7290.58	FR	
2747	1769218.395	1624795.335	7288.62	FR	
2748	1769219.265	1624795.53	7287.78	FR	
2749	1769217.67	1624794.225	7287.765	FR	
2750	1769217.605	1624793.865	7284.4	FR	
2751	1769219.27	1624794.485	7282.335	FR	
2752	1769218.73	1624794.15	7282.435	FR	
2753	1769218.005	1624793.5	7282.375	FR	
2754	1769217.03	1624792.45	7282.245	FR	
2755	1769217.545	1624791.91	7279.76	FR	
2756	1769219.05	1624794.145	7281.82	BOS	
2757	1769217.835	1624793.02	7281.6	BOS	
2758	1769217.09	1624792.395	7281.16	BOS	
2759	1769217.455	1624792.72	7282.195	TOS	
2760	1769218.735	1624794.06	7282.195	TOS	
2761	1769168.09	1624759.285	7283.215	TOS	
2762	1769168.435	1624759.62	7283.32	TOS	
2763	1769168.835	1624759.63	7283.335	TOS	
2764	1769221.145	1624798.38	7296.625	FR	
2765	1769221.76	1624798.715	7296.01	FR	
2766	1769220.8	1624797.42	7294.66	FR	
2767	1769220.81	1624797.31	7293.565	FR	
2768	1769219.115	1624795.585	7293.15	FR	
2769	1769221.105	1624797.17	7291.08	FR	
2770	1769223.605	1624799.075	7292.56	FR	
2771	1769223.625	1624798.98	7291.54	FR	
2772	1769222.475	1624798.61	7291.1	FR	
2773	1769223.265	1624798.92	7289.81	FR	
2774	1769221.975	1624797.935	7289.14	FR	
2775	1769221.435	1624797.28	7288.28	FR	
2776	1769222.38	1624798.2	7287.87	FR	
2777	1769221.56	1624797.15	7286.81	FR	
2778	1769222.685	1624797.825	7286.525	FR	
2779	1769220.94	1624795.88	7283.855	FR	
2780	1769221.45	1624796.375	7283.98	FR	
2781	1769223.235	1624797.235	7283.09	FR	
2782	1769221.22	1624795.515	7282.14	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2783	1769221.495	1624795.955	7282.385	FR	
2784	1769223.02	1624796.845	7282.435	FR	
2785	1769222.085	1624796.105	7282.165	TOS	
2786	1769223.225	1624796.87	7282.175	TOS	
2787	1769223.18	1624796.68	7281.745	OP	
2788	1769221.575	1624795.935	7281.965	OP	
2789	1769221.505	1624795.675	7281.22	BOS	
2790	1769223.68	1624797.045	7280.97	BOS	
2791	1769223.59	1624796.605	7279.69	FR	
2792	1769223.44	1624796.715	7280.9	FR	End survey 10 January 2007
7005	1769110.25	1624513.5	7272.56	BS	Backshot; start survey 11 January 2007
2793	1769223.3	1624799.12	7296.53	FR	
2794	1769223.415	1624799.065	7296.07	FR	
2795	1769225.34	1624800.51	7296.165	FR	
2796	1769226.4	1624801.345	7293.635	FR	
2797	1769225.925	1624800.61	7291.985	FR	
2798	1769224.94	1624799.63	7291.245	FR	
2799	1769225.77	1624800.605	7290.405	FR	
2800	1769224.37	1624799.45	7290.34	FR	
2801	1769224.33	1624799.28	7288.885	FR	
2802	1769225.815	1624800.45	7288.695	FR	
2803	1769227.28	1624801.005	7287.99	FR	
2804	1769225	1624799.455	7287.91	FR	
2805	1769226.95	1624800.525	7287.075	FR	
2806	1769226.485	1624800.175	7286.055	FR	
2807	1769226.145	1624799.45	7284.765	FR	
2808	1769225.595	1624798.545	7282.55	FR	
2809	1769227.305	1624799.615	7283.255	FR	
2810	1769228.675	1624799.44	7281.925	FR	
2811	1769225.065	1624797.895	7281.8	TOS	
2812	1769227.555	1624799.17	7281.865	TOS	
2813	1769226.2	1624798.19	7280.775	BOS	
2814	1769227.755	1624802.345	7296.345	FR	
2815	1769227.535	1624801.765	7295.15	FR	
2816	1769229.185	1624803.325	7295.8	FR	
2817	1769229.625	1624803.62	7295.995	FR	
2818	1769230.165	1624803.66	7295.265	FR	
2819	1769229.21	1624802.97	7293.47	FR	
2820	1769228.715	1624802.585	7293.385	FR	
2821	1769227.86	1624801.95	7292.565	FR	
2822	1769228.695	1624802.36	7291.7	FR	
2823	1769231.015	1624803.815	7292.605	FR	
2824	1769228.355	1624802.075	7290.385	FR	
2825	1769228.985	1624802.405	7290.34	FR	
2826	1769230.735	1624803.78	7290.18	FR	
2827	1769231.61	1624804.17	7289.2	FR	
2828	1769228.81	1624800.97	7284.13	FR	
2829	1769230.355	1624802	7283.64	FR	
2830	1769229.885	1624801.145	7283.195	FR	
2831	1769230.26	1624800.865	7282.265	FR	
2832	1769229.605	1624800.225	7282.165	TOS	
2833	1769229.2	1624799.375	7280.78	BOS	
2834	1769229.965	1624799.665	7280.02	FR	
2835	1769230.755	1624799.835	7279.76	FR	
2836	1769230.8	1624799.415	7278.365	FR	
2837	1769230.94	1624800.51	7280.59	FR	
2838	1769231.095	1624800.605	7280.475	FR	
2839	1769231.095	1624800.69	7280.675	BOS	
2840	1769231.13	1624803.71	7287.105	FR	
2841	1769231.595	1624802.55	7282.565	FR	
2842	1769232.715	1624803.32	7283.375	FR	
2843	1769233.185	1624803.53	7282.31	TOS	
2844	1769231.655	1624802.36	7281.93	TOS	
2845	1769231.74	1624802.445	7281.91	FR	
2846	1769231.92	1624802.49	7281.75	FR	
2847	1769232.05	1624802.355	7280.95	BOS	
2848	1769231.16	1624801.36	7280.485	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2849	1769233.325	1624806.205	7295.285	FR	
2850	1769235.825	1624808.22	7295.06	FR	
2851	1769235.89	1624808.28	7294.735	FR	
2852	1769237.02	1624809.36	7294.935	FR	
2853	1769237.545	1624810.145	7295.06	FR	
2854	1769236.705	1624808.765	7292.44	FR	
2855	1769238.385	1624811.11	7294.98	FR	
2856	1769239.75	1624811.855	7295.225	FR	
2857	1769239.68	1624811.485	7293.995	FR	
2858	1769238.895	1624811.2	7293.03	FR	
2859	1769236.425	1624809.11	7290.505	FR	
2860	1769237.84	1624810.225	7291.065	FR	
2861	1769239.215	1624810.935	7288.97	FR	
2862	1769237.51	1624809.49	7288.765	FR	
2863	1769238.395	1624809.88	7285.955	FR	
2864	1769242.51	1624809.47	7282.435	TOS	
2865	1769242.2	1624809.25	7281.66	BOS	
2866	1769241.08	1624808.705	7281.345	FR	
2867	1769240.29	1624808.52	7281.255	FR	
2868	1769240.18	1624808.76	7281.985	FR	
2869	1769239.89	1624807.935	7280.91	FR	
2870	1769240.55	1624809.62	7283	TOS	
2871	1769240.945	1624809.48	7282.69	TOS	
2872	1769235.3	1624807.05	7284.74	FR	
2873	1769237.44	1624808.31	7284.29	FR	
2874	1769238.355	1624808.825	7283.515	TOS	
2875	1769237.155	1624807.79	7283.04	FR	
2876	1769236.965	1624807.5	7283.31	TOS	
2877	1769236.285	1624807.05	7283.2	FR	
2878	1769235.55	1624806.44	7282.9	FR	
2879	1769238.84	1624808.14	7282.05	BOS	
2880	1769237.59	1624807.955	7282.13	BOS	
2881	1769237.23	1624806.85	7281.675	FR	
2882	1769236.205	1624806.395	7281.895	BOS	
2883	1769235.225	1624805.785	7282.84	TOS	
2884	1769234.575	1624805.535	7282.84	FR	
2885	1769234.57	1624805.025	7281.555	BOS	
2886	1769234.085	1624804.8	7282.56	TOS	
2887	1769233.93	1624804.655	7282.55	FR	
2888	1769234.54	1624805.02	7281.485	BOS	
2889	1769233.125	1624804.74	7286.19	FR	
2890	1769233.115	1624804.73	7286.16	FR	
2891	1769233.145	1624804.28	7284.665	FR	End survey 11 January 2007; conclude su

Total Southeast Temporary Wall survey points = 891

CMRR Geologic Investigations
Southwest Temporary Wall Surveying January 2007

Point Codes (Pcode):

BS	backshot (to benchmark)
FR	fracture
TOS	top of surge (Qbt_4-Qbt_s contact)
BOS	bottom of surge (Qbt_s-Qbt_3 contact)
C34	Qbt_3-Qbt_4 contact
STC	soil-tuff contact
CP	control point
FF	fossil fumarole
OOP	out-of-place block
FTC	fill-tuff contact

***Note: where prism is listed as horizontal, rod length (horiz. distance from wall) is 0.9 ft unless otherwise noted.

Point#	Northing	Easting	Elevation	Pcode	Notes
2892	1768976.94	1624797.53	7287.495	FR	Start survey 11 Jan 2007; continue from SET station setup
2893	1768975.96	1624797.41	7284.44	FR	
2894	1768975.86	1624797.52	7284.52	FR	
2895	1768974.73	1624797.54	7282.81	FR	
2896	1768972.6	1624796.96	7280.25	FR	
2897	1768973.4	1624793.9	7277.405	TOS	
2898	1768973.3	1624793.94	7277.24	BOS	
2899	1768970.77	1624797.58	7278.175	FR	
2900	1768969.83	1624796.97	7276.05	FR	
2901	1768971.45	1624796.49	7277.34	C34	
2902	1768971.5	1624792.8	7274.615	FR	
2903	1768973.38	1624793.47	7276.6	FR	
2904	1768974.17	1624793.64	7277.36	FR	
2905	1768977.64	1624796	7285.17	FR	
2906	1768978.89	1624794.37	7285.035	FR	
2907	1768976.27	1624795.82	7281.925	FR	
2908	1768976.72	1624794.61	7281.795	FR	
2909	1768976.81	1624793.24	7281.445	FR	
2910	1768975.53	1624793.97	7279.455	FR	
2911	1768975.77	1624792.1	7277.24	TOS	
2912	1768975.56	1624791.97	7277.18	BOS	0.2' horizontal prism
2913	1768979.9	1624793.96	7286.585	FR	
2914	1768979	1624791.37	7281.165	FR	
2915	1768977.34	1624789.02	7277.36	TOS	0.2' horizontal prism
2916	1768977.33	1624789	7277.205	BOS	
2917	1768978.78	1624788.44	7278.055	FR	0.2' horizontal prism
2918	1768980.36	1624787.86	7281.055	FR	0.2' horizontal prism
2919	1768979.77	1624787.55	7279.54	FR	0.2' horizontal prism
2920	1768979.67	1624787.82	7278.275	FR	0.2' horizontal prism
2921	1768979.91	1624786.73	7277.855	TOS	
2922	1768979.94	1624786.68	7277.585	BOS	
2923	1768978.53	1624787.78	7277.15	FR	
2924	1768977.66	1624787.74	7275.71	FR	
2925	1768982.87	1624789.77	7285.565	FR	
2926	1768982.15	1624789.25	7282.53	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
2927	1768985.52	1624785.83	7284.46	FR	
2928	1768984.43	1624785.6	7281.84	FR	
2929	1768985.19	1624783.83	7281.755	FR	
2930	1768983.11	1624784.56	7278.8	FR	
2931	1768981.76	1624785.21	7278.01	TOS	
2932	1768981.52	1624785.1	7277.63	BOS	
2933	1768981.7	1624783.85	7277.075	FR	
2934	1768980.68	1624783.81	7275.56	FR	
2935	1768984.4	1624780.09	7276.995	FR	
2936	1768984.81	1624779.05	7276.38	FR	
2937	1768985.47	1624778.31	7276.455	FR	
2938	1768985.84	1624776.83	7276.04	FR	
2939	1768985.57	1624776.77	7275.59	FR	
2940	1768986.22	1624776.58	7275.955	FR	
2941	1768987.11	1624776.69	7277.195	FR	
2942	1768988.78	1624774.66	7277.555	FR	
2943	1768988.62	1624773.93	7276.385	FR	
2944	1768988.2	1624774.18	7275.93	FR	
2945	1768988.51	1624773.43	7275.61	FR	
2946	1768987.92	1624773.48	7274.675	FR	
2947	1768989.05	1624772.04	7274.495	FR	
2948	1768989.91	1624771.55	7274.69	FR	
2949	1768987.08	1624776.7	7277.185	FR	
2950	1768986.17	1624782.09	7280.56	FR	
2951	1768984.94	1624781.38	7278.72	FR	0.2' horizontal prism
2952	1768984.87	1624781.33	7278.295	TOS	0.2' horizontal prism
2953	1768985.15	1624779.8	7278.425	TOS	0.2' horizontal prism
2954	1768985.16	1624780	7277.83	BOS	0.2' horizontal prism
2955	1768985.1	1624780.55	7277.635	FR	0.2' horizontal prism
2956	1768984.92	1624781.02	7278.08	BOS	0.2' horizontal prism
2957	1768983.58	1624782.3	7278.26	TOS	0.2' horizontal prism
2958	1768983.86	1624782.75	7277.89	BOS	
2959	1768990.21	1624780.85	7285.585	FR	
2960	1768991.26	1624779.25	7285.57	FR	
2961	1768991.2	1624778	7283.45	FR	
2962	1768992.16	1624777.74	7284.14	FR	
2963	1768989.86	1624778.41	7281.97	FR	
2964	1768989.62	1624778.33	7281.225	FR	
2965	1768990.49	1624776.7	7281.12	FR	
2966	1768987.41	1624778.49	7279.26	FR	0.2' horizontal prism
2967	1768988.46	1624777.55	7279.21	FR	
2968	1768987.51	1624777.58	7278.345	TOS	
2969	1768987.75	1624776.98	7278.295	FR	
2970	1768987.62	1624776.93	7277.995	BOS	
2971	1768987.48	1624776.93	7277.85	BOS	
2972	1768987.07	1624777.63	7277.86	BOS	
2973	1768986.76	1624778.23	7277.99	BOS	
2974	1768986.99	1624778.01	7278.215	FR	
2975	1768989.93	1624775.77	7279.48	FR	
2976	1768989.5	1624775.79	7279.095	TOS	
2977	1768988.93	1624775.21	7278.365	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
2978	1768992.52	1624775.79	7282.55	FR	
2979	1768993.42	1624773.96	7281.235	FR	
2980	1768990.86	1624771.18	7276.29	FR	
2981	1768991.74	1624770.83	7277.55	FR	
2982	1768993.13	1624769.73	7277.525	FR	
2983	1768992.45	1624769.25	7276.03	FR	
2984	1768994.11	1624770.29	7279.35	FR	
2985	1768993.35	1624771	7279.235	FR	
2986	1768993.16	1624771.28	7279.185	TOS	
2987	1768992.8	1624770.93	7278.51	BOS	
2988	1769050.59	1624700.28	7287.11	FR	
2989	1769050.84	1624699.76	7286.255	FR	
2990	1769049.95	1624702.16	7286.765	FR	
2991	1769049.24	1624701.88	7285.665	FR	
2992	1769048.95	1624702.89	7286.695	FR	
2993	1769048.7	1624701.92	7284.285	FR	
2994	1769049.95	1624699.65	7283.475	FR	
2995	1769048.02	1624701.63	7282.61	FR	
2996	1769047.57	1624701.66	7281.915	FR	
2997	1769047.39	1624701.07	7281.285	FR	
2998	1769048.36	1624700.67	7281.155	FR	
2999	1769047.11	1624700.47	7280.005	FR	
3000	1769048.62	1624700.35	7280.995	TOS	
3001	1769049.3	1624699.71	7280.9	FR	
3002	1769049.33	1624698.66	7280.005	TOS	
3003	1769050.22	1624698.94	7281.76	FR	
3004	1769047.12	1624700.46	7280.015	TOS	
3005	1769045.89	1624701.97	7280.99	FR	
3006	1769045.5	1624703.18	7281.595	FR	
3007	1769045.66	1624702.29	7281.05	TOS	
3008	1769045.3	1624703.05	7280.92	TOS	
3009	1769045.83	1624702.08	7279.97	TOS	
3010	1769044.66	1624704.24	7280.52	TOS	
3011	1769044.48	1624705.12	7280.83	TOS	
3012	1769044.91	1624703.69	7279.37	BOS	
3013	1769045.08	1624703.6	7278.935	BOS	
3014	1769045	1624703.48	7279.395	BOS	
3015	1769045.18	1624703.14	7279.77	BOS	
3016	1769045.19	1624703.06	7279.505	BOS	
3017	1769045.52	1624702.45	7279.425	BOS	
3018	1769045.7	1624702.33	7278.95	BOS	
3019	1769045.61	1624702.69	7278.345	FR	
3020	1769050.95	1624699.21	7283.66	FR	
3021	1769051.5	1624698.09	7285.08	FR	
3022	1769051.98	1624698.25	7286.16	FR	
3023	1769052.98	1624697.36	7285.535	FR	
3024	1769051.68	1624696.82	7282.04	FR	
3025	1769052.01	1624695.74	7281.855	FR	
3026	1769052.11	1624695.22	7281.68	FR	
3027	1769050.25	1624697.41	7279.605	TOS	
3028	1769050.07	1624697.25	7279.29	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
3029	1769050.31	1624696.35	7279.445	C34	
3030	1769050.76	1624696.58	7280.59	FR	
3031	1769052.89	1624695.3	7282.705	FR	
3032	1769053.24	1624694.23	7282.275	FR	
3033	1769053.01	1624694	7281.66	TOS	
3034	1769052.91	1624694.01	7281.505	TOS	
3035	1769052.74	1624694.2	7281.085	BOS	
3036	1769053.02	1624693.48	7280.9	FR	
3037	1769051.66	1624695.15	7280.59	FR	
3038	1769051.35	1624695.42	7279.445	TOS	
3039	1769051.48	1624695.36	7279.18	BOS	
3040	1769052.11	1624694.43	7279.2	TOS	
3041	1769052.29	1624694.62	7278.805	BOS	
3042	1769052.65	1624693.51	7279.35	TOS	
3043	1769052.95	1624693.66	7278.955	BOS	
3044	1769053.01	1624693.55	7279.075	FR	
3045	1769053.33	1624693.14	7278.595	FR	
3046	1769053.21	1624692.04	7277.055	FR	
3047	1769052.45	1624692.35	7275.83	FR	
3048	1769054.2	1624692.8	7282.395	FR	
3049	1769053.43	1624692.99	7280.87	FR	
3050	1769054.04	1624692.68	7281.98	TOS	
3051	1769053.76	1624692.49	7280.98	BOS	
3052	1769054.42	1624691.33	7280.565	FR	
3053	1769054.83	1624691.08	7280.93	BOS	
3054	1769055.86	1624690.57	7281.775	TOS	
3055	1769055.63	1624690.24	7281.38	TOS	
3056	1769056.72	1624689.15	7281.01	BOS	
3057	1769057.05	1624688.39	7280.245	BOS	
3058	1769057.46	1624687.86	7280.275	BOS	
3059	1769057.47	1624688.59	7281.305	TOS	
3060	1769054.79	1624689.8	7277.63	FR	
3061	1769055.25	1624688.68	7277.225	FR	
3062	1769053.68	1624689.81	7273.9	FR	
3063	1769009.89	1624749.6	7275.8	FR	
3064	1769010.76	1624747.86	7275.815	FR	
3065	1769011.46	1624746.91	7276.37	FR	
3066	1769012.27	1624746.53	7277.205	FR	
3067	1769012.85	1624745.26	7276.15	FR	
3068	1769012.56	1624744.65	7275.07	FR	
3069	1769012.22	1624745.21	7274.985	FR	
3070	1769013.31	1624745.4	7277.595	FR	
3071	1769013.73	1624744.63	7277.47	FR	
3072	1769014.63	1624742.49	7275.33	FR	
3073	1769014.86	1624742.14	7276.07	FR	
3074	1769015.45	1624741.21	7276.84	FR	
3075	1769016.68	1624739.75	7276.23	FR	
3076	1769015.48	1624739.18	7274.03	FR	
3077	1769018.01	1624738.71	7276.815	FR	
3078	1769017.4	1624740.25	7277.335	FR	
3079	1769018.28	1624735.69	7273.995	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
3080	1769019	1624735.24	7274.64	FR	
3081	1769019.02	1624736.15	7275.215	FR	
3082	1769009.9	1624749.6	7276.01	BOS	
3083	1769009.85	1624749.54	7276.47	BOS	
3084	1769010.56	1624748.62	7276.505	BOS	
3085	1769009.91	1624749.6	7275.84	FR	
3086	1769010.82	1624747.81	7275.92	FR	
3087	1769010.3	1624750.14	7278.51	TOS	
3088	1769014.51	1624743.5	7277.605	BOS	
3089	1769014.51	1624744.41	7278.195	TOS	
3090	1769018.11	1624739.59	7278.335	BOS	
3091	1769018.23	1624739.68	7279.01	TOS	
3092	1769016.9	1624740.77	7278.645	FR	0.2' horizontal prism
3093	1769016.83	1624742.98	7282.46	FR	
3094	1769018.34	1624743.27	7284.645	FR	End survey 11 January 2007
7006	1769253.5	1624797.01	7277.635	BS	Backshot; start survey 16 January 2007
3095	1769062.23	1624685.99	7287.575	FR	
3096	1769063.26	1624685.36	7287.02	FR	
3097	1769062.8	1624685.98	7286.22	FR	
3098	1769063.26	1624685.36	7286.025	FR	
3099	1769061.28	1624686.83	7287.12	FR	
3100	1769060.67	1624687.49	7286.455	FR	
3101	1769060.95	1624687.13	7285.235	FR	
3102	1769063.36	1624684.06	7284.285	FR	
3103	1769060.42	1624686.83	7284.13	FR	
3104	1769061.31	1624685.54	7284.21	FR	
3105	1769061.29	1624685.54	7283.88	FR	
3106	1769063.35	1624683.38	7282.55	TOS	
3107	1769063.21	1624683.47	7282.505	FR	
3108	1769061.46	1624685.16	7282.03	FR	
3109	1769061.01	1624685.21	7281.945	TOS	
3110	1769060.22	1624686.68	7282.855	FR	
3111	1769062.65	1624683.21	7280.81	FR	
3112	1769062.17	1624683.5	7280.63	BOS	
3113	1769060.34	1624685.4	7280.465	BOS	
3114	1769061.84	1624682.13	7278.475	FR	
3115	1769061.48	1624681.27	7276.48	FR	
3116	1769060.67	1624679.13	7272.235	FR	
3117	1769059.28	1624686.14	7280.11	BOS	
3118	1769058.74	1624686.75	7280.615	BOS	
3119	1769058.59	1624687.12	7281.645	TOS	
3120	1769058.1	1624687.89	7281.535	FR	
3121	1769056.64	1624689.06	7281.065	BOS	
3122	1769055.6	1624690.12	7281.41	TOS	
3123	1769055.79	1624690.49	7281.795	TOS	
3124	1769054.29	1624695.5	7287.865	FR	
3125	1769053.49	1624696.58	7287.825	FR	
3126	1769054.29	1624695.54	7286.175	FR	
3127	1769053.46	1624695.75	7285.375	FR	
3128	1769052.96	1624695.89	7284.18	FR	
3129	1769052.34	1624696.05	7283.94	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
3130	1769051.33	1624693.47	7274.475	FR	
3131	1769050.85	1624699.7	7287.595	FR	
3132	1769045.9	1624707.17	7287.79	FR	
3133	1769045.98	1624706.39	7286.61	FR	
3134	1769046.36	1624705.98	7287.275	FR	
3135	1769045.51	1624706.06	7284.185	FR	
3136	1769044.14	1624707.87	7283.5	FR	
3137	1769045.79	1624700.17	7274.625	FR	
3138	1769044.38	1624702.04	7276.015	FR	
3139	1769043.45	1624702.72	7274.575	FR	
3140	1769042.78	1624703.42	7274.335	FR	
3141	1769043.55	1624703.76	7276.865	FR	
3142	1769040.3	1624706.76	7273.94	FR	
3143	1769038.55	1624708.99	7276.405	FR	
3144	1769037.11	1624711.27	7274.42	FR	
3145	1769035.86	1624710.68	7272.92	FR	
3146	1769037.17	1624711.27	7276.45	FR	
3147	1769037.3	1624711.69	7277.27	FR	
3148	1769036.41	1624712.79	7275.395	FR	
3149	1769035.84	1624713.88	7278.03	FR	
3150	1769034.34	1624715.39	7275.405	FR	End 1st station setup 16 January 2007
7006	1769253.46	1624797	7277.615	BS	Backshot; start second station setup 16 Jan
3150	1769045.15	1624708.75	7286.775	FR	
3151	1769044.03	1624706.11	7282.82	FR	
3152	1769044.08	1624706.21	7281.735	TOS	
3153	1769043.43	1624706.98	7281.87	TOS	
3154	1769044.14	1624706.01	7280.89	FR	
3155	1769044.17	1624706.11	7280.575	TOS	
3156	1769043.87	1624706.2	7279.44	FR	
3157	1769044.08	1624705.64	7279.26	BOS	
3158	1769044.12	1624705.71	7278.93	BOS	
3159	1769043.48	1624707.19	7279.1	BOS	
3160	1769042.92	1624708.82	7281.375	TOS	
3161	1769042.3	1624709.45	7280.475	TOS	
3162	1769041.65	1624710.41	7280.67	TOS	
3163	1769041.29	1624710.6	7280.29	TOS	
3164	1769041.36	1624709.84	7279.41	BOS	
3165	1769040.45	1624709.97	7279.195	BOS	
3166	1769040.52	1624709.96	7279.485	TOS	
3167	1769039.09	1624711.06	7279.265	OOP	
3168	1769038.71	1624710.86	7278.71	OOP	
3169	1769038.39	1624711.32	7278.4	OOP	
3170	1769038.14	1624712.2	7279.245	OOP	
3171	1769038.02	1624712.4	7279.545	FR	
3172	1769038.4	1624711.3	7278.155	FR	
3173	1769037.58	1624713.37	7281.58	TOS	
3174	1769036.92	1624715.27	7281.455	TOS	
3175	1769036.49	1624716.02	7280.055	FR	
3176	1769028.99	1624720.96	7274.06	FR	
3177	1769029.58	1624720.71	7275.69	FR	
3178	1769030.41	1624721.43	7277.515	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
3179	1769035.81	1624717.24	7281.355	FR	
3180	1769036.94	1624713.35	7278.53	BOS	
3181	1769035.74	1624714.84	7278.825	BOS	
3182	1769034.2	1624715.89	7279.02	BOS	
3183	1769035	1624715.61	7278.985	FR	
3184	1769032.27	1624718.48	7278.755	BOS	
3185	1769032.81	1624719.62	7281.07	TOS	
3186	1769033.97	1624719.34	7281.5	FR	
3187	1769031.28	1624721.98	7280.805	TOS	
3188	1769031.01	1624721.97	7278.94	BOS	
3189	1769029.17	1624724	7279.035	BOS	
3190	1769027.4	1624724.21	7278.095	FR	
3191	1769027.2	1624724.36	7275.72	FR	
3192	1769026.84	1624725.62	7276.345	FR	
3193	1769029.27	1624724.43	7280.07	TOS	
3194	1769020.56	1624733.75	7276.495	FR	
3195	1769028.2	1624728.74	7283.86	FR	
3196	1769022.03	1624733.77	7278.455	BOS	
3197	1769028.84	1624727.02	7280.285	TOS	
3198	1769026.68	1624728.1	7279.955	FR	
3199	1769026.8	1624728.13	7279.615	TOS	
3200	1769026.47	1624727.51	7278.935	BOS	
3201	1769022.41	1624733.95	7278.77	TOS	
3202	1769022.6	1624733.8	7278.85	FR	
3203	1769023.11	1624733.08	7278.87	FR	
3204	1769024.15	1624730.51	7278.64	BOS	
3205	1769024.07	1624730.4	7279.165	TOS	
3206	1769025.74	1624730.95	7281.125	FR	
3207	1769022.26	1624734.45	7281.385	FR	
3208	1769023.37	1624733.95	7282.01	FR	
3209	1769019.43	1624735.92	7277.385	FR	
3210	1769015.16	1624741.02	7276.87	FR	
3211	1769025.8	1624731.63	7284.015	FR	
3212	1769026.07	1624731.27	7283.53	FR	
3213	1769019.25	1624737.18	7278.87	TOS	
3214	1769024.69	1624734.54	7286.12	FR	
3215	1769024.16	1624734.34	7284.145	FR	
3216	1769009.8	1624749.59	7277.855	FR	
3217	1769009.9	1624749.75	7278.285	FR	
3218	1769027.5	1624731.17	7286.15	FR	
3219	1769012.93	1624746.25	7278.5	FR	
3220	1769011.6	1624748.25	7278.745	FR	
3221	1769010.75	1624749.41	7279.02	FR	
3222	1769010.34	1624750.26	7279.725	FR	
3223	1769022.02	1624739.3	7288.195	FR	
3224	1769022.75	1624738.39	7287.32	FR	
3225	1769023.19	1624738.24	7288.59	FR	
3226	1769008.8	1624752.44	7278.895	TOS	
3227	1769006.84	1624755.24	7279.31	TOS	
3228	1769007.78	1624754.37	7279.725	FR	
3229	1769020.86	1624739.44	7287.195	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
3230	1769021.52	1624738.8	7286.995	FR	
3231	1769022.45	1624737.8	7286.65	FR	
3232	1769006.78	1624752.84	7276.42	BOS	
3233	1769020.54	1624739.09	7283.75	FR	
3234	1769021.93	1624737.29	7285.03	FR	
3235	1769022.28	1624736.38	7283.29	FR	
3236	1769005.35	1624754.84	7276.965	BOS	
3237	1769003.22	1624757.38	7276.965	BOS	
3238	1769002.45	1624758.38	7277.06	BOS	
3239	1769002	1624759.7	7277.69	BOS	
3240	1769001.94	1624759.81	7277.55	FR	
3241	1769001.93	1624759.16	7275.81	FR	
3242	1769021.35	1624736.73	7282.005	FR	
3243	1769002.65	1624758.09	7277.055	FR	
3244	1769020.54	1624736.06	7278.93	FR	
3245	1769004.08	1624756.55	7277.37	FR	
3246	1769003.53	1624756.68	7276.115	FR	
3247	1769001.82	1624759.99	7277.145	BOS	
3248	1769016.83	1624746.46	7288.14	FR	
3249	1769016.74	1624745.82	7285.055	FR	
3250	1769015.19	1624749.43	7288.01	FR	
3251	1769000.73	1624761.22	7277.43	BOS	
3252	1769015.91	1624745.24	7282.27	FR	
3253	1768999.44	1624762.73	7277.905	BOS	
3254	1768998.68	1624764.01	7278.125	BOS	
3255	1768999.81	1624762.97	7278.935	FR	
3256	1768999.5	1624762.61	7277.71	FR	
3257	1768998.87	1624762.54	7276.62	FR	
3258	1769016.27	1624744.45	7280.275	FR	
3259	1769014.87	1624745.11	7279.785	FR	
3260	1769014.14	1624745.15	7279.44	FR	
3261	1769014.18	1624745.76	7280.08	FR	
3262	1769014.42	1624746.32	7281.185	FR	
3263	1768995.49	1624765.73	7275.94	FR	
3264	1768996.2	1624765.99	7278.42	FR	
3265	1768998.96	1624764.46	7279.31	TOS	
3266	1769014.36	1624750.69	7289.025	FR	
3267	1768995.52	1624767.41	7278.77	BOS	
3268	1768994.23	1624769.24	7278.43	BOS	
3269	1769012.42	1624751.45	7285.5	FR	
3270	1769011.75	1624751.27	7284.285	FR	
3271	1769014.42	1624749.22	7284.815	FR	
3272	1769014.06	1624749.2	7284.42	FR	
3273	1769011.76	1624751.28	7284.26	FR	
3274	1769010.98	1624750.83	7281.97	FR	
3275	1769012.6	1624750.1	7283.5	FR	
3276	1769012.76	1624749.18	7282.78	FR	
3277	1769011.85	1624749.27	7281.03	FR	
3278	1769013.65	1624747.86	7281.795	FR	
3279	1769008.43	1624755.97	7282.36	FR	
3280	1769009.13	1624754.54	7282.35	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
3281	1769009.2	1624753.31	7281.73	FR	
3282	1769009.7	1624752.07	7280.83	FR	
3283	1769011.43	1624753.5	7287.575	FR	
3284	1769010.79	1624755.05	7288.725	FR	
3285	1769009.94	1624756.53	7289.005	FR	
3286	1769008.45	1624757.08	7286.83	FR	
3287	1769008.45	1624757.09	7285.885	FR	
3288	1769007.37	1624757.49	7283.04	FR	
3289	1769008.08	1624757.41	7283.68	FR	
3290	1769008.78	1624756.22	7283.985	FR	
3291	1769006.27	1624757.95	7281.11	FR	
3292	1769006.28	1624757.02	7280.39	FR	
3293	1769006.26	1624756.78	7279.495	FR	
3294	1769005.35	1624757	7278.915	FR	
3295	1769005.28	1624758.01	7280.285	FR	
3296	1769005.15	1624758.01	7279.665	TOS	
3297	1769002.99	1624760.38	7279.225	TOS	
3298	1769003.91	1624759.85	7279.62	TOS	
3299	1769003.44	1624760.24	7279.73	FR	
3300	1769003.96	1624758.08	7277.93	FR	
3301	1769004.07	1624761.54	7282.08	FR	
3302	1769004.36	1624762.54	7285.24	FR	
3303	1769000.87	1624763.84	7279.465	FR	
3304	1769001.17	1624764.5	7282.02	FR	
3305	1769001.45	1624765.35	7283.975	FR	
3306	1769001.65	1624765.79	7285.465	FR	
3307	1769001.89	1624765.61	7286.04	FR	
3308	1769001.38	1624766.78	7286.1	FR	
3309	1768999.41	1624768.5	7284.92	FR	
3310	1769001.64	1624767.04	7288.285	FR	
3311	1769001.3	1624767.41	7287.04	FR	
3312	1769001.78	1624766.32	7286.885	FR	
3313	1769002.23	1624765.85	7287.2	FR	
3314	1769003.11	1624765.09	7287.22	FR	
3315	1768997.78	1624770.61	7285.575	FR	
3316	1768998.36	1624769.65	7285.095	FR	
3317	1768998.27	1624768.11	7282.33	FR	
3318	1768995.72	1624773	7285.61	FR	
3319	1768995.33	1624771.64	7282.035	FR	
3320	1768995.49	1624771	7280.44	KBH	
3321	1768995.1	1624769.1	7279.41	TOS	End survey 16 January 2007; conclude survey on SWT

Total Southwest Temporary Wall survey points = 429

CMRR Geologic Investigations
Southeast Wall Surveying March and April 2007

Point Codes (Pcode):

BS	backshot (to benchmark)
FR	fracture
TOS	top of surge (Qbt_4-Qbt_s contact)
BOS	bottom of surge (Qbt_s-Qbt_3 contact)
C34	Qbt_3-Qbt_4 contact
STC	soil-tuff contact
CP	control point
FF	fossil fumarole
FTC	fill-tuff contact
OOP	out-of-place block

***Note: where prism is listed as horizontal, rod length (horiz. distance from wall) is 0.9 ft unless otherwise noted.

Point#	Northing	Easting	Elevation	Pcode	Notes
7007	1769263.06	1624628.85	7278.13	BS	Backshot; start survey 19 March 2007
4000	1769107.39	1624989.32	7281.965	FR	
4001	1769107.44	1624989.14	7280.905	FR	
4002	1769105.69	1624990.36	7281.96	FR	
4003	1769105.25	1624990.23	7281.175	FR	
4004	1769105.67	1624989.95	7280.125	FR	
4005	1769106.33	1624989.39	7278.74	FR	
4006	1769105.14	1624989.12	7278.26	FR	
4007	1769105.06	1624989.25	7279.225	FR	
4008	1769105.05	1624990.01	7281.07	FR	
4009	1769104.03	1624989.37	7283.18	FR	
4010	1769104.29	1624989.51	7282.19	FR	
4011	1769104.17	1624989.06	7280.685	FR	
4012	1769103.72	1624988.18	7280.09	FR	
4013	1769103.36	1624988.46	7281.96	FR	
4014	1769103.17	1624988.65	7283.475	FR	
4015	1769102.83	1624988.08	7282.12	FR	
4016	1769102.97	1624987.61	7279.655	FR	
4017	1769102.25	1624987.61	7282.755	FR	
4018	1769102.2	1624987.13	7280.76	FR	
4019	1769100.93	1624985.74	7279.405	FR	
4020	1769101.06	1624986.33	7281.055	FR	
4021	1769100.64	1624986.13	7281.945	FR	
4022	1769100.84	1624986.42	7282.39	FR	
4023	1769100.68	1624985.36	7279.685	FR	
4024	1769099.95	1624985.01	7281.415	FR	
4025	1769098.98	1624984.14	7279.055	FR	
4026	1769098.93	1624984.33	7282.865	FR	
4027	1769098.25	1624983.62	7280.125	FR	
4028	1769097.95	1624983.44	7279.285	FR	
4029	1769097.36	1624983.23	7280.98	FR	
4030	1769097.52	1624983.61	7282.01	FR	
4031	1769096.59	1624982.7	7281.965	FR	
4032	1769096.81	1624982.36	7280.175	FR	
4033	1769097.64	1624981.95	7278.48	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4034	1769096.4	1624981.59	7281.41	FR	
4035	1769096.65	1624981.43	7279.105	FR	
4036	1769096.62	1624981.25	7278.16	FR	
4037	1769096.64	1624981.1	7277.645	FR	
4038	1769104.37	1624988.48	7277.55	C34	
4039	1769103.21	1624987.46	7277.64	TOS	
4040	1769101.98	1624985.99	7277.67	TOS	
4041	1769100.81	1624985.03	7278	TOS	
4042	1769100.81	1624984.97	7277.86	BOS	
4043	1769101.21	1624984.9	7277.23	BOS	
4044	1769102.33	1624986.2	7277.205	BOS	
4045	1769102.97	1624987.12	7277.18	BOS	
4046	1769099.43	1624983.65	7278.105	BOS	
4047	1769099.36	1624983.66	7278.195	TOS	
4048	1769098.02	1624982.3	7278.465	C34	
4049	1769096.6	1624981.35	7278.12	C34	
4050	1769096.55	1624980.76	7277.18	C34	
4051	1769096.03	1624979.48	7276.5	C34	
4052	1769094.11	1624978.54	7277.03	C34	
4053	1769092.83	1624976.56	7276.995	C34	
4054	1769096.14	1624980.88	7279.64	FR	
4055	1769095.5	1624981.37	7281.625	FR	
4056	1769095.44	1624980.7	7281.1	FR	
4057	1769095.39	1624979.98	7279.83	FR	
4058	1769094.71	1624979.78	7280.35	FR	
4059	1769094.35	1624979.35	7281.025	FR	
4060	1769094.5	1624978.89	7280.01	FR	
4061	1769093.49	1624978.38	7280.12	FR	
4062	1769092.31	1624978.66	7282.055	FR	
4063	1769104.03	1624991.13	7289.095	FR	
4064	1769103.19	1624990.62	7288.09	FR	
4065	1769102.82	1624990.07	7288.115	FR	
4066	1769102.33	1624989.78	7287.715	FR	
4067	1769102.96	1624990.16	7287.565	FR	
4068	1769102.19	1624989.53	7287.275	FR	
4069	1769100.26	1624988.97	7289.28	FR	
4070	1769100.5	1624989	7287.59	FR	
4071	1769101.09	1624989.22	7287.22	FR	
4072	1769101.11	1624989.15	7288.125	FR	
4073	1769091.59	1624975.34	7277.275	FR	
4074	1769091.79	1624974.79	7276.5	FR	
4075	1769092.24	1624974.65	7275.76	FR	
4076	1769103.83	1624990.21	7285.92	FR	
4077	1769102.13	1624988.35	7284.655	FR	
4078	1769100.68	1624987.83	7285.995	FR	
4079	1769092.25	1624977.74	7280.365	FR	
4080	1769091.58	1624977.84	7281.59	FR	
4081	1769091.84	1624976.97	7279.975	FR	
4082	1769090.88	1624976.7	7281.42	FR	
4083	1769091.5	1624976.07	7280.125	FR	
4084	1769091.44	1624975.58	7279.01	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4085	1769099.96	1624987.6	7286.03	FR	
4086	1769098.92	1624986.77	7286.8	FR	
4087	1769099.65	1624987.7	7288.8	FR	
4088	1769097.69	1624986.47	7288.665	FR	
4089	1769090.77	1624976.54	7282.105	FR	
4090	1769090.28	1624975.73	7281.805	FR	
4091	1769089.91	1624974.97	7282.18	FR	
4092	1769089.77	1624974.6	7281.205	FR	
4093	1769089.28	1624973.58	7280.42	FR	
4094	1769088.49	1624973.32	7281.25	FR	
4095	1769088.55	1624972.72	7279.645	FR	
4096	1769088.69	1624972.64	7278.57	FR	
4097	1769090.51	1624973.91	7278.205	FR	
4098	1769100.21	1624986.6	7285.155	FR	
4099	1769100.26	1624986.31	7283.505	FR	
4100	1769099.85	1624985.83	7283.66	FR	
4101	1769089.17	1624973.49	7280.35	FR	
4102	1769088.41	1624973.26	7281.235	FR	
4103	1769088.59	1624972.74	7279.625	FR	
4104	1769088.67	1624972.62	7278.54	FR	
4105	1769088.25	1624972	7278.8	FR	
4106	1769088	1624972.23	7279.305	FR	
4107	1769087.31	1624972.12	7281.15	FR	
4108	1769087.08	1624971.43	7280.555	FR	
4109	1769087.34	1624971.65	7279.53	FR	
4110	1769086.58	1624971.85	7278.11	FR	
4111	1769087.2	1624971.03	7277.44	FR	
4112	1769095.11	1624983.94	7289.225	FR	
4113	1769095.63	1624983.68	7287.72	FR	
4114	1769095.17	1624983.16	7287.76	FR	
4115	1769094.86	1624983.25	7288.98	FR	
4116	1769097.13	1624985.85	7288.56	FR	
4117	1769096.51	1624985.33	7288.195	FR	
4118	1769097.25	1624985.2	7287.69	FR	
4119	1769096.65	1624984.71	7287.585	FR	
4120	1769096.5	1624984.63	7287.14	FR	
4121	1769096.39	1624984	7286.665	FR	
4122	1769090.77	1624973.86	7277.15	BOS	
4123	1769090.7	1624973.75	7277.235	TOS	
4124	1769094.73	1624982.2	7286.75	FR	
4125	1769095.01	1624982.2	7286.09	FR	
4126	1769095.53	1624982.69	7286.025	FR	
4127	1769095.96	1624982.94	7285.61	FR	
4128	1769096.16	1624982.96	7284.5	FR	
4129	1769096.86	1624983.33	7285.11	FR	
4130	1769096.93	1624983.69	7285.005	FR	
4131	1769096.95	1624983.16	7283.9	FR	
4132	1769089.29	1624972.94	7277.22	C34	
4133	1769088.49	1624972.05	7277.025	C34	
4134	1769087.9	1624970.43	7276.65	C34	
4135	1769087.38	1624969.75	7276.7	C34	

Point#	Northing	Easting	Elevation	Pcode	Notes
4136	1769085.81	1624968.25	7276.4	C34	
4137	1769085.16	1624967.57	7276.38	C34	
4138	1769084.26	1624967	7276.015	C34	
4139	1769084.14	1624966.93	7275.84	C34	
4140	1769083.93	1624966.63	7275.795	C34	
4141	1769083.28	1624965.8	7275.535	C34	
4142	1769082.53	1624965.19	7275.765	C34	
4143	1769082.41	1624965.1	7275.605	C34	
4144	1769097.87	1624984.94	7285.95	FR	
4145	1769095.46	1624982.51	7283.41	FR	
4146	1769086.5	1624970.83	7279.065	FR	
4147	1769085.81	1624970.7	7280.315	FR	
4148	1769086.16	1624970.58	7278.175	FR	
4149	1769085.91	1624970.17	7277.82	FR	
4150	1769085.44	1624970.13	7279.855	FR	
4151	1769084.65	1624969.92	7281.2	FR	
4152	1769084.67	1624969.48	7279.42	FR	
4153	1769085.14	1624969.27	7278.78	FR	
4154	1769085.24	1624968.34	7277.39	FR	
4155	1769084.25	1624968.1	7278.32	FR	
4156	1769084.45	1624967.91	7277.895	FR	
4157	1769083.82	1624967.82	7279.135	FR	
4158	1769083.96	1624967.56	7277.935	FR	
4159	1769084.01	1624967.46	7277.28	FR	
4160	1769093.24	1624981.77	7288.86	FR	
4161	1769094.46	1624982.22	7287.6	FR	
4162	1769094.01	1624981.85	7287.41	FR	
4163	1769093.23	1624980.91	7286.375	FR	
4164	1769092.98	1624980.26	7285.36	FR	
4165	1769083.12	1624967.64	7281.175	FR	
4166	1769081.97	1624966.62	7281.765	FR	
4167	1769082.02	1624966.58	7280.87	FR	
4168	1769083	1624967.16	7278.835	FR	
4169	1769082.37	1624965.48	7278.37	FR	
4170	1769082.93	1624966.5	7277.445	FR	
4171	1769090.4	1624978.66	7288.94	FR	
4172	1769092.22	1624979.6	7286.065	FR	
4173	1769091.39	1624978.26	7285.81	FR	
4174	1769092.41	1624979.2	7284.7	FR	
4175	1769091.93	1624978.33	7283.805	FR	
4176	1769081.3	1624965.43	7280.13	FR	
4177	1769081.36	1624965.26	7279.005	FR	
4178	1769081.87	1624964.87	7277.835	FR	
4179	1769079.9	1624964.46	7280.12	FR	
4180	1769080.05	1624964.35	7278.84	FR	
4181	1769094.72	1624980.93	7283.965	FR	
4182	1769093.83	1624979.78	7283.845	FR	
4183	1769078.76	1624963.17	7280.025	FR	
4184	1769078.08	1624962.86	7281.125	FR	
4185	1769077.97	1624962.64	7280.24	FR	
4186	1769077.84	1624962.23	7279.08	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4187	1769076.72	1624961.53	7279.755	FR	
4188	1769077.03	1624961.52	7278.615	FR	
4189	1769087.98	1624975.41	7287.665	FR	
4190	1769088.12	1624975.99	7288.755	FR	
4191	1769088.65	1624976.66	7288.625	FR	
4192	1769089.27	1624976.53	7287.385	FR	
4193	1769090.44	1624978.67	7289	FR	
4194	1769076.36	1624961.08	7280.445	FR	
4195	1769076.49	1624960.73	7278.965	FR	
4196	1769076.66	1624960.23	7277.28	FR	
4197	1769075.13	1624960.84	7281.015	FR	
4198	1769075.72	1624960.43	7279.625	FR	
4199	1769075.05	1624960.27	7280.11	FR	
4200	1769075.67	1624959.97	7278.515	FR	
4201	1769087.51	1624974.5	7287.05	FR	
4202	1769087.94	1624975.06	7286.62	FR	
4203	1769087.64	1624973.88	7285.275	FR	
4204	1769088.13	1624974.92	7285.325	FR	
4205	1769089.03	1624975.43	7285.34	FR	
4206	1769090	1624976.6	7285.31	FR	
4207	1769089.11	1624975.15	7283.69	FR	
4208	1769090.24	1624975.62	7282.795	FR	
4209	1769074.46	1624959.62	7281.045	FR	
4210	1769074.72	1624959.27	7279.67	FR	
4211	1769074.53	1624959.12	7278.89	FR	
4212	1769075.19	1624959.1	7277.73	FR	
4213	1769073.63	1624959.05	7279.705	FR	
4214	1769074.34	1624958.21	7277.335	FR	
4215	1769084.97	1624971.42	7287.785	FR	
4216	1769085.08	1624972.79	7288.54	FR	
4217	1769085.42	1624973.04	7288.54	FR	
4218	1769086.49	1624974.53	7289	FR	
4219	1769086.88	1624973.83	7286.37	FR	
4220	1769086.16	1624972.85	7286.155	FR	
4221	1769085.72	1624972.39	7286.945	FR	
4222	1769085.2	1624971.4	7286.245	FR	
4223	1769073.83	1624958.07	7277.685	FR	
4224	1769073.25	1624958.27	7278.78	FR	
4225	1769072.37	1624957.84	7279.055	FR	
4226	1769071.88	1624957.75	7280.22	FR	
4227	1769070.68	1624957.62	7280.555	FR	
4228	1769070.62	1624956.88	7280.235	FR	
4229	1769071.59	1624956.85	7278.065	FR	
4230	1769084.89	1624970.77	7285.37	FR	
4231	1769086.77	1624972.92	7285.225	FR	
4232	1769087.11	1624973.17	7284.495	FR	
4233	1769087.01	1624972.51	7283.41	FR	
4234	1769086.89	1624972.1	7282.58	FR	
4235	1769086.79	1624971.81	7281.99	FR	
4236	1769086.43	1624971.76	7282.815	FR	
4237	1769085.9	1624971.11	7281.845	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4238	1769085.16	1624970.73	7281.725	FR	
4239	1769085.39	1624970.68	7283.07	FR	
4240	1769084.83	1624970.46	7283.57	FR	
4241	1769069.42	1624956.51	7280.925	FR	
4242	1769068.88	1624955.72	7279.885	FR	
4243	1769069.88	1624956.1	7279.245	FR	
4244	1769070.97	1624956.19	7278.23	FR	
4245	1769069.7	1624955.24	7278	FR	
4246	1769081.81	1624968.46	7288.07	FR	
4247	1769082.24	1624968.75	7287.995	FR	
4248	1769083.2	1624970.13	7288.96	FR	
4249	1769083.52	1624970.55	7288.94	FR	
4250	1769084.18	1624970.6	7287.1	FR	
4251	1769083.66	1624969.96	7286.995	FR	
4252	1769084.05	1624970.22	7286.355	FR	
4253	1769084.46	1624970.68	7286.285	FR	
4254	1769081.61	1624964.25	7275.8	C34	
4255	1769080.45	1624963.25	7275.96	C34	
4256	1769078.9	1624962.04	7276.115	C34	
4257	1769077.79	1624961.44	7276.34	C34	
4258	1769077.48	1624960.97	7276.19	C34	
4259	1769076.84	1624960.31	7276.15	TOS	
4260	1769076.92	1624960.34	7275.95	BOS	
4261	1769076.61	1624959.95	7275.9	C34	
4262	1769074.13	1624957.81	7275.565	C34	
4263	1769071.67	1624956.12	7274.52	TOS	
4264	1769071.21	1624956.51	7273.74	BOS	
4265	1769084.03	1624968.46	7282.515	FR	
4266	1769082.81	1624967.68	7283.1	FR	
4267	1769082.52	1624967.6	7282.72	FR	
4268	1769078.69	1624967.31	7288.62	FR	
4269	1769078.42	1624966.26	7287.48	FR	
4270	1769079.38	1624967.15	7288.095	FR	
4271	1769080.54	1624967.07	7286.735	FR	
4272	1769081.04	1624967.66	7287.09	FR	
4273	1769080.58	1624966.04	7283.995	FR	
4274	1769081.5	1624967.17	7285.105	FR	
4275	1769081.49	1624967.65	7285.71	FR	
4276	1769077.85	1624966.92	7288.415	FR	
4277	1769077.58	1624965.02	7286.875	FR	
4278	1769078.19	1624965.26	7286.785	FR	
4279	1769077.8	1624964.43	7285.78	FR	
4280	1769078.36	1624964.62	7285.325	FR	
4281	1769078.34	1624963.89	7283.835	FR	
4282	1769077.04	1624962.92	7283.83	FR	
4283	1769076.61	1624962.87	7284.605	FR	
4284	1769074.42	1624965.52	7289.02	FR	
4285	1769075.12	1624966.11	7288.605	FR	
4286	1769073.96	1624962.92	7288.125	FR	
4287	1769073.27	1624961.97	7287.815	FR	
4288	1769073.96	1624962.92	7288.15	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4289	1769074.92	1624962.65	7287.535	FR	
4290	1769075.92	1624963.17	7286.675	FR	
4291	1769076	1624963.9	7287.3	FR	
4292	1769075.63	1624962.53	7285.965	FR	
4293	1769075	1624962.08	7286	FR	
4294	1769073.41	1624960.93	7284.82	FR	
4295	1769074.22	1624961.23	7284.29	FR	
4296	1769074.19	1624960.81	7283.145	FR	
4297	1769074.86	1624961.3	7283.515	FR	
4298	1769073.87	1624957.62	7275.1	FR	
4299	1769073.4	1624957.31	7275.31	FR	
4300	1769072.64	1624956.94	7275.63	FR	
4301	1769071.98	1624956.6	7276.76	FR	
4302	1769072.17	1624956.53	7276.005	FR	
4303	1769071.82	1624956.36	7274.755	FR	
4304	1769073.74	1624957.54	7275	OOP	
4305	1769073.1	1624957.09	7274.765	OOP	
4306	1769072.9	1624956.95	7275.19	OOP	
4307	1769072.85	1624956.86	7274.425	OOP	
4308	1769072.56	1624956.75	7274.78	OOP	
4309	1769077.94	1624962.89	7281.975	FR	
4310	1769076.51	1624961.85	7281.675	FR	
4311	1769076.19	1624962.14	7282.77	FR	
4312	1769076.8	1624963.01	7282.765	FR	0.3' horizontal prism
4313	1769076.01	1624962.23	7284.02	FR	
4314	1769072.33	1624961.37	7287.88	FR	
4315	1769071.66	1624960.38	7286.805	FR	
4316	1769072.45	1624960.55	7285.57	FR	
4317	1769068.65	1624961.14	7288.77	FR	
4318	1769067.91	1624959.67	7288.27	FR	
4319	1769067.85	1624959.06	7287.175	FR	
4320	1769066.58	1624958.68	7287.9	FR	
4321	1769065.18	1624957.16	7289.245	FR	
4322	1769065.65	1624957.09	7288.91	FR	
4323	1769066.18	1624956.92	7287.845	FR	
4324	1769074.92	1624960.99	7281.755	FR	
4325	1769074.31	1624960.43	7282.24	FR	
4326	1769071.99	1624959.44	7283.255	FR	
4327	1769070.23	1624959.02	7286.32	FR	
4328	1769070.2	1624958.95	7285	FR	
4329	1769069.33	1624958.66	7285.64	FR	
4330	1769070.18	1624957.86	7283.855	FR	
4331	1769069.79	1624957.36	7282.43	FR	
4332	1769068.75	1624957.01	7283.315	FR	
4333	1769068.66	1624957.26	7283.955	FR	
4334	1769067.64	1624956.91	7285.43	FR	
4335	1769067.73	1624955.85	7281.395	FR	
4336	1769065.5	1624953.38	7283.245	CP	
4337	1769066.33	1624955.29	7284.14	FR	
4338	1769059.5	1624952.46	7289.855	BH	
4339	1769061.04	1624952.79	7290.005	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4340	1769061.87	1624954.58	7289.985	FR	
4341	1769061.77	1624953.95	7288.625	FR	
4342	1769062.76	1624955.25	7289.265	FR	
4343	1769063.87	1624956.51	7289.78	FR	
4344	1769064.22	1624956.1	7288.55	FR	
4345	1769064.56	1624954.16	7285.42	FR	
4346	1769063.24	1624953.37	7285.56	FR	
4347	1769062.07	1624952.91	7287.29	FR	
4348	1769061.88	1624952.33	7286.945	FR	
4349	1769062.1	1624951.92	7285.61	FR	
4350	1769062.01	1624951.75	7284.62	FR	
4351	1769062.81	1624951.78	7283.545	FR	
4352	1769063.43	1624951.53	7281.83	FR	
4353	1769062.53	1624951.28	7282.925	FR	
4354	1769063.95	1624951.87	7280.48	FR	
4355	1769063.25	1624951.2	7280.77	FR	
4356	1769069.81	1624954.51	7274.47	TOS	
4357	1769068.36	1624953.46	7274.665	TOS	
4358	1769066.5	1624951.96	7274.655	TOS	
4359	1769066.51	1624951.86	7274.205	BOS	
4360	1769065.36	1624951.02	7274.425	TOS	
4361	1769064.21	1624950.05	7274.07	BOS	
4362	1769063.27	1624949.38	7274.17	TOS	
4363	1769066.54	1624953.13	7278.505	FR	
4364	1769066.24	1624953.27	7280.04	FR	
4365	1769065.73	1624952.38	7278.265	FR	
4366	1769065.93	1624952.06	7276.565	FR	
4367	1769064.65	1624951.85	7279.3	FR	
4368	1769064.9	1624951.76	7277.975	FR	
4369	1769063.81	1624950.91	7279.835	FR	
4370	1769064.16	1624950.98	7278.75	FR	
4371	1769064.4	1624951.24	7278.24	FR	
4372	1769063.17	1624949.76	7277.35	FR	
4373	1769063.55	1624949.47	7275.17	FR	
4374	1769061.12	1624948.81	7277.93	FR	
4375	1769060.12	1624948.22	7280.445	CP	
4376	1769060.38	1624947.43	7276.795	FR	
4377	1769059.58	1624947.13	7277.595	FR	
4378	1769058.9	1624947.14	7277.9	FR	
4379	1769058.42	1624946.97	7278.17	FR	
4380	1769058.7	1624946.65	7276.66	FR	
4381	1769057.51	1624945.8	7277.76	FR	
4382	1769057.47	1624945.56	7278.39	FR	
4383	1769056.82	1624945.51	7278.135	FR	
4384	1769056.11	1624945.44	7279.43	FR	
4385	1769055.5	1624944.36	7278.125	FR	
4386	1769054.73	1624945.05	7280.6	FR	
4387	1769054.19	1624944.43	7280.745	FR	
4388	1769053.55	1624944.09	7280.275	FR	
4389	1769053.74	1624943.17	7278.355	FR	
4390	1769053.18	1624943	7279.015	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4391	1769053	1624942.74	7278.9	FR	
4392	1769056.39	1624949.25	7290.58	FR	
4393	1769056.54	1624949.01	7289.79	FR	
4394	1769055.76	1624948.37	7289.52	FR	
4395	1769055.46	1624947.7	7288.415	FR	
4396	1769057.98	1624949.84	7288.38	FR	
4397	1769059.38	1624950.83	7287.495	FR	
4398	1769058.16	1624950.15	7286.795	FR	
4399	1769057.56	1624948.94	7286.08	FR	
4400	1769060.64	1624950.5	7284.025	FR	
4401	1769060.36	1624950.73	7284.71	FR	
4402	1769059.72	1624950.06	7285.235	FR	
4403	1769059.15	1624950	7285.345	FR	
4404	1769058.51	1624949.61	7285.585	FR	
4405	1769052.25	1624941.51	7277.245	FR	
4406	1769053.61	1624942.18	7277.005	TOS	
4407	1769055.03	1624943.36	7276.605	TOS	
4408	1769055.45	1624943.29	7276.225	TOS	
4409	1769056.64	1624944.04	7276.01	TOS	
4410	1769057.3	1624944.91	7276.04	TOS	
4411	1769057.96	1624945.03	7275.65	SOS	eroded side of surge
4412	1769058	1624945.02	7274.85	SOS	eroded side of surge
4413	1769055.44	1624948.15	7285.625	FR	
4414	1769056.4	1624947.79	7284.805	FR	
4415	1769057.13	1624948.4	7284.575	FR	
4416	1769058.05	1624948.71	7284.66	FR	
4417	1769058.51	1624948.62	7283.34	FR	
4418	1769057.68	1624948.25	7283.405	FR	End survey 19 March 2007
7009	1769128.19	1624956.68	7278.515	BS	Poor quality backshot; redo station setup
7009	1769128.18	1624956.7	7278.52	BS	Backshot; start survey 21 March 2007
4419	1769052.22	1624945.92	7290.345	FR	
4420	1769051.25	1624944.85	7289.785	FR	
4421	1769051.41	1624944.67	7288.865	FR	
4422	1769051.69	1624944.52	7287.855	FR	
4423	1769054.67	1624946.96	7288.16	FR	
4424	1769054.21	1624946.79	7288.905	FR	
4425	1769053.19	1624946.14	7288.325	FR	
4426	1769053.24	1624945.58	7287.14	FR	
4427	1769052.45	1624944.79	7286.955	FR	
4428	1769051.99	1624944.34	7286.285	FR	
4429	1769052.31	1624944.54	7285.355	FR	
4430	1769053.26	1624945.21	7285.73	FR	
4431	1769054.22	1624945.79	7285.745	FR	
4432	1769053.86	1624945.82	7286.415	FR	
4433	1769054.58	1624945.91	7285.195	FR	
4434	1769053.95	1624945.34	7284.7	FR	
4435	1769052.96	1624944.55	7284.56	FR	
4436	1769053.09	1624944.5	7284.145	FR	
4437	1769054	1624945.24	7284.06	FR	
4438	1769054.94	1624946.11	7284.52	FR	
4439	1769055.86	1624946.99	7283.495	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4440	1769056.31	1624946.87	7282.58	FR	
4441	1769055.02	1624946.48	7281.63	FR	
4442	1769054.24	1624945.23	7282.68	FR	
4443	1769053.77	1624944.5	7282.735	FR	
4444	1769054.86	1624945.6	7280.92	FR	
4445	1769056.28	1624946.31	7281.075	FR	
4446	1769057.01	1624944.06	7275.395	FR	
4447	1769056.21	1624944.17	7276.195	FR	
4448	1769056.69	1624943.79	7275.215	FR	
4449	1769055.9	1624943.47	7275.715	FR	
4450	1769055.04	1624943.58	7276.585	FR	
4451	1769055.3	1624943.25	7275.925	FR	
4452	1769055.15	1624942.78	7275.015	FR	
4453	1769054.54	1624942.13	7275.425	FR	
4454	1769053.81	1624941.98	7275.8	FR	
4455	1769053.76	1624942.81	7277.355	FR	
4456	1769053.33	1624942.38	7277.595	FR	
4457	1769049.27	1624944.01	7288.975	FR	
4458	1769049.87	1624943.43	7287.73	FR	
4459	1769048.8	1624942.62	7287.96	FR	
4460	1769049.01	1624941.88	7286.545	FR	
4461	1769050.4	1624942.77	7286.445	FR	
4462	1769051.42	1624943.52	7285.545	FR	
4463	1769051	1624943.16	7284.835	FR	
4464	1769050.27	1624942.89	7285.05	FR	
4465	1769054.04	1624941.65	7275.14	BOS	
4466	1769052.79	1624940.99	7275.415	BOS	
4467	1769051.89	1624940.43	7275.755	BOS	
4468	1769050.42	1624938.81	7275.415	BOS	
4469	1769048.43	1624937.47	7275.885	BOS	
4470	1769050.13	1624941.47	7283.305	FR	
4471	1769049.79	1624940.94	7281.945	FR	
4472	1769049.96	1624940.76	7281.145	FR	
4473	1769051.18	1624941.78	7280.665	FR	
4474	1769052.56	1624942.95	7280.645	FR	
4475	1769049.88	1624940.7	7281.125	FR	
4476	1769051.4	1624941.33	7278.985	FR	
4477	1769051.31	1624941.01	7279.49	FR	
4478	1769047.73	1624942.7	7289.22	FR	
4479	1769047.48	1624941.52	7288.035	FR	
4480	1769046.96	1624940.86	7286.96	FR	
4481	1769050.54	1624939.37	7276.95	FR	
4482	1769049.52	1624939.96	7279.6	FR	
4483	1769048.9	1624939.17	7279.68	FR	
4484	1769049.45	1624938.79	7277.37	FR	
4485	1769047.25	1624938.08	7279.945	FR	
4486	1769047.38	1624937.01	7277.345	FR	
4487	1769047.89	1624939.79	7283.435	FR	
4488	1769048.42	1624939.49	7281.55	FR	
4489	1769048.88	1624940.1	7280.905	FR	
4490	1769044.16	1624939.63	7290.23	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4491	1769044.04	1624939.36	7289.365	FR	
4492	1769043.46	1624938.04	7288.185	FR	
4493	1769041.73	1624938.18	7289.635	FR	
4494	1769041.49	1624937	7288.365	FR	
4495	1769042.19	1624937.16	7287.805	FR	
4496	1769049.46	1624939.62	7278.295	TOS	
4497	1769049.49	1624939.31	7277.93	TOS	
4498	1769046.15	1624936.91	7278.72	TOS	
4499	1769042.39	1624933.76	7278.36	TOS	location is both TOS and FR
4500	1769044.15	1624939.61	7290.26	FR	
4501	1769044.79	1624939.29	7287.85	FR	
4502	1769045.35	1624939.45	7286.685	FR	
4503	1769044.89	1624938.79	7286.42	FR	
4504	1769043.6	1624937.2	7285.855	FR	
4505	1769043.14	1624937.33	7286.66	FR	
4506	1769045.87	1624937.26	7280.48	FR	
4507	1769045.71	1624936.34	7278.175	FR	
4508	1769043.93	1624935.9	7278.69	FR	
4509	1769043.94	1624936.48	7279.835	FR	
4510	1769042.58	1624934.46	7279.1	FR	
4511	1769045.85	1624935.97	7276.615	BOS	
4512	1769043.92	1624934.71	7276.92	BOS	
4513	1769046.1	1624939.38	7285.625	FR	
4514	1769045.75	1624938.93	7285.445	FR	
4515	1769045.17	1624937.88	7284.455	FR	
4516	1769043.96	1624936.85	7284.19	FR	
4517	1769043.85	1624936.97	7283.35	FR	
4518	1769046.8	1624938.65	7282.98	FR	
4519	1769046.89	1624938.54	7282.645	FR	
4520	1769045.98	1624937.31	7280.54	FR	
4521	1769043.98	1624936.27	7281.165	FR	
4522	1769050.62	1624940.3	7277.525	TOS	
4523	1769041.53	1624933.05	7277	FR	
4524	1769039.6	1624931.4	7277.41	FR	
4525	1769039.75	1624932.39	7279.925	FR	
4526	1769040.08	1624932.77	7280.975	FR	
4527	1769038.6	1624932.01	7280.94	FR	
4528	1769038.46	1624931.65	7280.385	FR	
4529	1769038.76	1624931.54	7278.825	FR	
4530	1769037.2	1624930.5	7280.24	FR	
4531	1769035.61	1624929.63	7280.43	FR	
4532	1769035.59	1624929.75	7278.02	FR	
4533	1769034.5	1624929.05	7280.23	FR	
4534	1769033.72	1624928.56	7281.115	FR	
4535	1769033.59	1624928.68	7278.9	FR	
4536	1769040.33	1624931.83	7277.135	BOS	
4537	1769039.64	1624931.36	7277	BOS	
4538	1769039.37	1624931.26	7277.185	BOS	
4539	1769040.34	1624932.03	7277.965	TOS	
4540	1769039.62	1624931.45	7277.695	TOS	
4541	1769038.52	1624930.98	7277.345	TOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
4542	1769037.75	1624930.71	7277.35	C34	
4543	1769036.39	1624929.69	7277.465	C34	
4544	1769034.72	1624927.43	7277.015	C34	
4545	1769034.06	1624926.85	7276.77	C34	
4546	1769036.81	1624934.35	7290	FR	
4547	1769037.2	1624933.83	7288.81	FR	
4548	1769039.55	1624936.26	7289.835	FR	
4549	1769039.94	1624935.86	7288.895	FR	
4550	1769040.13	1624935.42	7288.06	FR	
4551	1769039.88	1624934.9	7285.45	FR	
4552	1769038.49	1624933.52	7285.925	FR	
4553	1769038.08	1624933.35	7285.46	FR	
4554	1769031.38	1624927.51	7279.78	FR	
4555	1769031.38	1624927.51	7279.735	FR	REDO 4554 after instrument level adjust
4556	1769031.49	1624927.04	7278.745	FR	
4557	1769030.45	1624926.2	7280.63	FR	
4558	1769030.98	1624926.17	7277.755	FR	
4559	1769031.73	1624926.23	7277.065	C34	
4560	1769041.53	1624934.13	7281.535	FR	
4561	1769040.03	1624933.2	7281.625	FR	
4562	1769038.76	1624932.18	7282.06	FR	
4563	1769038.05	1624931.81	7281.685	FR	
4564	1769030.15	1624924.17	7277	C34	
4565	1769029.62	1624924.27	7277.635	FR	
4566	1769028.95	1624924.99	7280.685	FR	
4567	1769028.75	1624924.22	7278.62	FR	
4568	1769028.44	1624923.79	7278.77	FR	
4569	1769028.3	1624923.08	7277.405	FR	
4570	1769035.57	1624933.8	7289.955	FR	
4571	1769034.36	1624932.16	7289.43	FR	
4572	1769034.5	1624931.92	7288.21	FR	
4573	1769034.67	1624931.3	7287.165	FR	
4574	1769028.75	1624923.26	7277.225	TOS	
4575	1769028.8	1624923.06	7276.975	BOS	
4576	1769027.47	1624922.53	7276.235	BOS	
4577	1769027.37	1624922.59	7277.155	TOS	
4578	1769035.25	1624930.41	7284.14	FR	
4579	1769034.05	1624928.8	7282.67	FR	
4580	1769026.68	1624922.77	7281.06	FR	
4581	1769026.38	1624922.28	7279.055	FR	
4582	1769032.45	1624930.56	7289.815	FR	
4583	1769032.47	1624930.07	7288.51	FR	
4584	1769030.69	1624929.71	7290.1	FR	
4585	1769029.97	1624928.96	7289.89	FR	
4586	1769030.57	1624928.4	7287.17	FR	
4587	1769025.76	1624922.54	7278.44	FR	
4588	1769025.21	1624922.67	7280.595	FR	
4589	1769024.95	1624922.39	7279.31	FR	
4590	1769024.88	1624922.2	7278.83	FR	
4591	1769032.65	1624929.55	7286.68	FR	
4592	1769032	1624929.08	7285.63	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4593	1769031.2	1624927.21	7283.545	FR	
4594	1769024.98	1624921.71	7277.925	TOS	
4595	1769022.34	1624920.04	7278.065	TOS	
4596	1769022.36	1624919.74	7276.64	BOS	
4597	1769025	1624921.56	7276.605	BOS	
4598	1769028.33	1624928.39	7290.435	FR	
4599	1769028.68	1624927.6	7288.865	FR	
4600	1769027.45	1624926.94	7289.335	FR	
4601	1769024.46	1624921.99	7280.435	FR	
4602	1769023.89	1624921.89	7281.37	FR	
4603	1769023.51	1624921.47	7280.77	FR	
4604	1769024.07	1624921.5	7279.36	FR	
4605	1769028.84	1624926.93	7286.305	FR	
4606	1769028.03	1624926.13	7285.28	FR	
4607	1769028.94	1624926.36	7283.56	FR	
4608	1769029.25	1624926.42	7282.705	FR	
4609	1769031.37	1624927.42	7281.17	FR	
4610	1769023.1	1624921.49	7280.85	FR	
4611	1769022.46	1624921.61	7280.35	FR	
4612	1769022.92	1624920.6	7278.97	FR	
4613	1769021.7	1624920	7279.51	FR	
4614	1769021.09	1624919.96	7280.365	FR	
4615	1769020.13	1624918.77	7278.815	FR	
4616	1769020.97	1624919.35	7278.245	FR	
4617	1769019.75	1624918.21	7277.705	TOS	
4618	1769020.15	1624918.24	7276.21	BOS	
4619	1769018.03	1624916.88	7277.355	TOS	
4620	1769019.23	1624916.85	7276.075	BOS	
4621	1769023.93	1624924.27	7288.645	FR	
4622	1769023.99	1624924.17	7287.44	FR	
4623	1769023.49	1624923.47	7286.94	FR	
4624	1769023.06	1624923.02	7286.31	FR	
4625	1769023.81	1624924.04	7286.05	FR	
4626	1769018.3	1624917.28	7279.605	FR	
4627	1769017.06	1624917.04	7280.42	FR	
4628	1769016.9	1624916.86	7281.265	FR	
4629	1769016.63	1624916.99	7280.515	FR	
4630	1769016.34	1624916.09	7280.3	FR	
4631	1769016.24	1624916.46	7278.5	FR	
4632	1769023.69	1624922.65	7284.035	FR	
4633	1769024.79	1624923.23	7283.78	FR	
4634	1769024.63	1624922.76	7282.815	FR	
4635	1769023.69	1624922.1	7281.925	FR	
4636	1769023.72	1624922.05	7281.75	FR	
4637	1769028.25	1624925.4	7281.29	FR	
4638	1769017.12	1624915.39	7276.145	FR	
4639	1769016.87	1624915.24	7275.845	BOS	
4640	1769013.3	1624913.01	7276.52	BOS	
4641	1769012	1624912.1	7276.485	BOS	
4642	1769009.51	1624910.33	7276.755	BOS	
4643	1769020.4	1624922.97	7289.185	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4644	1769019.28	1624921.75	7288.59	FR	
4645	1769020.25	1624921.2	7287.445	FR	
4646	1769021.86	1624921.95	7286.39	FR	
4647	1769021.26	1624921.58	7285.29	FR	
4648	1769014.13	1624913.88	7276.72	TOS	
4649	1769013.37	1624912.95	7276.825	TOS	
4650	1769012.12	1624912.17	7276.95	TOS	
4651	1769009.45	1624910.43	7277.24	TOS	
4652	1769023.01	1624922.39	7283.955	FR	
4653	1769021.72	1624921.52	7284.205	FR	
4654	1769020.9	1624920.45	7282.195	FR	
4655	1769020.34	1624919.81	7281.45	FR	
4656	1769014.6	1624914.88	7277.035	FR	
4657	1769014.33	1624914.63	7277.225	FR	
4658	1769014.94	1624914.59	7278.72	FR	
4659	1769014.29	1624914.37	7278.925	FR	
4660	1769014.44	1624914.89	7279.865	FR	
4661	1769014.52	1624915	7280.92	FR	
4662	1769017.57	1624921.2	7288.48	FR	
4663	1769018.33	1624919.81	7287.37	FR	
4664	1769019.13	1624920.06	7286.9	FR	
4665	1769012.56	1624913.22	7277.675	FR	
4666	1769012.15	1624913.19	7280.385	FR	
4667	1769011.96	1624912.83	7278.585	FR	
4668	1769010.88	1624912.05	7280.05	FR	
4669	1769011.23	1624912.01	7277.81	FR	
4670	1769017.7	1624919.14	7287.155	FR	
4671	1769016.62	1624920.81	7289.13	FR	
4672	1769016.55	1624919.01	7288.155	FR	
4673	1769008.67	1624910.64	7280.915	FR	
4674	1769008.39	1624910.14	7279.735	FR	
4675	1769008.99	1624910.47	7277.975	FR	
4676	1769019.05	1624919.66	7284.75	FR	
4677	1769008.08	1624909.46	7277.115	FR	
4678	1769006.83	1624908.59	7278.32	FR	
4679	1769006.56	1624908.27	7276.99	FR	
4680	1769017.6	1624918.83	7285.8	FR	
4681	1769017.47	1624918.2	7284.89	FR	
4682	1769017.84	1624917.74	7283.67	FR	
4683	1769018.33	1624917.86	7282.405	FR	
4684	1769016.92	1624916.9	7283.52	FR	
4685	1769016.11	1624916.5	7282.92	FR	End 1st station setup survey 21 March 2007
7009	1769128.2	1624956.72	7278.525	BS	Backshot; start 2nd survey setup 21 March 2007
4686	1769016.34	1624918.99	7289.455	FR	
4687	1769016.46	1624917.49	7286.47	FR	
4688	1769014.7	1624916.98	7289.235	FR	
4689	1769014.23	1624915.73	7288.035	FR	
4690	1769014.66	1624915.84	7286.62	FR	
4691	1769013.19	1624915.78	7288.885	FR	
4692	1769012.09	1624915.8	7289.13	FR	
4693	1769007.83	1624908.68	7277.485	TOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
4694	1769005.68	1624906.92	7277.62	TOS	
4695	1769004.45	1624906.24	7277.705	TOS	
4696	1769003.74	1624905.08	7277.77	TOS	
4697	1769000.79	1624902.42	7277.095	TOS	
4698	1769014.89	1624916.09	7285.16	FR	
4699	1769015.3	1624916.27	7284.025	FR	
4700	1769015.86	1624915.69	7282.425	FR	
4701	1769014.99	1624914.78	7282.56	FR	
4702	1769014.62	1624914.51	7283.24	FR	
4703	1769007.88	1624908.61	7276.815	BOS	
4704	1769006	1624906.78	7276.78	BOS	
4705	1769004.9	1624906.3	7276.9	BOS	
4706	1769004.28	1624904.84	7276.455	BOS	
4707	1769002.58	1624903.04	7276.325	BOS	
4708	1769001.06	1624901.51	7275.975	BOS	
4709	1769015.05	1624914.59	7281.67	FR	
4710	1769006.2	1624906.93	7276.8	FR	
4711	1769005.85	1624907.44	7279.005	FR	
4712	1769005.23	1624906.99	7278.59	FR	
4713	1769003.87	1624906.87	7279.065	FR	
4714	1769003.41	1624906.03	7280.005	FR	
4715	1769003.61	1624906.18	7279.8	FR	
4716	1769003.38	1624905.93	7278.615	FR	
4717	1769011.67	1624914.11	7288.765	FR	
4718	1769009.65	1624913.64	7289.13	FR	
4719	1769012.3	1624913.8	7286.035	FR	
4720	1769012.17	1624913.38	7283.975	FR	
4721	1769012.66	1624913.45	7282.8	FR	
4722	1769011.68	1624912.64	7282.145	FR	
4723	1769011.52	1624912.43	7281.44	FR	
4724	1769002.93	1624904.81	7277.975	FR	
4725	1769002.25	1624904.93	7280.07	FR	
4726	1769008.27	1624910.39	7283.27	FR	
4727	1769006.44	1624908.66	7282.26	FR	
4728	1769005.94	1624908.56	7283.215	FR	
4729	1769007.47	1624910.37	7285.625	FR	
4730	1769007.1	1624911.78	7289.76	FR	
4731	1769006.73	1624911.3	7289.69	FR	
4732	1769006.51	1624910.22	7288.505	FR	
4733	1769004.09	1624910	7288.875	BH	Kleinfelder borehole
4734	1769003.98	1624908.15	7288.11	FR	
4735	1769003.95	1624908.14	7288.195	FR	REDO 4734
4736	1769005.5	1624908.89	7286.305	FR	
4737	1769004.2	1624907.98	7285.61	FR	
4738	1769003.19	1624907.33	7287.45	FR	
4739	1769002.65	1624904.17	7277.215	FR	
4740	1769002.43	1624903.51	7276.815	FR	
4741	1769001.91	1624904.1	7277.94	FR	
4742	1769001	1624904.1	7279.44	FR	
4743	1769001.22	1624903.14	7277.23	FR	
4744	1769004.75	1624908.32	7284.58	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4745	1769003.66	1624907.63	7284.685	FR	
4746	1769004.75	1624907.85	7282.815	FR	
4747	1768999.87	1624903.3	7279.585	FR	
4748	1769000.35	1624902.82	7278.695	FR	
4749	1768999.99	1624902.31	7278.16	FR	
4750	1768999.08	1624902.3	7279.165	FR	
4751	1768999.25	1624902.13	7278.515	FR	
4752	1769004.45	1624907.75	7280.145	FR	
4753	1769003.9	1624906.56	7281.215	FR	
4754	1769001.65	1624901.66	7275.61	FR	
4755	1769001.29	1624901.9	7276.01	FR	
4756	1769000.6	1624901.71	7276.375	FR	
4757	1769000.4	1624902.16	7277.355	FR	
4758	1768999.91	1624901.91	7277.3	FR	
4759	1769001.09	1624901.24	7275.265	FR	
4760	1769000.66	1624901.12	7275.42	FR	
4761	1769000.7	1624900.92	7274.85	FR	
4762	1768999.92	1624900.85	7275.99	FR	
4763	1768999.96	1624900.55	7275.32	FR	
4764	1768999.6	1624900.36	7275.525	FR	
4765	1768999.89	1624900.53	7274.65	FR	
4766	1768999.5	1624901.02	7277.46	FR	
4767	1768998.09	1624901.17	7278.65	FR	
4768	1768997.55	1624901.54	7279.725	FR	
4769	1768998.45	1624902.09	7279.585	FR	
4770	1768994.56	1624899.66	7280.875	FR	
4771	1768994.67	1624898.94	7278.595	FR	
4772	1768991.73	1624897.51	7280.85	FR	
4773	1768992.55	1624897.25	7277.96	FR	
4774	1768993.4	1624896.91	7276.045	FR	
4775	1768993.24	1624896.64	7274.955	FR	
4776	1768992.96	1624896.6	7275.385	BOS	
4777	1768994.33	1624897.32	7275.45	BOS	
4778	1768995.92	1624898.11	7275.38	BOS	
4779	1768997.46	1624899.39	7275.49	BOS	
4780	1768998.91	1624899.78	7275.535	BOS	
4781	1769000.36	1624900.86	7275.32	BOS	
4782	1769000.2	1624901.2	7276.21	TOS	
4783	1768997.35	1624898.94	7276.555	TOS	
4784	1768995.41	1624898.41	7276.665	TOS	
4785	1768994.09	1624897.35	7276.615	TOS	
4786	1768993.39	1624896.97	7276.48	TOS	
4787	1768992.97	1624896.79	7276.455	TOS	End survey 21 March 2007
7009	1769128.2	1624956.72	7278.485	BS	Backshot; start survey 18 April 2007
4788	1769002.02	1624906.01	7286.32	FR	
4789	1769000.75	1624904.87	7283.495	FR	
4790	1768999.49	1624904.99	7285.86	FR	
4791	1768999.33	1624905.54	7287.185	FR	
4792	1768998.54	1624905.2	7288.565	FR	
4793	1768998.39	1624905.05	7287.475	FR	
4794	1768992.32	1624895.58	7276.54	TOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
4795	1768990.19	1624894.31	7276.175	TOS	
4796	1768989.29	1624893.98	7276.215	TOS	
4797	1768988.46	1624893.16	7276.195	TOS	
4798	1768987.24	1624892.15	7276.32	TOS	
4799	1768985.78	1624891.19	7276.02	TOS	
4800	1768985.44	1624890.81	7275.975	TOS	
4801	1768984.58	1624890.3	7276.06	TOS	
4802	1768983.5	1624889.1	7276.04	TOS	
4803	1768982.02	1624887.72	7276.21	TOS	
4804	1768980.25	1624886.59	7276.23	TOS	
4805	1768980.29	1624886.33	7275.955	TOS	
4806	1768978.05	1624884.7	7276.065	TOS	
4807	1768977.84	1624884.29	7275.6	TOS	
4808	1768998.62	1624905.17	7285.29	FR	
4809	1768999.15	1624904.79	7284.715	FR	
4810	1768997.71	1624903.66	7284.815	FR	
4811	1768998.6	1624903.74	7284.185	FR	
4812	1768998.26	1624903.42	7283.935	FR	
4813	1768997.31	1624902.58	7283.745	FR	
4814	1769001.26	1624905.16	7281.25	FR	
4815	1769000.15	1624903.57	7282.185	FR	
4816	1768998.36	1624903.05	7282.755	FR	
4817	1768997.94	1624902.83	7281.52	FR	
4818	1768992.29	1624894.74	7275.635	BOS	
4819	1768991.62	1624894.62	7274.93	BOS	
4820	1768990.73	1624893.78	7274.85	BOS	
4821	1768989.62	1624892.9	7275.005	BOS	
4822	1768988.84	1624892.44	7275.155	BOS	
4823	1768987.43	1624891.61	7275.165	BOS	
4824	1768986.24	1624890.76	7274.645	BOS	
4825	1768985.51	1624890.25	7274.49	BOS	
4826	1768985	1624889.68	7274.075	BOS	
4827	1768983.58	1624888.39	7274.02	BOS	
4828	1768978.01	1624884.45	7275.485	BOS	
4829	1768977.77	1624884.35	7275.135	BOS	
4830	1768976.44	1624883.31	7275.29	BOS	
4831	1768997.55	1624903.67	7287.175	FR	
4832	1768995.24	1624903.06	7287.78	FR	
4833	1768995.75	1624902.36	7286.96	FR	
4834	1768994.28	1624900.62	7286.925	FR	
4835	1768995.53	1624900.45	7283.31	FR	
4836	1768994.53	1624900.09	7283.905	FR	
4837	1768995.52	1624897.01	7274.31	CP	
4838	1768992.2	1624895.16	7275.955	FR	
4839	1768991.23	1624896.5	7279.25	FR	
4840	1768990.5	1624895.47	7279.115	FR	
4841	1768989.69	1624895.27	7279.335	FR	
4842	1768990.51	1624895.25	7277.605	FR	
4843	1768990.22	1624895.19	7277.02	FR	
4844	1768991.2	1624894.41	7275.315	FR	
4845	1768987.41	1624893.23	7279.99	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4846	1768987.96	1624893.38	7277.81	FR	
4847	1768988.35	1624893.12	7276.51	FR	
4848	1768988.96	1624892.87	7275.72	FR	
4849	1768991.98	1624900.6	7287.985	FR	
4850	1768991.62	1624899.94	7287.97	FR	
4851	1768991.55	1624899.61	7289.02	FR	
4852	1768989.27	1624897.23	7288.8	FR	
4853	1768990.59	1624897.1	7285.235	FR	
4854	1768990.28	1624896.02	7282.47	FR	
4855	1768988.9	1624895.59	7283.67	FR	
4856	1768985.04	1624894.37	7287.76	FR	
4857	1768983.17	1624893.74	7287.315	FR	
4858	1768985.06	1624893.05	7284.075	FR	
4859	1768986.93	1624893.56	7281.735	FR	
4860	1768984.25	1624891.75	7281.085	FR	
4861	1768985.7	1624892.44	7279.875	FR	
4862	1768986.61	1624892.19	7277.05	FR	
4863	1768987.2	1624891.65	7275.94	FR	
4864	1768985.71	1624891.6	7276.9	FR	
4865	1768983.02	1624890.66	7278.99	FR	
4866	1768983.16	1624888.25	7275.46	FR	
4867	1768985.04	1624889.61	7273.985	CP	
4868	1768981.54	1624889.4	7279.22	FR	
4869	1768978.22	1624885.33	7277.11	FR	
4870	1768978	1624884.8	7276.375	FR	
4871	1768973.65	1624881.03	7274.49	FR	
4872	1768974.4	1624881.37	7274.18	CP	
4873	1768971.6	1624881.06	7280.165	FR	
4874	1768971.68	1624880.55	7278.29	FR	
4875	1768970.23	1624879.22	7279.555	FR	
4876	1768969.4	1624878.24	7278.865	FR	
4877	1768968.36	1624876.96	7277.665	FR	
4878	1768968.15	1624877.35	7278.88	FR	
4879	1768968.16	1624878.03	7280.57	FR	
4880	1768967.5	1624877.2	7280.03	FR	
4881	1768966.93	1624876.64	7280.25	FR	
4882	1768978.3	1624893.25	7289.045	FR	
4883	1768980.33	1624891.04	7286.26	FR	
4884	1768982.38	1624891.59	7283.59	FR	
4885	1768979.99	1624889.45	7282.475	FR	
4886	1768979.63	1624888.08	7281.135	FR	
4887	1768975.68	1624882.76	7275.505	C34	
4888	1768974.26	1624882.12	7275.455	C34	
4889	1768973.59	1624881.16	7274.835	C34	
4890	1768973.08	1624881.01	7276.01	C34	
4891	1768971.94	1624879.91	7276.105	C34	
4892	1768981.96	1624890.43	7280.375	FR	
4893	1768969.46	1624877.81	7276.605	TOS	
4894	1768968.26	1624876.89	7277.035	TOS	
4895	1768967.61	1624876.46	7277.105	TOS	
4896	1768967.65	1624876.48	7276.94	TOS	REDO 4895

