REPORT

THE CORPORATION OF THE CITY OF SARNIA

FORMER MICHIGAN AVENUE LANDFILL

UPDATE ON LIGHT NON-AQUEOUS PHASE LIQUID (LNAPL) PLUME DELINEATION

RWDI #1801685

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SUBMITTED TO

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1 INTRODUCTION & BACKGROUND

1.1 Introduction

RWDI Air Inc. (RWDI) was retained by the City of Sarnia (the City) to delineate the extent of light nonaqueous phase liquid (LNAPL) otherwise known as oil and/or 'product' that is known to exist within select areas of the waste mound of the Former Michigan Avenue Landfill (FMAL). The subsurface delineation efforts utilized laser-induced fluorescence (LIF) technology to detect 'floating' oil within the subsurface. A borehole drilling, soil sampling and groundwater monitoring well installation program was subsequently undertaken to corroborate the LIF interpretations.

1.1.1 LIF Technology Overview

The LIF technology is designed to evaluate the potential presence or absence of free petroleum hydrocarbons (PHCs) and polycyclic aromatic hydrocarbons (PAHs) in LNAPLs in the subsurface. To access the subsurface, a drill rig is used where the drilling rods are equipped with the LIF attachment and advanced through the soil using direct push methods. The LIF probe will log the depth of the detected LNAPL.

For each LIF location, a log is produced illustrating the total fluorescence versus depth where the signal is relative to the Reference Emitter (RE). The total area of the waveform is divided by the total area of the RE to produce the %RE, which scales with the NAPL fluorescence. The LIF laser is "calibrated" prior to each location being pushed, which allows for maximum quality assurance and quality control (QA/QC) of the measured data.

Soil impacts can be inferred by the %RE measured by the laser. Higher %RE responses are more likely to be due to the presence of LNAPL rather than soil impacts. As such, the presence or absence of subsurface LNAPL should be verified with additional intrusive sampling and soil testing.

The LIF technology is a high-resolution subsurface investigative tool to refine and delineate the extent of LNAPL plume(s) and identify if additional remedial measure may be warranted. The results from the LIF investigation can be used as an indicator of the extent of the LNAPL plume(s), assess the effectiveness of the current remedial measures, and determine whether the current monitoring program is adequate in areas of potential plume migration.

1.2 Background

The City owns and operates the FMAL (Site), which is located north of Michigan Avenue, east of Front Street, and west of Christina Street in the Village of Point Edward, ON. The Site has an area of approximately 19-hectares (ha) and is now part of Canatara Park. A Site Location Plan is provided on **Figure 1.**

Based on information obtained from various sources including newspaper files, between the 1920s and 1940s, oily waste from industries located south of Sarnia was disposed at the Site. The oily waste reportedly consisted largely of oily sludge and/or oily clay hauled to the Site and allegedly dumped from rail cars. The Site was used for the disposal of municipal waste between approximately 1930 and 1967. The inferred limits of the landfill are presented on **Figure 1**.

Ongoing environmental monitoring completed to date at the Site has identified the presence of LNAPL, also referred to as floating oil, oil, or product at the Site in three (3) distinct areas:

1) the former Canada Lands Commission property (CLC Area);
2) the area along Michigan Avenue (G2 Area); and
3) the Lake Chipican Area.

Remedial measures undertaken to date at the Site have included the installation of a sheet-pile barrier wall in 2000 in the Lake Chipican Area and five (5) recovery wells (RW3, RW4, RW5, RW6, RW7) were installed immediately south of the sheet-pile barrier wall and each was equipped with an air-operated diaphragm pump. The sheet-pile barrier wall was extended southwest in 2011 and again in 2013 (Golder Associates Ltd. (Golder), 2013). In the G2 Area, a sheet-pile barrier wall was installed near the property line, north of Michigan Avenue in 2000. Two (2) active recovery wells (RW1A and RW2) and one inactive recovery well (RW1) were also installed immediately north of the barrier wall. Recovery wells RW1A and RW2 were equipped with a pneumatic pump. Currently, no remedial measures or preventative engineer controls (e.g., oil recovery system, sheet-pile wall). have been implemented in the CLC Area. The current Trigger and Contingency Plan (Golder, 2015) for the CLC Area indicates that if LNAPL is identified within 5 metres (m) of the western property boundary, and is considered to be actively migrating, an active containment and recovery system should be installed in the CLC Area within 12 months.

In 2012, Golder was retained by the City to complete a LNAPL delineation program in the Lake Chipican Area to assess the northwestern extent of the LNAPL and to install additional groundwater monitoring wells to allow further assessment of LNAPL migration. The program included the use of the laser induced fluorescence (LIF) characterization technology and conventional groundwater monitoring wells. The LNAPL delineation program was completed between April 2012 and April 2013. Golder (2014a) concluded that LNAPL is located between 10 to 30 m from the water bodies in the northwestern area of the Lake Chipican Area and the estimated thickness of the LNAPL ranged from 0.15 and 1.49 m. The LNAPL was noted to be limited to depths from 0.7 to 2.7 metres below ground surface (mBGS). In 2013, Golder completed a similar investigation in the Lake Chipican Area and again in the G2 Area in 2014 to further delineate LNAPL in these areas (Golder, 2014a). In this investigation, Golder interpreted that LNAPL was present at locations where the peak percent of the Reference Emitter (%RE) was greater than approximately 44%. In the Lake Chipican Area, the LIF and borehole drilling programs successfully identified the western and eastern flanks of the LNAPL plume, including the area west of the Animal Farm parking lot. In the G2 Area, no LNAPL was detected south of the sheet-pile wall except for well G2. North of the sheet-pile wall, LNAPL was inferred in LIF boreholes near groundwater monitoring well MW1403 to approximately 20 m west of groundwater monitoring well MW-1431.

RWDI was awarded the RFP 17-124 Landfill Consulting Services contract, which includes completing the monitoring program when City staff are not available, preparing and submitting the annual monitoring reports, and providing ongoing consultation per the requirements of Waste Environmental Compliance Approval (ECA) No. 9802-8TNKXK dated March 8, 2013 (Waste ECA), of which the monitoring program was amended by a MECP letter dated June 26, 2015. The monitoring program is a requirement of the ECA (and the aforementioned MECP letter) and is intended to determine if Lake Chipican and/or groundwater near the Site are being impacted by the waste disposed in the landfill. The long-term monitoring program also includes monitoring for combustible gas to assess the potential for explosive vapour conditions and to evaluate risks to nearby buildings and/or residential properties.

The RWDI 2019 Annual Monitoring Report (RWDI 2020) results continued to identify the presence of LNAPL in the CLC Area, G2 Area, and Lake Chipican Area. Generally, the results for 2019 were consistent with the historical interpreted extent of the LNAPL plumes, with the following exceptions:

- In the CLC Area, LNAPL was only detected within groundwater monitoring well 705, which is identified as a sentry well. LNAPL has been detected at groundwater monitoring well 705 historically, however, the LNAPL thicknesses measured at this groundwater monitoring well appears to be increasing and detections of LNAPL have also increased in frequency.

- In the G2 Area, the groundwater monitoring well locations where LNAPL were detected in 2019 were generally consistent with historical results. The LNAPL thickness measured within groundwater monitoring well 803 and groundwater monitoring well MW1403 were slightly greater than historically observed, although continued LNAPL migration does not appear to be occurring.

- For the Lake Chipican Area, the groundwater monitoring well locations where LNAPL were detected in 2019 were generally consistent with historical results; however, the LNAPL thickness measured within groundwater monitoring wells 313, MW1408, and MW1426 were noted to be slightly greater than historically observed. LNAPL was not measured at the location of groundwater monitoring well MW1428 in 2019 and, therefore, the interpreted extent of the plume slightly shifted in a westerly direction in that area. LNAPL was not detected at nearby groundwater monitoring wells MW1001, MW1422, and MW1423. As such, LNAPL migration from the area of groundwater monitoring wells 313, MW1101A, MW1111, and MW1201 toward the nearby surface water bodies does not appear to be occurring based on the 2019 monitoring results.

Due to the increasing thickness of LNAPL within sentry groundwater monitoring well 705 in the CLC Area near the property boundary and the downgradient residential properties to the west, a high-resolution subsurface investigation using the LIF technology was recommended to refine and delineate the extent of LNAPL plume(s) and identify if additional remedial measures may be warranted. As noted above, there are currently no remedial measures in the CLC Area.

LIF investigations in both the G2 Area and the Lake Chipican Area were recommended to more accurately define the extent of LNAPL plume(s) in each area and to identify if additional remedial measures may be warranted.

The current LIF investigation was completed to enhance and/or build upon existing subsurface knowledge of previous LIF investigations and the ongoing groundwater monitoring program. The results of the LIF investigation are intended to provide insight with respect to possible plume migration, assess the effectiveness of the current remedial measures in place, and determine if the current monitoring program is adequate in areas of potential plume migration.

Further to the discussion presented above, a representative from the Ministry of Environment, Conservation and Parks (MECP) was on-site during the 2020 LIF investigation and expressed a concern regarding the potential for vapour intrusion into a nearby residential dwelling located at 720 Ernest Street, in the Village of Point Edward, ON (Point Edward) based on the proximity of the inferred LNAPL plume to the property boundary. As a result, RWDI completed a supplementary investigation to further delineate the LNAPL plume and to install additional gas probes in this area. The results of this investigation were provided in a memorandum to the City dated July 13, 2020 and are also briefly summarized in this report as they are relevant to the delineation of LNAPL in that area.

Historical data collected by others has been relied upon by RWDI for the purposes of preparing this report. RWDI has assumed that historical information provided was factual and accurate as presented.

1.3 Scope of Work

RWDI was retained by the City to delineate the vertical and lateral extent of LNAPLs in the CLC Area, G2 Area, and Lake Chipican Area. The program included the use of the LIF technology mounted to a geoprobe drilling rig. The LIF technology is owned and operated by Vertex Environmental Inc. (Vertex) of Cambridge, Ontario who were sub-contracted by RWDI for this project. Subsequently, RWDI was retained to complete additional subsurface characterization and groundwater monitoring well installations at a select number of LIF borehole locations in the CLC, G2, and Lake Chipican areas.

The City also retained RWDI to conduct a soil vapour assessment program to address concerns raised by the MECP as it relates to the potential for migrating vapours from a LNAPL plume in the CLC Area of the FMAL to a nearby residential dwelling located at 720 Ernest Street in Point Edward.

2 SUBSURFACE INVESTIGATIONS

2.1 Laser Induced Fluorescence (LIF)

The LIF technology is based on the principle that certain compounds found in PHCs fluoresce under ultraviolet (UV) light. The process involves emitting ultraviolet light generated from a laser into the subsurface from a specialized tooling in the drill string. The measured wavelength response pattern is indicative of the type of product that is present. For example, lower fluorescence wavelengths are indicative of lighter mixtures such as diesel and gasoline and higher wavelengths are considered representative of the heavier PHC products such as tar, bunker oil and creosote. The system allows for centimeter (cm)-scale vertical resolution that allows for a high-resolution vertical delineation of LNAPL in the subsurface.

The LIF is specifically designed to evaluate the potential presence or absence of free PHCs; however, due to the relative response measured by the laser, soil impacts can also be inferred. Soil impacts refer to PHCs that are both adsorbed to the soil and present within the void space, also referred to as ganglia. The amount to which a PHC will fluoresce by the LIF is referred to as the Reference Emitter (RE) response or %RE. A strong response may indicate mobile product where a weaker response may indicate ganglia (discontinuous LNAPL above the groundwater table). This process is semi-qualitative, and there is variance between sites and types of PHCs. The LIF data can be modelled to create a 3D image of the subsurface.

Strata Drilling Group (Strata) was retained by Vertex to advance the LIF direct push boreholes in each of the three (3) areas using a direct push Geoprobe 6620DT drill rig. The LIF field work was completed between May 4, 2020 and May 29, 2020. In total, 191 boreholes were advanced to depths ranging from 3 - 6 mBGS across the three (3) areas of investigation. The LIF boreholes were distributed across the three areas as follows:

- 52 LIF boreholes were advanced in the CLC Area
- 38 LIF boreholes were advanced in the G2 Area
- 101 LIF boreholes were completed in the Lake Chipican Area

LIF borehole locations for three (3) areas are illustrated on **Figure 2. Figures 3A**, **4A**, and **5A** illustrate the locations of the LIF boreholes in the CLC Area, the G2 Area, and the Lake Chipican Area, respectively.

The LIF probe is fastened to the end of a string of drilling rods and is advanced into the subsurface either by hydraulic direct push or percussion hammer to screen for potential PHCs. For each LIF location, a log is produced illustrating the total fluorescence versus depth where the signal is relative to the Reference Emitter (RE). The total area of the waveform is divided by the total area of the RE to produce the %RE, which scales with the NAPL fluorescence. The LIF laser is "calibrated" prior to each location being pushed, which allows for maximum QA/QC of the measured data.

Upon completion of each LIF location, the open hole was backfilled with benseal hole plug to surface. The GPS co-ordinates and ground surface elevations at each of the LIF locations were recorded in the field.

Following completion of the field work, Vertex created three-dimensional visualizations of the %RE results using the Earth Volumetric Studio (EVS) software package. The %RE data was interpolated in each of the three (3) areas of interest using a kriging process. Interpolated zones of higher %RE responses may be indicative of higher levels of LNAPL in contrast to extrapolated zones with lower %RE response, which may be indicative of lower levels or LNAPL impacts or soil impacts. As previously noted, higher %RE responses are more likely to be due to the presence of LNAPL rather than soil impacts; however, the presence or absence of LNAPL should be verified with additional intrusive sampling and testing. Lastly, as with all methods of interpolating data such as kriging, the extrapolated values are more representative of actual conditions in areas with more data input points. Extrapolated results in areas with a limited number of data points should be treated with caution.

The final Vertex Memorandum, including the LIF borehole logs and three-dimensional visualization figures, is provided in **Appendix A**.

2.2 Subsurface Characterization

During the LIF investigation described above, soil samples were not collected concurrently to calibrate the %RE responses and, as such, there was some uncertainty correlating the LIF data with the presence or absence of LNAPL and its degree of saturation (i.e. moisture content in the soil). Thus, a follow-up subsurface characterization and supplemental groundwater monitoring well installation program took place between October 27, 2020 and October 30, 2020. As part of the subsurface characterization program, a select number of boreholes were advanced immediately adjacent to the original LIF boreholes to assess soil quality, visually identify for the presence or absence of LNAPL, as well as to collect soil samples for analytical testing. The drilled boreholes were identified using the same nomenclature as the original corresponding LIF boreholes. Some of the subsurface characterization program boreholes were instrumented with new groundwater monitoring wells.

In total, 26 boreholes were advanced to depths ranging from approximately 3 to 6 mBGS. The subsurface characterization boreholes and new groundwater monitoring wells were distributed as presented below.

- Five (5) boreholes (BH20009, BH20015, BH20019, BH20023, and BH20191) and four (4) new groundwater monitoring wells (MW20014, MW20025, MW20026, and MW20149) were advanced in the CLC Area (**Figure 3B**).
- Two (2) boreholes (BH20168 and BH20187) and two (2) new groundwater monitoring wells (MW20170 and MW20174) were advanced in the G2 Area (**Figure 4B**).
- Ten (10) boreholes (BH20037, BH20066, BH20069, 20070, BH20071, BH20080, BH20095, BH20110, BH20112, BH20117, and BH20123) and three (3) new groundwater monitoring wells (MW20070, MW20094, and MW20161) were completed in the Lake Chipican Area (**Figure 5B**).

2.2.1 Borehole Advancement

Drilling was completed using a Geoprobe 7822DT rubber track mounted drilling rig. Direction for the drilling locations and borehole depths were provided by RWDI. The boreholes were advanced through the fill/native overburden to a maximum depth of about 6.1 mBGS using a direct push, percussion hammer method.

Continuous soil core was collected at each of the borehole locations from ground surface to the terminal depth using a dual-tube soil sampling system. The outer dual-tube soil barrel was a 1.5 m long barrel, direct push device with an outer diameter of 83 mm. The sample barrel was equipped with a replaceable plastic liner for the purpose of collecting and storing soil samples, which was also 1.5 m in length and had an outer diameter of 42 mm. The sample barrel equipped with a liner was driven within the outer barrel one (1) sampling interval into the subsurface and retrieved using the drill rig. The sample barrel was removed from the subsurface and the liner containing the collected soil core was removed from the sample barrel, which was then fitted with a new liner. The sample barrel was then advanced back down the borehole to collect the soil core from the next deeper interval. This method was repeated at each borehole location until the terminal depth was achieved.

2.2.2 Soil Field Assessment

The soil cores collected at each borehole location were logged in the field by RWDI personnel. The soil cores were also screened in the field for soil characteristics, such as appearance, texture, odour, colour, organic vapour measurements, etc. Each soil core was screened in the field for off-gassing of volatile organic compounds (VOCs) using a MultiRAE Plus 4-way gas meter with photo-ionization detector (PID). The PID was calibrated using an isobutylene standard according to the manufacturer's specifications prior to use.

RWDI personnel screened the soil for VOC vapour readings by running a PID along the soil core. An aliquot of representative soil was also placed in a sealable plastic bag for headspace screening following equilibration to ambient temperatures, where relevant.

Soil samples were collected for laboratory analytical testing from select soil cores that were retrieved at each borehole location, where available. The soil sample collection methodology is discussed in **Section 2.2.3**. Following sample collection at each borehole location, the boreholes were backfilled with bentonite chips to grade.

2.2.3 Soil Sampling

Samples collected at the borehole locations for laboratory analyses were collected based on the following criteria.

- Visually identifiable free phase product in the soil cores.
- Visually identifiable hydrocarbon staining (i.e. black/dark brown with strong oily odour) in the soil cores.
- Soil exhibits strong hydrocarbon odour.
- If no free product, staining, or strong odour, sample was collected based on the highest PID reading.
- For the above field observations, consideration in sample selection was also given to sampling depth based on %RE signals noted at the borehole locations from the LIF investigation.

For each borehole, continuous soil cores were collected from grade to the terminal depth. New disposable nitrile gloves were used when handling samples from different boreholes and different depths from each borehole, to minimize the potential for cross-contamination.

One (1) soil sample for laboratory analysis was collected from each borehole based on field observations. A sample from BH20161 could not be collected due to metal and plastic waste obstructions in the lead auger and core sampler. A total of 25 soil samples were collected for laboratory analysis. The soil samples were designated with the borehole identifier (i.e. BH20025) and the sampling interval of the drilling run from which the samples were collected.

The soil samples for laboratory analysis were collected by RWDI personnel in the relevant laboratory provided containers. The collected soil samples were stored in coolers with ice from the time of collection and during shipment to the laboratory for analysis. The samples were transported to Eurofins Environment Testing (Eurofins) under chain-of-custody procedures for analysis of benzene, toluene, ethylbenzene, and xylene (BTEX), petroleum hydrocarbon (PHC) fraction F1, and polycyclic aromatic hydrocarbons (PAHs). The analytical parameters were selected based on historical investigative findings and the visual field identification of an oily liquid within the soil cores. Detailed stratigraphic descriptions, including the PID readings for each borehole are presented in the borehole logs included in **Appendix B**.

2.2.4 Groundwater Monitoring Well Installation

Nine (9) groundwater monitoring wells across the three (3) main areas of the Site were installed as part of the subsurface characterization investigation to monitor for the presence of measurable LNAPL as summarized below.

- Four (4) groundwater monitoring wells were installed in the CLC Area (MW20025, MW20026, MW20149, and MW20014) (**Figure 3B**).
- Two (2) groundwater monitoring wells were installed in the G2 Area (MW20170 and MW20174) (**Figure 4B**).
- Three (3) groundwater monitoring wells were installed in the Lake Chipican Area (MW20070, MW20094, and MW20161) (**Figure 5B).**

Existing groundwater monitoring wells that are currently being monitored as part of the FMAL monitoring program are also illustrated on **Figures 3B** to **5B**.

The groundwater monitoring wells were constructed with 50.8-mm diameter Schedule 40 polyvinyl chloride (PVC) risers connected to 20-slot PVC well screens. The 20-slot screen consists of larger slots compared to the typical 10-slot screen that is commonly used in the environmental industry. The premise of using these larger slotted screens is to facilitate the movement of potentially more viscous LNAPL into the groundwater monitoring well than the smaller slotted screens would permit, and as such increased reliability measurements and observations of presence/absence of LNAPLs can be made. It is noted that there may be instances where the LNAPL product is sufficiently viscous to prevent its flow into a groundwater monitoring well with smaller slot size. There are inferred locations at the Site where LNAPL appears to be present surrounding a groundwater monitoring well that is constructed with 10-slot screening, but there are no LNAPL or floating product present in the groundwater monitoring well.

The groundwater monitoring wells were screened to intersect the apparent groundwater table and LIF positive signal intervals. The groundwater monitoring wells were constructed using 51 mm diameter Schedule 40 flush threaded polyvinyl chloride (PVC) screen and casing. A well point and/or bottom cap, complete with weep hole, was attached to the base of each screen. The top of each groundwater monitoring well casing was secured with an expandable well plug. A filter pack consisting of No. 2 silica sand was typically placed from the base of each borehole to approximately 0.3 m above the top of the well screen. The remaining borehole annulus was backfilled with hydrated bentonite chips. Each installation was completed with either a flush mounted or steel monument-style stick-up protector.

In the Lake Chipican Area, groundwater monitoring well MW1201 was decommissioned and replaced with MW1201A following the discovery of the former groundwater monitoring well having been vandalized such that the monument-style stick-up had been struck, which broke the well PVC casing of the original well. New groundwater monitoring well MW1201A was completed with a flush mounted protector to minimize the potential for future vandalism.

Per the requirements of Ontario Regulation 903 [O. Reg. 903], the new groundwater monitoring wells were tagged, and a well record was prepared and submitted to the MECP. Copies of the Well Records are presented in **Appendix B**. The groundwater monitoring well completion details are presented on the Record of Borehole Sheets included in **Appendix B.**

The newly installed groundwater monitoring wells were developed between November 19 and 20, 2020, to remove any sediment introduced during drilling and to improve the hydraulic connection between the groundwater monitoring well filter pack and the adjacent overburden materials. Development was completed using a dedicated positive displacement pump consisting of polyethylene (PE) tubing and a check-valve. At least three (3) volumes were removed from each groundwater monitoring well, or if the rate at which groundwater recharged was low, the groundwater monitoring wells were purged until 'dry' at least twice. The length of each groundwater monitoring well screen was purged during the development process. Measurement of pH, temperature, electrical conductivity, visual observations of turbidity, and olfactory observations of the discharge water were recorded in the field following removal of each well volume, where appropriate. Groundwater purge water that displayed the presence of floating oily product were not chemically assessed in the field to minimize any potential damage to groundwater field monitoring equipment. Purge water was containerized into a dedicated steel drum and secured at the Site until its final off-Site disposal by Veolia Canada Industrial Services Inc. (Veolia), which is a licensed liquid and solid waste hauling company.

2.3 Groundwater Level and LNAPL Presence Monitoring

Groundwater and LNAPL level measurements were collected at the newly installed groundwater monitoring wells during dedicated liquid level measurement events on November 19 and December 9, 2020. The liquid level measurement events from within the newly installed groundwater monitoring well network were collected within a 24-hour period in order to obtain a 'snapshot' of groundwater and LNAPL levels across the Site in time. The liquid levels for each groundwater monitoring well was measured using an oil/water interface meter, which has a reported accuracy for detecting product at a thickness of 1.0 mm or greater. The meter was decontaminated between groundwater monitoring wells to mitigate the potential for cross-contamination between monitoring points. The liquid levels were referenced to the top of groundwater monitoring well casing (reference point).

2.4 Elevation Survey

The newly installed groundwater monitoring wells were surveyed for elevation on November 20, 2020, by RWDI using a Topcon RL-H3C laser level. The groundwater monitoring wells were surveyed relative to a local existing groundwater monitoring well top-of-pipe (T.O.P.) benchmark elevation established during historical subsurface investigations.

2.5 Supplementary Soil Vapour Assessment

Two (2) gas monitoring probes labelled GP20149 and GP20150 were installed by RWDI within the CLC Area east of the residential property at 720 Ernest Street. One (1) of the gas monitoring probes was installed within the product plume to evaluate off-gassing concentrations that may be present directly from the product plume while the second gas monitoring probe was installed closer to the residence located at 720 Ernest Street and outside the product plume to evaluate for the presence of potential vapours in the vadose zone beyond the product plume front. The screen intervals extended from about 0.5 to 2.9 mBGS for both gas probes so that the screened interval would intersect the saturated and non-saturated hydro-stratigraphic boundaries in consideration of the product elevation, and a fluctuating groundwater table throughout the year. The gas monitoring probe installations were completed manually by RWDI staff using a hand auger. Each gas monitoring probe was equipped with sampling ports such that handheld gas monitoring equipment can be directly connected to measure in-situ soil vapour concentrations. Additional details were provided in a July 13, 2020 RWDI Memorandum to the City (**Appendix C)**.

In addition to installing the two (2) gas probes, two (2) additional boreholes (BH20149A and BH20149B) were hand-augered in a line between these two (2) locations to inspect subsurface conditions and to further delineate the extent of the LNAPL plume in this area. The locations of these installations are illustrated in the inset box on **Figure 3A**.

3 INVESTIGATION RESULTS

3.1 LIF Investigation Overview

The results of the LIF survey indicated “low” to “high” responses from the LIF probe. The maximum %RE for the LIF logs range from 0.9 to 648.3 %RE. The responses ranged in thickness from 0 to approximately 5 m. The LIF boreholes with the greatest thickness were not associated with those with the higher %RE response over the entire Site in any of the three (3) areas of study.

As noted above, interpolated zones of higher %RE responses may be indicative of higher levels of LNAPL in contrast to extrapolated zones with lower %RE response, which may be indicative of lower levels or LNAPL impacts or soil impacts. The minimum %RE response threshold that may be representative of LNAPL is very site specific as the LNAPL type and geology for that Site can all be contributing factors to this type of analysis. The subsurface borehole characterization component of the study was intended to allow for a correlation of the %RE measured during the LIF investigation with the presence or absence of LNAPL, as well as the degree of relative saturation.

During their LIF investigation, Golder (2014a) completed a limited drilling program to asses for soil impacts beside several LIF boreholes. As outlined in **Section 1.2**, Golder interpreted that LNAPL was present at locations where the peak %RE was greater than approximately 44%. However, as illustrated on numerous LIF borehole logs (**Appendix A**) completed as part of the current study, most responses between approximately 5 and 44 %RE fluoresce a noticeable signal with variable thickness. LIF boreholes with %RE responses less than approximately 5 did not produce a noticeable signal. As such, LIF boreholes with %RE responses in the 5 to 44 %RE range were preliminarily interpreted to represent potential trace LNAPL and / or soil impacts, whereas boreholes with %RE responses <5 were interpreted to represent no LNAPL. These preliminary interpretations were investigated as part of the subsurface characterization program completed by RWDI.

The generalized interpretation of the 2020 LIF investigations for the CLC Area, the G2 Area, and the Lake Chipican Area are illustrated on **Figure 3A** through **Figure 5A**, respectively. On each figure, the LIF boreholes were colour-coded based on the %RE response in order to visually differentiate those LIF borehole results interpreted as potential LNAPL impacts from those with inferred little or no potential LNAPL impacts, as in the following.

- Red LIF boreholes - ≥44 %RE response and inferred to represent potential NAPL;
- Yellow LIF boreholes - 5 – 44 %Re response and inferred to represent potential trace LNAPL and / or soil impacts;
- Blue LIF boreholes - ≤5 %Re represent potential no inferred LNAPL.

The inferred limits of LNAPL based on the 2017 monitoring results (Golder, 2018) is also presented on each figure.

3.2 Applicable Site Condition Standards

The soil laboratory analytical results from the samples collected for this subsurface characterization program were evaluated to the MECP's Ontario Regulation 153/04 (O.Reg.153/04), or more specifically, the "*Soil, Ground Water and Sediment Standards, for Use Under Part XV.1 of the Environmental Protection Act*" (MECP Standards). Of the evaluation criteria within the MECP Standards, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition (Table 3 Site Condition Standards) was used for the soil quality assessment. The use of the Table 3 Standards for evaluating soil quality analytical data considers the historical groundwater quality evaluation/reporting precedent for the Site that were reported to, and evaluated by, the MECP in accordance with the Waste ECA.

3.3 LIF Results

3.3.1 CLC Area

The generalized interpretation of the results of the CLC Area 2020 LIF survey are illustrated on **Figure 3A** and provided in **Table 1**. Of the 52 LIF boreholes advances, the %RE ranged from 1.4 %RE to 648.3 %RE. The CLC Area had the highest positive responses observed on-site. The vertical responses ranged in thickness from 0 to approximately 3.5 m.

Based on the visualization results within the CLC Area, the higher LIF responses (≥44 %RE) are scattered in small clusters away from the western boundary of the LIF survey from LIF20159 in the northeast to LIF20026 south of groundwater monitoring well 705 (refer to **Table 1**). Another small cluster was noted in the area of LIF20149 just east of the residential property located at 720 Ernest Street. West of these LIF boreholes, near the perimeter of the surveyed area, the responses from LIF boreholes indicated trace or no presence of LNAPL. This is illustrated on **Figure 3A** by the LIF boreholes that are colour-coded blue or yellow.

As noted on **Figure 3A**, there are numerous LIF boreholes with relatively high %RE responses west and northwest of the 2017 inferred limit of LNAPL and which are closer to the Site boundary. This may be a result of plume migration in this direction; and was investigated as part of the subsequent subsurface characterization component of the study (**Section 3.4**). There are several LIF boreholes with relatively high %RE responses near groundwater monitoring wells where LNAPL was not present based on the 2019 monitoring program. Examples of this include LIF20014 and LIF20015 near groundwater monitoring wells 706 and 709, and LIF200020 near groundwater monitoring well 702. This was investigated as part of the subsequent groundwater monitoring well installation and monitoring component of the study (**Section 3.5**).

Multiple types of LNAPL were interpreted in the CLC Area based on the callouts of the LIF logs and the colouring of the waveforms in the LIF logs. The majority of the LIF boreholes with a noticeable %RE response were green, yellow or orange, which is indicative of diesel or weathered gasoline, highly weathered fuels / mixtures, or heavy ended oil products, respectively. Some LIF logs within the CLC Area had potential multiple LNAPL types within the same boring location (e.g., LIF20014, LIF20020, and LIF20156).

3.3.2 G2 Area

As noted in the 2019 RWDI annual monitoring report (RWDI, 2020), LNAPL was detected within the G2 Area in groundwater monitoring wells 801, 802, and 803, MW1403, MW1403, and recovery wells RW1, RW1a, and RW2. These locations are north of the sheet-pile barrier wall, which was installed in 2000 in response to floating oil being noted in well G2 just north of Michigan Ave. LNAPL was not present in groundwater monitoring wells 606, 611, and 612, which are located on the non-landfill side of the sheet-pile barrier wall based on the 2019 monitoring data.

The generalized interpretation of the results for the 2020 LIF survey are illustrated on **Figure 4A** and summarized in **Table 2**. Of the 38 LIF boreholes advanced, the %RE ranged from 0 %RE to 168.3 %RE and were generally lower than the other two (2) areas (CLC and Lake Chipican Areas) investigated for this study. The vertical responses ranged in thickness from 0 to approximately 4.6 m.

Based on the results within the G2 Area, 11 LIF boreholes had LIF %RE responses ≥44 %RE, as outlined in **Table 2**. Of these, three (3) (LIF20131, LIF20174, and LIF20170) were in the area east and north of the sheet-pile barrier wall in an area where LNAPL had not previously been noted. Moderate %RE responses representing potential trace LNAPL and/or soil impacts (ranging between 5 and 44 %RE and denoted by yellow borehole symbols on **Figure 4A**) were noted immediately north and east of the sheet-pile barrier wall. The LIF boreholes north of the sheet-pile barrier wall occur in an area of know LNAPL based on the 2019 routine FMAL monitoring findings and may correspond to the actual presence of subsurface LNAPL.

The LIF boreholes (LIF20187 and LIF20188) with moderate %RE responses (approximately 21% RE) east of the sheet-pile barrier wall and north of Michigan Avenue occur in an area where LNAPL had not previously been detected and represents a risk of potential off-site migration. LIF boreholes were not advanced immediately south of the sheet-pile barrier wall near Michigan Avenue due to concerns of an unmarkable utility.

Multiple types of LNAPL were interpreted in the G2 Area based on the callouts of the LIF logs and the colouring of the waveforms in the LIF logs. The majority of the LIF boreholes with a noticeable %RE response were either yellow or orange in colour, which is indicative of highly weathered fuels / mixtures, or heavy ended oil products, respectively. Some LIF logs within the G2 Area had potential multiple LNAPL types within the same boring location (e.g., LIF20130, and LIF20132).

3.3.3 Lake Chipican Area

As noted in the 2019 RWDI annual monitoring report (RWDI, 2020), LNAPL was detected in the Lake Chipican Area in groundwater monitoring wells MW1426, MW1408, MW1201, MW1122, MW1101A, MW1111, 313 and recovery wells EW1, EW2, RW3, RW4, RW5, and RW6. A number of these locations (groundwater monitoring wells MW1201, MW1122 and Recovery Wells EW1 and EW2) are located northwest of the sheet-pile barrier wall and southeast of the Duck Pond. Of note, floating product has not been measured at the location of groundwater monitoring well MW1201 since early April 2020, which includes its replacement well MW1201A up to early December 2020.

The results of the LIF survey are illustrated on **Figure 5A** and summarized in **Table 3**. Of the 101 LIF boreholes advanced, the %RE ranged from 1.2 %RE to 403 %RE. The vertical responses ranged in thickness from 0 to approximately 5 m.

Based on the visualization results within the Lake Chipican Area, numerous boreholes had LIF %RE responses ≥44 %RE (refer to **Table 3**), which are indicative of the potential presence of LNAPL. These LIF boreholes are scattered throughout the area and not concentrated in one (1) area, which could be indicative of several individual blobs of subsurface LNAPL. Several of these were in areas outside of the 2017 delineated plume, as summarized below.

- LIF20161, located in the southwest portion of the Lake Chipican Area. The plume had not been delineated this far south previously.
- LIF20123 and LIF20134 were located slightly west of the western extent of the 2017 inferred delineated plume.
- LIF20037, LIF20038 and LIF20049 were located slightly north of the 2017 inferred delineated plume in the parking lot area south of the Animal Farm.
- LIF20070 was located just east of the historically identified plume “finger” of LNAPL near Recovery Wells EW1 and EW2.

- LIF20106, LIF20107, LIF20094 and LIF20095 located north of Cathcart Blvd. and east of the 2017 inferred delineated plume. It should be noted that LIF20094 is within approximately 20 m of Lake Chipican but appears to be in line with the edge of the sheet-pile barrier wall.
- LIF20110, LIF20112. and LIF20117 located south of Cathcart Blvd. and east of 2017 inferred delineated plume.

In the area between the northwest-southeast trending sheet-pile barrier wall and Lake Chipican to the northeast, none of the LIF boreholes had elevated %RE responses.

Moderate %RE responses indicated the potential for the presence of trace LNAPL and/or soil impacts (>5 to 44 %RE) north of Cathcart Boulevard and west of the 2017 inferred delineated plume (LIF20096 and LIF20091). LIF20091 is in the same vicinity as LIF20094 referenced above and is also relatively close to Lake Chipican. Moderate responses indicating the potential for the presence of trace subsurface LNAPL and/or soil impacts (>5 to 44 %RE) were also noted northwest of the sheet-pile barrier wall and east of the historically identified LNAPL "finger" (LIF20073 and LIF20074).

Multiple types of LNAPL were interpreted to be present in the subsurface in the Lake Chipican Area based on the callouts and the colouring of the waveforms on the LIF logs. The majority of the LIF boreholes with a noticeable %RE response were either yellow or orange in colour, which is indicative of highly weathered fuels / mixtures, or heavy ended oil products, respectively. Numerous LIF logs within the Lake Chipican Area had potential multiple LNAPL types within the same boring location (e.g., LIF20043, LIF20049, LIF20123, and LIF20123).

3.4 Subsurface Characterization Results

3.4.1 Laboratory Quality Assurance and Quality Control

To validate the analytical results of the samples collected, one QA/QC field duplicate sample was prepared for approximately every ten (10) original samples submitted for laboratory analysis. As such, three (3) field-prepared duplicate soil samples were prepared for the subsurface characterization program and submitted for laboratory analysis.

For the field-prepared duplicate samples, the results for the parameters of analysis were evaluated for the relative percent difference (RPD) of parameter concentrations initially using the USEPA National Functional Guidelines (USEPA 540-R-10-011) as a general QA/QC RPD screening mechanism. The RPD screening mechanism is such that for concentrations greater than five (5) times the laboratory method reporting limit (MRL), a concentration difference of less than or equal to 20% would be deemed acceptable. For concentrations less than or equal to five (5) times the MRL, a concentration difference of equal to or less than the RDL would be deemed acceptable. Where an exceedance of the general QA/QC RPD screening mechanism is identified, the results for the required parameters of analysis are evaluated against the applicable performance standards for sample duplicates noted in Tables 5.1 to 5.15 of the MECP's *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*, dated March 8, 2004, and amended July 1, 2011.

The calculated RPD's between the original sample and its duplicate were acceptable. As the analytical results for the original and duplicate samples were within the regulatory and laboratory's QA/QC tolerances, the laboratory data is representative of good intra-laboratory precision. Additionally, laboratory QA/QC processes of laboratory-prepared blanks and percent recoveries of analyses were deemed to be within acceptable QA/QC tolerances. Therefore, the reported laboratory analytical results are interpreted to be representative of actual conditions at the time of sample collection.

Laboratory certificates of analyses are provided in **Appendix D**.

3.4.2 CLC Area

In October 2020, five (5) boreholes and four (4) groundwater monitoring wells (BH20015, MW20014, BH2009, BH20019, MW20149, MW20026, BH20023, BH20191, and MW20025) were advanced in the CLC Area to correlate soil quality with the presence or absence of subsurface LNAPL. The drilling locations are illustrated on **Figure 3B**. Additional details pertaining to drilling locations are summarized below.

- MW20149 and MW20025 were completed as groundwater monitoring wells and were installed near the property boundary and east of the residential property located at 720 Ernest Street.
- BH20023 and BH200191 were drilled east of the property limit boundary near Ernest Street.
- BH20019, BH20013, and BH20009 where advanced east of the property boundary between Ernest Street and Victoria Avenue.
- MW20026 was installed in the southern portion of the CLC Area east of the Front Street cul-de-sac.

The soil stratigraphy encountered during the drilling activities consisted of topsoil and/or fill overlaying layers of fill and/or native sand, silty sand, and sandy silt. Fill materials varied across the area and consisted of silty sand fill and extended to depths of 0.43 to 2.33 mBGS. The underlying native soil generally consisted of sand, silty sand, and sandy silt.

The laboratory analytical results for soil samples submitted for chemical analyses are summarized in **Table 4**. The laboratory Certificates of Analyses (COA) are provided in **Appendix D**. Samples from drilling locations BH20014, MW20149, MW20026, BH20023, and MW20025 exceeded the Table 3 criteria of the MECP Standards for one or more the of the parameters analyzed. Highlights of the subsurface characterization program are presented in the below summary.

- Soil samples collected from the locations of boreholes BH20014 and BH20019 indicated the greatest concentrations of PHCs in excess of the Table 3 criteria of the MECP Standards. These borehole locations also displayed the highest peak %RE with 648 %RE and 610 %RE noted, respectively. A sheen, as well as hydrocarbon (i.e. oily) staining was noted at BH20014. Though a sheen was not noted at the location of BH20019, hydrocarbon staining was evident. As such, LNAPL was confirmed to be present at these borehole locations.

- At the location of BH20015, which is located several metres from BH20014, a 469.6 %RE was noted during the LIF investigation. The soil exhibited the presence of a sheen with a slight hydrocarbon odour. However, the soil sample submitted from this borehole location satisfied the Table 3 criteria of the MECP Standards.

- Borehole BH20009, which is located east of the Site boundary between Ernest Street and Victoria Avenue, displayed an LIF peak response of 408.5 %RE. Although the soil quality satisfied the Table 3 criteria of the MECP Standards, a sheen, as well as a slight hydrocarbon odour were observed during the drilling program.

- Groundwater monitoring wells MW20025 and MW20149 indicated select constituent concentrations in the soil that were above the Table 3 criteria of the MECP Standards. The LIF %RE responses for MW20025 and MW20149 were 188 %RE and 179 %RE, respectively. Field observations of the retrieved soil cores at these two (2) groundwater monitoring well locations indicated hydrocarbon staining and heavy hydrocarbon odours. Of note, only the concentration of PHC F1 was noted to only be slightly above its respective Table 3 criteria of the MECP Standards at the location of MW20149.

- Visible sheens, hydrocarbon staining, and heavy hydrocarbon odours were noted within the soil at the locations of BH20191 and BH20023. These field observations correlate to the relatively elevated %RE signals of 192 %RE and 304 %RE for borehole locations BH20191 and BH20023, respectively. However, only the soil at BH20023 showed constituent concentrations of select PHCs and one PAH that were above their respective Table 3 criteria of the MECP Standards.

- Within the southern portion of the CLC Area, soil collected at the location of borehole BH20026 exceeded the Table 3 criteria of the MECP Standards for select PHCs (F1 to F3). Soil collected for analysis at this borehole exhibited black hydrocarbon staining, a visible sheen, and heavy hydrocarbon odours. The peak %RE signal was noted to be 80 %RE during the LIF investigation.

3.4.3 G2 Area

Two (2) boreholes and two (2) groundwater monitoring wells (MW20174, MW 20170, BH20187, and BH20168) were advanced to correlate soil quality with the presence or absence of subsurface LNAPL in the G2 Area. The drilling locations are located east of the sheet-pile barrier wall. One (1) soil sample was collected from each borehole and submitted for laboratory analysis.

The soil stratigraphy in these boreholes generally consisted of topsoil and/or fill overlying silty sand to sandy silt. The fill material consisted of silty clay to sand fill and extended to depths ranging from 1.0 to 3.04 mBGS. The native soil generally consisted of silty sand to sandy silt. Clayey silt to silty clay was observed at BH20168 below 2.42 mBGS.

The analytical results, which are summarized in **Table 5,** indicate that constituent concentrations within the soil at the tested locations were above their respective Table 3 criteria of the MECP Standards for PHC F2 to F4, with a PHC F1 exceedance noted at BH20168. Ethylbenzene and xylenes concentrations were also above their respective Table 3 criteria at the location of BH20168. When considering the findings of the LIF investigation, peak LIF signals were higher than 50 %RE at the locations of MW20174 and MW2017, whereas peak LIF response values were marginally above 20 %RE at the locations of BH20168 and BH20187. A sheen was observed within the saturated soil at MW20174. Hydrocarbon staining and odours were noted at MW20170, MW20174, and BH20187. There was no staining, sheens, or hydrocarbon odours noted in the field within the soil at BH20168.

PAHs could not be tested for samples retrieved from the locations of BH20168 and BH20170 as there was insufficient sample from both boreholes to perform the laboratory testing.

3.4.4 Lake Chipican Area

Ten (10) boreholes and three (3) groundwater monitoring wells (BH20037, BH20066, BH20069, MW20070, BH20071, BH20080, MW20094, BH20095, BH20110, BH20112, BH20117, BH20123, and MW20161) were advanced to correlate soil quality with the presence or absence of LNAPL in the Lake Chipican Area as summarized below.

- Boreholes BH20080, BH20069, BH20071, BH20066, and groundwater monitoring well MW20070 were advanced between Lake Chipican and the Duck Pond near the LNAPL plume finger that was discovered during the 2017 LIF investigation.
- BH20037 was drilled south of the Duck Pond and near the animal farm parking lot.
- MW20094 and BH20095 were advanced southwest of the Lake Chipican sheet-pile wall.
- BH20117, BH20112, and BH20110 were advanced east of the Canatara Park.
- MW20161 and BH20123 were advanced southeast of the Pavilion and near the inferred toe of waste of the FMAL.

One (1) soil sample was collected from each of the boreholes and submitted for laboratory analyses except for groundwater monitoring well MW20161 due to metal and plastic debris obstructions causing poor soil core recovery for sample collection.

The soil stratigraphy in the Lake Chipican Area generally consisted of topsoil overlying clay and sandy fill material, which was underlain by native silty sand to sandy soil. At the location of groundwater monitoring well MW20161, waste material comprised of plastic and debris was encountered during drilling indicative of a waste mound. Fill depths ranged from 0.81 to 3.04 mBGS.

Laboratory results are summarized in **Table 6**. Laboratory COAs are provided in **Appendix D**. Of the 12 samples submitted for chemical testing from the Lake Chipican Area, eight (8) samples showed constituent concentrations of one of more of PHCs, BTEX, and/or PAHs that were above their respective Table 3 criteria of the MECP Standards. The following observations are made in consideration of these elevated constituent concentrations in the soil.

- BH20095 and MW20094 located east of the Pavilion and southeast of the sheet-pile wall had constituent concentrations that were above their respective Table 3 criteria of the MECP Standards for PHCs with PHC concentrations typically greater at BH20095, which is closer to Lake Chipican. In addition, the concentration of 1-methlynaphthalene was also above its Table 3 criteria of the MECP Standards at BH20095. The LIF results for both tested locations were slightly above 50 %RE with slight to strong hydrocarbon odours and staining noted during drilling. A groundwater monitoring well was installed at the location of MW20094 to evaluate for the presence of floating oil/product and/or LNAPL.

- Of the five (5) tested locations between Lake Chipican and the Duck Pond, only two (2) sampled locations (BH20069 and BH20071) had constituent concentrations that were above their respective Table 3 criteria of the MECP Standards for one or more PHCs. Both drilling locations displayed peak %RE values greater than 100. The corresponding borehole logs indicate the presence of a sheen at both borehole locations. The sample collected from the location of BH20080 displayed a peak %RE value of approximately 71. Though it displayed a relatively elevated %RE signal, the soil at this tested location satisfied the Table 3 criteria of the MECP Standards for the parameters analyzed. Notwithstanding, the sampled soil exhibited a sheen and noticeable free product within the retrieved core.

- Samples collected at the western and eastern extents of the Lake Chipican Area (BH20123, BH20161, BH20117, BH20112, and BH20110) showed constituent concentrations that were above the Table 3 criterial of the MECP Standards for one or more of the tested parameters. These elevated soil concentrations are interpreted to correlate to relatively elevated %RE values (i.e. >50 %RE) noted during the LIF investigation. Field observations indicated the soil exhibited hydrocarbon odours, staining, sheen and free products at borehole locations BH20110, BH20117, and BH0123.

- As noted previously, a soil sampled could not be collected from the location of BH20161 could be submitted for analyses due to metal and plastic debris obstructions causing poor soil core recovery for sample collection.

- PAHs could not be tested for samples retrieved from the locations of BH20110 and BH20123 as there was insufficient sample from each borehole to perform the laboratory testing.

3.4.5 Soil Cuttings and Purge Water Disposal

Soil cuttings generated from the installation of groundwater monitoring wells were placed within 205 litre (L) steel drums and temporarily stored at the Site until disposed off-site by Veolia.

Prior to disposal, a composite soil sample was collected from the odorous soils in the drums to provide input for disposal options. The soil sample was submitted to Eurofins for a toxicity characteristic leachate procedure (TCLP) analysis. The TCLP list of chemical constituents reflected those that were required toward the acceptance of impacted soil for disposal. The TCLP testing results indicated the impacted soil to be non-hazardous and acceptable for disposal at a licensed solid non-hazardous landfill or equivalent facility in accordance with the appropriate regulatory approvals. The laboratory certificate of analysis for the TCLP results is contained in **Appendix B**.

3.5 Groundwater and Product Level Monitoring

3.5.1 CLC Area

The groundwater and LNAPL monitoring results for four (4) groundwater monitoring wells installed in the CLC Area are summarized in **Table 7**. As indicated, LNAPL (i.e. floating product) was observed in MW20014 and MW20149 during the November monitoring event and in MW20014, MW20026, and MW20149 during the December monitoring event. Detectable LNAPL measured thicknesses ranged from less than 0.003 m in MW20149 to 0.75 m in MW20014 on December 9, 2020. LNAPL was not observed in MW20025, even though nearby MW20149, which is closer to the property boundary, did exhibit measurable floating LNAPL, although less than 0.05 m in thickness. It should be noted that MW20149 is approximately 6.5 m from the western property boundary.

The peak LIF signals were noted to be approximately 648 %RE at MW20014, 187 %RE at MW20149, 179 %RE at MW20025 and 80 %RE at MW20026. The peak %RE generally occurred at the same elevation as the groundwater table for both MW20014 and MW20149. At MW20025, the measured groundwater table was above the zone of inferred LNAPL thickness based on the LIF log, and at MW20026, the measured groundwater level was toward the bottom of the inferred LNAPL based on the LIF logs. Refer to the Borehole Logs in **Appendix B** for additional details.