Point#	Northing	Easting	Elevation	Pcode	Notes
4897	1768966.66	1624875.72	7277.18	TOS	
4898	1768965.79	1624874.8	7277.31	TOS	
4899	1768964.18	1624873.71	7277.365	TOS	
4900	1768974.91	1624891.19	7288.6	FR	
4901	1768974	1624889.98	7287.275	FR	
4902	1768973.12	1624887.49	7287.475	FR	
4903	1768969.62	1624877.84	7276.165	BOS	
4904	1768968.83	1624877.12	7276.44	BOS	
4905	1768967.88	1624876.45	7276.525	BOS	
4906	1768967.8	1624876.4	7276.25	BOS	
4907	1768967.69	1624876.14	7276.355	BOS	
4908	1768966.74	1624875.48	7276.385	BOS	
4909	1768976.96	1624888.89	7283.58	FR	
4910	1768973.64	1624888.11	7283.965	FR	
4911	1768972.11	1624885.9	7284.775	FR	
4912	1768965.76	1624874.56	7276.365	BOS	
4913	1768964.05	1624873.43	7276.79	BOS	
4914	1768963.39	1624873.04	7277.02	BOS	
4915	1768974.75	1624886.87	7280.845	FR	
4916	1768972	1624882.81	7282.295	FR	0.5' horizontal prism
4917	1768970.19	1624883.62	7283.97	FR	
4918	1768970.71	1624880.51	7282.55	FR	
4919	1768966.75	1624875.1	7275.725	CP	
4920	1768965.16	1624873.98	7276.135	CP	
4921	1768963.31	1624872.87	7276.54	CP	
4922	1768961.28	1624870.92	7276.675	CP	
4923	1768964.92	1624873.28	7274.555	CP	
4924	1768976.33	1624890.01	7285.565	FR	
4925	1768967.28	1624881.85	7288.785	FR	
4926	1768968.84	1624883.37	7288.04	FR	
4927	1768966.13	1624875.51	7278.01	FR	
4928	1768963.83	1624874.55	7280.425	FR	
4929	1768963.96	1624874.33	7278.345	FR	
4930	1768964.66	1624874.12	7277.585	FR	
4931	1768962.82	1624873.45	7280.515	FR	
4932	1768962.89	1624872.97	7278.57	FR	
4933	1768963.51	1624873.06	7277.405	FR	
4934	1768968.13	1624881.67	7285.255	FR	
4935	1768966.13	1624879.04	7288.035	FR	
4936	1768967.82	1624879.06	7284.37	FR	
4937	1768966.37	1624877.45	7284.44	FR	
4938	1768968.37	1624878.48	7283.405	FR	End survey 18 April 2007
7009	1769128.19	1624956.71	7278.495	BS	Backshot; start survey 19 April; SKIP point 4939
4940	1768961.45	1624871.18	7277.565	FR	
4941	1768959.77	1624870.31	7277.545	TOS	
4942	1768958.75	1624869.31	7277.6	TOS	
4943	1768957.89	1624869.09	7277.905	TOS	
4944	1768961.31	1624871.07	7277.24	BOS	
4945	1768960.01	1624870.73	7277.425	BOS	
4946	1768959.13	1624869.46	7277.345	BOS	
4947	1768958.11	1624869.13	7277.245	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
4948	1768957.63	1624869.08	7277.655	BOS	
4949	1768964.53	1624877.98	7288.68	FR	
4950	1768963.99	1624876.83	7287.685	FR	
4951	1768964.82	1624876.49	7285.415	FR	
4952	1768961.75	1624872.2	7277.59	FR	
4953	1768962.03	1624871.88	7276.865	FR	
4954	1768960.76	1624872.77	7280.725	FR	
4955	1768960.37	1624871.2	7278.67	FR	
4956	1768959.4	1624870.88	7280.105	FR	
4957	1768959.28	1624869.69	7276.79	FR	
4958	1768959	1624869.5	7275.515	FR	
4959	1768957.91	1624868.73	7275.64	FR	
4960	1768957.13	1624868.71	7276.56	FR	
4961	1768958.24	1624869.17	7277.86	FR	
4962	1768958.3	1624869.1	7279.59	FR	
4963	1768965.77	1624876.25	7281.81	FR	
4964	1768964.38	1624874.78	7282.405	FR	
4965	1768964.1	1624875	7283.765	FR	
4966	1768962.63	1624874.37	7284.64	FR	
4967	1768962.73	1624874.64	7286.33	FR	
4968	1768962.17	1624875.4	7288.355	FR	
4969	1768960.91	1624873.75	7288.285	FR	
4970	1768956	1624869.18	7277.835	C34	
4971	1768955.26	1624868.95	7277.965	C34	
4972	1768951.98	1624867.59	7277.415	C34	
4973	1768946.13	1624860.58	7277.515	C34	
4974	1768965.62	1624876.13	7281.8	FR	
4975	1768964.45	1624874.89	7282.475	FR	
4976	1768964.24	1624875.12	7283.775	FR	
4977	1768962.81	1624873.85	7282.66	FR	
4978	1768957.09	1624868.8	7279.075	FR	
4979	1768956.69	1624868.76	7277.835	FR	
4980	1768955.75	1624869.16	7278.85	FR	
4981	1768954.25	1624868.66	7280.96	FR	
4982	1768954.5	1624868.85	7279.315	FR	
4983	1768953.93	1624866.62	7275.18	FR	
4984	1768952.55	1624868.04	7278.155	FR	
4985	1768952.12	1624868.2	7280.385	FR	
4986	1768951.02	1624867.4	7279.52	FR	
4987	1768957.88	1624873.45	7288.13	FR	
4988	1768959.21	1624872.6	7285.785	FR	
4989	1768954.87	1624867.81	7277.545	TOS	
4990	1768953.82	1624867.34	7277.535	TOS	
4991	1768954.73	1624867.75	7277.505	BOS	
4992	1768953.63	1624867.34	7277.475	BOS	
4993	1768961.05	1624873.41	7285.25	FR	
4994	1768960.98	1624873.66	7282.9	FR	
4995	1768959.68	1624871.42	7283.13	FR	
4996	1768955.27	1624867.14	7274.53	CP	
4997	1768952.05	1624865.81	7274.865	FR	
4998	1768951.36	1624865.11	7274.75	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
4999	1768949.94	1624864.77	7276.315	FR	
5000	1768949.45	1624865.93	7277.885	FR	
5001	1768949.25	1624864.78	7279.28	FR	
5002	1768954.44	1624873.92	7287.92	FR	
5003	1768955.35	1624872.29	7285.945	FR	
5004	1768954.29	1624872.12	7286.41	FR	
5005	1768950.54	1624866.41	7277.36	TOS	
5006	1768950.3	1624865.96	7277.3	BOS	
5007	1768949.48	1624864.88	7277.265	TOS	
5008	1768949.21	1624864.43	7277.185	BOS	
5009	1768948.04	1624863.01	7277.425	TOS	
5010	1768946.87	1624862.03	7277.475	BOS	
5011	1768952.69	1624872.01	7288.43	FR	
5012	1768953.14	1624871.12	7286.625	FR	
5013	1768951.31	1624870.98	7288.49	FR	
5014	1768952.91	1624870.49	7285.055	FR	
5015	1768951.82	1624870.55	7285.625	FR	
5016	1768955.79	1624870.72	7283.885	FR	
5017	1768954.92	1624869.8	7282.12	FR	
5018	1768956.72	1624870.73	7281.5	FR	
5019	1768957.42	1624870.5	7282.695	FR	
5020	1768949.63	1624862.83	7276.045	FR	
5021	1768949.8	1624862.67	7275.505	FR	
5022	1768949.36	1624862.24	7274.61	FR	
5023	1768948.73	1624861.97	7275.71	FR	
5024	1768948.6	1624861.6	7274.89	FR	
5025	1768949.19	1624869.79	7288.66	FR	
5026	1768949.3	1624870.3	7286.72	FR	
5027	1768949.77	1624866.12	7285.97	FR	
5028	1768949.61	1624866.07	7288.26	FR	
5029	1768948.15	1624863.54	7281.105	FR	
5030	1768946.85	1624863.18	7281.305	FR	
5031	1768947.8	1624863.26	7277.91	FR	
5032	1768946.58	1624862.86	7279.225	FR	
5033	1768946.78	1624862.89	7277.98	FR	
5034	1768946.27	1624861.93	7278.04	FR	
5035	1768946.49	1624860.46	7276.28	FR	
5036	1768946.56	1624860.24	7275.685	FR	
5037	1768946.23	1624859.78	7274.6	FR	
5038	1768947.97	1624864.85	7288.16	FR	
5039	1768948.92	1624864.34	7286.28	FR	
5040	1768948.83	1624863.96	7283.89	FR	
5041	1768946.9	1624863.51	7285.605	FR	
5042	1768946.44	1624863.95	7287.14	FR	
5043	1768945.04	1624860.42	7277.475	C34	
5044	1768943.19	1624859.71	7277.455	C34	
5045	1768942	1624858.98	7277.37	C34	
5046	1768941.65	1624857.95	7277.48	C34	0.5' horizontal prism
5047	1768941.41	1624857.14	7277.44	C34	
5048	1768947.01	1624863.34	7282.59	FR	
5049	1768945.53	1624862.94	7282.86	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5050	1768944.61	1624860.31	7277.42	BOS	
5051	1768944.36	1624860.17	7277.495	TOS	0.5' horizontal prism
5052	1768944.97	1624861.62	7279.12	FR	
5053	1768942.5	1624861.66	7279.03	FR	
5054	1768942.62	1624859.58	7278.32	FR	
5055	1768942.65	1624858.28	7276.1	FR	
5056	1768941.66	1624858.69	7277.565	FR	
5057	1768941.74	1624858.73	7279.13	FR	
5058	1768943.96	1624862.91	7287.71	FR	
5059	1768943.95	1624862.78	7285.605	CP	
5060	1768942.27	1624862.49	7287.215	FR	
5061	1768941.26	1624859.54	7280.6	FR	
5062	1768941.65	1624859.32	7279.695	FR	0.5' horizontal prism
5063	1768939.67	1624858.3	7279.705	FR	
5064	1768939.28	1624857.53	7279.81	FR	0.5' horizontal prism
5065	1768940.18	1624855.84	7277.845	FR	
5066	1768938.15	1624854.74	7278.295	FR	
5067	1768940.25	1624855.45	7276.485	FR	
5068	1768939.2	1624854.93	7276.87	FR	
5069	1768944.54	1624862.56	7281.235	FR	
5070	1768943.45	1624862.45	7282.815	FR	
5071	1768940.75	1624856.72	7277.535	TOS	
5072	1768940.7	1624856.28	7277.37	BOS	
5073	1768941.67	1624862.14	7283.86	FR	
5074	1768941.54	1624861.97	7281.88	FR	
5075	1768941.62	1624855.77	7274.38	CP	
5076	1768939.55	1624861.87	7287.45	FR	
5077	1768939.11	1624859.5	7287.73	FR	
5078	1768939.22	1624858.7	7285.495	FR	
5079	1768939.5	1624860.18	7285.675	FR	
5080	1768939.47	1624855.39	7277.465	C34	
5081	1768939.43	1624855.25	7277.26	C34	
5082	1768938.56	1624854.73	7277.195	C34	
5083	1768938.44	1624854.6	7276.95	C34	
5084	1768937.45	1624853.99	7277.135	C34	
5085	1768936.74	1624853.78	7277.45	C34	
5086	1768935.92	1624852.93	7277.645	C34	
5087	1768933.19	1624851.05	7277.75	C34	
5088	1768939.4	1624861.7	7284.285	FR	
5089	1768939.47	1624857.7	7282.615	FR	
5090	1768938.98	1624854.8	7276.83	FR	
5091	1768938.81	1624854.31	7276.045	FR	
5092	1768939.18	1624854.39	7275.715	FR	
5093	1768939.18	1624854.13	7274.2	FR	
5094	1768938.51	1624853.59	7274.415	FR	
5095	1768937.66	1624853.69	7276.005	FR	
5096	1768937.31	1624853.63	7276.94	FR	
5097	1768938.11	1624854.75	7278.37	FR	
5098	1768937.22	1624854.13	7278.57	FR	
5099	1768936.83	1624853.82	7278.02	FR	
5100	1768937.61	1624854.76	7281.845	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5101	1768936.56	1624858.63	7288.03	FR	
5102	1768938.1	1624857.52	7284.735	FR	
5103	1768937.29	1624856.78	7284.59	FR	
5104	1768936.99	1624856.24	7283.525	FR	
5105	1768935.38	1624856.59	7287.22	FR	
5106	1768935.84	1624857.25	7285.355	FR	
5107	1768938.19	1624857	7282.71	FR	
5108	1768934.58	1624855.04	7287.1	FR	
5109	1768935.6	1624854.7	7285.37	FR	
5110	1768934.3	1624854.03	7285.435	FR	
5111	1768932.85	1624853.33	7286.835	FR	
5112	1768935.62	1624855.61	7284.105	FR	
5113	1768935.69	1624854.19	7283.52	FR	
5114	1768934.69	1624853.27	7283.545	FR	
5115	1768935.52	1624853.73	7281.25	FR	
5116	1768933.18	1624853.18	7280.075	FR	
5117	1768932.67	1624852	7279.9	FR	
5118	1768932	1624851.82	7281.895	FR	
5119	1768930.98	1624851.05	7282.63	FR	
5120	1768932.69	1624852.97	7285.425	FR	
5121	1768930.23	1624852.51	7287.01	FR	
5122	1768929.3	1624852.39	7286.89	FR	
5123	1768932.23	1624853.01	7282.9	FR	
5124	1768931.73	1624852.87	7284.755	FR	
5125	1768930.32	1624852.61	7284.62	FR	
5126	1768930.3	1624851.79	7283.57	FR	
5127	1768929.09	1624850.84	7284.06	FR	
5128	1768929.96	1624850.32	7283.375	FR	
5129	1768930.92	1624850.35	7280.83	FR	
5130	1768927.46	1624852.09	7286.52	FR	
5131	1768926.12	1624851.87	7285.885	FR	
5132	1768936.69	1624853.61	7276.055	FR	
5133	1768928.92	1624852.33	7285.4	FR	
5134	1768928.29	1624851.3	7284.925	FR	
5135	1768934.74	1624853.47	7278.595	FR	
5136	1768933.56	1624852.37	7278.05	FR	
5137	1768934.49	1624850.74	7275.665	FR	
5138	1768933.02	1624849.61	7275.605	FR	
5139	1768926.9	1624847.91	7282.495	FR	
5140	1768926.71	1624848.41	7283.34	FR	
5141	1768926.92	1624850.1	7284.385	FR	
5142	1768926.04	1624850.45	7284.8	FR	
5143	1768926.93	1624847.93	7282.46	FR	
5144	1768932.28	1624850.23	7278.025	TOS	
5145	1768931.74	1624850.12	7277.975	BOS	
5146	1768930.48	1624849.3	7278.165	TOS	
5147	1768930.09	1624849.1	7278.095	BOS	
5148	1768928.98	1624849.51	7283.445	FR	
5149	1768928.5	1624849.32	7281.45	FR	
5150	1768928.35	1624849.57	7280.37	FR	
5151	1768931.63	1624849.49	7277.085	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5152	1768931.48	1624848.6	7274.535	CP	
5153	1768927.67	1624848.23	7279.69	FR	
5154	1768927.22	1624847.24	7279.7	FR	
5155	1768926.25	1624846.81	7279.315	FR	
5156	1768926.98	1624846.53	7278.235	FR	
5157	1768927.47	1624846.56	7276.7	FR	
5158	1768927.01	1624846.22	7275.405	FR	
5159	1768928.48	1624847.68	7276.845	BH	center of borehole
5160	1768924.72	1624851.74	7285.235	FR	
5161	1768923.08	1624852.59	7285.17	FR	
5162	1768924.59	1624851.06	7284.265	FR	
5163	1768923.69	1624851.61	7284.065	FR	
5164	1768923.23	1624851	7283.205	FR	
5165	1768924.87	1624849.53	7282.695	FR	
5166	1768929.01	1624848.23	7278.14	BOS	
5167	1768928.74	1624848.05	7278.365	TOS	
5168	1768927.87	1624847.26	7278.105	BOS	
5169	1768927.68	1624847.12	7278.24	TOS	
5170	1768925.71	1624846.16	7278.3	BOS	
5171	1768925.27	1624846.2	7278.32	TOS	
5172	1768925	1624845.38	7276.65	FR	
5173	1768926.84	1624847.59	7280.825	FR	
5174	1768921.21	1624851.54	7284.615	FR	
5175	1768919.42	1624851.12	7284.92	FR	
5176	1768920.67	1624850.33	7282.94	FR	
5177	1768921.66	1624850.41	7281.635	FR	
5178	1768923.89	1624849.17	7281.315	FR	
5179	1768925.6	1624847.67	7281.285	FR	
5180	1768924.85	1624846.6	7279.675	FR	
5181	1768923.45	1624847.32	7279.47	FR	
5182	1768923.87	1624846.51	7278.15	BOS	
5183	1768923.61	1624846.94	7278.42	TOS	
5184	1768922.21	1624847.73	7278.235	BOS	
5185	1768921.95	1624848.13	7278.6	TOS	
5186	1768920.44	1624848.48	7279.69	FR	
5187	1768917.55	1624847.61	7279.775	FR	
5188	1768916.69	1624847.14	7279.305	FR	
5189	1768917.75	1624848.93	7283.59	FR	
5190	1768916.14	1624848.88	7284.565	FR	
5191	1768915.93	1624848.05	7283.54	FR	
5192	1768916.46	1624847.62	7282.94	FR	
5193	1768913.8	1624847.92	7284.63	FR	
5194	1768917.13	1624848.03	7281.89	FR	
5195	1768915.42	1624846.66	7281.34	FR	
5196	1768914.42	1624846.52	7282.11	FR	
5197	1768913.58	1624846.79	7283.375	FR	
5198	1768912.71	1624845.8	7283.175	FR	
5199	1768913.86	1624845.34	7281.695	FR	
5200	1768919.72	1624849.66	7283.44	FR	
5201	1768919.5	1624849.05	7281.23	FR	
5202	1768918.17	1624847.82	7280.735	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5203	1768919.02	1624848.26	7279.155	FR	
5204	1768920.01	1624848.3	7278.935	TOS	
5205	1768920	1624848.21	7278.295	BOS	
5206	1768912.55	1624847.47	7284.695	FR	
5207	1768918.67	1624847.61	7278.39	BOS	
5208	1768918.36	1624847.47	7278.835	TOS	
5209	1768917.36	1624847.06	7278.275	BOS	
5210	1768917.33	1624847.05	7278.57	TOS	
5211	1768911.34	1624844.66	7284.565	FR	
5212	1768908.98	1624843.62	7284.505	FR	
5213	1768911.62	1624844.72	7283	FR	
5214	1768910.79	1624844.66	7282.11	FR	
5215	1768911.75	1624844.44	7280.825	FR	
5216	1768913.04	1624844.42	7280.085	FR	
5217	1768914.15	1624844.95	7280.135	FR	
5218	1768916.2	1624846.44	7278.16	BOS	
5219	1768915.53	1624846.3	7278.27	TOS	
5220	1768914.72	1624845.68	7279.62	FR	
5221	1768914.13	1624844.93	7277.835	BOS	
5222	1768913.63	1624844.44	7277.55	BOS	
5223	1768913.7	1624844.65	7278.09	TOS	
5224	1768906.66	1624841.21	7283.765	FR	
5225	1768907.96	1624842.93	7281.785	FR	
5226	1768906.5	1624841.16	7281.405	FR	
5227	1768906.09	1624839.62	7284.205	FR	
5228	1768905.8	1624839.15	7282.41	FR	
5229	1768909.1	1624843.68	7281.085	FR	
5230	1768904.86	1624837.75	7282.4	FR	
5231	1768903.79	1624836.92	7282.515	FR	
5232	1768905.75	1624840.08	7280.215	FR	
5233	1768904.99	1624839.57	7280.315	FR	
5234	1768911.07	1624844.13	7278.09	TOS	
5235	1768903.61	1624837.52	7280.375	FR	
5236	1768903.15	1624836.39	7280.46	FR	
5237	1768906.27	1624839.81	7275.79	BOS	
5238	1768905.84	1624839.95	7277.4	TOS	
5239	1768904.94	1624838.38	7277.42	TOS	
5240	1768904.21	1624836.53	7277.055	TOS	
5241	1768904.78	1624837.06	7276.01	BOS	
5242	1768905.21	1624837.06	7275.04	CP	
5243	1768901.38	1624836.43	7282.72	FR	
5244	1768900.98	1624835.16	7280.645	FR	
5245	1768900.27	1624834.2	7282.35	FR	
5246	1768900.73	1624834.45	7279.405	FR	
5247	1768899.9	1624833.66	7280.285	FR	
5248	1768903.2	1624834.95	7276.61	TOS	
5249	1768902.75	1624834.62	7276.34	BOS	
5250	1768898.03	1624832.86	7283.46	FR	
5251	1768898.37	1624832.76	7282.09	FR	
5252	1768899.21	1624832.94	7281.335	FR	
5253	1768900.34	1624833.01	7277.995	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5254	1768899.52	1624832.47	7279.285	FR	
5255	1768899.44	1624831.8	7277.45	FR	
5256	1768898.28	1624831.14	7279.02	FR	
5257	1768900.15	1624832.09	7274.965	FR	
5258	1768897.18	1624831.75	7281.285	FR	
5259	1768897.11	1624830.24	7279.605	FR	
5260	1768895.65	1624829.44	7280.51	FR	
5261	1768896.02	1624830.95	7281.95	FR	
5262	1768894.66	1624830.26	7282.225	FR	
5263	1768895.66	1624829.39	7280.425	FR	
5264	1768900.32	1624832.84	7276.44	TOS	
5265	1768900.23	1624832.59	7276.565	TOS	
5266	1768900.34	1624832.7	7275.98	BOS	
5267	1768900.15	1624832.58	7276.355	BOS	
5268	1768898.64	1624830.95	7276.345	BOS	
5269	1768891.51	1624827.6	7282.395	FR	
5270	1768891.82	1624827.45	7281.31	FR	
5271	1768893.25	1624828.58	7280.525	FR	
5272	1768894	1624827.74	7279.49	FR	
5273	1768897.23	1624830.04	7278.55	FR	
5274	1768897.29	1624829.94	7277.955	FR	
5275	1768896.87	1624829.35	7276.695	C34	
5276	1768892.76	1624826.15	7276.915	C34	
5277	1768894.16	1624827.6	7278.355	FR	
5278	1768894.41	1624827.45	7277.485	FR	
5279	1768895.46	1624826.89	7274.69	CP	End survey 19 April 2007; conclude survey of SE Wall

Total Southeast Wall survey points = 1279

CMRR Geologic Investigations
Northwest Wall Surveying May and June 2007

Point Codes (Pcode):

BS	backshot (to benchmark)
FR	fracture
TOS	top of surge (Qbt_4-Qbt_s contact)
BOS	bottom of surge (Qbt_s-Qbt_3 contact)
C34	Qbt_3-Qbt_4 contact
STC	soil-tuff contact
CP	control point
FF	fossil fumarole
FTC	fill-tuff contact
OOP	out-of-place block

***Note: where prism is listed as horizontal, rod length (horiz. distance from wall) is 0.9 ft unless otherwise noted.

Point#	Northing	Easting	Elevation	Pcode	Notes
7007	1769263.05	1624628.8	7278.16	BS	Backshot; start survey 10 May 2007
5280	1769309.18	1624660.67	7278.225	FR	
5281	1769308.66	1624659.81	7278.675	FR	
5282	1769310.54	1624662.27	7279.35	FR	
5283	1769310.23	1624661.1	7279.855	FR	
5284	1769309.75	1624660.15	7280.215	FR	
5285	1769310.96	1624661.71	7280.38	FR	
5286	1769311.66	1624662.3	7280.72	FR	
5287	1769311.84	1624662.47	7281.215	FR	
5288	1769311.5	1624661.83	7281.625	FR	
5289	1769308.04	1624658.25	7279.84	FR	
5290	1769309.21	1624658.66	7281.35	FR	
5291	1769306.83	1624656.99	7280.29	FR	
5292	1769306.92	1624656.14	7281.47	FR	
5293	1769306.22	1624656.13	7281.175	FR	
5294	1769305.05	1624655.62	7280.445	FR	
5295	1769305.37	1624656.18	7279.42	FR	
5296	1769303.74	1624656.08	7276.88	FR	
5297	1769302.79	1624655.16	7278.485	FR	
5298	1769300.61	1624654	7277.945	FR	
5299	1769300.95	1624653.33	7279.745	FR	
5300	1769311.59	1624661.45	7282.8	FR	
5301	1769311.52	1624661.03	7283.19	CP	
5302	1769301.21	1624653	7280.765	FR	
5303	1769302.1	1624652.95	7282.285	FR	
5304	1769301.42	1624652.58	7282.17	FR	
5305	1769310.23	1624658.64	7284.94	CP	
5306	1769300.05	1624652.06	7281.035	FR	
5307	1769300.59	1624652.89	7280.025	FR	
5308	1769298.88	1624652.33	7279.575	FR	
5309	1769299.05	1624652.73	7278.655	FR	
5310	1769312.89	1624661.94	7284.92	CP	
5311	1769299.56	1624653.5	7277.64	FR	
5312	1769300.07	1624654.03	7276.42	FR	
5313	1769299	1624653.41	7277.175	FR	
5314	1769297.04	1624652.51	7276.795	FR	
5315	1769313.89	1624662.74	7287.305	BOS	
5316	1769314.16	1624662.48	7288.285	TOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
5317	1769314.08	1624661.69	7288.85	FR	
5318	1769314.18	1624662.74	7288.835	FR	
5319	1769300.54	1624652.12	7282.38	FR	
5320	1769300.05	1624651.83	7282.49	FR	
5321	1769299.3	1624651.42	7282.35	FR	
5322	1769297.51	1624651.4	7279.865	FR	
5323	1769296.83	1624651.68	7278.95	FR	
5324	1769295.71	1624650.63	7279.375	FR	
5325	1769313.64	1624661.61	7286.365	FR	
5326	1769312.27	1624659.31	7286.84	FR	
5327	1769294.97	1624650.16	7278.65	FR	
5328	1769294.71	1624650.4	7277.275	FR	
5329	1769313.86	1624660.33	7288.435	TOS	
5330	1769312.96	1624659.41	7288.37	TOS	
5331	1769312.78	1624659.48	7287.66	BOS	
5332	1769312.28	1624659.32	7286.84	FR	
5333	1769311.36	1624658.68	7286.27	CP	
5334	1769297.18	1624650	7281.78	FR	
5335	1769296.18	1624649.59	7282.545	FR	
5336	1769294.32	1624648.39	7280.84	FR	
5337	1769294.74	1624648.66	7280.425	FR	
5338	1769293.99	1624648.56	7279.86	FR	
5339	1769294.28	1624648.72	7279.28	FR	
5340	1769311.45	1624657.97	7287.605	BOS	
5341	1769311.54	1624657.93	7288.055	TOS	
5342	1769311.34	1624657.84	7288.08	FR	
5343	1769311.1	1624657.64	7287.335	FR	
5344	1769310.48	1624657.03	7287.995	TOS	
5345	1769310.41	1624656.95	7287.795	TOS	
5346	1769310.6	1624657.04	7287.4	BOS	
5347	1769293.58	1624648.89	7278.045	FR	
5348	1769292.24	1624648.78	7276.815	FR	
5349	1769290.06	1624648.3	7276.73	FR	
5350	1769291.52	1624647.68	7279.3	FR	
5351	1769293	1624647.47	7281.935	FR	
5352	1769313.11	1624659.21	7289.665	FR	
5353	1769313.21	1624658.85	7290.535	FR	
5354	1769310.71	1624656.72	7289.83	FR	
5355	1769310.41	1624656.69	7288.865	FR	
5356	1769309.86	1624656.38	7288.53	FR	
5357	1769309.67	1624656.26	7287.79	TOS	
5358	1769309.65	1624656.44	7287.425	BOS	
5359	1769291.44	1624646.46	7281.735	FR	
5360	1769289.82	1624645.47	7280.985	FR	
5361	1769288.68	1624645.74	7278.87	FR	
5362	1769288.41	1624645.78	7278.155	FR	
5363	1769287.92	1624645.84	7277.035	FR	
5364	1769308.15	1624655.47	7289.665	FR	
5365	1769307.98	1624655.62	7288.505	FR	
5366	1769307.85	1624655.94	7287.715	TOS	
5367	1769308.01	1624656.11	7287.41	BOS	
5368	1769308.59	1624656.25	7287.37	FR	
5369	1769308.95	1624656.31	7287.505	C34	
5370	1769287.54	1624644.58	7280.985	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5371	1769288	1624644.96	7279.645	FR	
5372	1769287.47	1624644.79	7278.555	FR	
5373	1769308.42	1624657.68	7282.27	CP	
5374	1769314.25	1624663.1	7290.175	FR	
5375	1769314	1624661.89	7290.315	FR	
5376	1769313.87	1624660.45	7290.64	FR	
5377	1769285.33	1624643.15	7278.405	FR	
5378	1769285.79	1624642.9	7281.185	FR	
5379	1769284.33	1624642.45	7279.66	FR	
5380	1769283.92	1624642.05	7279.91	FR	
5381	1769283.84	1624641.95	7281.195	FR	
5382	1769282.19	1624641.09	7281.015	FR	
5383	1769282.91	1624641.06	7282.05	FR	
5384	1769282.01	1624640.76	7281.81	FR	
5385	1769315.1	1624662.58	7292.41	FR	
5386	1769315.06	1624661.88	7292.405	FR	
5387	1769314.9	1624661.16	7293.5	FR	
5388	1769315	1624660.3	7293	FR	
5389	1769313.94	1624659.15	7291.77	FR	
5390	1769313.21	1624658.28	7292.925	FR	
5391	1769312.98	1624658.16	7291.77	FR	
5392	1769312.65	1624657.76	7291.15	FR	
5393	1769282.79	1624641.66	7279.825	FR	
5394	1769283.02	1624642.2	7277.215	FR	
5395	1769283.46	1624642.64	7276.715	FR	
5396	1769280.56	1624640.87	7276.815	FR	
5397	1769281.41	1624640.74	7279.69	CP	
5398	1769314.63	1624661.25	7295.71	FR	
5399	1769314.63	1624660.55	7295.52	FR	
5400	1769314.52	1624659.84	7295.465	FR	
5401	1769313.66	1624658.5	7295.71	FR	
5402	1769312.29	1624657.71	7295.185	FR	
5403	1769281.73	1624640.29	7281.955	FR	
5404	1769279.94	1624638.4	7282.745	FR	
5405	1769278.62	1624637.27	7281.965	FR	
5406	1769314.46	1624659.27	7297.275	FR	
5407	1769314.12	1624658.66	7296.775	FR	
5408	1769313.17	1624657.74	7297.495	FR	
5409	1769312.75	1624657.81	7297.11	FR	
5410	1769310.91	1624657.2	7296.915	CP	
5411	1769311.58	1624657.38	7298.515	FR	
5412	1769309.67	1624656.26	7295.44	FR	
5413	1769280.13	1624639.84	7279.11	FR	
5414	1769280.2	1624639.09	7280.6	FR	
5415	1769279.21	1624639.08	7279.12	FR	
5416	1769278.7	1624638.99	7276.445	FR	
5417	1769277.14	1624637.41	7279.83	FR	
5418	1769313.7	1624657.86	7299.15	FR	
5419	1769313.73	1624657.96	7300.89	FR	
5420	1769311.52	1624657.39	7298.515	FR	
5421	1769275.41	1624637.19	7275.965	CP	
5422	1769274.97	1624636.29	7278.59	CP	
5423	1769273.78	1624634.94	7280.105	CP	
5424	1769271.67	1624634.59	7277.44	CP	