As noted in the 2019 RWDI annual monitoring report (RWDI, 2020), of the current groundwater monitoring locations, LNAPL was only detected in the CLC Area in groundwater monitoring well 705 located near the west property boundary north of the Front Street cul-de-sac (**Figure 3B**). It is noted that LNAPL thicknesses measured and frequencies of detected LNAPL at this groundwater monitoring well have increased since 2018. LNAPL has not been detected at adjacent groundwater monitoring well 704, which is located less than 2 m west of 705 and is between that well and the property boundary. Groundwater monitoring wells 706 and 709 are also included in the monitoring program and LNAPL has never been detected in these groundwater monitoring wells. Groundwater monitoring well MW20014, which, as noted, has a significant thickness of LNAPL, is located approximately 5 m north and slightly west of wells 706 and 709.

3.5.2 G2 Area

The groundwater and LNAPL monitoring results for two (2) groundwater monitoring wells installed in the G2 Area are summarized in **Table 8**. Of note, only MW20174 had measurable floating LNAPL for both the November and December 2020 monitoring events. Measured LNAPL thickness ranged from 0.1 m on November 11 and 0.014 m on December 9. LNAPL was not detected within groundwater monitoring well MW20170. During the LIF investigation, MW20170 displayed a higher peak %RE signal (~168 %RE), whereas a lower peak %RE signal (110 %RE) was noted at the location of MW20174. The peak %RE was generally noted to be at the same approximate elevation as the groundwater table at MW20174 and slightly above the groundwater table at MW20170 (refer to the Borehole Logs in **Appendix B** for additional details). This suggests that LNAPL at MW20170 may partially be above the groundwater table under tension (<100% saturation) within the vadose zone and, as such, would not be present as measurable floating LNAPL.

In the G2 Area, LNAPL was detected in groundwater monitoring wells 801, 802, 803, 1402, and 1403, as indicated on **Figure 4B**. These groundwater monitoring wells are located north of the sheet-pile wall that was installed just north of Michigan Ave. It should be noted that groundwater monitoring well MW20174, with measurable LNAPL, is over 10 m east of the eastern extent of the sheet-pile wall.

3.5.3 Lake Chipican Area

The groundwater and LNAPL monitoring results for three (3) groundwater monitoring wells installed in the Lake Chipican Area are provided in **Table 9**. Groundwater monitoring well MW20094, located south of Lake Chipican and east of the sheet-pile wall, indicated the presence of LNAPL during both the November and December monitoring events. Less than 1 cm of LNAPL was measured on November 11 and 5 cm of LNAPL was measured on December 9, 2020. MW20161, which is located within the southwestern portion of the Lake Chipican Area, indicated a slight presence of measurable LNAPL, but only during the November monitoring event, when approximately 0.001 m of LNAPL was measured. No LNAPL was measured during either monitoring events at MW20070, which is in the area of the "finger". Of these groundwater monitoring well locations, the greatest peak %RE signal was approximately 403 %RE at the location of MW20161 and the lowest peak %RE signal of approximately 56 %RE was noted at the location of MW20094. The peak % RE signal generally occurred at the same elevation as the groundwater table (refer to the Borehole Logs in **Appendix B** for additional details).

For the Lake Chipican Area, LNAPL is typically detected during the routine monitoring program at groundwater monitoring wells 313, MW1111, MW1122, MW1201, MW1408, and MW1426, as indicated on **Figure 5B**. Most of these occur in the vicinity of the sheet-pile wall and "finger" near Lake Chipican. It should be noted that LNAPL has not been detected at the location of MW1201 since early April 2020, including its replacement groundwater monitoring well MW1201A up to early December 2020.

The results of the current LIF and subsurface characterization programs suggest that the LNAPL plume may extend further to the southwest (MW20161) and east (20094) than previous interpretation by Golder.

3.6 Summary

As presented on **Figures 3B**, **4B**, and **5B**, the updated inferred LNAPL plume extents for each area was interpreted using the information obtained from the LIF and subsurface characterization investigations. Based on these data, the updated extents of the LNAPL plume correspond to an inferred LIF %RE boundary of approximately 20 %RE, which is interpreted to be a lower limit at which LNAPL is present at potentially unacceptable quality and quantity.

Though there may be LNAPL present in locations where the LIF %RE signals are less than 20 %RE. At these locations, LNAPL may occur as discontinuous free-phase liquid and/or residual liquids trapped by capillary forces above and/or below the groundwater table. Areas with residual LNAPL above the groundwater table will be held under tension and, as such, will not be able to flow into a groundwater monitoring well as a free-phase liquid. As a result, fluctuating groundwater levels, both upwards and downwards, may change the patterns of which wells have free-phase liquid.

3.6.1 CLC Area

The results from the CLC Area have demonstrated that there does appear to be a direct correlation with the LIF results and the presence of free LNAPL that can measured in groundwater monitoring wells. The presence or absence of LNAPL in the boreholes drilled was inferred from a combination of LIF results, measurable LNAPL in groundwater monitoring wells, the presence of visible sheens and hydrocarbon staining on samples collected during borehole drilling, and the laboratory analytical results. A summary of these results and observations is presented in **Table 10** for the CLC Area.

As indicated in **Table 10**, LNAPL is interpreted to be present in the subsurface at the groundwater monitoring well locations as part of this investigation in the CLC Area, though free phase floating product has not been identified within the groundwater at MW20025 or MW20026 during the November and December 2020 monitoring events. The data summarized within **Table 10** suggests that the LIF results are a reasonably accurate predictor of the presence of LNAPL. The range of visual, olfactory, and analytical results suggests that the LNAPL may exist as continuous, free phase liquid, or as residual liquids trapped by capillary forces above and below the groundwater table. This may explain why, in part, LNAPL may not be measurable as free product in groundwater monitoring wells in an area where LNAPL is likely to occur, based on the results from the LIF boreholes. It should also be noted that the wider slot sizes used in the groundwater monitoring well screen installed within MW20014 could explain the measurable thickness of LNAPL at MW20014 and not at the nearby groundwater monitoring wells 706 and 709, which are included in the routine monitoring program.

Figure 3B shows the updated inferred limit of LNAPL in the CLC Area based on the LIF investigation findings and follow-up subsurface characterization efforts completed in 2020. Groundwater monitoring wells that form part of the current compliance monitoring program, as well as the new groundwater monitoring wells installed in 2020 as part of the subsurface characterization effort, are also presented on the figure. A pinkish hue highlights those groundwater monitoring wells on the figure, which showed the presence of floating product during field monitoring tasks completed in 2020 from both the routine FMAL monitoring events and from this investigation. As indicated on **Figure 3B**, the plume is interpreted to be farther to the west than the extent previously interpreted in 2017 by Golder. In the area of the Ernest Street residential property, the inferred LNAPL plume is interpreted to be within approximately 6.5 m of the property line; however, a legal survey of the property line and groundwater monitoring well and gas probe locations would be required to more accurately reference the position these groundwater monitoring locations to the property boundary.

The inferred limit of LNAPL to the west of the previously inferred limit may be related to rising water levels in Lake Huron. Based on available data from the Government of Canada (https://www.tides.gc.ca/C&A/network_means-eng.html), Lake Huron levels have been steadily rising since 2013. The lake level in 2019 is higher than it's been since 1997. This may have the effect of raising the shallow groundwater levels and "pushing" groundwater levels and the corresponding free phase product to the southwest at the Site due to the Site's proximity to Lake Huron. For the CLC Area, the rising shallow groundwater table may have driven the LNAPL plume vertically upward to an elevation that is near the buried rail ballast stone layer, which, due to its relative large pore space, may have facilitated its lateral migration westward toward the property boundary.

3.6.2 G2 Area

Similar to the CLC Area, the results for the G2 Area demonstrated that there does appear to be a direct correlation with the LIF results and the presence of free LNAPL that can be measured in groundwater monitoring wells. The presence or absence of LNAPL in the boreholes drilled was inferred from a combination of LIF results, measurable LNAPL in groundwater monitoring wells, the presence of visible sheens and hydrocarbon staining on samples collected during borehole drilling, and the laboratory analytical results. A summary of these results and observations is presented in **Table 11**.

As indicated in **Table 11**, LNAPL is interpreted to be present within the subsurface at the groundwater monitoring well and borehole locations as part of this investigation in the G2 Area. At the location of BH20168, which had a peak %RE response of 22, there does not appear to be the presence of LNAPL based on field observations, but chemical analytical data seems to indicate otherwise. The summary table suggests that the LIF results are a reasonably accurate predictor of the presence of LNAPL. Like the CLC Area, the range of visual, olfactory, and analytical results suggests that the LNAPL may exist as continuous, free phase liquid, or as residual liquids trapped by capillary forces above and below the groundwater table.

Figure 4B shows the updated inferred limit of LNAPL in the G2 Area based on the LIF investigation findings and follow-up subsurface characterization efforts completed in 2020. As indicated on **Figure 4B**, the plume is interpreted to be farther to the east and slightly to the south (in the area of BH20187) than the extent previously interpreted by Golder.

3.6.3 Lake Chipican Area

In the Lake Chipican Area, the presence or absence of LNAPL in the boreholes drilled was similarly inferred from a combination of LIF results, measurable LNAPL in groundwater monitoring wells, the presence of visible sheens and hydrocarbon staining on samples collected during borehole drilling, and the laboratory analytical results. A summary of these results and observations is presented in **Table 12**.

As indicated in **Table 12**, LNAPL is interpreted to be present within the subsurface at the borehole locations as part of this investigation except possibly for BH20066 (61 %RE peak), BH20169 (124 %RE peak), MW20070 (137 %RE peak). However even for these wells, LNAPL is possible due to the LIF response and their respective locations and the lack of direct supporting evidence may be due to a number of factors such as the degree of LNAPL saturation, the location of the groundwater table relative the zone of residual LNAPL etc. Similar to the other two (2) areas, the summary table suggests that the LIF results are a reasonably accurate predictor of the presence of LNAPL. Like the other two (2) areas, the range of visual, olfactory, and analytical results suggests that the LNAPL may exist as continuous, free phase liquid, or as residual liquids trapped by capillary forces above and below the groundwater table.

Figure 5B shows the updated inferred limit of LNAPL in the Lake Chipican Area based on the LIF investigation findings and follow-up subsurface characterization efforts completed in 2020. As illustrated, the extent of the inferred LNAPL plume in the Lake Chipican Area in comparison to the previous interpretation by Golder, is slightly to the west and south along the plume's western limit, slightly farther north toward the Animal Farm, and slightly to the area east of the sheet-pile wall and south of Lake Chipican.

4 SUPPLEMENTARY SOIL VAPOUR ASSESSMENT RESULTS

Detailed results for the supplementary soil vapour assessment completed in the CLC Area were provided in a memorandum from RWDI to the City dated July 17, 2020. The results summarized below are considered relevant to the interpretation of LNAPL in a portion of the CLC Area.

As noted in the inset box on **Figure 3A**, the gas probe boreholes were completed from GP20149 in a southwest linear direction to GP0150 located within 3 m of the approximate property line and shed at 720 Ernest Street. GP20149 was intended to be in the vicinity of LIF20149, which had a %RE response of 187.8 %RE and, as such, interpreted to be within the LNAPL plume. GP20150 was intended to be in the vicinity of LIF20150, which had a %RE response of 2.8 %RE and interpreted to be outside of the plume.

The following summarizes pertinent results from that investigation.

- Visual and olfactory evidence of LNAPL or hydrocarbon was only noted in soil collected from GP20149. There was no evidence of product-like impacts in the soil at BH20149B, which was located 0.8 m further east than LIF BH20149.
- Based on the June 18, 2020 field observations, the product plume appears to be located approximately 8 m east of the residential property boundary.
- Soil samples were collected from GP20149 (Sample ID 20149C), BH20149A (sample ID 20149), and GP20150 (Sample ID 20150) and submitted to Eurofins Scientific for analytical testing for PAHs, volatile organic compounds (VOCs), and petroleum hydrocarbons (PHCs) Fractions F1 to F4.
- Soil quality results were below the laboratory detection limit for the tested parameters except for PHC Fraction F2 at GP20149, and PHC Fraction F3 at BH20149A and GP20150. However, the results were less than 5 times the laboratory reportable detection limit (RDL) and considered negligible. As noted above, the soil sample from GP20149 exhibited a distinct sheen and had a hydrocarbon odour. The negligible analytical results for this sample may be due to the potentially highly weathered nature of the product as suggested by LIF responses (see **Sections 3.3.1** and **3.4.2**); however, additional sampling and analytical testing would be required to confirm this interpretation.

- There were no combustible gas readings detected at gas monitoring probes GP20149 and GP20150 during three (3) different monitoring events (June 18th, July 2nd, or July 9, 2020). The lack of combustible gas readings from a location with visual indications of product suggests that the existing product in the area does not readily volatilize.

Based on the above and the results of the subsurface characterization and groundwater monitoring well installation completed in the CLC area, as described in **Sections 3.3.1, 3.4.2, 3.5.1,** and **3.6.1**, the LNAPL plume is interpreted to have migrated west of the 2017 inferred LNAPL plume delineation illustrated on **Figure 3B**. Based on the existing information, the LNAPL plume is conservatively estimated to be at least 6.5 m east of the 720 Ernest property boundary.

5 CONCLUSIONS

Based on the above discussion of findings, the LNAPL plume boundaries are interpreted to have shifted in some Areas of the FMAL compared to its inferred Golder limits in 2017. The change in the extent of the LNAPL plume may be the result of the steady rise in Lake Huron levels since 2013. The lake level in 2019 was the highest level since 1997 based on data from the Government of Canada. Rising lake levels are interpreted to have resulted in a rise in the shallow groundwater levels.

The subsurface characterization and groundwater monitoring well installation program that were undertaken as part of the follow-up investigation corroborate the LIF findings; however, there does not appear to be linear correlation between the LIF results as a peak %RE response and the presence or thickness of mobile LNAPL. Rather, the results suggest that the LNAPL plume in each of the areas of investigation occurs as both continuous and discontinuous free-phase liquid and/or residual liquids trapped by capillary forces above and/or below the water table. The distribution of LNAPL may also be somewhat "patchy" as a result of heterogeneity of subsurface conditions, associated with the wide range and thickness of fill overlying native soil. Areas with residual LNAPL above the groundwater table will be held under tension and, as such, will not be able to flow into a groundwater monitoring well as a free-phase liquid. As a result, fluctuating groundwater levels, both upwards and downwards, may change the patterns of which wells have free-phase liquid. This may explain the inferred change in the extent of LNAPL in the CLC area.

The subsequent field investigation that was completed in the CLC G2, and Lake Chipican areas generally corroborate the results of the LIF investigation and support the interpretation of the inferred LNAPL plume. In comparison to the 2017 LNAPL plume interpretation, the following updated inferred LNAPL plume is interpreted for the three (3) main areas of the Site.

- For the CLC Area, the inferred LNAPL plume is generally slightly west of the previous interpretation.
- For the G2 Area, the inferred LNAPL plume may have extended slightly east and south.
- For the Lake Chipican Area, the inferred LNAPL plume is slightly to the west and south along the plume's western limit, slightly farther north toward the Animal Farm, and slightly to the area east of the sheet-pile wall and south of Lake Chipican.

The field results; however, suggest that the LNAPL exists in a range of saturations and, as such, does not always occur as free-phase liquid that can be measured in a groundwater monitoring well.

In consideration of the findings presented in this report, conclusions are provided below for each of the areas investigated at the FMAL.

5.1 CLC Area

Generally, based on the LIF findings in the CLC Area and the subsequent field subsurface investigation, the LNAPL plume appeared to be similarly shaped as noted in 2017 but has migrated somewhat to the west and toward the property line. Technical details are presented below.

- Of the 52 LIF boreholes advances, the %RE ranged from 1.4 %RE to 648.3 %RE and the responses ranged in thickness from 0 to approximately 4.0 m.
- The majority of the LIF boreholes with noticeable %RE responses had responses indicative of diesel or weathered gasoline, highly weathered fuels / mixtures, or heavy ended oil products. Some LIF logs within the CLC Area appear to have potential multiple LNAPL types within the same boring location.
- There were numerous LIF boreholes with relatively high %RE (>44 %RE) responses west and northwest of the 2017 inferred limit of LNAPL and are closer to the Site boundary.
- Several LIF boreholes with a relatively high %RE responses were located near groundwater monitoring wells where LNAPL was not present during the 2019 monitoring program. Examples of this include LIF20014 and LIF20015 near groundwater monitoring wells 706 and 709, and LIF200020 near groundwater monitoring well 702.
- Based on the results of the field investigation and LIF study, the inferred extent of LNAPL appears to be within approximately 6.5 m of the residential property located at 720 Ernest Street. There are currently no remedial measures or preventative controls installed in the CLC Area, which would be required if LNAPL was determined to be 5 m or less of the property line.

5.2 G2 Area

Generally, based on the LIF findings in the G2 Area and the subsequent field subsurface investigation, the LNAPL plume based on the %RE responses indicated a potential plume edge that may have extended east and southeast in comparison to the 2017 interpretation. Technical details are presented below.

- Of the 38 LIF boreholes advanced, the %RE ranged from 0 %RE to 168.3 %RE and the responses ranged in thickness from 0 to approximately 4.5 m.

- Multiple types of LNAPL were interpreted in the G2 Area based on the LIF results and include highly weathered fuels / mixtures, or heavy ended oil products, respectively. Some LIF logs within the G2 Area had potential multiple LNAPL types within the same boring location.
- Ten LIF boreholes had relatively high %RE (>44 %RE) responses indicative of potential LNAPL impacts. Of these, three (3) (LIF20121, LIF20174, and LIF20170) were in the area east and north of the sheet-pile barrier wall in an area where LNAPL had not previously been noted. Moderate %RE responses (ranging between 5 and 50 %RE) were noted immediately north of the sheet-pile barrier wall in areas with known LNAPL presence based on the 2019 monitoring program findings.
- No LIF boreholes were advanced immediately south of the sheet-pile barrier wall near Michigan Avenue due to concerns of an unmarkable utility, therefore, the presence or absence of LNAPL in that area could not been assessed.
- Moderate responses (5 - 44 %RE) indicative of potential trace LNAPL and / or soil impacts were noted north and east of the sheet-pile barrier wall. The LIF boreholes with moderate %RE responses east of the sheet-pile barrier wall and north of Michigan Avenue occur in an area where LNAPL had not previously been detected and represent a risk of potential off-site migration.

5.3 Lake Chipican Area

Generally, based on the LIF findings in the Lake Chipican Area and the subsequent field subsurface investigation, the LNAPL plume may have increased in size overall. The %RE responses indicated a potential plume edge that may have slightly extended westward, northwest, and eastward in comparison to 2017. Technical details are presented below.

- Of the 101 LIF boreholes advanced, the %RE ranged from 1.2 %RE to 403 %RE and the responses ranged in thickness from 0 to approximately 5 m.
- Multiple types of LNAPL were interpreted in the Lake Chipican Area based on the LIF results. Most of the higher %RE responses were indicative of highly weathered fuels / mixtures, or heavy ended oil products, respectively. Numerous LIF logs may have multiple LNAPL types within the same boring location.
- Numerous boreholes had relatively high %RE (>44 %RE) responses. A number of these are in areas outside of the 2017 inferred delineated plume, as follows.
    - LIF20161 located in the southwest portion of the Lake Chipican Area.
    - LIF20123 and LIF20134 located slightly west of the western extent of the 2017 inferred delineated plume;
    - LIF20037, LIF20038, and LIF20049 located slightly north of the 2017 inferred delineated plume in the parking lot area south of the Animal Farm;

- LIF20070 located just east of the "finger" of LNAPL near Recovery Wells EW1 and EW2;
- LIF20106, LIF20107, LIF20094 and LIF20095 located north of Cathcart Blvd. and east of the 2017 inferred delineated plume. LIF20094 is within approximately 20 m of Lake Chipican; and
- LIF20110, LIF20112 and LIF20117 located south of Cathcart Blvd. and east of the 2017 inferred delineated plume.

- Trace to moderate (5-50 %RE) responses indicative of potential trace LNAPL and / or soil impacts were noted north of Cathcart Blvd. east of the 2017 inferred delineated plume (LIF20096 and LIF20091). LIF20091 is in the same vicinity as LIF20094 referenced above and is relatively close to Lake Chipican.
- Trace to moderate responses indicative of potential trace LNAPL and / or soil impacts were also noted northwest of the sheet-pile barrier wall and east of the LNAPL "finger" (LIF20073 and LIF20074).

6 RECOMMENDATIONS

Based on the findings of the 2020 LIF Investigation and follow-up subsurface characterization program, the following recommendations are provided for consideration.

- In the CLC Area, LNAPL may be present west of the area previously delineated near the property boundary and is now interpreted to be approximately 6.5 m from the property boundary and east of the resident located at 720 Ernest Street. To more accurately reference the position of the completed borehole and groundwater monitoring wells near the Ernest Street resident, a legal survey of the property line, as well as existing groundwater monitoring wells and gas probes should be completed. Based on the survey results, the City should consider the need for installing remedial measures or preventative controls in the CLC Area. Groundwater monitoring wells installed as part of the current investigation should be incorporated into the monitoring program.
- In the G2 Area, LNAPL or trace LNAPL is inferred east and north of the sheet-pile barrier wall where LNAPL had not previously been identified. Groundwater monitoring wells installed as part of the current investigation should be incorporated into the annual monitoring program to assess the short and long-term groundwater and/or floating oil trends to determine the need to improve upon existing remedial infrastructure.
- In the Lake Chipican Area, LNAPL is inferred to have extended west, northwest, and east in comparison to the 2017 interpretation by Golder. As such, a number of groundwater monitoring wells installed as part of the current investigation should be incorporated into the routine monitoring program to more accurately assess the LNAPL plume and determined the need to improve upon existing remedial infrastructure.

- Based on the findings of this investigation, a review of the evaluation for a need to update the Trigger and Contingency Plan (Golder, 2015), as well as the Remedial Action Plans (Golder, 2012 and 2014b) will be completed. If an update is required to any of these documents, further recommendations will be provided in a separate document to the City and the MECP for review and comment.

7 STUDY LIMITATIONS AND USE OF REPORT

This report was prepared using scientific principles and professional judgment in assessing available facts and presenting subjective interpretations. The professional judgments presented within this document are based on available facts within the limits of the existing information, budgeted scope of work, and schedule. It is RWDI's intent that the professional judgment and interpretive conclusions be utilized as guidance and not be necessarily construed as a firm course of action, unless explicitly stated otherwise. We make no warranties, expressed or implied, including without limitation, or warranties as to merchantability or fitness of the property for a particular purpose. The information presented in this report is not to be construed as legal advice.

RWDI relied on information obtained from Site representatives, independent sources, and other historical documentation as referenced in this report. The accuracy and completeness of third-party sources was not verified. It is noted that regulatory guidelines, standards, and related documents as they may be referenced in this report are subject to interpretation and may change over time.

This report was prepared for the exclusive use of The Corporation of the City of Sarnia and the Ministry of the Environment, Conservation and Parks. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. RWDI accepts no responsibility for damages, if any, suffered by any third party as result of decisions made or actions based on this report.

8 CLOSURE

We trust that this 2020 Update on LNAPL Plume Delineation Report for the Former Michigan Avenue Landfill in the City of Sarnia, Ontario, is satisfactory for your requirements. Should there be any questions or comments, please contact us.

Sincerely,

RWDI AIR Inc.

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SGD/PEJ/BJL/kta

Attach.

9 REFERENCES

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TABLES

Table 1

CLC Area LIF Results - *Former Michigan Avenue Landfill*

Project No. 1801685

LIF Borehole	Max Signal (%RE)	Max Signal Depth (m)	Approximate LNAPL Thickness (m)	Potential Impacts
20001	7.4	0	0.05	Soil Impact / Trace LNAPL
20002	265	2.97	3.5	LNAPL
20003	377.9	2.85	2.7	LNAPL
20004	27.1	0	1	Soil Impact / Trace LNAPL
20005	6.8	0.48	0.1	Soil Impact / Trace LNAPL
20006	55.7	2.03	1.5	LNAPL
20007	1.9	2.24	0	No Impact
20008	443.1	2.66	1.5	LNAPL
20009	408.5	1.82	1.15	LNAPL
20010	15.6	0.71	0.3	Soil Impact / Trace LNAPL
20011	2	2.49	0	No Impact
20012	408.6	1.35	1	LNAPL
20013	3.5	0.36	0.05	No Impact
20014	648.3	2.28	2	LNAPL
20015	469.6	1.62	2.55	LNAPL
20016	7.9	0.11	0.1	Soil Impact / Trace LNAPL
20017	2.3	3.13	0	No impact
20018	602.6	2.64	1.1	LNAPL
20019	610.4	2.64	2	LNAPL
20020	430.1	2.17	1.6	LNAPL
20021	1.9	2.46	0	No Impact
20022	279.9	2.07	2.8	LNAPL
20023	304.6	1.77	2.3	LNAPL
20024	3.5	2.45	1.6	No Impact
20025	179.4	2.43	1	LNAPL
20026	80.8	1.61	1.65	LNAPL
20027	1.5	2.65	0	No Impact
20028	1.4	3.07	0	No Impact
20029	14.2	2.16	2.05	Soil Impact / Trace LNAPL
20030	113.2	3.37	2.7	LNAPL
20031	1.8	0.97	0	No Impact
20034	1.8	1.55	0	No Impact
20035	7.9	1.74	0.65	Soil Impact / Trace LNAPL
20143	2.4	2.72	0.25	No Impact
20144	2.4	0.6	0.05	No Impact
20145	2.2	2.47	0.1	No Impact
20146	4.5	1.02	0.15	No Impact
20147	2.1	0.36	0.01	No Impact
20148	1.7	2.37	0	No Impact
20149	187.8	1.16	1.35	LNAPL
20150	2.8	2.21	0.1	No Impact

Table 1

CLC Area LIF Results - *Former Michigan Avenue Landfill*

Project No. 1801685

LIF Borehole	Max Signal (%RE)	Max Signal Depth (m)	Approximate LNAPL Thickness (m)	Potential Impacts
20151	7.5	0.02	0.1	Soil Impact / Trace LNAPL
20152	2.4	2.37	0.05	No Impact
20153	1.5	1.44	0	No Impact
20154	432.9	2.25	2.75	LNAPL
20155	2.3	2.42	0	No Impact
20156	431.4	3.27	2.1	LNAPL
20157	3	0.07	0.03	No Impact
20158	2.7	0.01	0.01	No Impact
20159	364	3.01	2	LNAPL
20190	2	1.81	0	No Impact
20191	292.2	2.28	3.35	LNAPL

Table 2

G2 Area LIF Results - *Former Michigan Avenue Landfill*

Project No. 1801685

Borehole	Max Signal (%RE)	Max Signal Depth (m)	Approximate LNAPL Thickness (m)	Potential Impacts
20032	1.3	1.17	0	No Impact
20033	39.1	2.61	1.15	Soil Impact / Trace LNAPL
20127	62.4	2.43	2.4	Red
20128	112.5	3.32	1.7	Red
20129	58.6	2.79	3.55	Red
20130	29.8	3.14	4.6	Soil Impact / Trace LNAPL
20131	97.4	3.85	3.35	Red
20132	17.3	2.36	0.75	Soil Impact / Trace LNAPL
20133	30	2.26	0.65	Soil Impact / Trace LNAPL
20134	14.2	2.67	1.4	Soil Impact / Trace LNAPL
20162	3	0.61	0.13	No Impact
20163	46.2	2.95	1.25	Red
20164	5.8	2.88	0.3	Soil Impact / Trace LNAPL
20165	3.5	0.89	0.05	No Impact
20166	3.5	2.38	0.5	No Impact
20167	58.3	1.52	1.05	Red
20168	22	1.52	1.5	Soil Impact / Trace LNAPL
20169	2.1	3.07	0	No Impact
20170	168.3	2.29	2.2	Red
20171	10	2.06	0.4	Soil Impact / Trace LNAPL
20172	2	3.05	0	No Impact
20173	16.5	1.64	0.9	Soil Impact / Trace LNAPL
20174	110	2.69	3.2	Red
20175	38.3	1.2	2.5	Soil Impact / Trace LNAPL
20176	52.4	2.55	2.2	Red
20177	29	3.07	2.3	Soil Impact / Trace LNAPL
20178	63.5	2.39	2.4	Red
20179	65.2	2.86	1.45	Red
20180	9.4	0.89	0.55	Soil Impact / Trace LNAPL
20181	1.9	2.15	0	No Impact
20182	4.5	1.97	0.4	No Impact
20183	2.3	2.09	0.02	No Impact
20184	12	1.13	13.15	Soil Impact / Trace LNAPL
20185	5.5	0.94	0.4	Soil Impact / Trace LNAPL
20186	14	1.27	0.6	Soil Impact / Trace LNAPL
20187	21.2	1.02	1.5	Soil Impact / Trace LNAPL
20188	21.1	1.24	0.6	Soil Impact / Trace LNAPL
20189	41.6	1.56	2.25	Soil Impact / Trace LNAPL

Table 3

Lake Chipican Area LIF Results - *Former Michigan Avenue Landfill*

Project No. 1801685

Borehole	Max Signal (%RE)	Max Signal Depth (m)	Approximate LNAPL Thickness (m)	Potential Impacts
20036	3.3	0.28	0.05	No Impact
20037	116.3	1.37	1.5	LNAPL
20038	71.1	1.77	1.4	LNAPL
20039	9.3	1	0.05	Soil Impact / Trace LNAPL
20040	1.6	2.23	0	No Impact
20041	5.2	1.3	0.05	Soil Impact / Trace LNAPL
20042	1.5	2.86	0	No Impact
20043	101.9	2.43	2.2	LNAPL
20044	1.5	1.04	0	No Impact
20045	4.8	0	0.35	No Impact
20046	40.7	1.11	1.25	Soil Impact / Trace LNAPL
20047	2.8	0.02	0.15	No Impact
20048	3.7	0.05	0.6	No Impact
20049	103	1.53	1.25	LNAPL
20050	3.6	0.91	0.2	No Impact
20051	81.4	1.7	1.3	LNAPL
20052	79.4	1.64	2.1	LNAPL
20053	4.6	0.07	0.15	No Impact
20054	136.9	1.42	1.8	LNAPL
20055	6.1	0	0.7	Soil Impact / Trace LNAPL
20056	29.1	1.48	0.5	Soil Impact / Trace LNAPL
20057	2.3	1.14	0.17	No Impact
20058	1.7	1.49	0	No Impact
20059	43.3	1.98	1	Soil Impact / Trace LNAPL
20060	1.3	2.82	0	No Impact
20061	52.6	1.89	0.25	LNAPL
20062	105.7	1.54	1.3	LNAPL
20063	23.1	1.79	0.15	Soil Impact / Trace LNAPL
20064	3.8	2.61	0.1	No Impact
20065	128.7	1.44	1.05	LNAPL
20066	61.3	2.26	0.75	LNAPL
20067	130.4	0.88	1.4	LNAPL
20068	145.2	0.92	1.25	LNAPL
20069	123.8	1.01	1.5	LNAPL
20070	137.1	0.86	1.05	LNAPL
20071	138	0.84	1.05	LNAPL
20072	3.4	0.74	0.05	No Impact
20073	45.6	1.3	0.9	LNAPL
20074	23.1	1.31	0.6	Soil Impact / Trace LNAPL
20075	2.2	1.22	0	No Impact
20076	17.5	1.68	0.2	Soil Impact / Trace LNAPL

Table 3

Lake Chipican Area LIF Results - *Former Michigan Avenue Landfill*

Project No. 1801685

Borehole	Max Signal (%RE)	Max Signal Depth (m)	Approximate LNAPL Thickness (m)	Potential Impacts
20077	1.7	0.53	0	No Impact
20078	1.6	0.88	0	No Impact
20079	4.1	2.85	0.45	No Impact
20080	71.2	1.69	0.7	LNAPL
20081	100.7	1.01	1.4	LNAPL
20082	80.5	1.15	1.45	LNAPL
20083	64.4	1.41	1.45	LNAPL
20084	1.7	0.87	0	No Impact
20085	52.8	0.96	1.1	LNAPL
20086	47.8	1.17	1.3	LNAPL
20087	22	1.56	1	Soil Impact / Trace LNAPL
20088	1.9	2.93	0	No Impact
20089	28.1	1.7	0.75	Soil Impact / Trace LNAPL
20090	6.2	0.74	0.35	Soil Impact / Trace LNAPL
20091	22.6	0	0.25	Soil Impact / Trace LNAPL
20092	1.8	2.64	0	No Impact
20093	4.5	0.9	0.05	No Impact
20094	56.3	2.43	1.1	LNAPL
20095	57.8	2.55	1.5	LNAPL
20096	31.5	2.4	0.75	Soil Impact / Trace LNAPL
20097	11.8	0.04	0.1	Soil Impact / Trace LNAPL
20098	12.9	2.39	0.9	Soil Impact / Trace LNAPL
20099	13	2.22	1.5	Soil Impact / Trace LNAPL
20100	19.1	2.46	1.1	Soil Impact / Trace LNAPL
20101	1.9	2.26	0	No Impact
20102	2.3	0.51	0.05	No Impact
20103	2.9	0.58	0.55	No Impact
20104	14.5	1.62	0.7	Soil Impact / Trace LNAPL
20105	3.6	1.72	0.5	No Impact
20106	76.2	2.38	1.75	LNAPL
20107	82.5	2.24	2.25	LNAPL
20108	4	0.75	0.02	No Impact
20109	2.4	0.15	0.05	No Impact
20110	102.8	2.3	3.1	LNAPL
20111	5.2	1.88	0.15	Soil Impact / Trace LNAPL
20112	50.1	4	3.65	LNAPL
20113	14.9	2.34	1.55	Soil Impact / Trace LNAPL
20114	15.4	1.93	2.3	Soil Impact / Trace LNAPL
20115	17.8	2.52	1.2	Soil Impact / Trace LNAPL
20116	2.7	0.51	0.02	No Impact
20117	185.9	2.88	5	LNAPL

Table 3

Lake Chipican Area LIF Results - *Former Michigan Avenue Landfill*

Project No. 1801685

Borehole	Max Signal (%RE)	Max Signal Depth (m)	Approximate LNAPL Thickness (m)	Potential Impacts
20118	351	2.1	4.5	LNAPL
20119	119	1.19	4.2	LNAPL
20120	4.6	3.18	1.65	No Impact
20121	3.1	3.32	1.5	No Impact
20122	160.3	2.17	4.2	LNAPL
20123	133.2	2.11	3.65	LNAPL
20124	85.5	0.9	4.3	LNAPL
20125	19	1.14	0.9	Soil Impact / Trace LNAPL
20126	2.3	3.06	0.04	No Impact
20135	120.2	3.23	1.75	LNAPL
20136	1.2	4.2	0	No Impact
20137	1.2	2.78	0	No Impact
20138	1.7	3.66	0	No Impact
20139	130.5	2.58	4.7	LNAPL
20140	2.7	4.25	0.1	No Impact
20141	97.3	4.86	2	LNAPL
20142	34.1	4.87	2	Soil Impact / Trace LNAPL
20160	6.3	0.2	0.4	Soil Impact / Trace LNAPL
20161	403.2	4.79	2.3	LNAPL

Table 4. CLC Area Laboratory Analytical Results

Former Michigan Avenue Landfill
City of Sarnia
Project No. 1801685

Parameter	Regulatory Criteria[1] MOE Table 3 Residential/Parkland/Institutional Property Use Coarse Grained Soil	Units	MRL	Soil Sample ID 20009 27-Oct-20	20014 27-Oct-20	20015 27-Oct-20	20019 27-Oct-20	20023 27-Oct-20	20025 27-Oct-20	20026 27-Oct-20
Petroleum Hydrocarbons (PHCs)										
Petroleum Hydrocarbons F1	55	µg/g	10	50	**80**	<10	**60**	30	<10	**90**
Petroleum Hydrocarbons F1-BTEX	--	µg/g	10	50	80	<10	60	30	<10	90
Petroleum Hydrocarbons F2	98	µg/g	10	70	**1470**	20	**920**	**290**	**400**	**110**
Petroleum Hydrocarbons F3	300	µg/g	20	250	**29200**	120	**16100**	**1240**	**790**	**2970**
Petroleum Hydrocarbons F4	2800	µg/g	20	90	**17000**	40	**5280**	170	190	1550
Petroleum Hydrocarbons F4g	2800	µg/g	100	200	**49700**	100	**24800**	800	1100	2800
Polycyclic Aromatic Hydrocarbons (PAHs)										
Acenaphthene	7.9	µg/g	0.05	<0.05	<0.5	<0.05	<0.05	0.1	0.11	<0.05
Acenaphthylene	0.15	µg/g	0.05	<0.05	**<0.5**	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	0.67	µg/g	0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	0.5	µg/g	0.05	<0.05	<0.5	<0.05	0.2	<0.05	<0.05	<0.05
Benzo[a]pyrene	0.3	µg/g	0.05	<0.05	**<0.5**	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	0.78	µg/g	0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	6.6	µg/g	0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	0.78	µg/g	0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	7	µg/g	0.05	<0.05	0.6	<0.05	0.4	<0.05	0.09	<0.05
Dibenz[ah]anthracene	0.1	µg/g	0.05	<0.05	**<0.5**	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.69	µg/g	0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	62	µg/g	0.05	<0.05	<0.5	<0.05	0.05	0.1	0.06	<0.05
Indeno[123-cd]pyrene	0.38	µg/g	0.05	<0.05	**<0.5**	<0.05	<0.05	<0.05	<0.05	<0.05
1-Methlynaphthalene	0.99	µg/g	0.05	0.2	**5**	<0.05	**2.18**	**3.76**	**5.34**	0.87
2-Methlynaphthalene	0.99	µg/g	0.05	0.22	**6.8**	<0.05	**2.11**	<0.05	**4.75**	0.12
Naphthalene	0.6	µg/g	0.05	0.07	**2**	<0.05	**0.77**	0.38	**1.47**	0.06
Phenanthrene	6.2	µg/g	0.05	<0.05	1.1	<0.05	0.23	0.35	0.07	0.18
Pyrene	78	µg/g	0.05	<0.05	<0.5	<0.05	<0.05	0.3	<0.05	<0.05
Benzene, Toluene, Ethylbenzene and Xylene (BTEX)										
Benzene	0.21	µg/g	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	2	µg/g	0.05	<0.05	0.7	<0.05	0.5	<0.05	<0.05	<0.05
Toluene	2.3	µg/g	0.2	<0.20	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20
Xylene Mixture	3.1	µg/g	0.05	<0.05	**3.7**	<0.05	1.3	<0.05	<0.05	<0.05
Xylene (m/p)	--	µg/g	0.05	<0.05	2.1	<0.05	1	<0.05	<0.05	<0.05
Xylene (o)	--	µg/g	0.05	<0.05	1.6	<0.05	0.3	<0.05	<0.05	<0.05

Notes:

1) Soil Standard as per Table 3 of Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (MOE, April 15, 2011).

2) -- denotes no data available.

3) MRL denotes Method Reporting Limit.

4) µg/g denotes micrograms per gram.

5) mS/cm denotes milli-Siemens per centimetre.

6) BOLD and SHADED indicates exceedance of O. Reg. 153 Table 3 (Residential/Parkland/Institutional Property Use Coarse-Grained Standards).

Table 4. CLC Area Laboratory Analytical Results

Former Michigan Avenue Landfill
City of Sarnia
Project No. 1801685

Parameter	Regulatory Criteria[1] MOE Table 3 Residential/Parkland/Institutional Property Use Coarse Grained Soil	Units	MRL	Soil Sample ID 20149 27-Oct-20	Soil Sample ID 20191 27-Oct-20
Petroleum Hydrocarbons (PHCs)					
Petroleum Hydrocarbons F1	55	µg/g	10	**70**	<10
Petroleum Hydrocarbons F1-BTEX	--	µg/g	10	70	<10
Petroleum Hydrocarbons F2	98	µg/g	10	20	20
Petroleum Hydrocarbons F3	300	µg/g	20	70	180
Petroleum Hydrocarbons F4	2800	µg/g	20	30	40
Petroleum Hydrocarbons F4g	2800	µg/g	100	200	300
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene	7.9	µg/g	0.05	<0.05	<0.05
Acenaphthylene	0.15	µg/g	0.05	<0.05	<0.05
Anthracene	0.67	µg/g	0.05	<0.05	<0.05
Benz[a]anthracene	0.5	µg/g	0.05	<0.05	<0.05
Benzo[a]pyrene	0.3	µg/g	0.05	<0.05	<0.05
Benzo[b]fluoranthene	0.78	µg/g	0.05	<0.05	<0.05
Benzo[ghi]perylene	6.6	µg/g	0.05	<0.05	<0.05
Benzo[k]fluoranthene	0.78	µg/g	0.05	<0.05	<0.05
Chrysene	7	µg/g	0.05	<0.05	0.06
Dibenz[ah]anthracene	0.1	µg/g	0.05	<0.05	<0.05
Fluoranthene	0.69	µg/g	0.05	<0.05	<0.05
Fluorene	62	µg/g	0.05	<0.05	<0.05
Indeno[123-cd]pyrene	0.38	µg/g	0.05	<0.05	<0.05
1-Methlynaphthalene	0.99	µg/g	0.05	<0.05	0.1
2-Methlynaphthalene	0.99	µg/g	0.05	<0.05	0.1
Naphthalene	0.6	µg/g	0.05	<0.05	0.06
Phenanthrene	6.2	µg/g	0.05	<0.05	<0.05
Pyrene	78	µg/g	0.05	<0.05	<0.05
Benzene, Toluene, Ethylbenzene and Xylene (BTEX)					
Benzene	0.21	µg/g	0.02	<0.02	<0.02
Ethylbenzene	2	µg/g	0.05	<0.05	<0.05
Toluene	2.3	µg/g	0.2	<0.20	<0.20
Xylene Mixture	3.1	µg/g	0.05	<0.05	<0.05
Xylene (m/p)	--	µg/g	0.05	<0.05	<0.05
Xylene (o)	--	µg/g	0.05	<0.05	<0.05

Notes:

1) Soil Standard as per Table 3 of Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (MOE, April 15, 2011).

2) -- denotes no data available.

3) MRL denotes Method Reporting Limit.

4) µg/g denotes micrograms per gram.

5) mS/cm denotes milli-Siemens per centimetre.

6) BOLD and SHADED indicates exceedance of O. Reg. 153 Table 3 (Residential/Parkland/Institutional Property Use Coarse-Grained Standards).

Table 5. G2 Area Laboratory Analytical Results

Former Michigan Avenue Landfill
City of Sarnia
Project No. 1801685

Parameter	Regulatory Criteria[1] MOE Table 3 Residential/Parkland/Institutional Property Use Coarse Grained Soil	Units	MRL	Soil Sample ID 20168 28-Oct-20	20170 28-Oct-20	20174 28-Oct-20	20187 28-Oct-20
Petroleum Hydrocarbons (PHCs)							
Petroleum Hydrocarbons F1	55	µg/g	10	**240**	30	20	<10
Petroleum Hydrocarbons F1-BTEX	--	µg/g	10	230	30	20	<10
Petroleum Hydrocarbons F2	98	µg/g	10	**1770**	**830**	**980**	**910**
Petroleum Hydrocarbons F3	300	µg/g	20	**11000**	**19600**	**28600**	**10300**
Petroleum Hydrocarbons F4	2800	µg/g	20	**6480**	**13000**	**15100**	**5020**
Petroleum Hydrocarbons F4g	2800	µg/g	100	**21800**	**48500**	**71700**	**23400**
Polycyclic Aromatic Hydrocarbons (PAHs)							
Acenaphthene	7.9	µg/g	0.05			<0.05	<0.05
Acenaphthylene	0.15	µg/g	0.05			<0.05	<0.05
Anthracene	0.67	µg/g	0.05			<0.05	<0.05
Benz[a]anthracene	0.5	µg/g	0.05			<0.05	<0.05
Benzo[a]pyrene	0.3	µg/g	0.05			0.29	<0.05
Benzo[b]fluoranthene	0.78	µg/g	0.05			0.1	<0.05
Benzo[ghi]perylene	6.6	µg/g	0.05			<0.05	<0.05
Benzo[k]fluoranthene	0.78	µg/g	0.05			<0.05	<0.05
Chrysene	7	µg/g	0.05			<0.05	<0.05
Dibenz[ah]anthracene	0.1	µg/g	0.05			<0.05	<0.05
Fluoranthene	0.69	µg/g	0.05			<0.05	0.17
Fluorene	62	µg/g	0.05			<0.05	<0.05
Indeno[123-cd]pyrene	0.38	µg/g	0.05			<0.05	<0.05
1-Methlynaphthalene	0.99	µg/g	0.05			0.13	<0.05
2-Methlynaphthalene	0.99	µg/g	0.05			0.12	<0.05
Naphthalene	0.6	µg/g	0.05			0.06	<0.05
Phenanthrene	6.2	µg/g	0.05			<0.05	<0.05
Pyrene	78	µg/g	0.05			<0.05	0.17

Table 5. G2 Area Laboratory Analytical Results

Former Michigan Avenue Landfill
City of Sarnia
Project No. 1801685

Parameter	Regulatory Criteria[1] MOE Table 3 Residential/Parkland/Institutional Property Use Coarse Grained Soil	Units	MRL	Soil Sample ID			
				20168	20170	20174	20187
				28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20
Benzene, Toluene, Ethylbenzene and Xylene (BTEX)							
Benzene	0.21	µg/g	0.02	0.19	0.16	<0.02	<0.02
Ethylbenzene	2	µg/g	0.05	**3.4**	0.62	<0.05	<0.05
Toluene	2.3	µg/g	0.2	0.34	0.3	0.21	<0.20
Xylene Mixture	3.1	µg/g	0.05	**9.4**	2.8	0.73	<0.05
Xylene (m/p)	--	µg/g	0.05	6.7	1.1	0.46	<0.05
Xylene (o)	--	µg/g	0.05	2.7	1.7	0.27	<0.05

Notes:

1) Soil Standard as per Table 3 of Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (MOE, April 15, 2011).

2) -- denotes no data available.

3) MRL denotes Method Reporting Limit.

4) µg/g denotes micrograms per gram.

5) mS/cm denotes milli-Siemens per centimetre.

6) BOLD and SHADED indicates exceedance of O. Reg. 153 Table 3 (Residential/Parkland/Institutional Property Use Coarse-Grained Standards).

Table 6. Lake Chipican Area Laboratory Analytical Results

Former Michigan Avenue Landfill
City of Sarnia
Project No. 1801685

Parameter	Regulatory Criteria[1] MOE Table 3 Residential/Parkland/Institutional Property Use Coarse Grained Soil	Units	MRL	Soil Sample ID						
				20037-2	20066-2	20069	20070-2	20071	20080	20094
				29-Oct-20	29-Oct-20	28-Oct-20	29-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20
Petroleum Hydrocarbons (PHCs)										
Petroleum Hydrocarbons F1	55	µg/g	10	<10	<10	**110**	<10	**180**	<10	**380**
Petroleum Hydrocarbons F1-BTEX	--	µg/g	10	<10	<10	110	<10	180	<10	380
Petroleum Hydrocarbons F2	98	µg/g	10	10	<10	20	<10	**1410**	20	**1830**
Petroleum Hydrocarbons F3	300	µg/g	20	70	<20	60	<20	**5410**	120	**4030**
Petroleum Hydrocarbons F4	2800	µg/g	20	30	<20	<20	<20	2510	50	1620
Petroleum Hydrocarbons F4g	2800	µg/g	100					**11000**	500	**6900**
Polycyclic Aromatic Hydrocarbons (PAHs)										
Acenaphthene	7.9	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.15	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	0.67	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.13
Benz[a]anthracene	0.5	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.44
Benzo[a]pyrene	0.3	µg/g	0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	0.78	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	6.6	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	0.78	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.14
Chrysene	7	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.42
Dibenz[ah]anthracene	0.1	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.69	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	62	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[123-cd]pyrene	0.38	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1-Methlynaphthalene	0.99	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	0.65	<0.05	0.93
2-Methlynaphthalene	0.99	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	0.6	µg/g	0.05	0.12	0.07	<0.05	<0.05	0.4	<0.05	<0.05
Phenanthrene	6.2	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.6
Pyrene	78	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.48
Benzene, Toluene, Ethylbenzene and Xylene (BTEX)										
Benzene	0.21	µg/g	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	2	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	2.3	µg/g	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Xylene Mixture	3.1	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene (m/p)	--	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene (o)	--	µg/g	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Notes:

1) Soil Standard as per Table 3 of Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (MOE, April 15, 2011).

2) -- denotes no data available.

3) MRL denotes Method Reporting Limit.

4) µg/g denotes micrograms per gram.

5) mS/cm denotes milli-Siemens per centimetre.

6) BOLD and SHADED indicates exceedance of O. Reg. 153 Table 3 (Residential/Parkland/Institutional Property Use Coarse-Grained Standards).

Table 6. Lake Chipican Area Laboratory Analytical Results

Former Michigan Avenue Landfill
City of Sarnia
Project No. 1801685

Parameter	Regulatory Criteria[1] MOE Table 3 Residential/Parkland/Institutional Property Use Coarse Grained Soil	Units	MRL	Soil Sample ID				
				20095	20110	20112	20117	20123-2
				28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	29-Oct-20
Petroleum Hydrocarbons (PHCs)								
Petroleum Hydrocarbons F1	55	µg/g	10	50	**410**	**360**	**600**	<10
Petroleum Hydrocarbons F1-BTEX	--	µg/g	10	50	370	330	570	<10
Petroleum Hydrocarbons F2	98	µg/g	10	**270**	**7220**	**10200**	**2300**	90
Petroleum Hydrocarbons F3	300	µg/g	20	**520**	**24400**	**24900**	**3460**	**1330**
Petroleum Hydrocarbons F4	2800	µg/g	20	210	**11000**	**10100**	1310	680
Petroleum Hydrocarbons F4g	2800	µg/g	100	**4500**	**14300**	**56400**	**5500**	1400
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene	7.9	µg/g	0.05	<0.05		<0.05	<0.05	
Acenaphthylene	0.15	µg/g	0.05	<0.05		<0.05	<0.05	
Anthracene	0.67	µg/g	0.05	0.13		<0.05	<0.05	
Benz[a]anthracene	0.5	µg/g	0.05	0.27		0.42	<0.05	
Benzo[a]pyrene	0.3	µg/g	0.05	<0.05		<0.05	<0.05	
Benzo[b]fluoranthene	0.78	µg/g	0.05	<0.05		<0.05	<0.05	
Benzo[ghi]perylene	6.6	µg/g	0.05	<0.05		<0.05	<0.05	
Benzo[k]fluoranthene	0.78	µg/g	0.05	0.07		<0.05	<0.05	
Chrysene	7	µg/g	0.05	0.36		0.38	<0.05	
Dibenz[ah]anthracene	0.1	µg/g	0.05	<0.05		<0.05	<0.05	
Fluoranthene	0.69	µg/g	0.05	<0.05		<0.05	<0.05	
Fluorene	62	µg/g	0.05	<0.05		<0.05	<0.05	
Indeno[123-cd]pyrene	0.38	µg/g	0.05	<0.05		<0.05	<0.05	
1-Methlynaphthalene	0.99	µg/g	0.05	**1.01**		**3.32**	**1**	
2-Methlynaphthalene	0.99	µg/g	0.05	0.06		**4.89**	**1.75**	
Naphthalene	0.6	µg/g	0.05	<0.05		**42.9**	**25.9**	
Phenanthrene	6.2	µg/g	0.05	0.52		1.45	<0.05	
Pyrene	78	µg/g	0.05	0.39		0.72	<0.05	
Benzene, Toluene, Ethylbenzene and Xylene (BTEX)								
Benzene	0.21	µg/g	0.02	<0.02	**0.25**	0.12	<0.02	<0.02
Ethylbenzene	2	µg/g	0.05	<0.05	**5.28**	**4.1**	**5**	<0.05
Toluene	2.3	µg/g	0.2	<0.20	**3.4**	1.9	1.3	<0.20
Xylene Mixture	3.1	µg/g	0.05	<0.05	**28.7**	**26.2**	**23.3**	<0.05
Xylene (m/p)	--	µg/g	0.05	<0.05	17.1	15.4	14	<0.05
Xylene (o)	--	µg/g	0.05	<0.05	11.6	10.8	9.3	<0.05

Notes:

1) Soil Standard as per Table 3 of Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (MOE, April 15, 2011).

2) -- denotes no data available.

3) MRL denotes Method Reporting Limit.

4) µg/g denotes micrograms per gram.

5) mS/cm denotes milli-Siemens per centimetre.

6) BOLD and SHADED indicates exceedance of O. Reg. 153 Table 3 (Residential/Parkland/Institutional Property Use Coarse-Grained Standards).

Table 7. Summary of LIF Characterization Groundwater Elevation and Product Measurements - CLC Area

Former Michigan Avenue Landfill, Sarnia, Ontario
City of Sarnia
Project No. 1801685

Monitoring ID	Product Measurements - CLC Area							
	MW-20025				MW-20026			
Ground Elevation (mASL)	178.84				179.32			
Monitoring Point Elevation (mASL)	178.62				180.14			
Measurement	Measured Product Elevation	Measured Groundwater Elevation	Corrected Groundwater Elevation	Apparent Product Thickness	Measured Product Elevation	Measured Groundwater Elevation	Corrected Groundwater Elevation	Apparent Product Thickness
Units	mASL	mASL	mASL	m	mASL	mASL	mASL	m
11-Nov-20	ND	177.06			ND	Ins		
9-Dec-20	ND	177.19			ND	176.90		

Monitoring ID	Product Measurements - CLC Area							
	MW-20014				MW-20149			
Ground Elevation (mASL)	178.71				178.23			
Monitoring Point Elevation (mASL)	179.57				179.16			
Measurement	Measured Product Elevation	Measured Groundwater Elevation	Corrected Groundwater Elevation	Apparent Product Thickness	Measured Product Elevation	Measured Groundwater Elevation	Corrected Groundwater Elevation	Apparent Product Thickness
Units	mASL	mASL	mASL	m	mASL	mASL	mASL	m
11-Nov-20	176.60	175.92	176.53	0.677	177.48	177.47	177.47	0.006
9-Dec-20	176.69	175.94	176.61	0.750	177.59	177.58	177.58	0.003

Note: ND = Non-Detect

Table 8. Summary of LIF Characterization Groundwater Elevation and Product Measurements - G2 Area

Former Michigan Avenue Landfill, Sarnia, Ontario
City of Sarnia
Project No. 1801685

Monitoring ID	Product Measurements - CLC Area							
	MW-20170				MW-20174			
Ground Elevation (mASL)	178.69				178.54			
Monitoring Point Elevation (mASL)	179.65				179.47			
Measurement	Measured Product Elevation	Measured Groundwater Elevation	Corrected Groundwater Elevation	Apparent Product Thickness	Measured Product Elevation	Measured Groundwater Elevation	Corrected Groundwater Elevation	Apparent Product Thickness
Units	mASL	mASL	mASL	m	mASL	mASL	mASL	m
11-Nov-20	ND	175.86			175.67	175.57	175.66	0.100
9-Dec-20	ND	175.95			175.79	175.775	175.79	0.014

Note: ND = Non-Detect

Table 9. Summary of LIF Characterization Groundwater Elevation and Product Measurements - Lake Chipican Area

Former Michigan Avenue Landfill, Sarnia, Ontario
City of Sarnia
Project No. 1801685

Monitoring ID	Product Measurements - CLC Area							
	MW-20070				MW-20094			
Ground Elevation (mASL)	179.77				177.58			
Monitoring Point Elevation (mASL)	179.59				178.49			
Measurement	Measured Product Elevation	Measured Groundwater Elevation	Corrected Groundwater Elevation	Apparent Product Thickness	Measured Product Elevation	Measured Groundwater Elevation	Corrected Groundwater Elevation	Apparent Product Thickness
Units	mASL	mASL	mASL	m	mASL	mASL	mASL	m
11-Nov-20	ND	178.54			175.99	175.98	175.99	0.007
9-Dec-20	ND	178.62			176.02	175.98	176.02	0.047

Monitoring ID	Product Measurements - CLC Area			
	MW-20161			
Ground Elevation (mASL)	181.83			
Monitoring Point Elevation (mASL)	181.69			
Measurement	Measured Product Elevation	Measured Groundwater Elevation	Corrected Groundwater Elevation	Apparent Product Thickness
Units	mASL	mASL	mASL	m
11-Nov-20	177.33	177.33	177.33	0.001
9-Dec-20	ND	177.45		

Note: ND = Non-Detect

Table 10. CLC Area Soil Characterization Study Summary

Former Michigan Avenue Landfill, Sarnia, Ontario
City of Sarnia
Project No. 1801685

Borehole	%RE	%RE Peak Depth (mBGS)	LIF Fluoresce Colour	MW Well Installed	Soil Sample Depth (mBGS)	Table 3 Exceedance	Predominant Exceedance	LNAPL Thickness (m)	Presence of Sheen	HCO odour	HCO staining	LNAPL Interpretation
20009	408	1.82	Green	-	2.1	NO	--	--	YES	SLIGHT	NO	Yes
MW20014	648	2.28	Yellow	Yes	2.1	YES	PHC/PAHs/Xylene	0.677	YES	SLIGHT	YES	Yes
20015	469	1.62	Yellow	-	1.5	NO	--	--	YES	SLIGHT	NO	Yes
20019	610	2.64	Yellow	-	1.8	YES	PHC, VOCs	--	NO	SLIGHT	NO	Yes
20023	304	3.69	Green/Yellow	-	2.1	YES	PHC/PAHs	--	YES	HEAVY	YES	Yes
MW20025	179	2.43	Green	Yes	1.97	YES	PHC/PAHs	0	NO	HEAVY	YES	Yes
MW20026	80	1.61	Yellow/Orange	Yes	2.22	YES	PHC	0*	YES	SLIGHT	YES	Yes
MW20149	188	1.16	Green/Yellow	Yes	0.6	YES	PHC	0.006	YES	HEAVY	YES	Yes
20191	292	2.28	Yellow/Green	-	3.04	NO	--	--	YES	HEAVY	YES	Yes

Table 11. G2 Area Soil Characterization Study Summary

Former Michigan Avenue Landfill, Sarnia, Ontario
City of Sarnia
Project No. 1801685

Borehole	%RE	%RE Peak Depth (mBGS)	LIF Fluoresce Colour	MW Well Installed	Soil Sample Depth (mBGS)	Table 3 Exceedance	Predominant Exceedance	LNAPL Thickness (m)	Presence of Sheen	HCO odour	HCO staining	LNAPL Interpretation
20168	22	1.52	Red	-	1.7	Yes	PHC/Ethylbenzen/Xylene	--	NO	NO	NO	Uncertain
MW20170	168	2.29	Orange/Yellow	Yes	1.8	Yes	PHC	0	NO	HEAVY	YES	Yes
MW20174	110	2.69	Yellow/Green	Yes	1.52	Yes	PHC	0.1	YES	STRONG	YES	Yes
20187	21	1.02	Orange	-	0.87	Yes	PHC	--	NO	STRONG	YES	Yes

Table 12. Lake Chipican Area Soil Characterization Study Summary

Former Michigan Avenue Landfill, Sarnia, Ontario

City of Sarnia

Project No. 1801685

Borehole	%RE	%RE Peak Depth (mBGS)	LIF Fluoresce Colour	MW Well Installed	Soil Sample Depth (mBGS)	Table 3 Exceedance	Predominant Exceedance	LNAPL Thickness (m)	Presence of Sheen	HCO odour	HCO staining	LNAPL Interpretation
20037	116	1.37	Orange/Yellow	--	1.5	NO	--	--	YES	SLIGHT	YES	Yes
20066	61.3	2.26	Yellow	--	1.5	NO	--	--	NO	NO	NO	Uncertain
20069	124	1.01	Orange/Yellow	--	1.8	YES	PHC	--	NO	SLIGHT	NO	Uncertain
MW20070	137	0.86	Yellow	Yes	1.5	NO	--	0	NO	NO	NO	Uncertain
20071	138	0.84	Yellow	--	1.5	YES	PHC/PAHs	--	YES	SLIGHT	YES	Yes
20080	71	1.69	Orange/Yellow	--	1.8	NO	--	--	YES	SLIGHT	YES	Yes
MW20094	56	2.43	Orange/Yellow	Yes	2.4	YES	PHC/PAHs	0.007	YES	STRONG	YES	Yes
20095	57	2.55	Orange/Yellow	--	1.9	YES	PHC/PAHs	--	NO	NO	YES	Yes
20110	102	2.3	Yellow/Orange	--	1.5	YES	PHC/BTEX	--	YES	SLIGHT	YES	Yes
20112	50	4	Yellow/Orange	--	3	YES	PHC/BTEX/PAHs	--	NO	STRONG	YES	Yes
20117	185	2.88	Green/Orange	--	4.8	YES	PHC/BTEX	--	YES	STRONG	YES	Yes
20123	133	2.11	Yellow/Red	--	1.7	YES	PHC	--	YES	STRONG	YES	Yes
MW20161	403	4.79	Green	Yes	--	--	--	0.001	NO	SLIGHT	NO	Yes

FIGURES

Map Document: C:\GIS Temp - Copy\1801685\1801865_Sarnia_Landfill.aprx

Area Location Plan

Former Michigan Avenue Landfill, Point Edward, Ontario

Map Projection: NAD 1983 UTM Zone 17N

City of Sarnia

Notes:

1. Drawing based on 2017 aerial image from First Base Solutions Web Mapping Service.
2. This drawing is schematic only and is to be read in conjunction with accompanying text.
3. All locations are approximate.

True North

Project #: 1801685

Drawn by:	DJH	Figure:	1
Approx. Scale:			1:4,500
Date Revised:			Dec 17, 2020

Map Document: C:\GIS Temp - Copy\1801685\1801865_Sarnia_Landfill.aprx

LIF Borehole Location Plan

Former Michigan Avenue Landfill, Point Edward, Ontario

Map Projection: NAD 1983 UTM Zone 17N

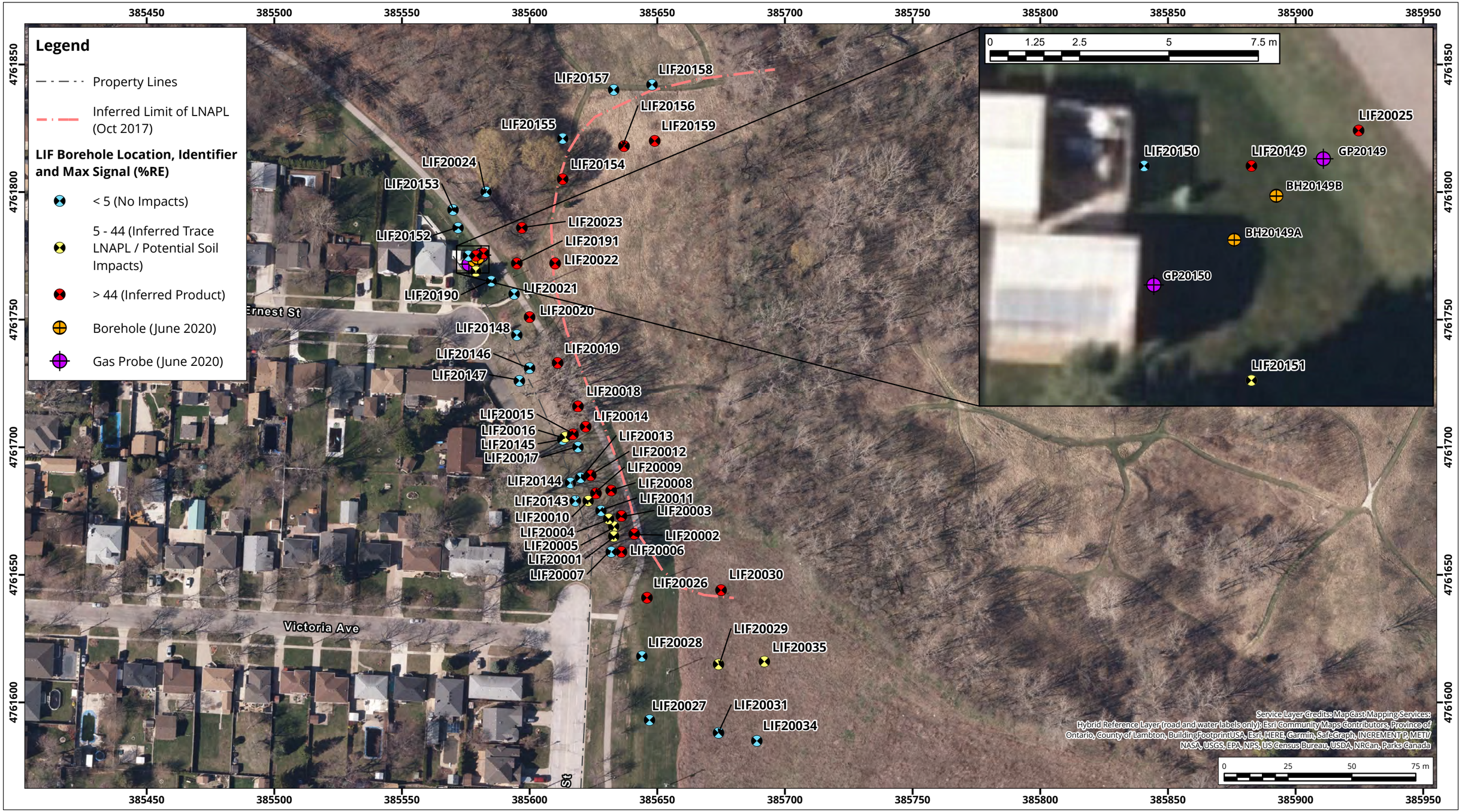
City of Sarnia

Notes:
1. Drawing based on 2017 aerial image from First Base Solutions Web Mapping Service.
2. Borehole locations measured using a handheld GPS unit with an accuracy of approximately 3 to 5 m.

True North

Drawn by: DJH	Figure: 2
Approx. Scale:	1:2,800
Date Revised:	Dec 18, 2020

Project #: 1801685



CLC Area LIF Borehole Location Plan

Former Michigan Avenue Landfill, Point Edward, Ontario

Map Projection: NAD 1983 UTM Zone 17N

City of Sarnia

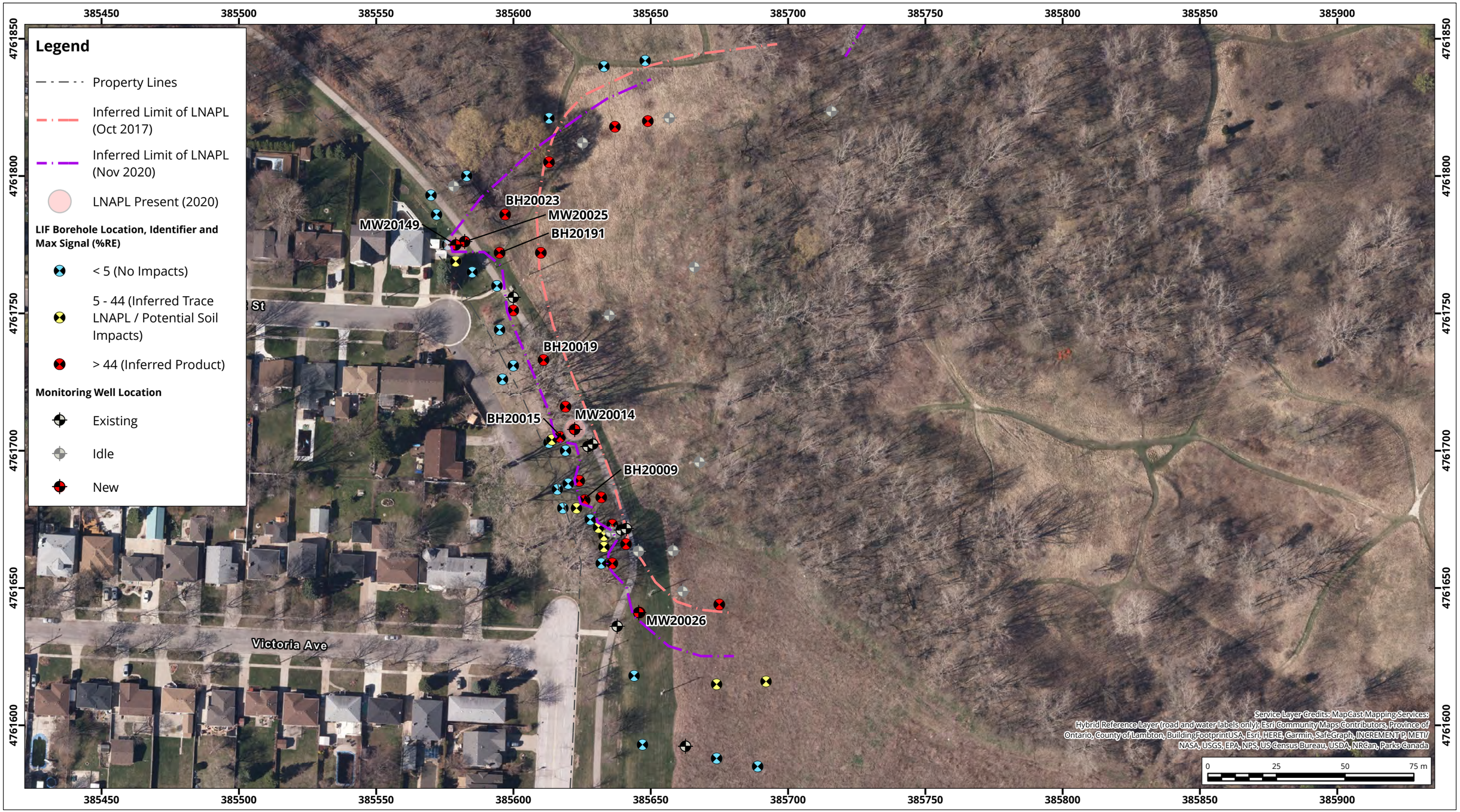
Notes:
1. Drawing based on 2017 aerial image from First Base Solutions Web Mapping Service.
2. Borehole locations measured using a handheld GPS unit with an accuracy of approximately 3 to 5 m.

True North

Drawn by: DJH	Figure: 3A	
Approx. Scale:	1:1,400	
Date Revised:	Dec 22, 2020	

Project #: 1801685

Map Document: C:\GIS Temp - Copy\1801685\1801865_Sarnia_Landfill.aprx



CLC Area Updated Inferred LNAPL Extent

Former Michigan Avenue Landfill, Point Edward, Ontario

Map Projection: NAD 1983 UTM Zone 17N

City of Sarnia

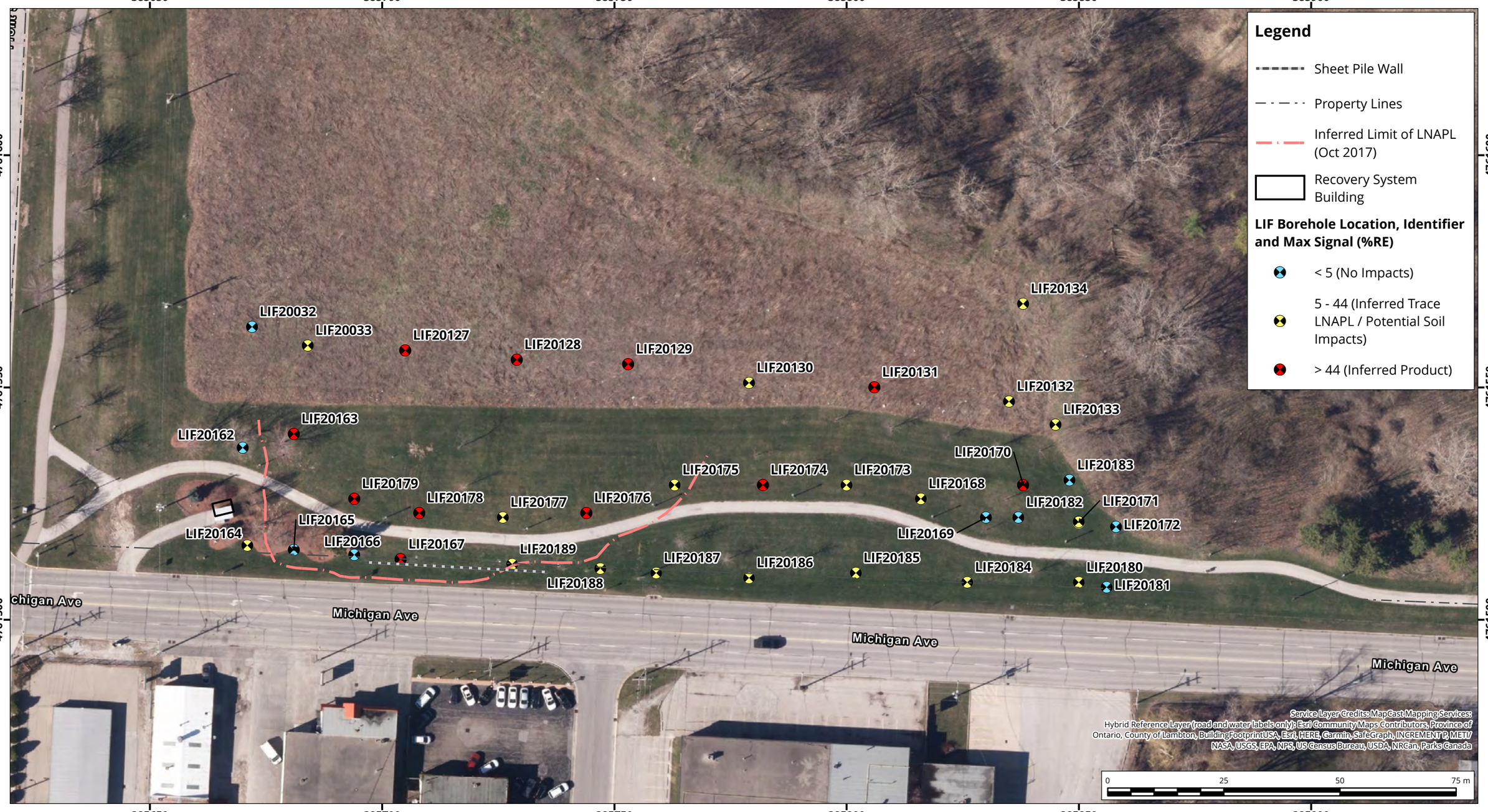
Notes:
1. Drawing based on 2017 aerial image from First Base Solutions Web Mapping Service.
2. Borehole locations measured using a handheld GPS unit with an accuracy of approximately 3 to 5 m.

True North

Project #: 1801685

Drawn by: DJH	Figure: 3B
Approx. Scale:	1:1,300
Date Revised:	Dec 22, 2020

Map Document: C:\GIS Temp - Copy\1801685\1801865_Sarnia_Landfill.aprx



G2 Area LIF Borehole Location Plan

Former Michigan Avenue Landfill, Point Edward, Ontario

Map Projection: NAD 1983 UTM Zone 17N

City of Sarnia

Notes:
1. Drawing based on 2017 aerial image from First Base Solutions Web Mapping Service.
2. Borehole locations measured using a handheld GPS unit with an accuracy of approximately 3 to 5 m.

True North

Project #: 1801685

Drawn by: DJH	Figure: 4A
Approx. Scale:	1:800
Date Revised:	Dec 22, 2020

Map Document: C:\GIS Temp - Copy\1801685\1801865_Sarnia_Landfill.aprx

G2 Area Updated Inferred LNAPL Extent

Former Michigan Avenue Landfill, Point Edward, Ontario

Map Projection: NAD 1983 UTM Zone 17N

City of Sarnia

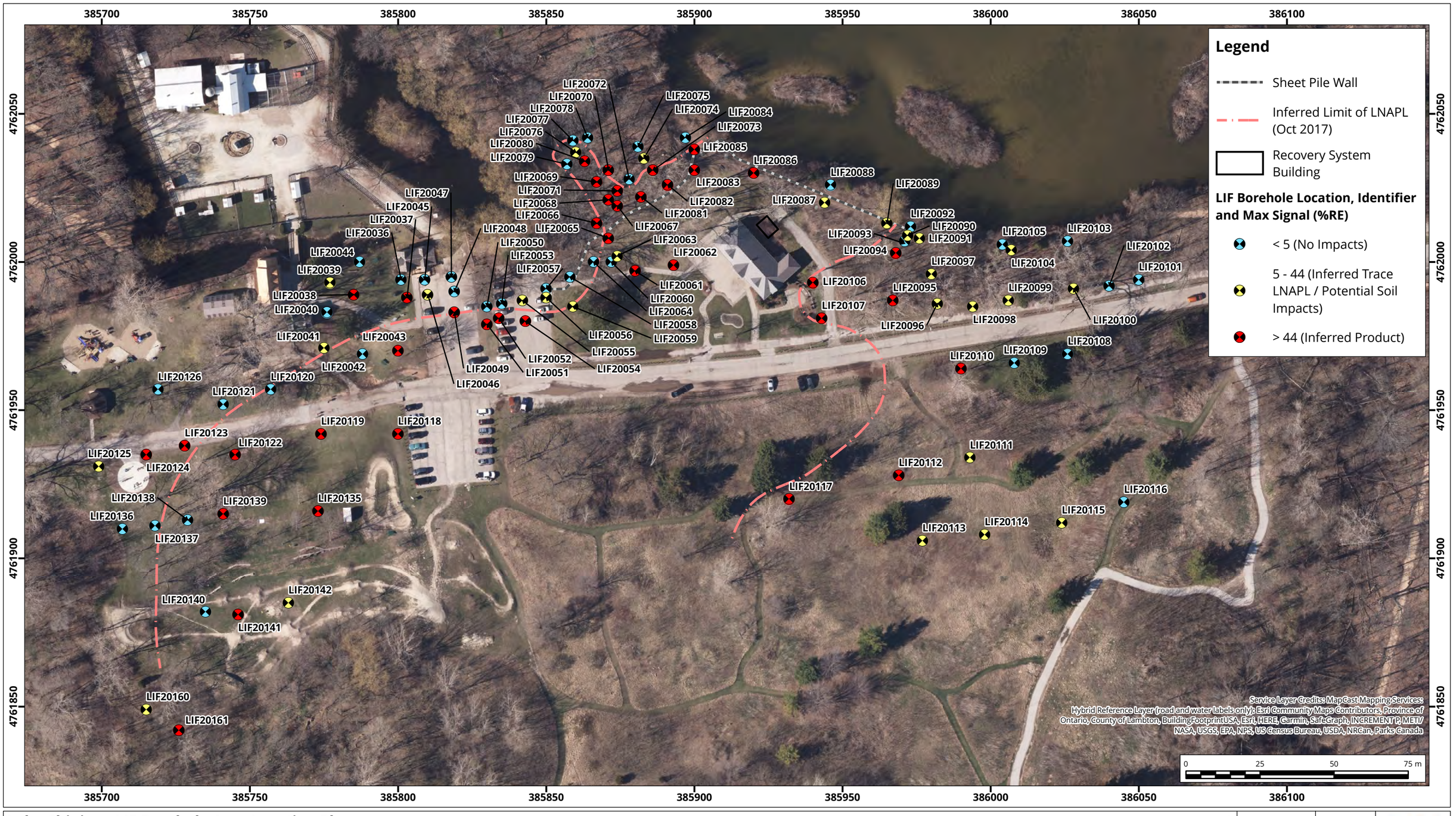
Notes:
1. Drawing based on 2017 aerial image from First Base Solutions Web Mapping Service.
2. Borehole locations measured using a handheld GPS unit with an accuracy of approximately 3 to 5 m.

True North

Project #: 1801685

Drawn by:	DJH	Figure:	4B
Approx. Scale:		1:800	
Date Revised:		Dec 22, 2020	

Map Document: C:\GIS Temp - Copy\1801685\1801865_Sarnia_Landfill.aprx



Lake Chipican LIF Borehole Area Location Plan

Former Michigan Avenue Landfill, Point Edward, Ontario

Map Projection: NAD 1983 UTM Zone 17N

City of Sarnia

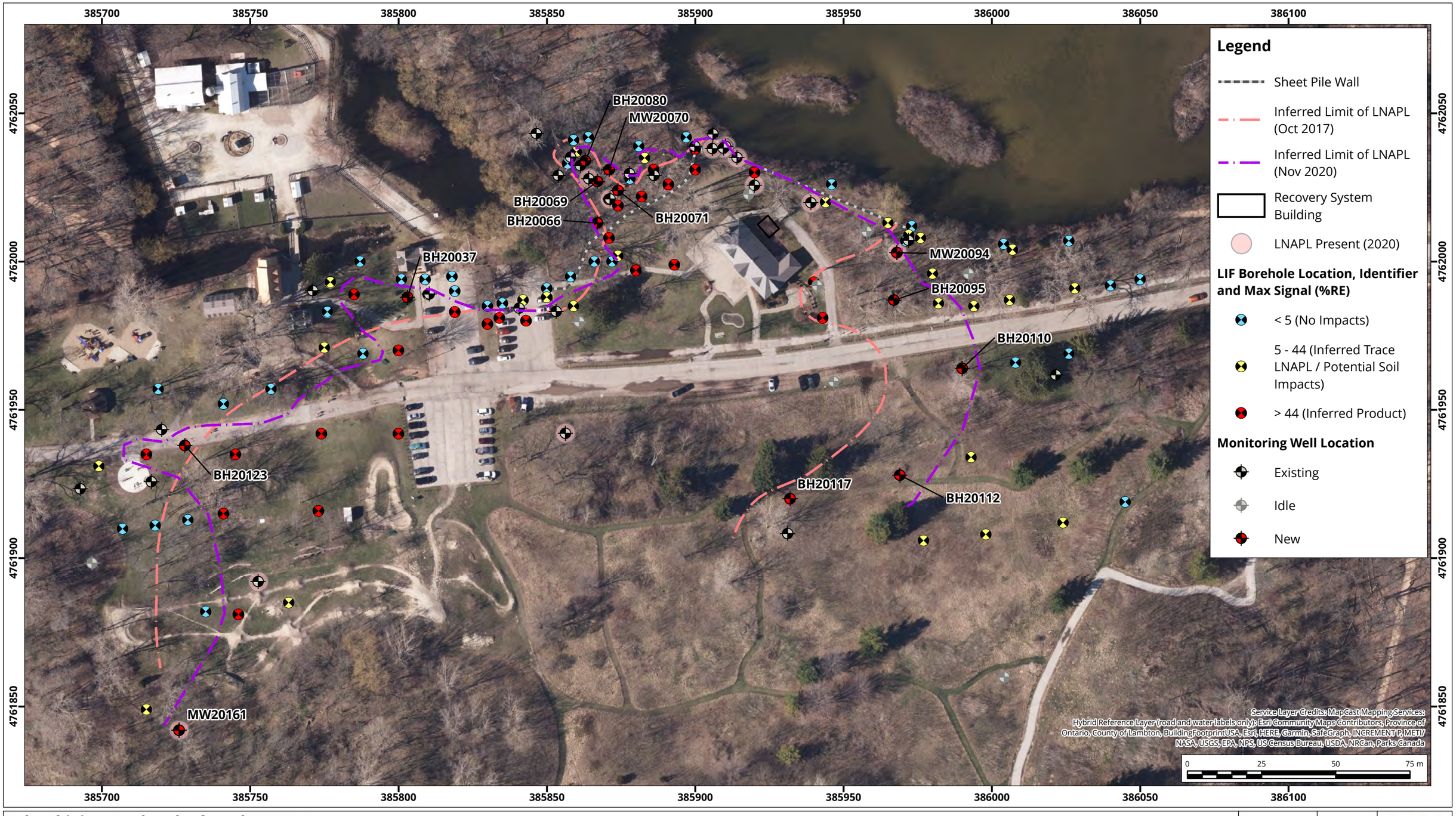
Notes:
1. Drawing based on 2017 aerial image from First Base Solutions Web Mapping Service.
2. Borehole locations measured using a handheld GPS unit with an accuracy of approximately 3 to 5 m.

True North

Drawn by: DJH	Figure: 5A		
Approx. Scale:	1:1,200		
Date Revised:	Dec 22, 2020		

Project #: 1801685

Map Document: C:\GIS Temp - Copy\1801685\1801865_Sarnia_Landfill.aprx



Lake Chipican Updated Inferred LNAPL Extent

Former Michigan Avenue Landfill, Point Edward, Ontario

Map Projection: NAD 1983 UTM Zone 17N

City of Sarnia

Notes:
1. Drawing based on 2017 aerial image from First Base Solutions Web Mapping Service.
2. Borehole locations measured using a handheld GPS unit with an accuracy of approximately 3 to 5 m.

True North

Project #: 1801685

Drawn by: DJH	Figure: 5B
Approx. Scale:	1:1,200
Date Revised:	Dec 22, 2020

Map Document: C:\GIS Temp - Copy\1801685\1801865_Sarnia_Landfill.aprx

APPENDIX A

VERTEX

Environmental Inc.

MEMORANDUM - DRAFT

To:	Claire Finoro, P.Eng., B.Sc. (Eng) – RWDI
From:	Patrick O'Neill, M.A.Sc. – Vertex
Subject:	Laser Induced Fluorescence Survey Results Canatara Park, Sarnia, ON
Date:	July 22, 2020
Reference:	VE848

Vertex Environmental Inc. (Vertex) has produced this memorandum summarizing the Laser Induced Fluorescence (LIF) survey completed at the Canatara Park, Sarnia, ON (the Site).

LIF Survey Objective

RWDI retained Vertex to provide LIF services to delineate the edges of three (3) areas of suspected Light Non-Aqueous Phase Liquid (LNAPL) plume(s) on-Site. These areas on-Site are known as;

- Lake Chipican Area,
- CLC Area, and
- G2 Area.

Timeline

- **HRSC Survey:** During the period from May 4 to 14, 2020 Vertex personnel mobilized the LIF equipment to Site. A total of one hundred and ninety-one (191) LIF points were advanced in the above-noted three (3) areas to various depths.

Laser Induced Fluorescence

The LIF probe (UVOST probe) is direct push a real time sensing system that responds to the presence of free-phase petroleum hydrocarbons (PHCs) including gasoline, diesel, kerosene, motor oil, cutting oils, and hydraulic oils. Ultraviolet light is generated from a laser and emitted into the subsurface from specialized tooling in the drill string. The laser

excites polycyclic aromatic hydrocarbons (PAHs) within the PHCs in the subsurface adjacent to the probe, causing them to fluoresce. The relative response of the sensor depends on the specific analyte being measured as well as the relative contaminant concentration. The system typically provides a vertical resolution on the order of centimeters, allowing for precise vertical delineation of the extent of inferred free phase PHC product. For the purposes of LIF identification, "free phase" will refer to both mobile and non-mobile free phase, as both will equally fluoresce.

The LIF is specifically designed to evaluate the potential presence or absence of free phase PHCs, however, due to the relative response measured by the laser, soil impacts can also be inferred. Soil impacts refer to PHCs that are both adsorbed to the soil and present in between the soil particles (within the void space). PHCs present between soil particles are often referred to as ganglia. The amount to which a PHC will fluoresce by the LIF is referred to as the Reference Emitter (RE) response. A strong response may indicate mobile product where a weaker response may indicate ganglia. This process is semi-qualitative, and there is variance between sites and type of PHCs.

Methodology

From May 4 to 14, 2020 Vertex advanced a total of one hundred and ninety-one (191) LIF points to depths ranging from approximately 3 to 6 meters below ground surface (mbgs) using a direct push Geoprobe 6620DT drill rig. Prior to LIF advancement, Vertex completed standard calibration of the LIF instrumentation to ensure it was working properly and able to generate reliable data for the Site. Upon completion of each LIF location the open hole was backfilled with clean benseal hole plug to surface and finished with cold patch when required. Vertex recorded GPS co-ordinates at each of the LIF locations. Later, RWDI provided surface elevations for each LIF location which were used for the three-dimensional (3D) visualization of the LIF data collected within each specific area on-Site. The Site plan is provided as a Google Earth image map (Attachment A). Ground conditions experienced on-Site were generally adequate for LIF deployment. The final logs for each LIF probe point advanced at the Site by Vertex are presented in Attachment B.

Three-Dimensional Visualization

Three-dimensional (3D) results can be used to visualize where the potential LNAPL impacts are located in the subsurface. The LIF data from the Site was entered into a 3D software package, Earth Volumetric Studio (EVS), to develop and produce 3D visualizations of the percent reference emitter (%RE) data collected by the LIF. The LIF response data were processed using a log-based approach versus a linear-based approach. This is the preferred data processing method when data sets have multiple orders of magnitude in range in a relatively small area (both vertically and horizontally). Based on Vertex's experience a log-based interpretation also provides a more realistic interpretation of natural systems and is less likely to overestimate the special extent of identified impacts. As such, the 3D visualizations presented herein may underestimate the actual extent of the inferred LNAPL present at the Site. The log processing of the data also allows for better

visualization of the data along the property boundaries where many points of data were collected and visualized without overestimating the potential LNAPL impacts along these areas.

The ground surface elevations were provided from RWDI for each LIF location. Each elevation was input into the 3D visualization with the exception of two (2) locations, LIF20073 and LIF20074 which appeared to be much higher than adjacent locations and were adjusted to match similar elevation of the surrounding area.

EVS is using a kriging process to interpolate and extrapolate the information between input data points from the LIF survey. Uncertainty in the EVS model can be produced when relatively high data (above the minimum %RE) are extrapolated out relatively far from the original input data point, resulting in predicted high responses that carry a relatively low degree of confidence. Basically, as data (%RE) are extrapolated away from the input point the level of uncertainty generally increases with distance. Therefore, caution should be taken on placing too much emphasis on these interpreted results. It should be noted that the extrapolated data not directly connected to any LIF location in these areas of the Site has not been confirmed by any actual LIF locations and should be treated as theoretical and unverified.

As the response from the LIF increases, the level of impacts present at these volumes increases, showing localized “hot spots” or pockets of higher levels of LNAPL versus wider-spread lower responses and lower levels of LNAPL impacts. These areas of the Site are considered most likely to contain LNAPL and more significant LNAPL impacts.

The plan and profile views of the combined 3D visualized results from the LIF are provided separately for the Lake Chipican, CLC and G2 areas in Attachments C, D and E respectively. Note that the coloring used in the 3D visualizations does not correspond to the assigned colours for different types of LNAPL shown on the LIF logs; rather the colours correspond to the %RE signal strength as shown by the scales on the 3D plots.

Finally, the maximum LIF response for each location was projected onto a 2D surface for each area and plotted using the EVS software. This was completed to show where the maximum responses were located on-Site in relation to the completed survey locations. These visualizations are included in the profile view of the 3D images and as stand-alone plan images for the Lake Chipican, CLC and G2 areas on-Site in Attachments C, D and E respectively. The stand-alone maximum LIF responses projections were created for the lowest response level (5 %RE) for each area.

Lake Chipican Area – 3D Visualization

The Lake Chpican area was the largest investigation area on-Site, located south of Lake Chipican and the north and west of the adjacent public bicycle track on-Site.

The LIF responses presented for the 3D visualizations for the Lake Chipican Area range from 5 to 300 %RE which are on the low to high end of %RE for LIF surveys based on Vertex’s experience.

Based on the visualization results within the Lake Chipican area, the higher LIF responses (≥150 %RE) are scattered throughout the area ranging from the South West corner (LIF20161) to the vicinity of the Northern edge (LIF2068) of the survey area. For much of the Lake Chipican area, LIF responses indicate no presence of LNAPL along the perimeter of the surveyed locations. The visualization of the LIF responses indicated that the bulk of the LNAPL located away from northern boundary of Lake Chipican with the exception of the two (2) "fingers" of LNAPL projecting into the wooded area between the on-Site petting zoo and Lake Chipican. These "fingers" of LNAPL appear to be protruding in a North Western direction towards a season creek feeding Lake Chipican and are in the vicinity of LIF20080 and LIF20074 and surrounding area.

CLC Area – 3D Visualization

The CLC area is located on the western property boundary on-Site, located along a pedestrian walking path east of the neighboring residential properties and surrounding area.

The LIF responses presented for the 3D visualizations for the CLC Area range from 5 to 600 %RE which are on the low to high end of %RE for LIF surveys based on Vertex's experience. The highest %RE LIF responses on-Site were observed in this area and the visualizations correspond to these high response levels.

Based on the visualization results within the CLC area, the higher LIF responses (≥150 %RE) are scattered throughout the survey ranging from the vicinity of the north edge (LIF20156) to midway through the survey area (LIF2002). With the highest LIF responses clustered in the vicinity of the pedestrian pathway that runs through the area, north of the end of Front Street between LIF20018 and LIF20014. The remaining clusters of 600 %RE indicated on the 3D visualization (near LIF20002, LIF2003, LIF 2008, LIF2009, LIF2012) are extrapolated based on the data input into the 3D software and should be treated as theoretical and unverified. For much of the CLC area, LIF responses indicate little or no presence of LNAPL along the perimeter of the surveyed locations. However, there were some locations relatively close to the LIF perimeter which indicated much higher LIF observations which is reflected in the visualization of the LIF responses. Based on the 3D visualizations the bulk of the LNAPL located away from western boundary of the CLC area but is relatively close in proximity based on the LIF survey locations.

G2 Area – 3D Visualization

The G2 area is located on the southern property boundary on-Site. The G2 area located north of Michigan Avenue and east of Front Street. The G2 area also include a pedestrian walking path and surrounding grassed area.

The LIF responses presented for the 3D visualizations for the G2 Area range from 5 to 80 %RE which are on the low to moderate end of %RE for LIF surveys based on Vertex's experience.

Based on the visualization results within the G2 area, the higher LIF responses (≥80 %RE) are isolated at LIF20174 located north of the pedestrian pathway. For much of the G2 area,

LIF responses indicate little or no presence of LNAPL along the perimeter of the surveyed locations. However, there were some locations at the southern property boundary (LIF20167 and LIF20189) where some higher LIF responses were observed and visualized. Based on the 3D visualizations the bulk of the LNAPL located away from southern property boundary of the G2 area.

Summary of the Results

The results of the LIF survey for the Site indicated "low" to "high" responses from the LIF probe. The maximum %RE for the Site LIF logs range from 0.9 to 648.3 %RE. The LIF survey locations were plotted on a Google Earth map and presented in Attachment A. The main objective of the LIF survey program was for LNAPL delineation along the downgradient boundaries in three (3) different areas known as "Lake Chipican Area," "CLC Area," and "G2 Area" on-Site. The results for each of the area is as follows;

Lake Chipican Area

- The Lake Chipcican Area LIF responses indicated that little or no presence of LNAPL along the boundaries of the survey in this area of the Site.
- Based on the LIF survey it appears that some LNAPL impacts are present in a North Western direction away from the bulk of the LNAPL impacts in the vicinity of a seasonal creek as evidenced in the areas around LIF20080 and LIF20074.

CLC Area

- The CLC Area LIF responses indicated little or no presence of LNAPL along the perimeter of the surveyed locations. However, there were some locations relatively close to the LIF perimeter which indicated much higher LIF observations.
- The CLC Area had the highest positive LIF responses observed on-Site with the majority of the highest LIF response clustered in small areas away from the western boundary of the LIF survey. These locations with the highest LIF responses are at (and assumed based on the 3D visualization between) LIF20018 and LIF20014.

G2 Area

- The G2 Area LIF responses generally indicated little or no presence of LNAPL along the perimeter of the surveyed locations which included the western and southern property boundaries for the area. However, two (2) locations, LIF20167 and LIF20189, along the southern property boundary indicated presence of LNAPL.

General Site results indicate the following;

- The LNAPL observed by the LIF ranges over depths from approximately 0.17 to 6.0 mbgs for the areas surveyed on-Site. However over the entire Site the ground elevations changed significantly and the depths of the positive LIF response should be measured relative to the ground elevation at that specific location.

- Based on the LIF results there appear to be multiple types of LNAPL located on-Site. The different LNAPL types can be highlighted by the different "fingerprints" located in the callouts of each positive identification of LNAPL on the LIF logs. The colouring on the LIF log responses and callouts suggest different LNAPL types based on the fluorescence signal observed from the product(s) in-situ. Some LIF logs had potential multiple LNAPL types within the same boring location. An example of potential multiple LNAPL types is observed in LIF20094 and LIF20115. Based on Vertex's understanding of the history of the Site observing multiple types of LNAPL would not be unexpected.
- The different assigned colours of response presented on the LIF logs in Attachment B generally correspond to the following typical LNAPL source products:
    - Blue – This colouring generally indicates lighter ended type of fuels such as kerosene or higher octane gasoline type products.
    - Green – This colouring generally indicates diesel and weathered gasoline type fuels/products.
    - Yellow – This colouring generally indicates highly weathered fuels and/or oil mixtures type products.
    - Orange/ Red – This colouring generally indicates heavy ended oil type products.

It should be noted that the descriptions for each of the log colorings noted above are intended to act as a general guide and not meant to be specific identification tool.

Limitations

The information, approach, and discussions presented in this memorandum are based on information recorded by Vertex Environmental Inc. at selected observation and sampling locations at Canatara Park, Sarnia, ON (the Site). LIF survey locations were chosen based upon previous subsurface investigations completed by others, historical information provided by others, and visual observations. Conditions observed on the property or noted in documents regarding the property may differ from time to time and may become apparent during future investigations or on-site work. Observations are made for select sampling / observation points only, conditions between and beyond these sampling points may be different. As a result, some conditions may not have been detected or anticipated at the time of this work and as such Vertex Environmental Inc. cannot be held responsible for environmental conditions at the Site.