Point#	Northing	Easting	Elevation	Pcode	Notes
5425	1769271.34	1624633.5	7279.445	CP	
5426	1769310.62	1624656.44	7300.095	FR	
5427	1769309.71	1624655.65	7300.955	FR	
5428	1769308.25	1624655.07	7299.35	FR	
5429	1769309.51	1624656.01	7297.76	FR	
5430	1769269.87	1624631.97	7280.485	FR	
5431	1769269.17	1624631.65	7280.76	FR	
5432	1769268.13	1624631.41	7280.19	FR	
5433	1769269.51	1624632.52	7277.335	FR	
5434	1769269.51	1624632.52	7277.28	FR	REDO 5433
5435	1769312.05	1624657.28	7292.68	FR	
5436	1769310.04	1624656.21	7291.74	FR	
5437	1769309.91	1624656.37	7292.64	FR	
5438	1769308.97	1624655.86	7294.605	FR	
5439	1769308.39	1624655.43	7291.96	FR	
5440	1769265.54	1624629.75	7280.75	CP	
5441	1769263.38	1624628.51	7280.48	CP	
5442	1769265.26	1624630.37	7277.575	CP	
5443	1769263.07	1624628.8	7278.155	CP	Benchmark 7007
5444	1769262.22	1624628.68	7276.7	CP	
5445	1769261.11	1624627.21	7279.73	CP	
5446	1769311.42	1624657.01	7291.405	FR	
5447	1769308.94	1624655.53	7291.09	FR	0.5' horizontal prism
5448	1769258.86	1624626.28	7277.705	CP	
5449	1769257.62	1624626.4	7274.855	CP	
5450	1769258.75	1624625.4	7279.405	FR	
5451	1769256.91	1624624.06	7277.565	FR	
5452	1769256.13	1624623.39	7276.46	FR	
5453	1769258.04	1624624.78	7280.25	FR	
5454	1769254.86	1624622.2	7280.09	FR	
5455	1769255.7	1624622.44	7279.34	FR	
5456	1769255.12	1624622.35	7278.415	FR	
5457	1769254.05	1624621.98	7278.605	FR	
5458	1769254.72	1624622.31	7276.825	FR	
5459	1769255.45	1624622.67	7277.17	FR	
5460	1769255.17	1624622.61	7276.6	FR	
5461	1769306.96	1624654.01	7299.065	FR	
5462	1769306.63	1624653.75	7300.29	FR	
5463	1769305.89	1624652.39	7300.07	FR	
5464	1769306.06	1624652.37	7298.745	FR	
5465	1769303.23	1624651.28	7296.175	FR	
5466	1769302.26	1624650.97	7295.455	FR	
5467	1769301.41	1624650.58	7298.845	FR	
5468	1769254.04	1624622.06	7276.605	FR	
5469	1769253.52	1624621.16	7277.77	FR	
5470	1769250.97	1624620.66	7276.15	CP	
5471	1769308.43	1624655.5	7296.345	FR	
5472	1769252.6	1624620.2	7279.16	FR	
5473	1769249.92	1624619.24	7278.435	FR	
5474	1769249.16	1624619.18	7277.645	FR	
5475	1769307.15	1624655.11	7293.57	FR	
5476	1769306.83	1624654.84	7291.97	FR	
5477	1769250.58	1624619.36	7279.56	FR	
5478	1769247.21	1624617.46	7279.985	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5479	1769247.86	1624617.84	7279.7	FR	
5480	1769248.38	1624618.4	7278.865	FR	End survey 10 May 2007
7007	1769263.07	1624628.77	7278.19	BS	Backshot; start survey 11 May 2007
5481	1769306.91	1624655.47	7287.255	BOS	
5482	1769306.1	1624654.77	7286.385	FR	
5483	1769306.97	1624655.78	7285.63	FR	
5484	1769307.55	1624656.01	7284.865	FR	
5485	1769305.67	1624655.22	7283.96	FR	
5486	1769307.13	1624656.07	7283.45	FR	
5487	1769306.26	1624655.46	7282.49	FR	
5488	1769305.42	1624654.25	7288.605	TOS	
5489	1769306.28	1624654.95	7288.425	TOS	
5490	1769305.16	1624654.44	7287.425	BOS	
5491	1769304.68	1624653.81	7287.49	BOS	
5492	1769304.48	1624653.64	7288.78	TOS	
5493	1769304.4	1624653.48	7288.5	TOS	
5494	1769304.46	1624653.69	7289.06	FR	
5495	1769305.18	1624654.58	7285.965	FR	
5496	1769304.45	1624654.1	7286.82	FR	
5497	1769304.63	1624654.38	7284.865	FR	
5498	1769303.8	1624652.97	7289.08	FR	
5499	1769304.79	1624653.52	7290.62	FR	
5500	1769305.26	1624653.74	7292.175	FR	
5501	1769305.61	1624653.63	7295.23	FR	
5502	1769304.55	1624651.9	7292.27	FR	
5503	1769304.81	1624652.34	7293.105	FR	
5504	1769303.17	1624652.52	7290.795	FR	
5505	1769304.71	1624651.69	7295.305	FR	
5506	1769303.14	1624651.3	7294.11	FR	
5507	1769303.02	1624651.04	7291.675	FR	
5508	1769301.86	1624650.74	7293.06	FR	
5509	1769302.25	1624649.99	7300.19	FR	horizontal prism
5510	1769302.95	1624650.2	7299.41	FR	horizontal prism
5511	1769304.04	1624650.81	7300.41	FR	horizontal prism
5512	1769300.48	1624649.03	7299.805	FR	
5513	1769299.76	1624649.34	7298.9	FR	
5514	1769299.78	1624650.05	7298.6	FR	horizontal prism
5515	1769299.85	1624649.75	7296.59	FR	
5516	1769300.2	1624650.08	7295.615	FR	
5517	1769299.67	1624649.67	7293.815	FR	
5518	1769298.92	1624648.84	7294.665	FR	
5519	1769298.56	1624649.12	7292.48	FR	
5520	1769299.97	1624649.82	7291.87	FR	
5521	1769300.85	1624650.3	7293.96	FR	
5522	1769300.28	1624649.96	7290.555	FR	
5523	1769301.6	1624650.22	7290.07	FR	
5524	1769298.35	1624649.56	7288.845	FR	
5525	1769298.12	1624648.98	7289.77	FR	
5526	1769297.89	1624649.16	7288.61	TOS	
5527	1769299.01	1624649.62	7288.9	TOS	
5528	1769301.56	1624651.18	7289.415	TOS	
5529	1769302.68	1624652.54	7289.145	TOS	
5530	1769302.53	1624652.33	7289.48	FR	
5531	1769301.21	1624651.46	7285.885	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
5532	1769301.27	1624651.45	7286.35	BOS	
5533	1769301.68	1624651.87	7286.795	BOS	
5534	1769301.8	1624652	7287.045	BOS	
5535	1769302.66	1624652.6	7287.095	BOS	
5536	1769302.72	1624652.72	7287.48	BOS	
5537	1769302.54	1624652.44	7286.545	FR	
5538	1769302.07	1624652.16	7285.045	FR	
5539	1769301.67	1624652.22	7283.38	FR	
5540	1769299.59	1624651.18	7283.335	FR	
5541	1769299.09	1624650.62	7284.44	CP	
5542	1769298.58	1624650.19	7285.895	BOS	
5543	1769297.96	1624649.26	7286.085	BOS	
5544	1769297.72	1624649.13	7286.275	BOS	
5545	1769296.75	1624648.42	7286.31	BOS	
5546	1769300.44	1624650.97	7285.715	BOS	
5547	1769296.14	1624649.56	7282.54	FR	
5548	1769295.51	1624648.65	7283.395	FR	
5549	1769295.45	1624647.4	7286.265	BOS	
5550	1769293.72	1624646.81	7286.325	BOS	
5551	1769293.71	1624646.68	7286.585	FR	
5552	1769294.48	1624646.65	7287.4	FR	
5553	1769294.14	1624646.91	7286.665	TOS	
5554	1769295.58	1624647.46	7287.135	TOS	
5555	1769297.05	1624648.12	7287.845	TOS	
5556	1769295.91	1624647.62	7290.375	CP	
5557	1769294.75	1624646.51	7289.96	FR	
5558	1769292.51	1624646.02	7288.87	FR	
5559	1769293.08	1624646.34	7286.46	BOS	
5560	1769292.14	1624646.03	7286.275	BOS	
5561	1769292.72	1624645.95	7286.545	TOS	
5562	1769293.4	1624646.13	7286.59	TOS	
5563	1769297.26	1624648.38	7289.63	FR	
5564	1769297.23	1624648.34	7292.05	FR	
5565	1769297.46	1624648.24	7292.73	FR	
5566	1769295.63	1624647.38	7293.45	CP	
5567	1769295.09	1624646.26	7291.79	FR	
5568	1769294.09	1624646.15	7292.55	FR	
5569	1769292.51	1624645.53	7291.055	FR	
5570	1769293.41	1624645.96	7293.67	FR	
5571	1769292.47	1624645.35	7292.37	CP	
5572	1769291.99	1624644.25	7295.345	FR	
5573	1769292.58	1624645.17	7295.45	FR	
5574	1769293	1624645.64	7295.015	FR	
5575	1769292.92	1624645.75	7296.645	FR	horizontal prism
5576	1769294.89	1624645.98	7295.85	FR	horizontal prism
5577	1769295.38	1624646.9	7294.84	FR	
5578	1769295.3	1624646.74	7295.92	FR	
5579	1769297.5	1624647.88	7295.89	FR	
5580	1769297.21	1624647.83	7297.13	FR	
5581	1769297.63	1624648.45	7294.53	FR	horizontal prism
5582	1769297.26	1624647.59	7300.18	FR	
5583	1769294.77	1624646.03	7298.435	FR	
5584	1769295.79	1624646.09	7299.96	FR	
5585	1769297.16	1624647.72	7298.865	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5586	1769294.72	1624645.28	7300.22	FR	
5587	1769294.77	1624643.73	7300.78	FR	
5588	1769293.23	1624643.02	7300.19	FR	horizontal prism
5589	1769291.01	1624643	7300.395	FR	horizontal prism
5590	1769290.44	1624642.42	7299.035	FR	
5591	1769291.37	1624643.34	7296.475	FR	
5592	1769289.84	1624643.37	7297.025	FR	
5593	1769289.85	1624642.94	7295.265	FR	
5594	1769290.12	1624643.4	7294.1	FR	
5595	1769290	1624643.48	7295.25	FR	horizontal prism
5596	1769291.45	1624644.01	7292.42	FR	
5597	1769290.44	1624643.65	7291.875	FR	
5598	1769289.43	1624643.68	7292.85	FR	horizontal prism
5599	1769289.58	1624643.58	7291.005	FR	
5600	1769290.66	1624643.88	7290.43	FR	
5601	1769290.74	1624644.23	7288.295	FR	
5602	1769289.23	1624643.42	7288.65	FR	
5603	1769290.51	1624644.06	7287.29	FR	
5604	1769291.36	1624645.24	7286.39	TOS	
5605	1769290.56	1624645.47	7286.235	BOS	horizontal prism
5606	1769289.91	1624643.72	7286.25	C34	
5607	1769291.64	1624646.16	7284.05	FR	
5608	1769290.73	1624645.75	7283.03	FR	
5609	1769288.65	1624644.71	7282.15	FR	
5610	1769287.47	1624643.97	7282.835	FR	
5611	1769287.9	1624643.72	7283.49	FR	
5612	1769288.9	1624644.43	7283.5	FR	
5613	1769289.04	1624644.7	7284.37	FR	
5614	1769288.3	1624643.69	7284.745	FR	
5615	1769287.04	1624643.32	7283.12	FR	
5616	1769285.55	1624642.31	7282.39	FR	
5617	1769285.2	1624642.15	7283.45	FR	
5618	1769288.48	1624644	7286.17	C34	horizontal prism
5619	1769288.61	1624644.02	7286.415	FR	horizontal prism
5620	1769287.25	1624642.67	7286.155	C34	
5621	1769285.24	1624641.68	7285.965	C34	
5622	1769288.21	1624642.64	7288.39	FR	
5623	1769286.9	1624641.98	7287.88	FR	
5624	1769287.23	1624642.02	7289.225	FR	
5625	1769287.97	1624642.23	7289.745	FR	
5626	1769287.14	1624641.43	7290.9	FR	
5627	1769288.01	1624641.48	7292.17	CP	
5628	1769287.98	1624642.27	7294.16	FR	
5629	1769287.25	1624641.66	7295.845	CP	
5630	1769289.2	1624641.9	7297.925	FR	
5631	1769290.15	1624641.94	7299.515	FR	
5632	1769289.19	1624641.47	7299.175	FR	
5633	1769287.53	1624640.19	7299.265	FR	
5634	1769287.09	1624640.72	7297.455	FR	
5635	1769285.75	1624639.74	7298.265	FR	
5636	1769285.48	1624639.6	7297.025	FR	
5637	1769286.14	1624640.54	7294.695	FR	
5638	1769285.96	1624640.99	7291.7	FR	
5639	1769285.4	1624641.25	7289.685	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5640	1769284.9	1624640.06	7292.83	FR	
5641	1769283.55	1624640.61	7284.935	FR	
5642	1769283.9	1624641.11	7284.395	FR	
5643	1769283.82	1624641.36	7283.555	FR	
5644	1769283.5	1624640.19	7286.135	C34	
5645	1769283.93	1624640.17	7287.225	FR	
5646	1769283.57	1624639.78	7289.37	FR	
5647	1769282.74	1624639.04	7289.175	FR	
5648	1769284.32	1624639.49	7289.98	FR	
5649	1769284.68	1624639.49	7296.045	FR	
5650	1769284.56	1624638.99	7297.9	FR	
5651	1769282.88	1624638.63	7296.375	FR	
5652	1769283.16	1624639.02	7295.345	FR	
5653	1769287.14	1624639.46	7300.445	FR	
5654	1769284.64	1624638.55	7299.08	FR	
5655	1769284.75	1624638.24	7300.405	FR	
5656	1769282.45	1624637.06	7299.82	FR	
5657	1769281.86	1624636.28	7299.94	FR	
5658	1769281.87	1624636.95	7298.225	FR	
5659	1769279.93	1624635.17	7299.755	FR	
5660	1769279.47	1624635.7	7298.065	FR	
5661	1769280.71	1624636.13	7296.99	FR	
5662	1769279.55	1624635.71	7296.775	FR	
5663	1769279.95	1624636.28	7298.695	FR	horizontal prism
5664	1769282.21	1624636.73	7296.62	FR	
5665	1769279.6	1624635.94	7294.96	FR	
5666	1769283.05	1624637.95	7294.935	FR	
5667	1769282.36	1624637.91	7294.325	FR	
5668	1769281.86	1624637.16	7294.575	FR	
5669	1769281.37	1624637.21	7292.845	FR	
5670	1769282.09	1624638.16	7291.22	FR	
5671	1769283.4	1624638.77	7292.22	FR	
5672	1769280.62	1624636.76	7292.595	FR	
5673	1769279.75	1624636.01	7292.87	FR	
5674	1769279.87	1624636.51	7290.73	FR	
5675	1769280.37	1624636.67	7290.81	FR	
5676	1769280.65	1624637.38	7289.29	FR	
5677	1769280.87	1624637.53	7289.5	FR	
5678	1769281.69	1624637.72	7290.74	FR	
5679	1769282.27	1624638.69	7289.12	FR	
5680	1769282.23	1624638.85	7286.6	FR	
5681	1769281.39	1624638.02	7287.465	FR	
5682	1769281.56	1624640	7282.885	FR	
5683	1769280.83	1624639.13	7283.06	FR	
5684	1769281.29	1624639.37	7284.14	FR	
5685	1769281.11	1624638.72	7284.785	FR	
5686	1769281.75	1624638.67	7286.23	C34	
5687	1769280.53	1624637.75	7286.27	C34	
5688	1769280.08	1624637.31	7286.35	TOS	
5689	1769280.12	1624637.29	7286.155	BOS	
5690	1769279.56	1624636.78	7286.205	BOS	
5691	1769279.92	1624636.96	7286.665	FR	
5692	1769279.61	1624638.08	7284.405	FR	
5693	1769278.78	1624637.51	7283.795	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5694	1769279.64	1624636.67	7286.525	TOS	
5695	1769278.22	1624635.64	7286.21	BOS	
5696	1769278.27	1624636.73	7283.9	FR	
5697	1769277.4	1624636.27	7283.725	FR	
5698	1769277.36	1624636.04	7284.62	FR	
5699	1769276.73	1624635.58	7284.585	FR	
5700	1769276.51	1624636.29	7281.995	FR	End survey 11 May 2007
7007	1769263.03	1624628.83	7278.14	BS	Backshot; start survey 15 May 2007
5701	1769277.47	1624632.37	7299.075	FR	
5702	1769278.2	1624633.97	7298.265	FR	
5703	1769277.49	1624633.3	7297.385	FR	
5704	1769278.58	1624634.69	7296.655	FR	
5705	1769277.84	1624633.87	7295.68	FR	
5706	1769277.18	1624633.33	7294.775	FR	
5707	1769276.81	1624633.08	7294.12	FR	
5708	1769276.08	1624632.52	7292.85	FR	
5709	1769278.11	1624634.41	7293.37	FR	
5710	1769277.23	1624633.66	7292.06	FR	
5711	1769277.97	1624634.48	7291.37	FR	
5712	1769279.16	1624635.88	7291.5	FR	
5713	1769276.25	1624633.3	7289.925	FR	
5714	1769275.96	1624632.31	7291.125	FR	
5715	1769278.63	1624635.18	7291.12	FR	
5716	1769278.98	1624635.4	7289.98	FR	
5717	1769277.43	1624634.38	7289.635	FR	
5718	1769276.08	1624633.6	7288.45	FR	
5719	1769279.42	1624636.12	7288.84	FR	
5720	1769279.54	1624636.26	7288.025	FR	
5721	1769278.28	1624634.78	7288.02	FR	
5722	1769278.66	1624635.43	7287.205	TOS	
5723	1769276.61	1624634.32	7287.325	TOS	
5724	1769275.21	1624632.89	7287.675	TOS	
5725	1769276.09	1624633.58	7288.45	FR	
5726	1769276.83	1624634.9	7286.3	BOS	
5727	1769275.5	1624633.98	7286.285	BOS	
5728	1769273.43	1624632.71	7286.245	BOS	
5729	1769272.35	1624633.05	7284.47	FR	
5730	1769274.57	1624633.94	7284.615	CP	
5731	1769274.04	1624634.87	7282.375	CP	
5732	1769271.89	1624633.52	7281.785	CP	
5733	1769275.95	1624630.45	7296.385	FR	
5734	1769274.63	1624629.73	7296.03	FR	
5735	1769274.16	1624630.25	7295.13	FR	
5736	1769273.91	1624630.64	7294.12	FR	
5737	1769274.42	1624631.83	7293.25	FR	
5738	1769276.25	1624632.66	7294.35	FR	
5739	1769275.8	1624631.65	7295.45	FR	
5740	1769274.81	1624632.02	7294.16	FR	
5741	1769273.72	1624630.96	7292.755	FR	
5742	1769274.14	1624631.62	7291.285	FR	
5743	1769274.41	1624629.29	7297.14	FR	
5744	1769275.15	1624627.87	7297.415	FR	
5745	1769270.89	1624623.46	7299.265	FR	
5746	1769272.62	1624623.78	7299.295	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5747	1769274.17	1624629.37	7294.625	FR	
5748	1769274.29	1624629.21	7294.585	FR	
5749	1769274.07	1624629.45	7293.37	FR	
5750	1769274.22	1624628.91	7293.44	FR	
5751	1769272.16	1624628.56	7292.1	FR	
5752	1769275.37	1624627.19	7298.54	FR	
5753	1769275.5	1624626.06	7298.59	FR	
5754	1769275.39	1624626.26	7297.37	FR	
5755	1769271.94	1624626.96	7294.545	FR	
5756	1769274.75	1624623.76	7300.26	FR	
5757	1769274.46	1624623.6	7300.155	FR	
5758	1769271.96	1624622.75	7299.9	FR	
5759	1769269.16	1624624.68	7296.015	FR	
5760	1769268.27	1624624.29	7295.27	FR	
5761	1769270.39	1624625.19	7295.085	FR	
5762	1769270.36	1624626.78	7293.565	FR	
5763	1769269.26	1624626.3	7293.58	FR	
5764	1769270.34	1624627.46	7292.02	FR	
5765	1769269.1	1624628.35	7291.085	FR	
5766	1769269.41	1624628.55	7289.785	FR	
5767	1769271.98	1624628.61	7291.1	FR	
5768	1769270.19	1624628.96	7289.81	FR	
5769	1769271.96	1624629.61	7290.05	FR	
5770	1769273.01	1624631.5	7287.935	TOS	
5771	1769273.34	1624631.65	7290.235	FR	
5772	1769273.48	1624630.07	7289.91	FR	
5773	1769273.12	1624630.5	7287.83	TOS	
5774	1769272.94	1624630.45	7287.345	TOS	
5775	1769271.73	1624630.09	7287.675	TOS	
5776	1769271.53	1624630.54	7286.425	BOS	
5777	1769270.44	1624630.49	7285.855	BOS	
5778	1769271.68	1624630.11	7287.78	TOS	
5779	1769270.87	1624629.47	7288.04	TOS	
5780	1769271.55	1624629.67	7288.26	FR	
5781	1769270.82	1624632.13	7284.49	FR	
5782	1769269.75	1624631.7	7282.325	FR	
5783	1769269.11	1624629.96	7285.615	BOS	
5784	1769267.23	1624629.18	7285.64	BOS	
5785	1769268.15	1624630.55	7283.095	FR	
5786	1769266.72	1624629.96	7283.155	FR	
5787	1769269.1	1624628.33	7288.365	FR	
5788	1769267.36	1624627.31	7288.05	TOS	
5789	1769267.67	1624627.49	7288.665	FR	
5790	1769268.08	1624627.65	7290.595	FR	
5791	1769267.4	1624627.11	7290.125	FR	
5792	1769266.77	1624626.52	7289.55	FR	
5793	1769266.86	1624626.62	7288.615	FR	
5794	1769267.85	1624627.26	7291.86	FR	
5795	1769266.78	1624626.36	7291.99	FR	
5796	1769267.18	1624626.41	7293.535	FR	
5797	1769267.11	1624625.58	7293.545	FR	
5798	1769266.71	1624624.5	7292.66	FR	
5799	1769266.3	1624625.11	7291.83	FR	
5800	1769269.8	1624622.61	7298.99	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5801	1769266.73	1624621.95	7297.995	FR	
5802	1769269.32	1624622.89	7297.11	FR	
5803	1769265.79	1624623.19	7295.865	FR	
5804	1769265.13	1624624.06	7295.145	FR	
5805	1769264.35	1624623.25	7295.675	FR	
5806	1769262.13	1624621.91	7294.745	FR	
5807	1769262.11	1624622.37	7293.415	FR	
5808	1769262.99	1624622.59	7295.015	FR	
5809	1769263.13	1624623.4	7294.105	FR	
5810	1769263.19	1624623.76	7292.3	FR	
5811	1769262.69	1624623.33	7292.895	FR	
5812	1769262.46	1624623.24	7291.785	FR	
5813	1769262.11	1624622.37	7293.4	FR	
5814	1769264.31	1624624.52	7292.38	FR	
5815	1769264.31	1624624.41	7290.51	FR	
5816	1769265.66	1624625.08	7290.06	FR	
5817	1769264.45	1624624.84	7288.34	FR	
5818	1769264.3	1624624.72	7288.1	TOS	
5819	1769265.93	1624626.04	7288.645	FR	
5820	1769265.33	1624625.46	7288.85	FR	
5821	1769265.74	1624626.04	7288.21	TOS	
5822	1769265.04	1624627.16	7285.825	BOS	
5823	1769267.36	1624627.33	7288.04	TOS	
5824	1769262.1	1624625.55	7285.785	BOS	
5825	1769261.53	1624626.04	7284.29	FR	
5826	1769262.01	1624626.47	7283.315	FR	
5827	1769260.19	1624624.24	7286.025	BOS	
5828	1769259.95	1624623.47	7286.66	TOS	
5829	1769260.18	1624623.53	7287.245	FR	
5830	1769260.66	1624623.11	7288.24	FR	
5831	1769261	1624623.65	7287.77	TOS	
5832	1769262.08	1624624.2	7289.13	FR	
5833	1769262.25	1624623.06	7290.51	FR	
5834	1769260.05	1624623	7290.795	FR	
5835	1769260.02	1624622.8	7289.55	FR	
5836	1769263.97	1624619.1	7298.735	FR	
5837	1769262.16	1624619.65	7298.12	FR	
5838	1769262.38	1624620.31	7297.085	FR	
5839	1769260.56	1624620.98	7293.99	FR	
5840	1769259.84	1624621.97	7292.79	FR	
5841	1769260.44	1624622.66	7292.77	FR	
5842	1769259.55	1624622.28	7291.35	FR	
5843	1769259.63	1624622.24	7290.64	FR	
5844	1769259.14	1624622.27	7288.01	FR	
5845	1769258.88	1624622.34	7286.815	TOS	
5846	1769257.63	1624621.49	7286.985	FR	
5847	1769259.28	1624623.34	7286.015	BOS	
5848	1769259.07	1624623.25	7285.735	FR	
5849	1769258.76	1624623.24	7285.33	BOS	
5850	1769258.52	1624623.82	7284.635	FR	
5851	1769258.02	1624622.76	7285.035	FR	
5852	1769259.15	1624624.58	7283.465	FR	
5853	1769259.47	1624625.29	7281.995	FR	
5854	1769260.4	1624625.93	7281.035	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5855	1769257.05	1624623.93	7281	CP	
5856	1769257.33	1624622.92	7283.065	FR	
5857	1769256.25	1624622.68	7281.905	FR	
5858	1769255.01	1624621.5	7281.565	FR	End survey 16 May 2007
7007	1769263.06	1624628.77	7278.15	BS	Backshot; start survey 17 May 2007
5859	1768953.81	1624869.58	7282.66	FRSEW	Fracture on southeast wall
5860	1768951.75	1624870.19	7283.61	FRSEW	Fracture on southeast wall
5861	1768949.96	1624868.24	7281.255	FRSEW	Fracture on southeast wall
5862	1768949.42	1624869.23	7284.875	FRSEW	Fracture on southeast wall
5863	1768950.05	1624866.39	7283.685	FRSEW	Fracture on southeast wall
5864	1768949.5	1624865.22	7281.91	FRSEW	Fracture on southeast wall
5865	1769261.67	1624619.36	7296.395	FR	
5866	1769260.41	1624620.08	7294.98	FR	
5867	1769263.83	1624621.52	7297.28	FR	
5868	1769263.23	1624621.61	7295.785	FR	
5869	1769262.23	1624621.95	7294.73	FR	
5870	1769262.26	1624617.36	7299.45	FR	
5871	1769260.71	1624616.13	7299.505	FR	
5872	1769259.5	1624616.91	7297.485	FR	
5873	1769260.15	1624618.39	7296.9	FR	
5874	1769258.61	1624615.63	7298.995	FR	
5875	1769257.73	1624616.15	7297.79	FR	
5876	1769257.51	1624617.63	7295.915	CP	
5877	1769257.44	1624614.3	7299.285	FR	
5878	1769256.66	1624614.87	7298.085	FR	
5879	1769258.99	1624614.27	7300.58	FR	
5880	1769256.8	1624615.85	7297.24	FR	
5881	1769257.78	1624613.37	7300.41	FR	
5882	1769255.56	1624614.1	7298.085	FR	
5883	1769248	1624618.17	7277.03	FR	
5884	1769247.6	1624617.75	7277.725	FR	
5885	1769246.89	1624617.49	7277.495	FR	
5886	1769246.99	1624617.52	7276.25	FR	
5887	1769247.35	1624617.9	7275.83	FR	
5888	1769247.26	1624618.09	7275.115	FR	
5889	1769255.37	1624614.69	7296.255	FR	
5890	1769259.59	1624620.1	7293.185	FR	
5891	1769258.85	1624621.02	7291.67	FR	
5892	1769257.81	1624620.53	7290.1	FR	
5893	1769257.16	1624619.99	7290.655	FR	
5894	1769257.48	1624621.08	7289.065	FR	
5895	1769258.09	1624622.8	7284.97	FR	
5896	1769258.05	1624621.88	7285.315	TOS	
5897	1769257.71	1624622.57	7284.095	BOS	
5898	1769257.77	1624622.73	7284.09	FR	
5899	1769257.45	1624623.02	7283.13	FR	
5900	1769256.62	1624622.19	7283.525	BOS	
5901	1769256.84	1624621.67	7284.715	TOS	
5902	1769256.03	1624621.83	7283.525	BOS	
5903	1769255.93	1624621.75	7283.535	FR	
5904	1769256.13	1624621.7	7284.15	FR	
5905	1769256.14	1624621.6	7284.45	FR	
5906	1769255.39	1624620.7	7285.275	FR	
5907	1769254.42	1624620.34	7284.725	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5908	1769254.35	1624620.53	7284.32	FR	
5909	1769254.09	1624620.66	7283.47	FR	
5910	1769253.81	1624620.61	7283.015	FR	
5911	1769254.67	1624621.05	7282.49	FR	
5912	1769254.11	1624620.06	7285.1	BOS	
5913	1769253.25	1624621.54	7280.635	CP	
5914	1769255.26	1624620.46	7286.775	FR	
5915	1769256.7	1624621.05	7287.69	FR	
5916	1769253.79	1624619.59	7285.795	TOS	
5917	1769252.6	1624619.38	7285.14	BOS	
5918	1769252.79	1624618.98	7285.805	TOS	
5919	1769256.62	1624620.31	7288.805	FR	
5920	1769255.92	1624618.62	7288.14	FR	
5921	1769253.19	1624618.37	7289.51	FR	
5922	1769257.22	1624618.87	7290.105	FR	
5923	1769257.29	1624619.14	7292.085	FR	
5924	1769256.19	1624618.61	7292.965	FR	
5925	1769258.05	1624619.25	7292.955	FR	
5926	1769258.19	1624618.96	7293.715	FR	
5927	1769255.75	1624617	7293.84	FR	
5928	1769254.49	1624617.67	7292.11	FR	
5929	1769253.63	1624616.96	7290.805	FR	
5930	1769254.2	1624617.74	7290.55	FR	
5931	1769253.6	1624615.34	7293.425	FR	
5932	1769252.25	1624617.33	7289.92	FR	
5933	1769252.6	1624614.42	7295.2	FR	
5934	1769251.83	1624614.39	7294.47	FR	
5935	1769250.52	1624613.6	7295.07	FR	
5936	1769253.77	1624612.95	7297.74	FR	
5937	1769251.74	1624612.62	7296.93	FR	
5938	1769254.92	1624611.67	7299.92	FR	
5939	1769253.5	1624611.1	7299.575	FR	
5940	1769252.73	1624611.68	7298.35	FR	End survey 17 May 2007
7007	1769263.07	1624628.82	7278.19	BS	Backshot; start survey 21 May 2007
5941	1769245.21	1624615.51	7279.905	FR	0.3' horizontal prism
5942	1769244.01	1624614.75	7278.48	FR	
5943	1769243.63	1624614.92	7277.065	FR	
5944	1769243.56	1624613.96	7278.955	FR	
5945	1769242.65	1624613.64	7279.95	FR	
5946	1769243.39	1624613.89	7280	FR	
5947	1769242.81	1624614.77	7277.49	FR	horizontal prism
5948	1769241.04	1624612.71	7277.385	FR	
5949	1769241.38	1624612.22	7279.13	FR	
5950	1769251.62	1624609.38	7299.6	FR	
5951	1769249.45	1624609.02	7297.92	FR	
5952	1769237.5	1624610.39	7274.87	FR	
5953	1769237.22	1624609.08	7276.95	FR	
5954	1769237.01	1624608.63	7278.345	FR	
5955	1769236.82	1624608.34	7278.565	FR	
5956	1769236.77	1624609.05	7275.505	FR	
5957	1769236.67	1624608.35	7277.08	FR	
5958	1769248.32	1624608.24	7298.095	FR	
5959	1769248.58	1624610.46	7296.255	FR	
5960	1769246.3	1624609.55	7295.775	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
5961	1769248.85	1624611.5	7294.945	FR	
5962	1769235.89	1624607.85	7277.925	FR	
5963	1769235.06	1624607.13	7278.395	FR	
5964	1769235.29	1624607.38	7276.755	FR	
5965	1769235.31	1624608.38	7275.72	FR	
5966	1769235.22	1624608.9	7274.66	FR	
5967	1769234.74	1624609.21	7273.775	FR	
5968	1769248.75	1624607.05	7299.835	FR	
5969	1769246.72	1624605.96	7298.845	FR	
5970	1769245.87	1624607.72	7296.895	FR	
5971	1769232.3	1624605.42	7277.47	CP	
5972	1769230.38	1624606.54	7273.79	CP	
5973	1769244.72	1624606.7	7296.485	FR	
5974	1769243.69	1624607.41	7295.555	FR	
5975	1769242.66	1624606.05	7296.765	FR	
5976	1769229.64	1624603.27	7278.025	FR	
5977	1769229.26	1624602.72	7277.71	FR	
5978	1769227.2	1624602.41	7275.86	FR	
5979	1769226.72	1624603.23	7274.815	FR	
5980	1769226.17	1624603.68	7273.56	FR	
5981	1769227.48	1624602.27	7278.175	FR	
5982	1769246.39	1624612.09	7293.315	CP	
5983	1769245.05	1624610.94	7293.38	CP	
5984	1769244.73	1624610.57	7291.475	FR	
5985	1769245.1	1624610.46	7290.14	FR	
5986	1769245.69	1624610.96	7289.89	FR	
5987	1769243.83	1624609.35	7293.3	FR	
5988	1769248.86	1624614.12	7291.73	CP	
5989	1769248.11	1624612.74	7292.53	FR	
5990	1769246.58	1624612.3	7291.89	FR	
5991	1769247.16	1624612.66	7290.67	FR	
5992	1769224.39	1624601.57	7275.5	CP	
5993	1769218.27	1624597.14	7276.275	CP	
5994	1769216.82	1624597.43	7273.97	CP	
5995	1769216.82	1624597.43	7273.975	CP	REDO 5994
5996	1769250.85	1624615.77	7292.035	FR	
5997	1769250.61	1624615.78	7289.96	FR	
5998	1769248.67	1624613.91	7290.56	FR	
5999	1769249.92	1624615.96	7288.745	FR	
6000	1769249.85	1624615.95	7288.07	FR	
6001	1769248.71	1624614.31	7288.505	FR	
6002	1769248.88	1624614.29	7287.295	FR	
6003	1769248.99	1624614.68	7288.025	FR	
6004	1769249.56	1624616.01	7287.06	FR	
6005	1769222.49	1624601.88	7272.7	FR	
6006	1769222.34	1624600.36	7274.435	FR	
6007	1769221.81	1624599.3	7275.855	FR	
6008	1769221.48	1624599.04	7275.67	FR	
6009	1769220	1624598.58	7274.67	FR	
6010	1769220.82	1624598.17	7277.415	FR	
6011	1769221.14	1624598.56	7277.43	FR	
6012	1769223.7	1624600.18	7277.675	FR	
6013	1769222.88	1624599.63	7278.77	FR	
6014	1769252.04	1624619.26	7283.99	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6015	1769250.95	1624618.47	7285.18	TOS	
6016	1769250.97	1624618.41	7284.895	BOS	
6017	1769250.25	1624617.87	7284.955	TOS	
6018	1769250.29	1624617.81	7284.79	BOS	
6019	1769250.59	1624618.08	7284.52	FR	
6020	1769252.01	1624619.23	7283.98	FR	
6021	1769251.42	1624619.34	7281.47	FR	
6022	1769250.87	1624618.84	7280.575	FR	
6023	1769250.62	1624618.15	7283.31	FR	
6024	1769214.03	1624595.42	7272.865	FR	
6025	1769213.74	1624594.52	7273.86	FR	
6026	1769215.56	1624594.86	7275.58	FR	
6027	1769216.05	1624594.62	7276.885	FR	
6028	1769249.38	1624616.55	7285.34	FR	
6029	1769249.23	1624616.53	7284.8	TOS	
6030	1769249.28	1624616.61	7284.66	BOS	
6031	1769248.97	1624616.97	7283.935	FR	
6032	1769247.55	1624616.94	7282.275	FR	
6033	1769248.73	1624617.09	7282.515	FR	
6034	1769247.51	1624615.13	7285.18	FR	
6035	1769247.45	1624614.31	7285.155	FR	
6036	1769247.53	1624615.17	7284.875	TOS	
6037	1769247.49	1624615.18	7284.49	BOS	
6038	1769247.2	1624614.97	7284.38	FR	
6039	1769246.4	1624615.18	7282.885	FR	
6040	1769246.93	1624614.1	7284.88	TOS	
6041	1769246.65	1624613.78	7285.06	TOS	
6042	1769246.44	1624613.88	7284.57	BOS	
6043	1769245.71	1624613.41	7284.68	C34	
6044	1769247.28	1624613.45	7285.69	FR	
6045	1769213.17	1624593.88	7274.855	FR	
6046	1769213.83	1624594.06	7275.785	FR	
6047	1769248.71	1624614.27	7288.5	FR	
6048	1769248.84	1624614.2	7287.275	FR	
6049	1769247.85	1624613.05	7288.06	FR	
6050	1769247	1624612.05	7288.89	FR	
6051	1769247.14	1624612.25	7286.99	FR	
6052	1769244.91	1624610.18	7288.545	FR	
6053	1769245.51	1624611.11	7286.575	FR	
6054	1769245.18	1624612.33	7284.69	BOS	
6055	1769245.48	1624612.25	7285.145	TOS	
6056	1769245.21	1624612.02	7285.05	TOS	
6057	1769244.99	1624611.64	7285.215	FR	
6058	1769245.08	1624611.72	7285.01	TOS	
6059	1769243.85	1624611.2	7285.355	FR	
6060	1769243.37	1624610.73	7285.265	TOS	
6061	1769243.28	1624611.01	7284.51	BOS	
6062	1769244.79	1624614.24	7280.105	FR	
6063	1769245.28	1624614.52	7280.785	FR	
6064	1769244.91	1624614.04	7281.58	FR	
6065	1769243.62	1624613.63	7281.13	FR	
6066	1769243.12	1624613.37	7280.745	FR	
6067	1769242	1624611.28	7281.395	CP	
6068	1769213.8	1624593.69	7276.41	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6069	1769214.59	1624593.84	7277.05	FR	
6070	1769213.85	1624593.04	7276.92	FR	
6071	1769213.12	1624593.25	7275.615	FR	
6072	1769242.72	1624609.38	7285.575	FR	
6073	1769242.14	1624608.6	7285.49	FR	
6074	1769241.64	1624608.88	7284.795	FR	
6075	1769241.92	1624608.91	7284.795	TOS	
6076	1769242.86	1624609.67	7285.295	TOS	
6077	1769242.42	1624609.56	7284.83	TOS	
6078	1769241.01	1624608.95	7284.355	TOS	
6079	1769241.18	1624609.04	7284.225	BOS	
6080	1769242.25	1624609.42	7284.63	BOS	
6081	1769216.01	1624594.3	7278.57	FR	
6082	1769214.85	1624593.59	7278.105	FR	
6083	1769211.66	1624594.14	7272.225	FR	
6084	1769211.97	1624593.03	7274.39	FR	
6085	1769243.92	1624609.82	7286.495	FR	
6086	1769242.95	1624608.74	7286.815	FR	
6087	1769242.39	1624608.47	7286.635	FR	
6088	1769241.69	1624607.73	7286.17	FR	
6089	1769240.26	1624607.49	7285.48	FR	
6090	1769240.64	1624608.53	7283.865	OOP	
6091	1769240.66	1624608.5	7284.145	OOP	
6092	1769240.33	1624608.04	7284.155	OOP	
6093	1769240.28	1624607.99	7283.81	OOP	
6094	1769240.17	1624607.94	7284.12	BOS	
6095	1769239.8	1624607.86	7284.41	TOS	
6096	1769243.87	1624609.25	7290.375	FR	
6097	1769243.85	1624608.82	7288.195	FR	
6098	1769242.59	1624608.12	7289.14	FR	
6099	1769242.1	1624607.35	7288.91	FR	
6100	1769211.35	1624592.04	7275.365	FR	
6101	1769212.45	1624592.04	7276.715	FR	
6102	1769209.51	1624591.46	7273.85	FR	
6103	1769210.26	1624590.69	7275.725	FR	
6104	1769210.34	1624590.74	7276.33	FR	
6105	1769209.59	1624590.3	7276.035	FR	
6106	1769242.17	1624607.32	7290.295	FR	
6107	1769240.97	1624606.73	7288.86	FR	
6108	1769239.66	1624606.44	7289.55	FR	
6109	1769242.69	1624607.5	7293.035	FR	
6110	1769242.34	1624606.24	7293.175	FR	
6111	1769239.03	1624607.38	7284.615	FR	
6112	1769238.78	1624607.12	7284.25	BOS	
6113	1769238.24	1624606.38	7284.325	BOS	
6114	1769237.96	1624605.79	7284.14	FR	
6115	1769238.91	1624606.06	7285.65	FR	
6116	1769237.18	1624605.85	7285.555	FR	
6117	1769238.21	1624605.92	7284.785	TOS	
6118	1769236.87	1624605.6	7284.835	TOS	
6119	1769236.01	1624605.36	7284.88	BOS	
6120	1769236.97	1624605.56	7284.365	BOS	
6121	1769238.9	1624609.19	7280.575	CP	
6122	1769210.67	1624590.7	7278.25	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6123	1769236.69	1624608.02	7279.805	FR	
6124	1769236.22	1624607.56	7279.785	FR	
6125	1769235.52	1624606.89	7280.41	FR	
6126	1769234.66	1624606.21	7280.51	FR	
6127	1769234.84	1624605.93	7282.19	FR	
6128	1769232.7	1624604.74	7283.395	CP	
6129	1769232.33	1624604.94	7281.08	CP	
6130	1769234.6	1624605.11	7284.81	C34	
6131	1769233.5	1624604	7285.01	C34	
6132	1769233.56	1624603.97	7285.595	FR	
6133	1769206.98	1624589.84	7273.465	CP	
6134	1769207.82	1624588.92	7276.18	FR	
6135	1769206.36	1624588.1	7275.53	FR	
6136	1769206.59	1624587.46	7277.66	FR	
6137	1769238.89	1624606.25	7286.785	FR	
6138	1769237.78	1624606.07	7286.65	FR	
6139	1769237.06	1624604.67	7287.485	FR	
6140	1769239.69	1624606.61	7287.28	FR	
6141	1769239.45	1624604.71	7289.195	FR	
6142	1769238.94	1624604.53	7288.91	FR	
6143	1769238.94	1624604.43	7289.6	FR	
6144	1769238.62	1624604.75	7291.09	FR	
6145	1769239.4	1624604.89	7291.24	FR	
6146	1769236.43	1624604.19	7293.42	FR	
6147	1769235.8	1624603.76	7294.095	FR	
6148	1769236.49	1624603.97	7291.17	FR	
6149	1769238.28	1624604.72	7294.355	FR	
6150	1769239.26	1624604.65	7294.06	FR	
6151	1769238.42	1624604.77	7292.93	FR	
6152	1769236.03	1624604.04	7293.95	FR	horizontal prism
6153	1769236.88	1624604.26	7294.85	FR	horizontal prism
6154	1769239.63	1624604.92	7292.11	FR	horizontal prism
6155	1769240.52	1624605.01	7293.27	FR	
6156	1769241.14	1624605.72	7291.27	FR	horizontal prism
6157	1769241.66	1624605.35	7293.525	FR	horizontal prism
6158	1769243.15	1624605.71	7298.2	FR	horizontal prism
6159	1769242.11	1624604.88	7298.285	FR	
6160	1769239.34	1624604.61	7297.695	FR	
6161	1769238.05	1624603.27	7298.015	FR	
6162	1769239.53	1624603.91	7299.3	FR	
6163	1769238.16	1624603.91	7295.84	FR	
6164	1769235.88	1624602.6	7297.645	FR	
6165	1769234.77	1624601.33	7298.05	FR	
6166	1769234.65	1624602.59	7296.395	CP	
6167	1769234.8	1624601.36	7298.055	FR	
6168	1769234.04	1624602.75	7294.17	FR	
6169	1769233	1624602.63	7292.805	FR	
6170	1769234.59	1624600.48	7299.07	FR	
6171	1769233.51	1624599.92	7298.615	FR	
6172	1769232.8	1624600.13	7297.225	FR	
6173	1769232.55	1624600.96	7295.555	FR	
6174	1769204.92	1624586.93	7275.53	FR	
6175	1769204	1624587.2	7273.82	FR	
6176	1769201.8	1624586.4	7272.375	CP	

Point#	Northing	Easting	Elevation	Pcode	Notes
6177	1769201.05	1624584.66	7274.23	FR	
6178	1769203.99	1624586.02	7276.745	FR	
6179	1769201.94	1624584.34	7276.77	FR	
6180	1769231.28	1624599.55	7297.675	FR	
6181	1769229.9	1624598.37	7296.08	FR	
6182	1769229.9	1624597.94	7297.365	FR	
6183	1769230.28	1624597.17	7298.745	FR	
6184	1769229.76	1624597.17	7297.315	FR	
6185	1769229	1624596.36	7297.925	FR	
6186	1769228.52	1624597.22	7295.78	FR	
6187	1769227.49	1624597.75	7293.935	CP	
6188	1769226.97	1624598.58	7291.7	CP	
6189	1769230.04	1624599.51	7294.245	FR	
6190	1769229.91	1624600	7289.965	FR	
6191	1769230.39	1624600.81	7290.035	FR	
6192	1769228.52	1624600.29	7289.43	FR	
6193	1769228.04	1624600	7290.015	FR	
6194	1769232.31	1624601.31	7292.975	FR	
6195	1769201.99	1624584.17	7278.095	FR	
6196	1769200.76	1624584.03	7275.59	FR	
6197	1769200.06	1624584.08	7274.245	FR	
6198	1769199.22	1624582.49	7277.165	FR	
6199	1769199.74	1624583	7276.515	FR	
6200	1769236.57	1624603.67	7289.18	FR	
6201	1769235.74	1624603.03	7288.345	FR	
6202	1769234.02	1624602.96	7288.03	FR	
6203	1769233.63	1624603.28	7289.08	FR	
6204	1769232.93	1624602.37	7290.47	FR	
6205	1769232.85	1624602.58	7288.875	FR	
6206	1769232.03	1624601.43	7290.07	FR	
6207	1769231.95	1624602.22	7288.305	FR	
6208	1769230.52	1624601.69	7288.465	FR	
6209	1769231.71	1624602.63	7286.205	FR	
6210	1769231.86	1624603.26	7285.325	FR	
6211	1769231.43	1624603.15	7284.915	C34	
6212	1769230.13	1624602.52	7284.87	C34	
6213	1769230.42	1624602.23	7285.355	FR	
6214	1769230.02	1624603.28	7282.835	CP	
6215	1769230.38	1624603.51	7280.2	FR	
6216	1769228.18	1624601.99	7281.04	FR	
6217	1769228.46	1624602.16	7283.13	FR	
6218	1769229.34	1624601.67	7285.015	FR	
6219	1769228.65	1624601.55	7284.885	C34	
6220	1769227.39	1624601.21	7285.17	FR	horizontal prism
6221	1769228.06	1624600.92	7286.86	FR	horizontal prism
6222	1769227.94	1624600.69	7286.42	FR	
6223	1769227.13	1624600.62	7285.655	FR	
6224	1769226.74	1624600.03	7286.16	FR	
6225	1769226.31	1624600.44	7284.49	FR	
6226	1769227.35	1624600.77	7285.02	TOS	
6227	1769227.3	1624600.73	7284.915	BOS	
6228	1769226.82	1624599.66	7287.51	FR	
6229	1769225.88	1624599.3	7287.72	FR	
6230	1769225.14	1624599.41	7286.03	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6231	1769225.53	1624599.77	7285.415	FR	
6232	1769225.44	1624599.78	7285.12	TOS	
6233	1769225.45	1624599.79	7284.995	BOS	
6234	1769224.33	1624599.17	7285.295	FR	
6235	1769224.02	1624598.92	7285.19	TOS	
6236	1769224.17	1624599.02	7285.085	BOS	
6237	1769225.69	1624599.93	7282.995	FR	
6238	1769225.03	1624599.94	7281.515	FR	
6239	1769225.47	1624600.56	7280.385	CP	
6240	1769223.66	1624599.67	7280.005	FR	
6241	1769223.72	1624598.77	7282.81	CP	
6242	1769221.39	1624598.21	7279.2	FR	
6243	1769221.54	1624597.7	7281.185	FR	
6244	1769221.62	1624597.53	7283.055	FR	
6245	1769220.16	1624597.57	7278.72	FR	
6246	1769219.93	1624596.65	7280.195	FR	
6247	1769219.47	1624596.19	7281.53	FR	
6248	1769223.68	1624598.5	7285.255	C34	
6249	1769223.65	1624598.29	7285.595	FR	
6250	1769222.99	1624597.88	7285.175	C34	
6251	1769221.61	1624597.08	7285.23	C34	
6252	1769224.37	1624598.5	7286.475	FR	
6253	1769223.26	1624597.55	7286.605	FR	
6254	1769220.96	1624596.33	7285.82	FR	
6255	1769224.96	1624598.59	7287.63	FR	
6256	1769223.92	1624597.6	7287.54	FR	
6257	1769222.53	1624596.67	7287.635	FR	
6258	1769224.94	1624598.59	7287.625	FR	
6259	1769224.77	1624597.75	7288.83	FR	
6260	1769223.72	1624597.12	7288.375	FR	
6261	1769224.68	1624597.28	7290.03	FR	
6262	1769222.51	1624596.08	7288.82	FR	
6263	1769221.58	1624595.72	7287.375	FR	
6264	1769226.82	1624599.66	7289.165	FR	
6265	1769226.44	1624598.99	7289.74	FR	
6266	1769225.6	1624598.08	7290.655	FR	
6267	1769198.36	1624582.25	7276.125	CP	
6268	1769198.05	1624583.13	7272.675	CP	
6269	1769196.93	1624581.72	7274.02	FR	
6270	1769196.61	1624581.43	7274.04	FR	
6271	1769196.76	1624580.54	7277.01	FR	
6272	1769197.04	1624580.72	7276.895	FR	
6273	1769224.86	1624596.22	7291.5	FR	
6274	1769224.55	1624595.88	7292.93	FR	
6275	1769225.04	1624594.49	7294.78	FR	
6276	1769225.93	1624594.86	7295.075	FR	
6277	1769223.93	1624593.59	7295.53	FR	
6278	1769225.42	1624593.9	7296.435	FR	
6279	1769225.84	1624594.21	7297.645	FR	
6280	1769226.8	1624595.25	7298.27	FR	
6281	1769227.72	1624595.52	7297.1	FR	
6282	1769227.03	1624594.9	7296.465	FR	
6283	1769224.11	1624592.59	7298.335	FR	
6284	1769224.04	1624592.77	7296.945	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6285	1769222.76	1624592.5	7296.12	FR	
6286	1769222.28	1624592.22	7295.165	FR	
6287	1769222.11	1624591.64	7296.75	FR	
6288	1769222.54	1624594.29	7292.76	FR	
6289	1769222.37	1624591.54	7298.26	FR	
6290	1769219.83	1624590.31	7297.67	FR	
6291	1769220.18	1624590.86	7296.685	FR	
6292	1769220.44	1624592.16	7293.545	CP	
6293	1769221.54	1624592.19	7294.16	FR	
6294	1769220.62	1624592.88	7290.675	FR	
6295	1769221.64	1624594.65	7288.695	FR	
6296	1769220.16	1624594.21	7287.795	FR	
6297	1769220.06	1624593.09	7288.87	FR	
6298	1769219.36	1624594.67	7286.49	FR	
6299	1769218.82	1624594.46	7286.05	FR	End survey 21 May 2007
7007	1769263.01	1624628.8	7278.13	BS	Backshot; start survey 22 May 2007
6300	1769219.77	1624595.23	7285.305	C34	
6301	1769218.64	1624594.45	7285.2	C34	
6302	1769219.77	1624595.64	7284.05	FR	
6303	1769219.43	1624595.36	7283.35	FR	
6304	1769219.95	1624595.81	7282.855	FR	
6305	1769219.43	1624595.87	7282.065	FR	
6306	1769217.82	1624593.61	7285.22	FR	
6307	1769217.68	1624593.51	7285.11	C34	
6308	1769216.65	1624592.75	7285.125	C34	
6309	1769217.12	1624592.55	7285.83	FR	
6310	1769216.55	1624591.98	7285.735	FR	
6311	1769215.74	1624591.73	7285.1	FR	
6312	1769215.58	1624592.3	7284.735	C34	
6313	1769216.03	1624592.78	7283.845	FR	
6314	1769215.72	1624593.21	7283.05	FR	
6315	1769217.74	1624594.25	7283.855	FR	
6316	1769217.84	1624594.83	7281.905	FR	
6317	1769216.98	1624594.17	7282.39	FR	
6318	1769216.89	1624594.2	7281.195	FR	
6319	1769216.58	1624593.75	7282.275	FR	
6320	1769216.24	1624594.46	7279.215	FR	
6321	1769215.05	1624593.52	7280.485	FR	horizontal prism
6322	1769215.27	1624592.67	7282.1	FR	
6323	1769214.7	1624592.29	7280.62	FR	
6324	1769214.22	1624591.85	7282.285	FR	
6325	1769214.87	1624591.98	7283.635	FR	
6326	1769214.27	1624591.29	7284.57	C34	
6327	1769218.8	1624593.74	7286.195	FR	
6328	1769218.66	1624593.57	7286.38	FR	
6329	1769218.43	1624593.15	7287.405	FR	
6330	1769217.75	1624592.84	7287.44	FR	
6331	1769217.78	1624591.94	7288.01	FR	
6332	1769215.24	1624590.23	7287.875	FR	
6333	1769215.97	1624591.11	7286.575	FR	
6334	1769215.15	1624590.88	7285.53	FR	
6335	1769215.79	1624591.67	7285.1	FR	
6336	1769214.24	1624589.5	7287.115	FR	
6337	1769219.06	1624591.93	7288.68	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
6338	1769217.92	1624590.16	7289.665	FR	horizontal prism
6339	1769215.96	1624590.79	7289.11	FR	horizontal prism
6340	1769217.75	1624590.25	7291.505	FR	horizontal prism
6341	1769216.95	1624589.87	7290.785	FR	
6342	1769216.13	1624589.37	7291.48	FR	horizontal prism
6343	1769219.19	1624591.53	7291.895	FR	horizontal prism
6344	1769219.18	1624591.36	7293.77	FR	horizontal prism
6345	1769218	1624589.99	7293.37	FR	
6346	1769218.66	1624591.01	7291.95	FR	
6347	1769217.15	1624589.7	7293.195	FR	
6348	1769215.97	1624588.48	7293.345	FR	
6349	1769217.18	1624589.26	7294.8	FR	
6350	1769219.47	1624590.51	7295.42	FR	
6351	1769218.31	1624590.05	7295.11	FR	
6352	1769219.19	1624589.48	7297.595	FR	
6353	1769218.39	1624589.29	7297.045	FR	
6354	1769217.13	1624587.94	7296.455	FR	
6355	1769216.15	1624586.58	7297.06	FR	
6356	1769215.2	1624587.3	7294.455	FR	
6357	1769214.19	1624585.47	7297.13	FR	
6358	1769213.66	1624585.63	7296.4	FR	
6359	1769214.24	1624586.2	7295.335	FR	
6360	1769212.94	1624584.74	7296.425	FR	
6361	1769214.34	1624586.65	7294.085	FR	
6362	1769214.16	1624586.92	7293.25	FR	
6363	1769213.01	1624586.52	7293.79	FR	
6364	1769212.52	1624585.58	7294.705	FR	
6365	1769211.67	1624586.22	7292.12	FR	
6366	1769211.98	1624584.55	7295.1	FR	
6367	1769213.22	1624587.8	7291.865	FR	horizontal prism
6368	1769213.61	1624587.96	7290.57	FR	
6369	1769212.74	1624587.08	7289.54	FR	
6370	1769214.25	1624588.86	7289.3	FR	
6371	1769213.29	1624588.82	7288.44	FR	
6372	1769212.74	1624589.39	7285.145	FR	
6373	1769213.17	1624589.22	7286.405	FR	
6374	1769211.7	1624588.44	7286.47	FR	
6375	1769211.75	1624588.74	7285.09	FR	
6376	1769210.77	1624587.83	7285.705	FR	
6377	1769213.62	1624590.69	7283.38	FR	
6378	1769212.9	1624590.32	7283.38	C34	
6379	1769211.81	1624589.5	7283.44	C34	
6380	1769212.86	1624590.08	7283.88	FR	
6381	1769213.96	1624590.49	7284.94	FR	
6382	1769213.23	1624591.15	7281.33	FR	
6383	1769214.09	1624591.89	7278.975	FR	
6384	1769209.96	1624588.95	7279.375	FR	
6385	1769207.17	1624587.03	7279.9	FR	
6386	1769211.16	1624589.69	7281.21	FR	
6387	1769209.52	1624588.03	7281.07	FR	
6388	1769208.97	1624587.39	7281.995	FR	
6389	1769210.22	1624588.37	7283.555	C34	
6390	1769209.67	1624587.86	7283.56	C34	
6391	1769208.97	1624586.96	7283.725	C34	

Point#	Northing	Easting	Elevation	Pcode	Notes
6392	1769209.28	1624587.14	7283.88	FR	
6393	1769207.88	1624586.02	7283.635	C34	
6394	1769206.05	1624584.84	7283.86	C34	
6395	1769208.19	1624585.42	7285.765	FR	
6396	1769209.65	1624586.91	7285.42	FR	
6397	1769206.86	1624584.2	7285.645	FR	
6398	1769210.9	1624587.04	7286.935	FR	
6399	1769209.8	1624586.49	7287	FR	
6400	1769210.01	1624585.95	7288.045	FR	
6401	1769208.85	1624584.75	7286.975	FR	
6402	1769207.21	1624583.93	7287.235	FR	
6403	1769209.68	1624585.77	7289.495	FR	horizontal prism
6404	1769211.75	1624586.7	7289.455	FR	
6405	1769210.8	1624586.05	7290.33	FR	
6406	1769209.82	1624585.03	7291.02	FR	
6407	1769209.44	1624584.78	7288.79	FR	
6408	1769207.31	1624583.07	7291.55	FR	
6409	1769209.06	1624584.11	7292.635	FR	
6410	1769211.09	1624583.29	7296.53	FR	
6411	1769210.08	1624584.18	7293.735	FR	
6412	1769209.38	1624583.15	7294.2	FR	
6413	1769209.28	1624582.51	7295.825	FR	
6414	1769208.19	1624581.3	7294.96	FR	
6415	1769208.19	1624580.73	7296.29	FR	
6416	1769206.25	1624579.94	7295.67	FR	
6417	1769206.76	1624581.28	7293.82	FR	
6418	1769206.11	1624581.5	7292.815	FR	
6419	1769205.45	1624581.28	7291.57	FR	
6420	1769204.74	1624580.06	7293.425	FR	
6421	1769203.59	1624579.81	7292.645	FR	
6422	1769204.05	1624578.94	7294.43	FR	
6423	1769202.93	1624578.83	7293.375	FR	
6424	1769203.96	1624578.33	7295.485	FR	
6425	1769205.31	1624582.19	7290.425	FR	
6426	1769205.41	1624582.61	7288.395	FR	
6427	1769204.48	1624581.75	7288.385	FR	
6428	1769203.95	1624581.24	7290.73	FR	
6429	1769202.73	1624580.77	7290.93	FR	horizontal prism
6430	1769202.78	1624581.35	7289.32	FR	horizontal prism
6431	1769202.05	1624580.49	7290.33	FR	horizontal prism
6432	1769205.73	1624583.21	7286.71	FR	
6433	1769204.46	1624582.41	7286.855	FR	
6434	1769205.3	1624584.01	7285.175	FR	horizontal prism
6435	1769204.38	1624582.88	7285.27	FR	
6436	1769204.11	1624582.89	7284.625	TOS	
6437	1769205.53	1624584.06	7284.155	TOS	
6438	1769204.85	1624583.76	7283.975	BOS	
6439	1769203.67	1624583.3	7283.835	BOS	
6440	1769205.08	1624583.3	7284.565	TOS	
6441	1769205.47	1624584.43	7283.095	FR	
6442	1769204.77	1624584.15	7282.455	FR	
6443	1769203.64	1624584.21	7280.955	FR	horizontal prism
6444	1769204.91	1624585.8	7278.955	CP	
6445	1769202.48	1624583.52	7281.34	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6446	1769202.36	1624583.85	7280.005	FR	
6447	1769201.86	1624583.64	7279.6	FR	
6448	1769202.37	1624583.86	7279.965	FR	
6449	1769201.83	1624583.48	7279.59	FR	
6450	1769200.15	1624582.35	7279.715	FR	
6451	1769199.25	1624582.01	7279.01	FR	
6452	1769200.27	1624581.91	7280.76	FR	
6453	1769199.8	1624581.93	7279.625	FR	
6454	1769201.46	1624582.12	7283.555	BOS	
6455	1769201.48	1624581.98	7284.03	TOS	
6456	1769199.83	1624580.99	7283.755	TOS	
6457	1769199.51	1624580.94	7283.43	BOS	
6458	1769202.04	1624581.36	7285.725	FR	
6459	1769200.39	1624580.62	7285.8	FR	
6460	1769201.68	1624580.72	7288.11	FR	
6461	1769200.25	1624579.62	7287.18	FR	
6462	1769202.39	1624579.85	7290.32	FR	
6463	1769200.69	1624579.02	7289.365	FR	
6464	1769201.44	1624578.42	7291.31	FR	
6465	1769201.33	1624577.58	7292.705	FR	
6466	1769199.11	1624576.46	7292.76	CP	
6467	1769202.7	1624577.02	7295.375	FR	
6468	1769201.31	1624576.5	7294.435	FR	
6469	1769200.25	1624575.23	7295.225	FR	End survey 22 May 2007
7007	1769263.05	1624628.8	7278.12	BS	Backshot; survey setup not used due to sudden rainstorm
7006	1769253.42	1624796.95	7277.63	BS	Backshot; start survey 23 May 2007
6470	1769198.8	1624573.86	7295.52	FR	
6471	1769198.64	1624574.82	7294.73	FR	
6472	1769197.39	1624573.65	7294.51	FR	
6473	1769197.15	1624573.16	7295.065	FR	
6474	1769197.75	1624574.76	7292.965	FR	
6475	1769195.64	1624572.26	7294.585	FR	
6476	1769195.38	1624572.55	7293.56	FR	
6477	1769194.82	1624572.91	7292.565	FR	
6478	1769194.06	1624570.95	7294.595	FR	
6479	1769195.99	1624571.56	7295.35	FR	
6480	1769193.39	1624569.75	7295.175	FR	
6481	1769196.55	1624574.69	7291.44	FR	
6482	1769196.73	1624575.75	7290.265	FR	
6483	1769196.12	1624575	7290.56	FR	
6484	1769196.14	1624574.03	7291.955	FR	
6485	1769195.58	1624573.63	7292.145	FR	
6486	1769194.3	1624572.78	7291.26	FR	
6487	1769195.56	1624574.51	7290.335	FR	
6488	1769194.89	1624574.75	7289.455	FR	
6489	1769193.64	1624573.43	7289.62	FR	
6490	1769192.87	1624574.81	7285.79	FR	
6491	1769193.09	1624573.92	7287.475	FR	
6492	1769192.49	1624574.07	7285.33	FR	
6493	1769190.6	1624573.04	7284.11	FR	
6494	1769191.69	1624574.3	7284.63	FR	
6495	1769195.82	1624576.7	7286.055	FR	
6496	1769196.2	1624576.87	7287.225	FR	
6497	1769195.26	1624575.6	7286.62	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6498	1769194.19	1624574.72	7287.06	FR	
6499	1769195.39	1624575.65	7288.095	FR	
6500	1769197.31	1624577.75	7287.79	FR	
6501	1769196.97	1624577	7289.485	FR	horizontal prism
6502	1769196.28	1624576.36	7288.83	FR	horizontal prism
6503	1769198.79	1624578.31	7287.6	FR	
6504	1769198.39	1624578.58	7287.035	FR	
6505	1769198.2	1624577.62	7289.95	FR	
6506	1769198.02	1624579	7286.015	FR	
6507	1769195.87	1624577.62	7284.81	FR	
6508	1769195.72	1624577.73	7284.005	TOS	
6509	1769198.17	1624579.43	7284.045	TOS	
6510	1769197.94	1624579.4	7283.52	BOS	
6511	1769196.57	1624578.17	7285.415	FR	
6512	1769195.62	1624577.88	7283.62	BOS	
6513	1769198.53	1624580.49	7282.545	FR	
6514	1769197.93	1624580.05	7281.995	FR	
6515	1769196.5	1624578.74	7281.29	FR	
6516	1769196.63	1624579.33	7280.145	FR	
6517	1769197.37	1624580.39	7281.215	FR	horizontal prism
6518	1769196.95	1624580.31	7280.115	FR	horizontal prism
6519	1769197.16	1624580.61	7278.61	FR	
6520	1769196.65	1624580.04	7278.55	FR	
6521	1769193.23	1624576.01	7283.745	TOS	
6522	1769193.42	1624576.02	7283.585	BOS	
6523	1769192.19	1624575.07	7283.205	BOS	End survey 23 May 2007
7005	1769110.23	1624513.58	7272.555	BS	Backshot; start survey 5 June 2007
6524	1769193.55	1624579.4	7274.115	CP	
6525	1769194.87	1624578.9	7277.36	CP	
6526	1769191.4	1624577.87	7272.39	CP	
6527	1769192.25	1624576.46	7276.94	CP	
6528	1769189.59	1624575.33	7274.105	CP	
6529	1769187.12	1624573.64	7272.94	FR	
6530	1769185.92	1624571.52	7274.325	FR	
6531	1769188.19	1624573.42	7276.05	FR	
6532	1769186.78	1624573.87	7274.13	FR	horizontal prism
6533	1769187.02	1624573.72	7275.235	FR	horizontal prism
6534	1769186.97	1624571.71	7276.51	FR	
6535	1769184.86	1624570.22	7276.2	FR	horizontal prism
6536	1769183.89	1624570.61	7274.36	FR	horizontal prism
6537	1769182.76	1624569.98	7274.03	FR	horizontal prism
6538	1769186.01	1624571.06	7277.78	CP	horizontal prism
6539	1769183.06	1624569.59	7276.9	FR	horizontal prism
6540	1769191.84	1624569.13	7294.45	FR	
6541	1769192.17	1624570.07	7293.18	FR	
6542	1769192.45	1624570.95	7292.29	FR	
6543	1769189.02	1624568.9	7291.775	FR	
6544	1769190.23	1624567.83	7294.58	FR	
6545	1769179.54	1624566.7	7276.56	FR	
6546	1769179.77	1624567.19	7275.64	FR	
6547	1769179.98	1624567.8	7273.755	FR	
6548	1769181.25	1624568.93	7272.215	FR	
6549	1769187.62	1624568.52	7290.28	FR	
6550	1769187.49	1624568.89	7288.615	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6551	1769188.78	1624569.82	7289.47	FR	
6552	1769186.8	1624568.87	7287.56	FR	
6553	1769186.43	1624568.26	7288.715	FR	
6554	1769186.86	1624567.72	7289.815	FR	
6555	1769176.6	1624564.85	7276.19	CP	
6556	1769176.5	1624565.52	7273.13	CP	
6557	1769173.63	1624564.35	7272.68	CP	
6558	1769191.85	1624570.89	7291.125	FR	
6559	1769191.29	1624571.97	7288.685	FR	
6560	1769191.5	1624572	7287	FR	
6561	1769191.01	1624571.66	7286.695	FR	
6562	1769192.4	1624573.22	7285.88	FR	
6563	1769189.99	1624570.86	7285.95	FR	
6564	1769190.99	1624572.52	7285	FR	
6565	1769190.45	1624571.26	7288.25	FR	
6566	1769174.18	1624562.28	7276.14	FR	
6567	1769172.63	1624561.7	7274.035	FR	
6568	1769169.77	1624559.95	7273.92	FR	
6569	1769171.33	1624561.14	7272.35	FR	
6570	1769170.62	1624559.83	7274.24	FR	
6571	1769191.72	1624574.38	7284.565	FR	
6572	1769188.86	1624572.21	7283.335	FR	
6573	1769188.26	1624571.81	7283.165	FR	
6574	1769188.73	1624571.53	7284.745	FR	
6575	1769188.3	1624572.13	7282.05	C34	
6576	1769189.98	1624573.28	7282.72	C34	
6577	1769190.88	1624574.2	7283.11	C34	
6578	1769191.89	1624575.03	7283.46	C34	
6579	1769193.2	1624575.85	7283.53	C34	
6580	1769171.54	1624560.5	7276.715	FR	
6581	1769170.1	1624558.82	7275.635	FR	
6582	1769168.92	1624558.52	7273.775	FR	
6583	1769167.98	1624558.15	7275.5	FR	
6584	1769167.48	1624557.92	7273.815	FR	horizontal prism
6585	1769194.39	1624577.41	7281.585	CP	
6586	1769191.48	1624575.22	7280.37	CP	
6587	1769164.94	1624558.5	7271.85	CP	
6588	1769166.33	1624557.2	7274.895	FR	horizontal prism
6589	1769163.91	1624555.05	7275.355	FR	horizontal prism
6590	1769190.15	1624574.53	7281.54	FR	horizontal prism
6591	1769189.68	1624573.99	7280.405	FR	horizontal prism
6592	1769188.96	1624574.11	7278.39	FR	horizontal prism
6593	1769162.84	1624554.04	7275.175	FR	
6594	1769163.38	1624555.47	7273.635	FR	
6595	1769161.99	1624554.77	7272.935	FR	
6596	1769162.59	1624555.14	7273.04	FR	
6597	1769161.37	1624555.35	7271.93	FR	
6598	1769162.71	1624556.09	7272.505	FR	
6599	1769162.6	1624556.58	7271.25	FR	
6600	1769163.42	1624556.95	7271.56	FR	
6601	1769188.26	1624566.46	7293.76	FR	
6602	1769187.33	1624565.71	7292.985	FR	
6603	1769186.11	1624565.31	7292.73	FR	
6604	1769186.87	1624566.36	7292.195	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6605	1769185.72	1624565.87	7291.68	FR	
6606	1769185.5	1624564.23	7293.635	FR	
6607	1769161.46	1624552.27	7277.13	FR	horizontal prism
6608	1769158.06	1624550.56	7274.055	FR	horizontal prism
6609	1769157.37	1624549.36	7275.735	FR	horizontal prism
6610	1769160.07	1624550.88	7275.305	FR	
6611	1769186.99	1624567.24	7290.5	FR	horizontal prism
6612	1769185.88	1624566.66	7290.155	FR	horizontal prism
6613	1769184.57	1624566.43	7289.6	FR	horizontal prism
6614	1769184.47	1624565.89	7288.975	FR	
6615	1769185.12	1624565.75	7290.555	FR	
6616	1769184.1	1624566.56	7287.635	FR	
6617	1769185.74	1624568.08	7287.025	FR	
6618	1769184.95	1624567.42	7285.775	FR	
6619	1769183.93	1624566.35	7285.83	FR	
6620	1769185.69	1624566.99	7288.675	CP	End survey 5 June 2007
7005	1769110.27	1624513.61	7272.57	BS	Backshot; start survey 6 June 2007
6621	1769155.82	1624547.85	7275.08	FR	
6622	1769152.43	1624547.42	7272.27	CP	
6623	1769152.64	1624545.24	7275.3	CP	
6624	1769149.99	1624543.71	7273.405	FR	
6625	1769188.87	1624570.29	7286.69	FR	
6626	1769187.82	1624569.73	7286.365	FR	
6627	1769186.3	1624568.58	7285.755	FR	
6628	1769187.99	1624569.76	7285.465	FR	
6629	1769186.81	1624569.03	7284.81	FR	
6630	1769185.96	1624568.23	7285	FR	
6631	1769185.31	1624567.65	7284.42	FR	
6632	1769149.82	1624543.15	7275.04	FR	horizontal prism
6633	1769148.23	1624542.99	7273.91	FR	horizontal prism
6634	1769147.36	1624542.83	7272.915	FR	horizontal prism
6635	1769148.84	1624541.5	7275.265	FR	
6636	1769148.47	1624541.05	7275.87	FR	
6637	1769144.38	1624540.98	7271.865	CP	
6638	1769143.93	1624538.69	7275.11	CP	
6639	1769187.75	1624571.19	7284.045	FR	
6640	1769187.53	1624571.3	7282.98	FR	
6641	1769185.9	1624569.42	7282.97	FR	
6642	1769184.79	1624568.74	7282.31	TOS	
6643	1769185.29	1624569.24	7282.005	TOS	
6644	1769184.88	1624569.91	7282.145	TOS	horizontal prism
6645	1769185.69	1624570.13	7282.54	TOS	horizontal prism
6646	1769186.07	1624570.43	7282.27	TOS	horizontal prism
6647	1769185.26	1624568.67	7283.675	FR	horizontal prism
6648	1769188.27	1624571.83	7283.23	FR	
6649	1769187.5	1624571.29	7282.98	FR	
6650	1769187.74	1624571.18	7284.045	FR	
6651	1769185.91	1624569.44	7282.96	FR	
6652	1769184.76	1624568.3	7282.97	FR	
6653	1769187.49	1624570.92	7281.725	TOS	
6654	1769188.15	1624572.66	7279.53	CP	
6655	1769186.39	1624570.34	7280.175	CP	
6656	1769184.47	1624570.28	7278.64	FR	horizontal prism
6657	1769184.83	1624570.2	7279.46	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
6658	1769183.43	1624568.34	7278.735	FR	
6659	1769183.8	1624568.64	7279.455	FR	
6660	1769183.33	1624568	7280.185	FR	
6661	1769184.25	1624568.63	7281.365	FR	
6662	1769181.63	1624567.06	7280.565	FR	
6663	1769181.08	1624566.97	7280.16	FR	
6664	1769181.73	1624567.88	7279.085	FR	horizontal prism
6665	1769141.75	1624539.03	7271.09	FR	
6666	1769140.98	1624537.11	7273.415	FR	horizontal prism
6667	1769140.93	1624536.34	7274.745	FR	horizontal prism
6668	1769139.53	1624535.84	7272.94	FR	
6669	1769139.07	1624535.25	7273.38	FR	
6670	1769139.03	1624534.73	7274.385	FR	
6671	1769136.61	1624534.94	7271.695	FR	
6672	1769137.36	1624534.76	7272.42	FR	
6673	1769137.09	1624534.04	7272.88	FR	
6674	1769137.92	1624534.31	7273.995	FR	
6675	1769137.58	1624532.97	7273.885	FR	
6676	1769183.81	1624567.66	7282.35	C34	
6677	1769182.84	1624566.65	7282.89	C34	
6678	1769184.22	1624568.6	7281.365	FR	
6679	1769182.21	1624566.83	7281.865	FR	
6680	1769180.79	1624565.78	7281.47	FR	
6681	1769181.83	1624565.53	7282.905	C34	
6682	1769181.28	1624565.17	7283.18	FR	
6683	1769181	1624565.17	7282.765	BOS	
6684	1769180.57	1624564.49	7283.13	TOS	
6685	1769183.61	1624565.65	7284.06	FR	
6686	1769181.34	1624564.61	7284.455	FR	horizontal prism
6687	1769138.08	1624532.64	7274.945	FR	
6688	1769136.9	1624532.64	7276.055	FR	horizontal prism
6689	1769136.96	1624532.66	7275.725	FR	horizontal prism
6690	1769136.1	1624532.11	7275.365	FR	horizontal prism
6691	1769136.13	1624532.97	7274.59	FR	horizontal prism
6692	1769135.45	1624531.17	7274.29	FR	
6693	1769135.5	1624532.1	7272.975	FR	
6694	1769136.12	1624532.55	7272.87	FR	
6695	1769183.14	1624565.45	7286.01	FR	
6696	1769181.69	1624564.27	7286.77	FR	
6697	1769182.08	1624564.26	7288.735	FR	
6698	1769182.45	1624564.22	7289.855	FR	
6699	1769133.84	1624532.31	7271.515	CP	
6700	1769133.93	1624530.17	7274.855	CP	
6701	1769133.26	1624531.26	7272.89	FR	
6702	1769183.21	1624563.97	7290.75	FR	
6703	1769182.09	1624563.17	7290.74	FR	
6704	1769182.92	1624563.28	7291.995	FR	
6705	1769184.07	1624563.8	7292.53	FR	
6706	1769181.06	1624562.03	7291.605	CP	
6707	1769180.32	1624562.37	7288.735	FR	
6708	1769183.84	1624562.57	7293.94	FR	
6709	1769181.95	1624561.24	7293.855	CP	End survey 6 June 2007
7005	1769110.25	1624513.62	7272.565	BS	Backshot; start survey 7 June 2007
6710	1769178.2	1624565.34	7278.42	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6711	1769179.16	1624565.06	7280.43	FR	
6712	1769177.05	1624563.86	7279.095	FR	
6713	1769176.14	1624563.67	7278.3	FR	
6714	1769132.49	1624529.95	7273.265	FR	horizontal prism
6715	1769131.67	1624529.62	7273.125	FR	
6716	1769131.7	1624530.12	7272.085	FR	
6717	1769129.76	1624529.39	7271.05	FR	
6718	1769130.4	1624527.9	7273.89	FR	
6719	1769130.54	1624527.53	7275.105	FR	
6720	1769177.04	1624562.93	7280.805	FR	
6721	1769174.63	1624561.54	7280.9	FR	
6722	1769172.81	1624560.43	7281.265	CP	
6723	1769132.6	1624528.98	7276.565	FR	
6724	1769130.94	1624528.83	7276.105	FR	horizontal prism
6725	1769127.6	1624526.72	7275.595	CP	horizontal prism
6726	1769179.87	1624564.33	7282.615	BOS	
6727	1769179.77	1624564.05	7282.97	TOS	
6728	1769178.9	1624563.48	7282.905	C34	
6729	1769177.97	1624562.6	7282.845	C34	
6730	1769176.85	1624561.71	7283.23	C34	
6731	1769176.65	1624561.6	7283.12	BOS	
6732	1769178.06	1624562.16	7284.135	FR	
6733	1769176.79	1624561.38	7283.59	TOS	
6734	1769176.62	1624561.21	7283.675	FR	
6735	1769129.22	1624528.55	7271.685	CP	
6736	1769128.18	1624527.85	7271.355	FR	
6737	1769125.92	1624524.37	7274.775	FR	
6738	1769124.1	1624523.59	7274.34	FR	
6739	1769123.63	1624524.91	7271.895	CP	
6740	1769125.5	1624526.03	7272.895	FR	horizontal prism
6741	1769124.9	1624524.33	7275.82	FR	horizontal prism
6742	1769179.45	1624563.27	7285.355	FR	horizontal prism
6743	1769179.29	1624562.38	7285.335	FR	
6744	1769179.25	1624561.86	7286.975	FR	
6745	1769179.02	1624561.19	7287.975	FR	
6746	1769177.76	1624560.91	7285.065	FR	
6747	1769177.56	1624560.47	7285.76	FR	
6748	1769177.04	1624559.36	7286.59	FR	
6749	1769178.31	1624560.17	7287.675	FR	
6750	1769175.35	1624560.49	7283.465	BOS	
6751	1769175.83	1624559.98	7284.335	TOS	
6752	1769122.77	1624522.53	7276.215	FR	
6753	1769122.17	1624523.12	7275.06	FR	horizontal prism
6754	1769121.46	1624522.18	7274.605	FR	horizontal prism
6755	1769179.28	1624561.15	7289.665	FR	
6756	1769178.99	1624560.88	7289.97	FR	
6757	1769179.35	1624560.49	7291.65	FR	
6758	1769178.28	1624559.82	7289.83	FR	
6759	1769178.6	1624560.09	7288.91	FR	
6760	1769177.7	1624559.5	7288.405	FR	
6761	1769177.75	1624558.81	7291.605	FR	
6762	1769122.31	1624522.46	7273.33	FR	
6763	1769120.4	1624521.34	7273.45	FR	
6764	1769120.6	1624522.77	7271.16	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6765	1769121.65	1624523.31	7271.19	FR	
6766	1769117.76	1624519.68	7272.865	FR	
6767	1769180.11	1624559.71	7293.83	FR	
6768	1769178.42	1624558.41	7293.53	FR	
6769	1769178.51	1624558.98	7292.53	FR	
6770	1769177.13	1624557.83	7292.42	FR	
6771	1769177.14	1624557.17	7293.725	FR	
6772	1769176.47	1624558.04	7290.74	FR	
6773	1769175.78	1624557.83	7291.59	FR	horizontal prism
6774	1769116.66	1624519.05	7274.545	FR	horizontal prism
6775	1769115.81	1624518.27	7274.445	FR	horizontal prism
6776	1769114.14	1624517.24	7274.78	FR	horizontal prism
6777	1769117.81	1624521.38	7270.33	CP	
6778	1769115.47	1624519.35	7270.37	FR	
6779	1769115.53	1624518.16	7271.605	FR	
6780	1769114.82	1624517.3	7273.325	FR	
6781	1769113.24	1624516.19	7272.32	FR	
6782	1769112.77	1624516.84	7270.07	FR	
6783	1769175.79	1624557.8	7291.515	FR	horizontal prism
6784	1769176.49	1624557.96	7290.775	FR	
6785	1769175.63	1624556.48	7292.915	FR	
6786	1769174.91	1624556.6	7291.055	FR	
6787	1769174.14	1624555.5	7290.735	FR	
6788	1769174.89	1624555.13	7293.28	FR	
6789	1769172.24	1624554.62	7290.325	FR	
6790	1769172.52	1624554.82	7291.805	FR	horizontal prism
6791	1769112.66	1624516.02	7274.86	FR	horizontal prism
6792	1769111.83	1624514.91	7275.325	FR	horizontal prism
6793	1769113.97	1624516.47	7275.725	FR	horizontal prism
6794	1769111.07	1624514.51	7274.535	FR	horizontal prism
6795	1769173.51	1624554.07	7293.855	FR	
6796	1769111.83	1624514.18	7274.02	FR	
6797	1769111.61	1624514.48	7273.13	FR	
6798	1769110.17	1624514	7271.555	FR	
6799	1769110.13	1624513.09	7273.66	FR	
6800	1769110.21	1624513.6	7272.565	CP	Benchmark 7005
6801	1769110.15	1624514.02	7271.565	FR	
6802	1769108.92	1624514.44	7269.085	FR	
6803	1769111.78	1624516.64	7269.75	FR	
6804	1769176.6	1624558.12	7287.055	FR	
6805	1769176.26	1624557.88	7287.865	FR	
6806	1769175.58	1624558.39	7286.75	FR	
6807	1769174.13	1624557.86	7285.675	FR	
6808	1769174.73	1624557.67	7286.805	FR	
6809	1769175.07	1624556.88	7288.49	FR	
6810	1769173.63	1624557.07	7287.46	FR	horizontal prism
6811	1769173.66	1624556.33	7289.29	FR	horizontal prism
6812	1769172.12	1624555.02	7289.07	FR	
6813	1769172.11	1624555.39	7288.31	FR	
6814	1769172.43	1624556.21	7286.415	FR	
6815	1769108.66	1624512.09	7272.38	FR	
6816	1769107.24	1624512.79	7269.125	FR	
6817	1769107.04	1624511.64	7270.635	FR	
6818	1769107.34	1624511.03	7272.235	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6819	1769107.53	1624511.14	7272.285	FR	
6820	1769106.97	1624510.6	7273.585	FR	horizontal prism
6821	1769106.28	1624510.24	7273.195	FR	horizontal prism
6822	1769174.88	1624559.73	7283.695	BOS	horizontal prism
6823	1769173.85	1624558.53	7283.585	BOS	
6824	1769174.34	1624558	7285.245	TOS	
6825	1769174.1	1624557.83	7285.68	FR	
6826	1769172.68	1624556.66	7285.58	TOS	
6827	1769172.66	1624556.73	7285.38	TOS	
6828	1769172.59	1624556.6	7284.75	FR	
6829	1769172.42	1624556.76	7283.78	BOS	
6830	1769172.44	1624557.39	7283.575	BOS	
6831	1769171.32	1624556.03	7283.765	BOS	
6832	1769171.34	1624555.88	7284.695	FR	
6833	1769171.22	1624555.85	7285.475	TOS	
6834	1769171.24	1624555.85	7285.82	TOS	
6835	1769171.37	1624555.77	7286.37	FR	
6836	1769170.62	1624554.85	7285.895	TOS	
6837	1769170.76	1624553.9	7287.23	FR	
6838	1769169.67	1624553.11	7286.925	FR	
6839	1769169.11	1624553.24	7285.92	TOS	
6840	1769168.58	1624552.63	7286.105	TOS	
6841	1769168.48	1624552.47	7286.205	TOS	
6842	1769168.46	1624552.38	7286.205	FR	
6843	1769170.09	1624552.98	7288.545	FR	
6844	1769171.19	1624553.75	7288.975	FR	
6845	1769169.93	1624552.97	7290.12	FR	horizontal prism
6846	1769169.22	1624552.15	7292.46	FR	horizontal prism
6847	1769167.97	1624550.53	7292.88	FR	
6848	1769167.6	1624550.95	7291.785	FR	
6849	1769165.77	1624550.36	7289.925	FR	
6850	1769168.72	1624551.96	7289.93	FR	
6851	1769168.04	1624551.64	7288.4	FR	
6852	1769167.8	1624551.63	7287.63	FR	
6853	1769166.14	1624551.82	7287.76	FR	horizontal prism
6854	1769166.1	1624551.57	7289.13	FR	horizontal prism
6855	1769165.85	1624549.19	7292.625	FR	
6856	1769165.12	1624549.44	7291.25	FR	
6857	1769164.36	1624548.65	7290.785	FR	
6858	1769164.08	1624549.28	7288.945	FR	
6859	1769164.4	1624550.2	7287.925	FR	
6860	1769164.57	1624549.76	7289.295	FR	
6861	1769165.23	1624549.82	7290.1	FR	
6862	1769165.77	1624550.37	7289.92	FR	
6863	1769166.27	1624551.96	7286.14	TOS	horizontal prism
6864	1769166.89	1624552.4	7286.215	TOS	horizontal prism
6865	1769165.84	1624551.51	7286.225	FR	
6866	1769165.83	1624551.33	7285.935	TOS	
6867	1769164.76	1624550.69	7285.96	TOS	
6868	1769164.07	1624550.17	7285.925	TOS	
6869	1769164.01	1624550.11	7286.065	FR	
6870	1769164.18	1624550.15	7287.085	FR	
6871	1769164.44	1624550.17	7287.92	FR	
6872	1769169.52	1624555.2	7283.21	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
6873	1769167.24	1624554.03	7282.36	BOS	
6874	1769166.14	1624553.95	7282.33	BOS	horizontal prism
6875	1769166.04	1624554.01	7282.625	BOS	horizontal prism
6876	1769164.71	1624553.74	7281.595	FR	horizontal prism
6877	1769166.71	1624554.7	7281.405	FR	horizontal prism
6878	1769165.2	1624552.58	7282.8	BOS	
6879	1769163.89	1624552.42	7282.865	BOS	horizontal prism
6880	1769163.72	1624551.73	7282.405	BOS	
6881	1769164.03	1624551.73	7282.81	FR	
6882	1769163.55	1624552.07	7281.435	FR	
6883	1769162.27	1624550.98	7282.64	BOS	
6884	1769162.7	1624551.25	7281.315	FR	
6885	1769170.85	1624558.88	7279.75	CP	
6886	1769170.47	1624557.41	7282.09	FR	
6887	1769168.52	1624556.02	7281.14	FR	
6888	1769169.01	1624556.99	7279.36	FR	
6889	1769169.26	1624557.53	7279.115	FR	
6890	1769170.36	1624557.7	7281.16	FR	
6891	1769168.74	1624558.06	7277.52	FR	horizontal prism
6892	1769166.45	1624554.82	7279.905	FR	horizontal prism
6893	1769165.33	1624554.08	7279.18	FR	horizontal prism
6894	1769164.21	1624552.88	7279.685	FR	
6895	1769166.55	1624555.4	7278.76	FR	horizontal prism
6896	1769164.18	1624552.79	7279.695	FR	
6897	1769163.25	1624551.92	7278.84	FR	
6898	1769161.18	1624550.72	7277.975	FR	
6899	1769161.79	1624550.48	7280.15	FR	
6900	1769160.3	1624549.5	7279.775	FR	
6901	1769161.65	1624550.42	7282.74	FR	
6902	1769160.55	1624549.1	7282.875	BOS	
6903	1769158.73	1624547.27	7283.04	BOS	
6904	1769157.89	1624547.95	7280.245	FR	
6905	1769163.07	1624549.72	7285.65	TOS	
6906	1769161.57	1624548.51	7285.1	TOS	
6907	1769160.17	1624547.89	7284.71	TOS	
6908	1769158.87	1624547.12	7284.325	TOS	
6909	1769158.84	1624547.06	7284.635	TOS	
6910	1769163.05	1624549.29	7286.91	FR	
6911	1769162.12	1624548.26	7287.25	FR	
6912	1769161.61	1624548.15	7286.285	FR	
6913	1769161.38	1624547.24	7288.525	FR	
6914	1769160.44	1624547.07	7287.16	FR	
6915	1769159.14	1624546.73	7286.03	FR	
6916	1769164.07	1624549.19	7288.96	FR	
6917	1769162.97	1624548.01	7289.535	FR	
6918	1769163.36	1624547.74	7291.115	FR	
6919	1769163.43	1624547.02	7291.825	FR	
6920	1769162.22	1624546.57	7291.875	FR	
6921	1769161.18	1624546.11	7290.905	FR	
6922	1769161.7	1624546.81	7290.445	FR	
6923	1769161.39	1624547.24	7288.515	FR	
6924	1769161.17	1624546.14	7290.895	FR	
6925	1769160.71	1624545.96	7290.255	FR	
6926	1769160.6	1624546.39	7289.63	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
6927	1769159.32	1624545.79	7288.14	FR	End survey 7 June 2007
7005	1769110.22	1624513.61	7272.545	BS	Backshot; start survey 18 June 2007
6928	1769156.29	1624541.88	7291.575	FR	
6929	1769157.61	1624542.93	7291.13	FR	
6930	1769157.64	1624543.38	7290.825	FR	
6931	1769158.7	1624544.56	7290.395	FR	
6932	1769155.41	1624541.28	7290.945	FR	
6933	1769154.18	1624540.49	7290.84	FR	
6934	1769154.51	1624541.51	7289.385	FR	
6935	1769153.52	1624541.11	7288.76	FR	
6936	1769153.79	1624540.29	7289.715	FR	
6937	1769155.24	1624542.56	7288.35	FR	
6938	1769153.83	1624541.69	7288.115	FR	
6939	1769156.41	1624544.12	7288.2	FR	horizontal prism
6940	1769156.12	1624544.18	7287.16	FR	horizontal prism
6941	1769155.73	1624544.15	7286.35	FR	horizontal prism
6942	1769158.27	1624545.55	7288.59	FR	horizontal prism
6943	1769158.14	1624546.04	7286.9	FR	horizontal prism
6944	1769154.98	1624542.99	7286.455	FR	
6945	1769153.42	1624541.97	7286.885	FR	
6946	1769152.87	1624541.54	7286.16	FR	
6947	1769150.54	1624540.65	7284.55	FR	
6948	1769151.68	1624541.39	7284.45	FR	
6949	1769152.33	1624542.03	7284.17	FR	
6950	1769148.53	1624539.32	7284.105	FR	
6951	1769149.22	1624539.84	7284.525	FR	
6952	1769149.2	1624539.04	7285.92	FR	
6953	1769149.77	1624539.13	7286.475	FR	
6954	1769150.18	1624539.7	7285.74	FR	
6955	1769151.03	1624539.96	7286.195	FR	
6956	1769158.34	1624546.28	7284.275	TOS	
6957	1769156.65	1624545.46	7283.9	TOS	
6958	1769155.27	1624544.28	7283.785	TOS	
6959	1769154.7	1624543.6	7283.855	TOS	
6960	1769154.58	1624543.55	7283.705	TOS	
6961	1769153.42	1624542.84	7283.69	TOS	
6962	1769156.26	1624545.24	7283.94	FR	
6963	1769153.64	1624542.8	7284.3	FR	
6964	1769154.15	1624544.06	7284.13	FR	horizontal prism
6965	1769153.53	1624543.99	7283.44	BOS	horizontal prism
6966	1769153.52	1624543.95	7283.28	BOS	horizontal prism
6967	1769153.29	1624542.84	7283.295	BOS	
6968	1769155.05	1624544.05	7283.26	BOS	
6969	1769155.67	1624544.8	7283.23	BOS	
6970	1769156.5	1624545.42	7283.29	BOS	
6971	1769157.94	1624546.24	7283.35	BOS	
6972	1769158.35	1624546.3	7284.29	TOS	
6973	1769148.18	1624539.22	7283.565	TOS	
6974	1769149.82	1624540.43	7283.545	TOS	
6975	1769151.63	1624541.78	7283.61	TOS	
6976	1769151.65	1624541.96	7282.81	BOS	
6977	1769151.09	1624541.57	7282.705	BOS	
6978	1769150.79	1624541.28	7282.955	BOS	
6979	1769150.12	1624540.62	7282.815	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
6980	1769149.53	1624540.2	7282.73	BOS	
6981	1769148.22	1624539.58	7282.335	BOS	
6982	1769149.54	1624540.26	7282.565	BOS	
6983	1769149.48	1624540.36	7282.4	FR	
6984	1769148.79	1624540.12	7281.285	FR	
6985	1769147.8	1624539.46	7280.695	FR	
6986	1769147.86	1624540.28	7278.4	FR	
6987	1769148.87	1624540.34	7279.21	FR	
6988	1769149.82	1624541.47	7278.875	FR	
6989	1769151.61	1624543.08	7278.365	FR	horizontal prism
6990	1769152.79	1624545.26	7278.43	CP	horizontal prism
6991	1769153.58	1624544.54	7280.865	CP	horizontal prism
6992	1769154.93	1624546.11	7280.06	FR	horizontal prism
6993	1769156.59	1624547.25	7281.235	FR	horizontal prism
6994	1769156.07	1624547.28	7278.66	FR	horizontal prism
6995	1769157.34	1624547.81	7278.705	FR	
6996	1769152.27	1624538.87	7290.56	FR	
6997	1769150.96	1624538.13	7290.27	FR	
6998	1769150.29	1624537.79	7290.095	FR	
6999	1769150.08	1624537.16	7290.405	FR	
7100	1769148.71	1624537.64	7288.685	FR	
7101	1769147.91	1624537.19	7288.895	FR	
7102	1769147.48	1624536.76	7288.33	FR	
7103	1769148.58	1624537.65	7289.335	FR	horizontal prism
7104	1769151.08	1624539.04	7289.2	FR	horizontal prism
7105	1769149.92	1624538.72	7288.855	FR	horizontal prism
7106	1769150.05	1624538.54	7287.73	FR	horizontal prism
7107	1769147.73	1624538.07	7286.85	FR	horizontal prism
7108	1769146.58	1624537.94	7286.24	FR	horizontal prism
7109	1769146.05	1624536.87	7285.865	FR	
7110	1769145.93	1624536.15	7287.76	FR	
7111	1769145.94	1624535.89	7289.2	FR	
7112	1769146.84	1624536.6	7289.98	FR	horizontal prism
7113	1769148.39	1624538.47	7285.475	FR	
7114	1769147.14	1624537.77	7285.49	FR	
7115	1769147.41	1624538.57	7283.545	TOS	
7116	1769146.04	1624537.98	7283.415	TOS	
7117	1769144.96	1624536.9	7283.375	TOS	
7118	1769145.05	1624536.93	7282.95	BOS	
7119	1769146	1624537.93	7283.065	BOS	
7120	1769146.9	1624538.44	7283.11	BOS	
7121	1769146.12	1624538.09	7281.825	FR	
7122	1769145	1624537.52	7281.16	FR	
7123	1769142.73	1624535.96	7279.72	CP	
7124	1769142.23	1624535.82	7278.435	FR	
7125	1769144.28	1624537.21	7279.44	FR	
7126	1769145.18	1624538.9	7277.43	CP	
7127	1769142.21	1624533.31	7289.11	FR	horizontal prism
7128	1769143.19	1624533.73	7289.69	FR	horizontal prism
7129	1769143.04	1624534.3	7288.265	FR	horizontal prism
7130	1769141.69	1624533.55	7287.555	FR	horizontal prism
7131	1769142.17	1624534.2	7287.245	FR	horizontal prism
7132	1769143.08	1624534.74	7286.95	FR	horizontal prism
7133	1769141.12	1624533.89	7285.95	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
7134	1769142.24	1624534.33	7286.09	FR	horizontal prism
7135	1769143.17	1624534.93	7286.08	FR	horizontal prism
7136	1769139.22	1624532.25	7288.36	FR	horizontal prism
7137	1769140.84	1624532.32	7288.57	FR	horizontal prism
7138	1769140.75	1624532.62	7288.045	FR	horizontal prism
7139	1769139.97	1624532.63	7287.92	FR	horizontal prism
7140	1769138.99	1624532.36	7287.045	FR	horizontal prism
7141	1769139.29	1624532.64	7286.655	FR	horizontal prism
7142	1769140.41	1624532.85	7286.6	FR	horizontal prism
7143	1769140.76	1624532.86	7287.31	FR	horizontal prism
7144	1769143.92	1624535.67	7286.22	FR	horizontal prism
7145	1769144.12	1624535.38	7287.32	FR	horizontal prism
7146	1769145.02	1624535.48	7288.795	FR	horizontal prism
7147	1769145.05	1624536.1	7286.105	FR	horizontal prism
7148	1769142.41	1624534.67	7285.105	FR	horizontal prism
7149	1769141.24	1624533.95	7284.84	FR	horizontal prism
7150	1769139.72	1624533.69	7284.02	FR	horizontal prism
7151	1769140.15	1624533.17	7285.24	FR	horizontal prism
7152	1769142.43	1624534.79	7283.43	FR	horizontal prism
7153	1769144.19	1624535.97	7283.075	C34	
7154	1769144.08	1624535.68	7284.255	FR	
7155	1769144.19	1624535.21	7285.38	FR	
7156	1769142.63	1624534.96	7283.05	C34	
7157	1769142.35	1624534.63	7283.08	BOS	
7158	1769142.39	1624534.72	7283.315	TOS	
7159	1769141.96	1624534.24	7283.16	C34	
7160	1769140.17	1624533.12	7283.215	BOS	
7161	1769140.24	1624533.16	7283.4	TOS	
7162	1769139.19	1624533.15	7281.05	CP	
7163	1769138.24	1624532.38	7280.3	FR	
7164	1769139.6	1624532.43	7283.215	BOS	
7165	1769139.63	1624532.47	7283.355	TOS	
7166	1769138.12	1624531.7	7283.035	BOS	
7167	1769138.19	1624531.59	7283.31	TOS	
7168	1769137.43	1624531.99	7283.22	FR	horizontal prism
7169	1769139.15	1624532.65	7283.355	FR	horizontal prism
7170	1769138.34	1624532.51	7283.215	TOS	horizontal prism
7171	1769138.44	1624532.54	7283.08	BOS	
7172	1769139.51	1624533.17	7284.395	FR	
7173	1769140.39	1624534.35	7279.465	FR	horizontal prism
7174	1769141.31	1624534.92	7279.89	FR	horizontal prism
7175	1769140.22	1624533.95	7277.42	FR	horizontal prism
7176	1769135.81	1624529.44	7287.25	FR	horizontal prism
7177	1769135.21	1624528.8	7286.445	FR	
7178	1769135.23	1624529.52	7285.205	FR	
7179	1769135.96	1624530.36	7285.225	FR	
7180	1769136.79	1624530.03	7287.455	FR	
7181	1769137.48	1624530.07	7288.025	FR	
7182	1769138.3	1624530.81	7288.54	FR	
7183	1769138.05	1624531.49	7286.205	FR	
7184	1769137.24	1624529.75	7286.805	FR	
7185	1769137.59	1624530.4	7285.845	FR	
7186	1769137	1624530.43	7284.765	FR	
7187	1769137.12	1624530.57	7284.54	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
7188	1769136.03	1624529.93	7283.46	FR	
7189	1769136.83	1624530.52	7283.63	FR	
7190	1769138.61	1624531.67	7285.035	FR	
7191	1769133.64	1624528.06	7283.22	C34	
7192	1769134.06	1624528.44	7283.32	C34	
7193	1769135.42	1624529.19	7283.095	C34	
7194	1769136.95	1624530.65	7283.06	C34	
7195	1769135.32	1624529.83	7282.12	FR	
7196	1769134.32	1624528.59	7283.3	FR	
7197	1769134.46	1624528.24	7284.86	FR	
7198	1769135.33	1624527.61	7287.225	FR	
7199	1769135.85	1624531.69	7278.575	FR	horizontal prism
7200	1769135.71	1624531.61	7277.64	FR	horizontal prism
7201	1769135.16	1624530.58	7279.675	FR	horizontal prism
7202	1769134.64	1624530.45	7278.905	FR	
7203	1769134.88	1624530.98	7276.675	FR	
7204	1769134.3	1624530.19	7281.225	FR	
7205	1769132.67	1624528.55	7281.4	FR	
7206	1769132.48	1624528.58	7280.405	FR	
7207	1769133.24	1624528.97	7280.525	FR	
7208	1769133.72	1624529.36	7279.995	FR	
7209	1769134.3	1624530.19	7281.205	FR	
7210	1769133.09	1624529.16	7278.675	FR	
7211	1769132.28	1624529.23	7278.645	FR	
7212	1769131.08	1624528.53	7278.43	FR	End survey 18 June 2007
7005	1769110.23	1624513.6	7272.585	BS	Backshot; start survey 19 June 2007
7213	1769133.68	1624526.71	7286.85	STC	
7214	1769133.6	1624527.65	7284.56	STC	
7215	1769133.17	1624527.48	7283.26	STC	
7216	1769132.15	1624526.96	7283.01	STC	
7217	1769130.71	1624524.46	7285.83	CP	
7218	1769131.59	1624526.58	7285.195	CP	horizontal prism
7219	1769130.09	1624524.73	7282.985	STC	
7220	1769129.1	1624524.52	7282.17	FR	
7221	1769128.47	1624524.15	7282.175	STC	
7222	1769126.8	1624524.17	7279.875	FR	
7223	1769127.62	1624524.22	7280.68	FR	
7224	1769130.03	1624525.66	7280.95	FR	
7225	1769127.23	1624524.41	7278.225	FR	
7226	1769128.36	1624525.38	7277.935	FR	
7227	1769130.91	1624526.46	7279.39	FR	
7228	1769130.99	1624527	7278.265	FR	
7229	1769129.44	1624526.38	7276.66	FR	
7230	1769124.2	1624523.13	7276.98	FR	
7231	1769124.62	1624522.76	7278.32	FR	
7232	1769126.48	1624523.69	7280.19	FR	
7233	1769125.8	1624524.39	7279.25	FR	horizontal prism
7234	1769124.73	1624523.17	7280.17	FR	horizontal prism
7235	1769126.33	1624524.28	7278.075	FR	horizontal prism
7236	1769125.81	1624524.32	7276.75	FR	horizontal prism
7237	1769125.66	1624523.27	7281.495	STC	horizontal prism
7238	1769126.51	1624522.89	7283.765	CP	horizontal prism
7239	1769128.31	1624522.27	7285.43	CP	horizontal prism
7240	1769125.68	1624521.22	7285.15	CP	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
7241	1769120.89	1624518.34	7282.925	CP	horizontal prism
7242	1769123.45	1624519.74	7283.76	CP	horizontal prism
7243	1769124.35	1624521.33	7282.88	CP	horizontal prism
7244	1769121.11	1624518.02	7280.33	STC	
7245	1769122.79	1624519.37	7280.69	STC	
7246	1769124.09	1624521.37	7280.96	STC	
7247	1769121.13	1624518.11	7280.205	FR	
7248	1769123.36	1624520.34	7279.85	FR	
7249	1769123.86	1624521.58	7279.925	FR	
7250	1769121.57	1624519.4	7277.95	CP	
7251	1769120.38	1624518.14	7278.895	FR	
7252	1769119.28	1624518.49	7277.46	FR	
7253	1769123.27	1624522.34	7277.43	FR	
7254	1769122.34	1624521.21	7276.73	FR	
7255	1769120.48	1624520.17	7276.195	CP	
7256	1769122.81	1624521.49	7277.595	FR	
7257	1769123.22	1624521.23	7278.3	FR	
7258	1769119.46	1624516.84	7283.055	CP	horizontal prism
7259	1769117.72	1624515.98	7282.54	CP	horizontal prism
7260	1769116.17	1624515.53	7281	CP	horizontal prism
7261	1769116.13	1624515.5	7279.45	STC	
7262	1769117.26	1624516.16	7279.41	STC	
7263	1769117.02	1624516.36	7278.75	FR	
7264	1769119.16	1624517.34	7279.67	STC	
7265	1769120.07	1624517.34	7280.395	STC	
7266	1769116.85	1624516.9	7276.83	FR	
7267	1769117.95	1624518.83	7276.415	FR	horizontal prism
7268	1769115.03	1624515.32	7277.945	FR	
7269	1769113.67	1624514.63	7277.68	FR	
7270	1769113.11	1624514.21	7277.365	FR	
7271	1769114.88	1624515.05	7278.66	STC	
7272	1769113.71	1624514.1	7279.01	STC	
7273	1769112.71	1624513.42	7278.72	STC	
7274	1769114.89	1624514.17	7280.365	CP	
7275	1769114.01	1624512.57	7282.035	CP	
7276	1769112.41	1624511.67	7282.04	CP	
7277	1769112.77	1624512.96	7280.345	CP	
7278	1769111.24	1624511.48	7279.815	CP	
7279	1769111.42	1624513.24	7276.14	FR	
7280	1769109.31	1624509.32	7280.255	CP	
7281	1769108.69	1624508.22	7281.855	CP	
7282	1769110.84	1624510.15	7281.985	CP	
7283	1769111.39	1624510.63	7281.815	CMRR001	Sample location CMRR001
7284	1769108.67	1624509.39	7278.75	STC	
7285	1769109.63	1624510.35	7278.685	STC	
7286	1769109.66	1624510.42	7278.135	FR	
7287	1769106.75	1624507.96	7277.53	STC	
7288	1769110.98	1624512.01	7277.565	STC	
7289	1769109.95	1624512.03	7275.685	FR	End survey 19 June 2007; conclude survey on NW