The scope of this report is limited to the matters expressly covered. This report is prepared for the sole benefit of RWDI, and may not be relied upon by any other person or entity without the written authorization of Vertex Environmental Inc. Any use or reuse of this document (or the opinions, findings, or conclusions represented herein), by parties other than RWDI is at the sole risk of those parties.

Attachment A
Google Earth View


LIF20085
LIF20079
LIF20073
LIF20069
LIF20087
LIF20103
LIF20082
LIF20047
LIF20062
LIF20097
LIF20099
LIF20100
LIF20036
LIF20106
LIF20040
LIF20054
LIF20096
Lake Chipican Dr
LIF20108
LIF20042
LIF20043
LIF20110
LIF20109
LIF20121
LIF20119
LIF20118
LIF20111
LIF20124
LIF20122
LIF20117
LIF20115
LIF20116
LIF20125
LIF20135
LIF20114
LIF20137
LIF20136
LIF20142
LIF20141
LIF20158
LIF20161
LIF20157
LIF20159
LIF20155
LIF20154
LIF20024
LIF20023
LIF20152
LIF20190
LIF20022
LIF20021
LIF20148
LIF20019
LIF20146
LIF20147
LIF20014
LIF20017
LIF20010
LIF20011
LIF20002
LIF20030
LIF20026
LIF20028
LIF20035
LIF20029
LIF20027b
LIF20031
LIF20134
LIF20033
LIF20128
LIF20129
LIF20127
LIF20132
LIF20162
LIF20174
LIF20170
LIF20172
LIF20164
LIF20179
LIF20185
LIF20169
LIF20167
LIF20180
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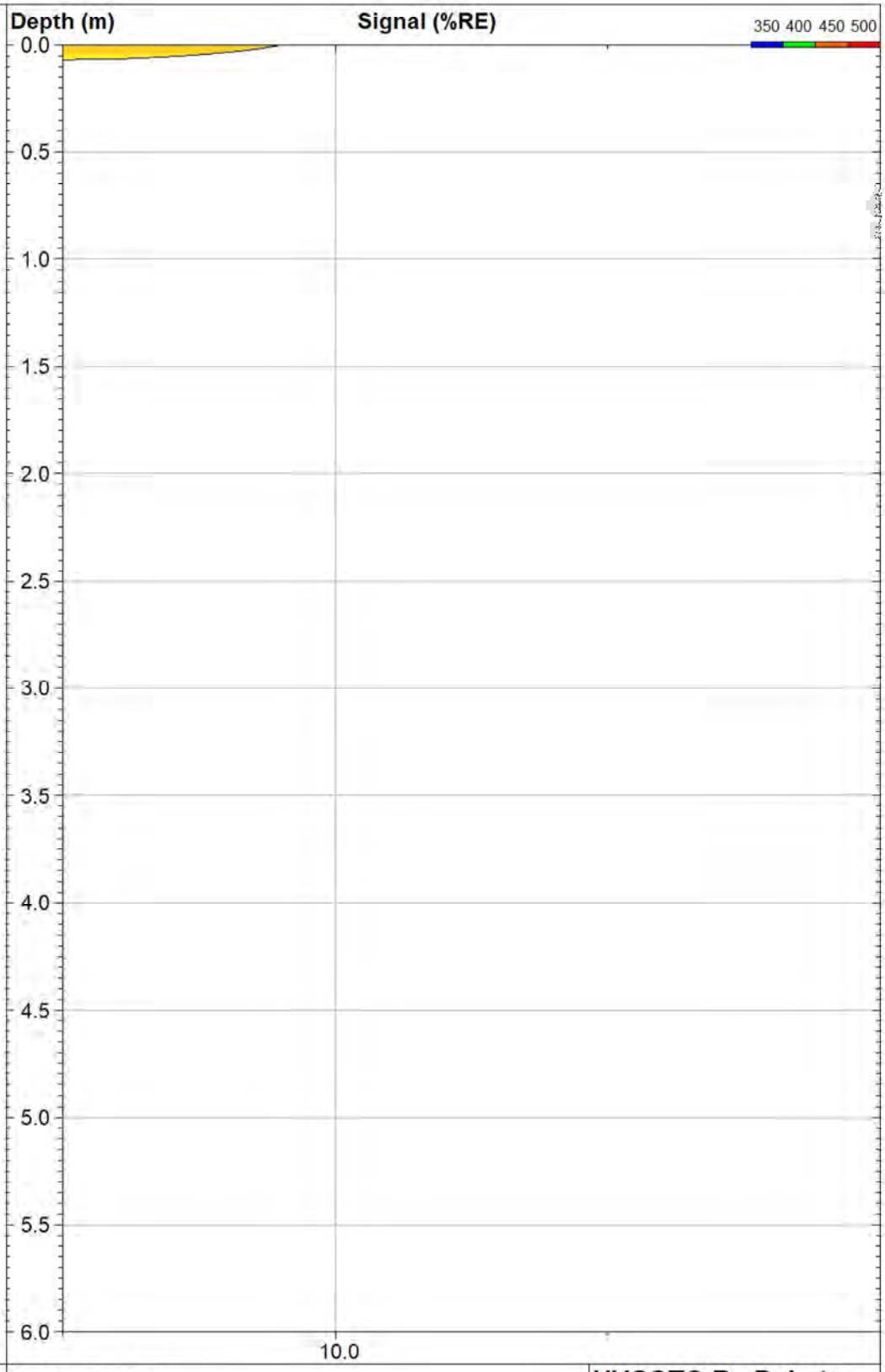
N
200 m

Attachment B

LIF Logs

Callouts



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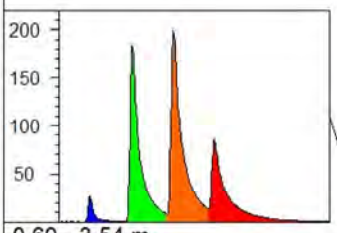
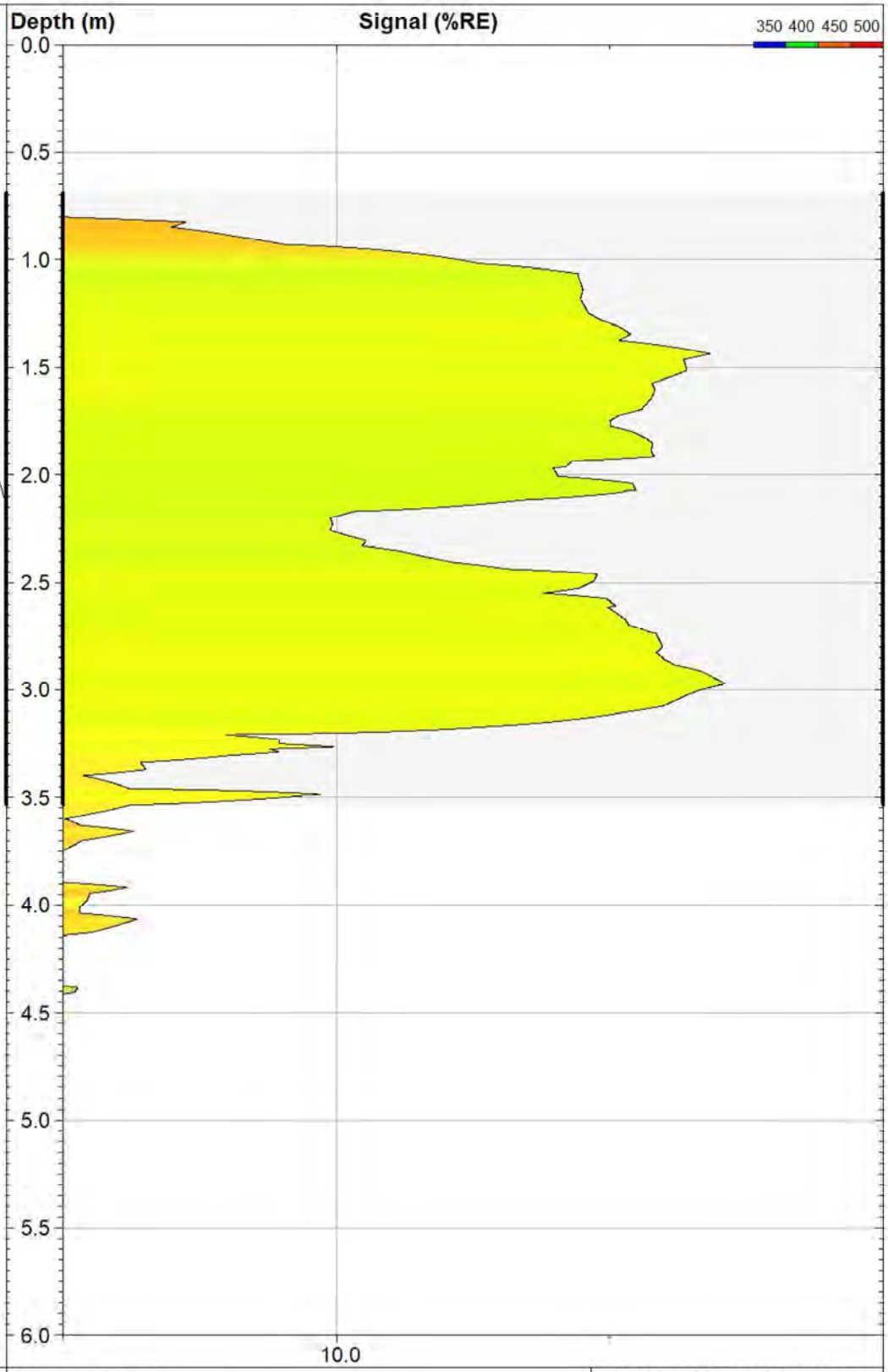
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761665.093 / UTM**	*Final depth:* **4.42 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385633.434 /**	*Max signal:* **7.4 %RE @ 0.00 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-04 13:00 ADT**

Callouts



0.69 - 3.54 m
76.5 %RE (s 67.3)



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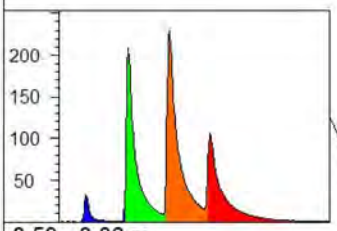
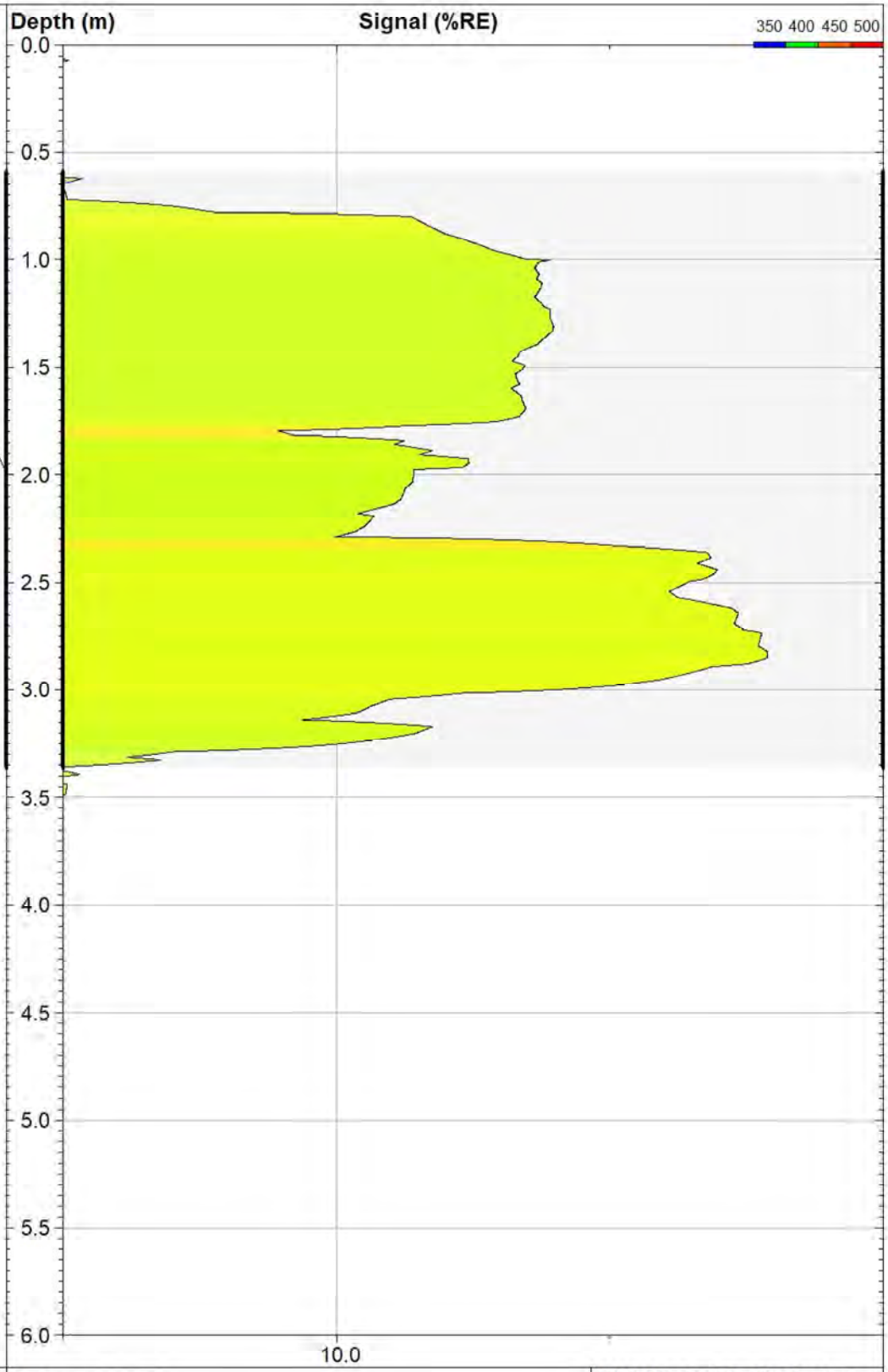
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761665.816 / UTM**	*Final depth:* **4.49 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385640.6284 /**	*Max signal:* **265.0 %RE @ 2.97 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.1 m**	*Date & Time:* **2020-05-04 13:19 ADT**

Callouts



0.59 - 3.36 m
78.7 %RE (s 98.8)



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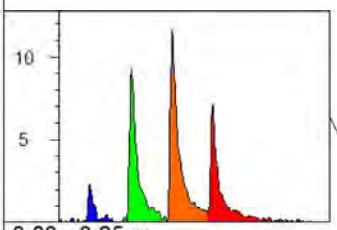
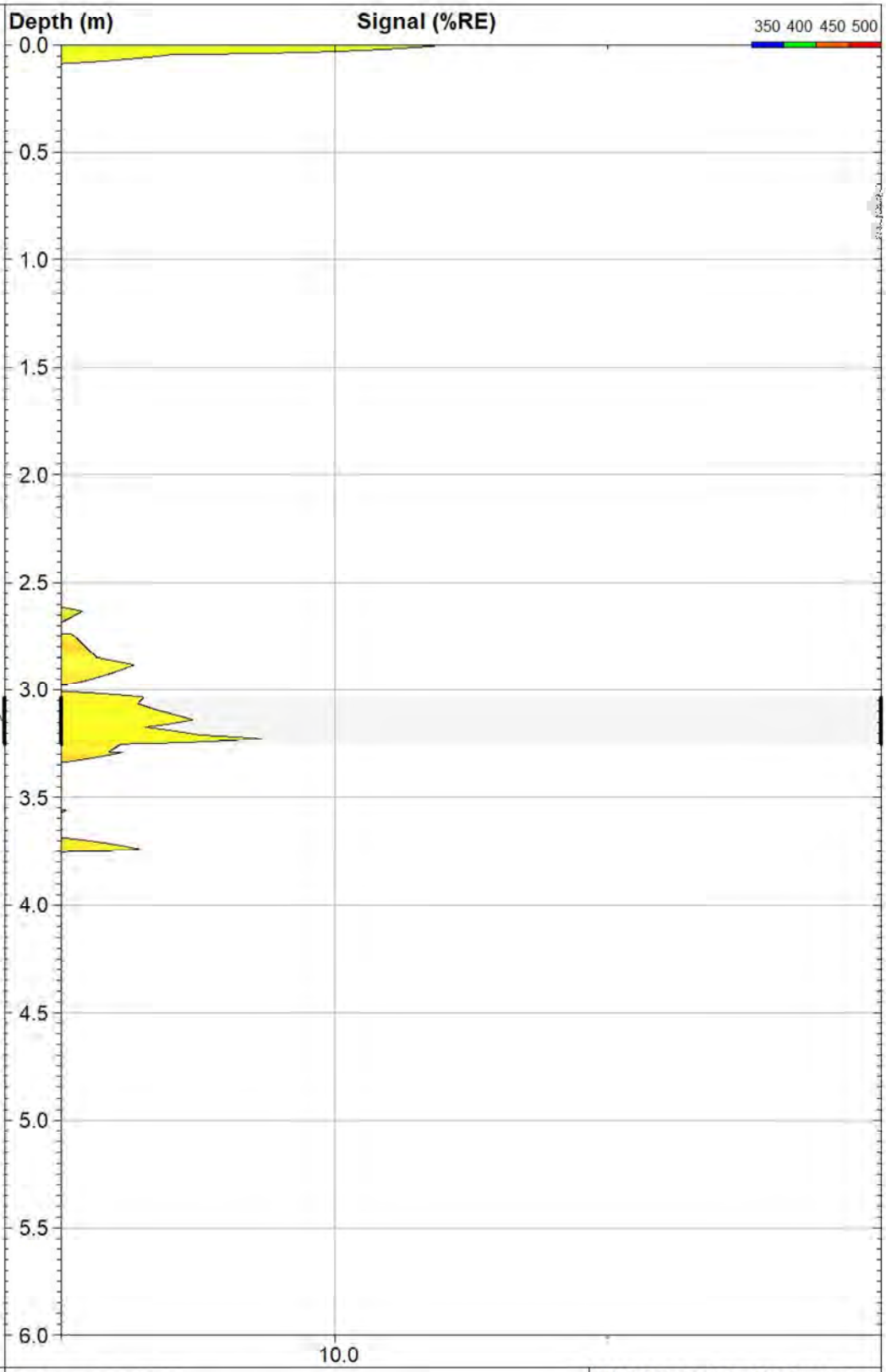
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761672.761 / UTM**	*Final depth:* **3.71 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385635.9739 /**	*Max signal:* **377.9 %RE @ 2.85 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.1 m**	*Date & Time:* **2020-05-04 13:33 ADT**

Callouts



3.03 - 3.25 m
3.7 %RE (s 1.2)



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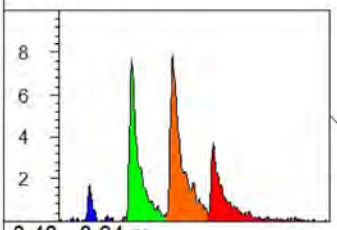
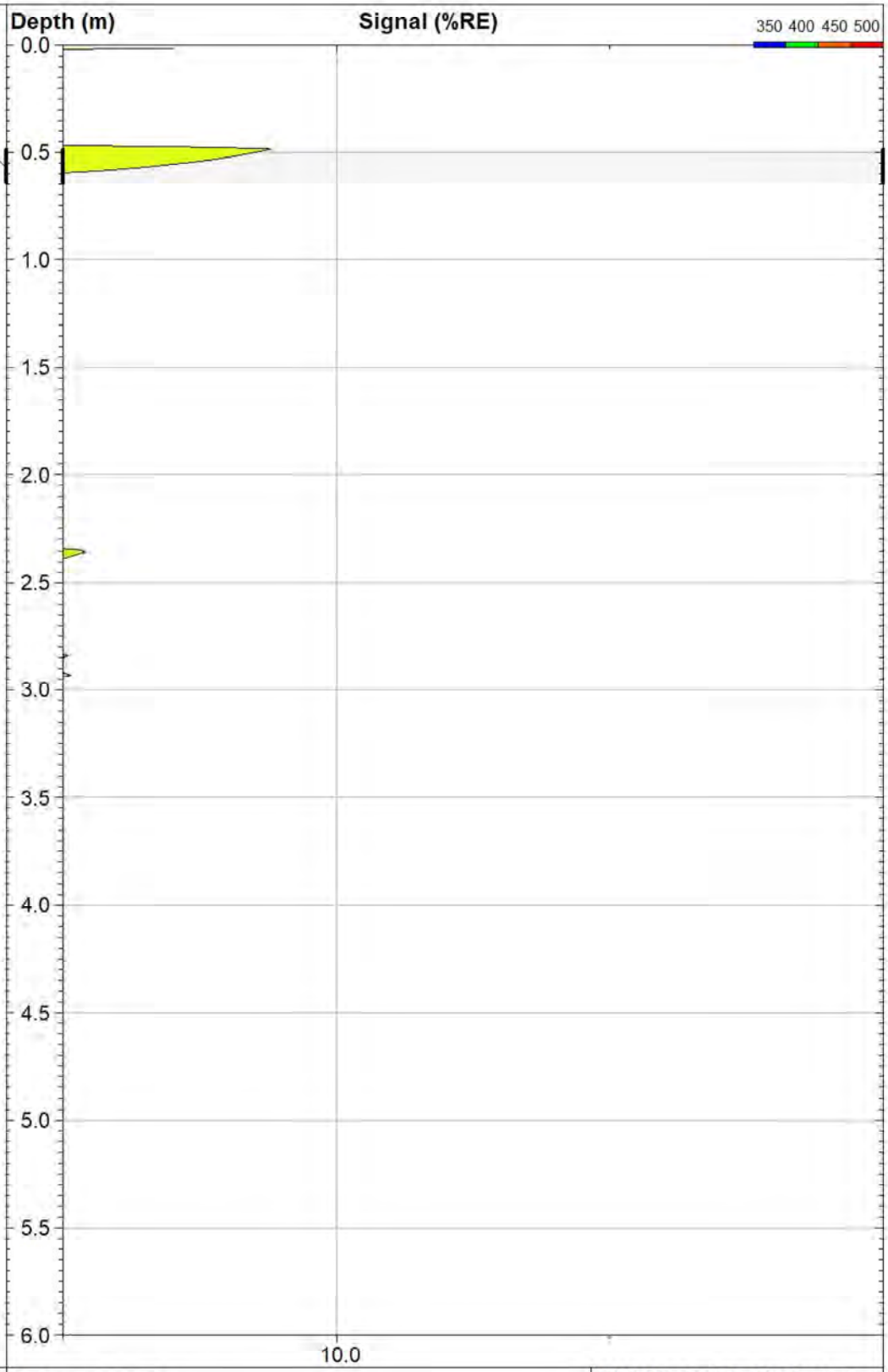
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761671.726 / UTM**	*Final depth:* **3.77 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385631.3646 /**	*Max signal:* **27.1 %RE @ 0.00 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-04 13:49 ADT**

Callouts



0.48 - 0.64 m
3.2 %RE (s 2.6)



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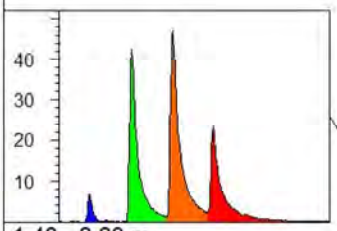
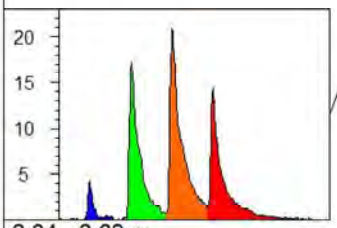
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761668.522 / UTM**	*Final depth:* **3.19 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385632.9083 /**	*Max signal:* **6.8 %RE @ 0.48 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-04 14:03 ADT**

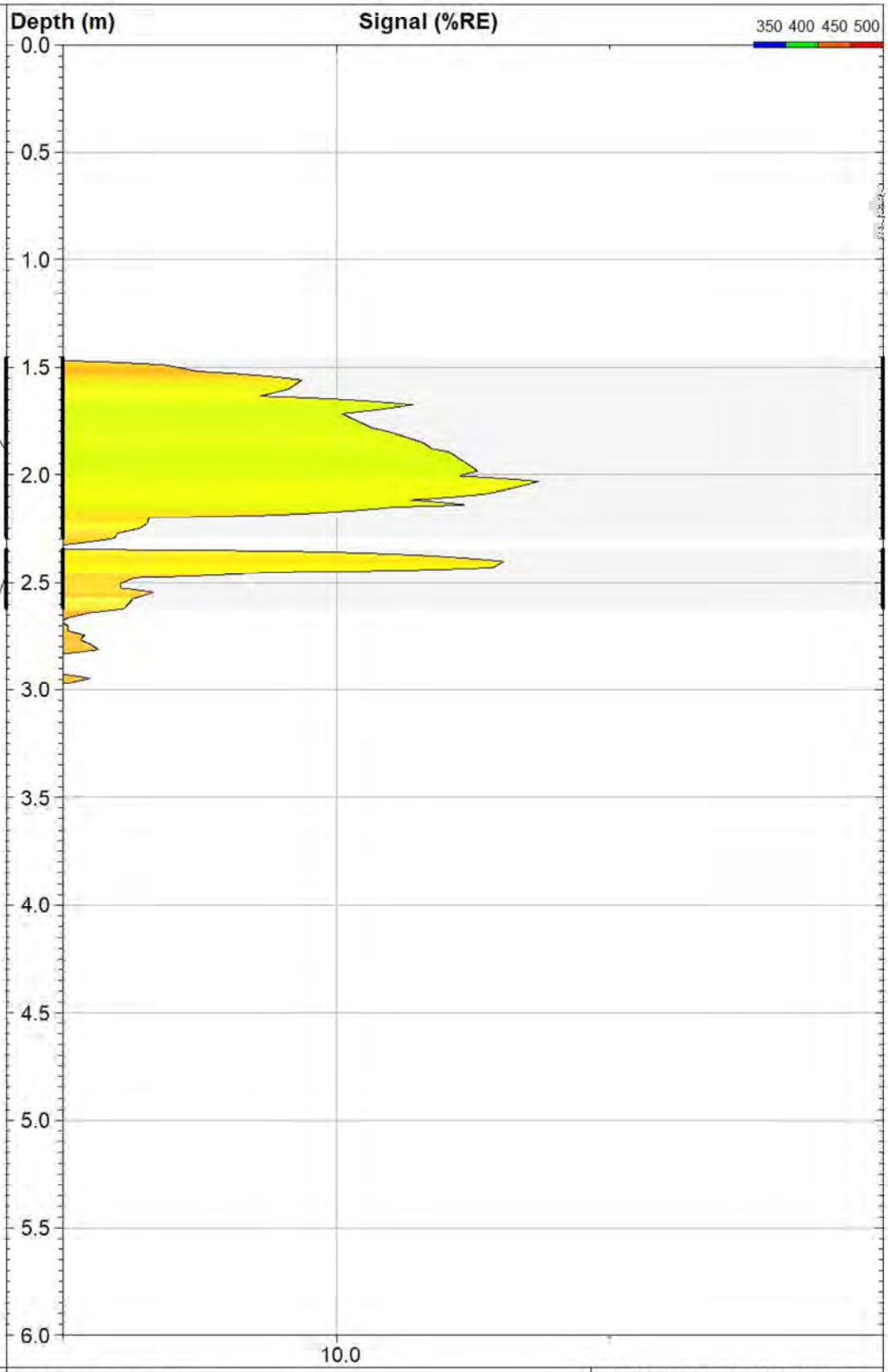
Callouts



1.46 - 2.29 m
17.0 %RE (s 13.8)



2.34 - 2.62 m
9.4 %RE (s 14.4)



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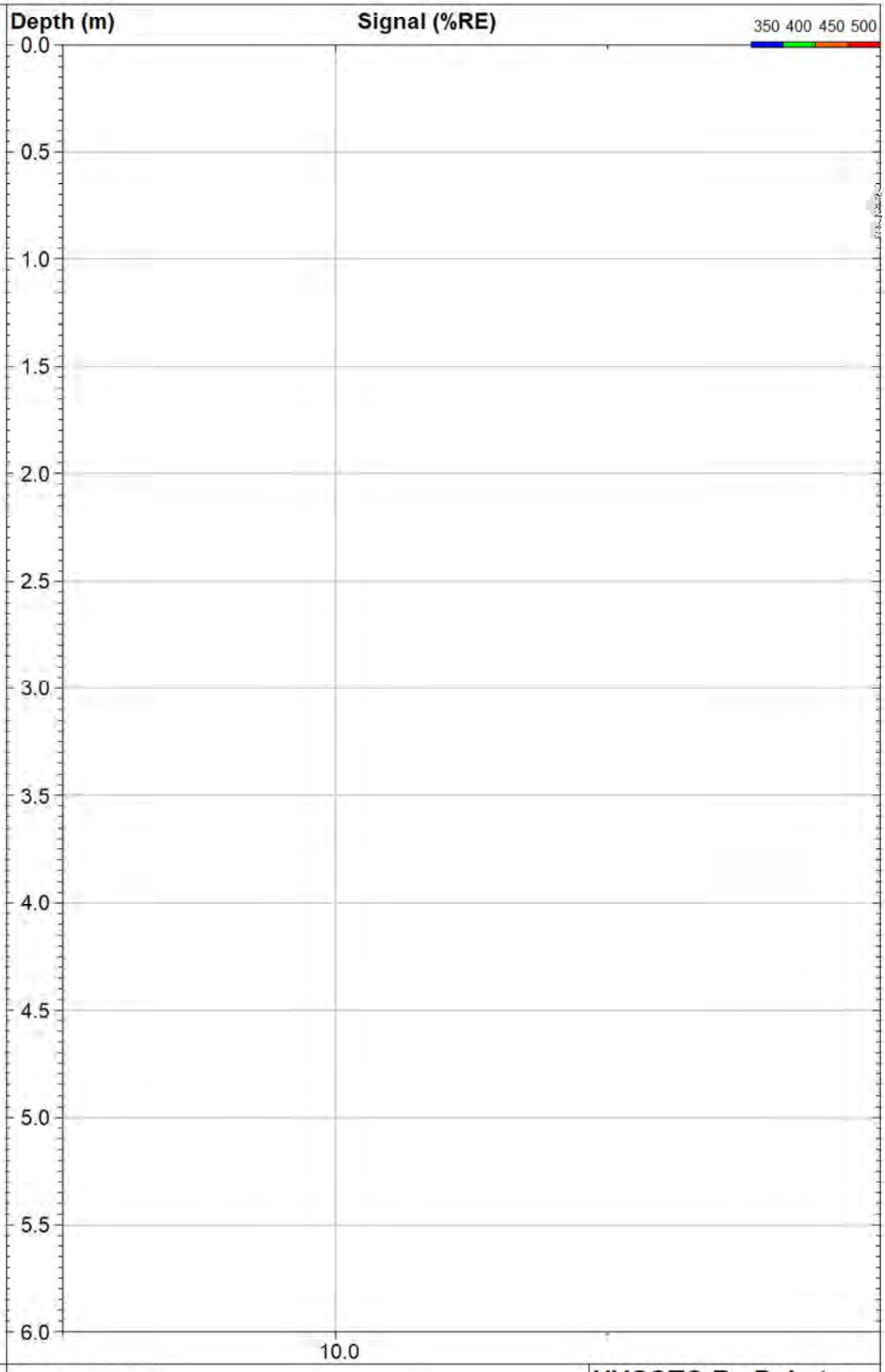
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761659.246 / UTM**	*Final depth:* **3.17 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385636.4028 /**	*Max signal:* **55.7 %RE @ 2.03 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.5 m**	*Date & Time:* **2020-05-04 14:17 ADT**

Callouts



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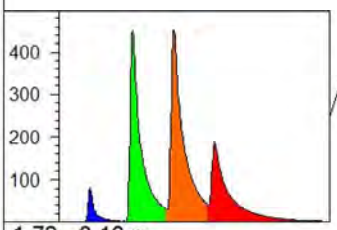
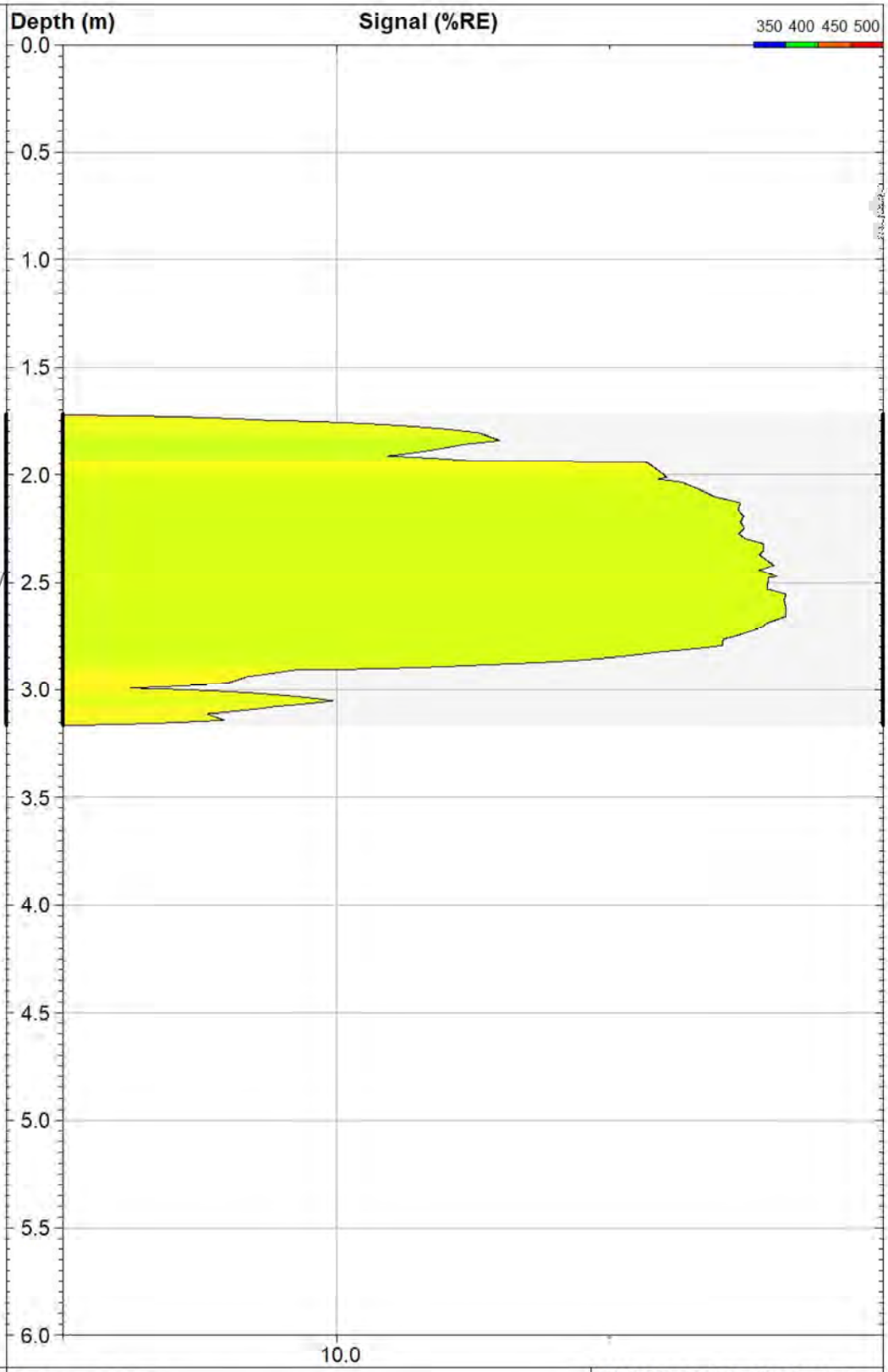
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761659.449 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385631.5289 /**	*Max signal:* **1.9 %RE @ 2.24 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-04 14:37 ADT**

Callouts



1.72 - 3.16 m
207.6 %RE (s 163.1)



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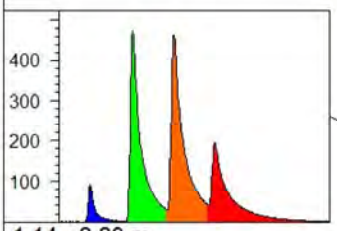
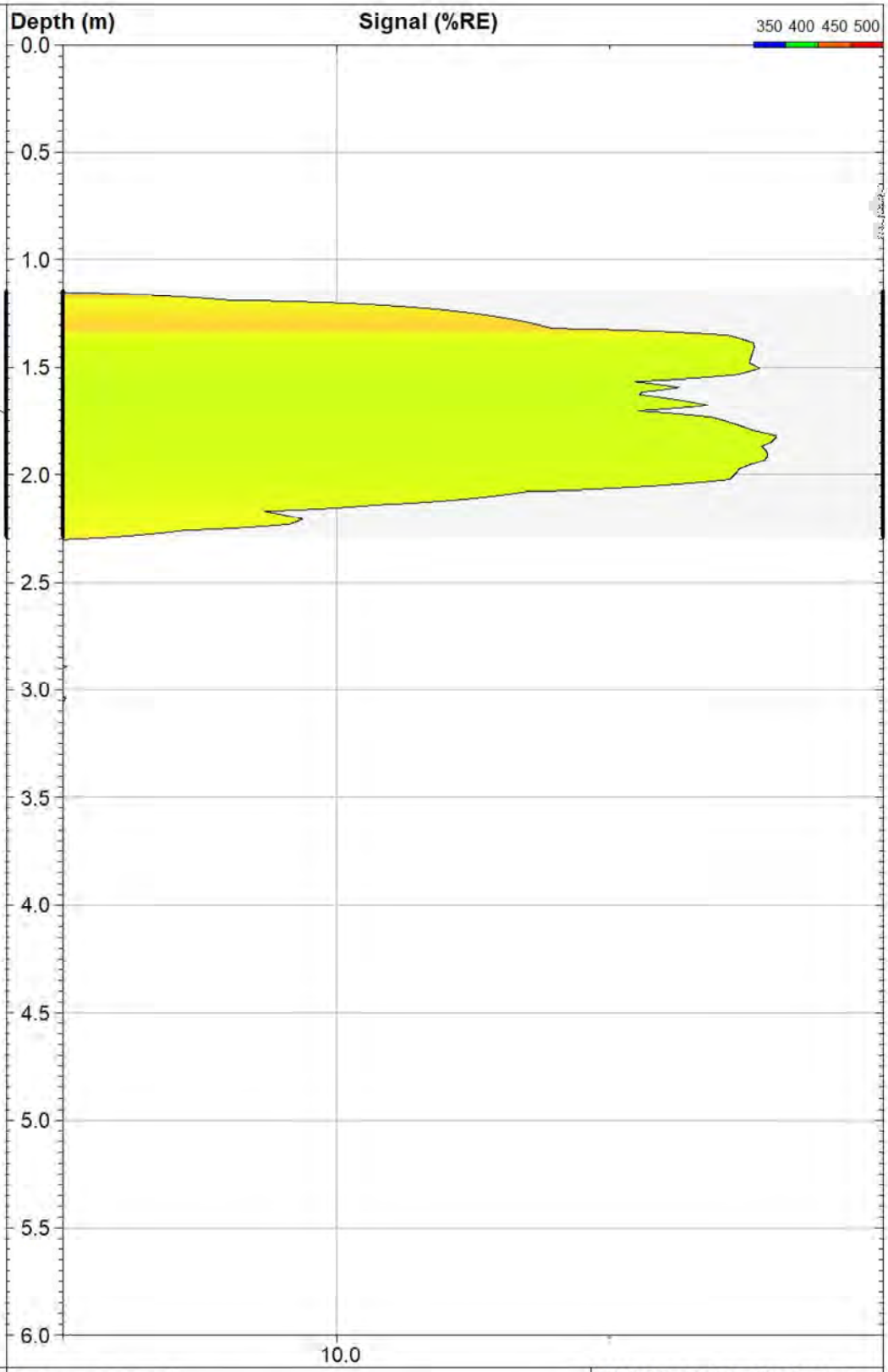
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761683.081 / UTM**	*Final depth:* **3.70 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385631.8951 /**	*Max signal:* **443.1 %RE @ 2.66 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.9 m**	*Date & Time:* **2020-05-04 14:49 ADT**

Callouts



1.14 - 2.29 m
209.3 %RE (s 143.8)



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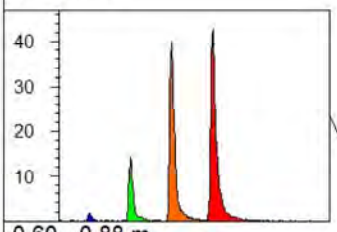
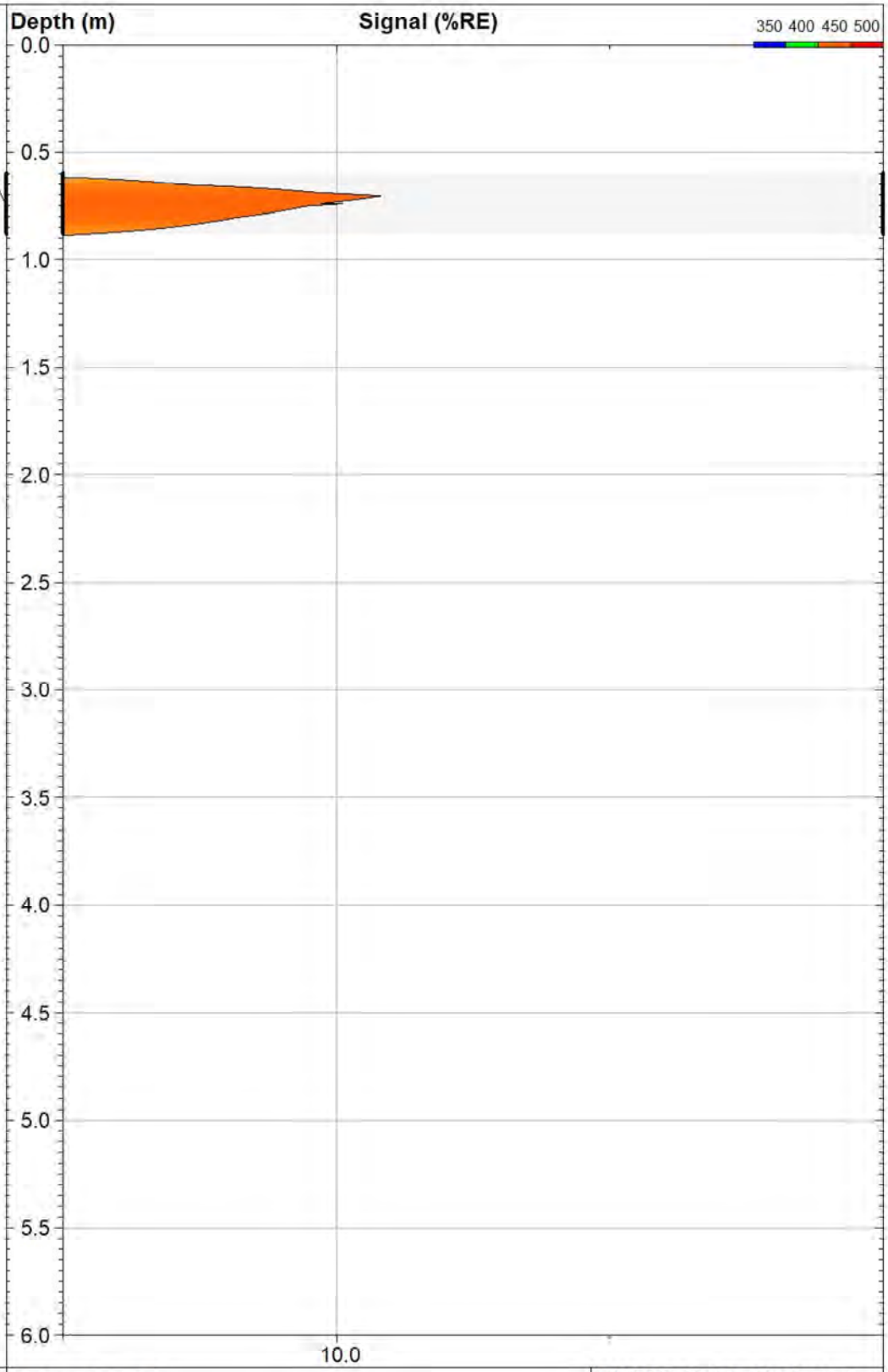
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761682.411 / UTM**	*Final depth:* **3.18 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385625.7485 /**	*Max signal:* **408.5 %RE @ 1.82 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.3 m**	*Date & Time:* **2020-05-04 15:05 ADT**

Callouts



0.60 - 0.88 m
7.5 %RE (s 4.8)



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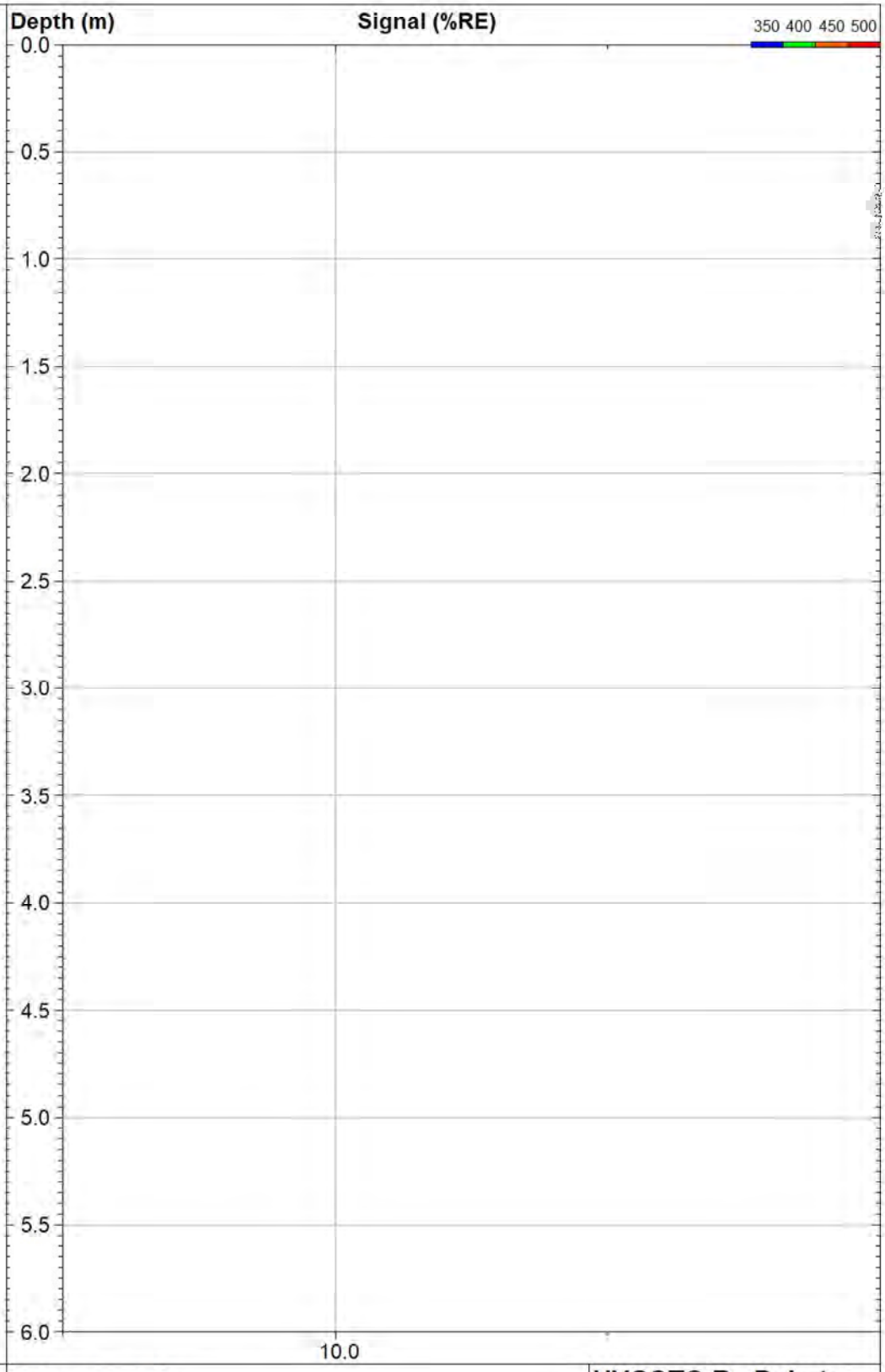
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761679.08 / UTM**	*Final depth:* **3.23 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385623.096 /**	*Max signal:* **15.6 %RE @ 0.71 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.3 m**	*Date & Time:* **2020-05-04 15:18 ADT**