Total Northwest Wall survey points = 2009

CMRR Geologic Investigations
North Wall Surveying July 2007

Point Codes (Pcode):

BS	backshot (to benchmark)
FR	fracture
TOS	top of surge (Qbt_4-Qbt_s contact)
BOS	bottom of surge (Qbt_s-Qbt_3 contact)
C34	Qbt_3-Qbt_4 contact
STC	soil-tuff contact
CP	control point
FF	fossil fumarole
FTC	fill-tuff contact

***Note: where prism is listed as horizontal, rod length (horiz. distance from wall) is 0.9 ft unless otherwise noted.

Point #	Northing	Easting	Elevation	Pcode	Notes
7006	1769253.41	1624797.03	7277.63	BS	backshot; start survey 23 July 07
7011	1769297.28	1624742.325	7278.765	BM	Benchmark 7011
7290	1769296.39	1624743.12	7277.22	FR	
7291	1769297.14	1624742.65	7278.665	FR	
7292	1769297.595	1624742.025	7278.74	FR	
7293	1769297.32	1624741.505	7278.1	FR	
7294	1769297.095	1624741.615	7277.055	FR	
7295	1769298.065	1624741.84	7280.505	CP	
7296	1769298.515	1624741.63	7282.055	CP	
7297	1769299.165	1624739.845	7281.765	CP	
7298	1769298.95	1624739.7	7280.15	CP	
7299	1769298.2	1624740.31	7278.075	FR	
7300	1769299.27	1624739.195	7277.44	FR	
7301	1769300.565	1624738.39	7282.65	FR	
7302	1769300.275	1624738.275	7281.18	FR	
7303	1769300.28	1624738.13	7278.83	FR	
7304	1769300.8	1624736.17	7278.145	FR	
7305	1769301.115	1624735.77	7280.275	FR	
7306	1769301.03	1624737.135	7279.555	FR	
7307	1769300.64	1624734.81	7280.54	FR	
7308	1769300.995	1624734.975	7281.305	FR	
7309	1769301.035	1624735.43	7281.99	FR	
7310	1769300.64	1624737.015	7281.525	FR	
7311	1769300.815	1624736.57	7283.175	CP	
7312	1769300.31	1624734.665	7279.66	FR	
7313	1769300.29	1624734.805	7277.77	FR	
7314	1769300.245	1624733.035	7277.08	FR	
7315	1769300.57	1624731.865	7276.885	FR	
7316	1769301.12	1624731.87	7279.01	FR	
7317	1769301.355	1624731.815	7279.445	FR	
7318	1769301.4	1624731.775	7281.35	FR	
7319	1769301.38	1624731.85	7282.035	FR	
7320	1769300.945	1624733.1	7281.21	FR	
7321	1769300.69	1624733.29	7279.76	CP	
7322	1769300.955	1624733.91	7281.675	FR	
7323	1769300.79	1624734.215	7282.325	FR	
7324	1769300.895	1624733.87	7282.99	FR	
7325	1769299.45	1624740.385	7283.905	CP	
7326	1769299.925	1624740.475	7285.475	C34	
7327	1769300.34	1624739.95	7285.765	FR	
7328	1769300.57	1624730.185	7276.595	FR	
7329	1769300.71	1624728.28	7276.66	FR	
7330	1769301.315	1624727.205	7277.16	FR	
7331	1769301.465	1624727.325	7278.025	FR	
7332	1769301.32	1624728.43	7278.15	FR	
7333	1769301.24	1624729.715	7278.23	CP	
7334	1769301.435	1624730.075	7279.7	FR	
7335	1769300.095	1624738.44	7286.4	FR	
7336	1769300.45	1624738.875	7287.325	FR	
7337	1769301.49	1624730.36	7281.245	CP	

Point #	Northing	Easting	Elevation	Pcode	Notes
7338	1769301.655	1624728.825	7280	FR	
7339	1769301.81	1624728.3	7280.065	FR	
7340	1769301.89	1624728.88	7281.965	FR	
7341	1769300.07	1624741.145	7287.8	FR	
7342	1769300.285	1624739.78	7286.67	FR	
7343	1769300.58	1624740.045	7288.59	FR	
7344	1769300.655	1624739.145	7287.825	FR	
7345	1769301.915	1624727.48	7282.11	FR	
7346	1769301.855	1624727.47	7281.1	FR	
7347	1769302.06	1624726.895	7281.025	FR	
7348	1769301.8	1624727.135	7279.055	FR	
7349	1769301.7	1624725.975	7279.25	FR	
7350	1769300.93	1624739.08	7288.48	FR	
7351	1769301.035	1624739.67	7289.555	FR	
7352	1769301.15	1624739.64	7290.33	FR	
7353	1769300.455	1624740.98	7289.86	FR	
7354	1769301.78	1624725.1	7278.315	FR	
7355	1769301.945	1624725.255	7279.2	FR	
7356	1769302.445	1624724.71	7280.895	FR	
7357	1769302.33	1624725.63	7280.175	FR	
7358	1769301.13	1624738.51	7290.03	FR	
7359	1769301.83	1624738.98	7291.88	FR	
7360	1769301.32	1624740.095	7292.43	FR	
7361	1769301.21	1624740.87	7292.51	FR	
7362	1769302.08	1624738.97	7293.07	FR	
7363	1769302.785	1624724.735	7282.255	FR	
7364	1769302.74	1624725.28	7282.22	FR	
7365	1769302.005	1624725.985	7279.735	FF	
7366	1769302.56	1624725.785	7280.72	FF	
7367	1769302.325	1624726.565	7281.02	FF	
7368	1769302.625	1624725.895	7281.83	FF	
7369	1769302.445	1624726.51	7281.985	FF	
7370	1769302.315	1624726.66	7282.815	FF	
7371	1769302.78	1624725.88	7282.77	FF	
7372	1769301.615	1624740.825	7294.185	FR	
7373	1769301.945	1624723.69	7278.02	CP	
7374	1769302.38	1624722.94	7280.11	CP	
7375	1769302.755	1624722.255	7281.62	CP	
7376	1769302.03	1624721.255	7279.27	CP	
7377	1769301.285	1624721.435	7276.83	CP	
7378	1769300.88	1624718.995	7276.17	CP	
7379	1769302.71	1624739.7	7295.555	CP	
7380	1769302.38	1624738.88	7294.135	FR	
7381	1769301.55	1624719.58	7277.705	FR	
7382	1769301.945	1624719.155	7278.8	FR	
7383	1769302.59	1624719.885	7280.1	FR	
7384	1769302.95	1624720.3	7281.105	FR	
7385	1769302.93	1624740.74	7297.165	FR	
7386	1769302.415	1624740.76	7295.8	FR	
7387	1769302.68	1624718.695	7281.485	CP	
7388	1769302.42	1624717.78	7279.625	CP	
7389	1769301.59	1624717.92	7277.86	FR	
7390	1769301.49	1624717.17	7277.235	FR	
7391	1769301.565	1624716.755	7277.665	FR	
7392	1769301.75	1624716.65	7277.98	FR	
7393	1769301.37	1624716.03	7276.55	FR	
7394	1769302.045	1624715.045	7277.68	FR	
7395	1769301.92	1624715.74	7277.42	FR	
7396	1769302.325	1624715.5	7278.17	FR	
7397	1769302.5	1624716.115	7278.76	FR	
7398	1769302.525	1624714.01	7277.19	FR	
7399	1769302.405	1624713.055	7277.265	FR	
7400	1769303.33	1624713.625	7278.585	FR	
7401	1769302.995	1624712.375	7278.715	FR	
7402	1769302.445	1624712.29	7277.45	FR	
7403	1769302.355	1624711.37	7277.05	FR	
7404	1769302.005	1624712.575	7276.545	FR	

Point #	Northing	Easting	Elevation	Pcode	Notes
7405	1769303.605	1624739.11	7296.86	FTC	
7406	1769303.735	1624738.09	7295.565	FTC	
7407	1769304.85	1624736.525	7296.26	FTC	
7408	1769305.13	1624736.58	7297.64	FTC	
7409	1769303.925	1624716.22	7282.515	FR	
7410	1769304.83	1624713.58	7282.91	FR	
7411	1769303.445	1624716.555	7281.815	FR	
7412	1769303.39	1624715.33	7281.34	FR	
7413	1769302.915	1624715.365	7279.985	FR	
7414	1769302.81	1624716.355	7280.04	FR	
7415	1769304.16	1624714.635	7281.87	FR	
7416	1769303.46	1624736.365	7294.51	FR	
7417	1769303.005	1624736.98	7293.775	FR	
7418	1769302.12	1624737.3	7292.03	FR	
7419	1769301.68	1624737.225	7290.46	CP	
7420	1769304.21	1624714.165	7281.285	FR	
7421	1769304.145	1624713.18	7281.355	FR	
7422	1769303.76	1624713.64	7280.58	FR	
7423	1769303.35	1624714.48	7279.55	FR	
7424	1769303.265	1624735.345	7293.485	CP	
7425	1769302.905	1624735.665	7292.07	FR	
7426	1769302.67	1624734.69	7291.02	FR	
7427	1769301.98	1624735.885	7289.235	FR	
7428	1769301.28	1624737.285	7289.285	FR	
7429	1769303.34	1624713.36	7279.72	FR	
7430	1769303.76	1624712.375	7279.28	FR	
7431	1769303	1624712.38	7278.71	FR	
7432	1769303.325	1624713.58	7278.595	FR	
7433	1769302.315	1624734.595	7289.94	FR	
7434	1769301.38	1624737.34	7288.345	FR	
7435	1769301.525	1624736.755	7288.03	FR	
7436	1769301.43	1624735.9	7287.25	FR	
7437	1769301.035	1624737.45	7287.32	FR	
7438	1769304.225	1624710.815	7282.655	FR	horizontal prism
7439	1769304.08	1624709.57	7282.66	CP	horizontal prism
7440	1769304.375	1624708.18	7282.375	FR	horizontal prism
7441	1769302.085	1624734.31	7288.765	FR	
7442	1769302	1624732.925	7288.17	FR	
7443	1769301.69	1624734.53	7287.81	FR	
7444	1769301.695	1624734.35	7286.285	FR	
7445	1769301.2	1624735.465	7285.115	C34	
7446	1769300.915	1624736.365	7285.44	FR	
7447	1769304.1	1624711.27	7281.64	FR	
7448	1769304	1624709.73	7281.155	FR	
7449	1769303.49	1624710.61	7280.26	FR	
7450	1769303.385	1624709.265	7279.835	FR	
7451	1769300.625	1624737.14	7285.93	FR	
7452	1769300.625	1624737.54	7285.24	C34	
7453	1769300.56	1624738.02	7284.625	FR	
7454	1769300.815	1624738.345	7283.64	FR	
7455	1769303.83	1624707.465	7280.655	CP	
7456	1769302.835	1624708.18	7278.715	CP	
7457	1769302.55	1624708.99	7277.34	FR	
7458	1769302.35	1624709.73	7276.95	FR	
7459	1769303.11	1624710.655	7278.13	FR	
7460	1769303.33	1624710.145	7278.645	FR	
7461	1769303.37	1624710.205	7279.515	FR	
7462	1769302.39	1624729.355	7286.61	FR	
7463	1769302.04	1624730.55	7287.245	FR	
7464	1769301.915	1624731.81	7286.48	FR	
7465	1769301.66	1624732.455	7285.63	FR	
7466	1769302.6	1624706.53	7276.79	FR	
7467	1769303.25	1624706.18	7278.48	FR	
7468	1769301.37	1624733.965	7285.105	C34	
7469	1769301.515	1624732.535	7284.96	C34	
7470	1769301.68	1624732.205	7285.23	C34	
7471	1769301.58	1624731.48	7285.475	FR	

Point #	Northing	Easting	Elevation	Pcode	Notes
7472	1769304.53	1624704.84	7281.505	FR	horizontal prism
7473	1769304.56	1624703.53	7281.36	FR	horizontal prism
7474	1769304.66	1624701.865	7281.35	FR	horizontal prism
7475	1769304.65	1624700.95	7281.285	FR	horizontal prism
7476	1769302.41	1624729.33	7286.655	FR	
7477	1769301.925	1624729.97	7285.17	TOS	
7478	1769301.61	1624731.195	7285.18	TOS	
7479	1769301.67	1624731.31	7284.79	BOS	
7480	1769301.945	1624729.98	7284.715	BOS	
7481	1769304.86	1624705.605	7280.92	FR	
7482	1769304.635	1624705.14	7280.085	FR	
7483	1769304.175	1624705.425	7279.895	FR	
7484	1769304.665	1624703.11	7279.655	FR	
7485	1769304.685	1624703.735	7279.81	FR	
7486	1769304.615	1624703.88	7279.475	FR	
7487	1769302.975	1624728.845	7288.075	FR	
7488	1769303.065	1624728.975	7288.8	FR	
7489	1769303.12	1624729.12	7289.175	FR	
7490	1769303.35	1624728.97	7289.775	FR	
7491	1769303.265	1624729.73	7289.365	FR	
7492	1769302.925	1624729.785	7288.685	FR	
7493	1769302.52	1624730.415	7287.98	FR	
7494	1769304.8	1624701.695	7279.9	FR	
7495	1769304.335	1624701.525	7279.115	FR	
7496	1769303.465	1624701.135	7277.79	FR	
7497	1769303.16	1624701.13	7276.54	FR	
7498	1769302.93	1624701.72	7275.93	FR	
7499	1769302.73	1624731.32	7289.145	FR	
7500	1769302.83	1624731.495	7288.54	FR	
7501	1769302.265	1624732.28	7288.105	FR	
7502	1769302.73	1624731.315	7289.14	FR	
7503	1769302.815	1624731.44	7288.53	FR	
7504	1769302.26	1624732.285	7288.12	FR	
7505	1769301.985	1624732.9	7288.16	FR	
7506	1769303.28	1624702.13	7277.6	FR	
7507	1769303.285	1624703.115	7278.235	FR	
7508	1769302.745	1624704.41	7276.815	CP	
7509	1769305.06	1624699.865	7280.345	CP	
7510	1769303.085	1624731.035	7290.16	CP	
7511	1769303.56	1624729.67	7290.81	FR	
7512	1769302.99	1624732.625	7289.94	FR	
7513	1769302.715	1624733.295	7289.895	FR	
7514	1769303.005	1624700.155	7275.92	FR	
7515	1769303.495	1624699.83	7276.76	FR	
7516	1769303.615	1624698.91	7277.07	FR	
7517	1769304.325	1624698.935	7278.96	FR	
7518	1769303.98	1624699.775	7278.47	FR	
7519	1769303.73	1624700.54	7278.23	FR	
7520	1769305.935	1624733.365	7297.835	FR	
7521	1769305.835	1624734.355	7297.425	FR	
7522	1769305.415	1624734.89	7296.685	FR	
7523	1769304.75	1624734.415	7295.95	FR	
7524	1769304.725	1624698.065	7279.505	FR	
7525	1769305.305	1624698.325	7280.7	FR	
7526	1769305.68	1624697.715	7281.135	FR	
7527	1769305.335	1624696.985	7280.4	FR	
7528	1769305.935	1624696.21	7281.045	FR	
7529	1769305.885	1624695.515	7281.165	FR	
7530	1769306.515	1624732.3	7298.255	FR	
7531	1769305.92	1624733.37	7297.815	FR	
7532	1769305.65	1624732.435	7297.02	FR	
7533	1769305.21	1624731.56	7295.455	CP	
7534	1769305.16	1624732.85	7295.95	FR	
7535	1769304.635	1624696.605	7279.325	CP	
7536	1769303.955	1624697.41	7277.645	CP	
7537	1769304.99	1624694.535	7279.865	CP	
7538	1769303.735	1624695.015	7277.045	CP	

Point #	Northing	Easting	Elevation	Pcode	Notes
7539	1769304.04	1624693.26	7278.585	CP	horizontal prism
7540	1769305.085	1624690.615	7278.85	CP	
7541	1769305.445	1624732.56	7295.295	FR	
7542	1769304.9	1624733.05	7294.75	FR	
7543	1769304.275	1624733.24	7293.74	FR	
7544	1769304.265	1624733.555	7293.875	FR	
7545	1769303.685	1624733.395	7293.29	FR	
7546	1769304.29	1624734.335	7294.54	FR	
7547	1769304.305	1624735.05	7295.105	FR	
7548	1769304.77	1624730.985	7294.675	FR	
7549	1769304.44	1624731.515	7293.945	FR	
7550	1769304.92	1624732.3	7294.11	FR	
7551	1769304.425	1624732.125	7293.265	FR	
7552	1769303.17	1624732.25	7291.185	FR	
7553	1769303.05	1624733.455	7291.84	FR	
7554	1769303.02	1624734.65	7291.8	FR	
7555	1769302.87	1624734.28	7291.58	FR	
7556	1769302.855	1624733.465	7290.965	FR	End survey 23 July 07
7006	1769253.41	1624796.975	7277.605	BS	backshot; start survey 24 July 07
7557	1769306.97	1624729.685	7297.91	FR	
7558	1769305.72	1624728.625	7296.175	FR	
7559	1769305.37	1624729.185	7295.375	FR	
7560	1769305.03	1624730.67	7295.83	FR	
7561	1769305.455	1624730.475	7296.625	CP	
7562	1769304.345	1624692.545	7277.13	FR	
7563	1769304.185	1624690.795	7276.565	CP	
7564	1769305.76	1624691.81	7279.61	FR	
7565	1769305.73	1624693.55	7281.285	FR	horizontal prism
7566	1769305.675	1624691.445	7280.89	FR	horizontal prism
7567	1769306.2	1624689.715	7280.77	FR	horizontal prism
7568	1769305.78	1624691.75	7279.59	FR	
7569	1769306.065	1624688.895	7279.85	CP	
7570	1769305.02	1624688.78	7278.925	CP	
7571	1769304.775	1624729.51	7293.52	FR	
7572	1769304.32	1624730.34	7293.275	FR	
7573	1769304.155	1624730.975	7293.11	FR	
7574	1769303.665	1624731.295	7292.46	FR	
7575	1769303.71	1624730.555	7291.95	FR	
7576	1769306.75	1624686.725	7280.505	CP	
7577	1769305.35	1624686.22	7278.575	CP	
7578	1769304.275	1624688.395	7276.555	CP	
7579	1769304.165	1624686.245	7275.905	CP	
7580	1769306.29	1624684.555	7279.875	CP	
7581	1769305.02	1624683.905	7276.91	CP	
7582	1769306.835	1624727.105	7297.975	FR	
7583	1769307.195	1624725.035	7297.785	FR	
7584	1769307.705	1624723.77	7298.115	FR	
7585	1769306.9	1624724.92	7297.165	FR	
7586	1769306.075	1624725.965	7295.585	FR	
7587	1769306.075	1624726.935	7296.02	FR	
7588	1769306.88	1624682.145	7280.305	FR	
7589	1769306.225	1624681.02	7277.205	FR	
7590	1769305.53	1624680.23	7276.2	FR	
7591	1769305.44	1624682.015	7277.94	FR	horizontal prism
7592	1769308.035	1624682.46	7281.41	FR	
7593	1769305.665	1624725.115	7294.16	CP	
7594	1769306.51	1624724.345	7295.105	FR	
7595	1769305.73	1624726.88	7294.29	FR	
7596	1769305.505	1624726.935	7293.415	FR	
7597	1769305.12	1624728.085	7293.365	FR	
7598	1769305.175	1624726.9	7292.255	FR	
7599	1769305.075	1624725.445	7292.04	FR	
7600	1769306.635	1624678.46	7277.86	CP	
7601	1769307.19	1624679.63	7279.69	FR	
7602	1769307.565	1624679.855	7281.045	FR	horizontal prism
7603	1769307.315	1624678.665	7280.435	FR	horizontal prism
7604	1769308.165	1624677.62	7280.635	FR	horizontal prism

Point #	Northing	Easting	Elevation	Pcode	Notes
7605	1769304.63	1624728.87	7292.32	CP	
7606	1769303.415	1624728.14	7289.315	FR	
7607	1769304.59	1624726.885	7290.92	FR	
7608	1769304.86	1624726.905	7291.625	FR	
7609	1769305.045	1624726.495	7291.495	FR	
7610	1769303.425	1624728.17	7289.34	FR	
7611	1769304.025	1624727.04	7289.105	FR	
7612	1769303.71	1624727.11	7288.32	FR	
7613	1769303.305	1624727.815	7288.09	FR	
7614	1769304.015	1624726.24	7288.65	FR	
7615	1769302.98	1624727.745	7286.47	FR	
7616	1769303.215	1624727	7286.755	FR	
7617	1769303.595	1624726.76	7287.315	FR	
7618	1769303.145	1624726.515	7286.18	FR	
7619	1769303.325	1624725.91	7285.785	FR	
7620	1769309.19	1624676.835	7281.655	FR	0.2' horizontal prism
7621	1769307.835	1624676.825	7279.43	FR	
7622	1769307.41	1624676.3	7278.33	FR	
7623	1769307.17	1624675.13	7277.705	CP	
7624	1769307.965	1624674.96	7279.945	CP	
7625	1769308.665	1624674.7	7281.415	CP	
7626	1769306.25	1624676.675	7276.195	CP	
7627	1769304.395	1624724.655	7289.16	CP	
7628	1769303.975	1624725.295	7288.05	FR	
7629	1769303.705	1624724.86	7286.605	FR	
7630	1769304.11	1624724.22	7287.09	FR	
7631	1769304.005	1624724.665	7287.7	FR	
7632	1769304.34	1624723.635	7287.815	FR	
7633	1769308.58	1624672.59	7280.905	CP	
7634	1769307.745	1624673.305	7279.29	CP	
7635	1769307	1624672.915	7277.205	CP	
7636	1769307.84	1624670.295	7279.48	CP	
7637	1769309.42	1624668.82	7280.77	CP	
7638	1769303.88	1624724.08	7286.335	FR	
7639	1769303.67	1624724.82	7286.1	C34	
7640	1769303.155	1624726.425	7285.9	TOS	
7641	1769303.145	1624726.43	7285.74	BOS	
7642	1769303.1	1624726.505	7285.565	FR	
7643	1769303.03	1624726.685	7285.625	TOS	
7644	1769303.02	1624726.69	7285.48	BOS	
7645	1769303.01	1624726.575	7285.32	FF	
7646	1769302.86	1624726.56	7284.815	FF	
7647	1769302.79	1624726.05	7284.345	FF	
7648	1769302.925	1624726.85	7285.32	TOS	
7649	1769302.975	1624726.79	7285.24	FR	
7650	1769302.935	1624726.9	7285.185	BOS	
7651	1769302.92	1624727.34	7285.355	TOS	
7652	1769302.895	1624727.29	7285.2	BOS	
7653	1769302.885	1624727.23	7285.07	FF	
7654	1769302.55	1624727.455	7284.54	FF	
7655	1769302.445	1624727.51	7283.825	FF	
7656	1769302.37	1624728.62	7285.15	TOS	
7657	1769302.37	1624728.32	7285	BOS	
7658	1769307.345	1624669.71	7276.65	FR	
7659	1769308.22	1624667.655	7278.395	CP	
7660	1769308.485	1624665.52	7277.145	CP	
7661	1769309.09	1624665.965	7278.935	BM	benchmark 7010
7662	1769309.84	1624666.215	7281.085	CP	
7663	1769310.06	1624664.185	7280.42	CP	
7664	1769310.415	1624664.175	7281.78	FR	horizontal prism
7665	1769309.94	1624666.255	7282.25	CP	horizontal prism
7666	1769307.085	1624724.125	7296.87	FR	
7667	1769307.355	1624722.555	7296.54	FR	
7668	1769308.27	1624721.505	7297.815	FR	
7669	1769307.955	1624721.575	7297.22	FR	
7670	1769307.35	1624722.515	7296.595	FR	
7671	1769307.465	1624720.955	7295.88	FR	

Point #	Northing	Easting	Elevation	Pcode	Notes
7672	1769307.095	1624721.045	7296.92	FR	
7673	1769306.79	1624721.825	7295.19	FR	
7674	1769306.675	1624722.77	7295.21	FR	
7675	1769306.185	1624723.34	7293.84	CP	
7676	1769305.4	1624724.095	7292.04	FR	
7677	1769305.55	1624722.935	7292.085	FR	
7678	1769306.335	1624721.655	7293.44	FR	
7679	1769305.99	1624721.655	7292.155	FR	
7680	1769305.47	1624722.32	7290.745	CP	
7681	1769304.905	1624724.09	7290.295	CP	
7682	1769306.93	1624720.655	7294.13	FR	
7683	1769307.24	1624720.11	7294.375	FR	
7684	1769306.72	1624720.485	7293.345	FR	
7685	1769306.24	1624721.105	7292.14	FR	
7686	1769307.3	1624718.92	7293.795	FR	
7687	1769307.25	1624718.44	7293.55	FR	
7688	1769307.6	1624718.155	7294.205	FR	
7689	1769304.865	1624722.82	7288.485	FR	
7690	1769304.68	1624722.515	7287.695	FR	
7691	1769305.22	1624721.745	7289.26	FR	
7692	1769305.025	1624721.31	7288.07	CP	
7693	1769305.565	1624721.11	7289.43	FR	
7694	1769305.59	1624721.045	7290.245	FR	
7695	1769306	1624720.55	7291.285	FR	
7696	1769305.81	1624720.375	7290.605	FR	
7697	1769305.6	1624720.29	7290.045	FR	
7698	1769304.09	1624723.535	7286.18	C34	
7699	1769304.24	1624722.6	7286.15	TOS	
7700	1769304.275	1624722.46	7286.045	BOS	
7701	1769304.36	1624722.05	7286.135	TOS	
7702	1769304.585	1624721.34	7286.32	TOS	
7703	1769304.56	1624721.325	7286.045	BOS	
7704	1769304.7	1624721.03	7286.21	FR	
7705	1769304.745	1624720.785	7286.725	FR	
7706	1769305.325	1624720.14	7288.14	FR	
7707	1769303.21	1624724.615	7283.89	CP	
7708	1769304.105	1624722.26	7284.26	CP	
7709	1769303.4	1624721.6	7283.045	CP	
7710	1769304.73	1624720.285	7284.54	CP	
7711	1769304.85	1624720.11	7286.22	FR	
7712	1769304.87	1624720.325	7286.345	FR	
7713	1769305.05	1624719.86	7286.795	FR	
7714	1769305.06	1624719.42	7286.49	TOS	
7715	1769304.93	1624719.13	7285.915	BOS	
7716	1769304.975	1624718.61	7286.465	TOS	
7717	1769305.33	1624718.675	7287.91	CP	
7718	1769303.61	1624719.315	7282.97	CP	
7719	1769304.745	1624718.58	7284.07	CP	
7720	1769304.875	1624717.145	7284.74	CP	
7721	1769304.355	1624715.275	7283.905	FR	horizontal prism
7722	1769304.57	1624714.655	7283.26	FR	horizontal prism
7723	1769304.36	1624717.725	7286	BOS	horizontal prism
7724	1769304.575	1624716.4	7286.215	BOS	horizontal prism
7725	1769304.675	1624716.18	7285.855	C34	horizontal prism
7726	1769305.065	1624715.13	7285.64	C34	horizontal prism
7727	1769304.925	1624715.43	7285.64	C34	horizontal prism
7728	1769304.58	1624716.28	7286.375	TOS	horizontal prism
7729	1769304.4	1624717.48	7286.38	TOS	horizontal prism
7730	1769305.155	1624715.83	7286.78	FR	horizontal prism
7731	1769304.715	1624717.2	7287.68	CP	horizontal prism
7732	1769306.06	1624715	7287.43	FR	horizontal prism
7733	1769306.585	1624714.14	7287.815	FR	horizontal prism
7734	1769306.735	1624713.455	7287.63	FR	horizontal prism
7735	1769305.635	1624718.01	7289.55	CP	
7736	1769306.145	1624716.26	7289.415	CP	
7737	1769307.07	1624714.89	7290.325	FR	
7738	1769306.02	1624718.56	7291.19	CP	

Point #	Northing	Easting	Elevation	Pcode	Notes
7739	1769306.6	1624716.85	7291.22	CP	
7740	1769307.075	1624715.66	7291.485	FR	
7741	1769306.8	1624714.075	7291.9	FR	horizontal prism
7742	1769306.975	1624717.74	7292.67	CP	
7743	1769307.165	1624716.3	7292.795	CP	
7744	1769306.97	1624714.17	7293.51	FR	horizontal prism
7745	1769307.965	1624715.825	7294.285	CP	
7746	1769307.48	1624714.275	7295.305	FR	horizontal prism
7747	1769307.23	1624716.79	7295.06	FR	horizontal prism
7748	1769307.4	1624717.51	7295.565	FR	horizontal prism
7749	1769307.23	1624718.625	7295.61	FR	horizontal prism
7750	1769308.885	1624716.22	7295.62	FR	
7751	1769308.645	1624716.875	7296.35	FR	
7752	1769308.845	1624716.315	7296.985	FR	
7753	1769309.08	1624714.875	7296.565	FR	
7754	1769309.105	1624717.185	7298.095	CP	
7755	1769309.78	1624714.84	7298.235	FR	
7756	1769310.215	1624711.36	7297.815	FR	
7757	1769309.35	1624712.425	7296.63	FR	
7758	1769309.315	1624713.245	7296.25	FR	
7759	1769309.235	1624712.9	7295.3	FR	
7760	1769309.96	1624710.165	7297.27	FR	
7761	1769309.585	1624710.945	7296.705	FR	
7762	1769309.03	1624711.495	7295.27	FR	
7763	1769309.16	1624713.22	7294.72	FR	
7764	1769308.66	1624710.84	7294.435	FR	
7765	1769308.755	1624712.225	7293.525	CP	
7766	1769307.995	1624713.305	7293.545	FR	horizontal prism
7767	1769307.75	1624714.105	7291.175	FR	
7768	1769307.6	1624713.445	7291.85	FR	horizontal prism
7769	1769308.2	1624712.025	7291.69	CP	
7770	1769308.425	1624710.895	7293.38	FR	
7771	1769308.21	1624710.895	7291.975	FR	
7772	1769307.97	1624712.27	7290.16	CP	
7773	1769308.06	1624713.63	7290.47	FR	
7774	1769307.745	1624714.09	7291.16	FR	
7775	1769307.77	1624712.21	7288.705	FR	
7776	1769307.9	1624713.535	7289.545	FR	
7777	1769307.76	1624713.175	7288.935	FR	
7778	1769307.47	1624714.115	7288.99	FR	
7779	1769308.245	1624711.545	7288.315	FR	
7780	1769308.33	1624710.67	7288.875	FR	
7781	1769308.03	1624710.9	7289.75	FR	
7782	1769307.565	1624712.69	7287.69	FR	
7783	1769307.825	1624712.05	7287.345	FR	
7784	1769307.48	1624712.425	7287.11	FR	
7785	1769307.26	1624712.235	7286.59	FR	
7786	1769307.18	1624711.79	7286.01	FR	
7787	1769306.78	1624713.905	7286.835	FR	
7788	1769306.815	1624713.485	7286.295	FR	
7789	1769306.62	1624712.905	7285.7	FR	
7790	1769307.01	1624711.565	7285.365	C34	
7791	1769307.025	1624711.805	7285.585	C34	
7792	1769306.81	1624712.55	7285.655	C34	
7793	1769306.24	1624713.6	7285.575	C34	
7794	1769305.865	1624713.41	7284.82	FR	
7795	1769305.37	1624712.57	7283.13	FR	
7796	1769305.435	1624713.765	7283.79	FR	
7797	1769305.36	1624712.555	7283.125	FR	
7798	1769305.7	1624711.79	7283.195	FR	
7799	1769306.115	1624710.295	7283.75	CP	End survey 24 July 07
7006	1769253.395	1624796.99	7277.615	BS	Backshot; start survey 25 July 07
7800	1769309.965	1624708.82	7297.115	CP	
7801	1769309.48	1624707.495	7296.06	CP	
7802	1769310.38	1624706.95	7297.515	FR	
7803	1769309.255	1624707.555	7294.49	FR	
7804	1769309.155	1624708.505	7294.175	FR	

Point #	Northing	Easting	Elevation	Pcode	Notes
7805	1769308.84	1624707.78	7293.455	FR	
7806	1769309.075	1624709.195	7294.925	FR	
7807	1769309.125	1624709.62	7294.475	FR	
7808	1769309.38	1624709.975	7295.445	FR	
7809	1769309.93	1624705.18	7294.53	FR	
7810	1769309.14	1624706.9	7294.065	FR	
7811	1769308.595	1624709.065	7292.885	FR	
7812	1769308.58	1624709.66	7291.93	FR	
7813	1769308.69	1624710.14	7291.05	FR	
7814	1769308.52	1624709.895	7290.685	FR	
7815	1769309.65	1624705.345	7293.61	FR	
7816	1769309.7	1624704.965	7292.785	FR	
7817	1769309.26	1624706.095	7292.45	FR	
7818	1769309.4	1624705.66	7291.775	FR	
7819	1769309.15	1624706.485	7291.5	FR	
7820	1769308.795	1624707.415	7291.06	FR	
7821	1769309.335	1624704.64	7291.01	FR	
7822	1769309.675	1624704.645	7289.445	FR	
7823	1769309.475	1624705.5	7290.185	FR	
7824	1769309.325	1624705.975	7290.36	FR	
7825	1769309.04	1624707.545	7290.225	FR	
7826	1769309.13	1624706.97	7289.19	FR	
7827	1769308.74	1624707.165	7288.395	FR	
7828	1769309.315	1624705.865	7288.955	FR	
7829	1769308.515	1624705.49	7289.035	FR	
7830	1769308.1	1624710.105	7287.94	FR	
7831	1769308.195	1624710.2	7286.99	FR	
7832	1769308.55	1624708.595	7288.335	FR	
7833	1769307.325	1624710.61	7285.26	C34	
7834	1769307.615	1624709.97	7285.42	TOS	
7835	1769307.47	1624710	7285.175	BOS	
7836	1769307.865	1624709.415	7285.4	TOS	
7837	1769307.415	1624708.835	7284.855	BOS	
7838	1769307.895	1624708.455	7285.865	TOS	
7839	1769307.56	1624707.105	7286.005	TOS	
7840	1769306.31	1624708.325	7283.1	FR	
7841	1769307.53	1624707.075	7285.985	TOS	
7842	1769307.085	1624706.555	7284.715	BOS	
7843	1769307.82	1624705.94	7285.95	TOS	
7844	1769308.27	1624705.525	7286.555	FR	
7845	1769308.31	1624704.525	7286.47	FR	
7846	1769308.01	1624705.4	7285.905	FR	
7847	1769308	1624704.65	7285.43	TOS	
7848	1769307.81	1624705.005	7284.795	BOS	
7849	1769305.52	1624706.615	7282.32	FR	
7850	1769306.16	1624706	7282.26	FR	
7851	1769307.04	1624704.12	7283.37	CP	
7852	1769306.885	1624703.295	7283.145	FR	
7853	1769306.7	1624702.315	7282.43	FR	
7854	1769307.245	1624702.3	7283.375	FR	
7855	1769307.755	1624701.485	7284.25	FR	
7856	1769307.8	1624703.99	7285.245	TOS	
7857	1769307.835	1624703.84	7285.04	BOS	
7858	1769308.03	1624703.145	7285.16	TOS	
7859	1769308.34	1624702.395	7285.165	TOS	
7860	1769308.265	1624702.3	7284.94	BOS	
7861	1769308.325	1624703.43	7287.2	FR	
7862	1769308.71	1624702.36	7287.235	FR	
7863	1769308.57	1624701.46	7286.875	FR	
7864	1769308.385	1624701.385	7286.045	FR	
7865	1769308.265	1624701.33	7285.445	FR	
7866	1769308.2	1624701.12	7285.23	TOS	
7867	1769308	1624700.88	7284.93	BOS	
7868	1769308.89	1624706.325	7287.015	FR	
7869	1769308.995	1624706.39	7288.125	FR	
7870	1769308.56	1624705.885	7287.715	FR	
7871	1769308.825	1624704.485	7289.23	FR	

Point #	Northing	Easting	Elevation	Pcode	Notes
7872	1769308.475	1624705.035	7288.12	FR	
7873	1769308.515	1624704.03	7288.375	FR	
7874	1769308.875	1624703.74	7289.81	FR	
7875	1769308.815	1624703.04	7289.05	FR	
7876	1769309.14	1624702.825	7290.265	FR	
7877	1769308.87	1624703.73	7289.8	FR	
7878	1769310.245	1624705.44	7297.22	FR	
7879	1769310.115	1624705.56	7296.71	FR	
7880	1769310.415	1624704.155	7296.875	FR	
7881	1769311	1624702.205	7297.08	FR	
7882	1769310.87	1624702.605	7296.71	FR	
7883	1769310.975	1624701.31	7296.685	FR	
7884	1769310.985	1624702.23	7295.935	FR	
7885	1769311.02	1624700.985	7295.37	FR	
7886	1769310.37	1624703.975	7295.225	FR	
7887	1769310.965	1624702.325	7294.79	FR	
7888	1769310.765	1624702.885	7294.63	FR	
7889	1769310.44	1624703.61	7294.35	FR	
7890	1769310.375	1624703.6	7292.92	FR	
7891	1769309.675	1624702.805	7292.4	FR	
7892	1769310.825	1624702.515	7293.32	FR	
7893	1769311.49	1624699.02	7297.35	FR	
7894	1769311.49	1624698.355	7296.935	FR	
7895	1769311.115	1624699.43	7294.9	FR	
7896	1769311.585	1624699.485	7295.64	FR	
7897	1769310.51	1624699.395	7293.795	FR	
7898	1769310.19	1624701.04	7293.99	FR	
7899	1769310.335	1624700.26	7293.55	FR	
7900	1769310.37	1624701.77	7293.215	FR	
7901	1769310	1624701.655	7292.53	FR	
7902	1769309.655	1624700.955	7292.01	FR	
7903	1769309.7	1624701.85	7291.665	FR	
7904	1769309.45	1624701.925	7291.02	FR	
7905	1769309.7	1624700.23	7291.255	FR	
7906	1769310.175	1624699.605	7292.085	FR	
7907	1769310.24	1624699.275	7292.02	FR	
7908	1769309.695	1624700.2	7291.255	FR	
7909	1769309.895	1624699.665	7292.945	FR	horizontal prism
7910	1769310.91	1624698.02	7295.655	FR	
7911	1769310.77	1624697.53	7294.805	FR	
7912	1769310.71	1624698.35	7294.665	FR	
7913	1769310.56	1624698.015	7293.905	FR	
7914	1769310.345	1624696.665	7293.37	FR	
7915	1769310.825	1624695.955	7294.11	FR	
7916	1769310.23	1624698.37	7293	FR	
7917	1769309.84	1624697.72	7291.87	FR	
7918	1769308.965	1624703.85	7290.73	FR	
7919	1769309.63	1624699.515	7291.02	FR	
7920	1769309.53	1624699.79	7290.87	FR	
7921	1769309.4	1624699.93	7290.095	FR	
7922	1769309.4	1624699.585	7289.67	FR	
7923	1769309.45	1624697.795	7289.575	FR	
7924	1769309.1	1624698.405	7287.585	FR	
7925	1769309.175	1624698.845	7287.98	FR	
7926	1769308.965	1624699.52	7288.305	FR	
7927	1769308.905	1624699.465	7287.475	FR	
7928	1769309.3	1624701.77	7290.155	FR	
7929	1769308.81	1624701.43	7288.265	FR	
7930	1769308.825	1624699.715	7286.475	FR	
7931	1769308.87	1624697.17	7286.485	FR	
7932	1769308.83	1624696.275	7288.025	FR	
7933	1769307.27	1624699.905	7283.41	CP	
7934	1769308.31	1624700.255	7285.54	TOS	
7935	1769308.295	1624699.785	7285.355	BOS	
7936	1769308.57	1624698.51	7285.655	BOS	
7937	1769308.185	1624698.455	7284.525	CP	
7938	1769308.745	1624699.19	7286.01	TOS	

Point #	Northing	Easting	Elevation	Pcode	Notes
7939	1769308.66	1624697.07	7286.005	C34	
7940	1769308.565	1624696.205	7286.09	C34	
7941	1769308.625	1624695.835	7286.825	FR	
7942	1769308.89	1624694.89	7287.31	FR	
7943	1769308.77	1624694.57	7286.575	FR	
7944	1769308.64	1624694.79	7286.19	TOS	
7945	1769308.655	1624694.93	7286.11	BOS	
7946	1769308.89	1624693.68	7286.135	BOS	
7947	1769308.92	1624693.45	7286.34	TOS	
7948	1769308.14	1624696.025	7285.075	CP	
7949	1769309.34	1624692.27	7288.11	FR	
7950	1769309.17	1624691.43	7287.105	FR	
7951	1769309.045	1624692.695	7287.195	FR	
7952	1769309.005	1624693.145	7286.91	FR	
7953	1769308.74	1624692.535	7286.5	TOS	
7954	1769309.075	1624691.85	7286.33	BOS	
7955	1769309.255	1624691.27	7286.595	TOS	
7956	1769309.49	1624690.475	7286.84	TOS	
7957	1769309.345	1624690.685	7286.455	BOS	
7958	1769309.3	1624690.91	7286.275	BOS	
7959	1769309.49	1624690.51	7287.105	FR	
7960	1769309.66	1624689.325	7287.725	FR	
7961	1769309.815	1624689.655	7287.24	FR	
7962	1769309.665	1624689.435	7286.77	TOS	
7963	1769309.48	1624688.325	7287.135	TOS	
7964	1769310.01	1624688.02	7287.94	FR	
7965	1769309.695	1624687.785	7287.245	FR	
7966	1769308.735	1624691.27	7284.95	CP	
7967	1769308.555	1624691.97	7284.825	FR	
7968	1769308.19	1624692.8	7284.245	FR	
7969	1769307.715	1624696.645	7283.13	CP	
7970	1769307.08	1624698.13	7282.655	CP	
7971	1769307.9	1624694.205	7283.64	FR	
7972	1769307.43	1624695.345	7282.75	FR	
7973	1769306.61	1624695.805	7281.605	FR	
7974	1769311.58	1624695.665	7297.065	FR	horizontal prism
7975	1769311.595	1624694.835	7296.06	FR	
7976	1769311.19	1624695.5	7295.525	FR	
7977	1769311.915	1624692.835	7297.505	FR	horizontal prism
7978	1769311.535	1624692.975	7296.665	FR	horizontal prism
7979	1769311.68	1624691.45	7297.48	FR	horizontal prism
7980	1769310.87	1624691.915	7295.405	FR	horizontal prism
7981	1769311.545	1624691.845	7294.85	FR	
7982	1769311.985	1624692.55	7296.025	FR	
7983	1769311.61	1624693.25	7295.825	FR	
7984	1769310.665	1624692.48	7293.415	FR	
7985	1769310.89	1624693.675	7294.56	FR	
7986	1769310.765	1624693.935	7293.545	FR	
7987	1769310.39	1624694.02	7292.19	FR	
7988	1769309.735	1624694.395	7289.565	FR	
7989	1769309.55	1624694.73	7288.225	FR	
7990	1769310.325	1624695.3	7289.545	FR	
7991	1769309.385	1624696.62	7289.22	FR	
7992	1769310.005	1624692.315	7291.535	CP	
7993	1769309.66	1624692.88	7289.54	FR	
7994	1769309.715	1624691.875	7289.085	FR	
7995	1769309.96	1624691.03	7290.04	FR	
7996	1769308.165	1624691.365	7283.135	CP	
7997	1769308.17	1624690.12	7283.215	CP	
7998	1769308.04	1624687.54	7282.98	CP	
7999	1769307.73	1624687.025	7281.97	FR	
8000	1769307.56	1624688.025	7281.75	FR	
8001	1769309.11	1624688.57	7284.995	CP	
8002	1769308.96	1624686.575	7283.765	CP	
8003	1769309.335	1624685.395	7285.2	CP	
8004	1769309.365	1624688.67	7286.58	BOS	
8005	1769309.665	1624687.365	7286.665	BOS	

Point #	Northing	Easting	Elevation	Pcode	Notes
8006	1769309.645	1624687.44	7287.15	TOS	
8007	1769310.03	1624686.015	7286.665	BOS	
8008	1769309.96	1624686.445	7287.06	FR	
8009	1769309.98	1624686.55	7287.32	TOS	
8010	1769310.16	1624686.45	7287.685	FR	
8011	1769310.305	1624686.935	7288.34	FR	
8012	1769310.35	1624686.66	7288.98	FR	
8013	1769309.67	1624688.375	7288.92	FR	
8014	1769310.35	1624687.035	7290.505	FR	
8015	1769309.19	1624689.51	7288.97	FR	horizontal prism
8016	1769310.07	1624689.725	7290.9	FR	
8017	1769309.54	1624695.195	7289.505	FR	horizontal prism
8018	1769308.975	1624696.525	7289.94	FR	horizontal prism
8019	1769308.85	1624695.54	7289.79	FR	1.97' horizontal prism
8020	1769309.145	1624696.26	7291.04	FR	1.97' horizontal prism
8021	1769309.14	1624695.445	7290.735	FR	1.97' horizontal prism
8022	1769309.67	1624695.6	7291.9	FR	1.97' horizontal prism
8023	1769310.03	1624694.995	7293.35	FR	1.97' horizontal prism
8024	1769312.72	1624687.93	7297.875	FR	
8025	1769311.685	1624689.24	7296.26	CP	
8026	1769311.025	1624690.595	7295.14	FR	
8027	1769310.805	1624689.815	7293.68	FR	
8028	1769310.775	1624690.88	7293.405	FR	
8029	1769310.525	1624690.335	7292.3	FR	
8030	1769310.22	1624690.22	7291.3	FR	
8031	1769310.355	1624689.055	7291.935	CP	
8032	1769312.015	1624686.71	7295.95	CP	
8033	1769311.245	1624688.265	7294.845	CP	
8034	1769311.54	1624686.205	7294.445	CP	
8035	1769311.155	1624687.615	7293.125	FR	
8036	1769310.56	1624687	7291.925	CP	
8037	1769310.8	1624685.35	7290.16	FR	
8038	1769311.025	1624684.81	7291.545	FR	
8039	1769310.965	1624684.24	7291.295	FR	
8040	1769310.905	1624684.125	7290.475	FR	
8041	1769310.805	1624684.2	7289.13	FR	
8042	1769310.78	1624685.625	7288.69	FR	
8043	1769310.26	1624684.63	7290.21	FR	horizontal prism
8044	1769309.93	1624685.405	7287.045	FR	
8045	1769309.96	1624684.29	7286.35	BOS	
8046	1769310.125	1624684.915	7287.43	TOS	
8047	1769310.275	1624685.05	7287.825	FR	
8048	1769309.6	1624683.73	7288.23	FR	horizontal prism
8049	1769310	1624683.245	7289.86	FR	horizontal prism
8050	1769310.225	1624683.62	7287.565	TOS	
8051	1769310.295	1624683.37	7287.785	FR	
8052	1769310.68	1624682.52	7287.855	TOS	
8053	1769310.415	1624681.82	7287.855	TOS	
8054	1769310.195	1624681.295	7287.935	FR	
8055	1769310.835	1624682.38	7289.045	FR	
8056	1769311.045	1624682.075	7290.185	CP	
8057	1769309.96	1624683.195	7286.01	BOS	
8058	1769309.98	1624683.175	7285.78	BOS	
8059	1769309.975	1624682.915	7285.985	BOS	
8060	1769310.22	1624682.385	7286.15	BOS	
8061	1769310.06	1624681.365	7286.56	BOS	
8062	1769308.015	1624684.925	7283.395	CP	
8063	1769309.055	1624683.715	7284.005	CP	
8064	1769308.215	1624683.235	7282.175	FR	
8065	1769308.675	1624682.44	7282.805	FR	
8066	1769309.11	1624681.24	7283.005	CP	
8067	1769309.77	1624681.67	7285.12	CP	
8068	1769310.64	1624679.655	7286.715	BOS	
8069	1769310.245	1624681.09	7287.085	FR	
8070	1769309.835	1624680.53	7288.245	TOS	horizontal prism
8071	1769309.875	1624680.415	7288.335	TOS	horizontal prism
8072	1769309.715	1624680.86	7288.615	FR	horizontal prism

Point #	Northing	Easting	Elevation	Pcode	Notes
8073	1769309.915	1624680.645	7288.905	FR	horizontal prism
8074	1769309.275	1624679.325	7283.42	CP	
8075	1769310.09	1624679.665	7284.915	CP	
8076	1769309.845	1624678.07	7283.82	CP	
8077	1769310.72	1624677.945	7284.905	CP	
8078	1769310.88	1624677.925	7286.49	BOS	
8079	1769309.33	1624677.905	7282.32	FR	
8080	1769312.68	1624685.31	7297.93	FR	
8081	1769312.555	1624684.52	7297.415	FR	
8082	1769312.71	1624684.025	7297.615	FR	
8083	1769312.47	1624683.25	7297.36	FR	horizontal prism
8084	1769312.735	1624681.955	7297.855	CP	horizontal prism
8085	1769312.03	1624685.03	7295.655	FR	
8086	1769311.65	1624685.005	7294.885	FR	
8087	1769311.855	1624684.39	7294.62	FR	
8088	1769311.3	1624685.68	7292.805	FR	
8089	1769312.605	1624682.335	7295.905	FR	
8090	1769312.39	1624681.57	7295.18	FR	
8091	1769313.865	1624680.22	7297.775	FR	
8092	1769311.96	1624683.42	7295.135	FR	
8093	1769311.135	1624682.14	7293.945	CP	horizontal prism
8094	1769313.435	1624677.435	7297.225	FR	
8095	1769313.33	1624678.85	7296.55	FR	
8096	1769312.81	1624679.42	7295.3	FR	
8097	1769312.515	1624679.945	7294.515	FR	
8098	1769312.1	1624680.025	7293.79	FR	
8099	1769311.975	1624679.2	7294.08	FR	horizontal prism
8100	1769313.295	1624676.61	7295.61	FR	
8101	1769313.07	1624676.225	7294.59	FR	
8102	1769312.715	1624677.27	7294.455	FR	
8103	1769311.725	1624678.275	7293.72	FR	horizontal prism
8104	1769312.54	1624676.01	7294.105	FR	
8105	1769311.8	1624676.975	7292.06	FR	
8106	1769311.485	1624677.41	7290.785	FR	
8107	1769311.74	1624678.545	7291.545	FR	
8108	1769312.12	1624679.11	7292.485	FR	
8109	1769311.38	1624678.255	7289.87	FR	
8110	1769311.865	1624678.63	7290.545	FR	
8111	1769311.815	1624676.93	7292.04	FR	
8112	1769311.74	1624680.3	7292.48	FR	
8113	1769311.475	1624680.49	7291.28	FR	
8114	1769311.085	1624680.73	7290.235	FR	End survey 25 July 07
7006	1769253.4	1624797	7277.635	BS	Backshot; start survey 26 July 07
8115	1769311.07	1624682.91	7291.515	FR	
8116	1769311.395	1624681.665	7291.8	FR	
8117	1769311.28	1624679.665	7289.86	FR	
8118	1769311.035	1624678.435	7288.525	TOS	
8119	1769311.025	1624678.465	7288.68	FR	
8120	1769310.94	1624677.415	7288.935	FR	
8121	1769310.97	1624676.605	7288.69	TOS	
8122	1769311.005	1624676.01	7286.81	BOS	
8123	1769311.3	1624684.135	7292.955	FR	
8124	1769314.18	1624674.83	7298.1	FR	
8125	1769313.685	1624674.74	7297.19	FR	
8126	1769313.195	1624674.235	7295.81	FR	
8127	1769313.075	1624673.945	7295.21	FR	
8128	1769314.21	1624673.08	7298.29	FR	
8129	1769313.58	1624673.19	7297.05	FR	
8130	1769313.25	1624673.16	7296.135	FR	
8131	1769312.935	1624674.745	7294.655	FR	
8132	1769312.855	1624673.245	7294.47	FR	
8133	1769312.685	1624673.405	7293.615	FR	
8134	1769312.935	1624674.775	7294.66	FR	
8135	1769312.58	1624674.03	7293.59	FR	
8136	1769312.39	1624673.785	7292.52	FR	
8137	1769312.33	1624675.26	7292.675	FR	
8138	1769311.875	1624675.175	7290.87	FR	