Callouts



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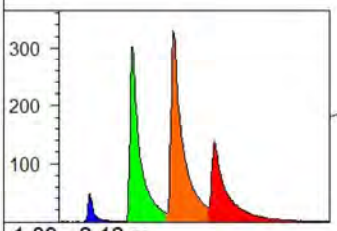
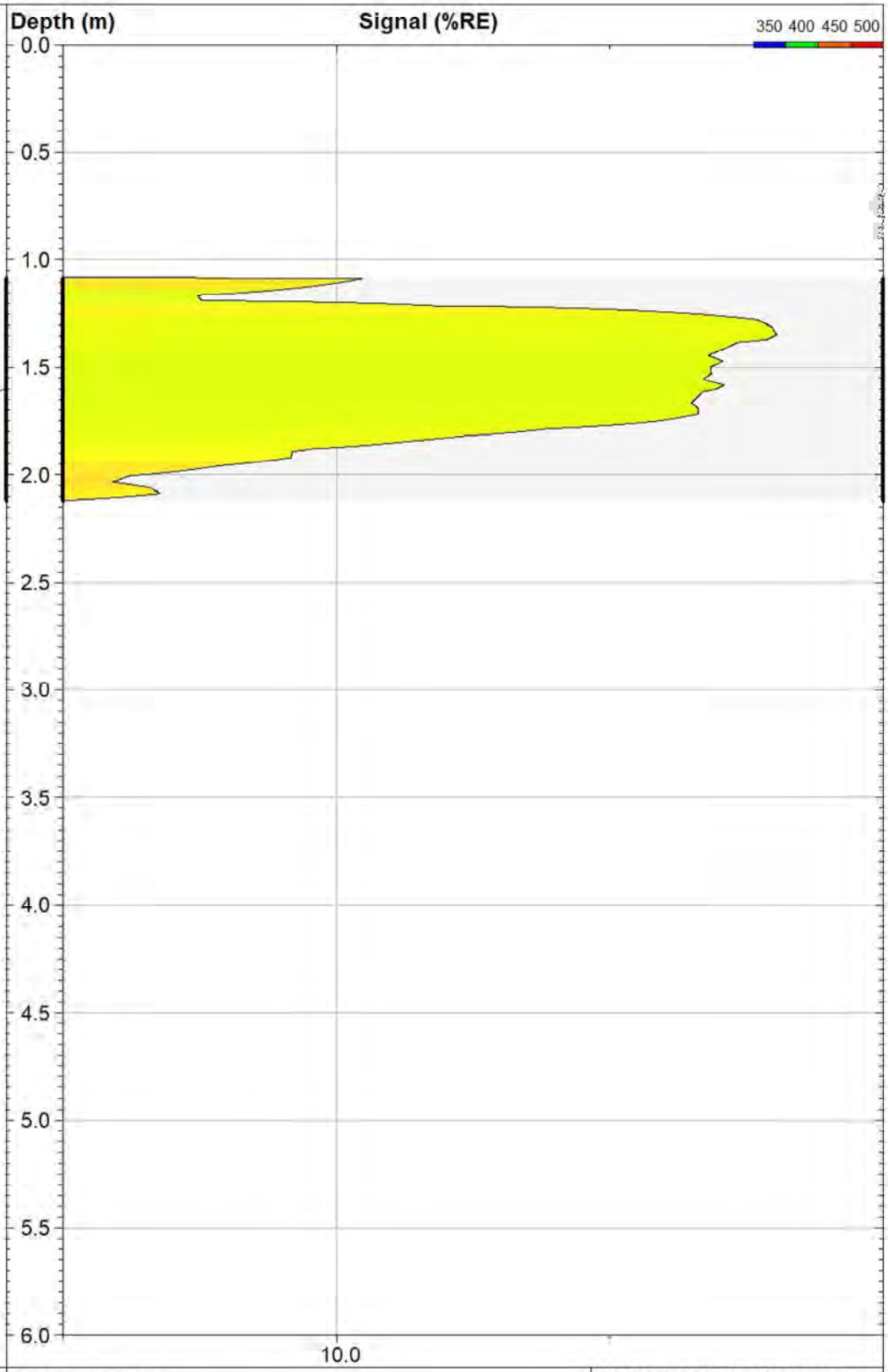
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761675.293 / UTM**	*Final depth:* **3.14 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385627.6312 /**	*Max signal:* **2.0 %RE @ 2.49 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-04 15:35 ADT**

Callouts



1.09 - 2.12 m
138.4 %RE (s 136.5)



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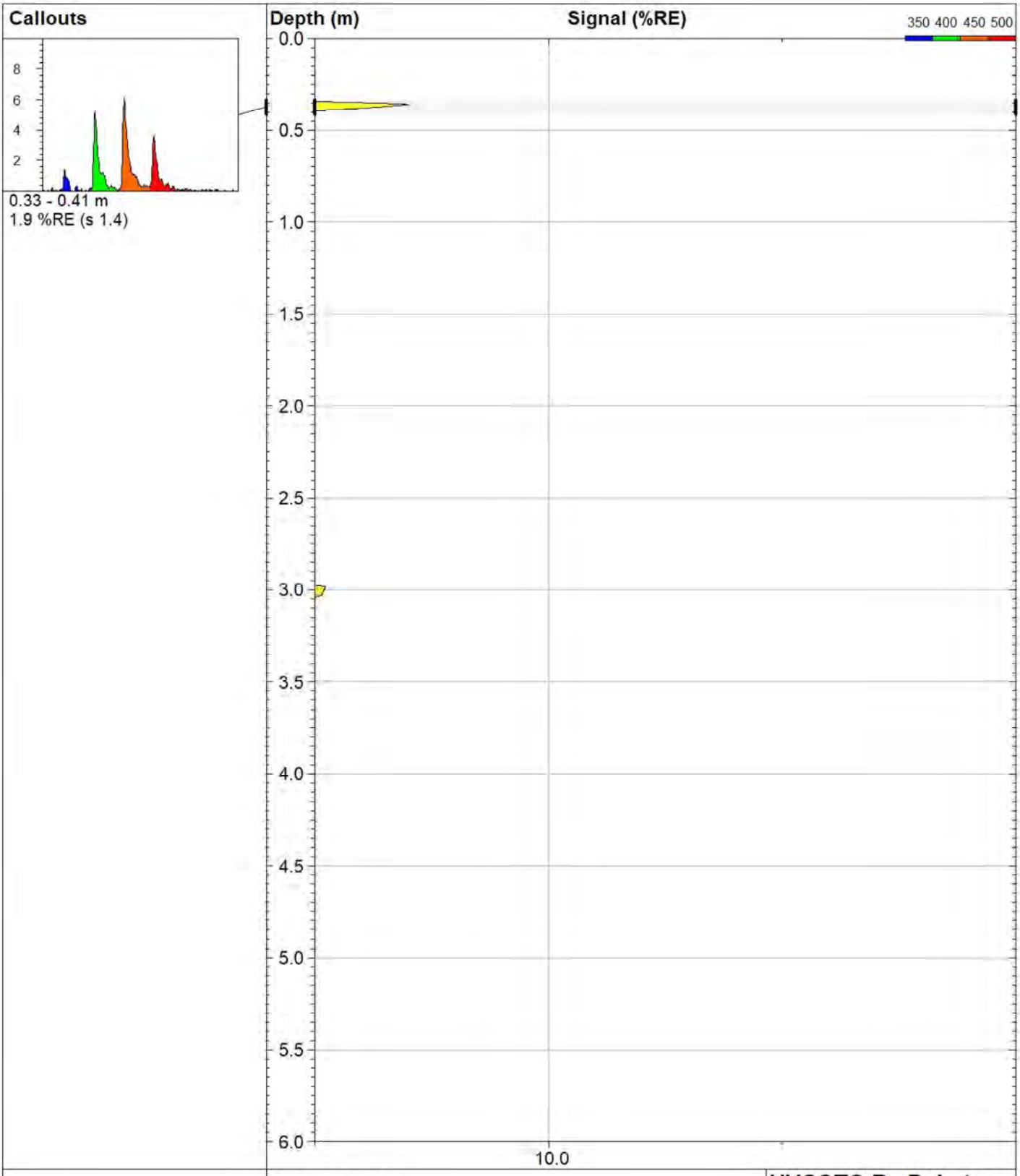
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761689.394 / UTM**	*Final depth:* **3.15 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385624.2907 /**	*Max signal:* **408.6 %RE @ 1.35 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-04 15:50 ADT**



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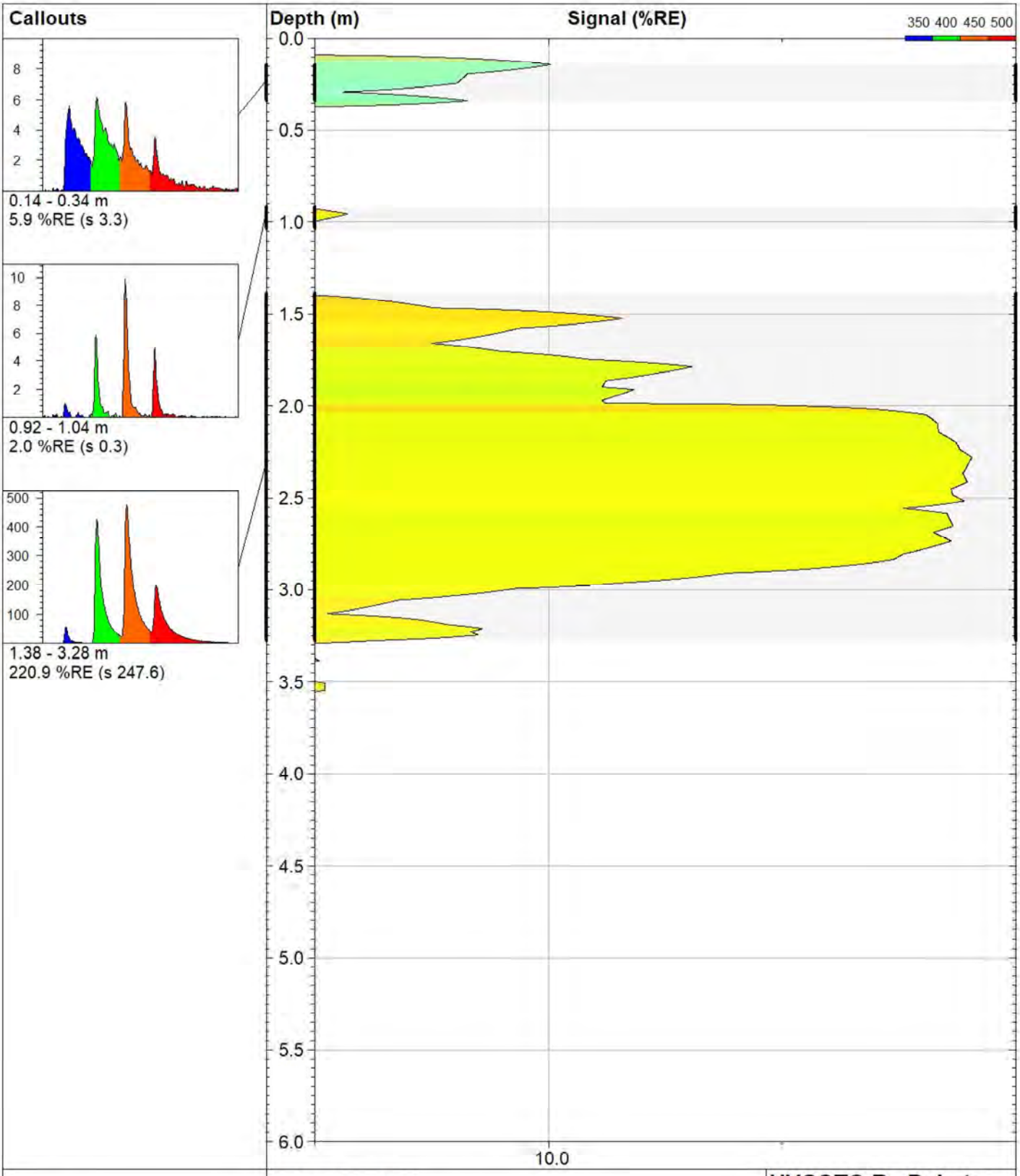
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761688.093 / UTM**	*Final depth:* **3.16 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385620.2249 /**	*Max signal:* **3.5 %RE @ 0.36 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-29 09:37 ADT**



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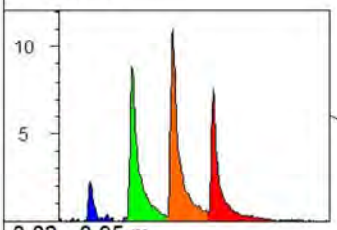
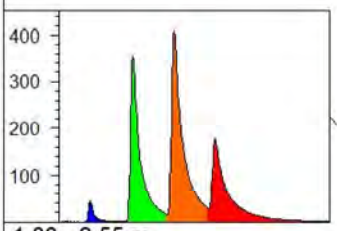
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761707.768 / UTM**	*Final depth:* **3.74 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385622.3375 /**	*Max signal:* **648.3 %RE @ 2.28 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-04 16:25 ADT**

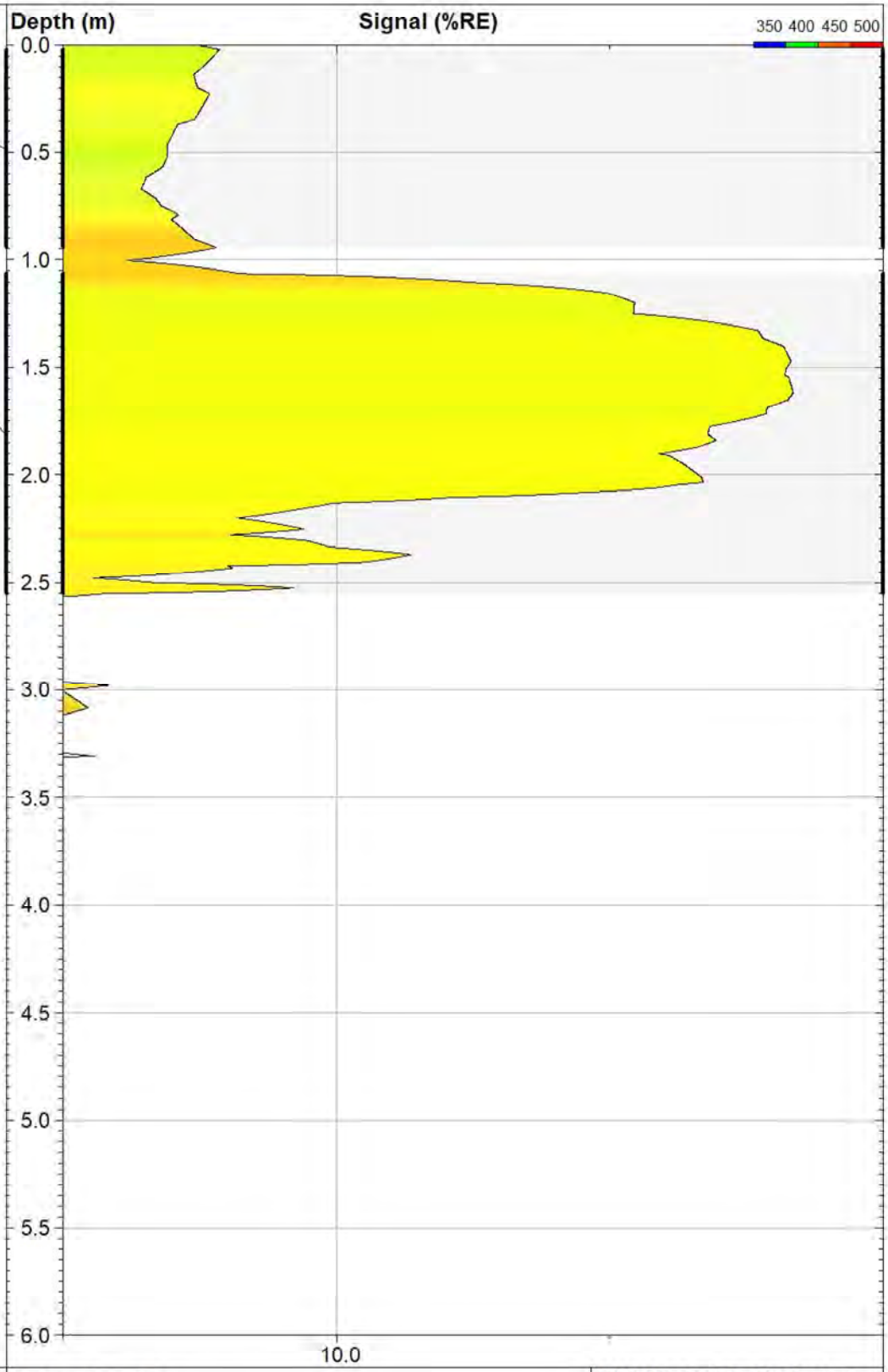
Callouts



0.02 - 0.95 m
3.7 %RE (s 0.5)



1.06 - 2.55 m
167.7 %RE (s 169.3)



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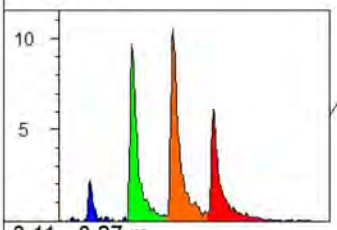
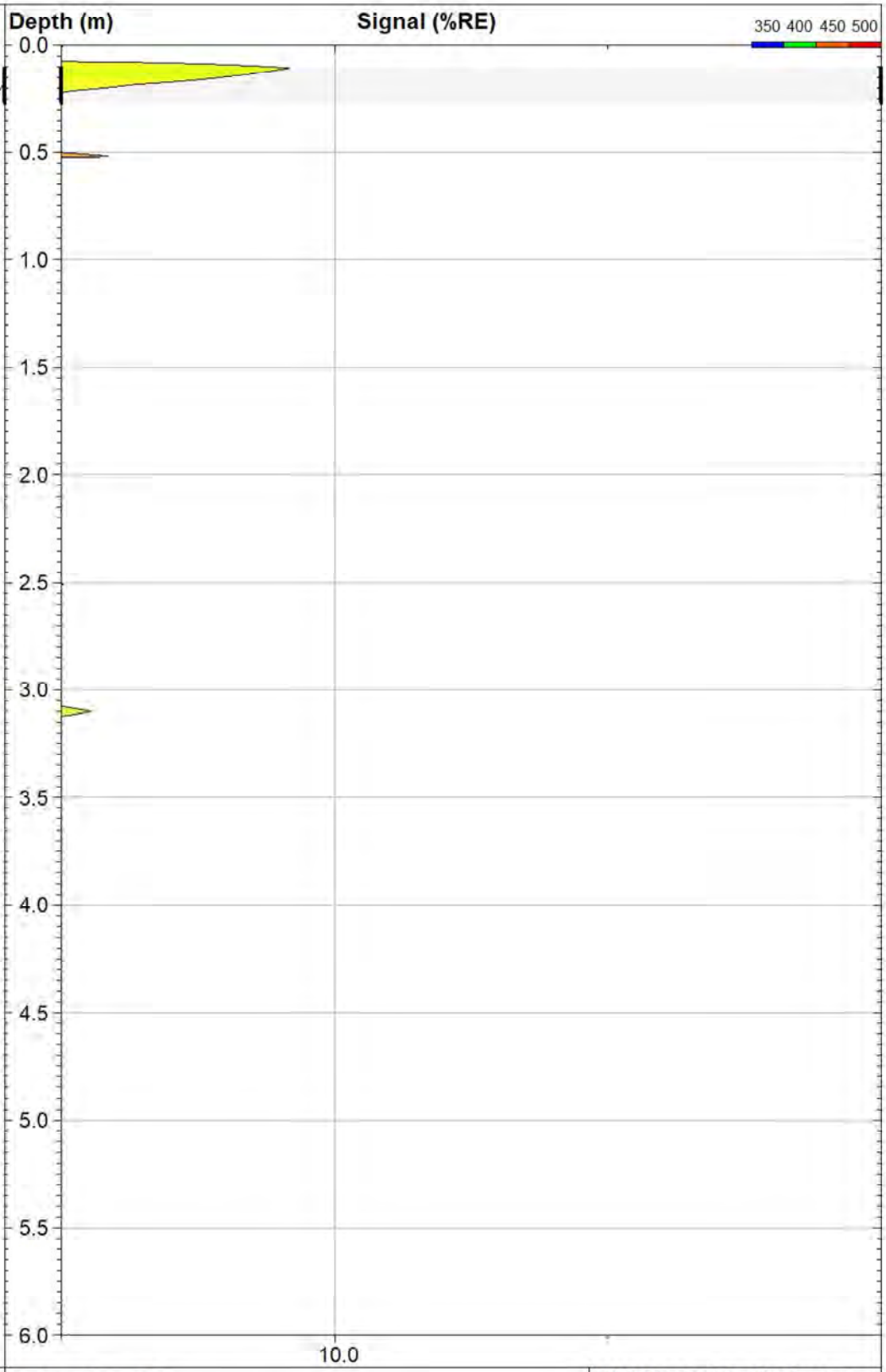
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761705.221 / UTM**	*Final depth:* **3.31 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385617.2986 /**	*Max signal:* **469.6 %RE @ 1.62 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-04 16:46 ADT**

Callouts



0.11 - 0.27 m
3.6 %RE (s 2.5)



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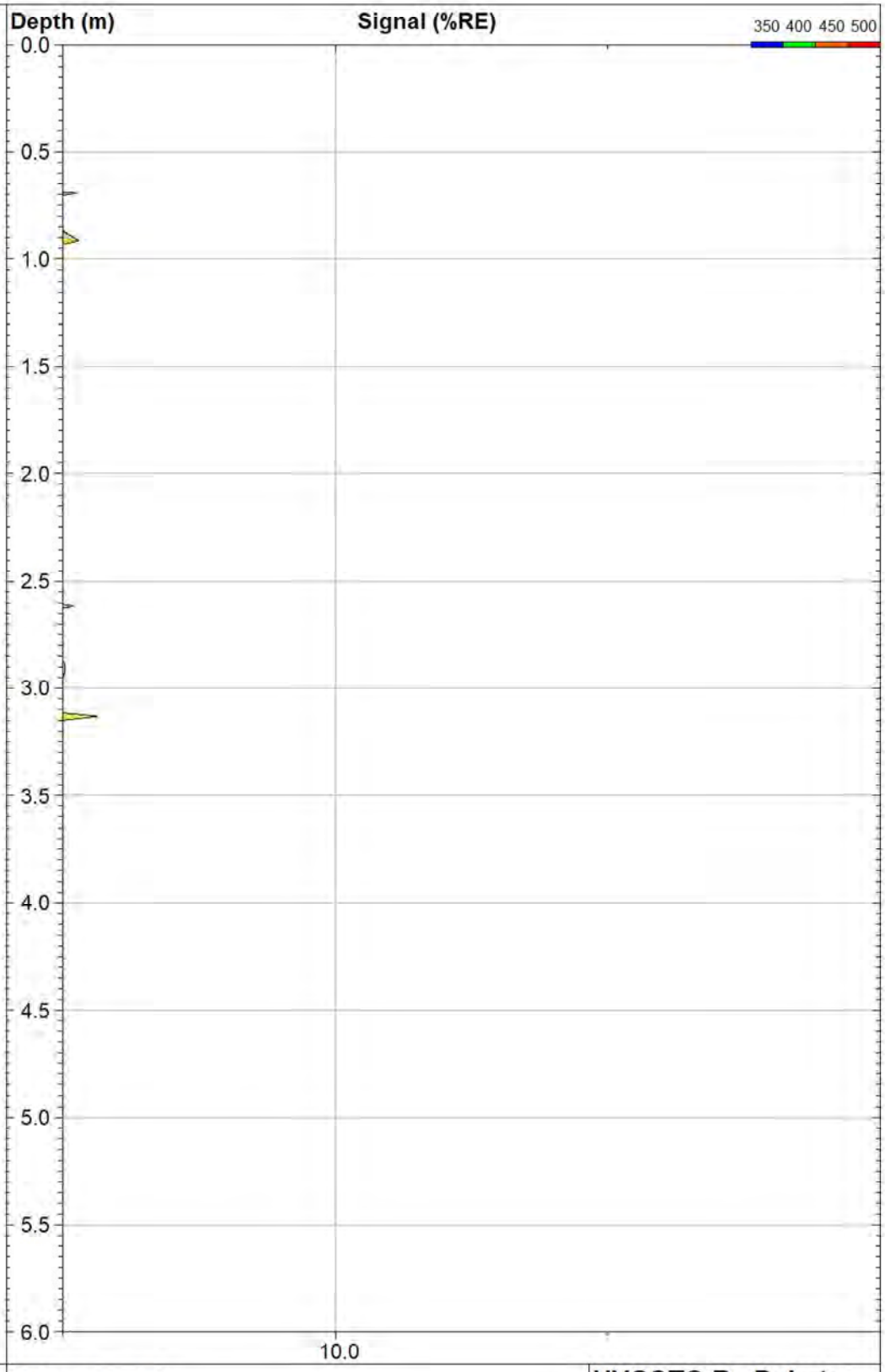
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761703.559 / UTM**	*Final depth:* **3.15 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385613.6018 /**	*Max signal:* **7.9 %RE @ 0.11 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-04 16:57 ADT**

Callouts



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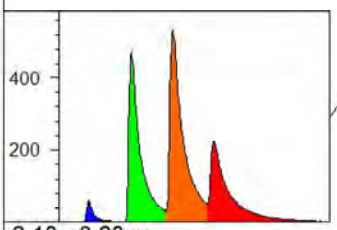
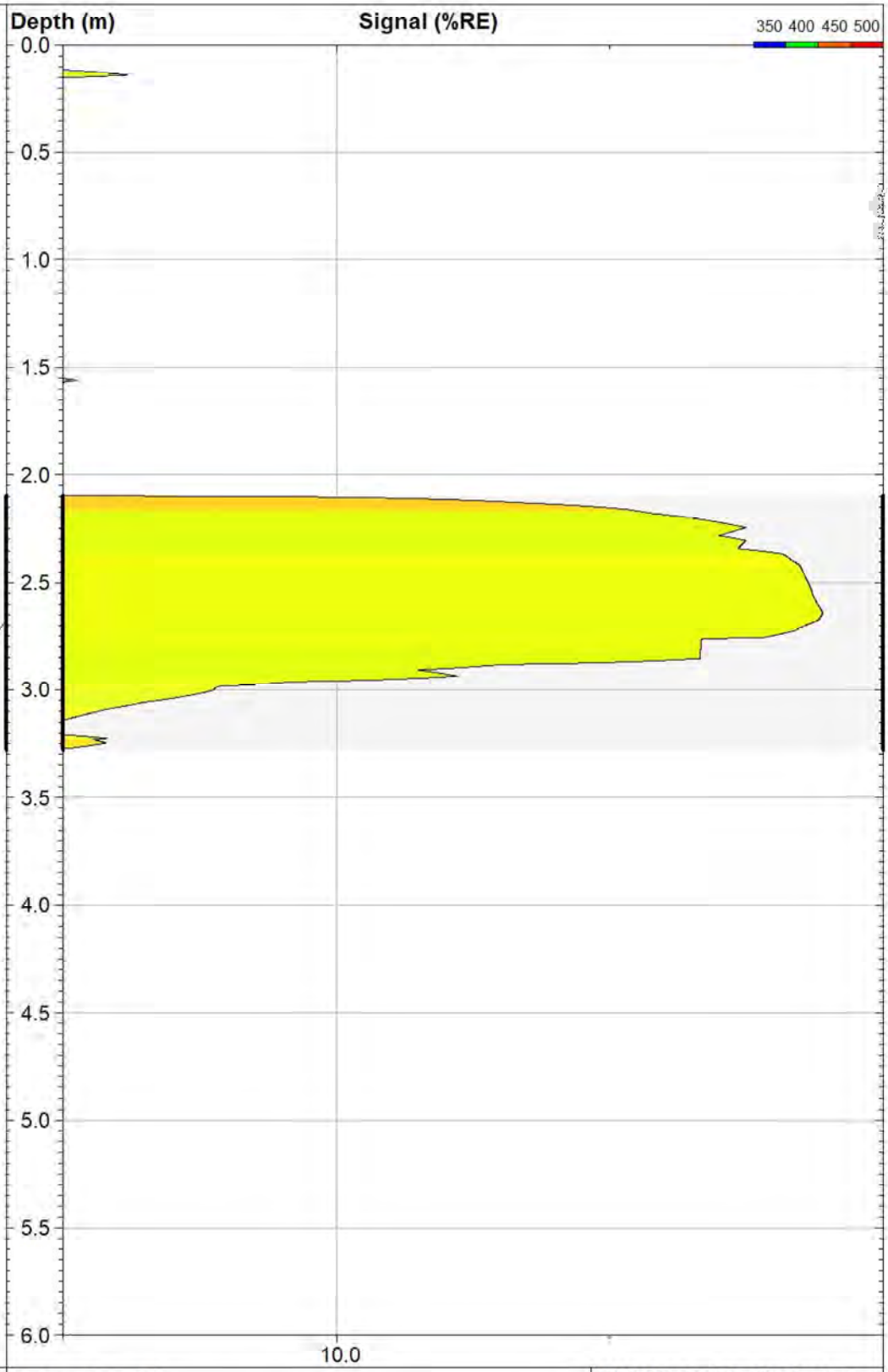
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761700.316 / UTM**	*Final depth:* **3.17 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385618.8538 /**	*Max signal:* **2.3 %RE @ 3.13 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-29 09:41 ADT**

Callouts



2.10 - 3.28 m
233.3 %RE (s 232.1)



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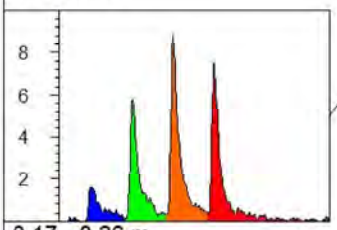
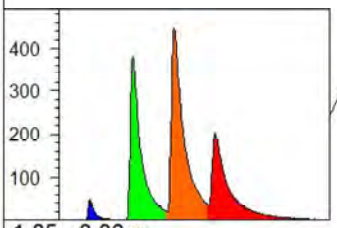
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761716.131 / UTM**	*Final depth:* **3.66 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385619.3504 /**	*Max signal:* **602.6 %RE @ 2.64 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-29 09:42 ADT**

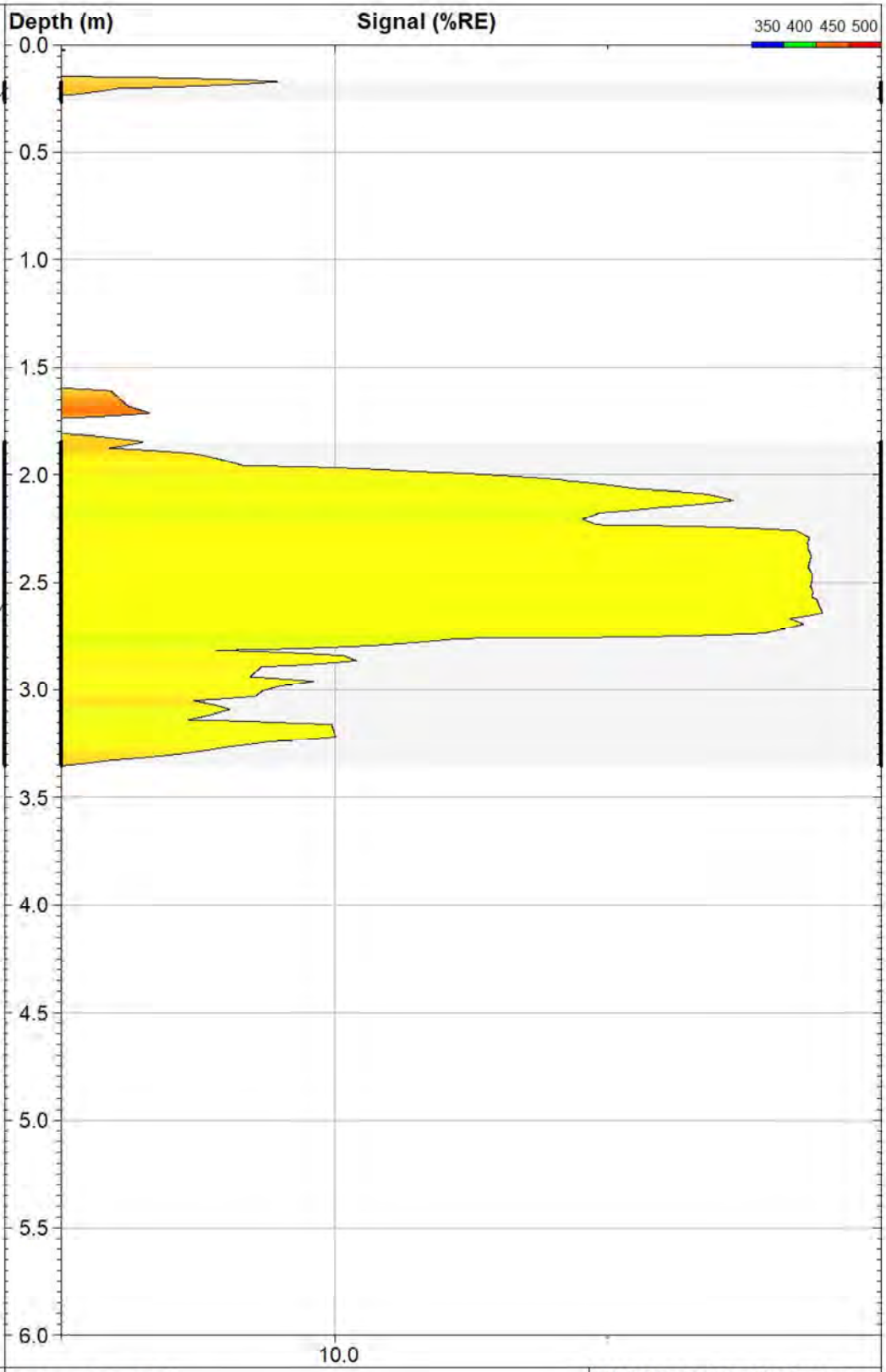
Callouts



0.17 - 0.26 m
3.3 %RE (s 2.7)



1.85 - 3.36 m
195.9 %RE (s 240.7)



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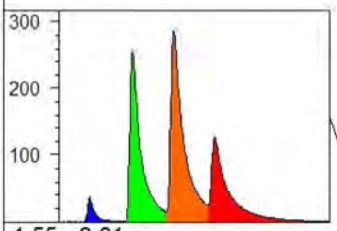
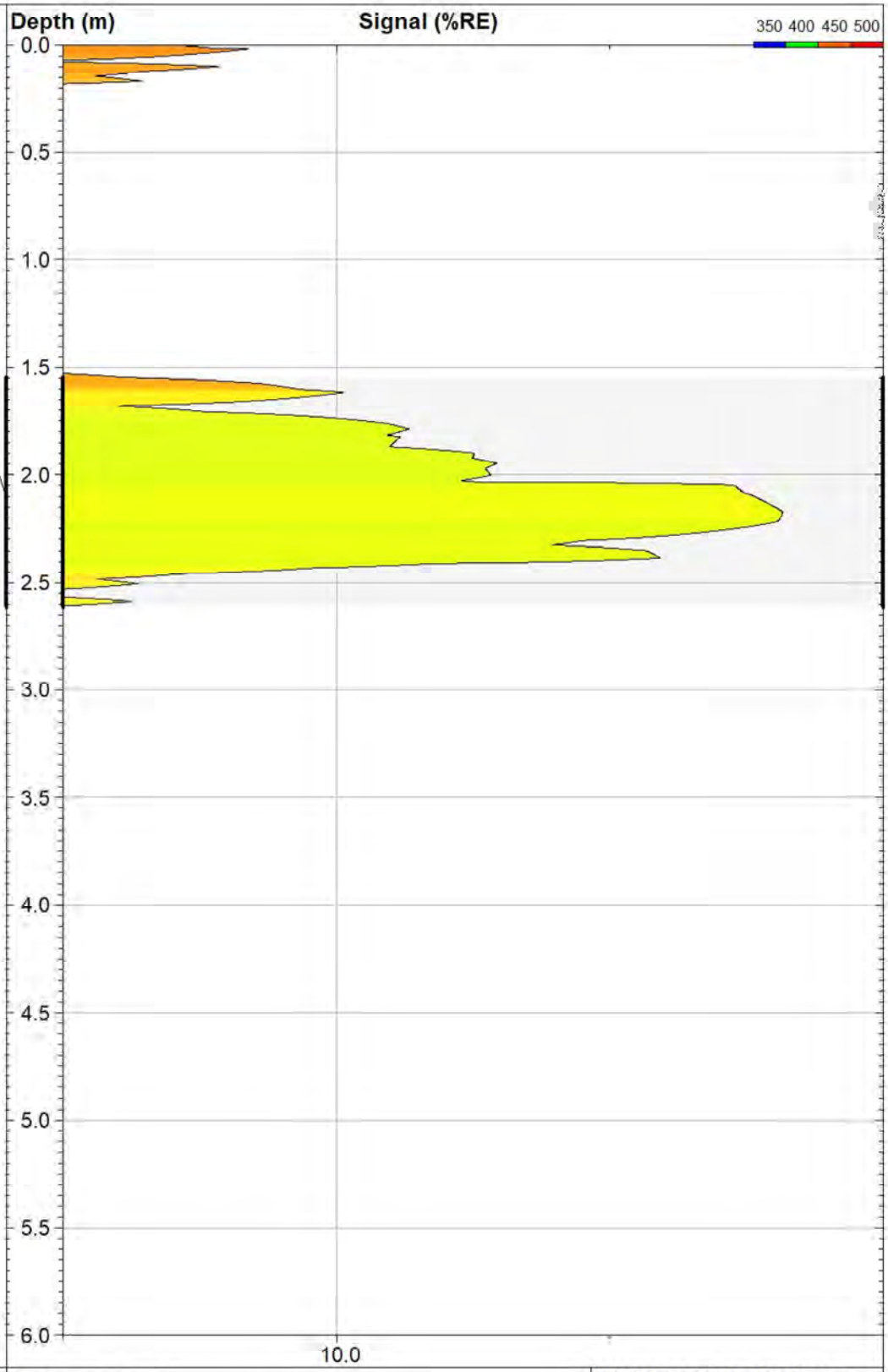
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761732.902 / UTM**	*Final depth:* **3.71 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385610.8511 /**	*Max signal:* **610.4 %RE @ 2.64 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-05 10:44 ADT**

Callouts



1.55 - 2.61 m
113.1 %RE (s 151.9)



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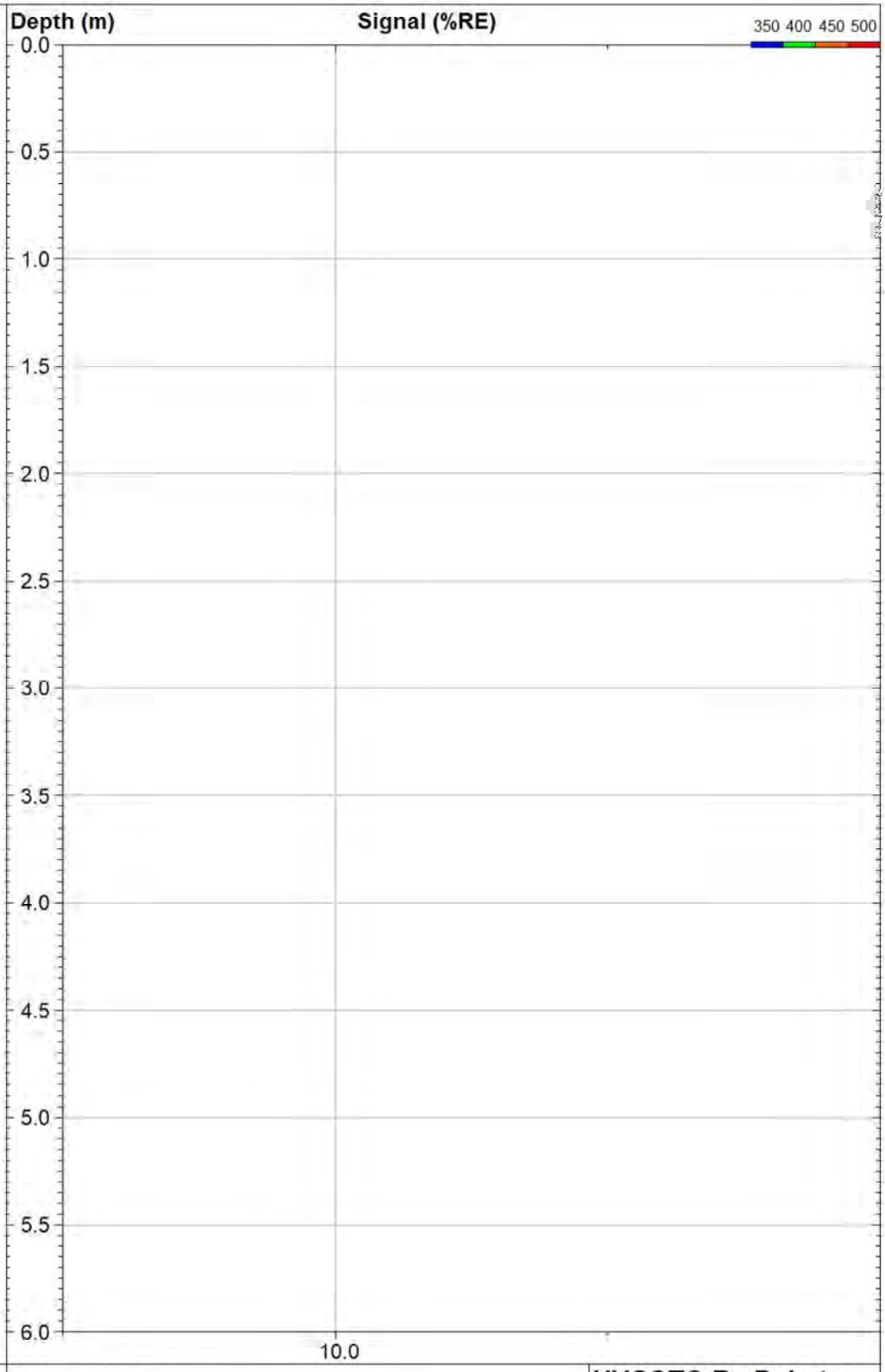
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761751.462 / UTM**	*Final depth:* **3.13 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385599.6316 /**	*Max signal:* **430.1 %RE @ 2.17 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-05 11:04 ADT**

Callouts



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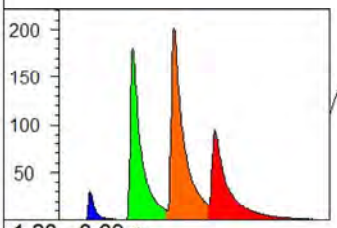
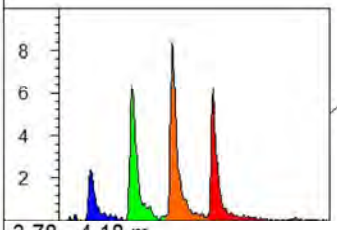
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761759.605 / UTM**	*Final depth:* **3.20 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385593.5524 /**	*Max signal:* **1.9 %RE @ 2.46 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-05 11:20 ADT**

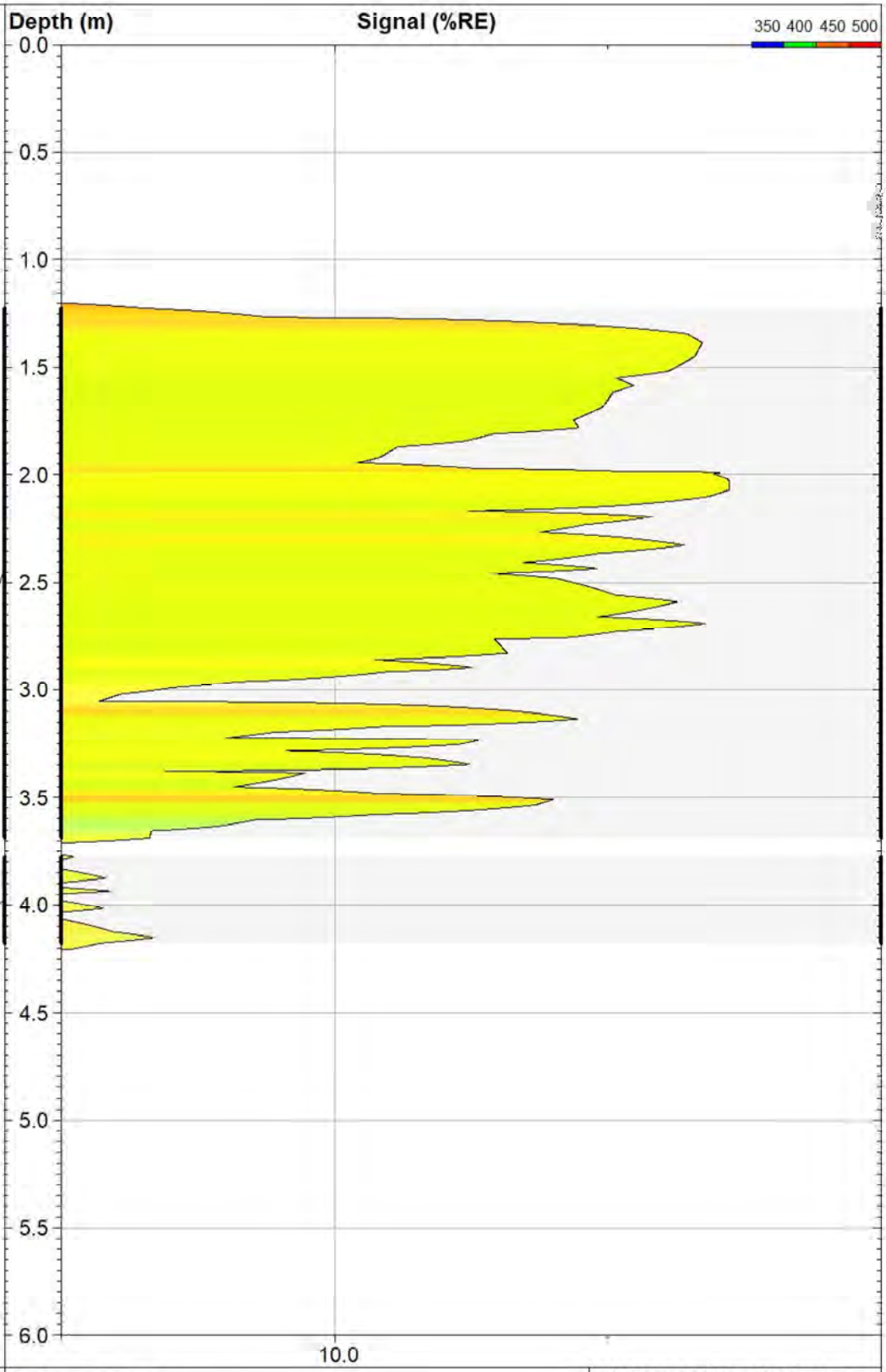
Callouts



1.23 - 3.69 m
79.7 %RE (s 79.4)



3.78 - 4.18 m
2.2 %RE (s 0.4)



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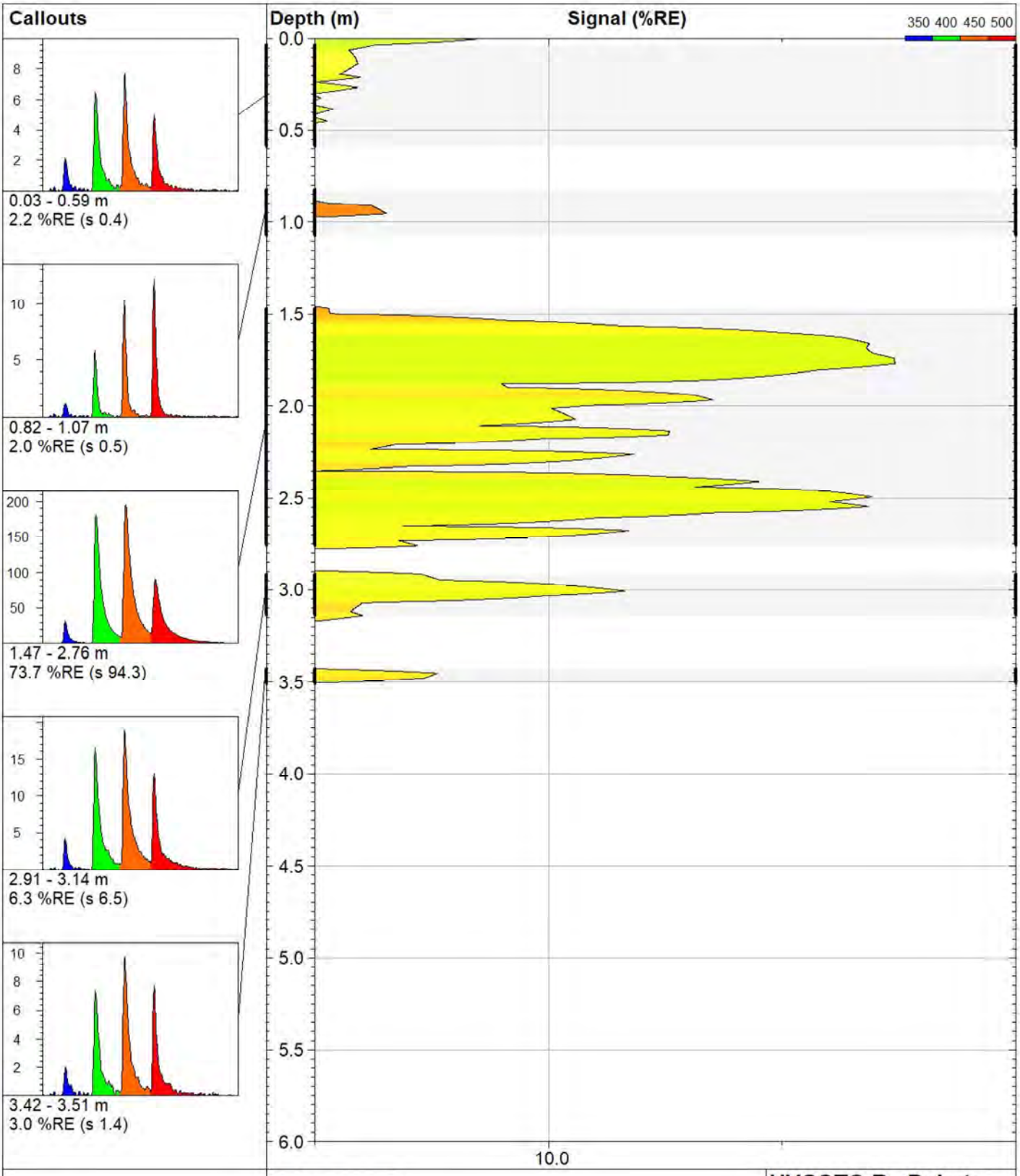
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761772.367 / UTM**	*Final depth:* **4.38 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385609.5676 /**	*Max signal:* **279.9 %RE @ 2.07 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-05 11:43 ADT**



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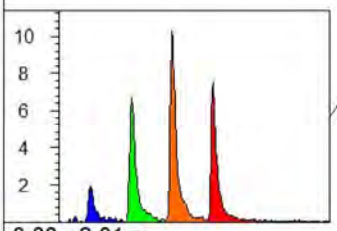
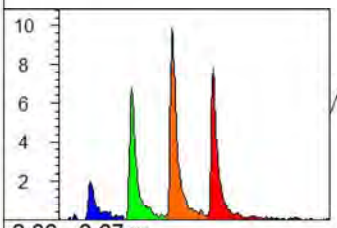
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761786.139 / UTM**	*Final depth:* **3.69 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385597.112 /**	*Max signal:* **304.6 %RE @ 1.77 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-05 12:06 ADT**

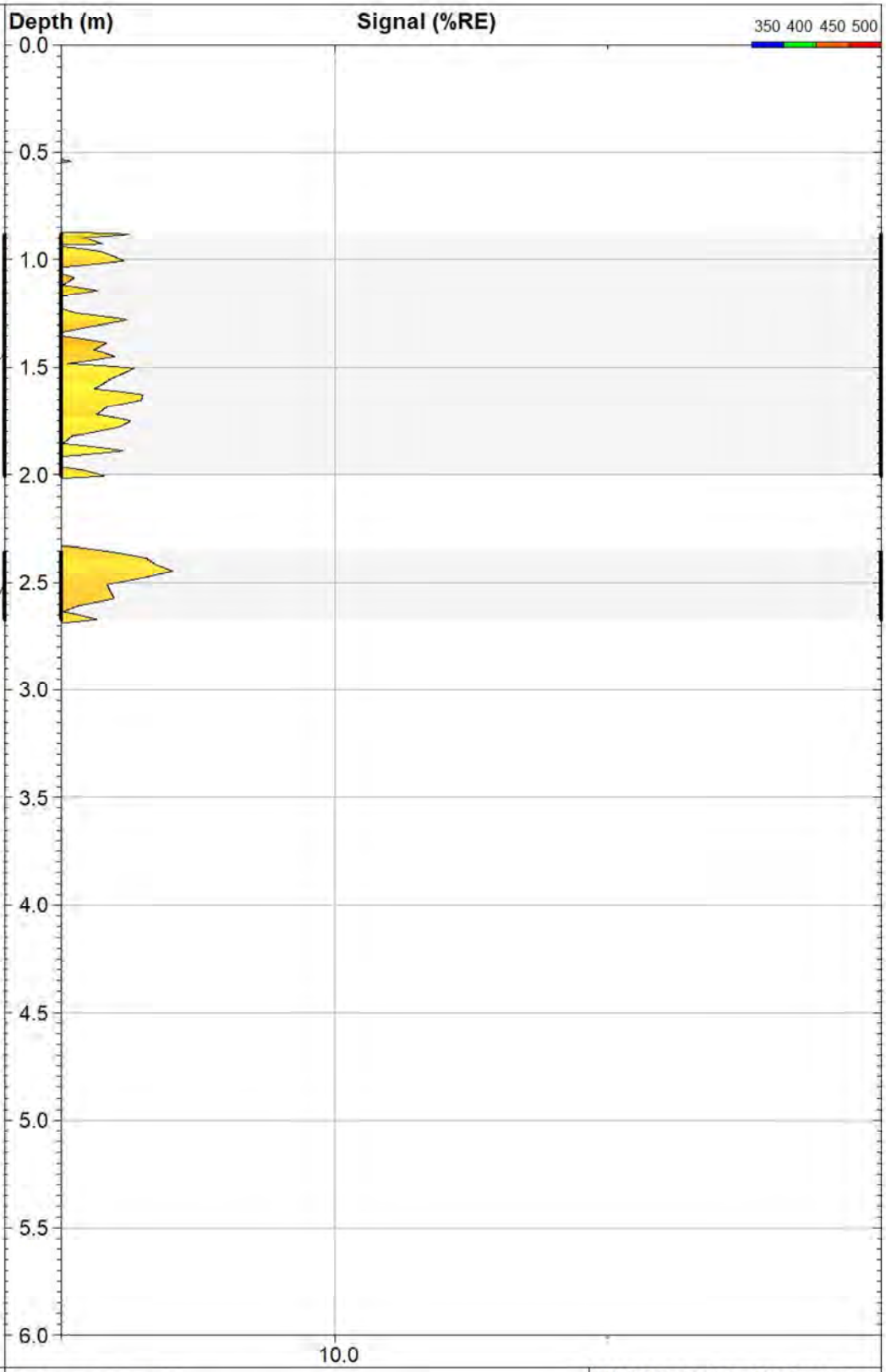
Callouts



0.88 - 2.01 m
2.3 %RE (s 0.3)



2.36 - 2.67 m
2.6 %RE (s 0.5)



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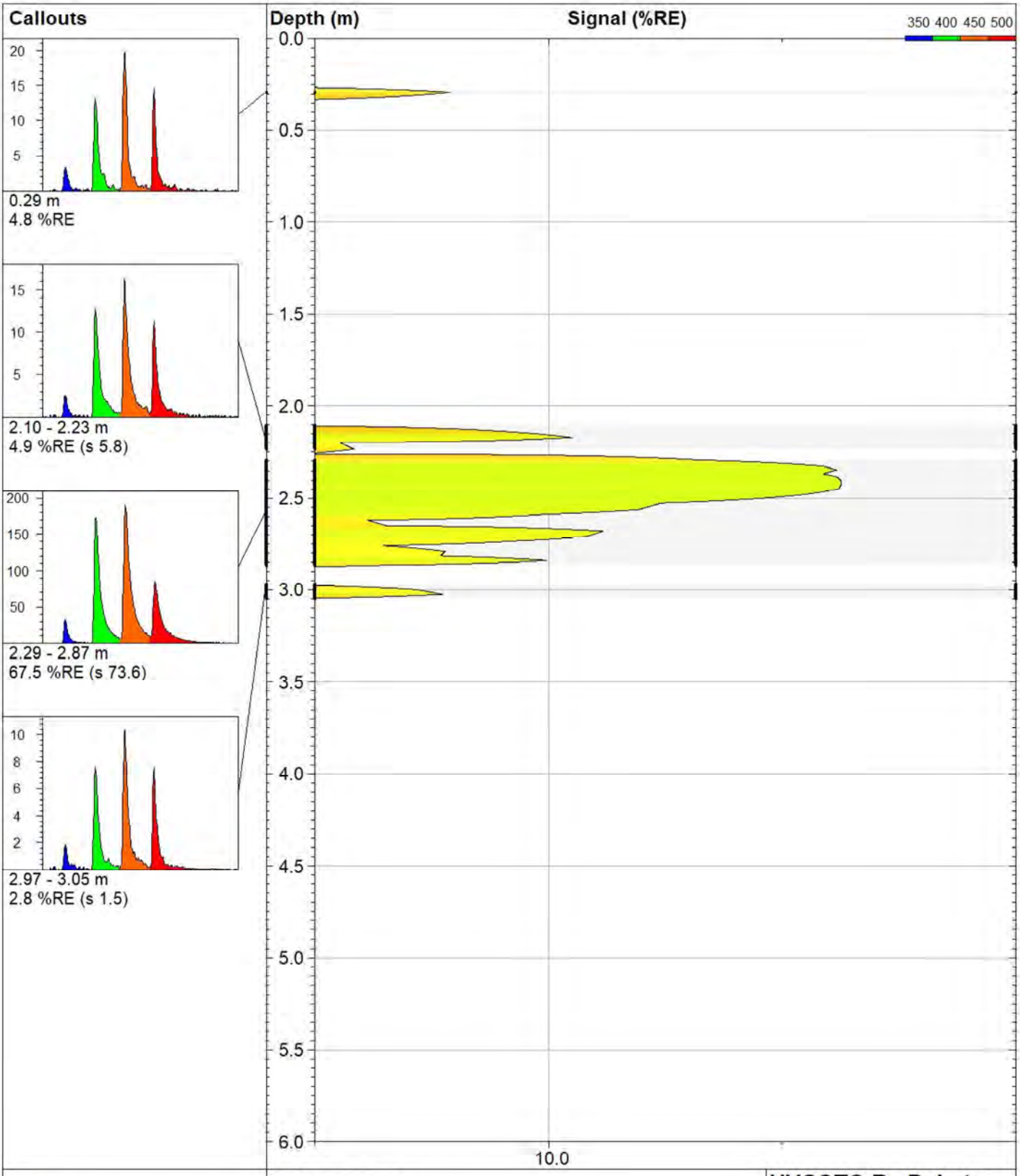
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761799.723 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385582.637 /**	*Max signal:* **3.5 %RE @ 2.45 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **177.7 m**	*Date & Time:* **2020-05-05 12:45 ADT**



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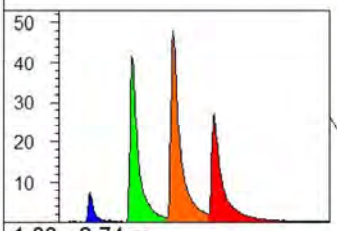
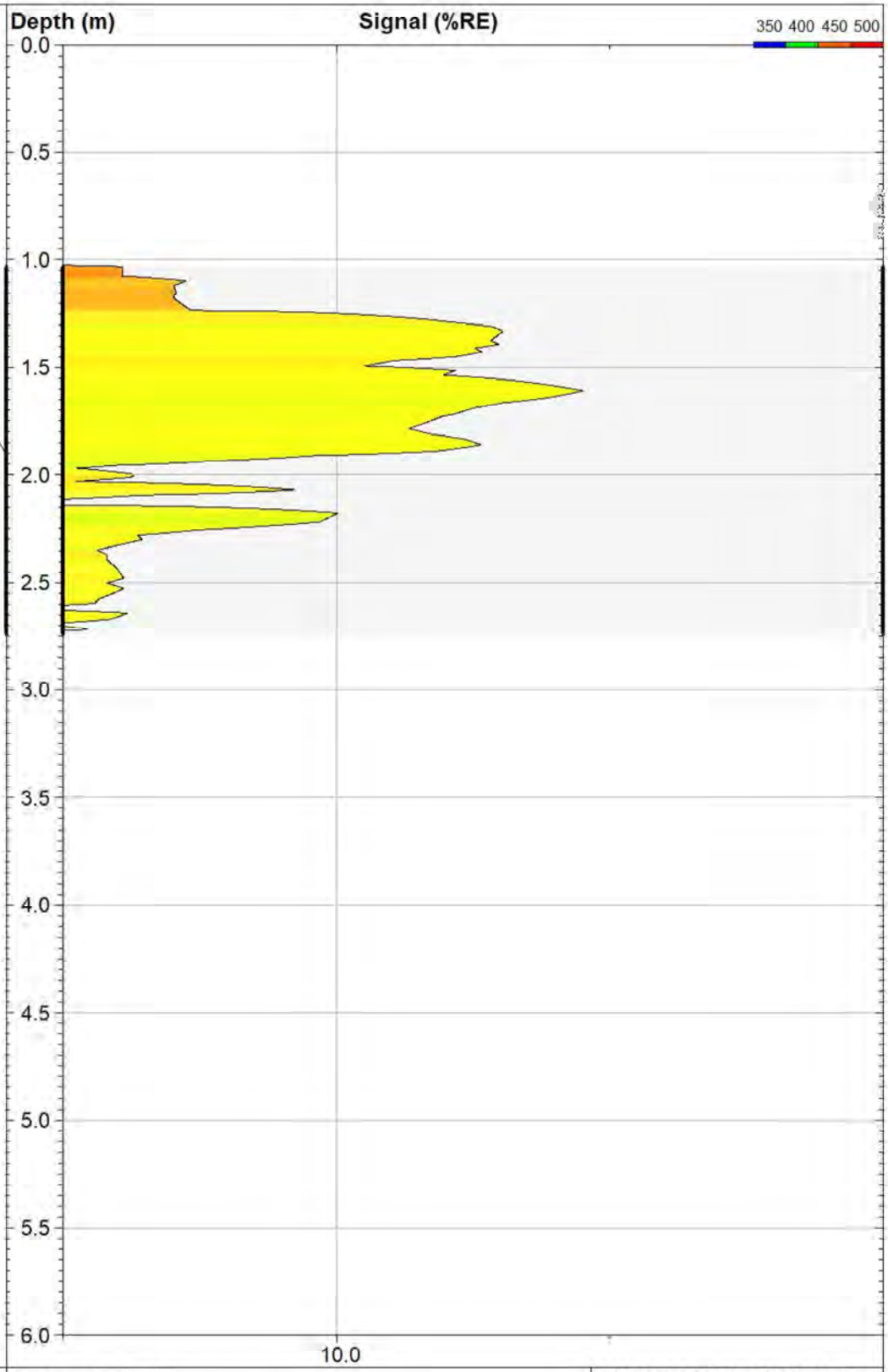
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761776.103 / UTM**	*Final depth:* **3.63 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385582.2439 /**	*Max signal:* **179.4 %RE @ 2.43 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-05 13:08 ADT**

Callouts



1.03 - 2.74 m
14.8 %RE (s 17.5)



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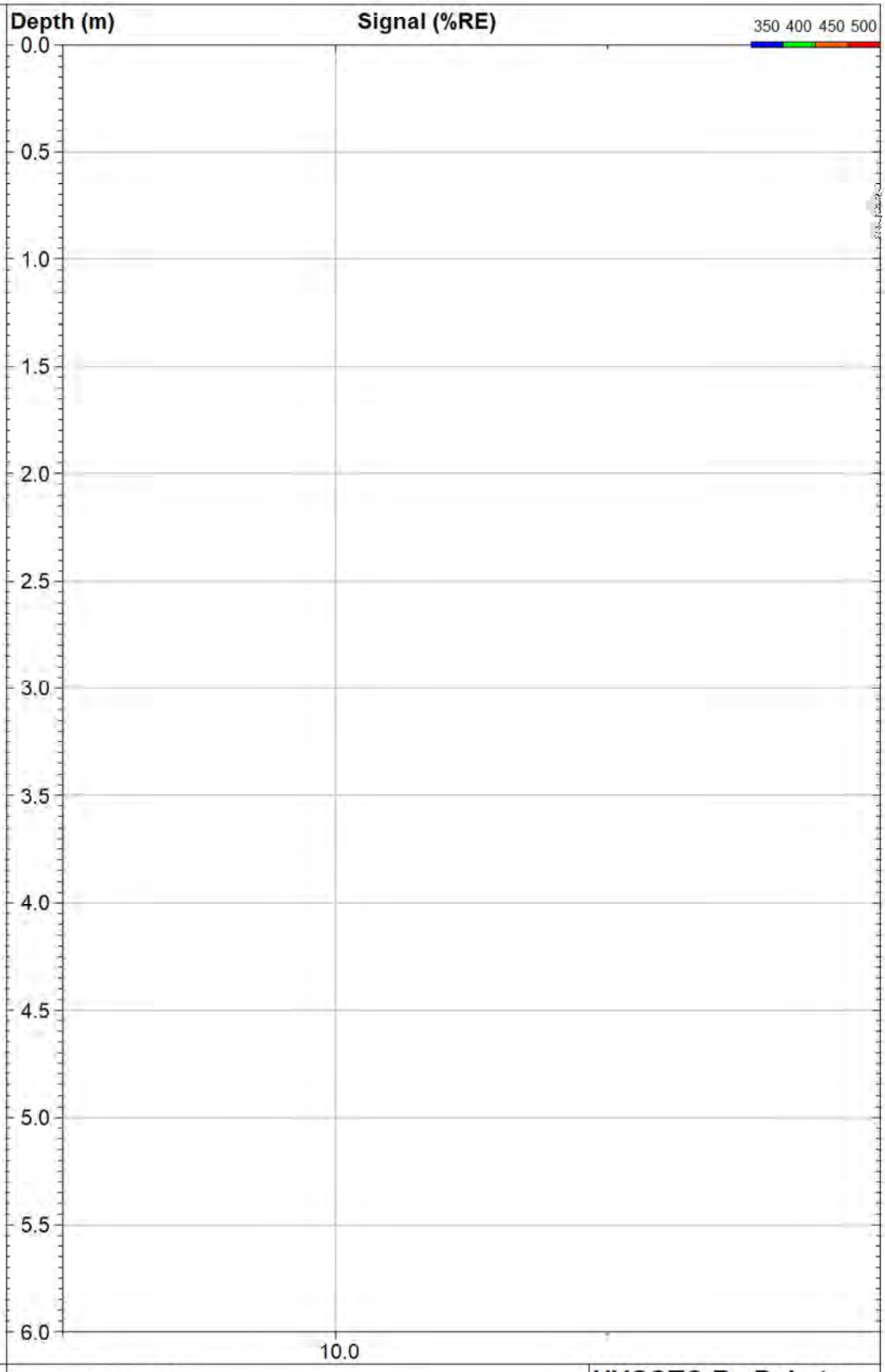
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761641.064 / UTM**	*Final depth:* **3.19 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385645.6297 /**	*Max signal:* **80.8 %RE @ 1.61 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.4 m**	*Date & Time:* **2020-05-05 14:02 ADT**

Callouts



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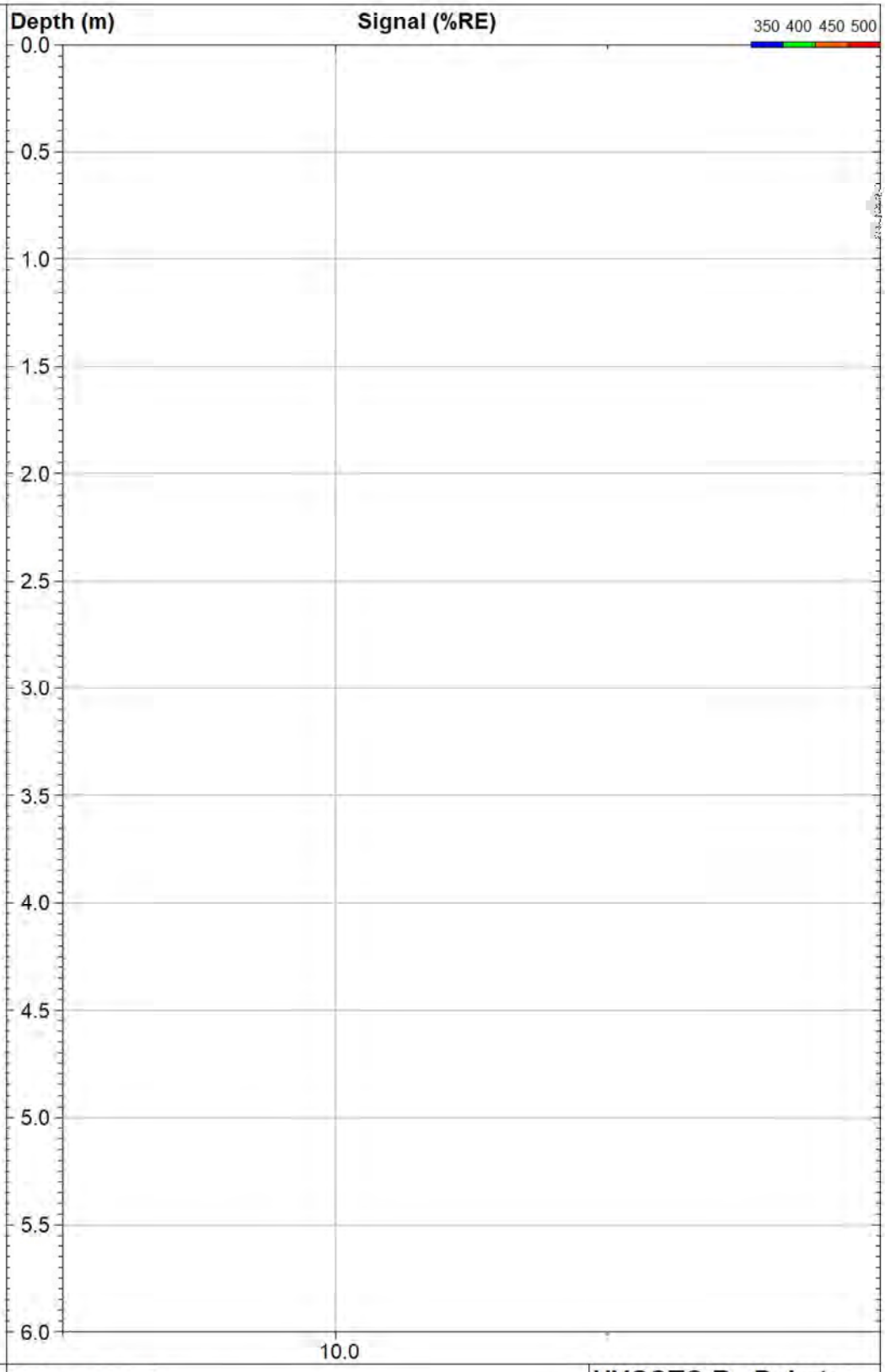
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761593.018 / UTM**	*Final depth:* **3.05 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385647.0857 /**	*Max signal:* **1.5 %RE @ 2.69 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-05 14:23 ADT**

Callouts



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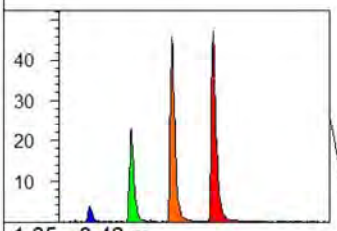
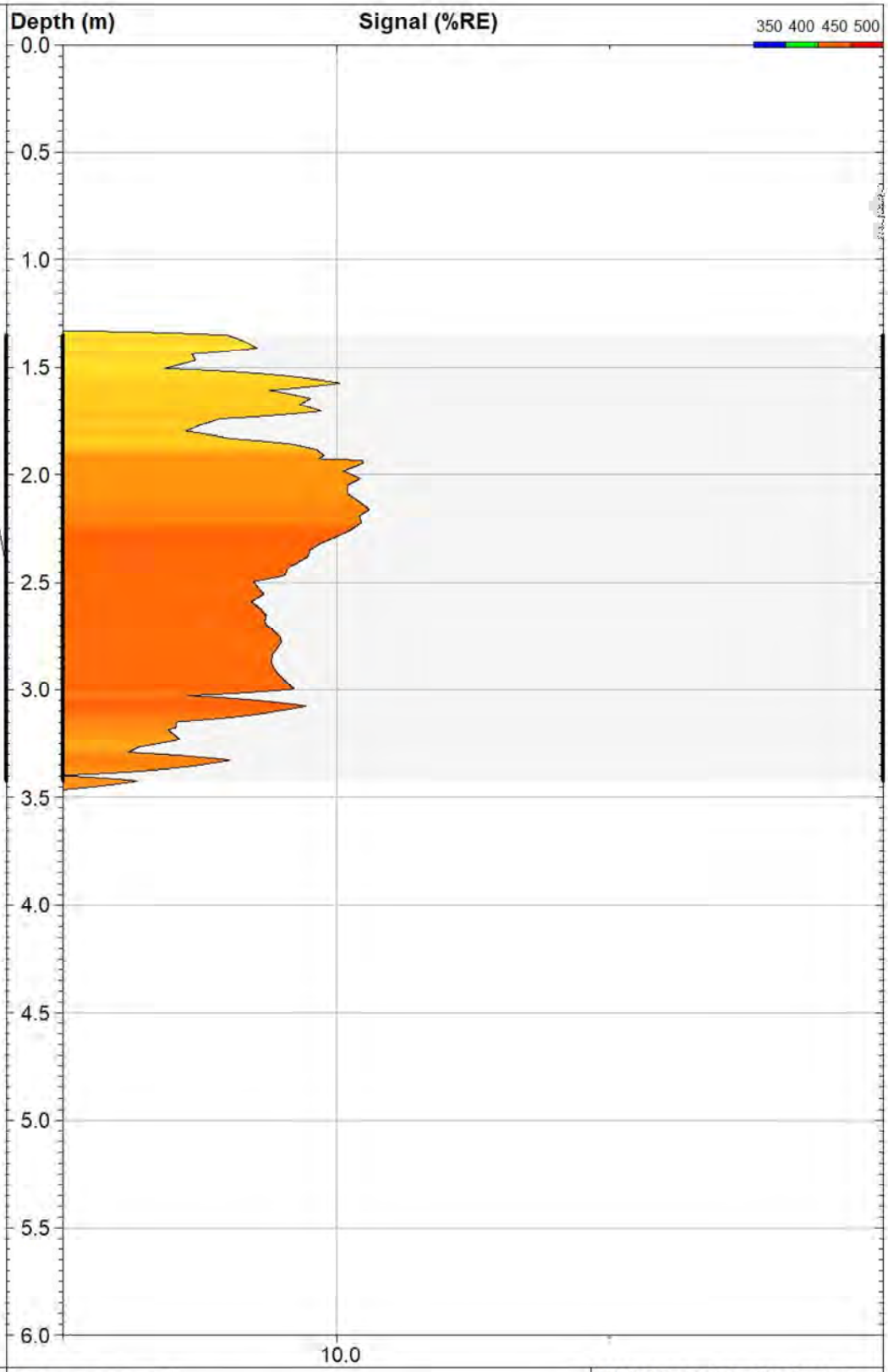
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761617.689 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385643.8344 /**	*Max signal:* **1.4 %RE @ 3.07 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-05 14:41 ADT**

Callouts



1.35 - 3.42 m
7.3 %RE (s 3.2)



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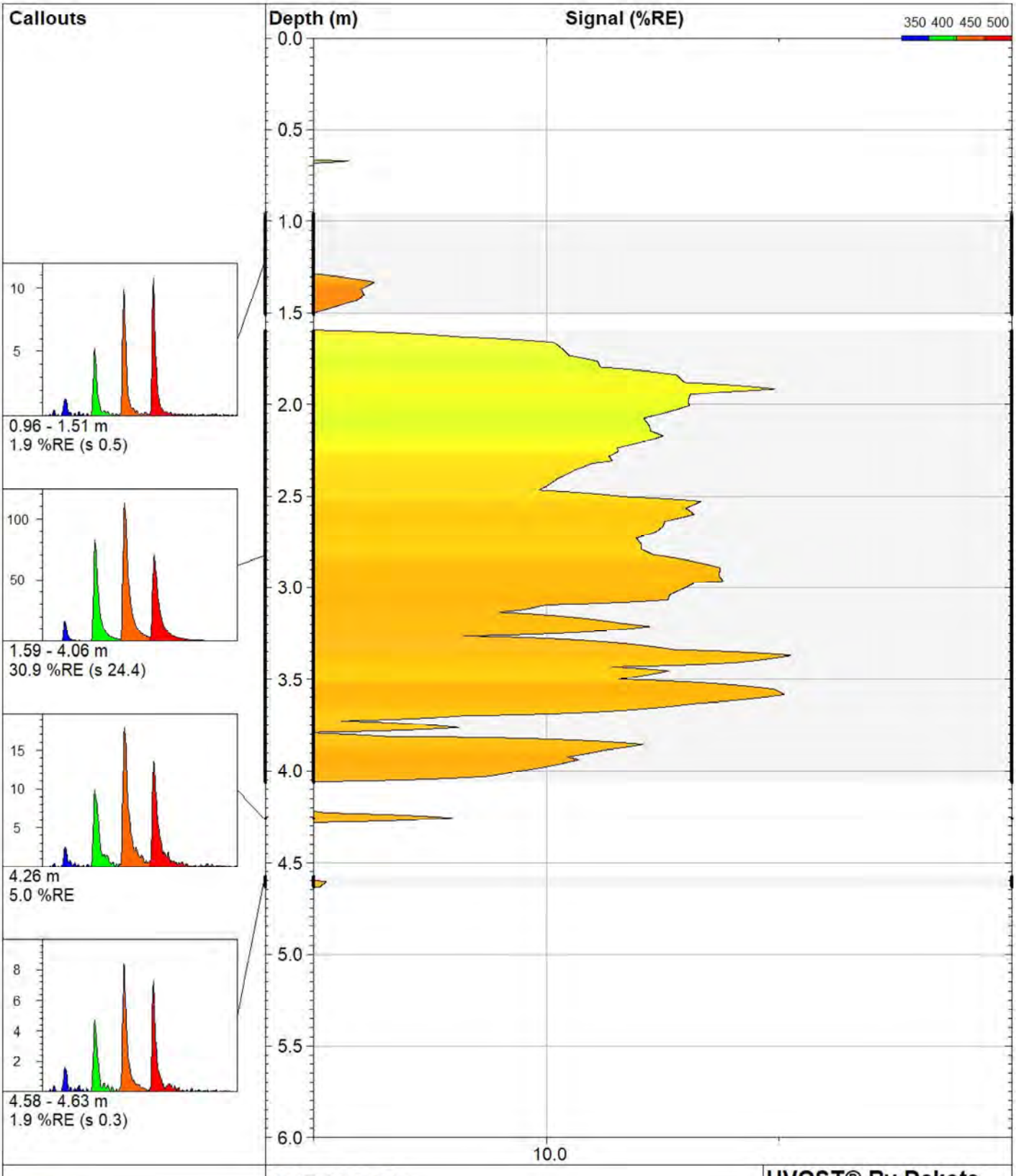
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761614.997 / UTM**	*Final depth:* **4.27 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385674.3731 /**	*Max signal:* **14.2 %RE @ 2.16 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-05 14:55 ADT**



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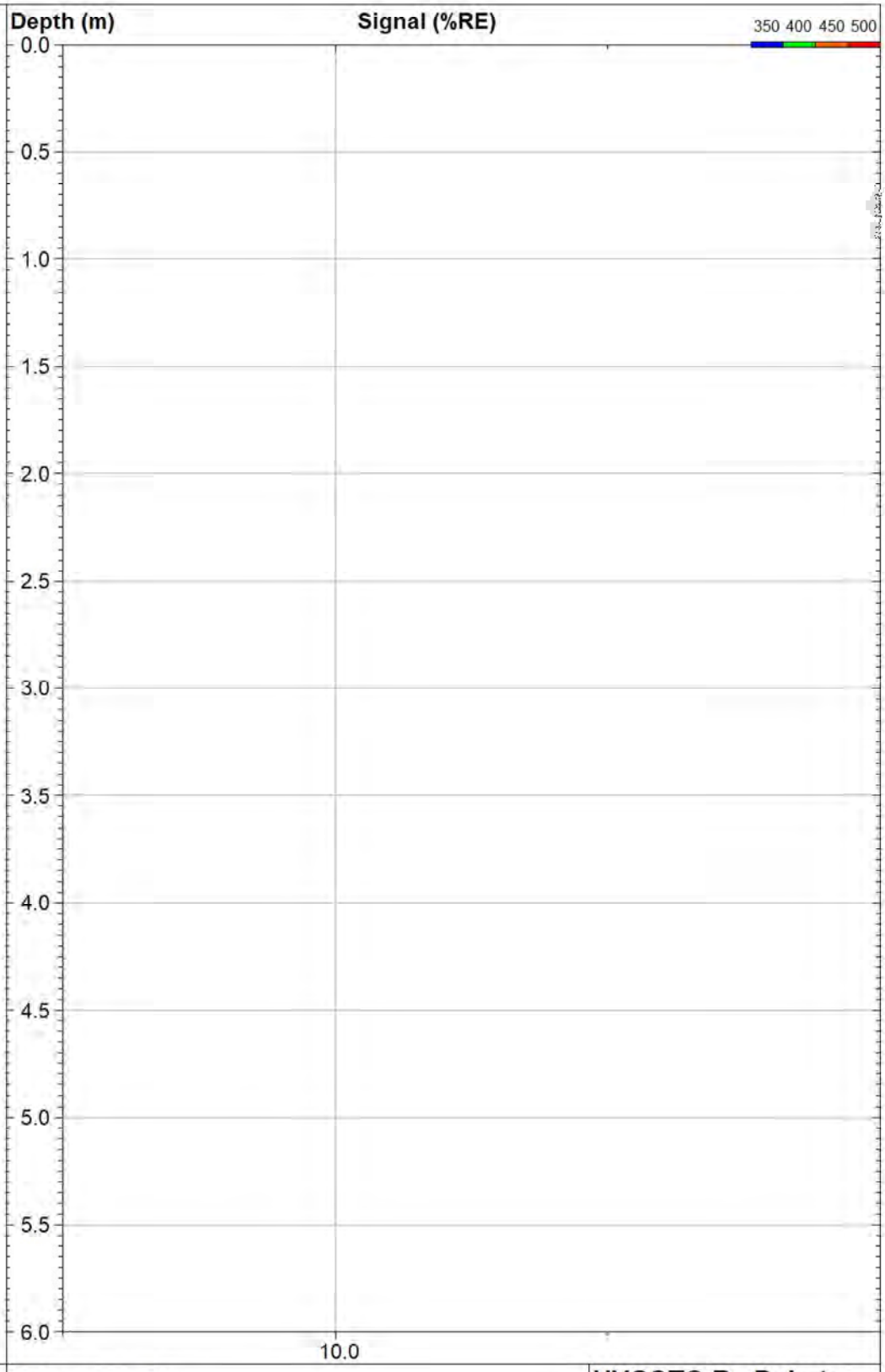
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761644.3 / UTM**	*Final depth:* **5.52 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385675.2057 /**	*Max signal:* **113.2 %RE @ 3.37 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-05 15:17 ADT**

Callouts



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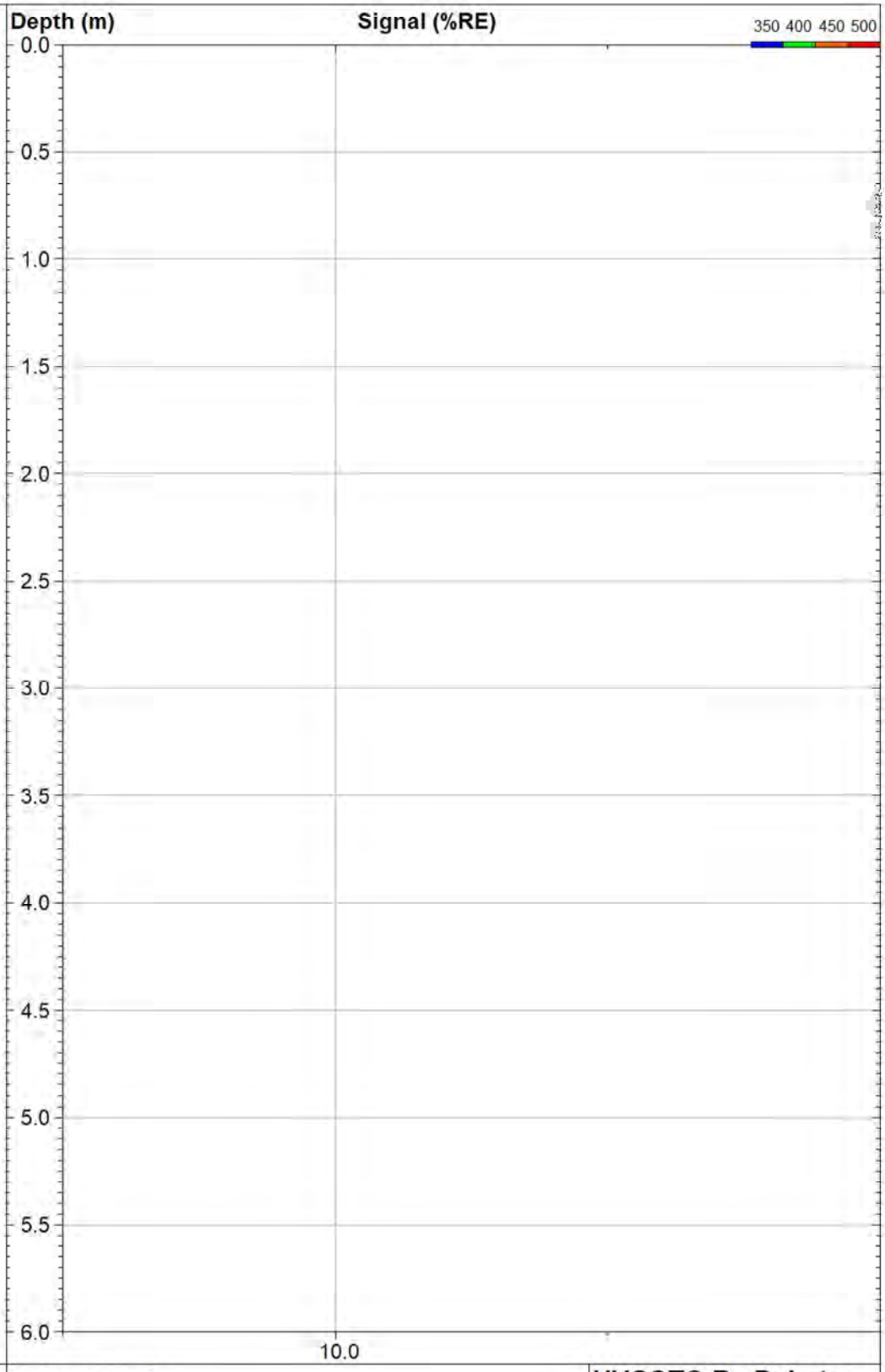
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761588.393 / UTM**	*Final depth:* **3.18 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385674.0284 /**	*Max signal:* **1.8 %RE @ 0.97 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-05 15:36 ADT**

Callouts



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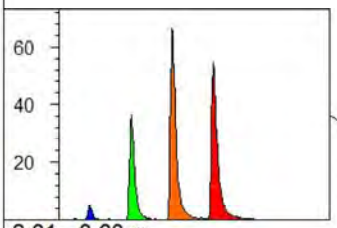
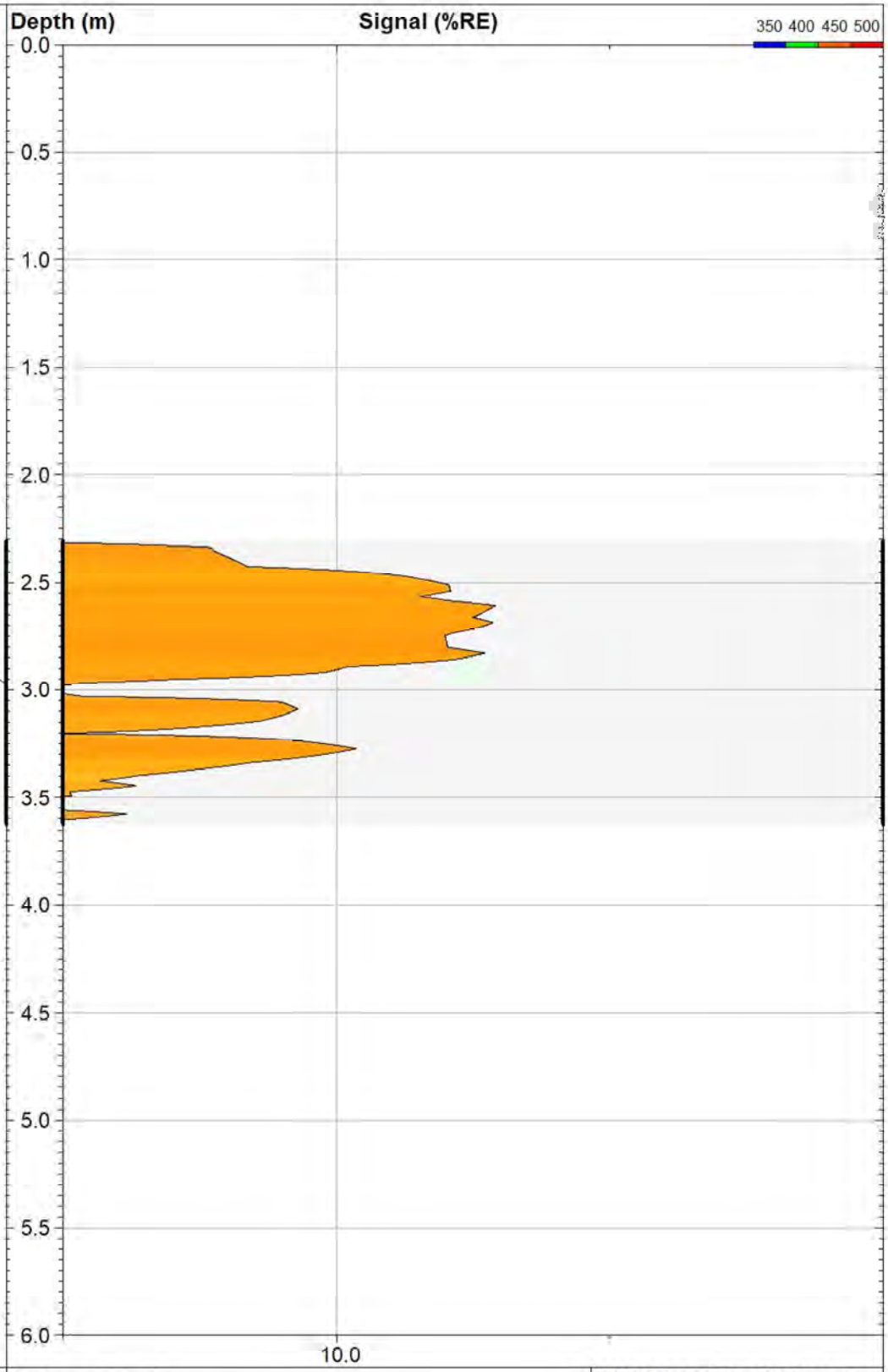
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761563.217 / UTM**	*Final depth:* **3.05 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385671.921 /**	*Max signal:* **1.3 %RE @ 1.17 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-05 16:06 ADT**

Callouts



2.31 - 3.63 m
12.1 %RE (s 12.2)



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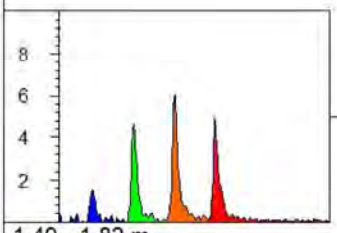
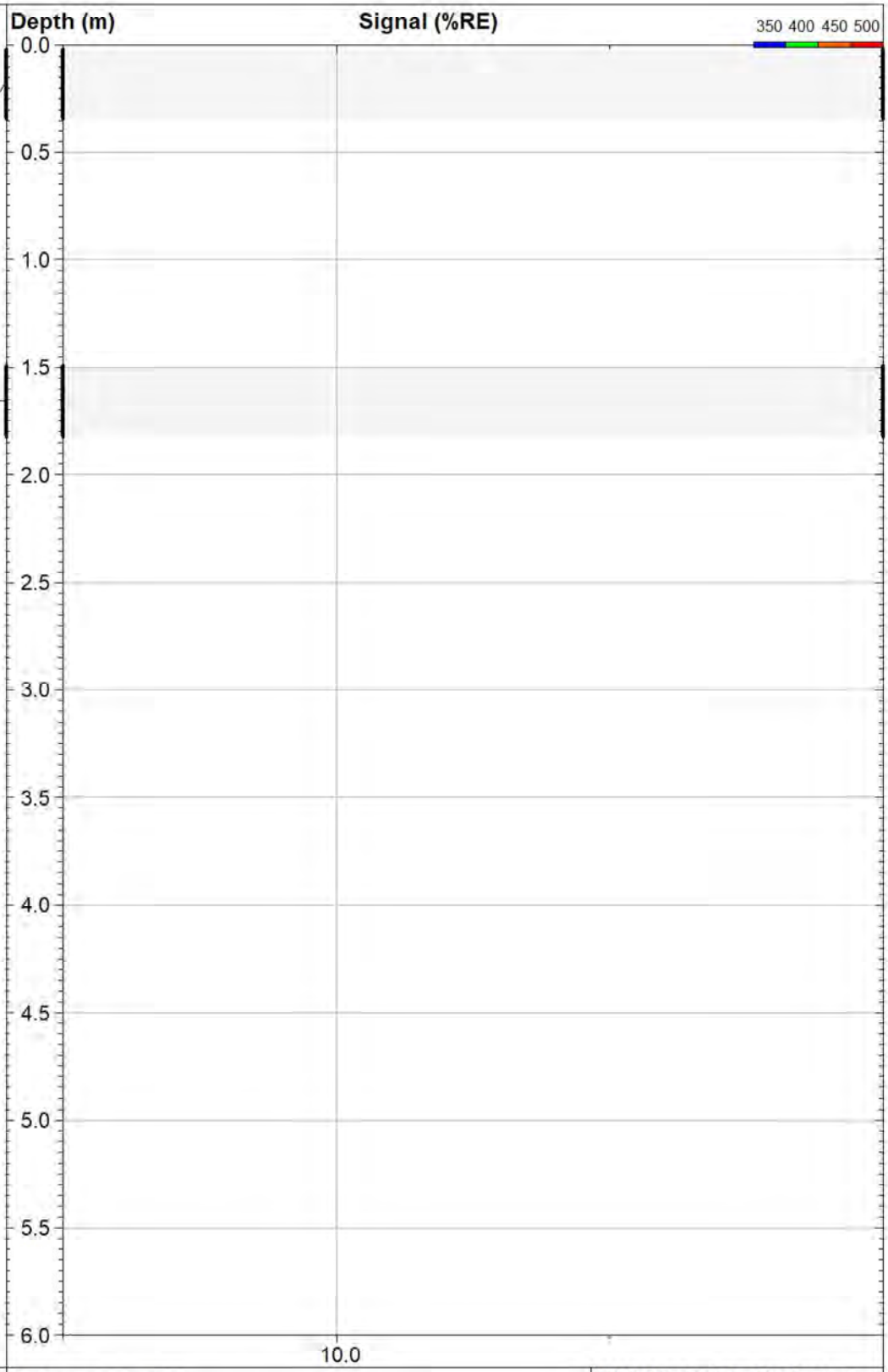
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761558.946 / UTM**	*Final depth:* **4.40 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385684.2863 /**	*Max signal:* **39.1 %RE @ 2.61 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-05 16:20 ADT**

Callouts

Note 0.02-0.34:
First 0.3 m invalid. Logging started 0.3 m early above ground surface.