Point #	Northing	Easting	Elevation	Pcode	Notes
8139	1769311.625	1624676.205	7291.265	FR	
8140	1769312.325	1624673.875	7291.62	FR	
8141	1769311.355	1624676.29	7289.79	FR	
8142	1769311.74	1624674.595	7289.9	FR	
8143	1769311.475	1624674.19	7289.05	FR	
8144	1769311.315	1624675.32	7288.495	TOS	
8145	1769311.48	1624673.385	7288.725	TOS	
8146	1769311.865	1624672.585	7289.385	FR	
8147	1769311.94	1624673.27	7290.15	FR	
8148	1769311.075	1624673.875	7287.65	FR	
8149	1769312.575	1624672.35	7291.87	FR	
8150	1769312.45	1624672.005	7291.31	FR	
8151	1769311.99	1624671.995	7290.295	FR	
8152	1769312.025	1624671.775	7289.065	FR	
8153	1769311.735	1624671.135	7288.685	TOS	
8154	1769310.84	1624675.16	7287.1	FR	
8155	1769310.845	1624674.39	7286.865	BOS	
8156	1769311.17	1624672.235	7286.745	BOS	
8157	1769310.635	1624672.7	7285.31	CP	
8158	1769310.765	1624675.225	7285.055	CP	
8159	1769310.16	1624674.9	7283.905	FR	
8160	1769309.91	1624675.53	7283.155	FR	
8161	1769309.08	1624673.435	7282.535	CP	horizontal prism
8162	1769309.605	1624671.135	7282.01	CP	
8163	1769310.25	1624671.79	7283.615	CP	
8164	1769310.13	1624669.16	7282.51	CP	
8165	1769310.805	1624666.02	7283.76	CP	horizontal prism
8166	1769311.59	1624663.72	7283.08	FR	horizontal prism
8167	1769311.14	1624670.47	7286.89	BOS	
8168	1769311.72	1624668.495	7286.99	BOS	
8169	1769312.21	1624666.3	7287.155	BOS	
8170	1769311.265	1624668.15	7285.15	CP	
8171	1769312.745	1624664.995	7286.91	BOS	
8172	1769312.97	1624664.265	7286.695	FR	
8173	1769311.23	1624665.955	7285.535	CP	horizontal prism
8174	1769311.96	1624664.52	7284.585	FR	horizontal prism
8175	1769312.52	1624663.645	7287.39	BOS	horizontal prism
8176	1769313.295	1624662.58	7287.365	BOS	horizontal prism
8177	1769311.725	1624670.615	7289.265	FR	
8178	1769311.905	1624669.73	7288.625	TOS	
8179	1769312.485	1624667.72	7289.19	FR	
8180	1769311.785	1624668.075	7288.6	TOS	horizontal prism
8181	1769312.58	1624665.385	7289.28	FR	
8182	1769312.545	1624666.015	7290.465	FR	
8183	1769312.48	1624665.45	7288.54	TOS	
8184	1769312.135	1624665.375	7290.035	FR	horizontal prism
8185	1769312.605	1624664.065	7288.99	FR	horizontal prism
8186	1769312.73	1624663.97	7288.47	TOS	horizontal prism
8187	1769312.525	1624663.55	7289.39	FR	horizontal prism
8188	1769312.485	1624663.895	7290.39	FR	horizontal prism
8189	1769312.805	1624665.59	7291.65	FR	
8190	1769313.035	1624666.645	7291.375	FR	
8191	1769312.71	1624667.935	7292.16	FR	
8192	1769312.715	1624669.11	7291.675	FR	
8193	1769312.36	1624669.6	7290.31	FR	
8194	1769312.41	1624670.785	7291.225	FR	
8195	1769312.7	1624667.915	7292.15	FR	
8196	1769312.715	1624669.295	7292.345	FR	
8197	1769312.54	1624670.13	7292.38	FR	
8198	1769312.225	1624667.525	7290.355	FR	horizontal prism
8199	1769313.925	1624663.365	7291.65	FR	horizontal prism
8200	1769313.42	1624662.57	7291.24	FR	horizontal prism
8201	1769314.235	1624663.85	7292.745	FR	horizontal prism
8202	1769314.05	1624665.185	7293.85	FR	
8203	1769313.405	1624664.585	7292.64	FR	horizontal prism
8204	1769314.705	1624662.08	7293.36	FR	horizontal prism
8205	1769313.28	1624666.98	7292.92	FR	

Point #	Northing	Easting	Elevation	Pcode	Notes
8206	1769313.245	1624668.495	7293.11	FR	
8207	1769313.56	1624668.855	7294.155	FR	
8208	1769313.795	1624667.465	7294.285	FR	
8209	1769314.29	1624666.055	7295.335	FR	
8210	1769313.57	1624666.875	7294.945	FR	horizontal prism
8211	1769312.69	1624670.92	7292.425	FR	
8212	1769312.53	1624671.725	7293.7	FR	
8213	1769313.03	1624671.445	7294.685	FR	
8214	1769313.345	1624670.06	7294.635	FR	
8215	1769313.225	1624670.91	7297.4	FR	horizontal prism
8216	1769313.55	1624667.895	7296.25	FR	horizontal prism
8217	1769314.14	1624669.595	7296.51	FR	
8218	1769314.505	1624666.395	7296.43	FR	
8219	1769314.91	1624665.33	7297.215	FR	
8220	1769315.03	1624667.18	7298.17	FR	
8221	1769313.61	1624671.15	7296.22	FR	
8222	1769314.79	1624670.03	7298.12	FR	
8223	1769314.565	1624664.175	7296.33	FR	
8224	1769314.96	1624662.885	7296.375	FR	
8225	1769314.85	1624662.045	7298.525	FR	
8226	1769314.825	1624661.805	7297.44	FR	
8227	1769313.205	1624663.83	7294.65	FR	horizontal prism
8228	1769313.285	1624662.67	7294.87	FR	horizontal prism
8229	1769313.045	1624663.675	7295.615	FR	horizontal prism
8230	1769314.575	1624664.18	7296.335	FR	End survey 26 July 07; conclude survey on north wall

Total North Wall survey points = 940

CMRR Geologic Investigations
Northeast Wall Surveying August and September 2007

Point Codes (Pcode):

BS	backshot (to benchmark)
FR	fracture
TOS	top of surge (Qbt_4-Qbt_s contact)
BOS	bottom of surge (Qbt_s-Qbt_3 contact)
C34	Qbt_3-Qbt_4 contact
STC	soil-tuff contact
CP	control point
FF	fossil fumarole
FTC	fill-tuff contact
OOP	out-of-place block

***Note: where prism is listed as horizontal, rod length (horiz. distance from wall) is 0.9 ft unless otherwise noted.

Point#	Northing	Easting	Elevation	Pcode	Notes
7011	1769297.355	1624742.4	7278.78	BS	Backshot; start survey 8 August 2007
8231	1769299.065	1624739.8	7280.13	CPN	North Wall control point
8232	1769299.29	1624739.935	7281.73	CPN	North Wall control point
8233	1769299.555	1624740.425	7283.85	CPN	North Wall control point
8234	1769298.615	1624741.73	7281.995	CPN	North Wall control point
8235	1769298.16	1624741.945	7280.47	CPN	North Wall control point
8236	1769298.295	1624740.4	7278.055	FRN	North Wall fracture
8237	1769297.38	1624741.6	7278.095	FRN	North Wall fracture
8238	1769297.7	1624742.09	7278.75	FRN	North Wall fracture
8239	1769296.48	1624743.24	7277.19	FRN	North Wall fracture
8240	1769298.92	1624742.025	7283.585	CP	
8241	1769297.935	1624743.285	7281.74	CP	
8242	1769297.215	1624744.17	7279.94	CP	
8243	1769296.33	1624744.125	7277.655	CP	
8244	1769297.455	1624744.905	7282.885	CP	
8245	1769297.35	1624745.805	7283.32	FR	
8246	1769297.09	1624746.39	7282.89	FR	
8247	1769296.905	1624746.735	7282.75	FR	
8248	1769297.155	1624745.965	7282.61	FR	
8249	1769296.565	1624745.85	7280.775	FR	
8250	1769296.03	1624745.81	7279.295	FR	
8251	1769295.42	1624745.945	7277.43	FR	horizontal prism
8252	1769295.37	1624746.895	7281.82	FR	horizontal prism
8253	1769294.34	1624747.355	7281.11	FR	horizontal prism
8254	1769293.88	1624748.02	7280.55	FR	horizontal prism
8255	1769293.285	1624748.77	7279.82	FR	
8256	1769293.84	1624748.525	7278.615	FR	
8257	1769293.855	1624748.1	7277.45	FR	
8258	1769295.575	1624747.04	7279.87	FR	
8259	1769294.86	1624747.195	7278.63	CP	
8260	1769295.36	1624748.365	7282.97	FR	
8261	1769295.645	1624748.01	7283.805	FR	
8262	1769294.445	1624749.115	7282.51	CP	
8263	1769293.08	1624749.55	7282.935	FR	horizontal prism
8264	1769292.795	1624749.36	7281.17	FR	horizontal prism
8265	1769292.725	1624749.21	7280.75	FR	horizontal prism
8266	1769292.6	1624748.895	7279.28	FR	horizontal prism
8267	1769292.33	1624748.66	7278.055	FR	horizontal prism
8268	1769299.99	1624740.585	7285.465	C34N	North Wall 3-4 contact
8269	1769299.74	1624741.145	7285.855	C34	
8270	1769300.105	1624740.65	7287.01	FR	
8271	1769299.84	1624741.905	7287.105	FR	
8272	1769300.67	1624740.11	7288.55	FRN	North Wall fracture
8273	1769300.595	1624741.125	7288.925	FR	
8274	1769300.595	1624741.04	7289.84	FRN	North Wall fracture
8275	1769300.91	1624741.085	7291.125	FR	
8276	1769301.43	1624740.165	7292.38	FRN	North Wall fracture
8277	1769301.375	1624740.935	7292.43	FRN	North Wall fracture
8278	1769301.675	1624740.91	7294.12	FRN	North Wall fracture
8279	1769301.325	1624741.875	7292.27	FR	
8280	1769301.58	1624741.885	7293.36	FR	
8281	1769301.73	1624740.55	7295.725	FRN	North Wall fracture; horizontal prism
8282	1769302.42	1624740.585	7297.075	FRN	North Wall fracture; horizontal prism
8283	1769301.885	1624741.775	7297.005	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
8284	1769301.625	1624742.045	7295.665	FR	horizontal prism
8285	1769300.5	1624743.865	7296.785	FR	horizontal prism
8286	1769300.325	1624744	7295.82	FR	horizontal prism
8287	1769300.665	1624743.095	7294.45	FR	horizontal prism
8288	1769300.965	1624742.175	7294.385	FR	horizontal prism
8289	1769300.38	1624745.285	7296.69	FR	
8290	1769300.37	1624744.75	7295.21	FR	
8291	1769299.62	1624745.945	7295.945	FR	
8292	1769299.455	1624746.13	7294.985	FR	
8293	1769299.785	1624744.915	7294.09	FR	
8294	1769298.83	1624745.945	7293.865	FR	
8295	1769298.74	1624745.39	7293.965	FR	horizontal prism
8296	1769297.905	1624746.155	7293.205	FR	horizontal prism
8297	1769298.105	1624745.645	7292.17	FR	horizontal prism
8298	1769299.065	1624744.525	7292.715	FR	horizontal prism
8299	1769299.145	1624744.31	7291.805	FR	horizontal prism
8300	1769300.15	1624744.38	7293.495	FR	
8301	1769300.155	1624743.68	7293.98	FR	horizontal prism
8302	1769300.035	1624743.505	7293.065	FR	horizontal prism
8303	1769299.19	1624744.19	7291.785	FR	horizontal prism
8304	1769298.43	1624744.475	7291.485	FR	horizontal prism
8305	1769301.73	1624742.53	7294.39	FR	
8306	1769300.89	1624743.025	7293.67	FR	
8307	1769301.035	1624742.115	7293.605	FR	horizontal prism
8308	1769300.26	1624742.775	7292.69	FR	horizontal prism
8309	1769300.295	1624742.695	7292.725	FR	horizontal prism
8310	1769299.72	1624743.405	7292.475	FR	horizontal prism
8311	1769299.935	1624743.075	7291.9	FR	horizontal prism
8312	1769300.685	1624741.92	7290.44	FR	
8313	1769300.205	1624742.675	7290.095	FR	
8314	1769299.51	1624743.875	7290.695	FR	
8315	1769299.645	1624742.63	7290.635	FR	horizontal prism
8316	1769300.095	1624742.425	7289.425	FR	
8317	1769298.925	1624742.83	7289.665	FR	
8318	1769300.08	1624742.43	7289.4	FR	
8319	1769299.735	1624742.67	7288.985	FR	
8320	1769299.045	1624744.12	7290.02	FR	
8321	1769299.99	1624742.075	7288.41	FR	
8322	1769299.85	1624742.265	7287.84	FR	
8323	1769299.37	1624742.86	7288.115	FR	
8324	1769298.99	1624743.715	7288.065	FR	
8325	1769299.14	1624742.865	7287.25	FR	
8326	1769298.855	1624743.065	7286.375	FR	
8327	1769298.445	1624743.735	7285.6	C34	
8328	1769298.78	1624742.575	7285.695	C34	
8329	1769298.82	1624743.01	7285.685	FR	
8330	1769291.54	1624749.595	7276.975	FR	
8331	1769292.415	1624749.64	7278.86	FR	
8332	1769291.28	1624750.585	7279.505	FR	
8333	1769290.5	1624750.935	7277.915	FR	
8334	1769291.3	1624750.405	7278.095	FR	
8335	1769290.075	1624751.635	7278.825	FR	
8336	1769290.365	1624750.635	7280.125	FR	horizontal prism
8337	1769290.635	1624750.89	7281.355	FR	horizontal prism
8338	1769291.11	1624749.78	7280.995	FR	horizontal prism
8339	1769291.77	1624749.425	7281.845	FR	horizontal prism
8340	1769290.335	1624753.06	7280.9	FR	
8341	1769289.605	1624753.715	7280.105	FR	
8342	1769288.95	1624754.16	7279.43	FR	
8343	1769287.675	1624754.86	7278.35	FR	
8344	1769288.39	1624753.87	7277.72	FR	
8345	1769289.255	1624752.58	7278.465	FR	
8346	1769288.62	1624753.22	7277.215	FR	
8347	1769289.255	1624752.39	7277.5	FR	
8348	1769288.935	1624752.53	7276.39	FR	
8349	1769289.25	1624752.135	7276.27	FR	
8350	1769289.425	1624754.82	7281.575	CP	
8351	1769288.015	1624756.015	7280.385	FR	
8352	1769287.235	1624756.325	7279.435	FR	
8353	1769286.94	1624756.55	7279.755	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
8354	1769286.22	1624756.42	7278.185	FR	
8355	1769285.66	1624757.265	7277.945	FR	
8356	1769285.28	1624757.395	7277.965	FR	
8357	1769285.425	1624756.61	7276.84	FR	REDO 8355
8358	1769297.81	1624744.825	7285.6	C34	
8359	1769298.12	1624743.515	7283.795	CP	
8360	1769298.385	1624744.515	7287.92	FR	
8361	1769297.665	1624745.69	7287.62	FR	
8362	1769297.025	1624746.54	7286.975	FR	
8363	1769297.345	1624745.945	7285.75	TOS	
8364	1769297.405	1624745.89	7285.565	BOS	
8365	1769296.08	1624748.03	7285.61	BOS	
8366	1769295.17	1624749.205	7285.655	BOS	
8367	1769295.42	1624749.035	7285.92	TOS	
8368	1769296.08	1624748.08	7285.85	TOS	
8369	1769295.085	1624749.37	7285.945	FR	
8370	1769295.705	1624748.345	7286.155	FR	
8371	1769296.51	1624747.58	7285.835	FR	
8372	1769296.07	1624748.165	7287.045	FR	
8373	1769295.55	1624748.475	7286.825	FR	
8374	1769295.29	1624749.195	7287.775	FR	
8375	1769296.4	1624747.93	7288.22	FR	
8376	1769296.25	1624747.52	7284.505	FR	
8377	1769295.13	1624748.7	7284.595	CP	
8378	1769298.4	1624744.84	7289.18	FR	
8379	1769298.05	1624745.43	7289.6	FR	
8380	1769298.46	1624745.19	7290.64	CP	
8381	1769297.555	1624746.585	7288.715	FR	
8382	1769296.23	1624748.16	7289.235	FR	
8383	1769295.69	1624748.955	7289.595	FR	
8384	1769297.46	1624747.285	7289.37	FR	
8385	1769297.5	1624747.3	7290.32	FR	
8386	1769296.48	1624747.34	7289.485	FR	horizontal prism
8387	1769296.415	1624747.42	7290.455	FR	horizontal prism
8388	1769296.22	1624747.565	7291.5	FR	horizontal prism
8389	1769297.475	1624747.45	7291.705	FR	
8390	1769296.105	1624748.625	7291.065	FR	
8391	1769298.075	1624746.15	7291.555	CP	
8392	1769295.41	1624749.78	7291.16	FR	
8393	1769295.385	1624749.485	7289.715	FR	
8394	1769297.52	1624747.685	7293.525	FR	
8395	1769297.3	1624747.97	7293.94	FR	
8396	1769296.555	1624748.915	7292.925	FR	
8397	1769296.7	1624748.745	7294.375	FR	
8398	1769296.41	1624749.17	7293.31	FR	
8399	1769295.935	1624749.675	7293.165	FR	
8400	1769295.53	1624749.28	7293.96	FR	horizontal prism
8401	1769298.41	1624746.505	7295.055	FR	horizontal prism
8402	1769297.525	1624747.66	7294.835	FR	horizontal prism
8403	1769299.36	1624746.415	7294.965	FR	
8404	1769299.345	1624746.41	7295.83	FR	
8405	1769299.545	1624746.62	7296.815	FR	
8406	1769299.155	1624747.055	7296.835	FR	
8407	1769298.105	1624747.535	7296.32	FR	horizontal prism
8408	1769297.385	1624747.87	7296.235	FR	horizontal prism
8409	1769293.64	1624749.585	7284.425	FR	horizontal prism
8410	1769293.165	1624750.41	7283.915	FR	
8411	1769292.43	1624750.54	7283.585	FR	
8412	1769294.495	1624749.805	7285.185	FR	
8413	1769292.55	1624751.795	7285.225	BOS	
8414	1769294	1624750.545	7285.595	BOS	
8415	1769294.315	1624750.335	7285.985	TOS	
8416	1769293.115	1624751.545	7286.05	TOS	
8417	1769292.93	1624751.65	7285.92	TOS	
8418	1769294.285	1624750.18	7286.85	FR	
8419	1769294.84	1624750.325	7287.89	FR	
8420	1769293.01	1624751.585	7286.165	FR	
8421	1769293.09	1624751.675	7287.02	FR	
8422	1769293.115	1624751.905	7287.635	FR	
8423	1769294.965	1624750.06	7289.915	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
8424	1769294.505	1624750.645	7289.105	FR	
8425	1769294.235	1624751.085	7289.545	FR	
8426	1769294.28	1624750.915	7290.11	FR	
8427	1769293.89	1624751.47	7290.02	FR	
8428	1769293.2	1624752.125	7288.29	FR	
8429	1769293.27	1624752.43	7289.475	FR	
8430	1769293.22	1624752.49	7289.915	FR	
8431	1769293.295	1624752.475	7290.495	FR	
8432	1769292.66	1624752.385	7287.18	FR	
8433	1769293.735	1624750.51	7291.43	FR	horizontal prism
8434	1769294.58	1624751.365	7292.96	FR	
8435	1769293.36	1624752.485	7292.25	FR	
8436	1769292.425	1624754.025	7292.13	FR	
8437	1769291.775	1624754.02	7289.74	FR	
8438	1769292.215	1624753.445	7287.98	FR	
8439	1769291.645	1624753.765	7287.025	FR	
8440	1769295.895	1624750.78	7294.59	FR	
8441	1769295.29	1624751.555	7294.21	FR	
8442	1769294.585	1624752.395	7293.975	FR	
8443	1769293.95	1624753.05	7293.81	FR	
8444	1769295.115	1624750.74	7294.8	FR	horizontal prism
8445	1769293.485	1624753.09	7294.375	FR	horizontal prism
8446	1769292.69	1624753.725	7293.63	FR	horizontal prism
8447	1769296.355	1624748.715	7296.45	FR	horizontal prism
8448	1769295.77	1624750.315	7296.695	FR	horizontal prism
8449	1769295.34	1624750.71	7295.95	FR	horizontal prism
8450	1769294.925	1624751.835	7295.465	FR	horizontal prism
8451	1769294.715	1624752.62	7296.63	FR	horizontal prism
8452	1769293.865	1624753.78	7296.415	FR	horizontal prism
8453	1769293.36	1624754.4	7295.745	FR	horizontal prism
8454	1769294.195	1624753.555	7295.31	FR	
8455	1769292.715	1624755.215	7294.58	FR	End survey 8 August 2007
7011	1769297.36	1624742.38	7278.76	BS	Backshot; start survey 9 August 2007
8456	1769292.325	1624752.295	7286.24	FR	
8457	1769291.89	1624752.75	7285.955	TOS	
8458	1769291.72	1624752.715	7285.11	BOS	
8459	1769291.325	1624753.395	7286.115	FR	
8460	1769290.945	1624754.155	7284.81	BOS	
8461	1769290.435	1624754.525	7284.315	BOS	
8462	1769290.1	1624754.71	7283.81	BOS	
8463	1769289.665	1624755.14	7283.15	BOS	
8464	1769290.775	1624754.23	7285.845	TOS	
8465	1769290.42	1624754.805	7286.37	FR	
8466	1769291.135	1624754.515	7287.76	FR	
8467	1769289.58	1624755.96	7285.45	TOS	
8468	1769289.53	1624755.99	7285.61	TOS	
8469	1769289.525	1624756.04	7286.28	FR	
8470	1769290.045	1624755.76	7287.335	FR	
8471	1769289.63	1624756.3	7287.18	FR	
8472	1769289.265	1624756.835	7286.905	FR	
8473	1769289.965	1624756.465	7288.02	FR	
8474	1769290.735	1624755.33	7288.23	FR	
8475	1769290.885	1624754.99	7288.665	FR	
8476	1769289.185	1624756.22	7288.51	FR	horizontal prism
8477	1769288.125	1624756.11	7285.865	FR	horizontal prism
8478	1769288.64	1624756.8	7287.86	FR	horizontal prism
8479	1769287.425	1624756.535	7285.26	TOS	horizontal prism
8480	1769291.77	1624754.48	7290.99	CP	
8481	1769291.055	1624755.195	7290.875	FR	
8482	1769290.595	1624755.975	7290.305	FR	
8483	1769291.075	1624756.05	7291.83	FR	
8484	1769289.545	1624757.24	7289.605	FR	
8485	1769289.935	1624756.47	7290.81	FR	horizontal prism
8486	1769289.15	1624757.175	7290.33	FR	horizontal prism
8487	1769291.96	1624755.18	7294.62	FR	horizontal prism
8488	1769291.595	1624755.705	7293.755	FR	horizontal prism
8489	1769291.49	1624755.42	7293.57	FR	horizontal prism
8490	1769290.655	1624756.625	7292.72	FR	horizontal prism
8491	1769290.805	1624757.055	7292.1	FR	horizontal prism
8492	1769290.54	1624757.205	7291.335	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
8493	1769291.895	1624755.555	7293.115	FR	
8494	1769291.635	1624756.635	7294.38	FR	
8495	1769291.395	1624756.83	7292.315	FR	
8496	1769290.27	1624757.84	7291.78	FR	
8497	1769289.5	1624757.485	7291.105	FR	horizontal prism
8498	1769289.225	1624757.86	7294.05	CP	horizontal prism
8499	1769293.45	1624755.83	7295.99	FR	
8500	1769292.22	1624757.015	7296.435	FR	
8501	1769291.48	1624757.665	7295.075	FR	
8502	1769291.065	1624758.305	7295.87	FR	
8503	1769291.83	1624756.025	7295.41	FR	horizontal prism
8504	1769290.84	1624753.155	7283.45	CP	
8505	1769288.81	1624755.975	7282.67	BOS	
8506	1769287.815	1624757.425	7282.335	BOS	
8507	1769285.355	1624758.955	7282.385	BOS	horizontal prism
8508	1769284.375	1624760.335	7282.87	BOS	horizontal prism
8509	1769283.68	1624761.83	7283.73	BOS	horizontal prism
8510	1769282.89	1624760.83	7280.61	FR	
8511	1769283.475	1624761.54	7281.795	FR	
8512	1769282.805	1624761.695	7280.965	FR	
8513	1769282.63	1624762.385	7281.68	FR	
8514	1769287.32	1624757.4	7286.27	FR	horizontal prism
8515	1769286.715	1624758.53	7286.635	CP	horizontal prism
8516	1769286.315	1624759.1	7286.215	FR	
8517	1769287.24	1624758.96	7285.145	TOS	
8518	1769286.415	1624760.355	7286.855	FR	
8519	1769286.41	1624760.25	7286.29	FR	
8520	1769286.39	1624760.21	7285.41	FR	
8521	1769285.95	1624760.9	7285.45	FR	
8522	1769285.9	1624760.945	7285.245	TOS	
8523	1769285.9	1624760.87	7285.195	TOS	
8524	1769285.555	1624761.615	7285.435	FR	
8525	1769285.285	1624762.035	7286.085	FR	
8526	1769284.855	1624762.005	7285.28	FR	
8527	1769284.59	1624762.66	7286.01	FR	
8528	1769285.445	1624760.965	7286.105	FR	horizontal prism
8529	1769285.205	1624761.475	7286.51	FR	horizontal prism
8530	1769284.345	1624762.455	7283.805	BOS	
8531	1769283.61	1624763.41	7285.355	FR	
8532	1769283.15	1624764.075	7285	BOS	
8533	1769284.215	1624762.955	7285.73	TOS	
8534	1769283.87	1624763.265	7285.69	TOS	
8535	1769283.835	1624763.31	7285.86	TOS	
8536	1769283.865	1624763.335	7286.365	FR	
8537	1769284.835	1624762.64	7286.97	FR	
8538	1769285.53	1624761.4	7287.6	FR	horizontal prism
8539	1769285.88	1624760.335	7287.845	FR	horizontal prism
8540	1769284.645	1624762.23	7287.705	FR	horizontal prism
8541	1769283.695	1624763.32	7287.76	FR	horizontal prism
8542	1769282.915	1624764.12	7286.2	FR	horizontal prism
8543	1769282.79	1624764.155	7285.945	TOS	horizontal prism
8544	1769282.47	1624763.605	7285.01	BOS	horizontal prism
8545	1769283.905	1624764.79	7288.425	FR	
8546	1769284.34	1624764.725	7289.115	FR	
8547	1769285.045	1624763.675	7288.875	FR	
8548	1769285.585	1624763.48	7289.345	FR	
8549	1769285.69	1624762.27	7289.01	CP	
8550	1769287.005	1624760.81	7289.315	FR	
8551	1769287.335	1624761.305	7290.86	FR	
8552	1769287.825	1624760.185	7291.01	FR	
8553	1769287.14	1624759.775	7289.085	FR	
8554	1769287.98	1624758.75	7290.04	CP	
8555	1769286.255	1624760.88	7288.695	FR	horizontal prism
8556	1769286.215	1624761.745	7289.8	FR	horizontal prism
8557	1769287.535	1624759.12	7288.405	FR	
8558	1769287.635	1624758.99	7288.04	FR	
8559	1769288.75	1624758.04	7288.425	FR	
8560	1769288.79	1624757.855	7287.13	FR	
8561	1769289.14	1624758.65	7293.01	CP	
8562	1769289.37	1624758.815	7291.52	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
8563	1769288.965	1624758.89	7291.32	FR	
8564	1769288.295	1624758.855	7292.265	FR	horizontal prism
8565	1769288.175	1624759.955	7293.115	FR	horizontal prism
8566	1769288.32	1624759.94	7292.135	FR	
8567	1769288.49	1624760.815	7293.88	FR	
8568	1769287.645	1624761.59	7292.9	FR	
8569	1769287.715	1624761.615	7294.015	FR	
8570	1769288	1624760.97	7291.37	FR	
8571	1769287.61	1624761.545	7291.895	FR	
8572	1769286.455	1624762.185	7291.565	FR	horizontal prism
8573	1769287.255	1624762.09	7292.835	FR	
8574	1769286.78	1624762.655	7293.475	FR	
8575	1769286.465	1624763.165	7292.88	FR	
8576	1769288.015	1624761.87	7294.86	FR	
8577	1769286.42	1624763.05	7291.415	FR	
8578	1769287.7	1624760.64	7292.375	FR	horizontal prism
8579	1769290.53	1624759.535	7296.29	FR	
8580	1769290.655	1624760.355	7296.56	FR	
8581	1769290.105	1624760.82	7296.47	FR	
8582	1769290.405	1624760.27	7295.36	FR	
8583	1769288.845	1624760.78	7294.86	FR	
8584	1769289.3	1624761.495	7296.085	FR	
8585	1769288	1624761.56	7295.855	FR	horizontal prism
8586	1769287.995	1624761.88	7294.815	FR	
8587	1769287.93	1624763.095	7296.255	FR	
8588	1769287.765	1624763.11	7294.82	FR	
8589	1769286.7	1624763.34	7294.33	FR	
8590	1769286.835	1624763.16	7295.45	FR	horizontal prism
8591	1769287.05	1624764.525	7296.76	FR	
8592	1769286.255	1624764.505	7295.105	FR	
8593	1769286.22	1624764.135	7293.98	FR	
8594	1769285.795	1624764.825	7294.325	FR	
8595	1769284.23	1624765.7	7296.05	FR	horizontal prism
8596	1769285.265	1624765.81	7296.595	FR	horizontal prism
8597	1769285.125	1624765.355	7295.62	FR	horizontal prism
8598	1769284.93	1624765.36	7294.125	FR	horizontal prism
8599	1769284.18	1624765.24	7294.14	FR	horizontal prism
8600	1769283.6	1624765.315	7294.605	FR	horizontal prism
8601	1769283.625	1624766.51	7295.58	FR	
8602	1769283.37	1624766.055	7294.16	FR	
8603	1769283.505	1624765.71	7292.995	FR	
8604	1769283.945	1624765.155	7292.95	FR	horizontal prism
8605	1769285.015	1624764.715	7293.34	FR	horizontal prism
8606	1769285.99	1624763.78	7292.21	FR	
8607	1769285.745	1624764.385	7292.75	FR	
8608	1769284.725	1624764.63	7291.56	FR	horizontal prism
8609	1769283.94	1624765.275	7291.25	FR	horizontal prism
8610	1769284.755	1624764.23	7290.475	FR	horizontal prism
8611	1769284.7	1624764.115	7289.395	FR	horizontal prism
8612	1769283.67	1624765.53	7290.6	FR	
8613	1769282.555	1624765.4	7285.415	BOS	
8614	1769282.71	1624765.39	7285.93	TOS	
8615	1769283.24	1624765.68	7287.18	TOS	
8616	1769282.73	1624765.795	7286.49	FR	
8617	1769282.845	1624765.625	7288.66	FR	
8618	1769282.2	1624766.455	7288.43	FR	
8619	1769282.175	1624766.25	7289.455	FR	
8620	1769281.975	1624766.69	7290.345	FR	
8621	1769282.27	1624765.77	7290.23	FR	horizontal prism
8622	1769282.76	1624765.14	7289.31	FR	horizontal prism
8623	1769281.38	1624766.495	7285.395	BOS	
8624	1769280.76	1624766.715	7285.325	BOS	
8625	1769280.25	1624767.57	7285.29	BOS	
8626	1769279.295	1624768.1	7285.155	BOS	
8627	1769278.635	1624768.685	7285.705	TOS	
8628	1769279.375	1624767.91	7285.925	TOS	
8629	1769279.585	1624767.65	7285.84	TOS	horizontal prism
8630	1769281.01	1624766.47	7285.935	TOS	horizontal prism
8631	1769281.07	1624766.61	7286.585	FR	horizontal prism
8632	1769280.555	1624767.49	7286.41	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
8633	1769279.465	1624768.575	7287.04	FR	horizontal prism
8634	1769280.36	1624769.375	7288.475	CP	
8635	1769281.17	1624767.935	7288.405	FR	
8636	1769281.17	1624768.07	7289.13	FR	
8637	1769281.22	1624768.17	7290.335	FR	
8638	1769280.97	1624768.775	7291.38	FR	
8639	1769280.785	1624769.205	7290.69	FR	
8640	1769281.765	1624766.99	7291.655	CP	
8641	1769282.59	1624766.54	7293.74	FR	
8642	1769281.76	1624766.3	7293.05	FR	horizontal prism
8643	1769281.865	1624767.14	7292.85	FR	
8644	1769281.44	1624768.1	7293.495	FR	
8645	1769281.12	1624768.565	7292.46	FR	
8646	1769280.77	1624769.255	7292.315	FR	
8647	1769280.435	1624769.845	7292.315	FR	
8648	1769282.045	1624767.76	7294.7	FR	
8649	1769282.99	1624767.41	7295.965	FR	
8650	1769282.365	1624768	7295.24	FR	
8651	1769281.195	1624769.175	7295.395	FR	
8652	1769283.685	1624767.2	7296.68	FR	
8653	1769282.815	1624768.085	7296.655	FR	
8654	1769282.545	1624768.635	7296.48	FR	
8655	1769282.01	1624769.515	7296.825	FR	End survey 9 August 2007
7011	1769297.375	1624742.39	7278.775	BS	Backshot; start survey 13 August 2007
8656	1769278.225	1624769.18	7285.005	BOS	
8657	1769277.21	1624770.555	7284.8	BOS	
8658	1769276.445	1624771.67	7284.855	FR	
8659	1769276.87	1624771.245	7285.035	FR	
8660	1769276.72	1624771.365	7285.26	TOS	
8661	1769277.54	1624770.18	7285.385	TOS	
8662	1769277.76	1624769.675	7286.025	FR	
8663	1769277.91	1624769.82	7286.83	FR	
8664	1769276.955	1624771.065	7286.205	FR	
8665	1769277.355	1624771.165	7287.585	FR	
8666	1769279.165	1624766.47	7281.505	FR	
8667	1769276.86	1624768.955	7281.535	CP	
8668	1769274.185	1624771.685	7280.695	FR	
8669	1769274.625	1624771.835	7281.585	CP	
8670	1769278.33	1624769.615	7287.185	FR	horizontal prism
8671	1769277.87	1624770.47	7287.32	FR	horizontal prism
8672	1769278.085	1624770.295	7288.57	FR	horizontal prism
8673	1769278.135	1624771.09	7290.62	FR	
8674	1769277.785	1624771.67	7291.535	FR	
8675	1769277.615	1624772.005	7290.89	FR	
8676	1769277.115	1624771.895	7289.02	FR	
8677	1769277.11	1624771.79	7288.1	FR	
8678	1769277.535	1624772.845	7290.92	FR	
8679	1769277.26	1624772.84	7290.225	FR	
8680	1769276.845	1624773.26	7289.065	FR	
8681	1769277.225	1624772.64	7288.86	FR	
8682	1769276.565	1624772.84	7287.605	FR	
8683	1769279.125	1624769.825	7290.65	CP	horizontal prism
8684	1769278.72	1624770.445	7290.09	FR	horizontal prism
8685	1769278.735	1624770.625	7291.635	FR	horizontal prism
8686	1769280.065	1624769.91	7296.535	FR	horizontal prism
8687	1769280.595	1624769.67	7294.36	FR	
8688	1769279.825	1624770.58	7294.455	FR	
8689	1769279.6	1624771.46	7295.48	FR	
8690	1769279.415	1624771.195	7294.205	FR	
8691	1769278.61	1624770.625	7292.845	FR	horizontal prism
8692	1769277.86	1624772.045	7292.965	CP	
8693	1769278.66	1624772.94	7295.44	FR	
8694	1769279.23	1624772.36	7295.97	FR	
8695	1769277.905	1624772.265	7294.115	FR	horizontal prism
8696	1769280.48	1624772.27	7296.685	FR	
8697	1769279.6	1624773.445	7296.805	CP	
8698	1769276.13	1624773.735	7292.8	CP	
8699	1769275.92	1624773.755	7291.645	CP	
8700	1769276.095	1624774.615	7294.295	FR	
8701	1769276.655	1624772.805	7291.74	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
8702	1769277.275	1624773.41	7293.765	FR	horizontal prism
8703	1769276.705	1624773.935	7294.245	FR	horizontal prism
8704	1769277.23	1624773.23	7292.91	FR	1.0' horizontal prism
8705	1769277.66	1624774.29	7295.465	FR	horizontal prism
8706	1769276.3	1624774.765	7296.29	FR	horizontal prism
8707	1769277.89	1624775.665	7296.57	FR	
8708	1769275.24	1624775.495	7295.53	FR	
8709	1769275.32	1624776.74	7296.6	FR	
8710	1769275.15	1624776.06	7295.66	FR	
8711	1769275.425	1624775.245	7293.925	FR	
8712	1769274.935	1624774.995	7292.345	FR	
8713	1769274.735	1624775.29	7291.245	FR	
8714	1769273.55	1624776.305	7289.715	FR	
8715	1769274.965	1624774.99	7289.29	CP	
8716	1769275.76	1624773.93	7290.035	FR	
8717	1769276.125	1624774.605	7288.055	CP	
8718	1769273.57	1624776.21	7287.705	CP	
8719	1769276.2	1624771.95	7284.595	BOS	
8720	1769276.06	1624772.1	7284.44	BOS	
8721	1769275.805	1624772.585	7285.305	TOS	
8722	1769275.325	1624773.105	7284.33	BOS	
8723	1769275.895	1624773.29	7286.505	FR	
8724	1769275.775	1624773.385	7285.505	FR	
8725	1769275.63	1624773.695	7285.29	TOS	
8726	1769273.215	1624775.015	7283.905	BOS	
8727	1769272.645	1624776	7283.835	BOS	
8728	1769272.62	1624776.025	7285.23	TOS	
8729	1769272.48	1624776.845	7285.315	TOS	
8730	1769273.56	1624776.23	7286.17	FR	
8731	1769272.725	1624775.36	7285.23	TOS	horizontal prism
8732	1769273.53	1624774.835	7285.13	TOS	horizontal prism
8733	1769274.5	1624774.005	7285.2	TOS	horizontal prism
8734	1769275.31	1624773.62	7286.405	FR	horizontal prism
8735	1769275.21	1624774.19	7285.9	FR	
8736	1769272.145	1624773.95	7281.99	CP	horizontal prism
8737	1769270.845	1624775.115	7280.625	FR	horizontal prism
8738	1769271.315	1624775.48	7281.47	CP	horizontal prism
8739	1769272.42	1624776.87	7285.36	TOS	
8740	1769272.525	1624777.72	7285.81	FR	
8741	1769272.02	1624777.575	7285.385	FR	
8742	1769271.555	1624778.46	7285.13	TOS	
8743	1769271.125	1624778.265	7285.82	FR	horizontal prism
8744	1769270.93	1624779.63	7285.905	FR	
8745	1769270.92	1624779.14	7284.975	TOS	
8746	1769270.915	1624779.645	7285.935	FR	
8747	1769270.75	1624780.055	7286.565	FR	
8748	1769270.605	1624779.71	7285.05	FR	
8749	1769270.38	1624780.03	7284.93	TOS	
8750	1769271.315	1624777.195	7284.005	BOS	horizontal prism
8751	1769270.645	1624778.355	7284.21	BOS	horizontal prism
8752	1769270.26	1624778.43	7282.81	CP	horizontal prism
8753	1769270.55	1624777.33	7282.015	FR	horizontal prism
8754	1769270.51	1624777.73	7281.045	FR	
8755	1769269.57	1624777.595	7279.89	FR	
8756	1769270.24	1624776.755	7279.945	FR	
8757	1769272.045	1624777.605	7284.015	BOS	
8758	1769271.31	1624778.795	7284.155	BOS	
8759	1769270.51	1624779.945	7284.12	BOS	
8760	1769273.03	1624776.8	7289.03	FR	
8761	1769272.975	1624777.905	7288.785	FR	
8762	1769271.94	1624778.875	7288.775	FR	
8763	1769272.17	1624778.6	7290.63	FR	
8764	1769270.995	1624779.35	7289.72	FR	horizontal prism
8765	1769270.92	1624779.385	7288.42	FR	horizontal prism
8766	1769270.875	1624779.44	7287.13	FR	
8767	1769272.52	1624778.085	7288.555	FR	
8768	1769271.945	1624778.055	7289.46	FR	
8769	1769272.485	1624778.14	7292.07	CP	
8770	1769272.17	1624778.735	7293.08	FR	
8771	1769271.13	1624779.105	7291.315	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
8772	1769273.255	1624777.075	7291.265	CP	
8773	1769273.765	1624777.14	7293.8	CP	
8774	1769273.685	1624777.64	7295.535	FR	
8775	1769274.02	1624777.995	7296.32	FR	
8776	1769273.185	1624778.27	7295.255	FR	
8777	1769272.855	1624778.48	7294.41	FR	
8778	1769272.74	1624778.985	7295.86	FR	
8779	1769273.17	1624779.47	7296.865	FR	
8780	1769271.83	1624780.125	7295.825	FR	
8781	1769271.03	1624781.35	7296.245	FR	
8782	1769271.835	1624780.12	7295.83	FR	
8783	1769271.78	1624779.74	7294.95	FR	
8784	1769271.315	1624780.13	7294.235	FR	
8785	1769270.905	1624780.265	7293.125	FR	
8786	1769270.6	1624780.67	7293.21	FR	
8787	1769270.125	1624780.965	7292.105	FR	
8788	1769270.77	1624780.225	7291.975	FR	
8789	1769270.53	1624780.355	7291.185	FR	
8790	1769270.305	1624780.82	7290.525	FR	
8791	1769270.4	1624780.645	7288.9	FR	
8792	1769270	1624781.23	7288.85	FR	
8793	1769269.935	1624781.165	7287.89	FR	
8794	1769270.07	1624780.595	7286.97	FR	
8795	1769269.265	1624781.68	7286.75	FR	
8796	1769269.4	1624781.625	7285.59	FR	
8797	1769269.165	1624781.69	7284.905	TOS	
8798	1769269.065	1624781.675	7284.235	BOS	
8799	1769268.89	1624781.21	7282.425	CP	
8800	1769270.23	1624780.435	7284.96	FR	
8801	1769270.405	1624780.415	7285.97	FR	
8802	1769267.62	1624783.235	7284.775	TOS	
8803	1769267.665	1624783.24	7284.405	BOS	
8804	1769267.79	1624783.305	7286.145	FR	
8805	1769267.26	1624783.705	7284.915	FR	
8806	1769267.115	1624783.86	7284.425	C34	
8807	1769266.52	1624784.3	7284.515	TOS	
8808	1769266.66	1624784.24	7284.32	BOS	
8809	1769267.36	1624783.355	7282.795	CP	
8810	1769265.855	1624784.64	7282.16	FR	
8811	1769268.545	1624782.44	7287.715	FR	
8812	1769268.29	1624782.81	7287.625	FR	
8813	1769268.11	1624782.975	7287.15	FR	
8814	1769268.79	1624782.405	7289.075	FR	
8815	1769268.08	1624783.175	7288.235	FR	
8816	1769267.765	1624784.075	7287.82	FR	
8817	1769266.96	1624784.34	7287.28	FR	
8818	1769266.01	1624784.78	7284.925	FR	
8819	1769266.72	1624784.765	7285.71	FR	
8820	1769266.68	1624784.93	7286.9	FR	
8821	1769265.83	1624785.255	7286.275	FR	
8822	1769266.05	1624785.095	7287.365	FR	
8823	1769266.535	1624785.055	7288.47	FR	
8824	1769269.13	1624782.25	7289.925	FR	
8825	1769269.365	1624782.06	7291.13	FR	
8826	1769269.035	1624782.405	7292.08	FR	
8827	1769267.84	1624783.46	7291.725	FR	
8828	1769268.165	1624783.205	7289.76	FR	
8829	1769267.585	1624784.105	7289.795	FR	
8830	1769267.315	1624784.12	7289.73	FR	
8831	1769265.6	1624785.58	7288.535	FR	
8832	1769265.64	1624785.885	7289.535	FR	
8833	1769266.365	1624785.345	7290.28	FR	
8834	1769265.515	1624786.385	7290.735	FR	
8835	1769266.245	1624785.825	7291.945	FR	
8836	1769266.71	1624785.47	7292.12	FR	
8837	1769267.345	1624784.56	7292.835	CP	
8838	1769266.385	1624784.795	7290.855	FR	horizontal prism
8839	1769269.775	1624781.675	7293.325	FR	
8840	1769268.825	1624782.93	7293.36	CP	
8841	1769270.485	1624781.57	7294.885	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
8842	1769269.77	1624782.655	7295.44	FR	
8843	1769269.19	1624783.005	7294.245	FR	
8844	1769268.815	1624783.895	7295.43	FR	
8845	1769268.105	1624784.23	7293.995	FR	
8846	1769267.945	1624784.56	7294.945	FR	
8847	1769270.99	1624781.41	7296.29	FR	
8848	1769268.74	1624785.01	7296.505	FR	
8849	1769267.95	1624785.745	7296.43	FR	
8850	1769266.94	1624787.025	7296.505	FR	
8851	1769267.13	1624785.775	7294.84	FR	
8852	1769267.17	1624785.51	7294.02	FR	End survey 13 August 2007
7011	1769297.375	1624742.385	7278.77	BS	Backshot; start survey 15 Aug 2007
8853	1769284.925	1624757.445	7279.475	FR	horizontal prism
8854	1769286.08	1624757.085	7280.495	FR	horizontal prism
8855	1769286.08	1624757.085	7280.495	FR	horizontal prism
8856	1769284.24	1624759.23	7279.45	FR	
8857	1769283.84	1624758.68	7278.415	FR	
8858	1769283.53	1624758.29	7276.77	CP	
8859	1769283.125	1624759.96	7278.2	FR	
8860	1769283.4	1624760.21	7279.595	FR	
8861	1769282.105	1624762.06	7280.36	FR	
8862	1769281.785	1624761.645	7279.4	FR	
8863	1769281.835	1624761.275	7278.64	FR	
8864	1769281.52	1624760.86	7276.79	FR	
8865	1769281.33	1624763.535	7280.775	FR	
8866	1769280.55	1624763.345	7279.12	CP	
8867	1769278.91	1624763.715	7276.89	CP	
8868	1769280.415	1624764.93	7281.17	FR	
8869	1769279.52	1624765.13	7279.84	CP	
8870	1769278.955	1624766.055	7279.47	FR	
8871	1769278.025	1624766.485	7279.06	CP	
8872	1769275.42	1624767.61	7276.655	CP	
8873	1769275.365	1624769.32	7278.91	CP	
8874	1769273.76	1624770.38	7277.095	FR	
8875	1769273.545	1624771.185	7277.885	FR	
8876	1769273.145	1624771.075	7276.74	FR	
8877	1769272.535	1624771.63	7276.73	FR	
8878	1769273.49	1624771.73	7279.145	FR	
8879	1769273.1	1624772.28	7279.225	FR	
8880	1769272.635	1624772.48	7278.73	FR	
8881	1769271.705	1624774.02	7279.68	FR	
8882	1769270.33	1624774.21	7276.905	CP	
8883	1769269.52	1624777.055	7278.39	FR	
8884	1769269.62	1624778.44	7279.705	FR	
8885	1769268.4	1624778.68	7278.515	FR	
8886	1769268.705	1624777.6	7277.935	FR	
8887	1769267.97	1624777.475	7276.58	FR	
8888	1769267.395	1624777.94	7275.83	FR	
8889	1769278.855	1624765.76	7279.02	FF	
8890	1769278.775	1624766.025	7279.105	FF	
8891	1769279.005	1624766.305	7280.69	FF	
8892	1769279.215	1624766.12	7280.49	FF	
8893	1769279.205	1624766.225	7281.53	FF	
8894	1769278.725	1624765.895	7281.59	FF	horizontal prism
8895	1769269.725	1624779.245	7281.695	FR	
8896	1769268.165	1624779.375	7280.955	FR	horizontal prism
8897	1769267.955	1624780.495	7280.535	CP	
8898	1769266.52	1624779.895	7277.06	FR	
8899	1769266.6	1624781.355	7278.905	CP	
8900	1769265.395	1624781.915	7277.935	FR	
8901	1769266.825	1624782.205	7280.805	CP	
8902	1769265.05	1624783.31	7278.305	FR	
8903	1769265.975	1624783.705	7281.05	FR	
8904	1769265.65	1624784.425	7281.185	FF	
8905	1769265.005	1624784.69	7280.925	FF	
8906	1769265.625	1624784.325	7280.435	FF	
8907	1769265.66	1624783.99	7280.18	FF	
8908	1769265.16	1624783.95	7279.075	FF	
8909	1769264.49	1624783.985	7279.08	FF	
8910	1769263.81	1624783.705	7277.06	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
8911	1769263.53	1624783.44	7276.16	FF	
8912	1769262.76	1624784.165	7275.74	FR	
8913	1769262.255	1624785.44	7275.775	FR	
8914	1769261.29	1624787.265	7277.075	FR	
8915	1769262.655	1624786.4	7278.99	CP	
8916	1769262.7	1624787.43	7280.455	CP	
8917	1769260.33	1624788.21	7277.105	FR	
8918	1769260.315	1624788.585	7277.985	FR	
8919	1769261.045	1624788.715	7279.24	FR	
8920	1769260.985	1624789.125	7279.305	FF	
8921	1769261.77	1624789.65	7280.515	FF	
8922	1769261.4	1624790.61	7280.595	FF	
8923	1769260.155	1624790.78	7279.685	FF	
8924	1769259.17	1624790.625	7279.165	FF	
8925	1769259.855	1624789.865	7278.805	FF	
8926	1769259.775	1624789.925	7278.245	FR	
8927	1769259.43	1624789.995	7277.42	FR	
8928	1769258.66	1624790.165	7276.2	FF	
8929	1769258.57	1624790.565	7276.325	FF	
8930	1769258.515	1624790.95	7276.435	FR	
8931	1769258.38	1624792.855	7280.415	CP	
8932	1769257.495	1624792.49	7277.935	FR	
8933	1769257.245	1624792.67	7277.85	FR	
8934	1769256.22	1624793.295	7276.97	CP	
8935	1769256.525	1624793.89	7278.445	FR	
8936	1769256.725	1624793.71	7279.025	FR	
8937	1769256.255	1624794.33	7278.6	FR	
8938	1769256.73	1624795.01	7280.42	FR	
8939	1769256.155	1624794.745	7277.955	FR	
8940	1769255.11	1624794.8	7276.23	FR	
8941	1769255.13	1624795.66	7276.305	FR	
8942	1769255.2	1624795.32	7276.73	FF	
8943	1769255.27	1624795.615	7276.73	FF	
8944	1769256.09	1624795.09	7278.7	FF	
8945	1769255.115	1624795.92	7278.455	FF	
8946	1769254.875	1624796.09	7278.635	FR	
8947	1769255.13	1624796.27	7280.175	FR	
8948	1769255.34	1624796.23	7280.53	FF	
8949	1769256.225	1624795.31	7280.345	FF	
8950	1769256.615	1624795.54	7281.28	FF	
8951	1769253.875	1624797.87	7281.435	CP	
8952	1769254.125	1624796.85	7279.47	FR	
8953	1769253.69	1624797.405	7279.685	FR	
8954	1769253.47	1624797.48	7278.715	FR	
8955	1769253.095	1624797.665	7277.565	FR	
8956	1769253.455	1624797	7277.74	BM	Benchmark 7006
8957	1769253.205	1624798.355	7279.38	FR	
8958	1769252.645	1624799.36	7280.45	FR	
8959	1769252.265	1624798.85	7278.045	FR	
8960	1769252.205	1624798.045	7275.88	FR	
8961	1769251.83	1624800.27	7278.21	FR	
8962	1769252.005	1624801.505	7280.845	FF	
8963	1769251.445	1624801.045	7278.57	FF	
8964	1769250.94	1624800.87	7276.46	FF	
8965	1769250	1624802.08	7277.695	FF	
8966	1769250.005	1624801.645	7276.365	FF	
8967	1769249.29	1624802.395	7276.145	FR	
8968	1769249.48	1624802.505	7277.32	FR	
8969	1769249.56	1624802.805	7279.44	FR	
8970	1769249.045	1624802.97	7278.455	FR	
8971	1769248.485	1624803.47	7279.315	FR	
8972	1769249.03	1624803.565	7280.265	FR	
8973	1769250.135	1624802.65	7281.13	FR	
8974	1769248.525	1624804.575	7280.85	FR	
8975	1769247.26	1624804.455	7276.7	FR	
8976	1769246.995	1624805.45	7280.02	FR	
8977	1769246.775	1624805.95	7280.645	FR	
8978	1769246	1624806.5	7278.52	FR	
8979	1769245.87	1624806.405	7277.255	FR	
8980	1769245.9	1624806.345	7276.765	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
8981	1769244.085	1624807.365	7277.07	FR	
8982	1769244.325	1624807.51	7277.8	FR	
8983	1769244.545	1624807.435	7278.095	FR	
8984	1769245.15	1624807.87	7280.195	FR	
8985	1769243.52	1624809.105	7279.115	FR	
8986	1769242.78	1624808.935	7277.02	FR	
8987	1769243.03	1624809.48	7278.545	FR	
8988	1769243.295	1624810.145	7279.985	FR	
8989	1769242.495	1624810.99	7280.36	FR	
8990	1769241.915	1624811.5	7280.565	FR	
8991	1769242.35	1624810.87	7279.03	FR	
8992	1769241.425	1624810.58	7277.07	FR	
8993	1769241.66	1624811.16	7277.715	FR	
8994	1769240.705	1624810.845	7275.87	FR	
8995	1769241.57	1624812.385	7278.58	FR	
8996	1769240.705	1624812.54	7276.825	FR	
8997	1769239.865	1624813.8	7279.33	FR	
8998	1769239.345	1624814.68	7280.235	FR	
8999	1769238.8	1624815.05	7279.255	FR	
9000	1769237.935	1624816.085	7278.11	FR	
9001	1769238.19	1624815.82	7277.855	FR	
9002	1769237.885	1624815.625	7276.225	FR	
9003	1769238.81	1624815.325	7277.095	FR	
9004	1769238.615	1624814.235	7276.01	FR	
9005	1769239.59	1624813.67	7276.84	FR	
9006	1769236.51	1624815.93	7276.495	FR	
9007	1769236.355	1624816.6	7275.92	FR	
9008	1769236.875	1624817.175	7277.49	FR	
9009	1769237.1	1624817.38	7278.805	FR	
9010	1769237.29	1624817.665	7280.42	FR	
9011	1769236.67	1624818.03	7279.315	FR	
9012	1769236.285	1624819.035	7279.365	FR	
9013	1769236.31	1624818.86	7281.275	C34	
9014	1769236.105	1624819.25	7280.275	FR	
9015	1769236.085	1624819.51	7279.275	FR	
9016	1769235.4	1624819.485	7278.155	FR	
9017	1769234.555	1624820.085	7276.69	FR	
9018	1769233.63	1624821.01	7276.205	FR	
9019	1769234.115	1624821.7	7277.855	CP	
9020	1769235.645	1624820.4	7280.435	FR	
9021	1769235.615	1624820.48	7281.765	FR	
9022	1769235.515	1624821.02	7281.27	C34	
9023	1769235.25	1624821.59	7280.59	FR	
9024	1769234.755	1624821.54	7281.545	FR	
9025	1769234.575	1624822.64	7281.15	C34	
9026	1769234.38	1624820.14	7277.825	FR	
9027	1769234.07	1624822.575	7279.23	FR	
9028	1769234.85	1624820.91	7278.85	FR	
9029	1769233.955	1624824.255	7281.475	FR	
9030	1769233.745	1624824.63	7280.875	C34	
9031	1769232.9	1624826.055	7281.17	FR	
9032	1769231.79	1624826.12	7281.455	FR	
9033	1769230.715	1624826.235	7281.005	C34	
9034	1769231.045	1624825.86	7280.405	FR	
9035	1769231.12	1624825.565	7279.36	FR	
9036	1769231.225	1624825.615	7278.29	FR	
9037	1769230.565	1624825.605	7276.92	FR	
9038	1769231.865	1624824.31	7277.605	FR	
9039	1769232.575	1624824.39	7279.295	FR	
9040	1769229.685	1624826.35	7276.325	FR	
9041	1769229.975	1624826.51	7277.955	FR	
9042	1769230.175	1624826.605	7279.955	FR	
9043	1769229.455	1624826.835	7278.39	FR	
9044	1769229.485	1624827.545	7279.25	FR	
9045	1769228.23	1624827.575	7276.405	FR	
9046	1769228.72	1624828.36	7279.325	FR	
9047	1769229.225	1624829.27	7281.27	FR	
9048	1769229.265	1624829.575	7281.935	FR	
9049	1769228.55	1624830.25	7280.92	C34	
9050	1769228.09	1624830.915	7281.27	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
9051	1769227.785	1624831.43	7281.045	C34	
9052	1769230.185	1624827.155	7280.97	FR	
9053	1769229.65	1624827.575	7281.02	C34	
9054	1769227.465	1624828.205	7277.93	FR	
9055	1769227.615	1624829.665	7279.31	FR	
9056	1769227.61	1624829.135	7278.655	FR	
9057	1769227.065	1624828.445	7276.715	FR	
9058	1769227.29	1624829.075	7276.85	FR	
9059	1769226.33	1624830.715	7277.635	CP	
9060	1769227.025	1624832.045	7280.75	C34	
9061	1769226.945	1624832.4	7281.51	FR	
9062	1769226.335	1624832.64	7280.035	FR	
9063	1769226.045	1624832.54	7278.75	FR	
9064	1769225.28	1624832.375	7277.365	FR	
9065	1769225.44	1624832.395	7276.165	FR	
9066	1769226.055	1624833.815	7281.385	FR	
9067	1769225.715	1624833.595	7280.365	C34	
9068	1769225.27	1624833.9	7278.485	FR	
9069	1769225.53	1624833.4	7277.46	FR	
9070	1769225.465	1624833.475	7275.88	FR	End survey 15 August 2007
7006	1769253.4	1624796.995	7277.66	BS	Backshot; start survey 20 August 2007
9071	1769265.145	1624785.11	7282.005	FR	
9072	1769264.61	1624785.43	7282.085	FR	
9073	1769263.735	1624786.365	7281.84	CP	
9074	1769264.88	1624785.56	7283.44	CP	
9075	1769265.435	1624785.155	7284.825	FR	
9076	1769265.07	1624786.035	7284.86	FR	
9077	1769264.905	1624786.265	7285.415	FR	
9078	1769265.48	1624785.08	7284.47	C34	
9079	1769265.15	1624785.655	7284.485	C34	
9080	1769264.915	1624786.185	7284.39	BOS	
9081	1769264.6	1624786.635	7284.495	TOS	
9082	1769263.91	1624787.455	7282.88	CP	
9083	1769264.4	1624787.09	7284.405	BOS	
9084	1769264.17	1624787.32	7284.515	TOS	
9085	1769263.685	1624787.915	7284.325	C34	
9086	1769263.425	1624788.295	7284.325	TOS	
9087	1769263.35	1624788.52	7284.105	BOS	
9088	1769262.945	1624789.34	7284.15	TOS	
9089	1769263.02	1624789.235	7283.195	FF	
9090	1769263.445	1624788.28	7286.13	FR	
9091	1769263.645	1624788.055	7285.23	FR	
9092	1769264.385	1624787.27	7285.38	FR	
9093	1769264.435	1624787.315	7285.895	FR	
9094	1769260.925	1624791.2	7284.95	FR	horizontal prism
9095	1769260.935	1624791.015	7286.43	FR	horizontal prism
9096	1769260.975	1624790.965	7287.305	FR	horizontal prism
9097	1769262.365	1624789.74	7287.055	FR	horizontal prism
9098	1769262.875	1624790.13	7286.225	FR	
9099	1769262.68	1624790.085	7284.97	FR	
9100	1769263.39	1624788.535	7287.025	FR	
9101	1769263.19	1624788.825	7287.93	FR	
9102	1769265.24	1624785.94	7287.27	FR	
9103	1769264.97	1624786.43	7288.49	FR	
9104	1769264.65	1624787.035	7287.47	FR	
9105	1769260.59	1624791.845	7287.115	FR	
9106	1769260.19	1624791.97	7285.845	FR	
9107	1769262.72	1624789.785	7283.885	BOS	
9108	1769262.345	1624790.02	7284.005	TOS	
9109	1769261.74	1624790.66	7284.055	TOS	
9110	1769261.83	1624790.555	7283.69	BOS	
9111	1769261.295	1624791.75	7283.935	TOS	
9112	1769261.32	1624791.675	7283.745	BOS	
9113	1769261.265	1624791.04	7282.8	FF	
9114	1769261.645	1624790.725	7281.925	FF	
9115	1769262.93	1624789.45	7282.44	FF	
9116	1769264.055	1624787.645	7288.82	FR	
9117	1769261.615	1624791.365	7289.125	FR	
9118	1769262.16	1624790.565	7289.875	FR	
9119	1769262.685	1624790.03	7289.8	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
9120	1769262.91	1624790.01	7290.54	FR	
9121	1769262.665	1624790.195	7291.325	FR	
9122	1769263.01	1624789.345	7288.9	FR	
9123	1769262.955	1624789.98	7290.545	FR	
9124	1769263.285	1624788.82	7289.475	FR	
9125	1769264.105	1624787.8	7289.785	FR	
9126	1769265.065	1624786.9	7290.155	FR	
9127	1769264.38	1624788.125	7290.9	FR	
9128	1769262.09	1624789.775	7288.8	FR	horizontal prism
9129	1769261.315	1624791.85	7291.845	FR	
9130	1769262.19	1624791.485	7293.185	FR	
9131	1769262.44	1624790.67	7292.165	FR	
9132	1769263.17	1624790.265	7293.015	FR	
9133	1769263.535	1624790.06	7293.065	FR	
9134	1769264.13	1624789.19	7293.655	FR	
9135	1769264.105	1624789.435	7293.01	FR	
9136	1769264.64	1624788.285	7293.89	FR	
9137	1769264.55	1624788.04	7293.24	FR	
9138	1769264.635	1624788.215	7292.36	CP	
9139	1769263.385	1624789.47	7293.73	FR	horizontal prism
9140	1769263.79	1624789.355	7291.845	FR	horizontal prism
9141	1769264.185	1624789.36	7291.03	FR	horizontal prism
9142	1769264.56	1624787.24	7293.045	FR	horizontal prism
9143	1769264.83	1624787.115	7293.635	FR	horizontal prism
9144	1769265.485	1624786.695	7293.465	FR	horizontal prism
9145	1769265.565	1624786.085	7292.575	FR	horizontal prism
9146	1769265.22	1624787.05	7291.385	CP	
9147	1769266.11	1624787.72	7295.675	FR	
9148	1769265.995	1624788.48	7296.695	FR	
9149	1769264.25	1624789.55	7295.98	FR	
9150	1769264.865	1624788.64	7295.305	FR	
9151	1769264.635	1624789.015	7296.5	FR	horizontal prism
9152	1769265.985	1624787.535	7294.59	FR	
9153	1769263.7	1624790.805	7296.61	FR	
9154	1769263.01	1624791.095	7295.775	FR	
9155	1769262.71	1624790.92	7294.76	FR	
9156	1769260.06	1624792.5	7283.445	FR	
9157	1769259.88	1624792.905	7283.985	FR	
9158	1769258.955	1624793.53	7284.485	FR	
9159	1769258.415	1624793.625	7282.85	FR	
9160	1769259.035	1624793.23	7283.15	FR	
9161	1769260.04	1624792.195	7282.71	FR	
9162	1769259.37	1624792.66	7282.365	FR	
9163	1769259.085	1624792.845	7281.96	FR	
9164	1769260.005	1624792.01	7281.865	FR	
9165	1769259.975	1624791.865	7281.305	FR	
9166	1769260.225	1624792.545	7285.165	FR	
9167	1769260.76	1624792.115	7284.495	FR	
9168	1769260.405	1624792.49	7283.93	TOS	
9169	1769260.44	1624792.38	7283.77	BOS	
9170	1769259.375	1624793.015	7283.5	BOS	
9171	1769259.34	1624793.225	7283.89	TOS	
9172	1769258.645	1624794.095	7283.99	TOS	
9173	1769258.28	1624794.145	7283.29	BOS	
9174	1769257.62	1624794.8	7283.055	BOS	
9175	1769257.55	1624794.9	7283.865	TOS	
9176	1769256.915	1624795.77	7283.505	TOS	
9177	1769256.795	1624795.975	7283.165	BOS	
9178	1769257.395	1624795.16	7283.58	FR	
9179	1769258.015	1624794.46	7283.725	FR	
9180	1769257.255	1624794.48	7284.545	FR	horizontal prism
9181	1769257.15	1624796.68	7286.755	FR	
9182	1769256.735	1624797.475	7286.99	FR	
9183	1769257.405	1624795.92	7286.225	FR	
9184	1769257.03	1624796.89	7289.145	CP	
9185	1769257.495	1624795.85	7287.83	CP	
9186	1769258.14	1624795.225	7288.935	CP	
9187	1769258.7	1624794.59	7287.61	FR	
9188	1769259.085	1624794.05	7288.84	FR	
9189	1769259.98	1624793.045	7289.225	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
9190	1769257.9	1624794.95	7285.74	FR	
9191	1769259.115	1624793.68	7287.02	FR	
9192	1769259.99	1624792.87	7287.975	CP	
9193	1769257.165	1624797.285	7290.305	FR	
9194	1769257.36	1624797.785	7291.28	FR	
9195	1769257.74	1624797.01	7292.22	FR	
9196	1769257.96	1624796.115	7290.225	FR	
9197	1769258.64	1624795.81	7293.225	FR	
9198	1769258.59	1624795.605	7291.645	CP	
9199	1769257.255	1624798.49	7292.115	FR	
9200	1769257.175	1624798.265	7290.82	FR	
9201	1769256.47	1624798.185	7289.765	FR	
9202	1769256.34	1624797.93	7288.93	FR	
9203	1769256.295	1624798.345	7288.925	FR	
9204	1769261.245	1624791.875	7291.865	FR	
9205	1769262.14	1624791.685	7294.28	FR	
9206	1769260.95	1624792.91	7293.77	FR	
9207	1769260.79	1624792.86	7292.32	FR	
9208	1769260.205	1624793.24	7291.025	FR	
9209	1769260.54	1624792.4	7290.455	FR	
9210	1769259.91	1624793.69	7290.29	FR	
9211	1769258.78	1624794.875	7290.31	FR	
9212	1769259.69	1624794.19	7292.265	FR	
9213	1769262.01	1624792.445	7295.63	FR	
9214	1769261.675	1624792.61	7294.855	FR	
9215	1769261.56	1624793.46	7296.375	FR	
9216	1769260.765	1624793.81	7294.89	FR	
9217	1769259.92	1624794.27	7294.125	FR	
9218	1769259.795	1624794.695	7295.07	FR	
9219	1769260.685	1624794.66	7295.7	FR	
9220	1769259.215	1624794.965	7293.815	FR	
9221	1769259.835	1624795.3	7295.41	FR	
9222	1769259.525	1624796.605	7295.76	FR	
9223	1769259.125	1624796.25	7294.755	FR	
9224	1769258.045	1624797.205	7294.36	FR	
9225	1769257.9	1624797.64	7295.26	FR	horizontal prism
9226	1769256.94	1624798.065	7293.835	FR	horizontal prism
9227	1769256.78	1624798.485	7294.975	FR	horizontal prism; end survey 20 August 2007
7006	1769253.405	1624797.005	7277.62	BS	backshot; start survey 21 August 2007
9228	1769256.21	1624796.38	7283.52	TOS	
9229	1769255.82	1624796.57	7283.36	BOS	
9230	1769255.165	1624797.315	7283.5	TOS	
9231	1769255.05	1624797.4	7283.265	BOS	
9232	1769254.29	1624798.085	7283.53	TOS	
9233	1769254.165	1624798.075	7283.145	BOS	
9234	1769254.165	1624798.41	7283.57	FR	
9235	1769254.395	1624798.575	7284.46	FR	
9236	1769255.28	1624797.725	7285.225	FR	
9237	1769254.95	1624797.535	7283.755	FR	
9238	1769255.87	1624797.285	7285.86	FR	
9239	1769256.17	1624796.835	7284.43	FR	
9240	1769254.09	1624798.87	7285.3	FR	
9241	1769253.405	1624799.19	7283.91	FR	
9242	1769253.71	1624799.725	7285.345	FR	
9243	1769252.89	1624800.92	7285.11	FR	
9244	1769253.32	1624799.045	7283.165	BOS	
9245	1769253.19	1624799.39	7283.475	TOS	
9246	1769252.46	1624800.115	7282.98	BOS	
9247	1769252.375	1624800.785	7283.33	TOS	
9248	1769251.7	1624801.645	7283.645	FR	
9249	1769252.415	1624802.23	7285.065	FR	
9250	1769251.85	1624802.385	7284.68	FR	
9251	1769251.15	1624802.45	7284.13	FR	
9252	1769250.97	1624802.285	7283.44	FR	
9253	1769250.87	1624803.315	7283.71	FR	
9254	1769249.975	1624804.355	7283.725	FR	
9255	1769249.785	1624804.475	7283.135	TOS	
9256	1769249.98	1624803.84	7283.1	TOS	
9257	1769250.73	1624802.755	7283.045	TOS	
9258	1769250.635	1624803.3	7282.695	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
9259	1769251.33	1624802.31	7282.705	BOS	
9260	1769251.655	1624801.99	7283.025	TOS	
9261	1769252.05	1624801.435	7282.845	BOS	
9262	1769250.47	1624804.22	7285.245	FR	
9263	1769250.985	1624803.91	7285.67	FR	
9264	1769251.295	1624803.89	7286.195	FR	
9265	1769251.775	1624803.045	7285.715	FR	
9266	1769252.44	1624802.295	7285.12	FR	
9267	1769252.79	1624801.66	7286.87	FR	
9268	1769251.33	1624803.09	7286.35	FR	horizontal prism
9269	1769253.01	1624800.455	7286.245	FR	horizontal prism
9270	1769253.6	1624800.055	7286.72	FR	horizontal prism
9271	1769254.22	1624798.305	7285.935	FR	horizontal prism
9272	1769255.215	1624798.02	7286.715	FR	horizontal prism
9273	1769254.935	1624798.85	7286.57	FR	
9274	1769254.495	1624799.825	7286.79	FR	
9275	1769255.51	1624798.45	7288.305	FR	
9276	1769255.27	1624799.355	7289.385	FR	
9277	1769255.575	1624799.485	7290.605	FR	
9278	1769254.81	1624800.535	7290.49	FR	
9279	1769254.14	1624801.195	7289.88	FR	
9280	1769254.27	1624799.645	7288.065	FR	
9281	1769254.935	1624798.77	7287.79	FR	
9282	1769253.5	1624801.49	7288.055	FR	
9283	1769253.11	1624802.2	7288.05	FR	
9284	1769252.505	1624803.185	7288.515	FR	
9285	1769252.495	1624803.115	7287.575	FR	
9286	1769252.02	1624803.755	7289.125	FR	
9287	1769253.025	1624803.31	7290.21	FR	
9288	1769253.84	1624802.025	7290.97	FR	
9289	1769251.92	1624803.48	7289.745	FR	
9290	1769252.265	1624804.84	7290.76	FR	
9291	1769252.67	1624804.475	7291.51	FR	
9292	1769253.58	1624803.03	7291.53	FR	
9293	1769253.84	1624803.91	7293.645	FR	
9294	1769254.475	1624802.525	7292.87	CP	
9295	1769254.345	1624801.78	7291.725	CP	
9296	1769252.7	1624804.085	7292.67	FR	horizontal prism
9297	1769255.445	1624800.635	7292.005	CP	
9298	1769256.93	1624799.375	7293.53	FR	
9299	1769256.285	1624800.315	7293.645	FR	
9300	1769256.35	1624801.32	7295.26	FR	
9301	1769255.945	1624802.105	7294.405	FR	
9302	1769249.565	1624805.11	7283.695	FR	
9303	1769249.17	1624805.08	7283.265	TOS	
9304	1769248.68	1624805.325	7282.125	BOS	
9305	1769247.79	1624805.99	7281.93	BOS	
9306	1769247.865	1624806.495	7283.28	TOS	
9307	1769248.175	1624805.14	7283.255	FR	horizontal prism
9308	1769250.245	1624804.99	7284.765	FR	
9309	1769249.085	1624805.89	7284.655	FR	
9310	1769248.07	1624807.175	7285.035	FR	
9311	1769246.755	1624807.49	7283	TOS	
9312	1769246.545	1624807.165	7281.76	BOS	
9313	1769245.64	1624807.86	7281.78	BOS	
9314	1769246.175	1624808.275	7283.41	FR	
9315	1769246.625	1624807.835	7283.915	FR	
9316	1769247.155	1624808.06	7285.605	FR	
9317	1769246.525	1624808.705	7285.72	FR	
9318	1769246.145	1624808.925	7284.53	FR	
9319	1769245.38	1624809.27	7284.51	FR	
9320	1769245.365	1624809.18	7283.705	FR	
9321	1769245.27	1624809.085	7282.925	TOS	
9322	1769244.93	1624809.365	7282.64	TOS	
9323	1769244.49	1624809.695	7282.545	TOS	
9324	1769243.33	1624810.54	7282.29	TOS	
9325	1769242.83	1624810.905	7281.6	FR	
9326	1769243.05	1624810.795	7281.64	FR	
9327	1769243.61	1624810.385	7281.695	BOS	
9328	1769243.97	1624810.015	7281.375	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
9329	1769244.865	1624809.195	7281.91	BOS	
9330	1769244.57	1624808.825	7282.845	FR	horizontal prism
9331	1769245.195	1624809.12	7285.05	FR	horizontal prism
9332	1769245.155	1624809.3	7285.41	FR	horizontal prism
9333	1769244.45	1624810.155	7283.48	FR	
9334	1769244.69	1624809.84	7284.68	FR	
9335	1769244.965	1624809.965	7285.845	FR	
9336	1769243.7	1624811.265	7285.63	FR	
9337	1769243.225	1624811.695	7284.67	FR	
9338	1769243.685	1624811.17	7283.635	FR	
9339	1769244.455	1624810.16	7283.49	FR	
9340	1769242.62	1624812.49	7285.375	FR	
9341	1769242.79	1624812.395	7285.9	FR	
9342	1769242.74	1624812.71	7286.875	FR	
9343	1769242.985	1624813.125	7288.41	FR	
9344	1769243.42	1624812.165	7288.025	FR	
9345	1769243.745	1624811.5	7286.745	FR	
9346	1769244.47	1624811	7288.12	FR	
9347	1769244.255	1624811.74	7289.845	CP	
9348	1769244.83	1624810.25	7286.535	FR	
9349	1769246.045	1624810.095	7289.49	FR	
9350	1769246.17	1624809.71	7287.82	FR	
9351	1769245.32	1624809.635	7288.095	FR	horizontal prism
9352	1769245.36	1624809.255	7286.975	FR	horizontal prism
9353	1769245.19	1624809.23	7286.34	FR	horizontal prism
9354	1769245.45	1624809.155	7285.99	FR	horizontal prism
9355	1769246.6	1624808.345	7287.62	FR	horizontal prism
9356	1769246.455	1624809.12	7289.04	FR	horizontal prism
9357	1769247.725	1624807.765	7286.845	FR	
9358	1769248.26	1624808.215	7288.965	FR	
9359	1769249.165	1624806.725	7286.45	FR	
9360	1769249.375	1624807.415	7288.28	FR	
9361	1769249.715	1624806.015	7286.565	FR	
9362	1769250.58	1624805.71	7288.88	FR	
9363	1769250.615	1624805.35	7287.875	FR	
9364	1769249.635	1624806.155	7288.84	FR	horizontal prism
9365	1769249.76	1624806.385	7288.295	FR	horizontal prism
9366	1769249.755	1624805.64	7287.47	FR	horizontal prism
9367	1769249.065	1624805.54	7286.605	FR	horizontal prism
9368	1769250.985	1624803.87	7287.68	FR	horizontal prism
9369	1769250.91	1624804.375	7288.59	FR	horizontal prism
9370	1769250.855	1624804.935	7288.83	FR	horizontal prism
9371	1769251.115	1624804.735	7289.74	FR	horizontal prism
9372	1769250.28	1624805.715	7290.545	FR	horizontal prism
9373	1769250.515	1624806.675	7291.555	FR	
9374	1769250.315	1624807.145	7291.445	FR	
9375	1769251.34	1624805.83	7290.985	FR	
9376	1769252.055	1624805.675	7292.38	FR	
9377	1769248.96	1624807.395	7289.075	FR	horizontal prism
9378	1769249.225	1624808.025	7290.095	FR	horizontal prism
9379	1769249.645	1624808.155	7291.105	FR	horizontal prism
9380	1769248.755	1624808.365	7291.22	FR	horizontal prism
9381	1769250.325	1624807.695	7290.17	FR	
9382	1769248.38	1624808.655	7290.12	FR	
9383	1769249.435	1624809.29	7292.59	FR	
9384	1769251.03	1624807.135	7292.945	FR	
9385	1769249.44	1624809.31	7292.635	FR	
9386	1769248.62	1624809.59	7291.96	FR	
9387	1769248.535	1624809.46	7291.14	FR	
9388	1769247.81	1624810.005	7291.475	FR	
9389	1769248.31	1624810.27	7293.205	FR	
9390	1769246.86	1624810.91	7292.795	FR	
9391	1769246.765	1624810.66	7291.895	FR	
9392	1769246.435	1624810.305	7290.79	FR	
9393	1769245.605	1624810.845	7290.115	FR	
9394	1769247.35	1624811.38	7294.11	FR	
9395	1769247.745	1624811.71	7295.22	FR	
9396	1769246.785	1624812.565	7295.73	FR	
9397	1769246.19	1624812.63	7294.455	FR	
9398	1769245.625	1624811.98	7292.2	CP	