1.49 - 1.82 m
1.5 %RE (s 0.2)



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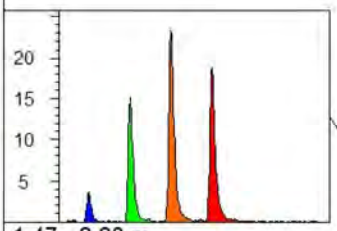
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761585.174 / UTM**	*Final depth:* **3.59 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385688.5302 /**	*Max signal:* **1.8 %RE @ 1.55 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.8 m**	*Date & Time:* **2020-05-29 10:20 ADT**

Callouts



1.47 - 2.28 m
4.5 %RE (s 2.7)

Depth (m) **Signal (%RE)** 350 400 450 500

0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
10.0

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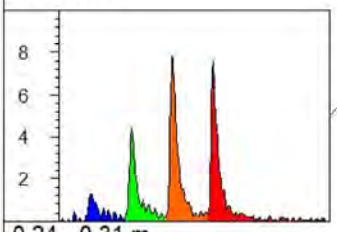
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761615.821 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385692.2071 /**	*Max signal:* **7.9 %RE @ 1.74 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.8 m**	*Date & Time:* **2020-05-05 16:47 ADT**

Callouts



0.24 - 0.31 m
2.4 %RE (s 0.8)

Depth (m) **Signal (%RE)** 350 400 450 500

0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
10.0

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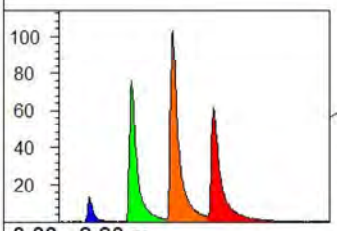
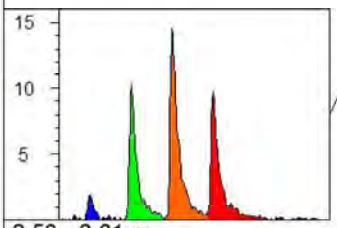
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761993.903 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385801.0486 /**	*Max signal:* **3.3 %RE @ 0.28 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-06 09:15 ADT**

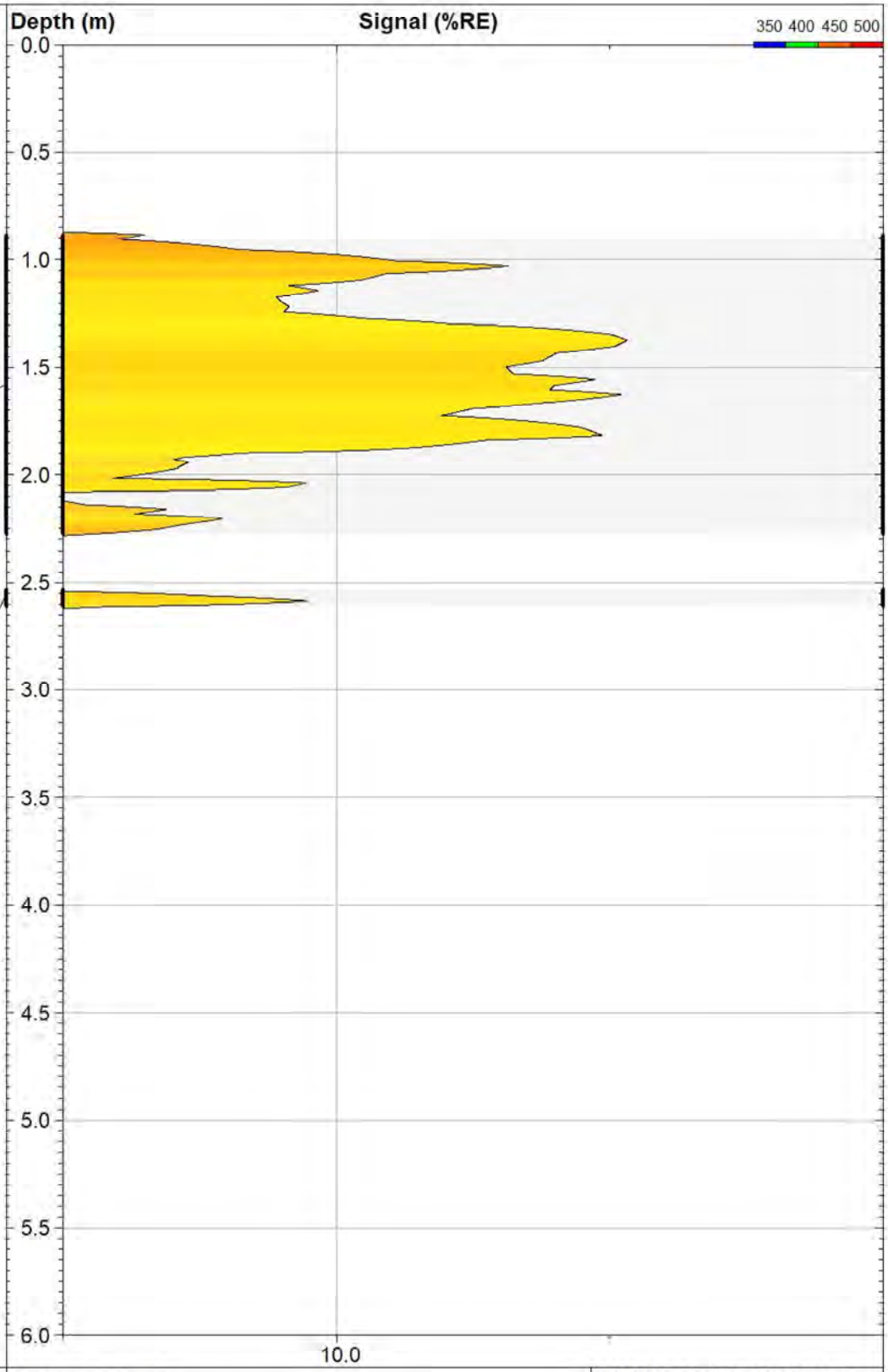
Callouts



0.88 - 2.28 m
29.1 %RE (s 34.2)



2.53 - 2.61 m
4.2 %RE (s 3.4)



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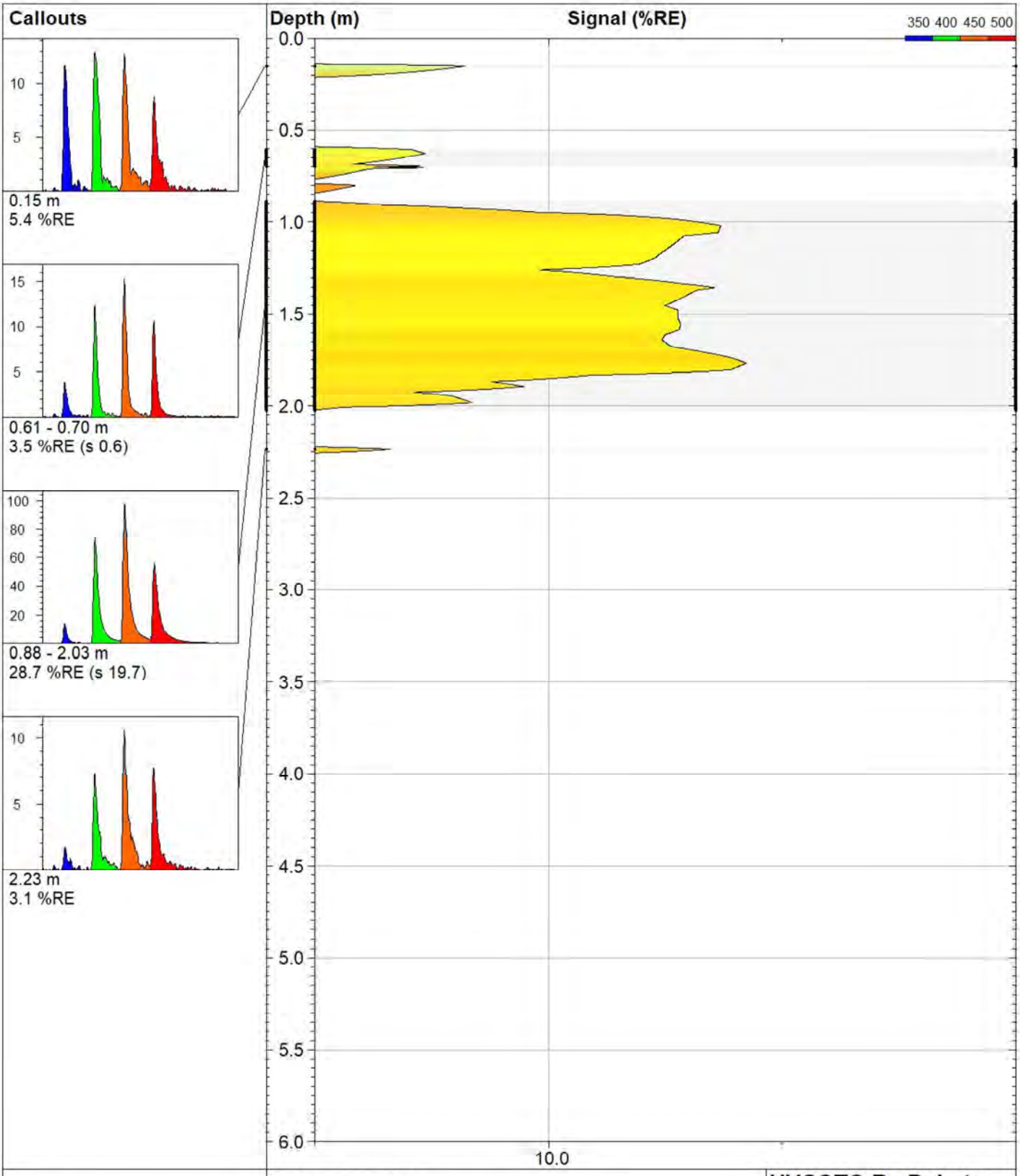
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761988.121 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385803.4526 /**	*Max signal:* **116.3 %RE @ 1.37 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-06 09:33 ADT**



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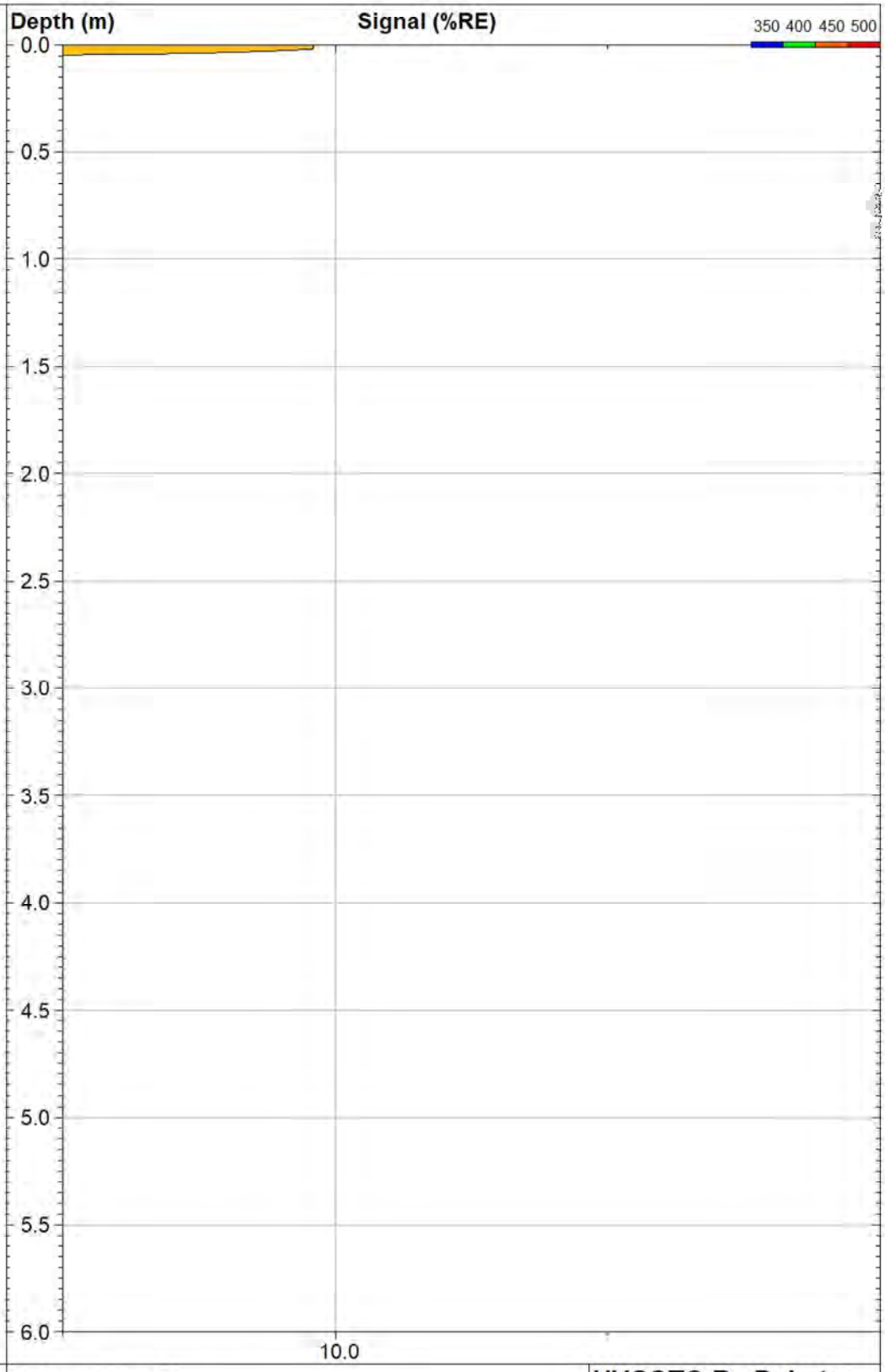
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761989.355 / UTM**	*Final depth:* **3.05 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385785.857 /**	*Max signal:* **71.1 %RE @ 1.77 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-06 11:42 ADT**

Callouts



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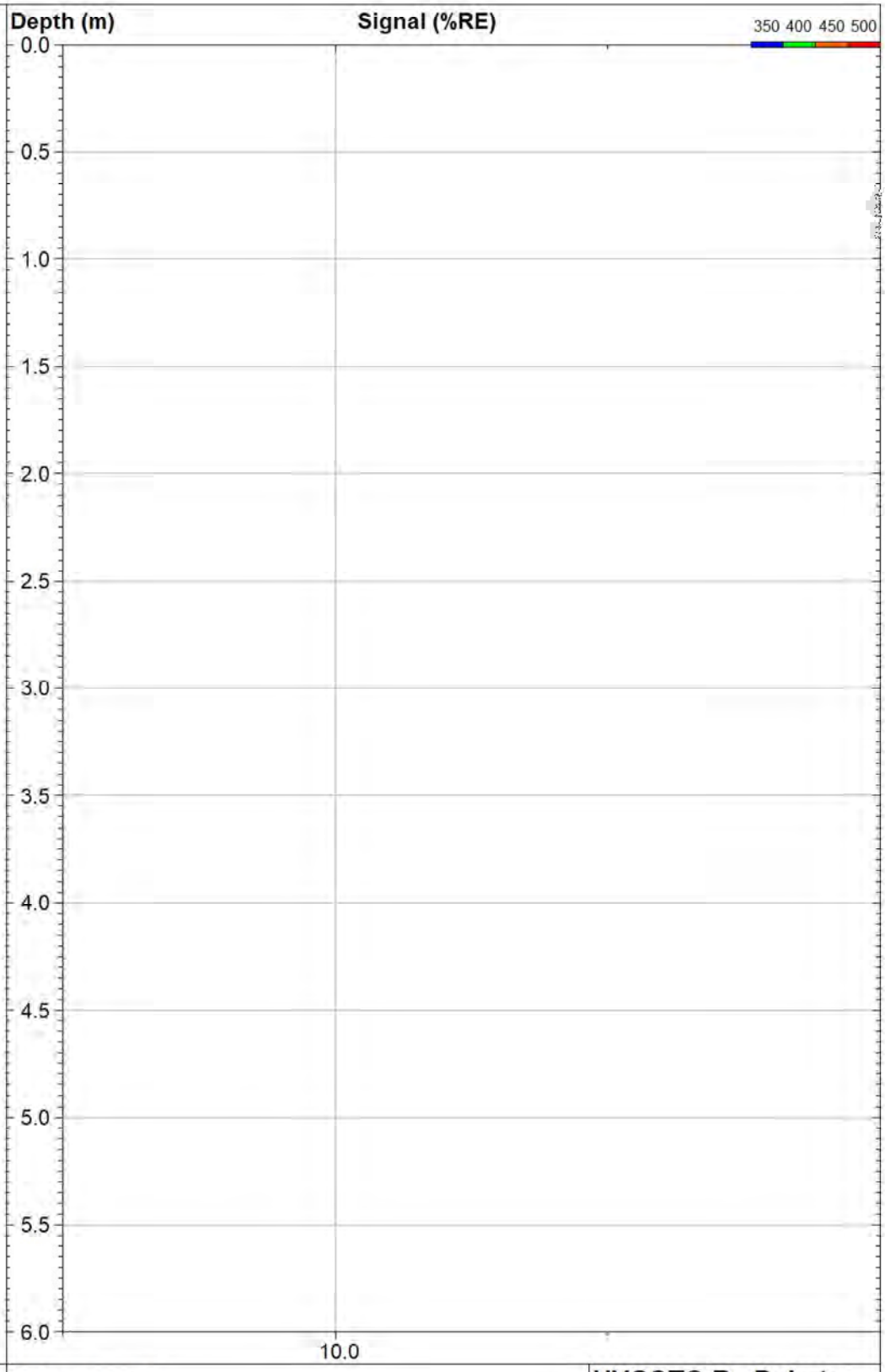
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761993.344 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385776.7694 /**	*Max signal:* **9.3 %RE @ 0.00 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.3 m**	*Date & Time:* **2020-05-06 12:12 ADT**

Callouts



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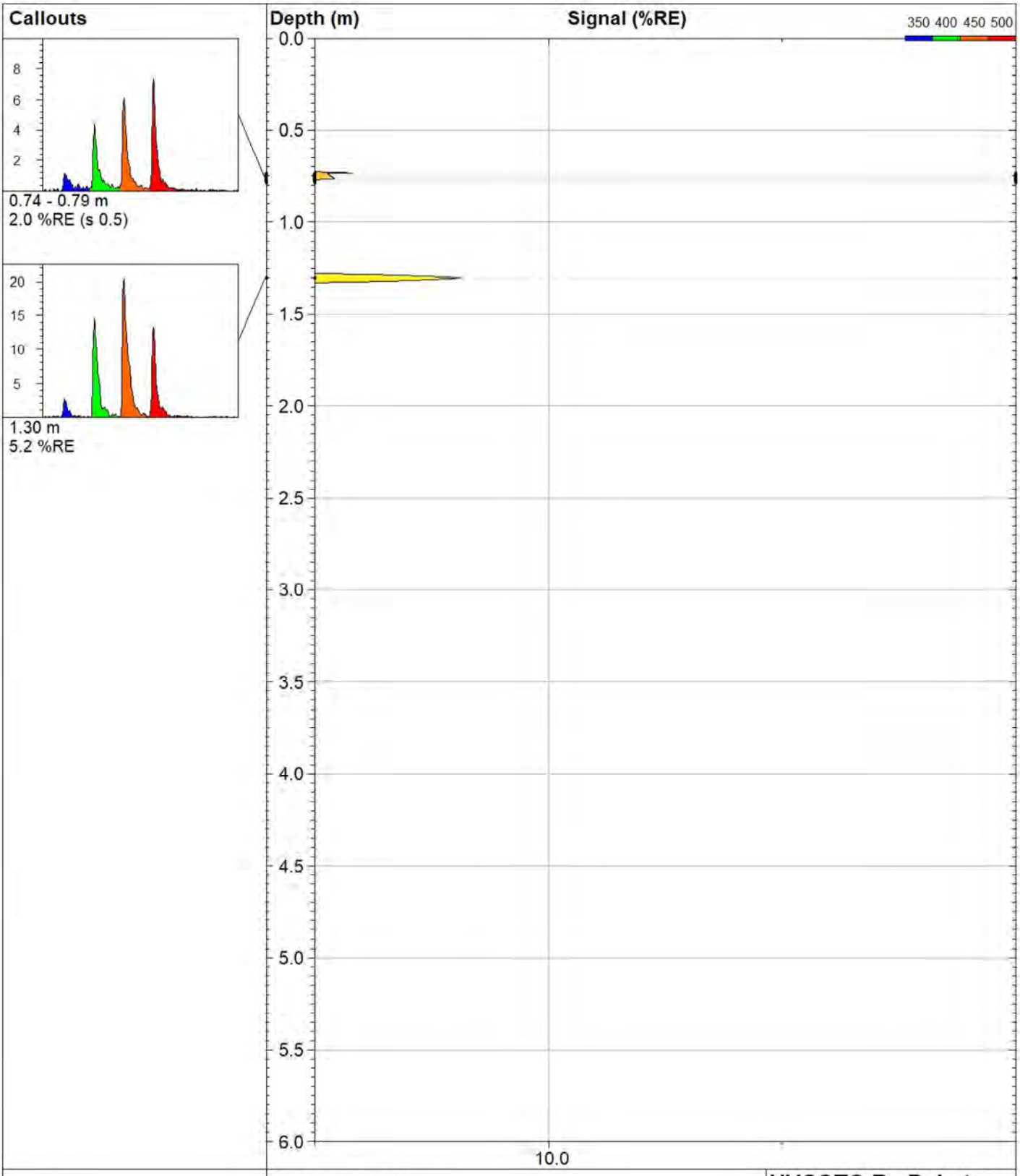
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761982.895 / UTM**	*Final depth:* **3.15 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385776.2999 /**	*Max signal:* **1.6 %RE @ 2.23 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-29 10:25 ADT**



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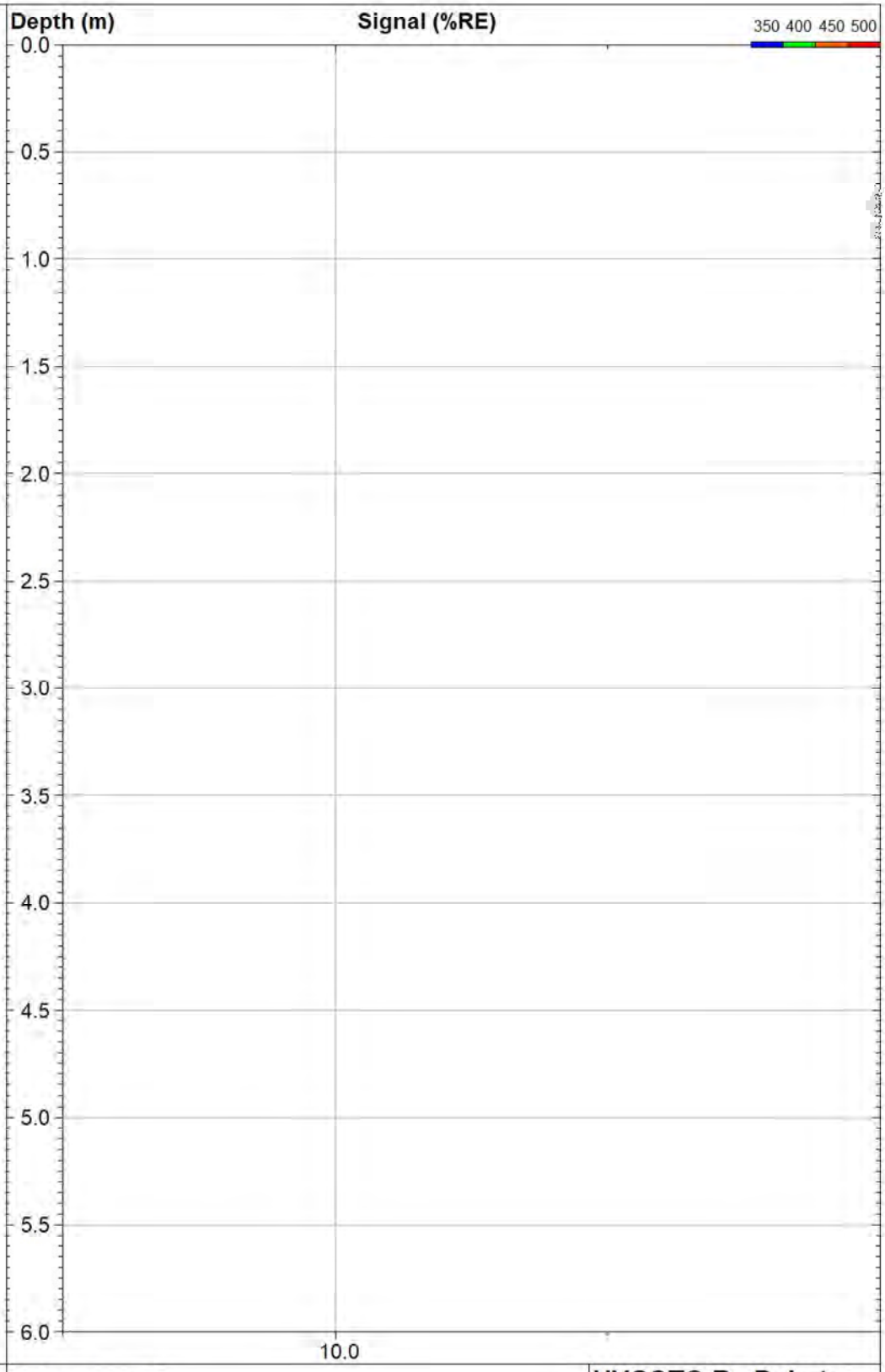
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761971.196 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385775.0114 /**	*Max signal:* **5.2 %RE @ 1.30 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.0 m**	*Date & Time:* **2020-05-06 12:45 ADT**

Callouts



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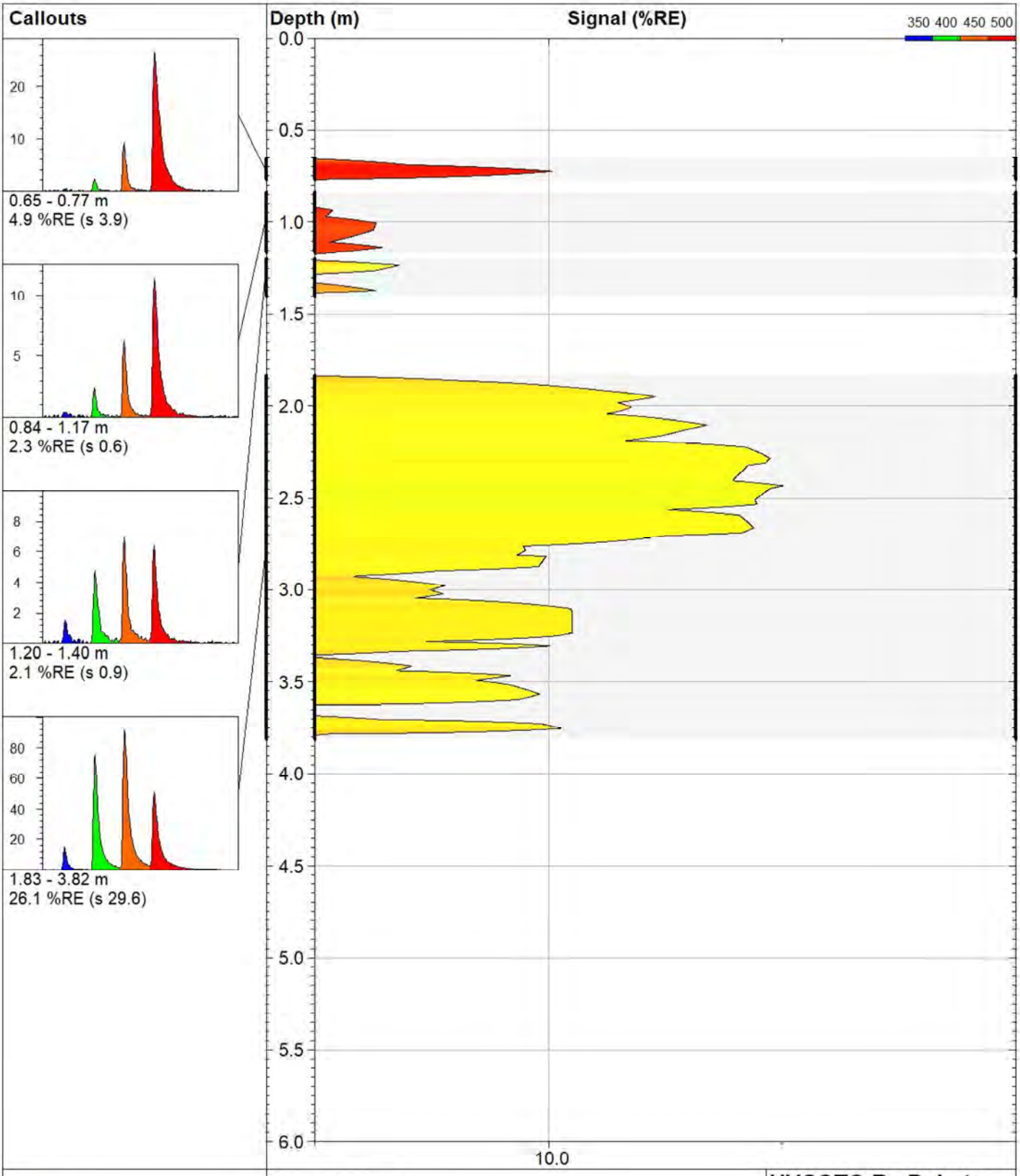
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761969.213 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385787.5837 /**	*Max signal:* **1.5 %RE @ 2.86 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.1 m**	*Date & Time:* **2020-05-06 13:00 ADT**



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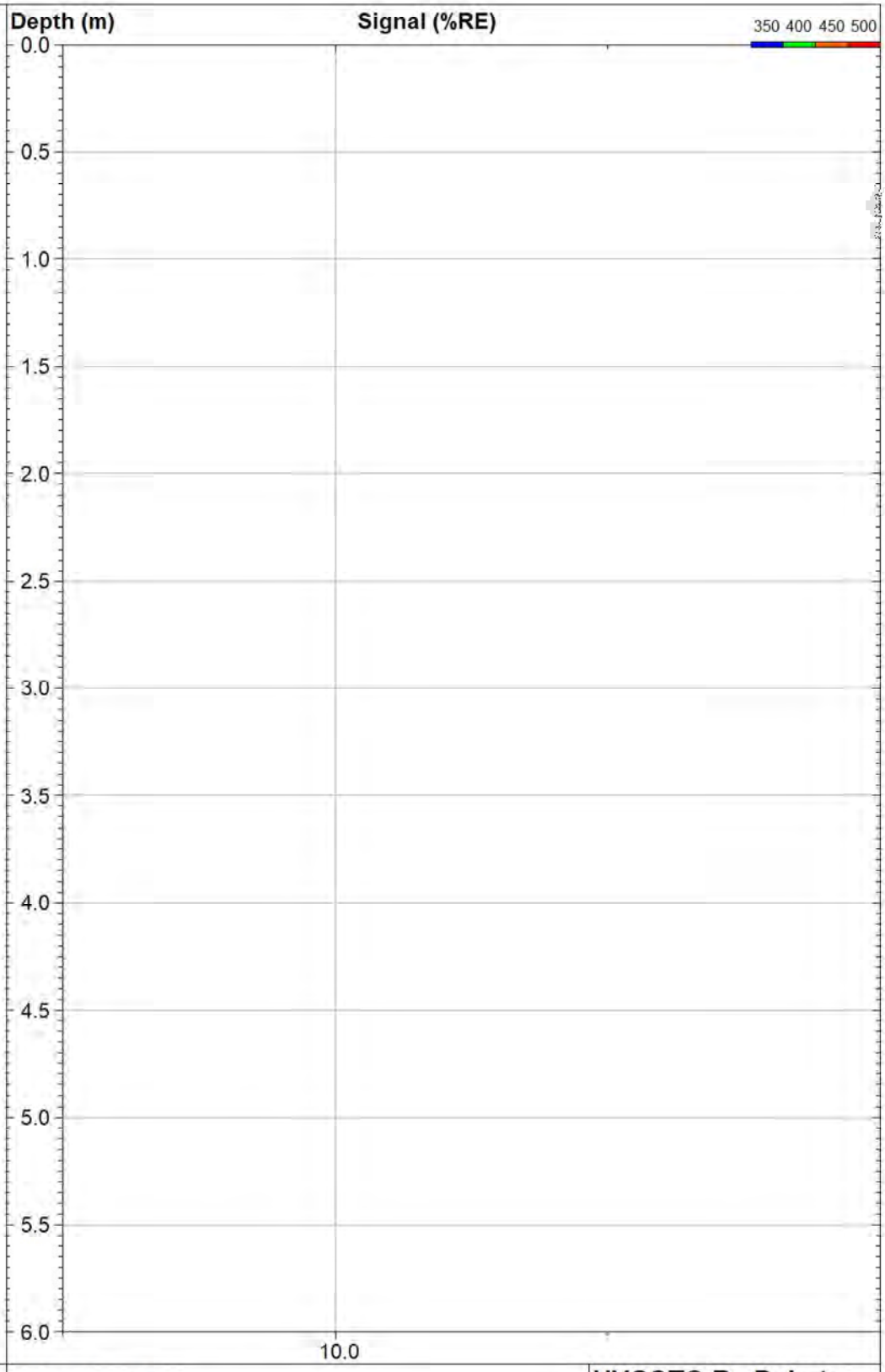
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761969.89 / UTM**	*Final depth:* **4.58 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385799.5506 /**	*Max signal:* **101.9 %RE @ 2.43 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-29 10:27 ADT**

Callouts



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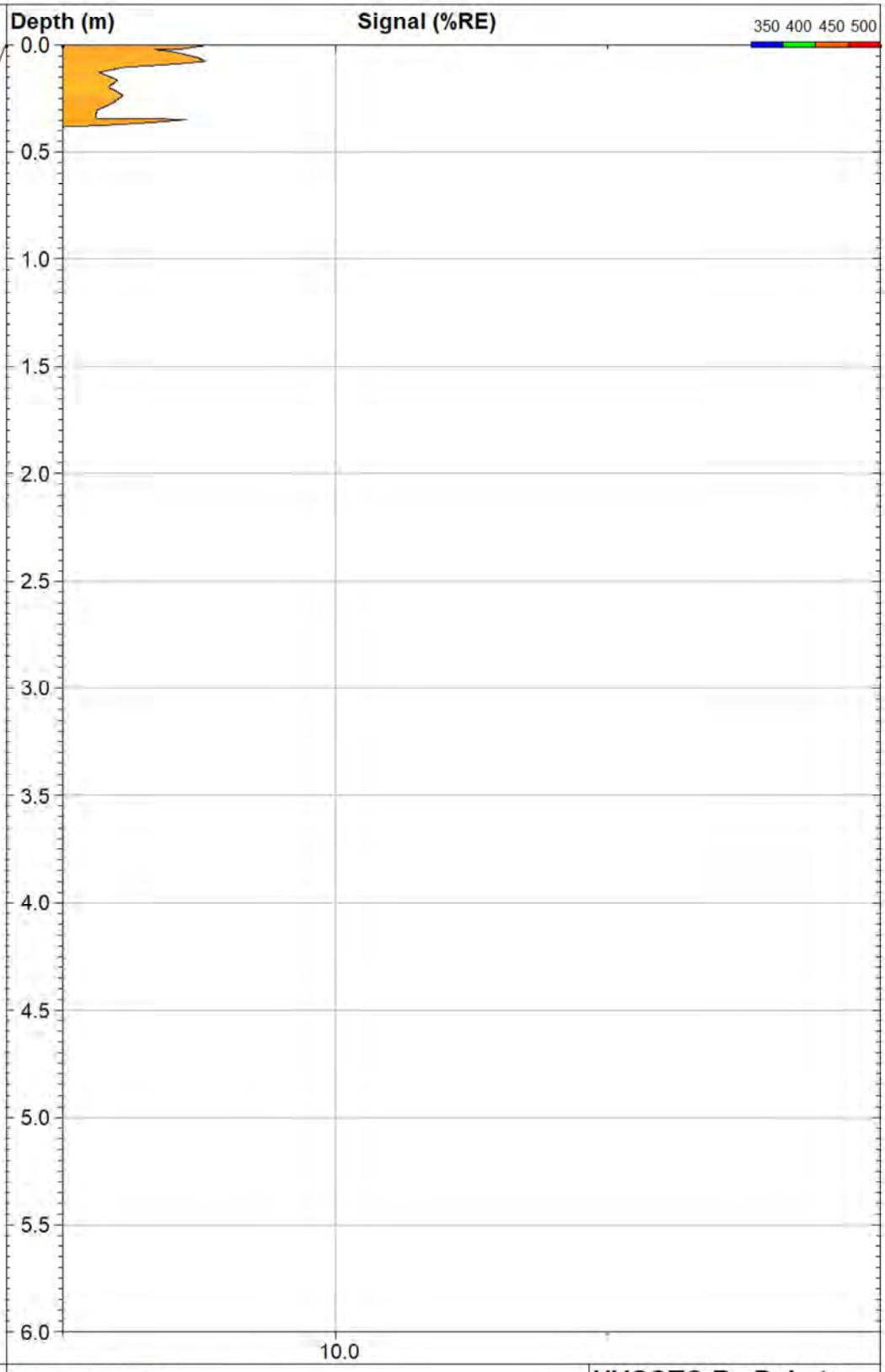
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762000.407 / UTM**	*Final depth:* **3.09 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385786.7344 /**	*Max signal:* **1.5 %RE @ 1.04 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-06 13:55 ADT**

Callouts

Note 0.00:
Asphalt parking lot



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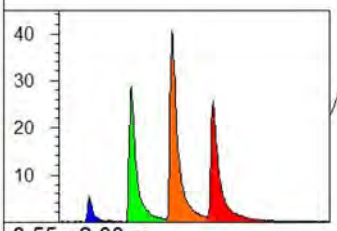
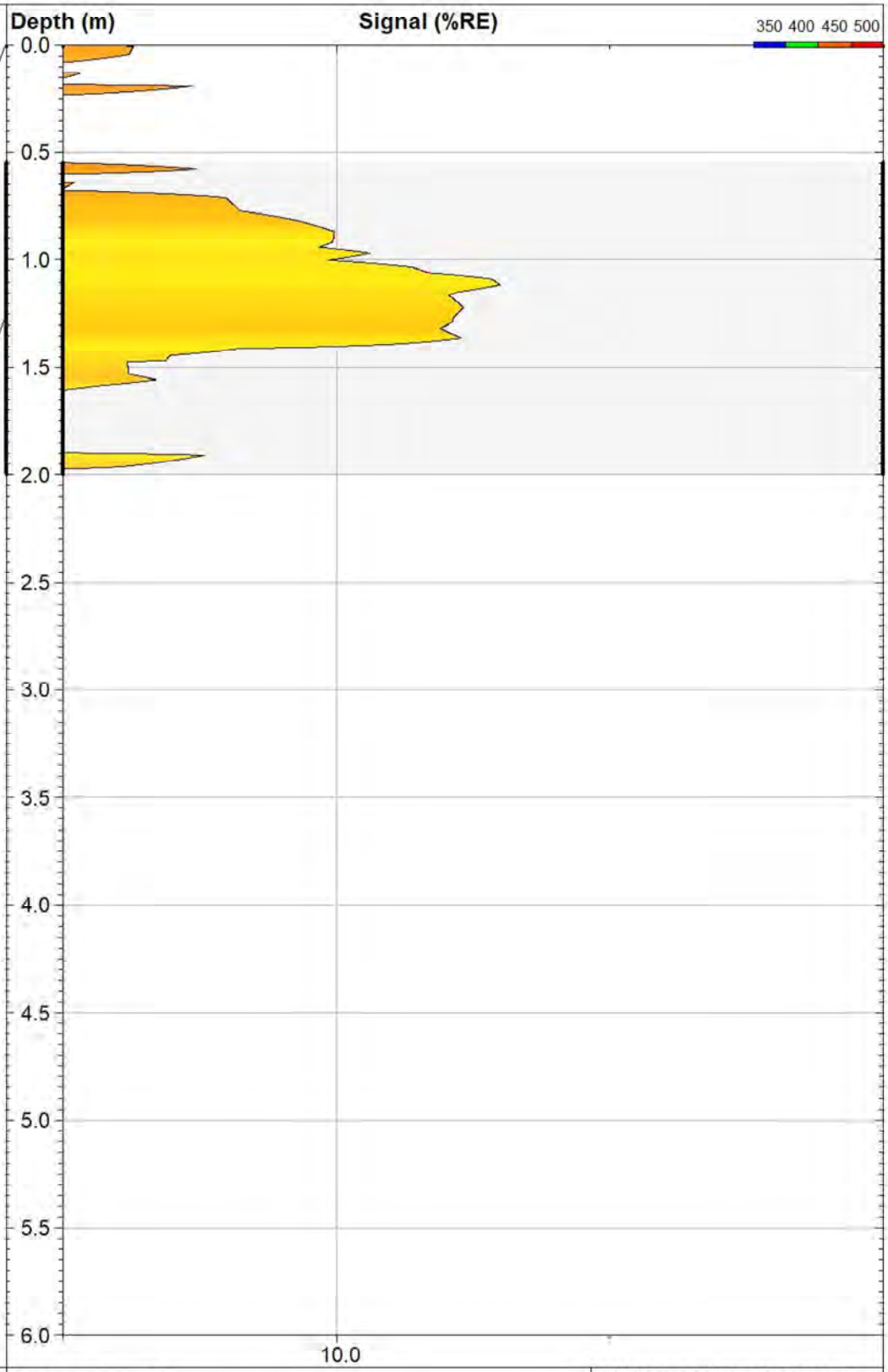
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761993.564 / UTM**	*Final depth:* **3.17 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385808.5298 /**	*Max signal:* **4.8 %RE @ 0.00 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-06 14:17 ADT**

Callouts

Note 0.01:
Asphalt parking lot



0.55 - 2.00 m
11.0 %RE (s 11.8)



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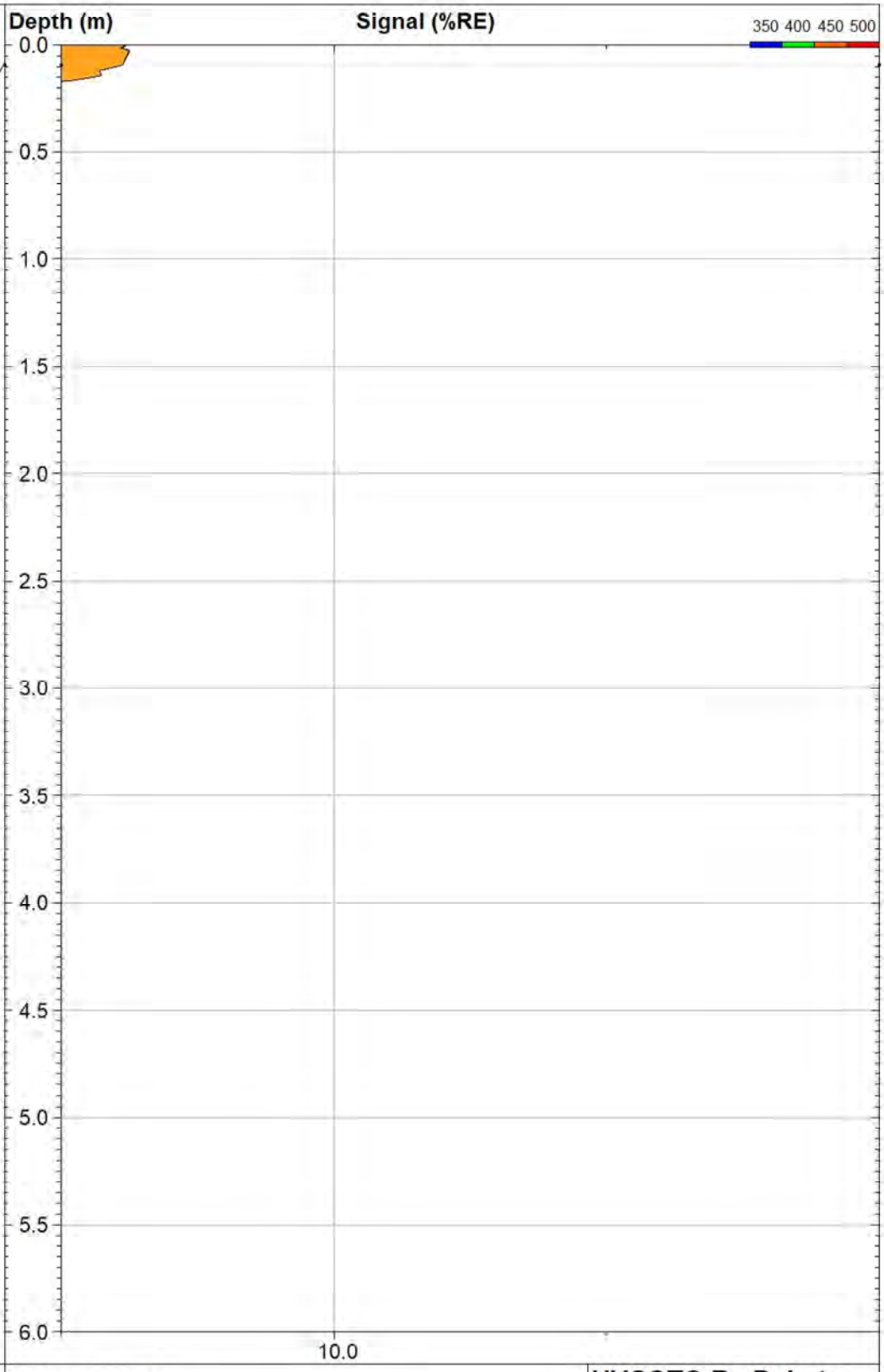
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761989.35 / UTM**	*Final depth:* **3.15 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385809.9784 /**	*Max signal:* **40.7 %RE @ 1.11 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-06 14:30 ADT**

Callouts

Note 0.09:
Asphalt parking lot



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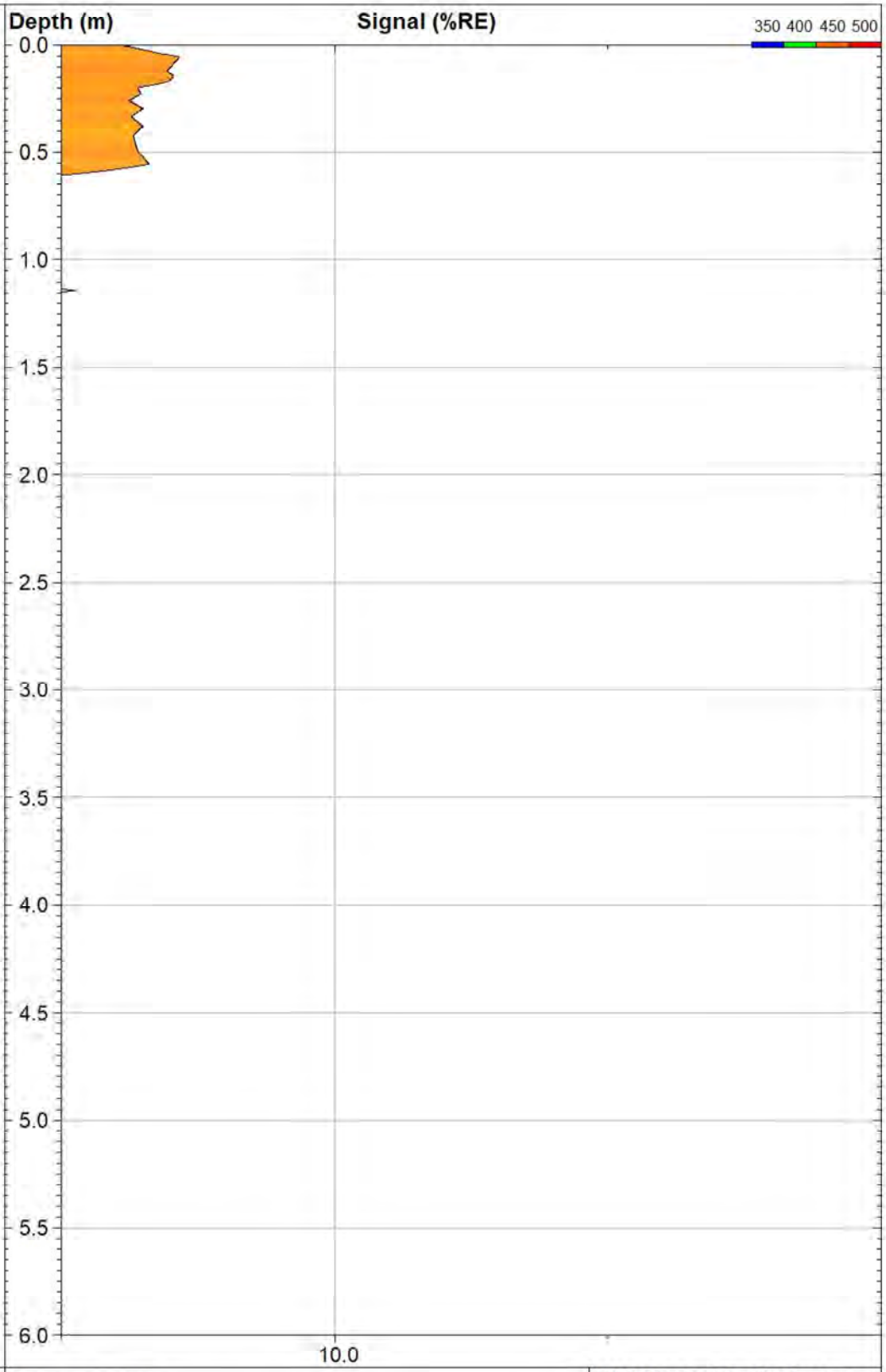
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761995.022 / UTM**	*Final depth:* **3.05 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385818.2016 /**	*Max signal:* **2.8 %RE @ 0.02 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-06 14:51 ADT**