Point#	Northing	Easting	Elevation	Pcode	Notes
9399	1769248.8	1624810.94	7294.865	FR	
9400	1769249.87	1624809.865	7293.975	FR	
9401	1769250.54	1624810.325	7295.37	FR	
9402	1769250.94	1624808.425	7295.52	FR	
9403	1769250.48	1624808.475	7294.63	FR	
9404	1769250.265	1624808.515	7293.53	FR	
9405	1769251.87	1624806.38	7294.385	FR	
9406	1769251.745	1624806.665	7293.71	FR	
9407	1769251.94	1624807.12	7294.765	FR	
9408	1769252.045	1624807.865	7295.67	FR	
9409	1769251.265	1624806.92	7294.22	FR	horizontal prism
9410	1769252.8	1624805.26	7293.14	FR	
9411	1769255.155	1624803.285	7295.345	FR	
9412	1769254.175	1624804.445	7295.46	FR	
9413	1769254.08	1624804.2	7294.985	FR	
9414	1769252.985	1624805.105	7295.315	FR	horizontal prism; end survey 21 August 2007
7006	1769253.39	1624796.995	7277.63	BS	Backshot; start survey 22 August 2007
9415	1769242.455	1624811.415	7281.61	BOS	
9416	1769242.39	1624811.665	7282.26	TOS	
9417	1769242.41	1624811.835	7282.52	FR	
9418	1769242.585	1624812.37	7283.05	FR	
9419	1769242.66	1624812.67	7284.15	FR	
9420	1769242.065	1624813.69	7285.325	FR	
9421	1769241.46	1624814.35	7284.54	FR	
9422	1769242.27	1624813.31	7283.39	FR	
9423	1769241.36	1624813.365	7282.735	FR	
9424	1769241.305	1624812.995	7282	TOS	
9425	1769241.67	1624812.63	7281.635	BOS	
9426	1769240.84	1624813.745	7281.535	BOS	
9427	1769241.01	1624813.675	7282.085	TOS	
9428	1769241.605	1624814.615	7285.375	FR	
9429	1769240.87	1624815.135	7284.235	FR	
9430	1769240.15	1624815.595	7284.935	FR	
9431	1769239.735	1624816.245	7284.235	FR	
9432	1769240.655	1624815.015	7283.39	FR	
9433	1769239.935	1624815.845	7283.43	FR	
9434	1769240.5	1624814.35	7282.66	FR	
9435	1769240.385	1624814.24	7281.935	FR	
9436	1769240.37	1624814.965	7282.45	FR	
9437	1769240.13	1624814.775	7281.79	FR	
9438	1769239.92	1624814.705	7281.23	BOS	
9439	1769240.005	1624815.325	7281.71	TOS	
9440	1769239.375	1624815.995	7281.6	TOS	
9441	1769239.47	1624815.99	7282.09	FR	
9442	1769239.685	1624816.035	7282.725	FR	
9443	1769239.24	1624816.815	7284.455	FR	
9444	1769238.575	1624817.16	7283.57	FR	
9445	1769238.89	1624817.045	7282.88	FR	
9446	1769238.565	1624816.735	7282.09	FR	
9447	1769238.83	1624816.6	7281.61	TOS	
9448	1769238.92	1624816.915	7281.365	BOS	
9449	1769238.275	1624818.23	7284.63	FR	
9450	1769237.715	1624818.55	7283.69	FR	
9451	1769238.285	1624818.105	7283.525	FR	
9452	1769237.065	1624818.915	7283.275	FR	
9453	1769237.975	1624817.925	7282.52	FR	
9454	1769237.44	1624818.39	7282.64	FR	
9455	1769237.055	1624817.845	7281.665	FR	horizontal prism
9456	1769237.91	1624817.33	7281.555	TOS	horizontal prism
9457	1769236.745	1624819.78	7283.86	FR	
9458	1769236.98	1624820.435	7284.94	FR	
9459	1769237.17	1624819.935	7285.35	FR	
9460	1769237.505	1624819.47	7287.15	FR	
9461	1769237.42	1624819.26	7286.035	FR	
9462	1769237.67	1624818.955	7284.815	FR	
9463	1769238.295	1624818.58	7286.405	FR	
9464	1769238.565	1624817.69	7285.26	FR	
9465	1769239.155	1624817.17	7286.02	FR	
9466	1769239.38	1624817.105	7286.56	FR	
9467	1769239.87	1624816.545	7286.63	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
9468	1769240.175	1624816.115	7286.29	FR	
9469	1769240.525	1624815.455	7286.97	FR	
9470	1769238.895	1624818.19	7287.26	FR	
9471	1769239.9	1624816.3	7285.725	FR	
9472	1769240.39	1624815.785	7285.775	FR	
9473	1769242.08	1624814.015	7287.725	FR	
9474	1769241.86	1624814.375	7286.73	CP	
9475	1769241.155	1624815.485	7285.61	FR	
9476	1769241.03	1624815.23	7287.195	FR	
9477	1769240.88	1624814.775	7287.545	FR	horizontal prism
9478	1769244.05	1624813.415	7291	CP	
9479	1769242.395	1624814.3	7289.83	FR	
9480	1769242.17	1624814.03	7288.63	FR	
9481	1769241.78	1624814.985	7288.58	FR	
9482	1769241.12	1624815.16	7289.655	FR	horizontal prism
9483	1769240.935	1624815.845	7290.995	FR	horizontal prism
9484	1769240.85	1624816.76	7290.57	FR	
9485	1769241.05	1624815.645	7288.64	FR	
9486	1769239.995	1624816.765	7288.225	CP	
9487	1769238.585	1624818.44	7288.435	FR	
9488	1769238.84	1624818.35	7289.465	FR	
9489	1769237.7	1624819.395	7288.27	CP	
9490	1769237.18	1624820.03	7287.975	FR	
9491	1769239.645	1624817.605	7289.835	FR	
9492	1769239.165	1624818.445	7290.465	FR	
9493	1769240.04	1624818.17	7291.21	FR	
9494	1769239.505	1624818.81	7291.395	FR	
9495	1769238.85	1624819.365	7290.65	FR	
9496	1769238.27	1624819.78	7290.19	FR	
9497	1769237.415	1624820.495	7289.365	FR	
9498	1769237.76	1624820.57	7290.84	FR	
9499	1769240.845	1624817.43	7292.155	FR	
9500	1769241.66	1624816.685	7292.2	FR	
9501	1769242.245	1624815.37	7292.185	FR	
9502	1769243.48	1624814.45	7292.71	CP	
9503	1769244.575	1624813.37	7293.205	CP	
9504	1769245.45	1624814.1	7295.225	FR	
9505	1769245.395	1624814.03	7294.44	FR	
9506	1769244.855	1624815.305	7296.12	FR	
9507	1769244.12	1624815.69	7295.5	FR	
9508	1769243.755	1624816.8	7295.905	FR	
9509	1769242.8	1624816.91	7294.71	FR	
9510	1769242.035	1624817.075	7293.895	FR	
9511	1769243.685	1624815.875	7293.8	FR	
9512	1769240.64	1624818.47	7294.135	FR	
9513	1769242.01	1624817.22	7294.58	FR	horizontal prism
9514	1769242.595	1624817.545	7295.535	FR	horizontal prism
9515	1769239.61	1624818.945	7293.005	CP	
9516	1769236.375	1624819.675	7282.4	FR	
9517	1769236.255	1624820.71	7283.185	FR	
9518	1769235.805	1624821.775	7283.875	FR	
9519	1769235.95	1624821.665	7282.795	FR	
9520	1769236.525	1624821.385	7284.92	FR	
9521	1769236.565	1624820.74	7287.22	FR	
9522	1769236.09	1624821.83	7287.285	FR	
9523	1769236.15	1624821.535	7286.16	CP	
9524	1769235.585	1624822.41	7286.455	FR	
9525	1769236.005	1624822.575	7284.785	FR	
9526	1769235.47	1624822.53	7284.17	FR	
9527	1769235.345	1624823.085	7285.79	FR	
9528	1769235.255	1624823.655	7285.21	FR	
9529	1769234.81	1624823.775	7284.935	FR	
9530	1769235.12	1624823.03	7287.485	FR	
9531	1769235.24	1624823.29	7283.135	FR	
9532	1769234.64	1624824.595	7283.43	FR	
9533	1769234.28	1624825.08	7284.955	FR	
9534	1769234.385	1624825.1	7285.825	FR	
9535	1769234.345	1624824.625	7286.565	FR	
9536	1769233.84	1624826.07	7286.1	FR	
9537	1769233.785	1624826.18	7285.32	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
9538	1769233.9	1624826.285	7284.03	FR	
9539	1769234.165	1624825.5	7283.055	FR	
9540	1769233.625	1624826.31	7282.745	FR	
9541	1769233.66	1624825.685	7282.075	FR	
9542	1769234.62	1624824.22	7282.625	FR	
9543	1769232.94	1624827.03	7282.08	FR	
9544	1769233.435	1624827.105	7283.135	FR	
9545	1769233.37	1624827.235	7284.99	FR	
9546	1769233.185	1624827.65	7284.06	FR	
9547	1769233.17	1624827.2	7286.43	FR	
9548	1769233.205	1624826.665	7286.96	FR	
9549	1769232.795	1624827.01	7287.83	FR	
9550	1769232.835	1624826.95	7289.055	FR	
9551	1769232.96	1624826.87	7289.935	FR	
9552	1769232.595	1624827.855	7290.67	FR	
9553	1769233.585	1624827.02	7291.335	FR	
9554	1769234.515	1624826.2	7291.99	FR	
9555	1769234.825	1624825.32	7291.34	CP	
9556	1769233.13	1624826.43	7289.045	FR	
9557	1769233.57	1624825.625	7287.98	CP	
9558	1769235.84	1624824.175	7291.715	CP	
9559	1769235.23	1624824.335	7289.39	CP	
9560	1769236.365	1624823.18	7290.63	FR	
9561	1769234.57	1624824.82	7288.925	FR	
9562	1769234.49	1624823.975	7287.555	FR	horizontal prism
9563	1769236.825	1624822.26	7288.96	FR	
9564	1769236.945	1624821.675	7289.96	FR	
9565	1769237.14	1624821.31	7289.145	FR	
9566	1769236.97	1624820.985	7288.59	FR	
9567	1769236.63	1624821.205	7287.95	FR	
9568	1769237.87	1624820.74	7291.82	FR	
9569	1769238.055	1624821.065	7293.08	FR	
9570	1769237.09	1624822.635	7291.58	FR	
9571	1769239.595	1624819.725	7293.98	FR	
9572	1769240.54	1624819.785	7294.89	FR	
9573	1769240.585	1624821.17	7295.56	FR	
9574	1769239.41	1624821.72	7294.63	FR	
9575	1769238.415	1624821.995	7294.09	FR	
9576	1769237.81	1624822.24	7293.36	FR	
9577	1769237.825	1624823.89	7295.225	FR	
9578	1769238.53	1624823.235	7294.89	FR	
9579	1769237.745	1624823.475	7294	FR	
9580	1769237.22	1624824.58	7294.38	FR	
9581	1769237.105	1624823.635	7293.165	FR	
9582	1769235.88	1624824.11	7291.745	CP	
9583	1769235.645	1624825.105	7293.175	FR	
9584	1769234.24	1624827.325	7292.44	FR	
9585	1769235.155	1624827.58	7293.895	FR	
9586	1769235.4	1624826.385	7293.7	FR	
9587	1769230.84	1624827.91	7281.895	FR	
9588	1769231.64	1624828	7282.72	FR	
9589	1769231.175	1624828.345	7283.285	FR	
9590	1769230.335	1624828.705	7282.68	FR	
9591	1769232.575	1624827.995	7282.575	FR	
9592	1769232.845	1624828.085	7285.93	FR	
9593	1769232.505	1624828.435	7286.97	CP	
9594	1769230.89	1624828.79	7287.215	FR	
9595	1769231.37	1624828.825	7285.38	FR	
9596	1769230.65	1624828.885	7285.8	FR	
9597	1769231.575	1624828.965	7284.71	FR	
9598	1769229.33	1624830.16	7283.6	CP	
9599	1769229.79	1624829.66	7284.635	FR	
9600	1769229.615	1624829.99	7286.2	FR	
9601	1769228.825	1624830.9	7285.465	CP	
9602	1769228.63	1624831.07	7284.265	FR	
9603	1769228.45	1624831.535	7286.5	FR	
9604	1769227.555	1624832.54	7285.16	FR	
9605	1769227.075	1624833.185	7284.29	FR	
9606	1769227.065	1624832.955	7282.74	FR	
9607	1769226.625	1624833.255	7282.3	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
9608	1769226.135	1624833.85	7282.43	FR	
9609	1769226.13	1624834.17	7283.54	FR	
9610	1769226.23	1624834.36	7284.58	FR	
9611	1769226.545	1624833.89	7285.675	CP	
9612	1769228.455	1624831.525	7286.485	FR	
9613	1769227.555	1624832.055	7282.715	FR	
9614	1769225.76	1624835.095	7287.765	FR	
9615	1769226.27	1624834.475	7288.22	FR	
9616	1769226.265	1624834.255	7287.27	FR	
9617	1769226.73	1624834.94	7289.425	FR	
9618	1769226.53	1624835.36	7289.43	FR	
9619	1769227.42	1624833.775	7289.215	FR	
9620	1769227.92	1624833.22	7290.345	FR	
9621	1769227.13	1624833.255	7286.975	FR	
9622	1769228.815	1624831.525	7289.645	FR	
9623	1769229.09	1624830.92	7287.215	FR	
9624	1769230.12	1624829.965	7288.435	FR	
9625	1769228.11	1624832.19	7288.065	FR	
9626	1769230.105	1624829.645	7287.325	FR	
9627	1769232.015	1624828.31	7288.605	CP	
9628	1769231.99	1624828.595	7290.01	FR	
9629	1769231.16	1624829.77	7289.37	FR	
9630	1769232.485	1624828.77	7291.52	FR	
9631	1769232.215	1624829.78	7292.085	FR	
9632	1769231.77	1624829.565	7290.64	FR	
9633	1769229.815	1624831.38	7291.405	FR	
9634	1769231.295	1624830.6	7291.99	FR	
9635	1769230.455	1624830.665	7290.285	FR	
9636	1769228.945	1624833.32	7291.565	FR	
9637	1769227.475	1624834.54	7290.77	FR	
9638	1769228.44	1624834.54	7291.36	FR	
9639	1769227.045	1624835.59	7290.76	FR	
9640	1769228.645	1624834.885	7292.225	FR	
9641	1769230.44	1624833.545	7292.775	FR	
9642	1769231.45	1624834.365	7294.185	FR	
9643	1769231.685	1624832.175	7293.265	FR	
9644	1769230.8	1624832.025	7292.435	FR	
9645	1769232.325	1624830.99	7293.195	CP	
9646	1769233.495	1624830.15	7293.405	FR	
9647	1769233.77	1624829.04	7293.135	FR	End survey 22 August 2007
7006	1769253.385	1624797.02	7277.635	BS	Backshot; start survey 23 August 2007
9648	1769230.105	1624835.61	7293.765	FR	
9649	1769228.785	1624837.86	7293.71	FR	
9650	1769227.71	1624839.415	7293.68	FR	
9651	1769226.265	1624838.965	7292.5	FR	
9652	1769227.64	1624837.58	7292.6	FR	
9653	1769227.15	1624837.205	7292.215	FR	
9654	1769227.955	1624835.925	7291.77	FR	
9655	1769228.63	1624835.515	7292.685	FR	
9656	1769225.6	1624840.22	7293.005	FR	
9657	1769226.27	1624838.935	7292.495	FR	
9658	1769226.41	1624836.905	7291.41	CP	
9659	1769227.1	1624835.37	7291.16	FR	horizontal prism
9660	1769225.265	1624840.945	7293.13	FR	
9661	1769225.61	1624840.205	7293.015	FR	
9662	1769225.5	1624838.675	7291.915	FR	
9663	1769224.925	1624838.14	7291.075	FR	
9664	1769224.62	1624839.69	7291.87	FR	
9665	1769223.235	1624840.355	7290.815	FR	
9666	1769222.835	1624839.32	7289.835	FR	
9667	1769223.625	1624839.2	7290.9	FR	
9668	1769223.78	1624839.03	7289.67	FR	
9669	1769224.64	1624838.425	7289.645	FR	
9670	1769225.255	1624837.17	7290.27	FR	
9671	1769224.145	1624837.565	7288.315	CP	
9672	1769224.91	1624836.51	7288.79	FR	
9673	1769224.595	1624837.13	7289.595	FR	horizontal prism
9674	1769225.03	1624836.095	7289.465	FR	horizontal prism
9675	1769222.04	1624839.67	7289.155	FR	horizontal prism
9676	1769221.675	1624839.46	7287.66	CP	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
9677	1769222.825	1624838.595	7286.945	FR	horizontal prism
9678	1769222.485	1624838.8	7286.275	FR	horizontal prism
9679	1769222.94	1624839.36	7288.67	FR	
9680	1769222.92	1624838.17	7285.535	FR	
9681	1769223.2	1624837.85	7285.765	FR	
9682	1769223.835	1624837.125	7286.41	FR	
9683	1769224.14	1624836.64	7285.485	FR	
9684	1769224.905	1624836.105	7287.255	FR	
9685	1769224.735	1624835.05	7286.445	FR	horizontal prism
9686	1769224.12	1624836.65	7285.445	FR	
9687	1769225.04	1624835.48	7284.81	FR	
9688	1769224.87	1624835.5	7283.61	FR	
9689	1769223.535	1624836.905	7282.545	FR	
9690	1769223.69	1624836.965	7284.025	CP	
9691	1769223.19	1624837.845	7285.72	FR	
9692	1769222.925	1624838.14	7285.48	FR	
9693	1769222.74	1624838.125	7284.415	FR	
9694	1769221.55	1624839.8	7284.59	FR	
9695	1769221.69	1624839.29	7283.405	FR	
9696	1769222.115	1624838.655	7282.56	FR	
9697	1769220.905	1624840.47	7283.255	FR	
9698	1769221.555	1624840.5	7285.865	FR	
9699	1769220.61	1624841.41	7285.595	FR	
9700	1769219.555	1624841.41	7284.585	FR	horizontal prism
9701	1769224.745	1624835.35	7282.335	FR	
9702	1769225.105	1624834.715	7281.43	FR	
9703	1769224.47	1624835.22	7280.85	FR	
9704	1769224.48	1624835.235	7280.29	C34	
9705	1769222.985	1624837.135	7280.36	C34	
9706	1769223.535	1624836.91	7282.535	FR	
9707	1769221.935	1624838.705	7281.195	FR	
9708	1769220.71	1624840.415	7281.835	FR	
9709	1769221.975	1624838.56	7280.53	C34	
9710	1769221.215	1624839.62	7280.46	C34	
9711	1769220.4	1624840.775	7280.535	C34	
9712	1769219.67	1624841.83	7280.63	C34	
9713	1769219.53	1624842.15	7281.69	FR	
9714	1769219.035	1624842.725	7281.44	FR	
9715	1769219.025	1624842.82	7282.73	FR	
9716	1769219.075	1624842.99	7284.42	FR	
9717	1769218.415	1624843.785	7283.995	FR	
9718	1769218.325	1624843.84	7282.475	FR	
9719	1769217.755	1624844.72	7282.9	FR	
9720	1769217.6	1624844.89	7284.165	FR	
9721	1769217.58	1624844.96	7284.54	FR	
9722	1769218.665	1624843.175	7280.68	C34	
9723	1769218.24	1624843.73	7280.78	TOS	
9724	1769218.19	1624843.865	7280.61	BOS	
9725	1769217.49	1624844.64	7280.59	BOS	
9726	1769217.18	1624845.06	7280.93	TOS	
9727	1769216.805	1624845.545	7280.585	BOS	
9728	1769216.015	1624846.69	7281.235	TOS	
9729	1769218.14	1624844.045	7281.495	FR	
9730	1769217.765	1624844.49	7281.795	FR	
9731	1769216.755	1624845.735	7281.67	FR	
9732	1769216.585	1624845.915	7280.87	FR	
9733	1769216.37	1624846.17	7281.52	FR	
9734	1769215.535	1624847.26	7281.31	FR	
9735	1769214.945	1624848.12	7283.445	FR	
9736	1769215.565	1624847.41	7283.45	FR	
9737	1769215.405	1624847.55	7284.985	FR	
9738	1769216.465	1624846.19	7283.43	FR	
9739	1769216.875	1624845.865	7285.15	FR	
9740	1769218.975	1624842.735	7286.135	FR	horizontal prism
9741	1769218.505	1624843.09	7286.805	FR	horizontal prism
9742	1769218.425	1624843.95	7285.445	FR	
9743	1769217.46	1624845.435	7286.945	FR	
9744	1769215.84	1624847.24	7286.715	FR	
9745	1769215.07	1624847.915	7285.92	FR	
9746	1769215.52	1624848.06	7288.215	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
9747	1769216.62	1624846.835	7288.585	FR	
9748	1769218.37	1624844.73	7288.31	CP	
9749	1769222.72	1624846.365	7293.85	FR	
9750	1769223.44	1624844.76	7293.14	FR	
9751	1769224.215	1624843.87	7293.505	FR	
9752	1769224.85	1624842.14	7293.185	FR	
9753	1769223.725	1624841.695	7291.795	FR	
9754	1769222.985	1624841.21	7291.46	FR	horizontal prism
7006	1769253.415	1624796.99	7277.635	BS	Backshot; start 2nd station setup on 23 Aug
9756	1769220.78	1624847.38	7293.685	FR	
9757	1769219.675	1624846.915	7292.98	FR	
9758	1769220.395	1624845.895	7291.34	FR	
9759	1769221.155	1624845.165	7291.43	FR	
9760	1769221.735	1624843.855	7290.87	FR	
9761	1769221.365	1624843.94	7289.96	FR	
9762	1769220.275	1624845.53	7292.265	FR	horizontal prism
9763	1769222.91	1624843	7292.5	FR	
9764	1769222.83	1624844.9	7292.625	FR	
9765	1769222.64	1624843.72	7291.75	FR	
9766	1769222.82	1624841.91	7291.145	FR	
9767	1769222.515	1624842.835	7290.89	FR	
9768	1769218.49	1624846	7291.035	FR	horizontal prism
9769	1769217.66	1624846.135	7290.355	FR	horizontal prism
9770	1769217.58	1624845.74	7290.075	FR	horizontal prism
9771	1769217.64	1624844.755	7289.795	FR	horizontal prism
9772	1769219.71	1624844.91	7290.315	FR	
9773	1769219.15	1624844.365	7289.27	FR	
9774	1769221.435	1624843.945	7289.95	FR	
9775	1769220.71	1624843.745	7289.19	FR	
9776	1769219.82	1624843.475	7288.15	FR	
9777	1769220.09	1624843.21	7288.28	FR	
9778	1769222.36	1624841.445	7289.61	FR	
9779	1769221.015	1624841.555	7287.69	CP	
9780	1769219.075	1624849.825	7293.845	FR	
9781	1769219.84	1624848.66	7293.645	FR	
9782	1769219.17	1624847.695	7292.685	FR	
9783	1769218.545	1624847.69	7291.845	FR	
9784	1769218.305	1624848.78	7292.82	FR	
9785	1769217.44	1624850.24	7293.51	FR	
9786	1769217.255	1624848.59	7291.445	CP	
9787	1769219.24	1624846.71	7292.23	FR	
9788	1769216.445	1624851.745	7293.28	FR	
9789	1769216.605	1624849.8	7291.59	CP	
9790	1769217.085	1624847.125	7289.26	FR	
9791	1769216.845	1624848.155	7290.055	FR	
9792	1769216.385	1624848.99	7290.47	FR	
9793	1769215.795	1624849.505	7290.075	FR	
9794	1769215.395	1624849.285	7289.105	FR	
9795	1769217.2	1624845.495	7288.815	FR	horizontal prism
9796	1769212.67	1624856	7293.645	FR	
9797	1769213.28	1624855.055	7293.505	FR	
9798	1769214.085	1624854.745	7293.74	FR	
9799	1769213.105	1624854.305	7292.205	CP	
9800	1769212.585	1624854.49	7291.615	FR	
9801	1769215.33	1624853.98	7293.23	FR	
9802	1769215.26	1624853.22	7292.36	FR	
9803	1769215.81	1624851.015	7291.88	FR	
9804	1769215.445	1624850.855	7290.905	FR	
9805	1769215.25	1624850.73	7290.345	FR	
9806	1769213.8	1624851.91	7291.1	FR	horizontal prism
9807	1769213.825	1624851.215	7290.475	FR	horizontal prism
9808	1769214.85	1624850.705	7290.315	FR	
9809	1769211.575	1624855.22	7291.875	FR	horizontal prism
9810	1769212.26	1624854.05	7290	FR	
9811	1769213.65	1624851.79	7288.65	FR	
9812	1769213.32	1624851.76	7287.735	FR	
9813	1769214.39	1624850.61	7288.12	FR	
9814	1769214.28	1624850.565	7287.505	FR	
9815	1769210.735	1624855.145	7287.065	FR	
9816	1769211.885	1624853.755	7287.41	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
9817	1769211.715	1624853.245	7286.08	FR	
9818	1769210.695	1624854.68	7285.91	FR	
9819	1769211.91	1624852.395	7284.845	FR	
9820	1769212.115	1624851.605	7286.21	FR	horizontal prism
9821	1769211.69	1624852.215	7283.55	FR	
9822	1769212.595	1624851.07	7283.67	FR	
9823	1769213.47	1624850.49	7285.55	FR	
9824	1769213.34	1624850.535	7284.215	FR	
9825	1769214.56	1624849.135	7285.63	FR	
9826	1769213.635	1624850.18	7283.285	FR	
9827	1769213.06	1624850.5	7282.695	FR	
9828	1769212.625	1624851.025	7283.64	FR	
9829	1769214.58	1624849.12	7285.645	FR	
9830	1769214.69	1624848.805	7282.185	FR	
9831	1769214.035	1624849.755	7281.87	FR	
9832	1769215.68	1624847.475	7280.275	FR	
9833	1769215	1624848.48	7280.145	FR	
9834	1769215.135	1624848.15	7281.35	FR	
9835	1769215.39	1624847.8	7281.075	TOS	
9836	1769214.365	1624849.2	7280.985	TOS	
9837	1769215.645	1624847.54	7280.46	BOS	
9838	1769215.255	1624848.155	7280.45	BOS	
9839	1769214.28	1624849.37	7280.47	BOS	
9840	1769213.29	1624850.2	7280.265	BOS	
9841	1769212.64	1624850.15	7281.91	FR	
9842	1769212.64	1624850.735	7280.935	TOS	
9843	1769212.65	1624850.74	7280.81	TOS	
9844	1769210.46	1624854.62	7284.75	FR	
9845	1769209.94	1624854.615	7283.455	FR	
9846	1769210.585	1624853.815	7283.39	FR	
9847	1769210.42	1624853.73	7281.77	FR	
9848	1769211.16	1624852.64	7280.2	BOS	
9849	1769212.13	1624851.45	7280.29	BOS	
9850	1769211.845	1624851.73	7280.925	TOS	End survey 23 August 2007
7006	1769253.395	1624797.015	7277.635	BS	backshot; start survey 27 August 2007
9851	1769224.45	1624834.85	7275.825	FR	
9852	1769223.87	1624835.525	7275.99	FR	
9853	1769223.9	1624835.375	7277.66	FR	
9854	1769225.025	1624835.41	7278.85	FR	
9855	1769222.96	1624837.65	7277.805	FR	
9856	1769222.02	1624839.045	7279.065	FR	
9857	1769221.92	1624839.17	7278.075	FR	
9858	1769222.535	1624838.075	7276.575	FR	
9859	1769221.52	1624839.51	7277.125	FR	
9860	1769220.68	1624840.725	7277.89	FR	
9861	1769219.7	1624841.87	7276.565	CP	
9862	1769219.31	1624842.765	7278.585	CP	
9863	1769218.145	1624844.125	7277.24	CP	
9864	1769217.335	1624845.525	7279.3	CP	
9865	1769216.31	1624846.82	7278.795	CP	
9866	1769216.065	1624846.82	7276.9	CP	
9867	1769215.28	1624848.42	7278.335	FR	
9868	1769214.635	1624849.32	7278.785	FR	
9869	1769214.66	1624848.88	7277.93	FR	
9870	1769212.965	1624851	7279.03	FR	
9871	1769213.275	1624850.68	7277.96	FR	
9872	1769213.21	1624850.045	7276.685	FR	
9873	1769212.35	1624851.4	7276.43	FR	
9874	1769211.14	1624852.9	7278.795	CP	
9875	1769210.69	1624853.485	7276.86	CP	
9876	1769210.785	1624853.465	7281.08	TOS	
9877	1769210.55	1624853.79	7280.18	BOS	
9878	1769210.16	1624854.385	7281.905	FR	
9879	1769210.095	1624854.775	7281.32	TOS	
9880	1769210.05	1624854.465	7280.13	BOS	
9881	1769210.23	1624854.195	7278.145	FR	
9882	1769208.84	1624855.2	7276.7	CP	
9883	1769208.6	1624856.455	7278.525	CP	
9884	1769208.965	1624855.805	7280.235	BOS	
9885	1769207.78	1624857.305	7280.09	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
9886	1769207.52	1624859	7280.08	BOS	
9887	1769206.075	1624860.715	7279.98	BOS	
9888	1769205.35	1624861.99	7280.01	BOS	
9889	1769205.33	1624862.015	7280.16	BOS	
9890	1769203.955	1624863.7	7280.22	BOS	
9891	1769202.22	1624865.47	7280.23	BOS	
9892	1769200.95	1624866.96	7280.065	BOS	
9893	1769200.08	1624868.005	7280.09	BOS	
9894	1769199.955	1624868.33	7280.505	TOS	
9895	1769200.68	1624867.295	7280.765	TOS	
9896	1769201.855	1624866	7281.185	TOS	
9897	1769202.755	1624865.03	7281.615	TOS	
9898	1769203.89	1624863.905	7282.005	TOS	
9899	1769205.02	1624862.37	7282.18	TOS	
9900	1769205.785	1624861.34	7282.04	TOS	
9901	1769206.825	1624859.735	7281.535	TOS	
9902	1769208.075	1624858.035	7281.405	TOS	
9903	1769208.52	1624856.31	7281.52	TOS	
9904	1769209.635	1624856.22	7281.775	FR	
9905	1769207.175	1624857.42	7276.535	CP	
9906	1769206.72	1624858.63	7276.22	FR	
9907	1769206.8	1624858.86	7277.195	FR	
9908	1769207.05	1624859.235	7278.095	FR	
9909	1769208.035	1624858.33	7280.64	FR	
9910	1769208.3	1624856.96	7282.27	FR	
9911	1769208.15	1624857.685	7281.535	FR	
9912	1769207.89	1624858.68	7281.885	FR	
9913	1769207.32	1624859.02	7282.585	FR	
9914	1769206.42	1624860.425	7281.95	FR	
9915	1769206.37	1624860.505	7282.805	FR	
9916	1769206.045	1624860.71	7282.07	FR	
9917	1769205.77	1624861.09	7281.455	FR	
9918	1769205.6	1624861.195	7277.37	FR	
9919	1769205.32	1624862.22	7277.845	FR	
9920	1769205.065	1624862.37	7279.125	FR	
9921	1769204.29	1624862.525	7277.225	FR	
9922	1769203.59	1624862.5	7276.195	FR	
9923	1769203.19	1624863.22	7276.26	FR	
9924	1769203.945	1624863.75	7278.13	FR	
9925	1769202.475	1624864.035	7276.22	FR	
9926	1769202.64	1624864.695	7277.18	FR	
9927	1769203.13	1624864.67	7279.225	CP	
9928	1769200.905	1624866.445	7276.485	CP	
9929	1769201.265	1624866.38	7278.145	FR	
9930	1769201.265	1624866.845	7279.165	FR	
9931	1769200.21	1624868	7277.935	FR	
9932	1769199.835	1624869.09	7280.66	FR	
9933	1769199.93	1624869.37	7281.495	FR	
9934	1769200.17	1624868.55	7282.26	FR	
9935	1769200.43	1624868.06	7281.56	FR	
9936	1769200.5	1624867.625	7280.415	FR	
9937	1769201.035	1624867.735	7282.085	FR	
9938	1769201.66	1624866.39	7281.355	FR	
9939	1769203.5	1624864.15	7281.455	FR	
9940	1769204.44	1624863.71	7282.03	FR	
9941	1769204.525	1624863.395	7282.53	FR	
9942	1769199.665	1624869	7280.095	TOS	
9943	1769198.625	1624869.84	7280.055	TOS	
9944	1769198.055	1624870.665	7279.945	TOS	
9945	1769197.265	1624871.555	7279.84	TOS	
9946	1769195.745	1624873.14	7279.815	TOS	
9947	1769195.3	1624874.265	7279.74	TOS	
9948	1769194.5	1624875.33	7279.87	TOS	
9949	1769193.36	1624876.035	7279.85	TOS	
9950	1769192.075	1624877.485	7279.585	TOS	
9951	1769191.17	1624878.55	7279.53	TOS	
9952	1769191.11	1624878.695	7279.665	TOS	
9953	1769190.015	1624879.82	7279.59	TOS	
9954	1769188.855	1624881.545	7279.215	TOS	
9955	1769188.98	1624881.12	7278.595	BOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
9956	1769189.795	1624879.975	7278.785	BOS	
9957	1769190.59	1624878.965	7279.18	BOS	
9958	1769191.605	1624877.885	7279.255	BOS	
9959	1769192.915	1624876.485	7279.42	BOS	
9960	1769193.85	1624875.43	7279.565	BOS	
9961	1769194.98	1624874.39	7279.605	BOS	
9962	1769195.545	1624873.48	7279.595	BOS	
9963	1769196.6	1624872.2	7279.705	BOS	
9964	1769197.32	1624871.81	7279.58	BOS	
9965	1769197.955	1624870.77	7279.77	BOS	
9966	1769199.14	1624869.375	7279.95	BOS	
9967	1769199.135	1624869.975	7281.83	FR	
9968	1769198.85	1624870.73	7282.28	FR	
9969	1769198.24	1624871.275	7281.59	FR	
9970	1769198.83	1624870.445	7280.975	FR	
9971	1769198.385	1624870.45	7279.98	FR	
9972	1769197.78	1624871.04	7280.315	FR	
9973	1769197.765	1624871.06	7279.565	FR	
9974	1769197.385	1624871.48	7278.805	FR	
9975	1769197.79	1624871.835	7282.275	FR	
9976	1769197.07	1624872.665	7282.035	FR	
9977	1769197.035	1624872.325	7280.795	FR	
9978	1769196.535	1624872.985	7281.09	FR	
9979	1769196.915	1624871.995	7279.995	FR	
9980	1769196.22	1624872.77	7279.845	FR	
9981	1769196.5	1624873.915	7282.195	FR	
9982	1769196.015	1624873.975	7281.16	FR	
9983	1769195.605	1624873.58	7280.225	FR	
9984	1769195.355	1624874.17	7280.65	FR	
9985	1769195.14	1624873.02	7277.69	FR	
9986	1769194.695	1624874.675	7279.92	FR	
9987	1769194.48	1624875.3	7280.845	FR	
9988	1769195.12	1624875.59	7281.67	FR	
9989	1769194.26	1624876.7	7281.86	FR	
9990	1769194.06	1624876	7280.95	FR	
9991	1769193.76	1624875.75	7280.235	FR	
9992	1769193.395	1624876.685	7280.645	FR	
9993	1769192.945	1624878.17	7281.44	FR	
9994	1769192.6	1624877.43	7280.45	FR	
9995	1769192.465	1624876.875	7279.795	FR	
9996	1769192.28	1624878.11	7280.475	FR	
9997	1769192.065	1624879.13	7281.23	FR	
9998	1769191.48	1624879.12	7280.485	FR	
9999	1769191.105	1624878.575	7279.42	FR	
10000	1769191.935	1624879.29	7282.355	FR	
10001	1769191.1	1624880.15	7282.39	FR	
10002	1769190.66	1624880.025	7281.035	FR	
10003	1769190.505	1624879.53	7279.875	FR	
10004	1769189.515	1624880.445	7279.555	FR	
10005	1769189.735	1624880.845	7280.595	FR	
10006	1769190.175	1624880.775	7281.89	FR	
10007	1769189.595	1624881.475	7281.88	FR	
10008	1769189.335	1624882.005	7282.265	FR	
10009	1769189.475	1624881.49	7281.315	FR	
10010	1769189.2	1624881.34	7280.085	FR	
10011	1769189.26	1624881.015	7279.645	FR	
10012	1769189.185	1624881.035	7279.11	FR	
10013	1769188.835	1624881.835	7279.41	FR	
10014	1769198.455	1624869.565	7278.435	CP	
10015	1769197.44	1624869.95	7276.52	FR	
10016	1769197.235	1624871.19	7277.365	FR	
10017	1769195.75	1624871.555	7276.14	CP	
10018	1769194.745	1624873.22	7276.625	FR	
10019	1769193.98	1624873.83	7276.54	FR	
10020	1769193.655	1624874.465	7277.28	FR	
10021	1769193.285	1624875.365	7277.605	FR	
10022	1769192.17	1624876.015	7276.57	CP	
10023	1769191.295	1624877.8	7277.955	CP	
10024	1769189.985	1624878.595	7276.125	CP	
10025	1769188.13	1624881.455	7277.025	CP	

Point#	Northing	Easting	Elevation	Pcode	Notes
10026	1769188.605	1624882.54	7279.47	FR	
10027	1769188.14	1624882.505	7278.75	FR	
10028	1769188.38	1624882.815	7279.61	FR	
10029	1769188.07	1624883.14	7280.305	FR	
10030	1769188.49	1624882.945	7281.015	FR	
10031	1769188.755	1624882.78	7281.865	FR	
10032	1769187.62	1624883.975	7281.58	FR	
10033	1769187.12	1624884.29	7280.63	FR	
10034	1769187.255	1624883.88	7279.9	FR	
10035	1769187.535	1624883.275	7279.06	FR	
10036	1769187.21	1624884.63	7282.39	FR	
10037	1769186.565	1624885.415	7282.3	FR	
10038	1769186.235	1624885.705	7281.84	FR	
10039	1769186.415	1624885.21	7280.63	FR	
10040	1769186.56	1624884.83	7279.885	FR	
10041	1769185.74	1624886.395	7282.63	FR	
10042	1769185.545	1624886.46	7281.74	FR	
10043	1769185.36	1624886.265	7280.345	FR	
10044	1769185.01	1624887.225	7282.215	FR	
10045	1769184.58	1624887.93	7282.68	FR	
10046	1769184.615	1624887.68	7280.985	FR	
10047	1769184.75	1624887.12	7279.545	FR	
10048	1769183.985	1624887.93	7279.915	FR	
10049	1769183.14	1624889.405	7281.585	FR	
10050	1769182.775	1624889.56	7280.445	FR	
10051	1769182.605	1624889.77	7279.515	FR	
10052	1769182.095	1624890.825	7282.255	FR	
10053	1769181.945	1624890.88	7281.23	FR	
10054	1769180.81	1624892.375	7281.12	FR	
10055	1769180.035	1624892.095	7280.675	FR	
10056	1769178.465	1624893.915	7280.855	FR	
10057	1769178.555	1624893.55	7280.49	TOS	
10058	1769179.74	1624892.52	7280.355	TOS	
10059	1769181.845	1624890.9	7279.775	TOS	
10060	1769182.795	1624889.48	7279.36	TOS	
10061	1769183.675	1624888.3	7279.125	TOS	
10062	1769184.555	1624887.115	7279.06	TOS	
10063	1769184.895	1624886.87	7279.2	TOS	
10064	1769185.585	1624885.76	7279.18	TOS	
10065	1769186.5	1624884.5	7279.03	TOS	
10066	1769187.9	1624882.89	7278.825	TOS	
10067	1769188.005	1624882.545	7278.315	BOS	
10068	1769186.97	1624883.885	7278.27	BOS	
10069	1769185.96	1624885.145	7278.255	BOS	
10070	1769185.265	1624886.11	7278.305	BOS	
10071	1769184.495	1624887.26	7278.605	BOS	
10072	1769183.425	1624888.675	7278.49	BOS	
10073	1769181.38	1624890.26	7278.535	BOS	
10074	1769180.08	1624891.325	7278.525	BOS	
10075	1769178.795	1624892.925	7278.795	BOS	
10076	1769178.08	1624894.285	7279	BOS	
10077	1769186.455	1624883.77	7276.95	CP	
10078	1769184.46	1624885.875	7276.875	CP	
10079	1769182.98	1624887.57	7277.17	CP	
10080	1769182.14	1624888.8	7277.47	FR	
10081	1769181.445	1624889.635	7276.955	FR	
10082	1769178.98	1624891.72	7276.07	FR	
10083	1769178.32	1624892.785	7277.32	FR	
10084	1769179.14	1624891.675	7277.235	CP	
10085	1769176.995	1624894.845	7277.62	CP	
10086	1769175.105	1624896.915	7278.14	CP	
10087	1769178.14	1624893.775	7281.79	FR	horizontal prism
10088	1769178.79	1624893.915	7282.55	FR	horizontal prism
10089	1769177.99	1624895.905	7281.485	FR	horizontal prism
10090	1769177.485	1624896.46	7283.035	FR	horizontal prism
10091	1769177.38	1624896.835	7282.365	FR	
10092	1769176.88	1624897.17	7282.95	FR	
10093	1769175.94	1624897.85	7282.365	FR	
10094	1769175.905	1624898.285	7282.91	FR	
10095	1769175.535	1624898.01	7281.89	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10096	1769175.55	1624897.725	7281.375	FR	
10097	1769175.175	1624898.01	7281.175	FR	
10098	1769175.305	1624897.57	7280.485	FR	
10099	1769174.86	1624898.96	7281.82	FR	
10100	1769174.18	1624898.725	7280.43	FR	
10101	1769174.05	1624899.36	7281.175	FR	
10102	1769173.635	1624899.975	7281.89	FR	
10103	1769173.445	1624899.635	7280.275	FR	
10104	1769172.175	1624901.64	7282.25	FR	
10105	1769172.41	1624901.485	7281.295	FR	
10106	1769171.435	1624901.9	7280.16	FR	
10107	1769171.375	1624901.755	7279.755	FR	
10108	1769171.015	1624901.595	7278.945	FR	
10109	1769172.44	1624901.395	7280.92	FF	
10110	1769172.48	1624901.385	7280.23	FF	
10111	1769171.345	1624901.385	7279.325	FF	
10112	1769171.835	1624900.635	7279.065	FF	
10113	1769171.465	1624900.92	7278.665	FF	
10114	1769171.48	1624900.645	7277.635	FF	
10115	1769172.815	1624899.64	7279.095	FF	
10116	1769171.35	1624900.37	7276.62	FF	
10117	1769172.36	1624899.205	7276.135	FF	
10118	1769173.03	1624898.855	7277.36	FF	
10119	1769173.84	1624898.45	7278.78	FF	
10120	1769173.73	1624898.815	7279.34	FF	
10121	1769174.515	1624897.985	7279.415	FF	
10122	1769175.03	1624897.59	7279.68	FF	
10123	1769175.165	1624897.415	7279.61	FF	
10124	1769176.77	1624895.72	7278.995	BOS	
10125	1769175.105	1624897.06	7278.96	BOS	
10126	1769174.18	1624898.07	7278.955	BOS	
10127	1769170.565	1624901.925	7278.9	BOS	
10128	1769172.245	1624900.73	7279.965	TOS	
10129	1769173.54	1624899.215	7279.95	TOS	
10130	1769174.63	1624898.06	7279.585	TOS	
10131	1769175.15	1624897.485	7279.73	TOS	
10132	1769176.01	1624897.525	7281.29	TOS	End survey 27 August 2007
7006	1769253.385	1624797.04	7277.635	BS	Backshot; start survey 28 August 2007
10133	1769209.68	1624855.555	7283.81	FR	
10134	1769208.96	1624855.875	7282.935	FR	horizontal prism
10135	1769209.135	1624855.99	7284.47	FR	horizontal prism
10136	1769208.205	1624857.79	7283.945	FR	
10137	1769208.53	1624857.91	7284.835	FR	
10138	1769209.85	1624856.875	7285.335	FR	
10139	1769210.09	1624856.51	7285.62	FR	
10140	1769209.24	1624858.225	7285.465	FR	
10141	1769207.625	1624858.895	7283.955	FR	
10142	1769207.12	1624859.445	7283.53	FR	
10143	1769206.5	1624860.705	7283.565	FR	
10144	1769206.79	1624860.895	7284.13	FR	
10145	1769207.115	1624860.61	7284.94	FR	
10146	1769205.7	1624861.555	7283.08	FR	
10147	1769205.75	1624862.115	7283.92	FR	
10148	1769204.75	1624863.1	7283.67	FR	
10149	1769205.865	1624863.01	7284.835	FR	
10150	1769205.735	1624863.615	7285.6	FR	
10151	1769206.565	1624862.465	7285.84	FR	
10152	1769206.66	1624861.745	7285.395	FR	
10153	1769207.315	1624861.305	7286.2	FR	
10154	1769208.225	1624860.45	7285.585	FR	
10155	1769208.58	1624859.51	7285.59	FR	
10156	1769208.645	1624859.455	7286.53	FR	
10157	1769204.415	1624864.255	7283.295	FR	
10158	1769203.71	1624865.09	7283.385	FR	
10159	1769203.99	1624865.17	7284.295	FR	
10160	1769204.53	1624864.495	7284.145	FR	
10161	1769205.035	1624864.085	7284.765	FR	
10162	1769205.395	1624864.415	7285.76	FR	
10163	1769204.645	1624865.085	7285.16	FR	
10164	1769202.835	1624866.095	7283.065	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10165	1769203.215	1624866.24	7284.59	CP	
10166	1769205.015	1624865.015	7287.29	FR	
10167	1769206.185	1624863.715	7286.68	FR	
10168	1769206.4	1624863.375	7287.535	FR	
10169	1769205.61	1624864.065	7288.075	FR	
10170	1769206.065	1624864.085	7289.925	FR	
10171	1769205.49	1624864.585	7289.7	FR	
10172	1769205.1	1624865.05	7289.24	FR	
10173	1769205.625	1624864.805	7288.63	FR	
10174	1769206.8	1624862.745	7288.805	CP	
10175	1769207.69	1624861.92	7287.295	FR	
10176	1769208.355	1624860.51	7287.89	FR	
10177	1769207.605	1624861.52	7288.86	FR	
10178	1769208.87	1624860.02	7289.715	FR	
10179	1769208.69	1624859.635	7287.76	FR	
10180	1769209.245	1624859.115	7288.405	FR	
10181	1769208.045	1624861.295	7290.07	FR	
10182	1769207.35	1624862.36	7290.35	FR	
10183	1769210.95	1624855.875	7287.595	FR	
10184	1769210.4	1624856.525	7287.495	FR	
10185	1769210.24	1624856.99	7286.615	FR	
10186	1769210.065	1624857.82	7287.42	FR	
10187	1769209.44	1624858.325	7287.255	FR	
10188	1769209.685	1624858.385	7287.735	FR	
10189	1769210.455	1624857.47	7289.545	FR	
10190	1769209.85	1624858.45	7289.925	FR	
10191	1769209.28	1624859.24	7290.215	FR	
10192	1769211.715	1624856.495	7292.38	FR	
10193	1769211.5	1624856.97	7292.985	FR	
10194	1769210.765	1624857.56	7292.625	FR	
10195	1769210.695	1624857.685	7291.075	FR	
10196	1769209.11	1624859.975	7291.31	FR	
10197	1769209.29	1624860.005	7291.94	FR	
10198	1769209.24	1624860.115	7292.86	FR	
10199	1769210.605	1624858.82	7293.665	FR	
10200	1769210.02	1624860.335	7293.99	FR	
10201	1769208.215	1624861.12	7290.78	FR	
10202	1769211.45	1624858.465	7293.74	FR	
10203	1769208.615	1624861.85	7293.96	CP	
10204	1769207.825	1624862.01	7292.335	FR	
10205	1769207.235	1624863.225	7293.26	FR	
10206	1769207.55	1624862.055	7291.03	FR	
10207	1769207.055	1624862.935	7290.915	FR	
10208	1769207.52	1624864.13	7293.835	FR	
10209	1769206.535	1624864.59	7292.335	FR	
10210	1769206.33	1624865.44	7293.78	FR	
10211	1769206.54	1624863.925	7291.505	FR	
10212	1769206.675	1624863.375	7290.47	FR	
10213	1769205.72	1624864.895	7291.245	FR	
10214	1769205.435	1624865.41	7291.895	FR	
10215	1769204.925	1624865.665	7291.04	FR	
10216	1769200.22	1624869.255	7283.34	FR	
10217	1769199.74	1624870.09	7283.165	FR	
10218	1769200.07	1624869.95	7284.75	FR	
10219	1769200.835	1624868.675	7283.775	FR	
10220	1769201.415	1624868.365	7284.34	FR	
10221	1769202.055	1624867.49	7283.925	FR	
10222	1769201.7	1624867.315	7283.08	FR	
10223	1769200.33	1624869.99	7286.56	FR	
10224	1769198.615	1624871.885	7286.815	CP	
10225	1769198.2	1624871.95	7285.17	CP	
10226	1769197.99	1624871.625	7283.425	CP	
10227	1769197.78	1624872.95	7287.69	CP	
10228	1769197.285	1624873.89	7287.12	FR	
10229	1769197.12	1624873.395	7286.185	FR	
10230	1769196.705	1624873.82	7285.64	FR	
10231	1769197.08	1624873.275	7285.075	FR	
10232	1769196.32	1624873.745	7283.87	FR	
10233	1769196.985	1624872.82	7283.215	FR	
10234	1769196.345	1624873.76	7283.135	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10235	1769195.14	1624875.395	7283.155	FR	
10236	1769195.275	1624875.25	7284.635	FR	
10237	1769195.585	1624875.335	7286.31	FR	
10238	1769195.83	1624875.34	7287.765	FR	
10239	1769195.19	1624876.61	7289.025	FR	
10240	1769195.55	1624876.97	7291.43	CP	
10241	1769194.265	1624877.895	7289.825	CP	
10242	1769194.19	1624877.64	7288.585	FR	
10243	1769194.395	1624877.09	7286.725	CP	
10244	1769197.285	1624874.685	7291.72	FR	
10245	1769198.185	1624873.745	7291.5	FR	
10246	1769197.6	1624873.92	7289.775	FR	
10247	1769197.395	1624873.89	7289.065	FR	
10248	1769197.035	1624875.605	7293.015	FR	
10249	1769198.665	1624873.745	7293.025	FR	
10250	1769198.62	1624872.94	7290.73	CP	
10251	1769199.885	1624871.725	7290.79	CP	
10252	1769199.05	1624871.86	7288.855	CP	
10253	1769198.33	1624872.805	7289.07	FR	
10254	1769201.115	1624871.995	7293.685	FR	
10255	1769200.915	1624873.47	7293.705	FR	
10256	1769200.84	1624872.265	7291.9	FR	
10257	1769201.8	1624870.155	7292.865	FR	
10258	1769201.05	1624870.56	7291.98	FR	
10259	1769202.195	1624869.37	7292.03	FR	
10260	1769203.39	1624868.165	7293.625	FR	
10261	1769200.9	1624870.91	7291.065	FR	
10262	1769200.735	1624870.61	7289.36	FR	
10263	1769200.495	1624870.335	7288.265	FR	
10264	1769201.735	1624869.72	7290.425	FR	
10265	1769204.37	1624867.06	7293.43	FR	
10266	1769204.025	1624866.69	7291.4	FR	
10267	1769203.32	1624868.315	7291.555	FR	
10268	1769202.48	1624868.185	7289.4	CP	
10269	1769201.355	1624869.46	7288.74	CP	
10270	1769201.59	1624868.505	7287.04	CP	
10271	1769203.725	1624866.995	7289.855	CP	
10272	1769203.74	1624867.13	7288.23	CP	
10273	1769203.05	1624867.54	7287.24	CP	
10274	1769204.82	1624866.135	7289.44	FR	
10275	1769204.95	1624866.45	7287.735	FR	
10276	1769204.825	1624866.59	7286.225	FR	
10277	1769203.53	1624867.48	7285.89	FR	
10278	1769193.67	1624877.685	7285.42	FR	
10279	1769194.15	1624876.845	7283.89	FR	
10280	1769192.87	1624878.195	7282.95	FR	
10281	1769192.885	1624878.41	7284.13	FR	
10282	1769192.995	1624878.87	7285.76	FR	
10283	1769193.1	1624879.04	7287.575	FR	
10284	1769193.425	1624878.525	7287.645	FR	
10285	1769193.155	1624879.075	7288.74	FR	
10286	1769194.23	1624877.935	7289.84	CP	
10287	1769194.26	1624878.435	7291.47	CP	
10288	1769193.51	1624879.865	7292.715	FR	
10289	1769193.27	1624879.335	7290.745	FR	
10290	1769195.15	1624878	7292.995	CP	
10291	1769192.56	1624882.905	7293.205	FR	
10292	1769192.69	1624882.4	7292.515	FR	
10293	1769192.165	1624881.275	7291.785	FR	
10294	1769192.195	1624881.02	7290.89	FR	
10295	1769192.21	1624880.625	7289.63	FR	
10296	1769192.25	1624880.405	7288.445	FR	
10297	1769192.17	1624880.24	7287.36	FR	
10298	1769192.065	1624879.9	7285.625	FR	
10299	1769191.95	1624879.57	7284.14	FR	
10300	1769189.845	1624881.73	7283.075	FR	
10301	1769190.715	1624880.935	7283.775	FR	
10302	1769190.595	1624881.415	7285.11	FR	
10303	1769190.97	1624881.62	7286.91	FR	
10304	1769191.175	1624881.59	7287.94	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10305	1769189.575	1624882.86	7286.665	FR	
10306	1769189.535	1624883.225	7285.49	FR	
10307	1769189.42	1624883.07	7284.735	FR	
10308	1769189.045	1624882.925	7283.16	FR	
10309	1769188.605	1624883.14	7282.745	FR	
10310	1769190.89	1624882.665	7290.59	FR	
10311	1769190.475	1624882.665	7288.975	FR	
10312	1769189.76	1624883.35	7288.13	FR	
10313	1769189.565	1624883.47	7286.265	FR	
10314	1769189.855	1624883.69	7287.435	FR	
10315	1769189.885	1624883.99	7289.2	FR	
10316	1769189.92	1624884.115	7288.675	FR	
10317	1769190.31	1624884.575	7290.81	FR	
10318	1769190.79	1624884.85	7293.06	FR	
10319	1769190.575	1624884.635	7291.605	FR	
10320	1769191.445	1624883.89	7291.87	FR	End survey 28 August 2007
7009	1769128.23	1624956.655	7278.515	BS	Backshot; start survey 29 August 2007
10321	1769188.38	1624883.6	7284.175	FR	
10322	1769188.31	1624883.985	7285.315	FR	
10323	1769188.28	1624884.23	7285.92	FR	
10324	1769187.495	1624884.77	7284.705	FR	
10325	1769186.605	1624885.91	7285.315	FR	
10326	1769186.19	1624886.52	7285.66	FR	
10327	1769185.865	1624886.785	7285.06	FR	
10328	1769185.745	1624886.945	7284.715	FR	
10329	1769185.22	1624887.505	7285.16	FR	
10330	1769185.32	1624886.865	7283.105	FR	
10331	1769186.07	1624886.035	7283.07	FR	
10332	1769186.445	1624885.695	7283.68	FR	
10333	1769184.93	1624887.54	7284.075	FR	
10334	1769187.19	1624885.83	7287.03	FR	
10335	1769188.385	1624884.67	7286.97	FR	
10336	1769184.08	1624888.465	7283.32	FR	
10337	1769184.44	1624888.17	7284.025	FR	
10338	1769184.235	1624888.6	7285.01	FR	
10339	1769184.365	1624888.61	7285.87	FR	
10340	1769184.84	1624888.15	7286.12	FR	
10341	1769182.78	1624890.405	7285.025	CP	
10342	1769183.06	1624889.665	7283.51	CP	
10343	1769181.865	1624891.185	7283.44	FR	
10344	1769181.01	1624892.295	7282.87	FR	
10345	1769181.135	1624892.215	7283.945	FR	
10346	1769180.47	1624893.25	7283.685	FR	
10347	1769180.82	1624892.97	7285.445	FR	
10348	1769181.515	1624891.985	7285.045	FR	
10349	1769181.805	1624891.98	7286.255	FR	
10350	1769180.61	1624893.785	7287.915	CP	
10351	1769183.93	1624890.19	7290.195	CP	
10352	1769181.85	1624892.215	7287.375	FR	
10353	1769181.785	1624892.46	7288.32	FR	
10354	1769181.79	1624892.755	7289.44	FR	
10355	1769181.46	1624893.355	7289.69	FR	
10356	1769182.395	1624892.125	7289.97	FR	
10357	1769182.325	1624892.62	7290.63	FR	
10358	1769181	1624894.125	7290.15	FR	
10359	1769183.93	1624889.38	7286.83	FR	
10360	1769182.76	1624890.925	7286.655	FR	
10361	1769183.595	1624890.315	7288.21	FR	
10362	1769183.405	1624890.82	7288.785	FR	
10363	1769183.215	1624891.24	7289.525	FR	
10364	1769184.915	1624889.16	7290.015	FR	
10365	1769185.08	1624888.65	7288.93	FR	
10366	1769185.61	1624888.135	7289.34	FR	
10367	1769185.395	1624887.995	7287.615	FR	
10368	1769186.98	1624886.7	7289.6	FR	
10369	1769186.45	1624886.725	7287.945	CP	
10370	1769187.255	1624887.1	7291.065	CP	
10371	1769188.52	1624884.95	7288.515	FR	
10372	1769188.61	1624885.345	7289.86	FR	
10373	1769188.615	1624885.515	7290.36	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10374	1769189.455	1624884.94	7290.485	FR	
10375	1769188.93	1624886.32	7293.245	FR	
10376	1769188.785	1624885.875	7291.855	FR	
10377	1769189.325	1624885.355	7291.475	FR	
10378	1769187.49	1624888.015	7293.195	CP	
10379	1769185.935	1624889.06	7292.35	FR	
10380	1769184.82	1624889.88	7291.54	FR	
10381	1769185.325	1624890.89	7291.965	FR	
10382	1769183.225	1624891.535	7290.625	FR	
10383	1769182.93	1624892.58	7291.62	FR	
10384	1769183.845	1624891.74	7292.225	CP	
10385	1769182.795	1624893.65	7292.355	FR	
10386	1769181.77	1624894.64	7291.96	FR	
10387	1769181.165	1624894.225	7290.795	FR	
10388	1769178.455	1624894.89	7282.585	FR	
10389	1769178.385	1624894.93	7280.84	TOS	
10390	1769178.67	1624896.03	7281.125	TOS	
10391	1769177.065	1624896.73	7281.155	TOS	
10392	1769172.81	1624900.365	7281.34	FR	
10393	1769180.075	1624894.11	7286.5	FR	
10394	1769180.06	1624893.975	7285.345	FR	
10395	1769179.96	1624894.245	7284.775	FR	
10396	1769179.715	1624894.19	7283.815	FR	
10397	1769179.16	1624894.465	7283.385	FR	
10398	1769179.195	1624894.825	7284.98	FR	
10399	1769179.285	1624895.42	7287.13	FR	
10400	1769179.385	1624895.25	7285.655	FR	
10401	1769178.665	1624895.955	7286.545	FR	
10402	1769178.075	1624896.775	7286.46	FR	
10403	1769178.775	1624896.03	7284.785	FR	
10404	1769178.505	1624895.585	7284.1	FR	
10405	1769178.57	1624896.625	7284.33	FR	
10406	1769178.02	1624897.185	7284.025	FR	
10407	1769177.38	1624897.97	7284.885	FR	
10408	1769177.3	1624897.415	7283.645	FR	
10409	1769177.735	1624896.69	7285.04	FR	horizontal prism
10410	1769177.135	1624897.945	7287.025	FR	
10411	1769177.405	1624898.33	7286.485	FR	
10412	1769177.07	1624898.345	7285.87	FR	
10413	1769176.85	1624898.31	7284.395	FR	
10414	1769176.725	1624898.26	7283.86	FR	
10415	1769176.395	1624898.115	7283.4	FR	
10416	1769176.58	1624899.1	7285.585	FR	
10417	1769175.825	1624898.94	7283.99	FR	
10418	1769175.77	1624898.78	7283.445	FR	
10419	1769175.59	1624900.175	7285.28	FR	
10420	1769175.95	1624899.975	7286.075	FR	
10421	1769175.09	1624899.905	7284.205	FR	
10422	1769174.205	1624899.77	7283.44	FR	
10423	1769179.135	1624895.815	7288.31	FR	
10424	1769178.475	1624896.965	7288.11	FR	
10425	1769178.145	1624898.055	7288.39	FR	
10426	1769177.585	1624898.1	7287.71	FR	
10427	1769177.575	1624898.615	7288	FR	
10428	1769177.61	1624898.76	7287.235	FR	
10429	1769176.47	1624899.62	7287.16	FR	
10430	1769175.095	1624901.175	7287.845	FR	
10431	1769175.195	1624900.995	7287.465	FR	
10432	1769174.455	1624901.055	7286.45	FR	
10433	1769174.235	1624900.85	7285.41	FR	
10434	1769175.595	1624900.145	7287.54	FR	horizontal prism
10435	1769176.625	1624899.045	7287.72	FR	horizontal prism
10436	1769176.375	1624899.62	7287.78	FR	horizontal prism
10437	1769173.36	1624900.76	7283.65	CP	
10438	1769173.02	1624902	7284.61	FR	
10439	1769173.125	1624902.44	7284.92	FR	
10440	1769173.77	1624901.92	7285.815	FR	
10441	1769172.505	1624902.11	7284.065	FR	
10442	1769172.43	1624901.785	7282.945	FR	
10443	1769172.335	1624902.31	7283.045	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10444	1769173.68	1624902.615	7286.71	FR	
10445	1769174.165	1624902.29	7286.665	FR	
10446	1769174.4	1624901.71	7286.81	FR	
10447	1769174.46	1624901.84	7287.735	FR	
10448	1769174.26	1624902.67	7288.77	FR	
10449	1769173.865	1624903.07	7288.285	FR	
10450	1769174.77	1624902.055	7289.01	FR	
10451	1769176.64	1624900.225	7289.39	CP	
10452	1769175.785	1624901.24	7289.49	CP	
10453	1769174.68	1624902.71	7289.44	FR	
10454	1769174.175	1624903.25	7289.32	FR	
10455	1769177.59	1624899.525	7289.3	FR	
10456	1769178.025	1624898.935	7289.88	FR	
10457	1769177.68	1624898.75	7288.855	FR	
10458	1769179.085	1624899.645	7291.24	FR	
10459	1769179.705	1624898.415	7291.685	CP	
10460	1769180.045	1624894.905	7289.42	FR	
10461	1769180.2	1624895.57	7290.705	FR	
10462	1769179.61	1624896.345	7290.57	FR	
10463	1769181.105	1624895.435	7291.62	FR	
10464	1769180.315	1624896.64	7291.815	FR	
10465	1769179.35	1624897.29	7290.725	FR	
10466	1769175.75	1624903.205	7290.485	FR	
10467	1769176.035	1624904.135	7291.24	FR	
10468	1769175.315	1624904.535	7291.09	FR	
10469	1769176.78	1624903.015	7290.825	FR	
10470	1769176.555	1624902.975	7289.57	FR	
10471	1769176.995	1624902.115	7289.435	FR	
10472	1769177.53	1624901.91	7290.92	FR	
10473	1769177.98	1624901.415	7290.935	FR	
10474	1769177.285	1624901.895	7290.095	FR	
10475	1769178.34	1624900.355	7289.965	FR	
10476	1769169.9	1624901.98	7277.385	CP	
10477	1769168.48	1624903.55	7277.395	CP	
10478	1769166.435	1624905.63	7276.74	CP	
10479	1769163.25	1624908.61	7276.43	CP	
10480	1769158.26	1624914.245	7276.31	CP	
10481	1769156.705	1624916.04	7276.475	CP	
10482	1769154.57	1624918.545	7276.425	CP	
10483	1769153.955	1624920.325	7277.87	CP	
10484	1769152.645	1624921.105	7276.63	CP	
10485	1769151.305	1624923.105	7277.14	CP	
10486	1769160.015	1624915.32	7281.66	CP	
10487	1769160.71	1624913.86	7280.75	CP	
10488	1769163.65	1624911.015	7281.395	CP	
10489	1769167.83	1624906.245	7281.525	CP	
10490	1769171.32	1624902.605	7281.31	TOS	
10491	1769170.27	1624904.06	7281.065	TOS	
10492	1769168.615	1624905.12	7280.26	TOS	
10493	1769166.915	1624906.39	7279.5	TOS	
10494	1769165.98	1624907.28	7278.84	TOS	
10495	1769164.295	1624908.865	7278.465	TOS	
10496	1769163.1	1624910.19	7278.45	TOS	
10497	1769162.005	1624911.26	7278.405	TOS	
10498	1769161.47	1624911.675	7278.235	TOS	
10499	1769160.9	1624912.325	7278.1	TOS	
10500	1769159.15	1624914.285	7277.94	TOS	End survey 29 August 2007
7009	1769128.21	1624956.655	7278.52	BS	Backshot; start survey 30 August 2007
10501	1769169.275	1624903.185	7278.875	BOS	
10502	1769166.77	1624905.905	7278.375	BOS	
10503	1769165.42	1624907.32	7278.135	BOS	
10504	1769165.125	1624907.76	7278.26	BOS	
10505	1769164.505	1624908.395	7278.045	BOS	
10506	1769163.405	1624909.735	7277.94	BOS	
10507	1769162	1624911.05	7277.81	BOS	
10508	1769161.115	1624911.87	7277.8	BOS	
10509	1769160.44	1624912.67	7277.83	BOS	
10510	1769159.07	1624914.24	7277.79	BOS	
10511	1769158.405	1624914.825	7277.845	C34	
10512	1769157.67	1624916.165	7278.075	C34	

Point#	Northing	Easting	Elevation	Pcode	Notes
10513	1769156.205	1624917.97	7278.5	C34	
10514	1769155.395	1624918.965	7278.48	C34	
10515	1769155.33	1624919.095	7278.71	C34	
10516	1769154.585	1624920.005	7278.69	C34	
10517	1769153.54	1624921.63	7278.65	C34	
10518	1769152.565	1624923.1	7278.545	C34	
10519	1769151.325	1624924.16	7278.69	C34	
10520	1769150.295	1624925.475	7278.86	C34	
10521	1769148.93	1624927.14	7278.54	C34	
10522	1769147.285	1624929.21	7278.495	C34	
10523	1769146.335	1624930.76	7278.455	C34	
10524	1769145.805	1624932.13	7278.625	C34	
10525	1769144.985	1624933.82	7278.335	C34	
10526	1769144.055	1624934.915	7278.46	C34	
10527	1769142.99	1624934.83	7278.375	C34	
10528	1769142.095	1624936.45	7278.45	C34	
10529	1769140.905	1624937.685	7278.305	C34	
10530	1769139.31	1624939.845	7278.55	C34	
10531	1769138.65	1624940.97	7278.46	C34	
10532	1769171.18	1624903.37	7281.5	FR	
10533	1769171.125	1624903.395	7282.49	FR	
10534	1769169.91	1624904.515	7282.525	FR	
10535	1769169.16	1624905.225	7282.115	FR	
10536	1769166.875	1624906.765	7280.915	FR	
10537	1769166.68	1624907.48	7281.59	FR	
10538	1769166.22	1624907.245	7280.45	FR	
10539	1769165.515	1624907.45	7278.765	FR	
10540	1769164.78	1624907.43	7277.06	FR	
10541	1769164.9	1624908.14	7278.665	FR	
10542	1769165.06	1624908.12	7279.91	FR	
10543	1769165.1	1624908.89	7281.025	FR	
10544	1769164.455	1624909.07	7279.945	FR	
10545	1769164.57	1624909.29	7280.62	FR	
10546	1769164.595	1624910.02	7281.75	FR	
10547	1769163.795	1624910.2	7280.655	FR	
10548	1769163.225	1624909.98	7278.755	FR	
10549	1769162.525	1624910.71	7278.45	FR	
10550	1769162.135	1624910.35	7277.145	FR	
10551	1769161.585	1624910.22	7275.96	FR	
10552	1769161.94	1624911.45	7279.09	FR	
10553	1769162.055	1624911.58	7279.77	FR	
10554	1769162.67	1624911.445	7280.665	FR	
10555	1769162.955	1624911.56	7281.4	FR	
10556	1769162.545	1624912.435	7282.055	FR	
10557	1769161.565	1624913.685	7282.305	FR	
10558	1769161.99	1624913.035	7281.73	FR	
10559	1769161.61	1624912.65	7280.68	FR	
10560	1769161.39	1624912.51	7279.945	FR	
10561	1769162.295	1624913.15	7282.75	FR	
10562	1769161.15	1624912.885	7280.165	FR	
10563	1769160.665	1624913.15	7279.245	FR	
10564	1769160.77	1624912.35	7278.105	FR	
10565	1769160.09	1624913.145	7278.255	FR	
10566	1769159.87	1624913.595	7278.8	FR	
10567	1769159.43	1624914.54	7279.595	FR	
10568	1769159.085	1624916.155	7281.12	FR	
10569	1769158.56	1624915.715	7279.725	FR	
10570	1769158.13	1624915.375	7278.365	FR	
10571	1769157.245	1624917.145	7278.825	FR	
10572	1769157.3	1624917.195	7279.655	FR	
10573	1769158.335	1624917.305	7281.585	FR	
10574	1769156.705	1624918.345	7279.94	FR	
10575	1769155.545	1624919.03	7279.01	FR	
10576	1769155.07	1624919.695	7279.14	FR	
10577	1769156.03	1624919.15	7279.61	FR	
10578	1769156.395	1624919.205	7280.32	FR	
10579	1769155.62	1624920.075	7280.64	FR	
10580	1769156.475	1624919.465	7281.11	FR	
10581	1769157.04	1624919.28	7281.975	FR	
10582	1769156.57	1624920.165	7282.455	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10583	1769155.44	1624921	7281.95	FR	
10584	1769154.795	1624921.94	7282.11	FR	
10585	1769154.755	1624921.23	7280.79	FR	
10586	1769154.31	1624921.05	7279.12	FR	
10587	1769153.83	1624922.365	7280.84	FR	
10588	1769153.805	1624921.805	7279.26	FR	
10589	1769152.555	1624923.165	7279.46	FR	
10590	1769151.8	1624924.195	7279.365	FR	
10591	1769152.07	1624924.13	7280.4	FR	
10592	1769152.615	1624924.21	7281.46	FR	
10593	1769152.02	1624925.135	7280.775	FR	
10594	1769151.265	1624925.405	7280.01	FR	
10595	1769150.01	1624924.5	7276.935	FR	
10596	1769149.6	1624925.625	7277.57	FR	
10597	1769148.145	1624926.58	7276.525	FR	
10598	1769147.63	1624927.57	7277	FR	
10599	1769146.935	1624928.325	7276.29	FR	
10600	1769149.495	1624926.81	7279.39	FR	
10601	1769148.52	1624928.105	7279.185	FR	
10602	1769148.525	1624929.205	7279.975	FR	
10603	1769148.6	1624929.26	7281.285	FR	
10604	1769147.86	1624930.385	7281.615	FR	
10605	1769147.665	1624930.125	7280.815	FR	
10606	1769147.25	1624929.715	7279.28	FR	
10607	1769147.01	1624930.7	7280.01	FR	
10608	1769147.015	1624931.43	7281.07	FR	
10609	1769146.175	1624932.635	7281.27	FR	
10610	1769146.125	1624931.46	7279.415	FR	
10611	1769145.165	1624931.51	7277.06	FR	
10612	1769145.555	1624930.39	7276.96	CP	
10613	1769144.045	1624933.01	7276.885	CP	
10614	1769142.29	1624935.125	7276.81	CP	
10615	1769149.085	1624928.05	7280.695	CP	
10616	1769150.82	1624926.325	7281.535	CP	
10617	1769145.97	1624932.51	7280.205	FR	
10618	1769146.11	1624934.01	7281.67	FR	
10619	1769145.885	1624934.19	7280.56	FR	
10620	1769145.64	1624934.395	7279.68	FR	
10621	1769145.625	1624935.3	7280.405	FR	
10622	1769144.185	1624934.985	7279.465	FR	
10623	1769144.67	1624934.93	7281.715	FR	
10624	1769144.365	1624935.325	7280.385	FR	
10625	1769144.18	1624935	7279.45	FR	
10626	1769143.395	1624936.06	7281.58	FR	
10627	1769143.335	1624935.645	7280.11	FR	
10628	1769142.94	1624935.565	7278.915	FR	
10629	1769142.99	1624935.29	7278.49	FR	
10630	1769143.405	1624936.03	7281.575	FR	
10631	1769142.28	1624936.625	7279.74	FR	
10632	1769142.9	1624937.395	7282.47	FR	
10633	1769142.4	1624938.27	7282.875	FR	
10634	1769141.425	1624938.79	7281.39	FR	
10635	1769141.755	1624937.845	7280.54	FR	
10636	1769141.135	1624938.54	7280.25	FR	
10637	1769140.49	1624939.39	7280.13	FR	
10638	1769140.935	1624937.85	7279.255	FR	
10639	1769140.46	1624937.535	7277.235	FR	
10640	1769139.655	1624938.21	7276.585	FR	
10641	1769140.05	1624940.975	7282.045	FR	
10642	1769139.27	1624941.905	7281.9	FR	
10643	1769139.68	1624940.735	7280.08	FR	
10644	1769139.345	1624941.095	7280.1	FR	
10645	1769138.915	1624940.935	7278.955	FR	
10646	1769138.125	1624943.685	7282.475	FR	
10647	1769138.14	1624943.105	7281.2	FR	
10648	1769138.28	1624942.485	7279.87	FR	
10649	1769137.165	1624942.75	7277.425	FR	
10650	1769137.065	1624943.45	7278.25	FR	
10651	1769137.21	1624944.7	7281.61	FR	
10652	1769137.115	1624944.375	7280.07	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10653	1769135.955	1624944.295	7277.225	FR	
10654	1769134.87	1624945.435	7276.785	FR	
10655	1769135.8	1624945.655	7279.015	FR	
10656	1769136.32	1624945.63	7280.18	FR	
10657	1769135.72	1624946.09	7279.985	FR	
10658	1769136.105	1624946.12	7281.655	FR	
10659	1769134.875	1624947.815	7281.825	FR	
10660	1769135.02	1624947.335	7280.93	FR	
10661	1769134.575	1624947.38	7279.47	FR	
10662	1769135.41	1624947.27	7282.31	CP	
10663	1769134.145	1624948.93	7281.67	FR	
10664	1769134.16	1624948.34	7280.58	FR	
10665	1769134.19	1624948.095	7279.325	FR	
10666	1769134.445	1624947.385	7278.855	FR	
10667	1769133.52	1624949.545	7280.875	FR	
10668	1769133.13	1624949.155	7279.195	FR	
10669	1769132.98	1624949.045	7278.07	FR	
10670	1769132.74	1624948.41	7276.19	FR	
10671	1769132.675	1624951.59	7281.4	FR	
10672	1769131.86	1624952.095	7280.99	FR	
10673	1769132.635	1624950.745	7280.31	FR	
10674	1769131.58	1624953.375	7281.8	FR	
10675	1769130.94	1624953.86	7281.125	FR	
10676	1769131.185	1624953.26	7280.8	FR	
10677	1769130.63	1624953.125	7279.385	FR	
10678	1769130.685	1624951.415	7275.96	FR	
10679	1769129.785	1624955.545	7281.465	FR	
10680	1769128.775	1624956.785	7280.845	FR	
10681	1769128.405	1624958.245	7281.205	FR	
10682	1769128.15	1624956.685	7278.62	BM	benchmark 7009
10683	1769129.52	1624954.73	7278.745	TOS	
10684	1769130.19	1624953.98	7278.965	TOS	
10685	1769130.62	1624952.635	7279.02	TOS	
10686	1769131.595	1624951.385	7278.96	TOS	
10687	1769132.715	1624949.965	7279.1	TOS	
10688	1769133.78	1624948.365	7278.925	TOS	
10689	1769134.92	1624947.005	7278.75	TOS	
10690	1769135.295	1624946.03	7278.63	TOS	
10691	1769136.365	1624944.995	7278.69	TOS	
10692	1769137.1	1624943.755	7278.805	TOS	
10693	1769137.335	1624942.915	7278.54	TOS	
10694	1769138.065	1624941.97	7278.56	TOS	
10695	1769137.99	1624942.1	7278.405	BOS	
10696	1769136.915	1624943.71	7277.975	BOS	
10697	1769136.12	1624944.605	7277.855	BOS	
10698	1769135.145	1624945.825	7277.975	BOS	
10699	1769134.045	1624947.44	7277.78	BOS	
10700	1769131.93	1624950.375	7277.89	BOS	
10701	1769130.675	1624952.225	7278.035	BOS	
10702	1769129.415	1624953.525	7278.48	BOS	horizontal prism
10703	1769172.205	1624902.98	7285.355	FR	
10704	1769171.605	1624903.05	7284.065	FR	
10705	1769173	1624903.235	7286.75	FR	
10706	1769172.15	1624902.705	7285.76	FR	horizontal prism
10707	1769170.755	1624903.325	7284.045	FR	horizontal prism
10708	1769169.89	1624905.105	7284.555	CP	
10709	1769172.53	1624904.19	7287.25	FR	
10710	1769171.635	1624905.09	7287.28	FR	
10711	1769171.69	1624904.4	7286.525	FR	
10712	1769171.21	1624904.205	7285.755	FR	
10713	1769170.89	1624904.615	7285.185	FR	
10714	1769170.555	1624905.67	7286.025	FR	
10715	1769170.465	1624906.32	7286.695	FR	
10716	1769171.005	1624906.135	7287.71	FR	
10717	1769169.465	1624906.82	7285.665	FR	
10718	1769168.835	1624906.42	7284.215	FR	
10719	1769168.88	1624905.73	7283.545	FR	
10720	1769168.525	1624908.105	7285.98	FR	
10721	1769168.205	1624907.845	7285.635	FR	
10722	1769167.965	1624907.655	7284.7	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10723	1769167.6	1624907.32	7283.525	FR	
10724	1769167.17	1624907.785	7283.005	FR	
10725	1769167.095	1624908.32	7283.83	FR	
10726	1769169.09	1624906.86	7286.32	FR	horizontal prism
10727	1769169.92	1624907.23	7287.71	FR	
10728	1769169.065	1624908.33	7286.54	FR	
10729	1769169.385	1624908.055	7287.565	FR	
10730	1769168.055	1624909.49	7287.29	FR	
10731	1769167.565	1624909.945	7286.515	FR	
10732	1769167.84	1624908.99	7286.425	FR	
10733	1769167.535	1624908.78	7285.44	FR	
10734	1769166.5	1624908.575	7283.16	FR	
10735	1769165.67	1624909.04	7282.615	FR	
10736	1769165.415	1624910.02	7283.77	FR	
10737	1769166.355	1624909.845	7285.2	CP	
10738	1769164.58	1624910.425	7282.275	FR	
10739	1769164.73	1624910.78	7283.83	FR	
10740	1769164.135	1624911.385	7283.165	FR	
10741	1769164.85	1624911.62	7284.76	FR	
10742	1769167.56	1624910.485	7287.8	FR	
10743	1769167.19	1624911.285	7288.905	FR	
10744	1769167.16	1624912.09	7289.74	FR	
10745	1769166.49	1624912.2	7288.315	FR	
10746	1769166.635	1624911.245	7287.83	FR	
10747	1769166.955	1624910.875	7286.345	FR	
10748	1769166.535	1624911.32	7286.91	FR	
10749	1769165.14	1624912.225	7286.085	FR	
10750	1769165.69	1624911.475	7286.17	FR	horizontal prism
10751	1769167.98	1624911.055	7289.845	CP	
10752	1769168.96	1624909.915	7289.615	FR	
10753	1769169.08	1624909.775	7288.6	FR	
10754	1769168.475	1624908.695	7287.29	FR	horizontal prism
10755	1769169.95	1624909.395	7290.035	FR	
10756	1769169.78	1624909.05	7288.805	FR	
10757	1769170.195	1624907.68	7288.67	FR	
10758	1769170.815	1624908.08	7289.97	FR	
10759	1769171.725	1624906.66	7289.815	FR	
10760	1769171.255	1624906.335	7288.715	FR	
10761	1769173.155	1624903.79	7288.435	FR	
10762	1769173.705	1624904.265	7289.965	FR	
10763	1769172.935	1624905.59	7290.445	FR	
10764	1769172.51	1624905.065	7288.885	FR	
10765	1769172.12	1624904.975	7288.115	FR	
10766	1769175.27	1624905.54	7291.785	FR	
10767	1769174.385	1624905.35	7290.865	FR	
10768	1769174.805	1624906.645	7292.205	FR	
10769	1769173.395	1624907.565	7292.215	FR	
10770	1769172.585	1624906.94	7290.915	FR	
10771	1769171.71	1624908.85	7291.65	FR	
10772	1769170.66	1624909.815	7291.295	FR	
10773	1769169.27	1624911.05	7290.725	FR	
10774	1769169.035	1624912.145	7291.765	FR	
10775	1769169.91	1624910.67	7291.69	FR	horizontal prism
10776	1769164.29	1624912.25	7284.99	FR	
10777	1769164.6	1624913.415	7287.17	FR	
10778	1769163.445	1624914.525	7286.34	FR	
10779	1769162.975	1624914.185	7285.27	FR	
10780	1769162.775	1624913.84	7284.6	FR	
10781	1769163.57	1624913.07	7285	FR	
10782	1769163.475	1624912.47	7283.755	FR	
10783	1769162.965	1624912.445	7283.125	FR	
10784	1769163.955	1624913.445	7286.21	CP	
10785	1769162.65	1624915.135	7286.29	FR	
10786	1769162.005	1624915.06	7285.175	FR	
10787	1769161.235	1624915.355	7284.24	FR	
10788	1769162.015	1624914.21	7283.55	FR	
10789	1769161.16	1624914.685	7283.19	FR	
10790	1769160.115	1624915.825	7282.93	FR	
10791	1769161.735	1624915.875	7286.595	FR	horizontal prism
10792	1769159.865	1624916.695	7283.785	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
10793	1769160.64	1624916.435	7284.75	FR	
10794	1769160.15	1624917.505	7285.315	FR	
10795	1769160.78	1624917.445	7286.575	FR	
10796	1769159.065	1624918.23	7284.645	CP	
10797	1769158.9	1624919.275	7285.99	FR	
10798	1769158.28	1624919.635	7285.455	FR	
10799	1769157.75	1624919.26	7283.705	FR	
10800	1769157.56	1624920.94	7286.065	FR	
10801	1769156.665	1624920.51	7283.71	FR	
10802	1769156.54	1624921.89	7284.67	FR	
10803	1769155.915	1624921.87	7284.23	FR	
10804	1769158.91	1624917.39	7283.05	FR	
10805	1769158.38	1624920.725	7287.12	FR	
10806	1769158.67	1624921.765	7288.05	FR	
10807	1769157.275	1624922.2	7287.255	FR	
10808	1769158.915	1624919.265	7285.99	FR	
10809	1769160.085	1624918.34	7286.095	FR	
10810	1769160.8	1624918.155	7287.42	FR	
10811	1769159.195	1624918.88	7286.72	FR	
10812	1769161.925	1624916.985	7287.35	FR	End survey 30 August 2007
7009	1769128.23	1624956.64	7278.53	BS	Backshot; start survey 4 September 2007
10813	1769168.025	1624913.45	7291.895	FR	
10814	1769167.245	1624914.675	7291.645	FR	
10815	1769167.43	1624912.865	7291.09	FR	
10816	1769166.465	1624914.11	7290.86	FR	
10817	1769165.025	1624915.365	7290.53	FR	
10818	1769165.79	1624914.385	7289.865	FR	
10819	1769165.02	1624914.535	7288.875	FR	
10820	no point				-----
10821	no point	*Point gap from #10820 to 10824*			-----
10822	no point	*due to instrument memory-full error*			-----
10823	no point				-----
10824	no point				-----
10825	1769165.45	1624916.24	7291.11	FR	
10826	1769163.72	1624915.12	7288.32	FR	
10827	1769163.545	1624914.36	7287.59	FR	
10828	1769162.945	1624916.915	7289.02	FR	
10829	1769163.1	1624916.605	7287.95	FR	
10830	1769163.125	1624915.92	7287.95	FR	
10831	1769162.87	1624915.58	7287.23	FR	
10832	1769163.175	1624917.975	7291.24	FR	
10833	1769130.03	1624954.62	7280.8	FR	
10834	1769128.805	1624954.61	7277.45	FR	
10835	1769128.495	1624956.83	7279.23	FR	
10836	1769128.17	1624958.195	7279.01	FR	
10837	1769128.245	1624959.12	7279.775	FR	
10838	1769128.605	1624960.175	7281.52	FR	
10839	1769162.715	1624918.895	7291.025	FR	
10840	1769161.74	1624919.895	7291.245	FR	
10841	1769161.485	1624919.72	7290.575	FR	
10842	1769160.425	1624921.71	7289.78	FR	
10843	1769160.77	1624920.515	7289.38	FR	
10844	1769128.11	1624956.02	7275.645	FR	
10845	1769127.805	1624956.615	7277.125	FR	
10846	1769127.51	1624957.57	7277.285	FR	
10847	1769127.185	1624958.885	7276.38	FR	
10848	1769128.205	1624960.145	7279.22	FR	
10849	1769162.725	1624918.89	7291.015	FR	
10850	1769159.915	1624920.73	7288.235	FR	
10851	1769160.965	1624919.495	7288.365	FR	
10852	1769160.785	1624920.53	7289.375	FR	
10853	1769159.36	1624919.67	7287.405	FR	
10854	1769161.055	1624919.66	7289.475	FR	
10855	1769127.865	1624960.19	7277.535	FR	
10856	1769128.68	1624960.805	7280.44	FR	
10857	1769128.235	1624961.44	7279.8	FR	
10858	1769128.215	1624962.66	7281.465	FR	
10859	1769127.88	1624961.97	7279.08	FR	
10860	1769161.585	1624918.245	7289.935	FR	horizontal prism
10861	1769161.63	1624918.355	7288.745	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
10862	1769162.155	1624918.305	7287.77	FR	
10863	1769126.95	1624962.675	7279.365	FR	
10864	1769126.825	1624963.155	7282.515	FR	
10865	1769126.87	1624964.49	7282.29	FR	
10866	1769127.01	1624963.41	7281.16	FR	
10867	1769125.945	1624964.17	7279.875	FR	
10868	1769125.65	1624963.515	7279.16	FR	
10869	1769125.07	1624964.215	7277.18	FR	
10870	1769160.79	1624923.17	7291.155	FR	
10871	1769160.43	1624924.915	7291.62	FR	
10872	1769159.115	1624925.36	7290.79	FR	
10873	1769159.48	1624924.14	7290.37	FR	
10874	1769158.645	1624923.665	7289.82	FR	
10875	1769159.365	1624922.885	7289.605	FR	
10876	1769158.075	1624923.265	7288.765	FR	
10877	1769158.615	1624922.445	7288.925	FR	
10878	1769124.91	1624964.92	7278.22	FR	
10879	1769125.15	1624964.725	7279.665	FR	
10880	1769125.045	1624965.57	7281.77	FR	
10881	1769124.65	1624965.775	7280.3	FR	
10882	1769123.765	1624966.54	7280.62	FR	
10883	1769123.95	1624965.915	7278.93	FR	
10884	1769123.94	1624966.32	7277.67	FR	
10885	1769123.06	1624966.7	7278.8	FR	
10886	1769122.355	1624967.5	7277.37	FR	
10887	1769159.06	1624925.44	7290.775	FR	
10888	1769157.965	1624924.665	7289.52	FR	
10889	1769156.965	1624925.13	7288.7	FR	
10890	1769155.965	1624926.09	7288.64	FR	
10891	1769156.18	1624924.605	7288.1	FR	
10892	1769156.655	1624923.565	7287.95	FR	
10893	1769156.445	1624923.175	7287.06	FR	
10894	1769158.12	1624926.83	7290.96	FTC	
10895	1769157.545	1624926.49	7290.11	FTC	
10896	1769155.975	1624927.07	7289.66	FTC	
10897	1769122.92	1624968.06	7281.375	FR	
10898	1769122.065	1624968.9	7281.015	FR	
10899	1769121.535	1624969.72	7281.405	FR	
10900	1769121.485	1624969.9	7280.105	FR	
10901	1769122.465	1624968.015	7279.705	FR	
10902	1769122.405	1624968.615	7278.615	FR	
10903	1769121.955	1624969.49	7278.09	FR	
10904	1769120.83	1624969.935	7276.935	FR	
10905	1769122.155	1624969.155	7282.905	CP	
10906	1769154.55	1624925.9	7288.595	FR	1.97' horizontal prism
10907	1769154.8	1624924.6	7287.31	FR	1.97' horizontal prism
10908	1769154.905	1624923.555	7286.765	FR	1.97' horizontal prism
10909	1769154.32	1624923.46	7285.935	FR	1.97' horizontal prism
10910	1769154.6	1624924.745	7285.29	FR	
10911	1769153.635	1624925.635	7285.84	FR	
10912	1769154.145	1624925.72	7286.605	FR	
10913	1769154.345	1624926.965	7288.72	FR	horizontal prism
10914	1769156.435	1624923.42	7285.735	FR	
10915	1769154.865	1624923.27	7284.6	FR	
10916	1769154.585	1624922.815	7283.445	FR	
10917	1769153.565	1624923.515	7282.56	CP	
10918	1769153.49	1624924.66	7284.095	FR	
10919	1769152.685	1624924.69	7282.65	FR	
10920	1769110.85	1624984.33	7277.725	C34	
10921	1769114.33	1624980.35	7278.05	C34	
10922	1769113.365	1624981.71	7277.76	C34	
10923	1769115.665	1624978.97	7278.07	C34	
10924	1769117.625	1624977.125	7278.015	C34	
10925	1769122.25	1624967.69	7276.645	C34	
10926	1769124.645	1624964.57	7276.88	C34	
10927	1769126.355	1624963.15	7277.1	C34	
10928	1769127.515	1624958.505	7278.42	C34	
10929	1769128.575	1624955.83	7278.65	TOS	
10930	1769123.63	1624965.875	7276.925	TOS	
10931	1769121.33	1624969.04	7276.96	TOS	

Point#	Northing	Easting	Elevation	Pcode	Notes
10932	1769121.065	1624969.15	7276.415	BOS	
10933	1769123.52	1624965.76	7276.695	BOS	
10934	1769128.69	1624955.5	7278.445	BOS	
10935	1769151.48	1624926.445	7283.175	CP	
10936	1769150.625	1624928.27	7284.41	CP	
10937	1769152.47	1624926.04	7284.47	CP	
10938	1769152.265	1624927.275	7285.98	FR	
10939	1769151.5	1624928.325	7286.04	FR	
10940	1769153.39	1624926.885	7287.33	FR	
10941	1769152.14	1624928.51	7287.35	FR	
10942	1769152.35	1624929.115	7288.515	FR	
10943	1769153.92	1624927.87	7288.935	FR	
10944	1769152.75	1624928.92	7289.03	FTC	
10945	1769153.71	1624927.365	7289.335	FTC	horizontal prism
10946	1769153.195	1624926.91	7287.745	FR	horizontal prism
10947	1769121.275	1624971.135	7283.77	FR	
10948	1769121.11	1624971	7282.41	FR	
10949	1769121.595	1624971.94	7281.695	FR	
10950	1769120.91	1624970.8	7281.125	FR	
10951	1769122.25	1624973.115	7282.185	FR	
10952	1769121.02	1624972.445	7280.59	FR	
10953	1769121.235	1624971.225	7279.615	FR	
10954	1769121.375	1624971.21	7278.34	FR	
10955	1769151.37	1624930.75	7289.21	FTC	
10956	1769150.345	1624932.545	7289.345	FTC	
10957	1769149.23	1624933.095	7288.875	FR	
10958	1769150.08	1624931.695	7288.585	FR	
10959	1769150.745	1624930.44	7287.695	FR	
10960	1769148.995	1624931.755	7286.625	FR	
10961	1769150.535	1624929.72	7286.14	FR	
10962	1769149.745	1624931.04	7286.38	FR	
10963	1769149.53	1624930.74	7285.505	FR	
10964	1769120.855	1624971.84	7278.965	FR	
10965	1769119.535	1624972.81	7279.795	FR	
10966	1769120.04	1624972.79	7278.225	FR	
10967	1769120.81	1624974.365	7280.71	FR	
10968	1769120.435	1624974.745	7282.105	FR	
10969	no point	*Point gap from #10969 to 10970*			-----
10970	no point	*due to instrument memory-full error*			-----
10971	1769149.04	1624930.05	7283.84	FR	
10972	1769148.585	1624930.44	7284.23	FR	horizontal prism
10973	1769147.57	1624931.425	7282.6	FR	
10974	1769147.945	1624931.56	7283.79	FR	
10975	1769148.375	1624931.67	7284.99	FR	
10976	1769146.26	1624933.09	7282.4	FR	
10977	1769146.33	1624933.685	7283.995	FR	
10978	1769147.435	1624933.175	7285.705	FR	
10979	1769146.82	1624934.68	7286.89	FR	
10980	1769147.37	1624934.55	7287.89	FR	
10981	1769147.7	1624934.85	7289.115	FR	
10982	1769149.225	1624933.11	7288.87	FR	
10983	1769148.19	1624932.915	7288.015	FR	horizontal prism
10984	1769149.055	1624934.105	7289.88	FTC	
10985	1769148.04	1624935.53	7290.325	FTC	
10986	1769147.46	1624935.785	7289.74	FR	
10987	1769146.755	1624936.375	7289.145	FR	
10988	1769146.175	1624934.83	7285.785	FR	
10989	1769146.26	1624936.09	7287.68	FR	
10990	1769145.745	1624936.2	7286.96	FR	
10991	1769146.15	1624936.955	7288.69	FR	
10992	1769144.99	1624936.36	7285.73	CP	
10993	1769144.785	1624933.785	7282.245	FR	1.97' horizontal prism
10994	1769145.63	1624934.4	7284.645	FR	horizontal prism
10995	1769144.57	1624934.24	7282.74	FR	horizontal prism
10996	1769119.785	1624973.805	7278.875	FR	
10997	1769119.83	1624975.19	7278.075	FR	
10998	1769118.335	1624976.525	7278.425	FR	
10999	1769117.725	1624977.085	7279.585	FR	
11000	1769118.97	1624975.955	7279.71	FR	
11001	1769120.205	1624974.88	7279.76	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
11002	1769120.37	1624974.845	7284.03	FR	
11003	1769120.08	1624975.11	7283.885	FR	
11004	1769118.78	1624976.32	7284.49	FR	
11005	1769118.615	1624976.445	7283.73	FR	
11006	1769118.105	1624976.915	7283.59	FR	
11007	1769119.11	1624975.905	7281.695	FR	
11008	1769117.67	1624977.2	7281.065	FR	
11009	1769118.935	1624975.98	7279.7	FR	
11010	1769117.695	1624977.115	7279.585	FR	
11011	1769116.715	1624978.12	7281.43	FR	
11012	1769116.54	1624978.365	7283.325	FR	
11013	1769115.195	1624979.515	7278.96	FR	
11014	1769115.25	1624979.545	7281.29	FR	
11015	1769115.03	1624979.845	7283.365	FR	
11016	1769114.325	1624981.055	7283.565	FR	
11017	1769114.145	1624980.68	7281.92	FR	
11018	1769113.48	1624981.67	7282.12	FR	
11019	1769113.21	1624981.595	7280.58	FR	
11020	1769114.035	1624980.7	7279.09	FR	
11021	1769112.155	1624983.035	7282.64	FR	
11022	1769112.16	1624983.125	7280.62	FR	
11023	1769111.48	1624984.36	7282.995	FR	
11024	1769110.74	1624984.57	7282.205	FR	
11025	1769111.305	1624983.895	7280.63	FR	
11026	1769111.77	1624983.62	7279.29	FR	
11027	1769111.55	1624983.64	7277.815	FR	
11028	1769143.59	1624936.685	7283.085	FR	
11029	1769143.765	1624937.28	7284.515	FR	
11030	1769143.11	1624938.16	7284.44	FR	
11031	1769143.98	1624937.78	7285.675	FR	
11032	1769147.125	1624937.49	7290.355	FTC	
11033	1769145.935	1624938.75	7290.285	FTC	
11034	1769145.085	1624939.06	7289.875	FR	
11035	1769144.695	1624938.655	7288.675	FR	
11036	1769145.205	1624937.475	7287.815	FR	
11037	1769146.425	1624937.62	7289.515	FR	
11038	1769110.48	1624984.815	7279.305	FR	
11039	1769110.09	1624985.385	7280.755	FR	
11040	1769110	1624985.59	7283.01	FR	
11041	1769109.01	1624987.12	7284.26	FR	
11042	1769108.475	1624987.74	7283.24	FR	
11043	1769107.87	1624988.74	7283.89	FR	
11044	1769107.855	1624988.75	7282.16	FR	
11045	1769109.005	1624986.895	7281.6	FR	
11046	1769109.19	1624986.42	7278.79	FR	
11047	1769108.75	1624987.2	7280.34	FR	
11048	1769108.245	1624987.89	7278.81	FR	
11049	1769107.84	1624988.72	7280.105	FR	
11050	1769107.535	1624989.35	7281.88	FR	
11051	1769107.44	1624989.495	7283.005	FR	
11052	1769105.815	1624990.475	7282.865	FR	
11053	1769105.295	1624990.325	7282.095	FR	
11054	1769105.805	1624989.99	7281.03	FR	
11055	1769105.265	1624989.19	7278.235	FR	
11056	1769144.285	1624940.225	7290.01	FTC	
11057	1769143.06	1624941.65	7290.13	FTC	
11058	1769141.745	1624942.455	7288.715	FR	
11059	1769142.44	1624940.9	7287.51	FR	
11060	1769143.53	1624939.7	7287.9	FR	
11061	1769143.645	1624938.845	7286.865	FR	
11062	1769143.005	1624939.805	7287.05	FR	
11063	1769142.595	1624941.64	7288.975	FR	
11064	1769142.145	1624940.49	7286.035	FR	
11065	1769142.645	1624939.595	7285.66	FR	
11066	1769143.69	1624938.925	7286.845	FR	
11067	1769141.16	1624939.82	7282.85	CP	
11068	1769140.415	1624941.365	7283.81	FR	
11069	1769140.82	1624941.825	7285.535	FR	
11070	1769141.89	1624939.985	7284.765	FR	
11071	1769140.48	1624943.03	7286.91	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
11072	1769141.13	1624942.2	7286.82	FR	
11073	1769141.725	1624942.49	7288.73	FR	
11074	1769141.345	1624942.88	7288.01	FR	
11075	1769142.185	1624943.545	7290.555	FTC	
11076	1769141.625	1624943.9	7290.415	FR	End survey 4 September 2007
7009	1769128.24	1624956.745	7278.46	BS	Backshot; start survey 6 September 2007
11078	1769140.78	1624947.235	7290.115	FR	
11079	1769140.175	1624946.24	7289.575	FR	
11080	1769139.83	1624947.51	7288.975	FR	
11081	1769141.395	1624945.62	7290.325	FR	
11082	1769139.145	1624945.67	7288.03	FR	
11083	1769138.41	1624945.66	7286.68	FR	
11084	1769140.145	1624945.07	7288.795	FR	
11085	1769139.965	1624944.385	7287.9	FR	
11086	1769141.655	1624944.03	7290.42	FR	
11087	1769140.45	1624944.12	7289.185	FR	horizontal prism
11088	1769141.375	1624943.035	7287.95	FR	
11089	1769137.235	1624944.96	7285.02	FR	horizontal prism
11090	1769136.86	1624946.205	7284.155	CP	
11091	1769135.985	1624947.805	7285.04	CP	
11092	1769136.975	1624947.675	7286.885	CP	
11093	1769135.835	1624949.675	7286.72	CP	
11094	1769135.685	1624947.415	7283.65	FR	
11095	1769134.34	1624949.385	7283.93	FR	
11096	1769134.57	1624950.235	7285.74	FR	
11097	1769134.605	1624951.22	7286.775	FR	
11098	1769135.225	1624951.06	7287.335	FR	
11099	1769135.685	1624951.555	7288.49	FR	
11100	1769136.41	1624949.635	7288.265	FR	
11101	1769137.26	1624948.98	7288.695	FR	
11102	1769138.485	1624948.155	7289.325	FR	
11103	1769138.085	1624947.3	7288.36	FR	
11104	1769138.565	1624947.06	7288.795	FR	
11105	1769139.1	1624949.11	7289.8	FR	
11106	1769138.245	1624949.845	7289.685	FR	
11107	1769139.855	1624948.69	7290.445	FTC	
11108	1769138.625	1624949.78	7290.675	FTC	
11109	1769137.62	1624951.75	7290.85	FTC	
11110	1769135.945	1624953.275	7290.43	FTC	
11111	1769134.3	1624954.73	7290.61	FTC	horizontal prism
11112	1769134.09	1624954.8	7289.73	FR	
11113	1769134.95	1624953.245	7289.355	FR	
11114	1769134.155	1624953.81	7288.69	FR	
11115	1769134.895	1624952.8	7288.05	FR	
11116	1769136.81	1624951.405	7289.36	FR	
11117	1769135.585	1624951.385	7289.185	FR	horizontal prism
11118	1769133.31	1624954.95	7288.44	FR	
11119	1769132.9	1624954.635	7286.92	FR	
11120	1769133.4	1624953.76	7287.715	FR	
11121	1769133.825	1624953.045	7286.89	FR	
11122	1769132.185	1624953.83	7284.605	FR	
11123	1769133.515	1624952.52	7284.87	FR	
11124	1769133.31	1624952.255	7283.765	FR	
11125	1769132.35	1624953.2	7282.695	FR	
11126	1769131.055	1624955.05	7284.155	FR	
11127	1769131.075	1624954.81	7283.16	FR	
11128	1769131.455	1624954.13	7282.285	FR	
11129	1769133.83	1624951.825	7286.845	FR	horizontal prism
11130	1769134.015	1624951.375	7285.17	FR	horizontal prism
11131	1769133.985	1624951.51	7284.02	FR	
11132	1769134.575	1624951.135	7283.725	FR	
11133	1769133.32	1624951.65	7282.28	FR	
11134	1769134.11	1624951.085	7282.67	FR	
11135	1769131.05	1624955.61	7285.635	CP	
11136	1769131.055	1624955.16	7284.25	FR	
11137	1769130.925	1624956.455	7284.44	FR	
11138	1769130.27	1624957.3	7284.395	FR	
11139	1769129.805	1624957.75	7283.93	FR	
11140	1769129.495	1624956.805	7283.08	FR	
11141	1769130.47	1624956.04	7282.86	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
11142	1769132.31	1624955.815	7287.65	FR	
11143	1769131.63	1624956.345	7286.96	FR	
11144	1769128.66	1624958.745	7282.61	FR	
11145	1769128.81	1624958.775	7283.65	FR	
11146	1769128.84	1624959.11	7285.26	FR	
11147	1769129.7	1624958.59	7284.505	FR	
11148	1769129.505	1624958.03	7282.765	FR	
11149	1769129.17	1624957.125	7281.925	FR	
11150	1769129.12	1624961.855	7288.77	FR	
11151	1769129.995	1624961.15	7289.885	FR	
11152	1769129.645	1624960.885	7288.24	FR	
11153	1769129.14	1624961.915	7288.715	FR	
11154	1769129.27	1624960.415	7287.515	FR	
11155	1769129.015	1624960.895	7286.41	FR	
11156	1769128.98	1624962.11	7286.465	FR	
11157	1769128.77	1624961.445	7285.51	FR	
11158	1769128.825	1624960.715	7284.93	FR	
11159	1769127.92	1624965.4	7290.635	FTC	
11160	1769128.97	1624963.43	7290.245	FTC	
11161	1769129.32	1624962.09	7290.32	FTC	
11162	1769130.585	1624960.585	7290.415	FTC	
11163	1769127.48	1624964.635	7289.885	FR	
11164	1769127.06	1624964.605	7288.5	FR	
11165	1769126.915	1624964.095	7286.985	FR	
11166	1769126.735	1624964.845	7286.1	FR	
11167	1769126.82	1624965.855	7287.275	FR	
11168	1769127.255	1624964.465	7285.08	FR	
11169	1769127.615	1624963.605	7285.995	FR	
11170	1769127.825	1624963.655	7286.72	FR	
11171	1769127.945	1624963.835	7288.23	FR	
11172	1769128.58	1624963.84	7289.74	FR	
11173	1769129.025	1624963.53	7287.78	FR	
11174	1769127.98	1624963.935	7285.315	FR	
11175	1769129.13	1624962.805	7289.46	FR	
11176	1769128.995	1624963.205	7285.88	FR	
11177	1769126.91	1624963.44	7283.99	FR	
11178	1769127.84	1624963.17	7284.295	FR	
11179	1769128.855	1624962.945	7284.37	FR	
11180	1769127.73	1624962.92	7283.055	FR	
11181	1769128.655	1624962.595	7282.65	FR	
11182	1769128.82	1624962.1	7284.87	FR	
11183	1769128.73	1624961.255	7283.285	FR	
11184	1769128.7	1624959.965	7283.36	FR	
11185	1769129.7	1624959.06	7286.3	FR	
11186	1769130.255	1624959.055	7287.52	FR	
11187	1769131.225	1624957.425	7288.185	FR	
11188	1769130.78	1624958.16	7286.965	FR	
11189	1769131.395	1624957.87	7289.29	FR	
11190	1769130.89	1624958.86	7288.94	FR	
11191	1769130.385	1624959.78	7288.375	FR	
11192	1769131.945	1624958.75	7290.86	FTC	
11193	1769133.49	1624957.495	7290.795	FTC	
11194	1769131.275	1624959.05	7290.275	FR	
11195	1769132.665	1624957.03	7289.4	FR	
11196	1769133.325	1624956.035	7289.16	FR	
11197	1769126.955	1624964.58	7283.335	FR	
11198	1769124.15	1624967.265	7282.665	FR	
11199	1769124.075	1624967.7	7284.52	FR	
11200	1769125.04	1624967.045	7284.12	FR	
11201	1769126.415	1624966.06	7285.345	FR	
11202	1769126.855	1624966.21	7283.505	FR	
11203	1769126.345	1624965.36	7282.47	FR	
11204	1769127.74	1624965.6	7283.705	FR	
11205	1769126.395	1624966.075	7285.35	FR	
11206	1769124.525	1624969.075	7288.32	FR	
11207	1769124.46	1624969.155	7287.35	FR	
11208	1769124.385	1624969.07	7286.205	FR	
11209	1769124.055	1624968.59	7285.29	FR	
11210	1769123.98	1624968.95	7283.955	FR	
11211	1769123.315	1624969.835	7284.96	FR	

Point#	Northing	Easting	Elevation	Pcode	Notes
11212	1769123.625	1624968.67	7282.715	FR	
11213	1769125.22	1624968.78	7289.415	FR	
11214	1769124.005	1624970.02	7287.805	FR	
11215	1769123.76	1624970.22	7286.105	FR	
11216	1769125.365	1624968.285	7288.33	FR	
11217	1769125.21	1624968.39	7285.815	FR	
11218	1769127.275	1624967.16	7288.67	FR	
11219	1769127.555	1624966.4	7289.455	FR	
11220	1769126.925	1624967	7287.76	FR	
11221	1769126.415	1624967.205	7286.575	FR	
11222	1769126.395	1624967.955	7286.85	FR	
11223	1769127.35	1624966.735	7290.905	FTC	
11224	1769126.525	1624967.615	7290.885	FTC	
11225	1769125.61	1624968.915	7290.01	FTC	
11226	1769125.56	1624969.54	7291.415	CP	
11227	1769126.055	1624968.02	7290.45	FR	
11228	1769122.99	1624973.045	7289.78	FR	
11229	1769124.05	1624971.945	7289.275	FR	
11230	1769124.38	1624971.295	7288.41	FR	
11231	1769123.675	1624972.025	7288.08	FR	
11232	1769123.21	1624972.535	7289.985	FTC	
11233	1769124.565	1624970.815	7289.065	FTC	
11234	1769121.8	1624974.195	7289.905	FTC	
11235	1769122.335	1624974.035	7291.685	CP	
11236	1769121.195	1624974.475	7289.42	FR	
11237	1769121.985	1624973.74	7289.665	FR	
11238	1769122.425	1624973.25	7288.365	FR	
11239	1769121.055	1624974.465	7287.435	FR	
11240	1769122.025	1624973.575	7287.025	FR	
11241	1769121.495	1624974.015	7286.06	FR	
11242	1769124.015	1624971.6	7286.23	FR	
11243	1769122.91	1624972.76	7286.55	FR	
11244	1769123.08	1624972.55	7284.96	FR	
11245	1769122.065	1624971.825	7284.355	FR	
11246	1769122.27	1624973.045	7283.765	FR	
11247	1769120.325	1624975.38	7289.53	FR	
11248	1769119.52	1624976.015	7288.24	FR	
11249	1769120.215	1624975.255	7286.93	FR	
11250	1769120.16	1624975.22	7285.74	FR	
11251	1769120.185	1624975.13	7285.015	FR	
11252	1769120.07	1624976.11	7289.815	FTC	
11253	1769118.845	1624976.51	7286.295	FR	End survey 6 September 2007
7006	1769253.37	1624796.975	7277.62	BS	Backshot; start survey 11 September 2007
11254	1769120.75	1624977.11	7291.03	CP	
11255	1769120.185	1624978.815	7290.91	CP	
11256	1769118.675	1624980.175	7290.575	FTC	
11257	1769116.91	1624981.525	7290.535	FTC	
11258	1769118.885	1624976.7	7287.475	FTC	horizontal prism
11259	1769117.415	1624978.685	7287.365	FTC	horizontal prism
11260	1769117.8	1624977.7	7286.51	FTC	
11261	1769118.22	1624977.595	7287.3	CP	horizontal prism
11262	1769117.68	1624977.43	7285.1	FR	
11263	1769117.93	1624979.35	7288.905	FR	
11264	1769117.265	1624980.16	7289.24	FR	
11265	1769117.44	1624979.895	7287.605	FR	
11266	1769117.27	1624979.55	7286.825	FR	
11267	1769116.46	1624981.605	7289.27	FR	
11268	1769116.17	1624980.655	7287.27	FR	
11269	1769116.98	1624978.21	7286.01	FR	
11270	1769116.335	1624978.865	7286.17	FR	
11271	1769116.415	1624978.65	7284.975	FR	
11272	1769115.705	1624979.81	7285.76	FR	
11273	1769114.89	1624980.455	7285.065	FR	
11274	1769115.285	1624981.53	7287.34	FR	
11275	1769114.635	1624982.73	7288.245	FR	
11276	1769114.21	1624983.465	7289.07	FR	
11277	1769114.435	1624982.28	7286.5	FR	
11278	1769113.36	1624982.71	7286.415	FR	
11279	1769114.995	1624982.405	7289.085	FR	horizontal prism
11280	1769113.625	1624983.35	7289.6	FR	horizontal prism

Point#	Northing	Easting	Elevation	Pcode	Notes
11281	1769115.95	1624982.675	7290.135	FR	
11282	1769115.36	1624983.65	7289.855	FR	
11283	1769115.73	1624983.245	7290.315	FTC	
11284	1769112.57	1624986.48	7290.655	FTC	
11285	1769114.47	1624985.17	7290.225	FTC	
11286	1769112.36	1624984.29	7287.27	FR	
11287	1769111.375	1624985.835	7287.465	FR	
11288	1769112.825	1624985.105	7288.92	FR	
11289	1769113.045	1624985.665	7290.08	FR	
11290	1769111.545	1624986.17	7289.985	FR	horizontal prism
11291	1769111.28	1624985.76	7288.375	FR	horizontal prism
11292	1769111.31	1624986.85	7290.135	FR	horizontal prism
11293	1769110.65	1624987.395	7288.255	FR	
11294	1769110.765	1624988.14	7290.525	FTC	
11295	1769112.21	1624987.06	7291.805	CP	horizontal prism
11296	1769113.385	1624982.095	7284.55	FR	
11297	1769112.69	1624983.14	7284.03	FR	
11298	1769111.95	1624983.735	7283.86	FR	
11299	1769112.145	1624984.245	7285.695	FR	
11300	1769111.4	1624985.58	7285.98	FR	
11301	1769111.37	1624985.335	7285.06	FR	
11302	1769111.3	1624985.15	7284.45	FR	
11303	1769112.65	1624982.62	7284.61	FR	horizontal prism
11304	1769110	1624986.275	7284.845	FR	
11305	1769107.915	1624988.62	7285.175	FR	
11306	1769109.445	1624986.995	7287.02	FR	
11307	1769109.715	1624989.025	7288.89	FR	
11308	1769109.125	1624989	7287.92	FR	
11309	1769108.175	1624989.695	7287.675	FR	
11310	1769108.62	1624990.585	7289.535	FR	
11311	1769109.565	1624988.335	7289.805	FR	horizontal prism
11312	1769109.08	1624990.145	7290.26	FTC	
11313	1769107.335	1624992.07	7290.29	FTC	
11314	1769107.815	1624992.25	7292.4	CP	
11315	1769109.32	1624990.395	7292.115	CP	End survey 11 September 2007; conclude NE survey

Total Northeast Wall survey points = 3077

APPENDIX E.

STRUCTURAL DATA

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CMRR STRUCTURAL DATA

Compilation of Measurements for All Walls [#]

Wall [1]	*Strike (quad.)* [2]	*Strike (az.)* [3]	*Dip*	*Dip Dir.*	*Units Affected* [4]	*Displacement*	*Sense*	*Magnitude*	*Notes*
SWT	N0E	000	85	E	Qbt4, Qbts, Qbt3	Y	DTE/W	1.4 ft DTW on TOS; 0.3 ft DTE on BOS	Both Qbt_s contacts displaced with opposite sense; feature SWT-5
SWT	N0E	000	48	W	Qbt4	---	---	---	
SWT	N10E	010	80	SE	Qbt4	---	---	---	
SWT	N10E	010	85	W	Qbt4	---	---	---	
SWT	N10E	010	85	SW	Qbt4	---	---	---	
SWT	N10E	010	90	---	Qbt4, Qbts, Qbt3	Y, BOS only	DT?	0.4 ft	Downdrops block of Qbt_s in tiny graben; feature SWT-7
SWT	N10E	010	90	---	Qbt4, Qbts	Y, TOS only	DTE	1.1 ft	Fracture terminates at Qbt_s-Qbt_3 contact; feature SWT-4
SWT	N15E	015	90	---	Qbt4	---	---	---	
SWT	N15E	015	75	W	Qbt4, Qbts	Y, TOS only			
SWT	N15E	015	25	W	Qbt4	---	---	---	
SWT	N20E	020	90	---	Qbt4, Qbts, Qbt3	Y	DTE	1.2 ft on TOS; 0.7 ft on BOS	Feature SWT-2
SWT	N30E	030	90	---	Qbt4, Qbts, Qbt3	---	---	---	
SWT	N40E	040	90	---	Qbt4, Qbts, Qbt3	---	---	---	
SWT	N40E	040	90	---	Qbt4, Qbts, Qbt3	---	---	---	
SWT	N40E	040	90	---	Qbt4, Qbts, Qbt3	Y	DTNW	0.6 ft	East boundary of feature SWT-6
SWT	N45E	045	90	---	Qbt4	---	---	---	
SWT	N50E	050	90	---	Qbt4, Qbts, Qbt3	Y	DTSE	0.1 ft	West boundary of feature SWT-9
SWT	N50E	050	90	---	Qbt4, Qbts, Qbt3	Y	DTNW	0.1 ft	East boundary of feature SWT-9
SWT	N55E	055	90	---	Qbt4, Qbts	---	---	---	
SWT	N55E	055	75	NW	Qbt4, Qbts, Qbt3	---	---	---	
SWT	N65E	065	90	---	Qbt4	---	---	---	
SWT	N66E	066	90	---	Qbt4, Qbts,Qbt3	---	---	---	
SWT	N70E	070	75	S	Qbt4	---	---	---	
SWT	N80E	080	90	---	Qbt4, Qbts,Qbt3	Y	DTSE	0.5 ft on TOS; 0.3 ft on BOS	West boundary of feature SWT-6
SWT	N80E	080	90	---	Qbt4, Qbts,Qbt3	Y	DTSE	0.5 ft on TOS; 0.7 ft on BOS	Feature SWT-8
SWT	N80E	080	55	N	Qbt4	---	---	---	
SWT	N85E	085	90	---	Qbt4, Qbts, Qbt3	---	---	---	
SWT	N90E	090	73	S	Qbt4, Qbts, Qbt3	---	---	---	
SWT	N90E	090	87	N	Qbt4	---	---	---	
SWT	N90E	090	90	---	Qbt4, Qbts, Qbt3	---	---	---	
SWT	N90E	090	76	N	Qbt4	---	---	---	
SWT	N85W	095	80	N	Qbt4, Qbts, Qbt3	Y	DTS	2.0 ft	High-angle reverse fault; feature SWT-1
SWT	N80W	100	90	---	Qbt4	---	---	---	
SWT	N80W	100	85	N	Qbt4	---	---	---	
SWT	N75W	105	90	---	Qbt4	---	---	---	
SWT	N70W	110	85	S	Qbt4	---	---	---	
SWT	N45W	135	65	N	Qbt4	---	---	---	
SWT	N85W	275	30	N	Qbt4	---	---	---	
SWT	N35W	325	85	N	Qbt4	---	---	---	
SWT	N30W	330	90	---	Qbt4	---	---	---	
SWT	N25W	335	90	---	Qbt4, Qbts	---	---	---	
SWT	N20W	340	90	---	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
SWT	N20W	340	90	---	Qbt4	---	---	---	
SWT	N20W	340	85	E	Qbt4	---	---	---	
SWT	N10W	350	75	N	Qbt4, Qbts	---	---	---	
SWT	N10W	350	75	N	Qbt4	---	---	---	
SWT	N7W	353	60	NE	Qbt3	---	---	---	
SWT	N7W	353	65	SW	Qbt3	---	---	---	
N	N40W	320	73	E	Qbt4	---	---	---	
N	N55W	305	50	E	Qbt4	---	---	---	
N	N03W	3	90	---	Qbt4	---	---	---	
N	N49W	311	66	NW	Qbt3	---	---	---	
N	N62W	298	78	NE	Qbt3	---	---	---	
N	N83E	83	40	N	Qbt4	---	---	---	
N	N75W	285	67	N	Qbt4	---	---	---	
N	N05W	355	80	SE	Qbt4	---	---	---	
N	N82W	278	73	N	Qbt4	---	---	---	
N	N10E	10	10	W	Qbt4	---	---	---	Caliche on fracture surface
N	N73W	287	73	N	Qbt4	---	---	---	
N	N00E	0	5	E	Qbt4	---	---	---	
N	N75W	285	54	N	Qbt4	---	---	---	
N	N07W	353	90	---	Qbt4	---	---	---	
N	N45W	315	76	NE	Qbt4	---	---	---	
N	N53W	307	86	N	Qbt4	---	---	---	
N	N53W	307	90	---	Qbt4	---	---	---	
N	N10E	10	53	W	Qbt4	---	---	---	
N	N63W	297	48	N	Qbt4	---	---	---	
N	N83W	277	26	SE	Qbt4	---	---	---	
N	N31W	329	77	NE	Qbt3	---	---	---	
N	N47W	313	72	NE	Qbt3	---	---	---	
N	N81W	279	90	---	Qbt3	---	---	---	
N	N47W	313	75	NE	Qbt3	---	---	---	
N	N47E	47	84	NW	Qbt4	---	---	---	
N	N61W	299	90	---	Qbt4	---	---	---	
N	N33W	327	90	---	Qbt4	---	---	---	
N	N50W	310	83	N	Qbt3	---	---	---	
N	N00E	0	90	---	Qbt3	---	---	---	Rubble towards base of fracture
N	N07E	7	84	W	Qbt4	---	---	---	
N	N06W	354	3	E	Qbt4	---	---	---	
N	N90E	90	16	N	Qbt4	---	---	---	
N	N05E	5	72	E	Qbts, Qbt4	---	---	---	No displacement along Qbt_s contact, visible fracture dies out halfway through Qbt_s
N	N69W	291	40	N	Qbt4	---	---	---	
N	N20W	340	20	E	Qbt4	---	---	---	
N	N29W	331	82	W	Qbt4	---	---	---	
N	N90E	90	49	N	Qbt4	---	---	---	
N	N20W	340	90	---	Qbt4	---	---	---	Clay and rubble filled
N	N76W	284	43	N	Qbt3	---	---	---	
N	N75W	285	37	N	Qbt4	---	---	---	
N	N66E	66	90	---	Qbt4	---	---	---	
N	N09E	9	37	E	Qbt4	---	---	---	
N	N52W	308	18	N	Qbt4	---	---	---	
N	N45E	45	90	---	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
N	N33W	327	90	---	Qbt4	---	---	---	
N	N80W	280	47	N	Qbt4	---	---	---	
N	N33W	327	90	---	Qbt4	---	---	---	
N	N60E	60	35	N	Qbt4	---	---	---	
N	N42E	42	69	SE	Qbt4	---	---	---	
N	N53E	53	90		Qbt4	---	---	---	
N	N87E	87	26	N	Qbt4	---	---	---	
N	N75W	285	38	N	Qbt4	---	---	---	
N	N79W	281	45	N	Qbt3	---	---	---	
N	N54W	306	62	NE	Qbt3	---	---	---	
N	N53E	53	35	N	Qbt4	---	---	---	
N	N30W	330	36	SW	Qbt4	---	---	---	
N	N45W	315	37	S	Qbt4	---	---	---	
N	N86W	274	40	N	Qbt4	---	---	---	
N	N23E	23	75	E	Qbt4	---	---	---	
N	N50W	310	39	S	Qbt4	---	---	---	
N	N16E	16	90	---	Qbt4	---	---	---	
N	N11E	11	86	E	Qbt4	---	---	---	
N	N06E	6	90		Qbt4	---	---	---	Terminates at Qbt_3-Qbt_4 contact
N	N19E	19	88	NW	Qbt3	---	---	---	
N	N64W	296	90	---	Qbt3	---	---	---	
N	N11E	11	88	NW	Qbt3	---	---	---	
N	N72W	288	90		Qbt4	---	---	---	
N	N54E	54	85	NW	Qbt3	---	---	---	
N	N85W	275	69	N	Qbt4	---	---	---	
N	N45E	45	56	SE	Qbt4	---	---	---	
N	N79E	79	81	S	Qbt4	---	---	---	Fracture face
N	N33W	327	90	---	Qbt4	---	---	---	
N	N18E	18	55	W	Qbt4	---	---	---	Terminates at Qbt_3-Qbt_4 contact
N	N05E	5	67	E	Qbt3	---	---	---	
N	N11W	349	62	NE	Qbt3	---	---	---	
N	N45E	45	63	N	Qbt3	---	---	---	
N	N53W	307	62	SW	Qbt3	---	---	---	
N	N31E	31	90	---	Qbt4	---	---	---	
N	N33W	327	78	SW	Qbt4	---	---	---	
N	N34E	34	88	NW	Qbt3	---	---	---	
N	N90W	270	42	N	Qbt3	---	---	---	
N	N71E	71	54	N	Qbt4	---	---	---	
N	N82W	278	60	N	Qbt4	---	---	---	
N	N51W	309	68	N	Qbt4	---	---	---	
N	N03E	3	73	W	Qbt4	---	---	---	
N	N56W	304	61	N	Qbt4	---	---	---	
N	N05W	355	90	---	Qbts, Qbt4	---	---	---	
N	N90W	270	32	N	Qbt4	---	---	---	
N	N83W	277	43	N	Qbt4	---	---	---	
N	N64W	296	56	N	Qbt4	---	---	---	
N	N26E	26	33	W	Qbt4	---	---	---	
N	N00E	0	80	W	Qbt4	---	---	---	
N	N11W	349	90	---	Qbt4	---	---	---	Clay filled
N	N66W	294	50	N	Qbt4	---	---	---	
N	N07E	7	10	SE	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
N	N0E	0	40	W	Qbt4	---	---	---	
N	N0E	0	57	W	Qbt4	---	---	---	
N	N77E	77	56	N	Qbt4	---	---	---	
N	N09W	351	87	W	Qbt4, Qbts	---	---	---	
N	N73E	73	62	S	Qbt3	---	---	---	
N	N58E	58	70	S	Qbt3	---	---	---	
N	N66E	66	90	---	Qbt3	---	---	---	Terminates at Qbt_s contact
N	N13E	13	65	N	Qbt3	---	---	---	
N	N30E	30	90	---	Qbt3	---	---	---	
N	N72E	72	65	N	Qbt3	---	---	---	
N	N19W	341	73	E	Qbt3	---	---	---	
N	N0E	0	62	W	Qbt3	---	---	---	
N	N35W	325	90	---	Qbt4	---	---	---	
N	N25W	335	90	---	Qbt4	---	---	---	
N	N80E	80	71	N	Qbt4	---	---	---	
N	N17E	17	20	E	Qbt4	---	---	---	
N	N07W	353	90	---	Qbt4	---	---	---	
N	N88W	272	52	N	Qbt4	---	---	---	
N	N10W	350	52	E	Qbt4	---	---	---	
N	N70W	290	65	N	Qbt4	---	---	---	
N	N62W	298	59	N	Qbt4	---	---	---	
N	N78W	282	76	N	Qbt4	---	---	---	
N	N51W	309	80	NE	Qbt4	---	---	---	
N	N70E	70	81	N	Qbt4	---	---	---	
N	N11E	11	80	NW	Qbt4, Qbts	---	---	---	
N	N35E	35	46	SE	Qbt4	---	---	---	
N	N50W	310	23	S	Qbt4	---	---	---	
N	N79E	79	34	N	Qbt4	---	---	---	
N	N07W	353	72	E	Qbt3	---	---	---	
N	N12W	348	90	---	Qbt3	---	---	---	
N	N72W	288	56	N	Qbt4	---	---	---	
N	N80W	280	50	N	Qbt4	---	---	---	
N	N78E	78	57	N	Qbt4	---	---	---	
N	N57W	303	72	N	Qbt4	---	---	---	
N	N75W	285	42	S	Qbt4	---	---	---	
N	N15W	345	90	---	Qbt4	---	---	---	Clay filled
N	N13W	347	80	E	Qbt4	---	---	---	
N	N06W	354	90	---	Qbt4, Qbts, Qbt3	---	---	---	Changes dip entering Qbt_s and Qbt_3
SET	N59E	59	77	W	Qbt4	---	---	---	
SET	N52W	308	82	N	Qbt4, Qbts, Qbt3	---	---	---	
SET	N43W	317	85	N	Qbt4	---	---	---	
SET	N19W	341	62	W	Qbt4	---	---	---	
SET	N06W	354	74	W	Qbt4, Qbts, Qbt3	---	---	---	
SET	N62W	298	83	N	Qbt4, Qbts, Qbt3	Y, TOS only	DTN	0.4 ft	Feature SET-1
SET	N81W	279	84	W	Qbt4	Y, TOS only	DTN	0.3 ft	North side of small graben; fracture displaces Qbt_4-Qbt_s contact but does not project into Qbt_s; feature SET-2
SET	N04W	356	90	---	Qbt4	---	---	---	Associated with step at Qbt_4-Qbt_s contact
SET	N85E	85	90	---	Qbt4, Qbts	Y, TOS only	DTN	0.5 ft	Feature SET-4
SET	N77E	77	76	S	Qbt4, Qbts	Y, TOS only	DTS	0.1 ft	Feature SET-5

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
SET	N71W	289	81	S	Qbt4	---	---	---	
SET	N87W	273	90	---	Qbt4	---	---	---	
SET	N86W	274	84	S	Qbt4	---	---	---	
SET	N88E	88	80	S	Qbt4	---	---	---	
SET	N88E	88	86	S	Qbt4	---	---	---	
SET	N66E	66	84	S	Qbt4	---	---	---	
SET	N88W	272	89	N	Qbt4, Qbts	---	---	---	
SET	N62W	298	86	S	Qbt4	---	---	---	
SET	N21W	339	90	---	Qbt4	---	---	---	
SET	N79W	281	90	---	Qbt4	---	---	---	Clay fill
SET	N36W	324	90	---	Qbt4	---	---	---	
SET	N23W	337	87	S	Qbt4	---	---	---	
SET	N77W	283	87	N	Qbt4	Y	DTS	1.2 ft	North side of intensely fractured tuff region; feature SET-6
SET	N67W	293	88	N	Qbt4	---	---	---	
SET	N04E	4	85	E	Qbt4	Y	DTS	1.2 ft	South side of intensely fractured tuff region; feature SET-6
SET	N77E	77	72	NW	Qbt4	---	---	---	
SET	N57W	303	90	---	Qbt4	---	---	---	
SET	N29W	331	90	---	Qbt4, Qbts, Qbt3	Y, TOS only	DTS	0.2 ft	Feature SET-8
SET	N85E	85	58	S	Qbt4	---	---	---	
SET	N88E	88	71	S	Qbt4	---	---	---	
SET	N87E	87	67	S	Qbt4, Qbts, Qbt3	Y, TOS only	DTS	0.7 ft	Feature SET-9
SET	N83W	277	79	S	Qbt4, Qbts, Qbt3	Y, TOS only	DTS	0.4 ft	Feature SET-10
SET	N55W	305	68	S	Qbt3	---	---	---	
SET	N72W	288	90	---	Qbt4, Qbts	Y	DTN	0.4 ft	Feature SET-11
SET	N75W	285	85	N	Qbt4, Qbts	Y	DTN	0.1 ft	Clay fill; fracture disappears within Qbt3; feature SET-12
SET	N53W	307	90	---	Qbt4	---	---	---	
SET	N57W	303	84	S	Qbt4	---	---	---	
SET	N64W	296	84	S	Qbt4, Qbt3	Y	DTS	1.3 ft	Feature SET-13
SET	N88E	88	90	---	Qbt4	---	---	---	
SET	N9W	351	90	---	Qbt4	---	---	---	
SET	N11W	349	79	N	Qbt4, Qbt3	Y, TOS only	DTN	0.2 ft	Thickness of Qbt_s changing here; feature SET-14
SET	N38W	322	87	S	Qbt4	---	---	---	
SET	N58W	302	74	N	Qbt3, Qbts?	Y, TOS only	DTN	0.2 ft	Feature SET-15
SET	N83W	287	84	N	Qbt4, Qbts?	Y, TOS only	DTN	0.2 ft	Feature SET-16
SET	N81E	81	80	S	Qbt4	---	---	---	
SET	N22W	338	62	SW	Qbt4	---	---	---	
SET	N16E	16	64	E	Qbt4	---	---	---	
SET	N89E	89	84	S	Qbt4	---	---	---	
SET	N27W	333	89	N	Qbt4, Qbt3	---	---	---	
SET	N87W	273	79	S	Qbt3, Qbt4	---	---	---	
SET	N46W	314	56	N	Qbt4	---	---	---	
SET	N50W	310	78	N	Qbt4	---	---	---	
SET	N89W	271	90	---	Qbt4	---	---	---	
SET	N11W	349	88	S	Qbt4	---	---	---	
SET	N79W	281	86	S	Qbt4	---	---	---	Clay fill
SET	N90E	90	90	---	Qbt4, Qbts, Qbt3	---	---	---	Irregularity on Qbt_s-Qbt_3 contact does not appear structural; feature SET-16
SET	N80E	80	75	N	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
SET	N80E	80	90	---	Qbt4	---	---	---	
SET	N15W	345	90	---	Qbt4	---	---	---	
SET	N80E	80	85	S	Qbt4, Qbts, Qbt3	Y	DTS	0.6 ft	Feature SET-17
SET	N90E	90	90	---	Qbt3, Qbts?	---	---	---	
SET	N60W	300	80	N	Qbt4	---	---	---	
SET	N15W	345	70	N	Qbt4	---	---	---	
SET	N10W	350	35	E	Qbt3	---	---	---	
SET	N45E	45	80	NW	Qbt4	---	---	---	Fracture face
SET	N85W	275	90-70	N	Qbt4	---	---	---	
SET	N20E	20	90	---	Qbt4	---	---	---	Fracture face
SET	N07E	7	80	W	Qbt3	---	---	---	
SET	N70W	290	90	---	Qbt4, Qbt3	---	---	---	
SET	N65W	295	90	---	Qbt3	---	---	---	
SET	N30W	330	73	S	Qbt3	---	---	---	
SET	N75E	75	65	S	Qbt3	---	---	---	
SET	N20E	20	60	E	Qbt4	---	---	---	
SET	N63E	63	90	---	Qbt4, Qbts, Qbt3	---	---	---	
SET	N25W	335	70	NE	Qbt4	---	---	---	
SET	N65W	295	77	N	Qbt4	Y, TOS only	DTN	0.3 ft	Feature SET-18
SET	N55E	55	85	SE	Qbt4, Qbts?	---	---	---	
SE	N25E	25	70	E	Qbt4	---	---	---	
SE	N25E	25	70	E	Qbt4	---	---	---	
SE	N35W	325	90	---	Qbt4	---	---	---	
SE	N90E	90	90	---	Qbt4	---	---	---	
SE	N80W	280	90	---	Qbt4	---	---	---	
SE	N50E	50	65	NE	Qbt4	---	---	---	
SE	N75W	285	90	---	Qbt4	---	---	---	
SE	N40W	320	90	---	Qbt4, Qbt3	---	---	---	
SE	N90E	90	90	---	Qbt4, Qbt3	Y	DTSW	1.1 ft	No Qbt_s present; feature SE-2
SE	N70W	290	65	N	Qbt4	---	---	---	
SE	N25E	25	60	W	Qbt4	---	---	---	
SE	N35W	325	80	NE	Qbt4	---	---	---	
SE	N50E	50	45	E	Qbt4	---	---	---	
SE	N35W	325	75	NE	Qbt4	---	---	---	
SE	N70E	70	70	SE	Qbt4	---	---	---	
SE	N70W	290	65	NE	Qbt4	---	---	---	
SE	N65E	65	90	---	Qbt4	---	---	---	
SE	N0E	0	45	W	Qbt4	---	---	---	
SE	N45W	315	40	N	Qbt4	---	---	---	
SE	N35W	325	65	NE	Qbt4	---	---	---	
SE	N40W	320	70	SW	Qbt4, Qbt3	---	---	---	
SE	N30E	30	85	E	Qbt4	---	---	---	
SE	N50E	50	85	E	Qbt4	---	---	---	
SE	N10E	10	65	E	Qbt4	---	---	---	
SE	N30E	30	76	SW	Qbt4	---	---	---	
SE	N10E	10	45	E	Qbt4	---	---	---	
SE	N80E	80	90	---	Qbt4	---	---	---	
SE	N10W	350	50	E	Qbt4	---	---	---	
SE	N25W	335	40	E	Qbt4	---	---	---	
SE	N80E	80	90	---	Qbt4	---	---	---	
SE	N20W	340	75	E	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
SE	N10W	350	85	NE	Qbt4	---	---	---	
SE	N50W	310	50	NE	Qbt4	---	---	---	
SE	N30E	30	50	NW	Qbt4	---	---	---	
SE	N0E	0	90	---	Qbt4	---	---	---	
SE	N80E	80	65	N	Qbt4, Qbts	---	---	---	
SE	N10E	10	90	---	Qbt4, Qbt3	possible?	DTS	0.9 ft	Feature SE-3
SE	N25W	335	60	E	Qbt4	---	---	---	
SE	N40W	320	90	---	Qbt4	---	---	---	
SE	N40E	40	85	W	Qbt4	---	---	---	
SE	N20E	20	3	N	Qbt4	---	---	---	
SE	N30W	330	65	N	Qbt4	---	---	---	
SE	N45W	315	75	N	Qbt4	---	---	---	
SE	N40E	40	45	SE	Qbt4	---	---	---	
SE	N80E	80	80	S	Qbt4	---	---	---	
SE	N80E	80	80	SE	Qbt4	---	---	---	
SE	N70E	70	75	SE	Qbt4	---	---	---	
SE	N10W	350	80	NE	Qbt4	---	---	---	
SE	N80E	80	90	---	Qbt4	---	---	---	
SE	N10W	350	80	NE	Qbt4	---	---	---	
SE	N40W	320	90	---	Qbt4	---	---	---	
SE	N20W	340	70	SW	Qbt4, Qbts	Y, TOS only	DTN	0.5 ft	Displaces Qbt_4-Qbt_s contact only; fracture changes dip within Qbt_s; feature SE-5
SE	N80E	80	80	S	Qbts, Qbt4	Y, TOS only	DTN	0.5 ft	Displaces Qbt_4-Qbt_s contact only; fracture changes dip within Qbt_s; feature SE-5
SE	N80E	80	75	S	Qbt4	---	---	---	
SE	N80E	80	75	S	Qbt4	---	---	---	
SE	N45E	45	85	E	Qbt4	---	---	---	Fracture face
SE	N80E	80	70	S	Qbt4, Qbts	Y, TOS only	DTN	0.6 ft (reverse displacement)	Step at Qbt_4-Qbt_s contact; fracture splays within Qbt_s; feature SE-6
SE	N40W	320	80	E	Qbt4	---	---	---	Fracture face
SE	N65E	65	90	---	Qbt4, Qbts	---	---	---	No displacement at contact; fracture changes dip and dies out within Qbt_s
SE	N80E	80	90	---	Qbt4	---	---	---	
SE	N50E	50	60	SE	Qbt4	---	---	---	
SE	N60E	60	67	SE	Qbt4, Qbts, Qbt3	---	---	---	
SE	N55W	305	73	S	Qbt4, Qbts	Y, TOS only	DTS	0.4 ft	Displaces Qbt_4-Qbt_s contact only; feature SE-7
SE	N60W	300	85	S	Qbt4	---	---	---	
SE	N70W	290	90	---	Qbt4	---	---	---	
SE	N15E	15	80	E	Qbt4	---	---	---	Fracture face
SE	N20E	20	80	E	Qbt4	---	---	---	
SE	N20W	340	9	NE	Qbt4	---	---	---	
SE	N80E	80	90	---	Qbt4, Qbts, Qbt3	Y, TOS only	DTS	0.3 ft	Displaces Qbt_4-Qbt_s contact only; changes dip and splays in lower Qbt_4 and into Qbt_s; feature SE-8
SE	N35W	325	52	S	Qbt4	---	---	---	
SE	N30W	330	85	S	Qbt4	---	---	---	
SE	N20W	340	80	E	Qbt4	---	---	---	
SE	N35W	325	75	SW	Qbt4	---	---	---	
SE	N55E	55	80	SE	Qbt4	---	---	---	
SE	N5W	5	85	E	Qbt4	---	---	---	
SE	N7W	353	85	E	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
SE	N20W	340	90	---	Qbt4	---	---	---	
SE	N80W	280	90	---	Qbt4	---	---	---	
SE	N70E	70	80	SE	Qbt4	---	---	---	
SE	N75E	75	85	SE	Qbt4	---	---	---	
SE	N75E	75	80	N	Qbt4	---	---	---	
SE	N20W	340	90	---	Qbt4, Qbts	---	---	---	Fracture changes dip and splays in Qbt_s
SE	N20W	340	80	NE	Qbt4	---	---	---	
SE	N15W	345	90	---	Qbt4, Qbts?	---	---	---	
SE	N80E	80	85	SE	Qbt4	---	---	---	
SE	N80E	80	85	SE	Qbt4	---	---	---	
SE	N20W	340	80	E	Qbt4	---	---	---	Clay fill
SE	N20W	340	82	E	Qbt4	---	---	---	
SE	N60E	60	80	SE	Qbt4	---	---	---	
SE	N60E	60	80	SE	Qbt4	---	---	---	
SE	N60E	60	90	---	Qbt4, Qbts, Qbt3	---	---	---	North side of rubblized/fracture fill zone; feature SE-9
SE	N45W	315	90	---	Qbt4, Qbts, Qbt3	---	---	---	Fracture changes dip within Qbt_s and Qbt_3
SE	N25W	335	75	E	Qbt4	---	---	---	
SE	N10E	10	85	E	Qbt4	---	---	---	
SE	N10E	10	75	SW	Qbt4	---	---	---	
SE	N70E	70	90	---	Qbt4	---	---	---	
SE	N45W	315	85	NE	Qbt4, Qbts, Qbt3	Y	DTS	0.2 ft on BOS; 0.4 ft on TOS	Feature SE-10
SE	N65W	295	90	---	Qbt4, Qbts, Qbt3	Y	DTS	0.7 ft on BOS; 0.5 ft on TOS	Feature SE-11
SE	N25W	335	85	E	Qbt4	---	---	---	
SE	N70W	290	72	N	Qbt4, Qbts	---	---	---	
SE	N25W	335	90	---	Qbt4, Qbts	---	---	---	
SE	N25W	335	90	---	Qbt4	---	---	---	
SE	N70W	290	55	N	Qbt4	---	---	---	
SE	N85W	275	55	N	Qbt4	---	---	---	
SE	N55W	305	60	N	Qbt4	---	---	---	
SE	N80E	80	30	N	Qbt4	---	---	---	
SE	N90E	90	70	S	Qbt4, Qbts, Qbt3	Y	DTS	0.5 ft	Feature SE-13
SE	N80E	80	73	S	Qbt4	---	---	---	
SE	N80W	280	85	N	Qbt4, Qbt3	Y	DTN	1.2 ft	Pronounced curving failure surface; switches sense from high-angle reverse (upper Qbt_4) to normal (lower Qbt_4 and Qbt_3); feature SE-14
SE	N10E	10	35	W	Qbt4	---	---	---	
SE	N60W	300	85	E	Qbt4	---	---	---	Fracture face
SE	N45W	315	90	---	Qbt4	---	---	---	
SE	N60W	300	78	S	Qbt4	---	---	---	
SE	N13W	347	79	W	Qbt4	---	---	---	
SE	N75E	75	80	SE	Qbt4, Qbts, Qbt3	---	---	---	
SE	N10W	350	75	W	Qbt4, Qbts, Qbt3	---	---	---	
SE	N75E	75	80	S	Qbt4, Qbts, Qbt3	Y	DTN	0.55 ft on BOS; 0.4 ft on TOS	Pink staining within fracture zone; Qbt_s thickens on upthrown side of small fault; feature SE-16
SE	N65E	65	50	S	Qbt4	---	---	---	
SE	N85W	275	90	---	Qbt4, Qbts, Qbt3	---	---	---	
SE	N70W	290	85	S	Qbt4	---	---	---	
SE	N65W	295	75	N	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
SE	N50W	310	33	S	Qbt4, Qbts, Qbt3	---	---	---	
SE	N65W	295	85	N	Qbt4	---	---	---	
SE	N90E	90	83	S	Qbt4	---	---	---	
SE	N15E	15	87	W	Qbt4	---	---	---	Faint vertical striae on fracture plane
SE	N15E	15	90	---	Qbt4	---	---	---	
SE	N90E	90	90	---	Qbt4	---	---	---	
SE	N90E	90	90	---	Qbt4, Qbt3	---	---	---	
SE	N90E	90	90	---	Qbt4, Qbt3	---	---	---	
SE	N90E	90	90	---	Qbt4	---	---	---	
SE	N10E	10	87	E	Qbt4, Qbt3	Y	DTN	0.5 ft	Fault plane has clay and root mats; faint vertical striae; feature SE-18
SE	N20E	20	50	E	Qbt4	---	---	---	
SE	N85W	285	86	S	Qbt4	---	---	---	
SE	N25E	25	50	E	Qbt4	---	---	---	
SE	N60E	60	83	SE	Qbt4, Qbts, Qbt3	---	---	---	
SE	N90E	90	73	S	Qbt3, Qbts, Qbt4	---	---	---	
SE	N85W	275	90	---	Qbt3, Qbts, Qbt4	---	---	---	Fracture changes dip within Qbt_4
SE	N60E	60	90	---	Qbt4	---	---	---	
SE	N75W	285	80	S	Qbt4	---	---	---	
SE	N22W	338	90	---	Qbt4	---	---	---	
SE	N25W	335	80	S	Qbt4	---	---	---	
SE	N18W	342	66	E	Qbt4	---	---	---	
SE	N60E	60	90	---	Qbt4, Qbts, Qbt3	---	---	---	North side of fumarole; feature SE-19
SE	N5E	5	87	W	Qbt4, Qbts?	---	---	---	Within fumarole; feature SE-19
SE	N0E	0	83	W	Qbt4	---	---	---	Feature SE-19
SE	N5E	5	87	E	Qbt4, Qbts, Qbt3	---	---	---	South side of fumarole; feature SE-19
SE	N25W	335	90	---	Qbt4	---	---	---	
SE	N65E	65	90	---	Qbt4	---	---	---	
SE	N40W	320	71	S	Qbt4	---	---	---	
SE	N40W	320	90	---	Qbt4	---	---	---	
SE	N50W	310	75	NE	Qbt3, Qbts	---	---	---	
SE	N40W	320	80	SW	Qbt4, Qbts, Qbt3	Y	DTN	0.3 ft on BOS; 0.2 ft on TOS	Feature SE-20
SE	N65W	295	90	---	Qbt4	---	---	---	
SE	N10W	350	80	NE	Qbt4	---	---	---	
NE	N0E	0	90	---	Qbt4	---	---	---	
NE	N10W	350	90	---	Qbt4	Y	DTN	0.5 ft	Fracture does not continue into Qbt_3; feature NE-1
NE	N40W	320	90	---	Qbt4	---	---	---	
NE	N75E	75	84	SE	Qbt4	---	---	---	
NE	N15W	345	65	N	Qbt4	---	---	---	
NE	N75W	285	90	---	Qbt4, Qbt3	Y	DTN	0.5 ft	
NE	N35W	325	90	---	Qbt3	---	---	---	
NE	N22E	22	84	SE	Qbt3	---	---	---	
NE	N80E	80	75	N	Qbt4	---	---	---	
NE	N75W	285	88	N	Qbt4	---	---	---	
NE	N75W	285	90	---	Qbt4	---	---	---	
NE	N15E	15	90	---	Qbt4	---	---	---	
NE	N0E	0	83	E	Qbt4	---	---	---	
NE	N60E	60	32	SE	Qbt3	---	---	---	
NE	N85E	85	85	S	Qbt3	---	---	---	
NE	N90E	90	80	S	Qbt3	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N06W	354	79	SW	Qbt3	---	---	---	
NE	N35E	35	40	SW	Qbt4	---	---	---	
NE	N65W	295	24	N	Qbt4	---	---	---	
NE	N80W	280	75	N	Qbt4	---	---	---	
NE	N60W	300	35	N	Qbt4	---	---	---	
NE	N20E	20	90	---	Qbt4	---	---	---	
NE	N80W	280	75	N	Qbt4	---	---	---	
NE	N72E	72	85	NW	Qbt4	---	---	---	
NE	N85W	275	79	N	Qbt4	---	---	---	
NE	N60E	60	90	---	Qbt4	---	---	---	
NE	N72E	72	38	NW	Qbt4	---	---	---	
NE	N90E	90	60	S	Qbt4	---	---	---	
NE	N87W	273	19	N	Qbt4	---	---	---	
NE	N10E	10	41	E	Qbt4	---	---	---	
NE	N20E	20	45	NW	Qbt4	---	---	---	
NE	N65W	295	74	NE	Qbt4	---	---	---	
NE	N42W	318	25	W	Qbt4	---	---	---	
NE	N72E	72	37	N	Qbt4	---	---	---	
NE	N57E	57	83	N	Qbt4, Qbts	Y, TOS only	DTS	0.15 ft	No displacement on Qbt_s-Qbt_3 contact; feature NE-2
NE	N79E	79	87	N	Qbt3	---	---	---	
NE	N37W	323	83	N	Qbt3	---	---	---	
NE	N20W	340	82	SW	Qbt4	---	---	---	
NE	N70E	70	78	S	Qbt4	---	---	---	
NE	N20W	340	82	SW	Qbt4	---	---	---	
NE	N35E	35	90	---	Qbt4	---	---	---	
NE	N48W	312	29	NE	Qbt4	---	---	---	
NE	N35E	35	68	NW	Qbt4	---	---	---	
NE	N82W	278	56	NE	Qbt4	---	---	---	
NE	N45E	45	85	SW	Qbt4	---	---	---	
NE	N71E	71	31	N	Qbt4	---	---	---	
NE	N90E	90	90	---	Qbt3	---	---	---	
NE	N40W	320	57	NE	Qbt3	---	---	---	
NE	N80E	80	90	---	Qbt3	---	---	---	
NE	N80E	80	66	S	Qbt3	---	---	---	
NE	N59W	301	37	NE	Qbt3	---	---	---	
NE	N20W	340	64	E	Qbt4, Qbts	---	---	---	Fracture changes dip within Qbt_s
NE	N40W	320	84	SW	Qbt4	---	---	---	
NE	N90E	90	84	N	Qbt4	---	---	---	
NE	N20W	340	90	---	Qbt4	---	---	---	
NE	N80E	80	85	S	Qbt4	---	---	---	
NE	N30E	30	80	SE	Qbt4	---	---	---	
NE	N65W	295	83	NE	Qbt4	---	---	---	
NE	N40W	320	80	NE	Qbt3	---	---	---	
NE	N35E	35	85	SW	Qbt3, Qbts	---	---	---	
NE	N25E	25	90	---	Qbt4	---	---	---	
NE	N0E	0	10	E	Qbt4	---	---	---	
NE	N30E	30	86	SW	Qbt4	---	---	---	
NE	N35E	35	70	SE	Qbt4	---	---	---	
NE	N50E	50	28	SW	Qbt4	---	---	---	
NE	N45W	315	80	S	Qbt4	---	---	---	
NE	N60E	60	65	N	Qbt3	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N10W	350	90	---	Qbt3	---	---	---	
NE	N7W	353	85	NE	Qbt4	---	---	---	
NE	N45E	45	90	---	Qbt4	---	---	---	
NE	N80E	80	75	NW	Qbt4	---	---	---	
NE	N80E	80	73	NW	Qbt4	---	---	---	
NE	N28W	332	85	W	Qbt4	---	---	---	
NE	N25W	335	87	SW	Qbt4	---	---	---	
NE	N30E	30	30	SW	Qbt4	---	---	---	
NE	N50E	50	60	SW	Qbt4	---	---	---	
NE	N90E	90	62	N	Qbt3	---	---	---	
NE	N90E	90	90	---	Qbt3	---	---	---	
NE	N80E	80	61	N	Qbt3	---	---	---	
NE	N0E	0	90	---	Qbt3	---	---	---	
NE	N20E	20	32	SW	Qbt4	---	---	---	
NE	N60E	60	70	SW	Qbt4	---	---	---	
NE	N0E	0	85	W	Qbt4	---	---	---	
NE	N70W	290	85	S	Qbt4	---	---	---	
NE	N30E	30	90	---	Qbt4, Qbts	---	---	---	
NE	N10W	350	90	---	Qbt4	---	---	---	
NE	N10W	350	80	E	Qbt3	---	---	---	
NE	N0E	0	90	---	Qbt3	---	---	---	
NE	N10W	350	83	W	Qbt3	---	---	---	
NE	N30E	30	32	SW	Qbt4	---	---	---	
NE	N10E	10	20	E	Qbt4	---	---	---	
NE	N0E	0	83	E	Qbt4	---	---	---	
NE	N80E	80	80	N	Qbt4	---	---	---	
NE	N10E	10	85	E	Qbt4	---	---	---	
NE	N25W	335	80	NE	Qbt4	---	---	---	
NE	N0E	0	85	E	Qbt4	---	---	---	Clay fill and caliche present
NE	N80E	80	30	S	Qbt4	---	---	---	
NE	N5W	355	90	---	Qbt3	---	---	---	Possible fumarole; feature NE-4
NE	N75E	75	85	N	Qbt4	---	---	---	
NE	N07E	7	90	---	Qbt4	---	---	---	Clay fill
NE	N65W	295	23	S	Qbt4	---	---	---	
NE	N84W	276	90	---	Qbt4	---	---	---	
NE	N80W	280	90	---	Qbt4	---	---	---	
NE	N44E	44	80	NW	Qbt4	---	---	---	
NE	N04E	4	90	---	Qbt4	---	---	---	
NE	N80E	80	71	NW	Qbt4	---	---	---	
NE	N53E	53	90	---	Qbt4	---	---	---	
NE	N13E	13	25	NW	Qbt4	---	---	---	
NE	N60E	60	75	NW	Qbt4	---	---	---	
NE	N40E	40	18	NW	Qbt4	---	---	---	
NE	N55E	55	76	NW	Qbt4	---	---	---	
NE	N0E	0	90	---	Qbt4	---	---	---	
NE	N80E	80	86	S	Qbt3	---	---	---	
NE	N0E	0	85	E	Qbt3	---	---	---	Possible fumarole; feature NE-5
NE	N5W	355	86	E	Qbt3	---	---	---	
NE	N11W	349	90	---	Qbt4	---	---	---	
NE	N87E	87	90	---	Qbt4	---	---	---	
NE	N52E	52	50	NW	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N87E	87	80	N	Qbt4	---	---	---	
NE	N80E	80	85	SE	Qbt4	---	---	---	
NE	N45W	315	32	SW	Qbt4	---	---	---	
NE	N0E	0	87	W	Qbt3	---	---	---	
NE	N22E	22	90	---	Qbt3	---	---	---	
NE	N75W	285	53	NE	Qbt3	---	---	---	
NE	N75W	285	71	NE	Qbt3	---	---	---	
NE	N90E	90	90	---	Qbt3	---	---	---	
NE	N65E	65	50	NW	Qbt4	---	---	---	
NE	N45E	45	90	---	Qbt4	---	---	---	
NE	N20W	340	85	SW	Qbt4	---	---	---	
NE	N20E	20	52	SW	Qbt4, Qbts	---	---	---	No displacement on Qbt_4-Qbt_s contact
NE	N75E	75	50	SE	Qbt4	---	---	---	
NE	N20W	340	13	NE	Qbt4	---	---	---	
NE	N90E	90	74	N	Qbt4	---	---	---	
NE	N25W	335	35	NE	Qbt4	---	---	---	
NE	N15E	15	55	E	Qbt4	---	---	---	
NE	N80W	280	80	S	Qbt4	---	---	---	Clay fill and caliche present
NE	N45E	45	74	NW	Qbt4	---	---	---	
NE	N50W	310	45	SW	Qbt4	---	---	---	
NE	N0E	0	60	W	Qbt4	---	---	---	
NE	N8W	352	71	SW	Qbt3	---	---	---	
NE	N85W	275	90	---	Qbt3	---	---	---	
NE	N12W	348	70	SW	Qbt3	---	---	---	
NE	N10W	350	84	E	Qbt4	---	---	---	
NE	N5W	355	90	---	qbt4	---	---	---	
NE	N40E	40	90	---	Qbt4	---	---	---	
NE	N80W	280	70	N	Qbt4	---	---	---	
NE	N35E	35	8	NW	Qbt4	---	---	---	
NE	N75E	75	59	SE	Qbt4	---	---	---	
NE	N75W	285	83	N	Qbt4	---	---	---	
NE	N75W	285	87	S	Qbt4	---	---	---	
NE	N10E	10	64	W	Qbt4	---	---	---	
NE	N25E	25	90	---	Qbt3	---	---	---	
NE	N75E	75	90	---	Qbt4	---	---	---	
NE	N90E	90	40	N	Qbt4	---	---	---	
NE	N10E	10	60	W	Qbt4	---	---	---	
NE	N65E	65	30	NW	Qbt4	---	---	---	
NE	N80E	80	80	S	Qbt4	---	---	---	
NE	N10E	10	65	S	Qbt4	---	---	---	
NE	N50E	50	15	NE	Qbt4	---	---	---	
NE	N10E	10	86	W	Qbt4	---	---	---	
NE	N0E	0	50	W	Qbt3	---	---	---	
NE	N60E	60	45	NW	Qbt3	---	---	---	
NE	N75E	75	60	N	Qbt3	---	---	---	
NE	N50W	310	40	N	Qbt3	---	---	---	
NE	N10E	10	87	E	Qbt4, Qbts	Y, TOS only	DTS	0.2 ft	
NE	N0E	0	90	---	Qbt4	---	---	---	
NE	N35E	35	90	---	Qbt4	---	---	---	
NE	N45E	45	90	---	Qbt4	---	---	---	
NE	N80W	280	22	N	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N35E	35	85	SE	Qbt3, Qbts	---	---	---	
NE	N60E	60	85	W	Qbt4	---	---	---	
NE	N90E	90	27	N	Qbt4	---	---	---	
NE	N15W	345	40	E	Qbt4	---	---	---	
NE	N50E	50	90	---	Qbt4	---	---	---	
NE	N70E	70	85	S	Qbt4	---	---	---	
NE	N60E	60	85	NW	Qbt4	---	---	---	
NE	N45W	315	80	SW	Qbt4	---	---	---	
NE	N55E	55	90	---	Qbt4, Qbts	---	---	---	
NE	N60E	60	90	---	Qbt4, Qbts	---	---	---	
NE	N55E	55	40	NW	Qbt4	---	---	---	
NE	N5E	5	17	E	Qbt4	---	---	---	
NE	N50W	310	62	N	Qbt3	---	---	---	
NE	N80E	80	52	N	Qbt3	---	---	---	
NE	N20E	20	60	E	Qbt3	---	---	---	
NE	N15W	345	90	---	Qbt4	---	---	---	
NE	N35W	325	55	N	Qbt4	---	---	---	
NE	N20W	340	77	N	Qbt4	---	---	---	
NE	N0E	0	85	E	Qbt4	---	---	---	
NE	N20E	20	65	SE	Qbt4	---	---	---	
NE	N40E	40	65	NW	Qbt4	---	---	---	
NE	N65E	65	80	N	Qbt4	---	---	---	
NE	N50E	50	44	SE	Qbt3	---	---	---	
NE	N45E	45	90	---	Qbt3	---	---	---	
NE	N65E	65	50	NW	Qbt3	---	---	---	
NE	N10W	350	72	E	Qbt4	---	---	---	
NE	N0E	0	62	W	Qbt4	---	---	---	
NE	N30W	330	84	SE	Qbt4	---	---	---	
NE	N35E	35	70	SW	Qbt4	---	---	---	
NE	N40E	40	55	SE	Qbt4	---	---	---	
NE	N0E	0	85	E	Qbt4	---	---	---	
NE	N35E	35	40	SE	Qbt4	---	---	---	
NE	N30E	30	90	---	Qbt4	---	---	---	
NE	N20E	20	76	SW	Qbt4	---	---	---	
NE	N45W	315	83	NE	Qbt4	---	---	---	
NE	N20E	20	90	---	Qbt4	---	---	---	
NE	N65W	295	68	N	Qbt4	---	---	---	
NE	N25W	335	70	NE	Qbt3	---	---	---	
NE	N50E	50	76	SE	Qbt3	---	---	---	
NE	N30E	30	77	NW	Qbt3, Qbts, Qbt4	---	---	---	
NE	N40E	40	80	NW	Qbt3	---	---	---	
NE	N35E	35	75	NW	Qbt4	---	---	---	
NE	N65E	65	42	SE	Qbt4	---	---	---	
NE	N65E	65	74	N	Qbt4	---	---	---	
NE	N80E	80	86	N	Qbt4	---	---	---	
NE	N55E	55	67	SE	Qbt4	---	---	---	
NE	N35E	35	80	SE	Qbt3	---	---	---	
NE	N25W	335	78	SW	Qbt3	---	---	---	
NE	N10E	10	87	E	Qbt3	---	---	---	
NE	N15E	15	57	SE	Qbt3	---	---	---	
NE	N50W	310	80	NE	Qbt3	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N90E	90	78	S	Qbt3	---	---	---	
NE	N55W	305	55	N	Qbt4	---	---	---	
NE	N80E	80	40	S	Qbt4	---	---	---	
NE	N25W	335	48	SW	Qbt4	---	---	---	
NE	N5E	5	11	E	Qbt4	---	---	---	
NE	N50W	310	30	S	Qbt4	---	---	---	
NE	N35E	35	90	---	Qbt4	---	---	---	
NE	N35E	35	65	SE	Qbt4	---	---	---	
NE	N10E	10	90	---	Qbt4	---	---	---	
NE	N70W	290	75	N	Qbt4	---	---	---	
NE	N25E	25	87	E	Qbt4	---	---	---	
NE	N30E	30	74	SE	Qbt4	---	---	---	
NE	N90E	90	86	N	Qbt4	---	---	---	
NE	N15W	345	75	E	Qbt4	---	---	---	
NE	N55W	305	38	N	Qbt4	---	---	---	
NE	N60W	300	47	S	Qbt4	---	---	---	
NE	N55E	55	80	SE	Qbt4	---	---	---	
NE	N68W	292	80	N	Qbt4	---	---	---	
NE	N5W	355	65	W	Qbt4	---	---	---	
NE	N10W	350	35	SW	Qbt4	---	---	---	
NE	N65W	295	50	S	Qbt4	---	---	---	
NE	N77E	77	85	SE	Qbt4	---	---	---	
NE	N30W	330	87	NE	Qbt4	---	---	---	
NE	N85E	85	75	S	Qbt3	---	---	---	
NE	N0E	0	88	E	Qbt3	---	---	---	
NE	N65E	65	55	SE	Qbt4	---	---	---	
NE	N40W	320	87	NE	Qbt4	---	---	---	
NE	N45E	45	90	---	Qbt4	---	---	---	
NE	N15W	345	40	S	Qbt4	---	---	---	
NE	N45W	315	45	SW	Qbt4	---	---	---	
NE	N5E	5	56	E	Qbt4	---	---	---	
NE	N30W	330	75	SW	Qbt4	---	---	---	
NE	N20W	340	60	W	Qbt4	---	---	---	
NE	N10E	10	78	W	Qbt4	---	---	---	
NE	N80E	80	74	S	Qbt4	---	---	---	
NE	N75W	285	60	N	Qbt4	---	---	---	
NE	N15W	345	75	W	Qbt4	---	---	---	
NE	N20W	340	80	E	Qbt4	---	---	---	
NE	N75W	285	82	S	Qbt4	---	---	---	
NE	N60W	300	22	S	Qbt4	---	---	---	
NE	N60W	300	80	N	Qbt4	---	---	---	
NE	N45E	45	87	W	Qbt4	---	---	---	
NE	N15W	345	50	SW	Qbt4	---	---	---	
NE	N55W	305	55	NE	Qbt4	---	---	---	
NE	N50W	310	20	SW	Qbt4	---	---	---	
NE	N35E	35	83	E	Qbt4	---	---	---	
NE	N50W	310	47	NE	Qbt4	---	---	---	
NE	N10E	10	87	E	Qbt4, Qbts, Qbt3	Y, TOS only	DTSE	0.15 ft	No displacement on Qbt_s-Qbt_3 contact; fracture within Qbt_3 bounds a fines-depleted zone; feature NE-8
NE	N70E	70	90	---	Qbt3	---	---	---	
NE	N80E	80	80	S	Qbt3	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N20W	340	90	---	Qbt3	---	---	---	
NE	N5W	355	85	W	Qbt4	---	---	---	
NE	N85E	85	90	---	Qbt4	---	---	---	
NE	N55W	305	45	NE	Qbt4	---	---	---	
NE	N50E	50	85	NW	Qbt4	---	---	---	
NE	N35W	325	90	---	Qbt4	---	---	---	
NE	N55E	55	90	---	Qbt4	---	---	---	
NE	N50E	50	90	---	Qbt4	---	---	---	
NE	N25E	25	35	E	Qbt4	---	---	---	Clay fill
NE	N20E	20	90	---	Qbt4	---	---	---	
NE	N15W	345	85	W	Qbt4	---	---	---	
NE	N65W	295	90	---	Qbt4	---	---	---	
NE	N20E	20	85	W	Qbt4, Qbts	---	---	---	
NE	N30W	330	60	NE	Qbt3	---	---	---	
NE	N50E	50	82	NW	Qbt3	---	---	---	
NE	N80E	80	75	N	Qbt3	---	---	---	
NE	N75E	75	45	N	Qbt3	---	---	---	
NE	N5E	5	85	E	Qbt3	Y, BOS only	DTN	0.15 ft	No displacement on Qbt_4-Qbt_s contact; feature NE-9
NE	N10W	350	55	W	Qbt3	---	---	---	
NE	N35E	35	65	SE	Qbt4, Qbts	---	---	---	
NE	N65E	65	52	SE	Qbt4	---	---	---	
NE	N10W	350	40	E	Qbt4	---	---	---	
NE	N80E	80	90	---	Qbt4	---	---	---	
NE	N15E	15	84	E	Qbt4	---	---	---	
NE	N40E	40	20	SE	Qbt4	---	---	---	
NE	N10W	350	44	W	Qbt4	---	---	---	
NE	N60E	60	87	NW	Qbt4	---	---	---	
NE	N60W	300	70	NE	Qbt4	---	---	---	
NE	N45W	315	78	NE	Qbt4	---	---	---	
NE	N20W	340	80	E	Qbt4	---	---	---	
NE	N80E	80	90	---	Qbt4	---	---	---	
NE	N40W	320	74	NE	Qbt4	---	---	---	
NE	N15E	15	85	E	Qbt4	---	---	---	
NE	N70E	70	35	N	Qbt4	---	---	---	
NE	N0E	0	87	E	Qbt4	---	---	---	
NE	N10W	350	90	---	Qbt4	---	---	---	
NE	N60W	300	25	N	Qbt4	---	---	---	
NE	N45W	315	70	NE	Qbt4	---	---	---	
NE	N80E	80	87	S	Qbt4	---	---	---	
NE	N10W	350	80	E	Qbt4	---	---	---	
NE	N90E	90	84	S	Qbt4, Qbts	Y, TOS only	DTS	0.3 ft	No displacement on Qbt_s-Qbt_3 contact; feature NE-10
NE	N60E	60	69	S	Qbt4	---	---	---	
NE	N75E	75	82	S	Qbt3, Qbts, Qbt4	---	---	---	
NE	N75E	75	70	S	Qbt3	---	---	---	
NE	N70E	70	90	---	Qbt3	---	---	---	
NE	N80E	80	88	S	Qbt4, Qbts, Qbt3	---	---	---	
NE	N35E	35	47	SE	Qbt4	---	---	---	
NE	N40E	40	82	SE	Qbt4	---	---	---	
NE	N15E	15	87	E	Qbt4	---	---	---	
NE	N75E	75	90	---	Qbt4	---	---	---	
NE	N10E	10	90	---	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N45E	45	85	SE	Qbt4	---	---	---	
NE	N5W	355	85	E	Qbt4	---	---	---	
NE	N85W	275	82	S	Qbt4	---	---	---	
NE	N90E	90	90	---	Qbt4	---	---	---	
NE	N60E	60	34	S	Qbt4	---	---	---	
NE	N54W	306	90	---	Qbt4	---	---	---	
NE	N50W	310	86	NE	Qbt3	---	---	---	
NE	N40E	220	83	NW	Qbt4, Qbts	Y, TOS only	DTN	0.15 ft	No displacement on Qbt_s-Qbt_3 contact; fracture changes dip and splays within Qbt_s; feature NE-11
NE	N85E	85	90	---	Qbt4	---	---	---	
NE	N45E	45	80	SW	Qbt4	---	---	---	Clay fill
NE	N70E	70	90	---	Qbt4	---	---	---	
NE	N45E	45	75	SW	Qbt4	---	---	---	Clay fill
NE	N45W	315	80	SW	Qbt4	---	---	---	
NE	N60E	60	90	---	Qbt4	---	---	---	
NE	N55E	55	87	W	Qbt4	---	---	---	
NE	N40W	320	76	SW	Qbt4	---	---	---	
NE	N55E	55	75	NW	Qbt4	---	---	---	
NE	N10E	10	87	E	Qbt4	---	---	---	
NE	N45W	45	82	SW	Qbt4	---	---	---	
NE	N40E	40	63	N	Qbt4	---	---	---	
NE	N80W	280	75	N	Qbt4	---	---	---	Clay fill
NE	N46W	314	55	N	Qbt4	---	---	---	
NE	N27E	27	69	SE	Qbt4	---	---	---	
NE	N90E	90	90	---	Qbt4	---	---	---	
NE	N68W	292	86	NE	Qbt3	---	---	---	
NE	N70W	290	90	---	Qbt3	---	---	---	
NE	N23E	23	76	SE	Qbt4, Qbts	---	---	---	
NE	N4E	4	70	W	Qbt4	---	---	---	
NE	N56W	304	52	N	Qbt4	---	---	---	
NE	N20E	20	71	SE	Qbt4	---	---	---	
NE	N22E	22	76	SE	Qbt4	---	---	---	
NE	N85E	85	90	---	Qbt4	---	---	---	
NE	N32W	328	76	W	Qbt4	---	---	---	
NE	N63W	297	40	S	Qbt4	---	---	---	
NE	N6E	6	87	W	Qbt4	---	---	---	
NE	N30E	30	87	S	Qbt4	---	---	---	
NE	N26E	26	85	SE	Qbt4, Qbts	Y, TOS only	DTNE	1.6 ft	Western boundary of feature NE-12
NE	N18W	342	77	NE	Qbt3	---	---	---	
NE	N53W	307	58	NE	Qbt4	---	---	---	
NE	N86E	86	60	N	Qbt4	---	---	---	
NE	N69W	291	69	N	Qbt4	---	---	---	
NE	N83W	277	65	N	Qbt4	---	---	---	
NE	N7E	7	20	SE	Qbt4	---	---	---	
NE	N24W	336	70	W	Qbt4	---	---	---	
NE	N36W	324	36	NE	Qbt4	---	---	---	
NE	N24E	24	27	W	Qbt4	---	---	---	
NE	N76W	284	74	N	Qbt4	---	---	---	
NE	N24E	24	69	SE	Qbt4	---	---	---	
NE	N15E	15	75	E	Qbt4	---	---	---	Brecciated zone
NE	N0E	0	78	E	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N76W	284	71	N	Qbt4	---	---	---	
NE	N66E	66	90	---	Qbt4, Qbts, Qbt3	Y, TOS only	DTSE	1.4 ft	Eastern boundary of feature NE-12
NE	N26E	26	80	E	Qbt4	---	---	---	
NE	N37E	37	80	E	Qbt4	---	---	---	
NE	N58W	302	90	---	Qbt4	---	---	---	
NE	N30W	330	11	SW	Qbt4	---	---	---	
NE	N83W	277	70	N	Qbt4	---	---	---	
NE	N61W	299	77	N	Qbt4	---	---	---	
NE	N82E	82	90	---	Qbt4	---	---	---	
NE	N56E	56	90	---	Qbt4	---	---	---	
NE	N51E	51	70	NW	Qbt4	---	---	---	
NE	N62E	62	76	SE	Qbt4	---	---	---	
NE	N53E	53	79	SE	Qbt4	---	---	---	
NE	N55E	55	74	SE	Qbt4	---	---	---	
NE	N39E	39	74	E	Qbt4	---	---	---	
NE	N77E	77	67	S	Qbt4	---	---	---	
NE	N26E	26	90	---	Qbt4	---	---	---	
NE	N73E	73	68	N	Qbt4	---	---	---	
NE	N56E	56	71	SE	Qbt3	---	---	---	
NE	N52E	52	81	SE	Qbt4, Qbts	---	---	---	Fracture splays before it crosses Qbt_4-Qbt_s contact
NE	N33W	327	90	---	Qbt4	---	---	---	
NE	N60E	60	76	SE	Qbt4	---	---	---	
NE	N90E	90	90	---	Qbt4	---	---	---	
NE	N64E	64	45	N	Qbt4	---	---	---	
NE	N2W	358	75	E	Qbt4	---	---	---	
NE	N70E	70	60	S	Qbt4	---	---	---	
NE	N61E	61	77	S	Qbt4	---	---	---	
NE	N45W	315	55	NE	Qbt4	---	---	---	
NE	N56W	304	90	---	Qbt4, Qbt3	Y	DTNW	0.3 ft	Feature NE-14
NE	N1W	359	90	---	Qbt4, Qbt3	Y	DTNW	0.2 ft	Feature NE-15
NE	N62W	298	55	N	Qbt4	---	---	---	
NE	N33E	33	70	E	Qbt4	---	---	---	
NE	N88E	88	68	N	Qbt4	---	---	---	
NE	N82E	82	89	N	Qbt4	---	---	---	
NE	N90E	90	90	---	Qbt4	---	---	---	
NE	N81W	279	13	NE	Qbt4	---	---	---	
NE	N56W	304	8	SW	Qbt4	---	---	---	
NE	N16E	16	77	E	Qbt4	---	---	---	
NE	N90E	90	90	---	Qbt4	---	---	---	
NE	N90E	90	90	---	Qbt4	---	---	---	
NE	N47W	313	38	NE	Qbt4	---	---	---	
NE	N55W	305	43	NE	Qbt4	---	---	---	
NE	N80W	280	88	N	Qbt3	---	---	---	
NE	N33W	327	85	NE	Qbt3	---	---	---	
NE	N22W	338	70	SW	Qbt3	---	---	---	
NE	N26W	334	90	---	Qbt4	---	---	---	
NE	N90E	90	35	N	Qbt4	---	---	---	
NE	N75E	75	55	S	Qbt4	---	---	---	
NE	N82E	82	90	---	Qbt4	---	---	---	
NE	N21E	21	73	E	Qbt4	---	---	---	
NE	N16E	16	78	E	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N67W	293	90	---	Qbt4	---	---	---	
NE	N90E	90	90	---	Qbt4	---	---	---	
NE	N21W	339	52	E	Qbt4	---	---	---	
NE	N75E	75	83	N	Qbt4	---	---	---	
NE	N52W	308	69	NE	Qbt4	---	---	---	
NE	N39E	321	71	SE	Qbt4	---	---	---	
NE	N79E	79	60	S	Qbt4	---	---	---	
NE	N80W	280	7	SW	Qbt4	---	---	---	
NE	N81E	81	87	S	Qbt4	---	---	---	
NE	N19W	341	86	NE	Qbt4	---	---	---	
NE	N47E	47	81	SE	Qbt4	---	---	---	
NE	N5W	5	86	E	Qbt4	---	---	---	
NE	N82W	278	77	S	Qbt4	---	---	---	
NE	N17E	17	90	---	Qbt4	---	---	---	
NE	N47E	47	82	N	Qbt4	---	---	---	
NE	N54E	54	88	N	Qbt4	---	---	---	
NE	N21W	339	65	NE	Qbt3, Qbt4	---	---	---	
NE	N77E	77	58	S	Qbt4	---	---	---	
NE	N35W	325	90	---	Qbt4	---	---	---	
NE	N48E	48	90	---	Qbt4	---	---	---	
NE	N87W	273	90	---	Qbt4	---	---	---	
NE	N31W	329	83	NE	Qbt4	---	---	---	
NE	N45W	315	80	NE	Qbt4	---	---	---	
NE	N72E	72	78	S	Qbt4	---	---	---	
NE	N37E	37	90	---	Qbt4	---	---	---	
NE	N42W	318	83	NE	Qbt4	---	---	---	
NE	N46E	46	90	---	Qbt4	---	---	---	
NE	N29E	29	78	E	Qbt4	---	---	---	
NE	N45E	45	68	NW	Qbt4	---	---	---	
NE	N3E	3	65	W	Qbt4	---	---	---	
NE	N43W	317	73	SE	Qbt4	---	---	---	
NE	N40E	40	90	---	Qbt4	---	---	---	
NE	N53W	307	73	NE	qbt4	---	---	---	
NE	N69E	69	46	N	Qbt4	---	---	---	
NE	N70W	290	45	N	Qbt4	---	---	---	
NE	N71E	71	86	S	Qbt4	---	---	---	
NE	N63E	63	85	N	Qbt4	---	---	---	
NE	N19W	341	78	SW	Qbt4	---	---	---	
NE	N18W	342	76	SW	Qbt4	---	---	---	
NE	N27W	333	76	W	Qbt4	---	---	---	
NE	N26W	334	53	SW	Qbt4, Qbts, Qbt3	---	---	---	
NE	N23W	337	70	W	Qbt3	---	---	---	
NE	N9W	351	90	---	Qbt3	---	---	---	
NE	N54E	54	82	NW	Qbt3, Qbts, Qbt4	---	---	---	
NE	N43W	317	25	NE	Qbt4	---	---	---	
NE	N22W	338	50	NE	Qbt4	---	---	---	
NE	N83E	83	90	---	Qbt4, Qbts	Y, TOS only	DTN	0.2 ft	No displacement on Qbt_s-Qbt_3 contact; feature NE-16
NE	N66E	66	81	SE	Qbt4, Qbts, Qbt3	---	---	---	
NE	N53W	307	45	NE	Qbt4	---	---	---	
NE	N33W	327	2	NE	Qbt4	---	---	---	
NE	N43W	317	85	SW	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N78W	282	55	N	Qbt4	---	---	---	
NE	N71W	289	67	N	Qbt4	---	---	---	
NE	N82E	82	89	N	Qbt4	---	---	---	
NE	N82E	82	86	N	Qbt4	---	---	---	Brecciated zone
NE	N62E	62	82	S	Qbt4	---	---	---	
NE	N62W	298	3	SW	Qbt4	---	---	---	
NE	N80W	280	6	NE	Qbt4	---	---	---	
NE	N30W	330	29	W	Qbt4	---	---	---	
NE	N25E	25	5	NW	Qbt4	---	---	---	
NE	N82E	82	90	---	Qbt4	---	---	---	
NE	N52W	308	43	NE	Qbt4	---	---	---	
NE	N41W	319	59	NE	Qbt4	---	---	---	
NE	N66E	66	76	SE	Qbt4	---	---	---	
NE	N67W	293	55	N	Qbt4	---	---	---	
NE	N33W	327	90	---	Qbt3	---	---	---	
NE	N71W	289	35	NE	Qbt3	---	---	---	
NE	N0E	0	90	---	Qbt4	---	---	---	
NE	N83W	277	52	N	Qbt4	---	---	---	
NE	N11W	349	81	W	Qbt4, Qbts	---	---	---	
NE	N33W	327	69	NE	Qbt4	---	---	---	
NE	N69W	291	62	NE	Qbt4	---	---	---	
NE	N73W	287	33	NE	Qbt4	---	---	---	
NE	N69W	291	45	NE	Qbt4	---	---	---	
NE	N63W	297	36	NE	Qbt4	---	---	---	
NE	N29E	331	15	E	Qbt4	---	---	---	
NE	N62W	298	50	S	Qbt4	---	---	---	
NE	N53W	307	56	NE	Qbt4	---	---	---	
NE	N2E	2	22	E	Qbt4	---	---	---	
NE	N39W	321	3	SW	Qbt4	---	---	---	
NE	N11E	11	87	E	Qbt4	---	---	---	
NE	N10E	10	5	E	Qbt4	---	---	---	
NE	N57E	57	90	---	Qbt4, Qbt3	Y	DTSE	1.5 ft	Fracture filled with Qbt_4 blocks and breccia; feature NE-17
NE	N39W	321	88	NE	Qbt4	---	---	---	
NE	N52E	52	60	SE	Qbt4	---	---	---	
NE	N87E	87	42	N	Qbt4, Qbt3	---	---	---	
NE	N50W	310	67	NE	Qbt4	---	---	---	
NE	N13E	13	42	W	Qbt4	---	---	---	
NE	N88E	88	88	S	Qbt4	---	---	---	
NE	N15E	15	90	---	Qbt4	---	---	---	
NE	N43W	317	49	SW	qbt4	---	---	---	
NE	N85E	85	90	---	Qbt4	---	---	---	
NE	N39W	321	40	SW	Qbt4	---	---	---	
NE	N76W	284	66	S	Qbt4	---	---	---	
NE	N80E	80	75	E	Qbt4	---	---	---	
NE	N20W	340	86	W	Qbt4	---	---	---	
NE	N80E	80	62	S	Qbt4	---	---	---	
NE	N58E	58	77	SE	Qbt4	---	---	---	
NE	N60E	60	72	SE	Qbt4	---	---	---	
NE	N73E	73	43	N	Qbt4	---	---	---	
NE	N61W	299	75	N	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NE	N60W	300	43	N	Qbt4	---	---	---	
NE	N53E	53	90	---	Qbt4	---	---	---	
NE	N76E	76	68	N	Qbt4	---	---	---	
NE	N76W	284	62	N	Qbt4	---	---	---	
NE	N65E	65	79	SE	Qbt4	---	---	---	Clay fill
NE	N51E	51	82	SE	Qbt4	---	---	---	Clay fill
NE	N63W	297	90	---	Qbt4	---	---	---	
NE	N33W	327	13	W	Qbt4	---	---	---	
NE	N33E	33	79	NW	Qbt4	---	---	---	
NE	N60E	60	72	SE	Qbt4, Qbts, Qbt3	Y	DTN	0.5 ft	Feature NE-18
NE	N33E	33	81	NW	Qbt4	---	---	---	
NE	N66E	66	90	---	Qbt4	---	---	---	
NE	N16W	344	30	NE	Qbt4	---	---	---	
NE	N38W	322	21	SW	Qbt4	---	---	---	
NE	N46E	46	83	SE	Qbt4, Qbts	---	---	---	
NE	N35E	35	41	SE	Qbt4	---	---	---	
NE	N56W	304	90	---	Qbt4	---	---	---	
NE	N23E	23	90	---	Qbt4	---	---	---	
NE	N12E	12	56	SE	Qbt4	---	---	---	
NE	N66E	66	83	N	Qbt4	---	---	---	
NE	N90E	90	33	S	Qbt4	---	---	---	
NE	N28E	28	69	NW	Qbt4	---	---	---	
NE	N83E	83	55	S	Qbt4	---	---	---	
NW	N35W	325	66	E	Qbt4	---	---	---	
NW	N20W	340	70	W	Qbt4	---	---	---	
NW	N50W	310	55	E	Qbt4	---	---	---	
NW	N16W	344	90	---	Qbt4	---	---	---	
NW	N0E	0	90	---	Qbt4	---	---	---	
NW	N16W	344	75	W	Qbt4, Qbts, Qbt3	---	---	---	
NW	N60W	300	87	N	Qbt4	---	---	---	
NW	N50E	50	73	NW	Qbt4	---	---	---	
NW	N33W	327	90	---	Qbt4	---	---	---	
NW	N0E	0	90	---	Qbt3, Qbts, Qbt4	---	---	---	
NW	N80E	80	75	N	Qbt3	---	---	---	
NW	N50W	310	90	---	Qbt3, Qbts	Y, BOS only	DTS	0.4 ft	Fracture does not affect Qbt_s-Qbt_4 contact; feature NW-17
NW	N10E	10	90	---	Qbt4	---	---	---	
NW	N70E	70	80		Qbt4	---	---	---	
NW	N20E	20	85	W	Qbt4	---	---	---	
NW	N50E	50	70	W	Qbt4	---	---	---	
NW	N35W	325	90	---	Qbt4	---	---	---	
NW	N13E	13	84	W	Qbt3	---	---	---	
NW	N60E	60	35	NW	Qbt3	---	---	---	
NW	N7E	7	90	---	Qbt3	---	---	---	
NW	N80E	80	24	S	Qbt3	---	---	---	
NW	N10W	350	90	---	Qbt4	---	---	---	
NW	N0E	0	43	W	Qbt4	---	---	---	
NW	N70W	290	38	S	Qbt4	---	---	---	
NW	N20W	340	86	W	Qbt4	---	---	---	
NW	N10W	350	60	N	Qbt4	---	---	---	
NW	N10W	350	65	W	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NW	N65E	65	85	S	Qbt4	---	---	---	
NW	N65E	65	90	---	Qbt4	---	---	---	
NW	N21W	339	56	W	Qbt4	---	---	---	
NW	N35E	35	22	W	Qbt4	---	---	---	
NW	N65W	295	83	SW	Qbt4, Qbt3	---	---	---	
NW	N81E	81	76	NW	Qbt3	---	---	---	
NW	N68W	292	85	SW	Qbt3	---	---	---	
NW	N68W	292	90	---	Qbt3	---	---	---	
NW	N24W	336	90	---	Qbt4, Qbt3	---	---	---	
NW	N16E	16	78	W	Qbt4	---	---	---	
NW	N12W	348	72	NE	Qbt4	---	---	---	
NW	N85W	275	90	---	Qbt4	---	---	---	
NW	N43E	43	70	NW	Qbt4	---	---	---	
NW	N78W	282	90	---	Qbt4	---	---	---	
NW	N78W	282	78	S	Qbt4	---	---	---	
NW	N70E	70	70	NW	Qbt4	---	---	---	
NW	N63W	297	60	N	Qbt4	---	---	---	
NW	N65W	295	53	N	Qbt3	---	---	---	
NW	N46W	314	87	N	Qbt3	---	---	---	
NW	N68E	68	87	NW	Qbt4	---	---	---	
NW	N13W	347	82	E	Qbt4	---	---	---	
NW	N85E	85	82	N	Qbt4	---	---	---	
NW	N38W	322	44	S	Qbt4	---	---	---	
NW	N40W	320	52	N	Qbt4	---	---	---	
NW	N85E	85	85	S	Qbt4	---	---	---	
NW	N76W	284	90	---	Qbt4	---	---	---	
NW	N76W	284	83	N	Qbt4, Qbts	---	---	---	
NW	N73W	287	87	S	Qbt4, Qbts	Y, TOS only	DTS	0.6 ft	Fracture does not affect Qbt_s-Qbt_3 contact; feature NW-15
NW	N81W	279	87	S	Qbt4	---	---	---	
NW	N90E	90	90	---	Qbt4	---	---	---	
NW	N68W	292	90	---	Qbt3	---	---	---	North side of fumarole
NW	N43W	317	59	N	Qbt3	---	---	---	South side of fumarole
NW	N8W	352	22	N	Qbt4	---	---	---	
NW	N26W	334	26	N	Qbt4	---	---	---	
NW	N90E	90	57	S	Qbt4	---	---	---	
NW	N56W	304	73	S	Qbt4	---	---	---	
NW	N65W	295	83	S	Qbt4	---	---	---	
NW	N90E	90	89	S	Qbt4	---	---	---	
NW	N41E	41	90	---	Qbt4	---	---	---	
NW	N19W	341	73	SW	Qbt4	---	---	---	
NW	N49E	49	83	SE	Qbt4	---	---	---	
NW	N11E	11	70	NW	Qbt3. Qbts, Qbt4	---	---	---	
NW	N43W	317	87	N	Qbt3	---	---	---	
NW	N15W	345	83	SW	Qbt3, Qbts, Qbt4	---	---	---	Northeast margin of fumarole; feature NW-14
NW	N67W	293	83	N	Qbt3	---	---	---	Southwest margin of fumarole; feature NW-14
NW	N45E	45	80	NW	Qbt3	---	---	---	
NW	N54W	306	88	SW	Qbt3, Qbts, Qbt4	---	---	---	
NW	N62W	298	90	---	Qbt3	---	---	---	
NW	N10E	10	67	W	Qbt4	---	---	---	
NW	N74E	74	88	SE	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NW	N56E	56	84	W	Qbt4	---	---	---	
NW	N41E	41	90	---	Qbt4	---	---	---	
NW	N48E	48	85	SE	Qbt4	---	---	---	
NW	N39W	321	79	S	Qbt4, Qbts, Qbt3	---	---	---	
NW	N20W	340	90	---	Qbt3	---	---	---	
NW	N33W	327	90	---	Qbt3	---	---	---	
NW	N76E	76	80	S	Qbt3	---	---	---	
NW	N83W	277	45	N	Qbt3	---	---	---	
NW	N61E	61	85	NW	Qbt4	---	---	---	
NW	N33E	33	77	NW	Qbt4	---	---	---	
NW	N55W	305	83	SW	Qbt4	---	---	---	
NW	N45W	315	85	NE	Qbt4	---	---	---	
NW	N35E	35	85	W	Qbt4	---	---	---	
NW	N71E	71	85	NW	Qbt4	---	---	---	
NW	N81E	81	84	SE	Qbt4	---	---	---	
NW	N59W	301	88	N	Qbt4	---	---	---	
NW	N59W	301	76	N	Qbt4	---	---	---	
NW	N72W	288	86	S	Qbt4	---	---	---	
NW	N72W	288	86	S	Qbt4	---	---	---	
NW	N23W	337	52	N	Qbt3	---	---	---	
NW	N29W	331	76	N	Qbt3	---	---	---	
NW	N51W	309	60	N	Qbt3	---	---	---	
NW	N64W	296	85	S	Qbt3	---	---	---	
NW	N75W	285	85	N	Qbt4	---	---	---	
NW	N78W	282	90	---	Qbt4	---	---	---	
NW	N19E	19	80	W	Qbt4	---	---	---	
NW	N66E	66	90	---	Qbt4	---	---	---	
NW	N90E	90	90	---	Qbt4	---	---	---	
NW	N67W	293	87	S	Qbt4	---	---	---	
NW	N73W	287	90	---	Qbt4, Qbts, Qbt3	---	---	---	
NW	N86W	274	80	N	Qbt4	---	---	---	
NW	N48W	312	29	S	Qbt4	---	---	---	
NW	N56E	56	75	N	Qbt4	---	---	---	
NW	N66W	294	90	---	Qbt3	---	---	---	
NW	N43W	317	56	NE	Qbt3	---	---	---	
NW	N10W	350	52	E	Qbt3	---	---	---	
NW	N43W	317	86	S	Qbt4, Qbt3	---	---	---	
NW	N42E	42	55	W	Qbt4	---	---	---	
NW	N69W	291	90	---	Qbt4	---	---	---	
NW	N90E	90	90	---	Qbt4	---	---	---	
NW	N18W	342	67	W	Qbt4	---	---	---	
NW	N27W	333	90	---	Qbt3	---	---	---	
NW	N30E	30	81	N	Qbt3, Qbts, Qbt4	---	---	---	Open fracture; displacement accommodated on adjacent fracture
NW	N25W	335	83	N	Qbt4	---	---	---	
NW	N7W	353	81	SW	Qbt4, Qbt3	---	---	---	
NW	N65W	295	87	N	Qbt4, Qbt3	Y	DTS	1.2 ft	Fumarole; feature NW-11
NW	N24E	24	37	W	Qbt4	---	---	---	
NW	N50W	310	81	N	Qbt4	---	---	---	Clay fill
NW	N36W	324	86	S	Qbt4	---	---	---	
NW	N24W	336	90	---	Qbt4	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NW	N62W	298	87	N	Qbt3	---	---	---	Northeast margin of fumarole and open fissure with max. 1.1 ft aperture; feature NW-10
NW	N62W	298	80	N	Qbt3	---	---	---	Southwest margin of fumarole and open fissure with max. 1.1 ft aperture; feature NW-10
NW	N60W	300	77	N	Qbt4	---	---	---	
NW	N19E	19	90	---	Qbt4	---	---	---	
NW	N85E	85	59	N	Qbt4	---	---	---	
NW	N47W	313	60	S	Qbt4	---	---	---	
NW	N82E	82	52	W	Qbt4	---	---	---	
NW	N79W	281	33	N	Qbt4	---	---	---	
NW	N42W	318	86	N	Qbt4	---	---	---	
NW	N76W	284	54	N	Qbt4	---	---	---	
NW	N39W	321	90	---	Qbt4	---	---	---	
NW	N81E	81	43	S	Qbt4	---	---	---	
NW	N88E	88	66	S	Qbt3, Qbt4	---	---	---	Fracture changes dip in upper Qbt_3 and into Qbt_4
NW	N42W	318	61	S	Qbt4	---	---	---	
NW	N48W	312	43	N	Qbt4	---	---	---	
NW	N12W	348	48	E	Qbt4	---	---	---	
NW	N48E	48	52	W	Qbt4	---	---	---	
NW	N48W	312	71	N	Qbt4, Qbt3	---	---	---	Fracture changes dip in Qbt_3
NW	N61W	299	84	S	Qbt4	---	---	---	
NW	N68W	292	62	S	Qbt4	---	---	---	
NW	N47W	313	86	N	Qbt4	---	---	---	
NW	N76E	76	90	---	Qbt4	---	---	---	
NW	N72W	288	90	---	Qbt4	---	---	---	
NW	N27E	27	86	W	Qbt4	---	---	---	
NW	N50W	310	87	S	Qbt4	---	---	---	
NW	N31W	329	69	S	Qbt3	---	---	---	Northeast margin of fumarole and rubblized Qbt_3; feature NW-9
NW	N68W	292	90	---	Qbt3	---	---	---	Within fumarole; north side of rubblized zone
NW	N31W	329	90	---	Qbt3	---	---	---	Southwest margin of fumarole and rubblized Qbt_3; feature NW-9
NW	N56W	304	90	---	Qbt3	---	---	---	
NW	N56W	304	56	N	Qbt3	---	---	---	
NW	N53W	307	90	---	Qbt4	---	---	---	
NW	N87E	87	69	NW	Qbt4	---	---	---	
NW	N20W	340	72	S	Qbt4	---	---	---	
NW	N17W	343	90	---	Qbt4	---	---	---	
NW	N37E	37	69	W	Qbt4	---	---	---	
NW	N77W	283	90	---	Qbt4	---	---	---	
NW	N66E	66	90	---	Qbt4	---	---	---	
NW	n19E	19	76	W	Qbt3	---	---	---	Open fissure with 0.4 to 0.5 ft aperture; feature NW-8
NW	N11W	349	79	W	Qbt3	---	---	---	Open fissure with 0.4 to 0.5 ft aperture; feature NW-8
NW	N54E	54	87	N	Qbt3	---	---	---	
NW	N81E	81	81	N	Qbt4	---	---	---	
NW	N60W	300	78	S	Qbt4	---	---	---	
NW	N78E	78	90	---	Qbt4	---	---	---	
NW	N42E	42	60	W	Qbt4	---	---	---	
NW	N87W	273	81	N	Qbt4, Qbts	Y, TOS only	DTS	0.15 ft	Fracture does not affect Qbts-Qbt3 contact; feature NW-7

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NW	N52E	308	90	---	Qbt4, Qbts	Y, TOS only	DTS	0.3 ft	Fracture does not affect Qbt_s-Qbt_3 contact; feature NW-7
NW	N61E	61	90	---	Qbt4	---	---	---	
NW	N27W	333	65	SW	Qbt3	---	---	---	Margin of fumarole; feature NW-6
NW	N46W	314	81	S	Qbt3	---	---	---	
NW	N40E	40	63	W	Qbt3	---	---	---	
NW	N67W	293	85	S	Qbt3	---	---	---	
NW	N61W	299	80	N	Qbt3	---	---	---	
NW	N2W	358	90	---	Qbt3	---	---	---	
NW	N19W	341	90	---	Qbt3	---	---	---	
NW	N60E	60	71	W	Qbt3	---	---	---	
NW	N56W	304	49	N	Qbt4	---	---	---	
NW	N72E	72	69	S	Qbt4	---	---	---	
NW	N86W	274	20	S	Qbt4	---	---	---	
NW	N68W	292	68	S	Qbt4	---	---	---	
NW	N69E	69	81	S	Qbt4, Qbts	Y, TOS only	DTS	0.25 ft	Continuant feature of different strike affects Qbt_s-Qbt_3 contact; NW-4
NW	N77E	77	88	S	Qbts, Qbt3	Y, BOS only	DTS	0.4 ft	Continuant feature of different strike feature affects Qbt_s-Qbt_4 contact; NW-4
NW	N03W	357	55	W	Qbts, Qbt3	Y, BOS only	DTS	0.3 ft	Feature NW-5
NW	N88W	272	81	S	Qbt4	---	---	---	
NW	N54E	54	62	NW	Qbt4	---	---	---	
NW	N84E	84	72	nw	Qbt4	---	---	---	
NW	N70E	70	80	NW	Qbt3	---	---	---	
NW	N5W	355	85	E	Qbt3	---	---	---	
NW	N66W	294	8	N	Qbt4	---	---	---	
NW	N10W	350	90	---	Qbt4	---	---	---	
NW	N64E	64	74	SE	Qbt4	---	---	---	
NW	N85W	275	90	---	Qbt4	---	---	---	
NW	N82E	82	82	SE	Qbt4, Qbts	Y, TOS only	DTS	0.3 ft	Fracture does not continue into Qbt_s
NW	N40W	320	90	---	Qbt4	---	---	---	
NW	N57W	303	57	S	Qbt4	---	---	---	
NW	N6E	6	74	W	Qbt4	---	---	---	
NW	N53W	307	33	S	Qbt4	---	---	---	
NW	N85E	85	80	SE	Qbt3	---	---	---	Margin of rubblized Qbt_s
NW	N82W	278	90	---	Qbt3	---	---	---	Margin of rubblized Qbt_s; feature NW-2
NW	N70E	70	85	S	Qbt3	---	---	---	
NW	N9W	351	90	---	Qbt3	---	---	---	
NW	N81E	81	90	---	Qbt3	---	---	---	
NW	N15E	15	79	W	Qbt3	---	---	---	
NW	N15W	345	30	W	Qbt3	---	---	---	
NW	N13E	13	77	W	Qbt4	---	---	---	
NW	N90E	90	46	N	Qbt4	---	---	---	
NW	N72E	72	90	---	Qbt4	---	---	---	
NW	N75W	285	86	N	Qbt4	---	---	---	
NW	N82W	278	90	---	Qbt4	---	---	---	
NW	N23W	337	86	NE	Qbt4	---	---	---	
NW	N20E	20	81	W	Qbt3	---	---	---	Caliche present
NW	N53W	307	81	S	Qbt3	---	---	---	
NW	N53W	307	84	N	Qbt3	---	---	---	

Wall [1]	Strike (quad.) [2]	Strike (az.) [3]	Dip	Dip Dir.	Units Affected [4]	Displacement	Sense	Magnitude	Notes
NW	N81W	279	57	N	Qbt3	---	---	---	
NW	N81W	279	90	---	Qbt3	---	---	---	
NW	N85E	85	84	N	Qbt3	---	---	---	
NW	N26W	334	9	N	Qbt4	---	---	---	
NW	N31W	329	16	S	Qbt4	---	---	---	
NW	N70W	290	88	N	Qbt4	---	---	---	
NW	N23W	337	69	SW	Qbt4	---	---	---	
NW	N85W	275	47	N	Qbt3	---	---	---	
NW	N02E	2	90	---	Qbt3	---	---	---	
NW	N58W	302	90	---	Qbt3	---	---	---	Northeast margin of feature NW-1
NW	N55W	305	76	S	Qbt3	---	---	---	
NW	N57W	303	86	N	Qbt3	---	---	---	Southwest margin of feature NW-1
NW	N43W	317	83	SW	Qbt3	---	---	---	
NW	N43W	317	86	NE	Qbt3	---	---	---	
NW	N61W	299	90	---	Qbt3	---	---	---	
NW	N73W	287	50	S	Qbt3	---	---	---	
NW	N90E	90	82	S	Qbt3	---	---	---	
NW	N21E	21	56	W	Qbt3	---	---	---	
NW	N50W	310	86	N	Qbt3	---	---	---	
NW	N55W	305	90	---	Qbt3	---	---	---	
NW	N46W	314	66	N	Qbt3	---	---	---	
NW	N21W	339	58	N	Qbt3	---	---	---	
NW	N87W	273	11	S	Qbt3	---	---	---	
NW	N33E	327	70	W	Qbt3	---	---	---	
NW	N72E	72	90	---	Qbt3	---	---	---	
NW	N70E	70	90	---	Qbt3	---	---	---	
NW	N77E	77	74	S	Qbt3	---	---	---	

Total measurements collected = 1204

Notes:

[1] Abbreviation for excavation wall. SWT = Southwest Temporary; SET = Southeast Temporary; SE = Southeast; NE = Northeast; N = North; NW = Northwest.

[2] Strike of feature as measured in the field in quadrant notation, relative to north.

[3] Strike of feature as notated in azimuthal format (0-360); reported according to the right-hand-rule relative to dip direction.

[4] "Units Affected" by fracture describes geologic unit(s) that are fractured by a continuous plane of weakness, and does not imply displacement across contacts unless stated.

* Measurements may represent multiple locations along a single fracture plane. See corresponding excavation log (Plates 1-6) for reference.

[#] Not all features identified in Appendix A are included in this data catalogue, as displacements were occasionally noted on fractures where structural measurements could not be obtained.

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