Callouts

Asphalt parking lot



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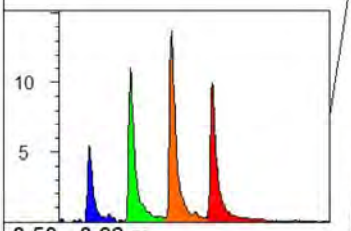
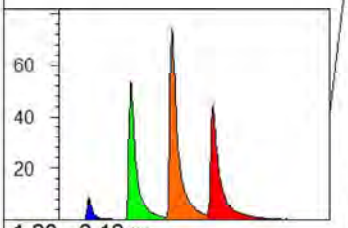
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761989.909 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385818.546 /**	*Max signal:* **3.7 %RE @ 0.05 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.5 m**	*Date & Time:* **2020-05-06 15:05 ADT**

Callouts

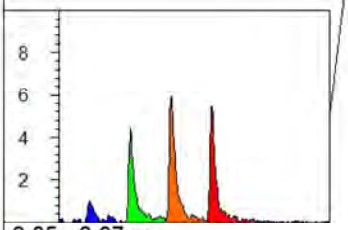
Note 0.06:
Asphalt parking lot



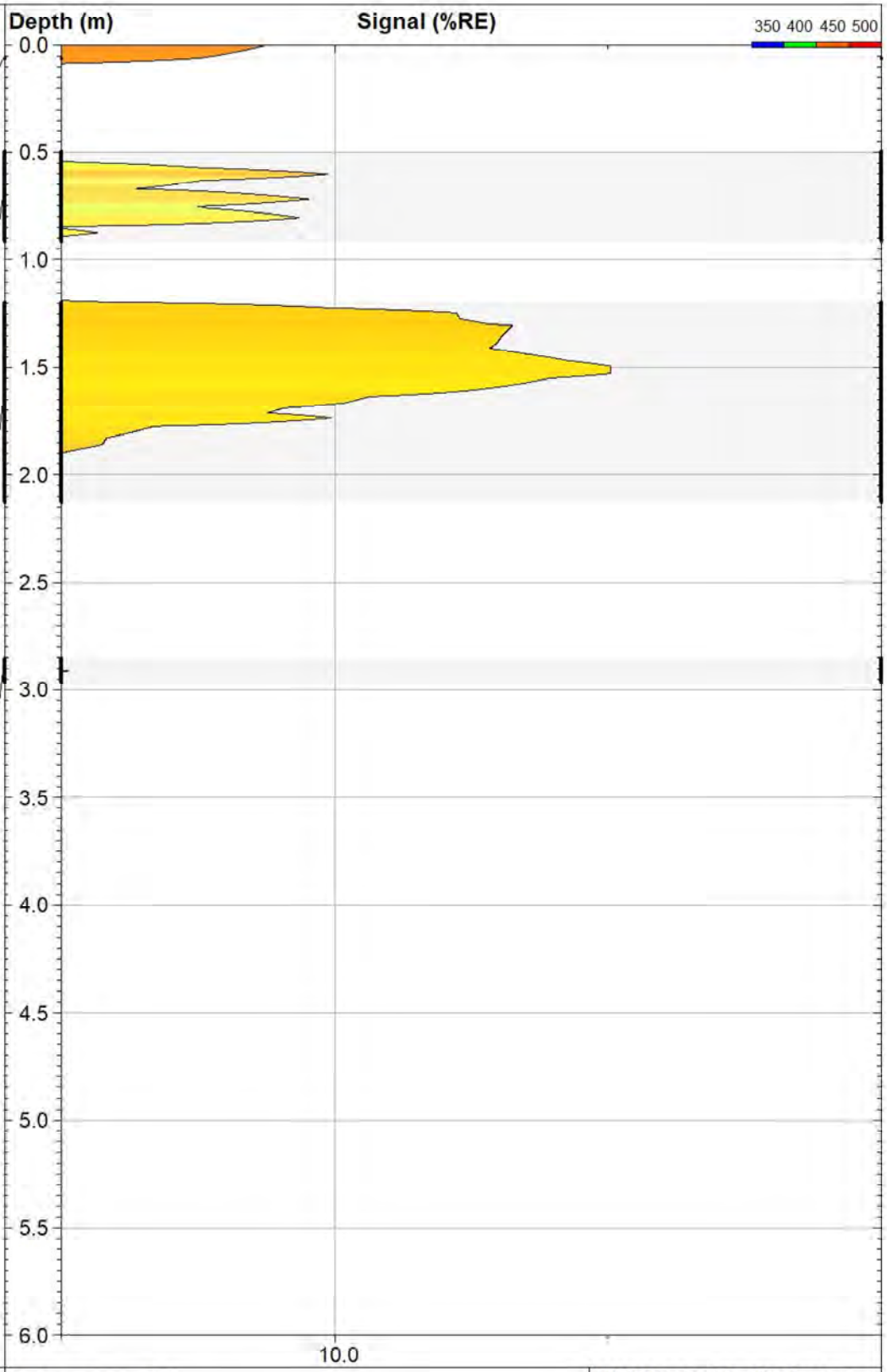
0.50 - 0.92 m
4.2 %RE (s 2.8)



1.20 - 2.12 m
22.2 %RE (s 28.3)



2.85 - 2.97 m
1.7 %RE (s 0.2)



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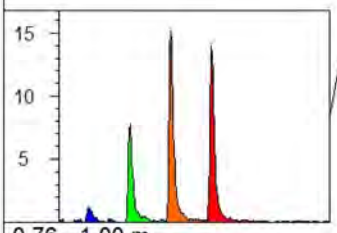
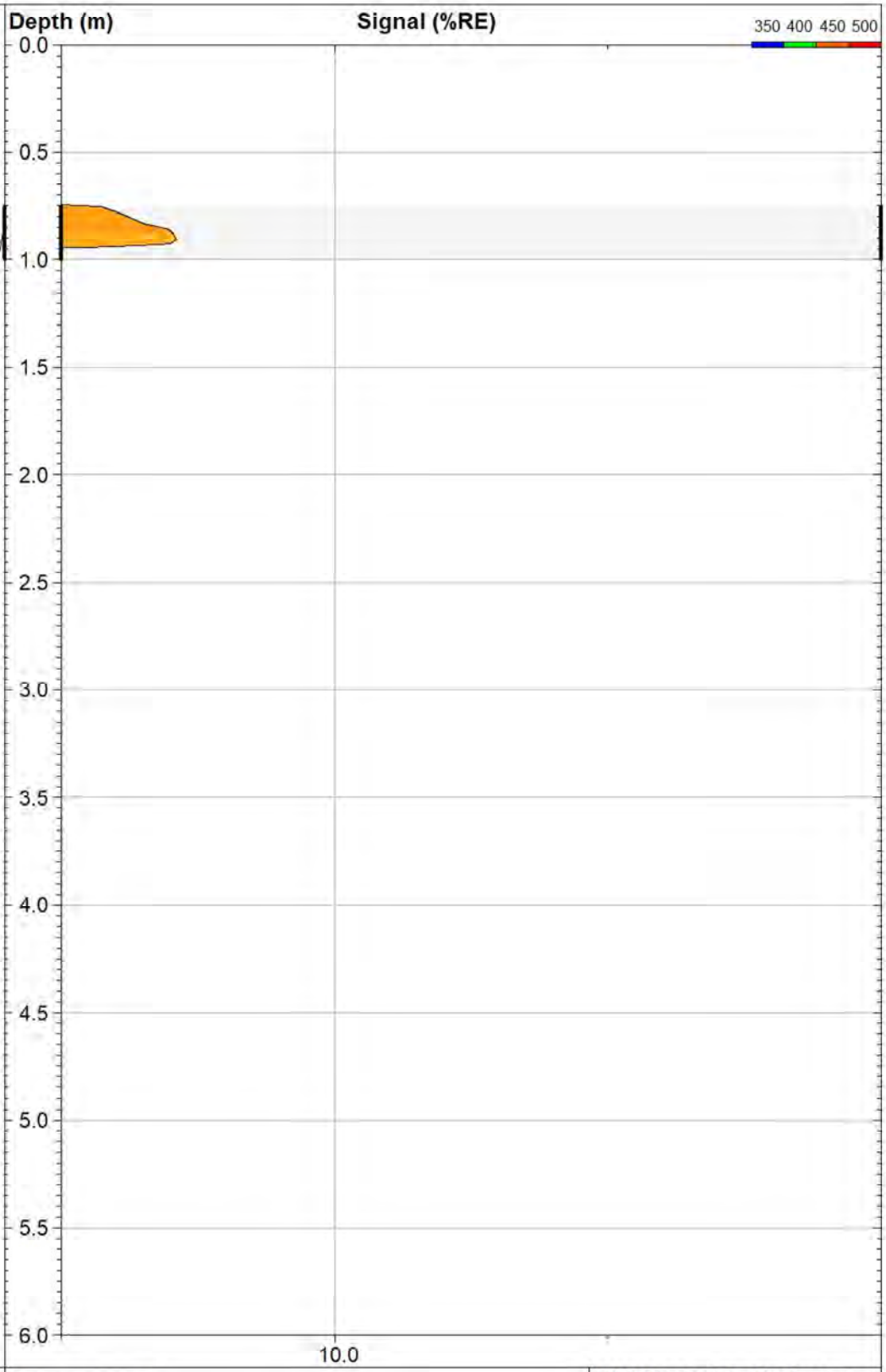
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761983.454 / UTM**	*Final depth:* **3.12 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385819.2821 /**	*Max signal:* **103.6 %RE @ 1.53 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-06 15:21 ADT**

Callouts



0.76 - 1.00 m
2.8 %RE (s 0.8)



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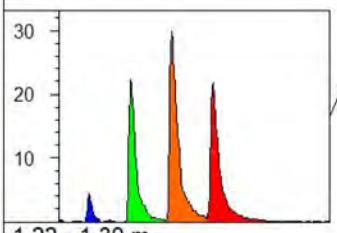
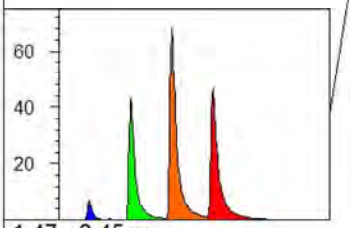
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761984.537 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385830.1641 /**	*Max signal:* **3.6 %RE @ 0.91 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-06 15:37 ADT**

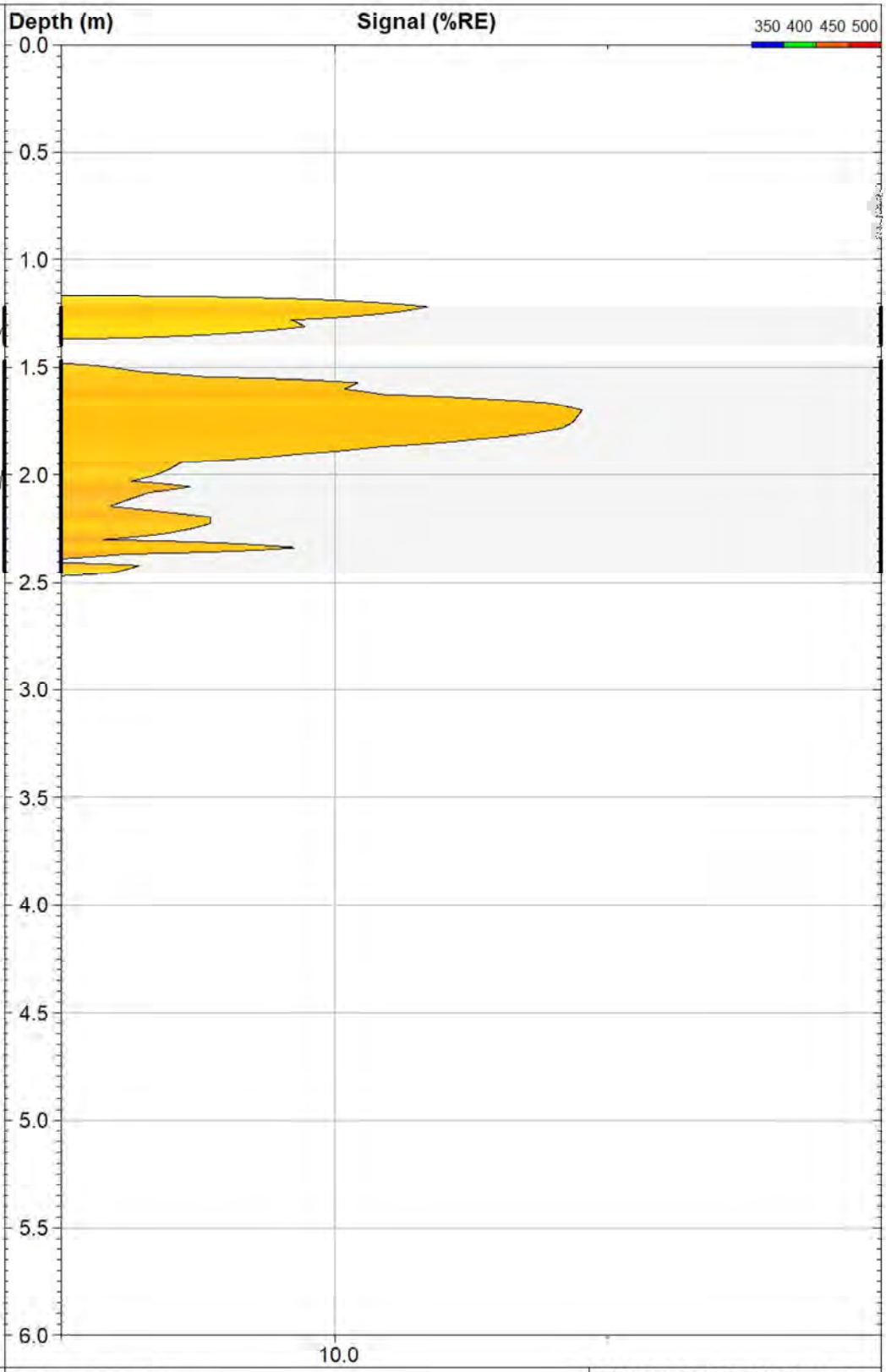
Callouts



1.22 - 1.39 m
9.5 %RE (s 8.0)



1.47 - 2.45 m
17.2 %RE (s 25.1)



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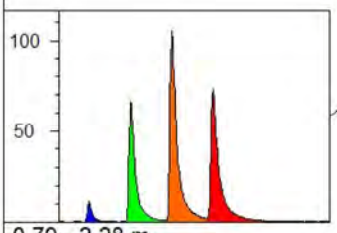
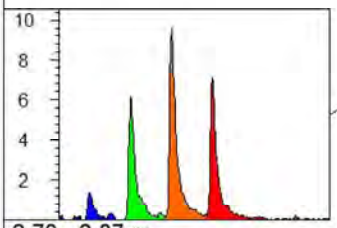
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761978.524 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385830.0133 /**	*Max signal:* **81.4 %RE @ 1.70 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.1 m**	*Date & Time:* **2020-05-06 15:53 ADT**

Callouts

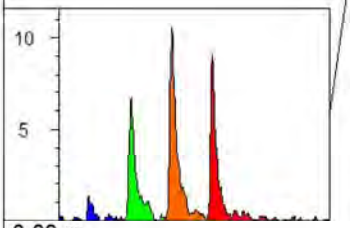
Note 0.06:
Asphalt parking lot



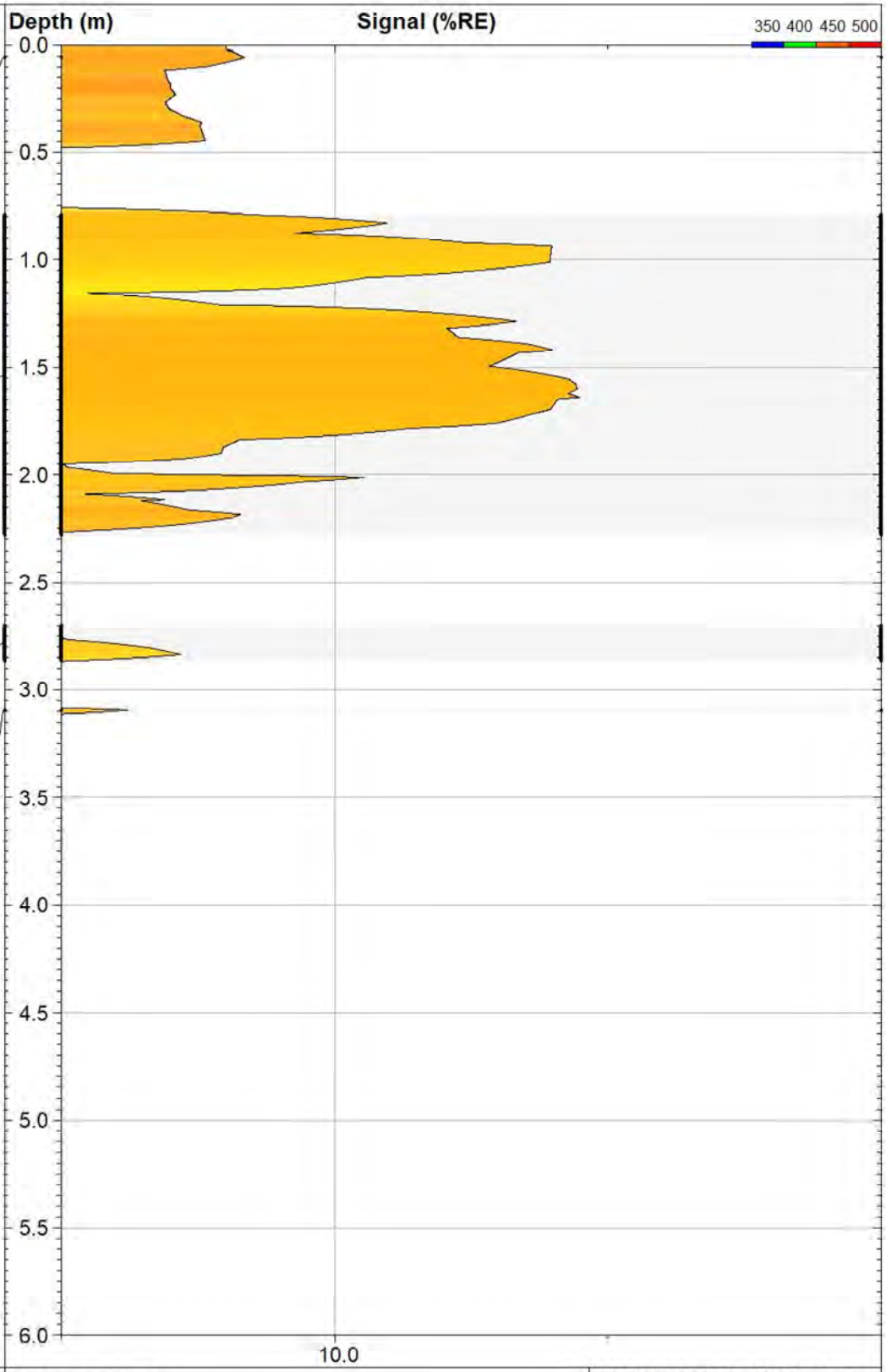
0.79 - 2.28 m
26.2 %RE (s 26.5)



2.70 - 2.87 m
2.5 %RE (s 0.9)



3.09 m
2.8 %RE



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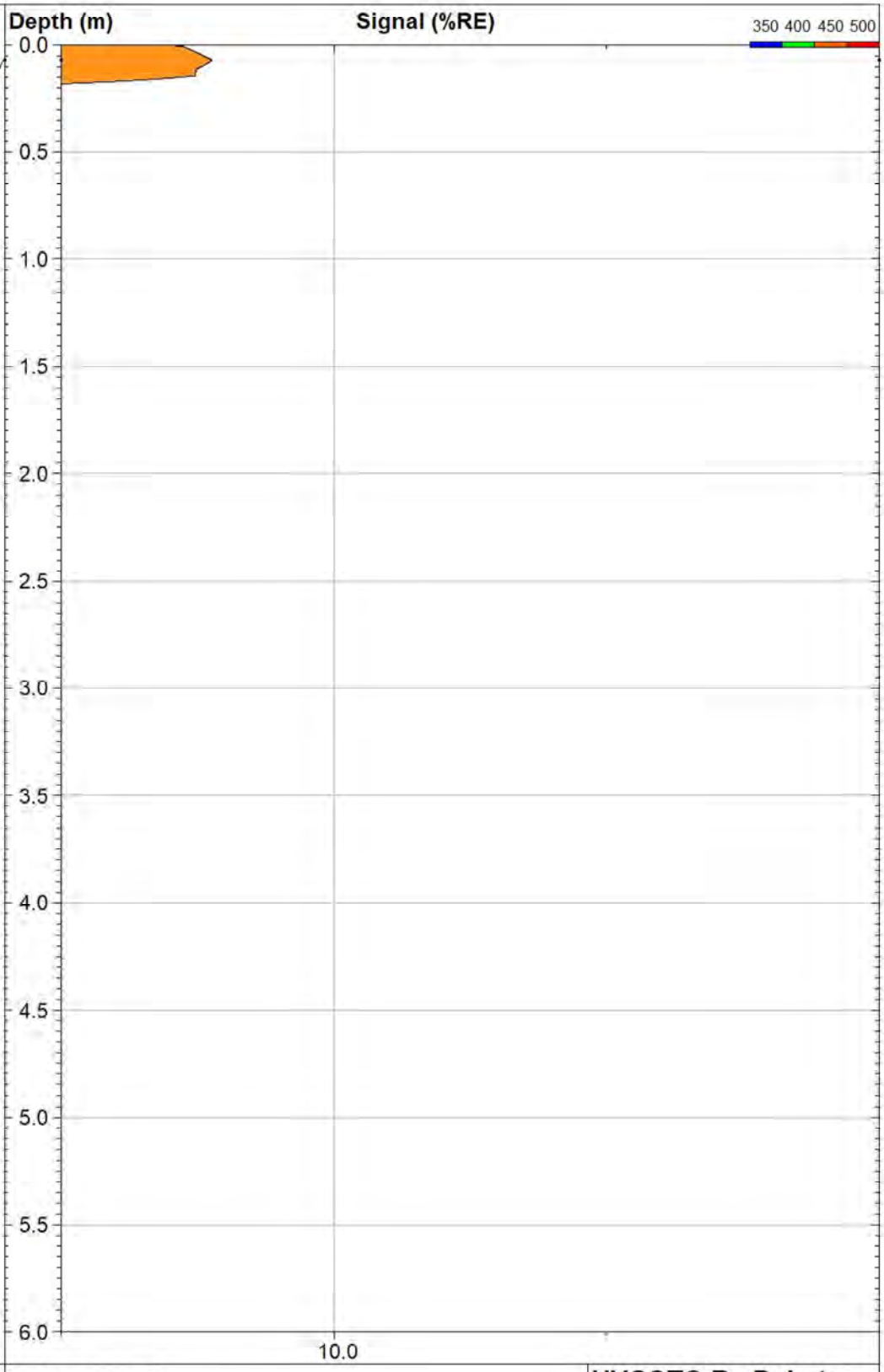
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761980.699 / UTM**	*Final depth:* **3.13 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385834.3332 /**	*Max signal:* **79.4 %RE @ 1.64 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-06 16:10 ADT**

Callouts

Note 0.07:
Asphalt parking lot



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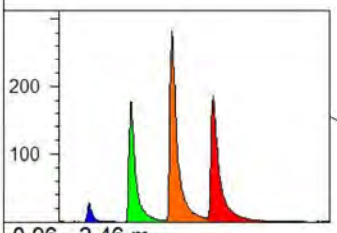
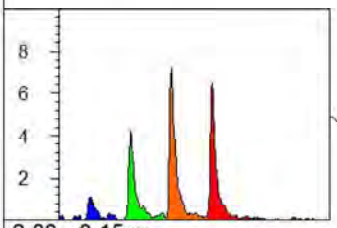
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761986.402 / UTM**	*Final depth:* **3.09 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385835.202 /**	*Max signal:* **4.6 %RE @ 0.07 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-06 16:27 ADT**

Callouts

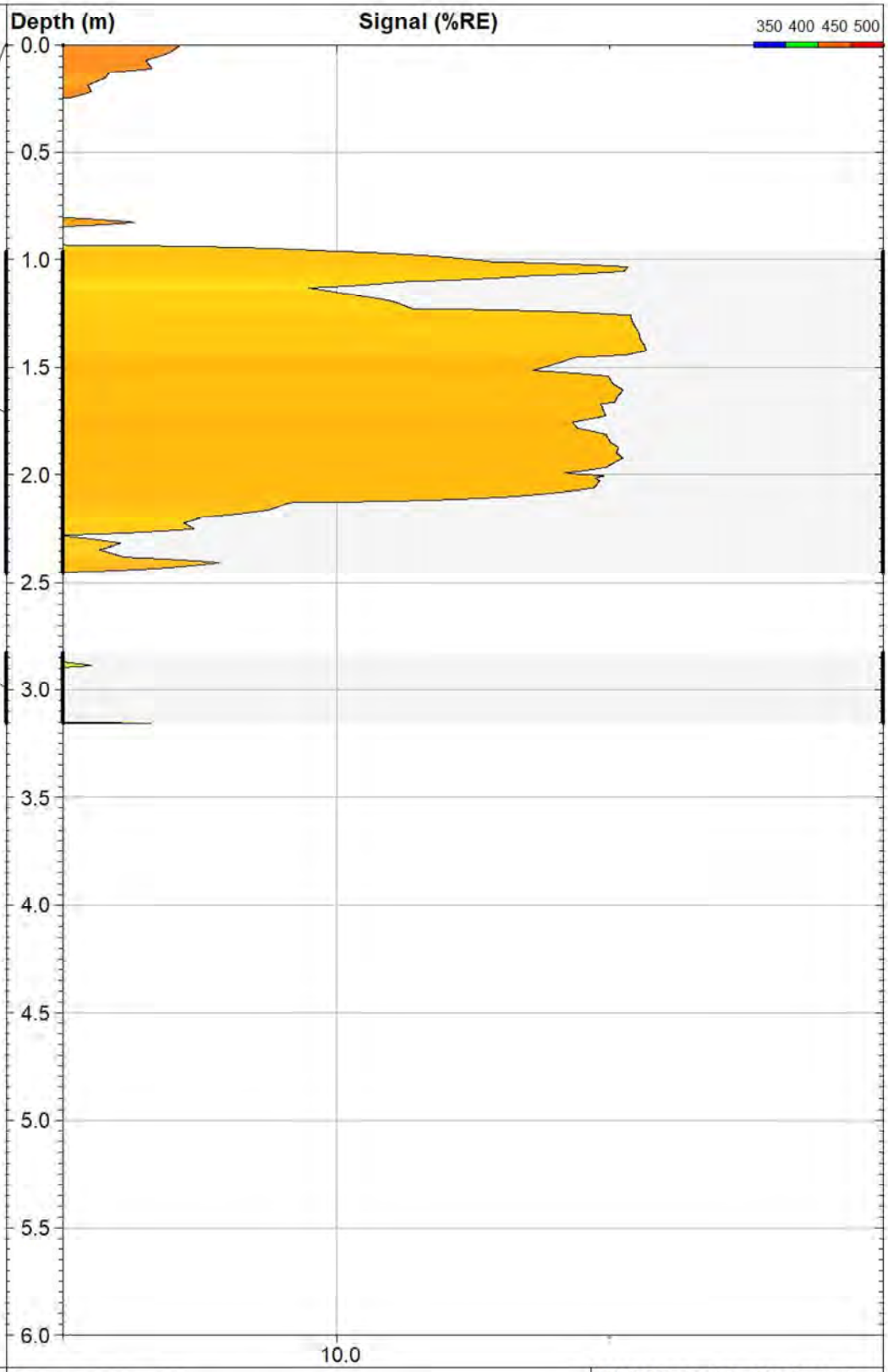
Note 0.00:
Asphalt parking lot



0.96 - 2.46 m
67.7 %RE (s 47.3)



2.83 - 3.15 m
1.7 %RE (s 0.5)



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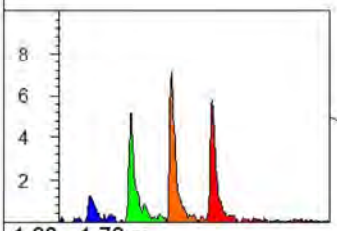
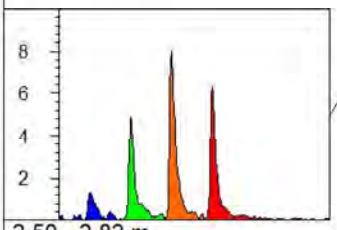
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761979.806 / UTM**	*Final depth:* **3.15 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385842.627 /**	*Max signal:* **136.9 %RE @ 1.42 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-06 16:40 ADT**

Callouts

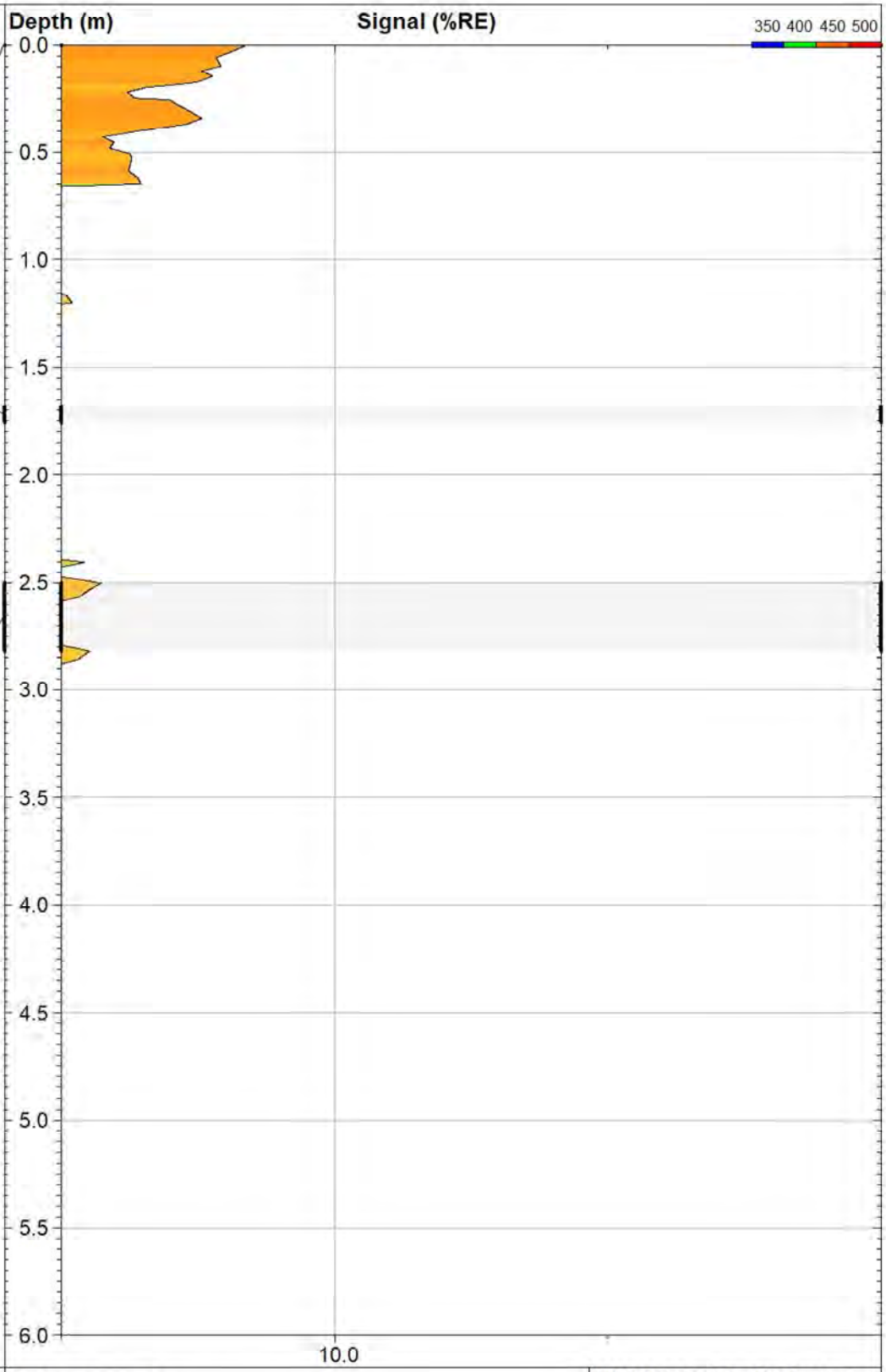
Note 0.00:
Asphalt parking lot



1.68 - 1.76 m
1.8 %RE (s 0.1)



2.50 - 2.82 m
2.0 %RE (s 0.3)



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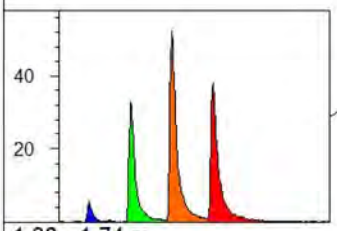
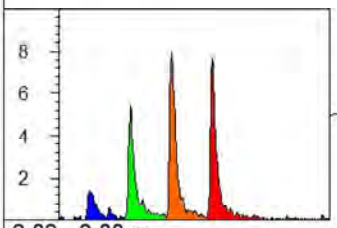
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761986.784 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385841.5237 /**	*Max signal:* **6.1 %RE @ 0.00 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.5 m**	*Date & Time:* **2020-05-06 16:56 ADT**

Callouts

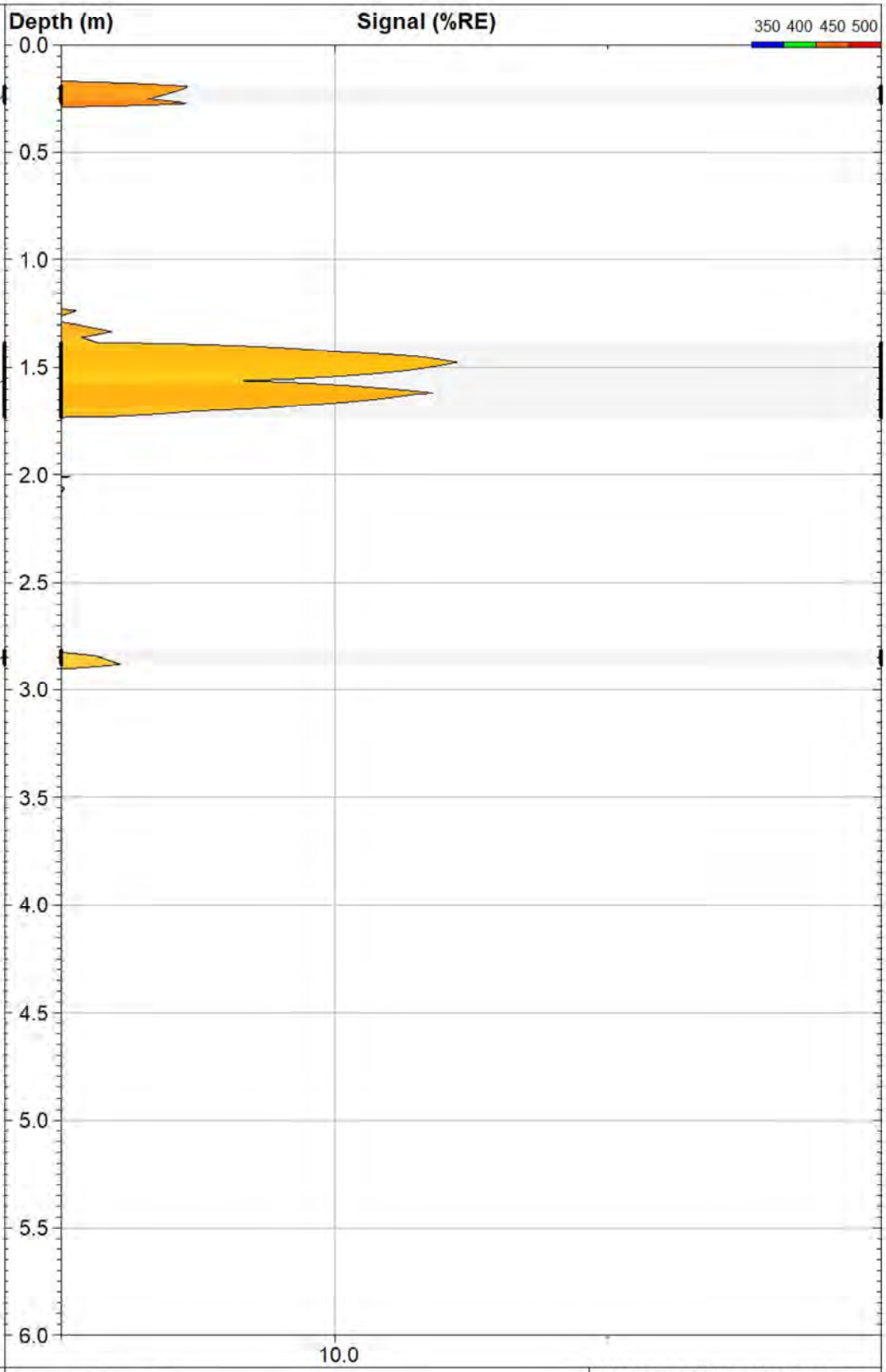
Note 0.19-0.27:
Asphalt parking lot



1.38 - 1.74 m
12.7 %RE (s 9.4)



2.82 - 2.88 m
2.3 %RE (s 0.4)



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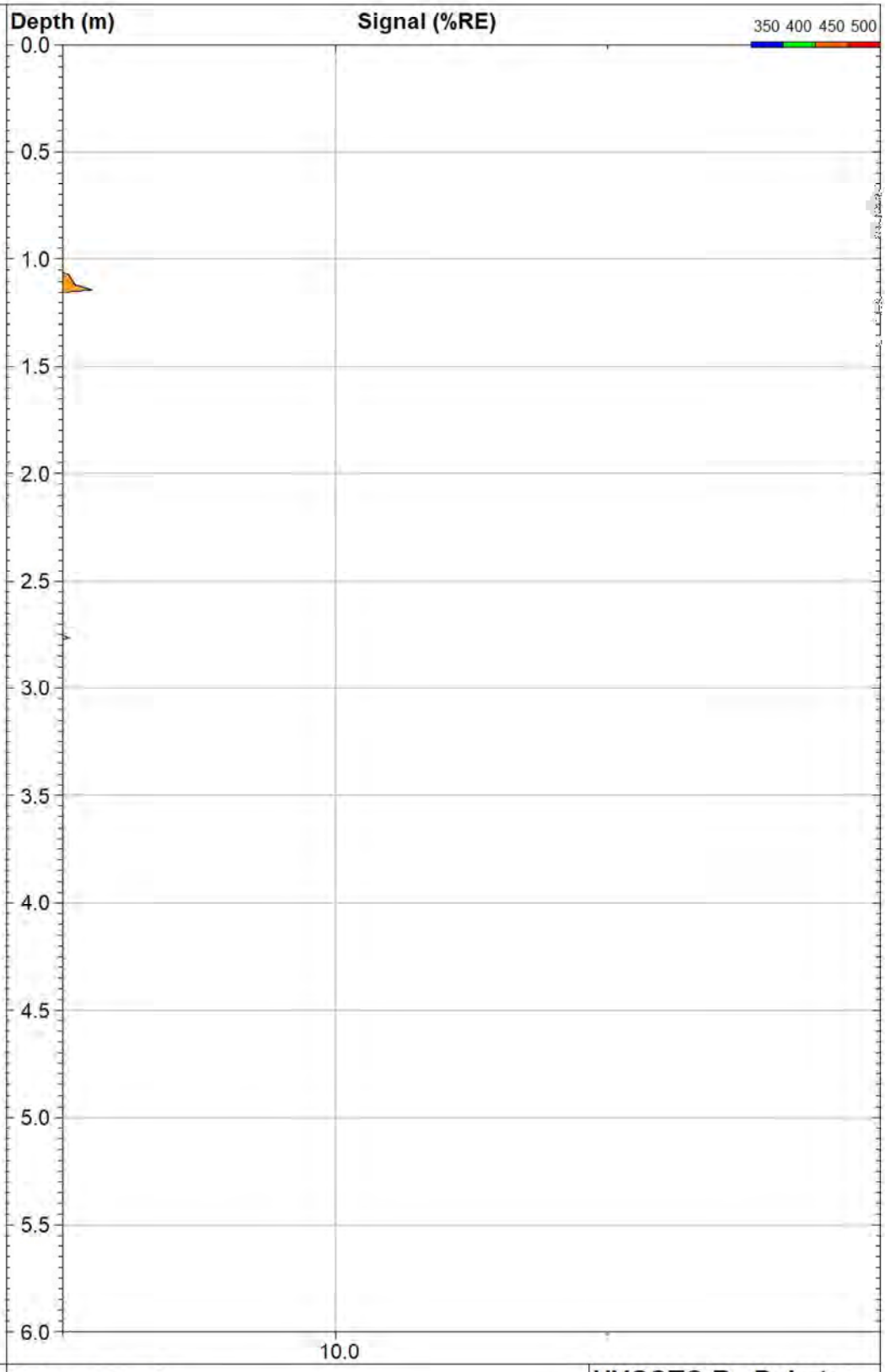
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761988.069 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385849.9582 /**	*Max signal:* **29.1 %RE @ 1.48 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-06 17:08 ADT**

Callouts



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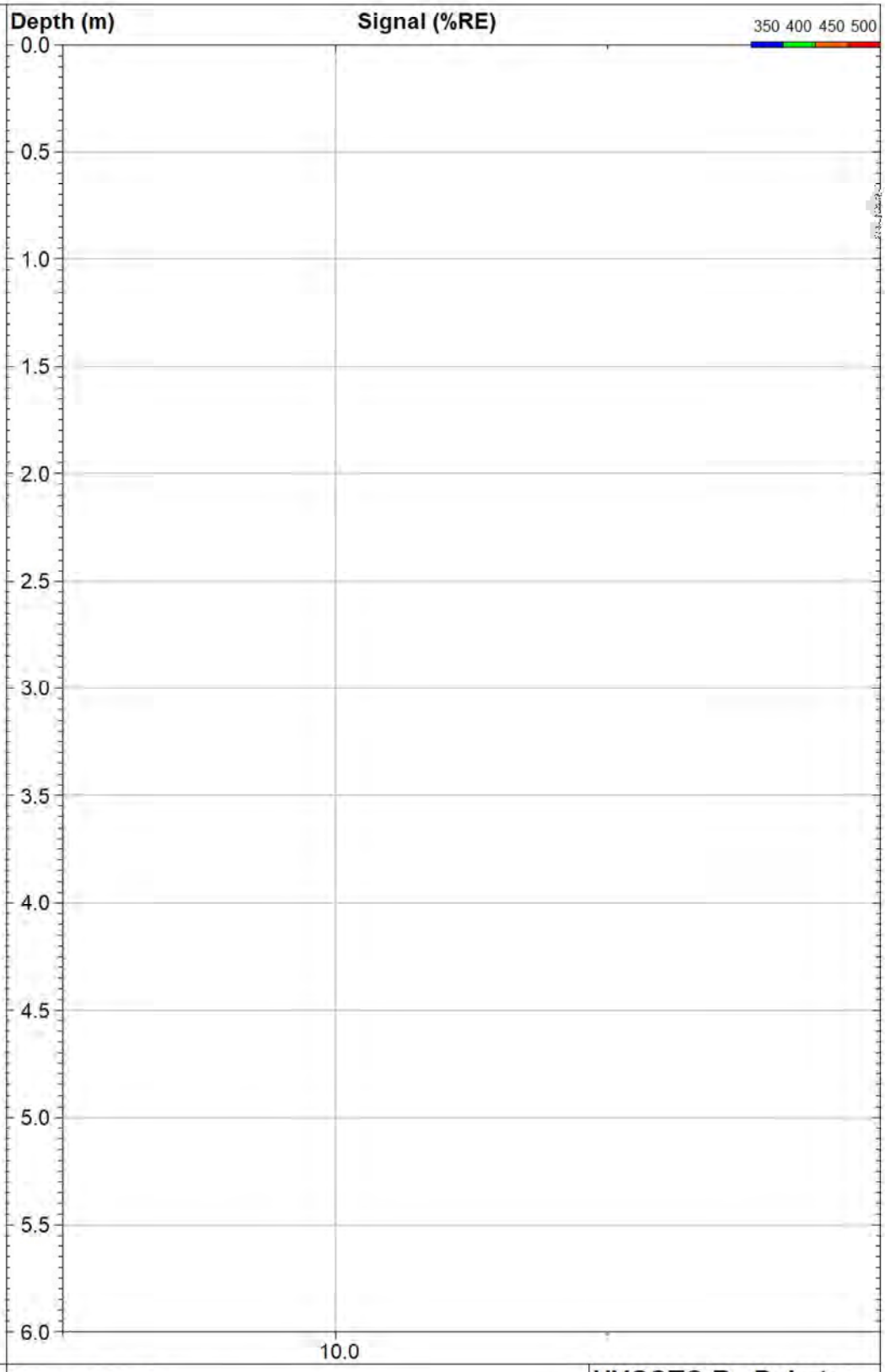
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761991.338 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385850.0094 /**	*Max signal:* **2.3 %RE @ 1.14 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-06 17:22 ADT**

Callouts



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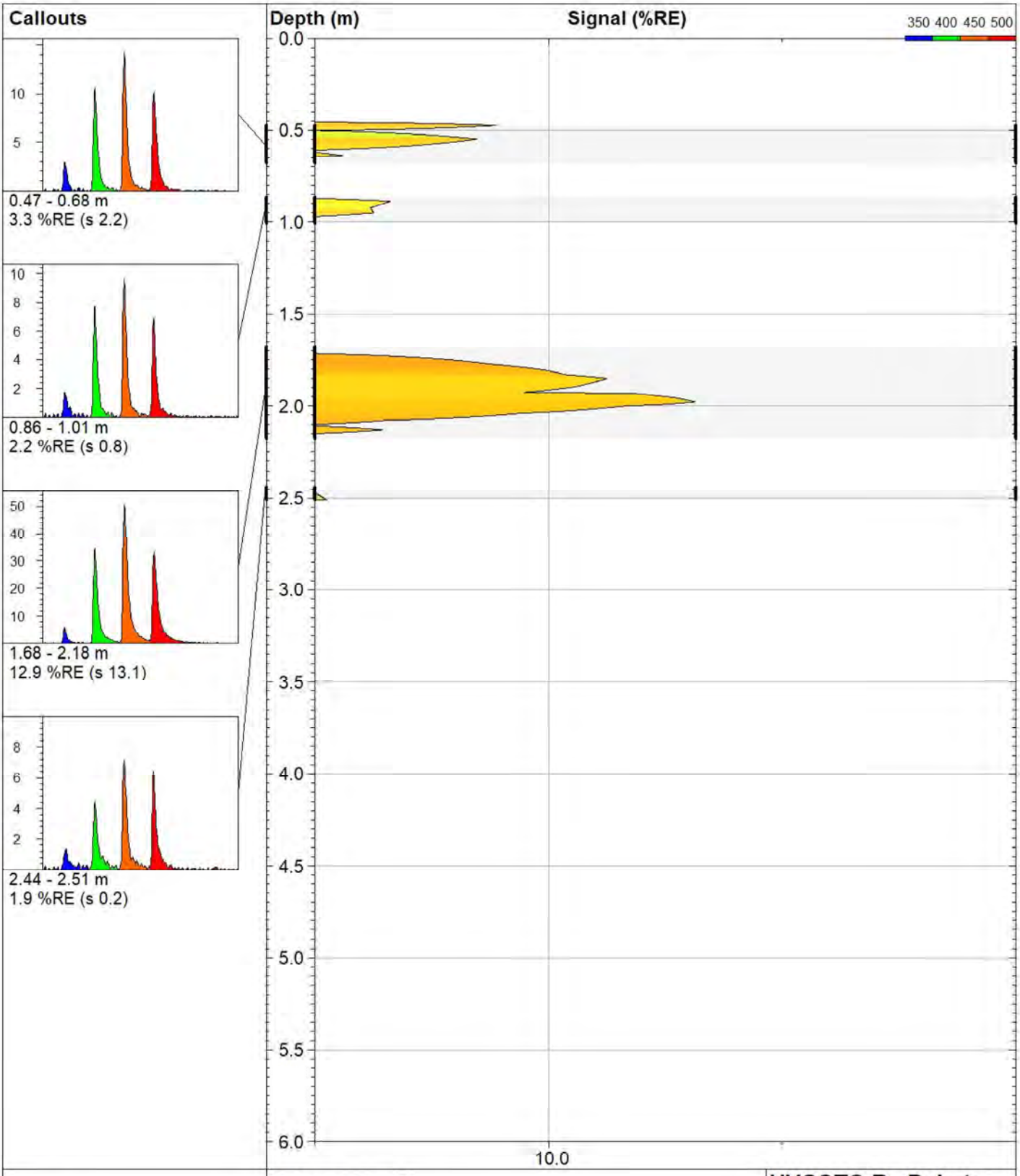
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761994.818 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385857.6693 /**	*Max signal:* **1.7 %RE @ 1.49 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-07 09:39 ADT**



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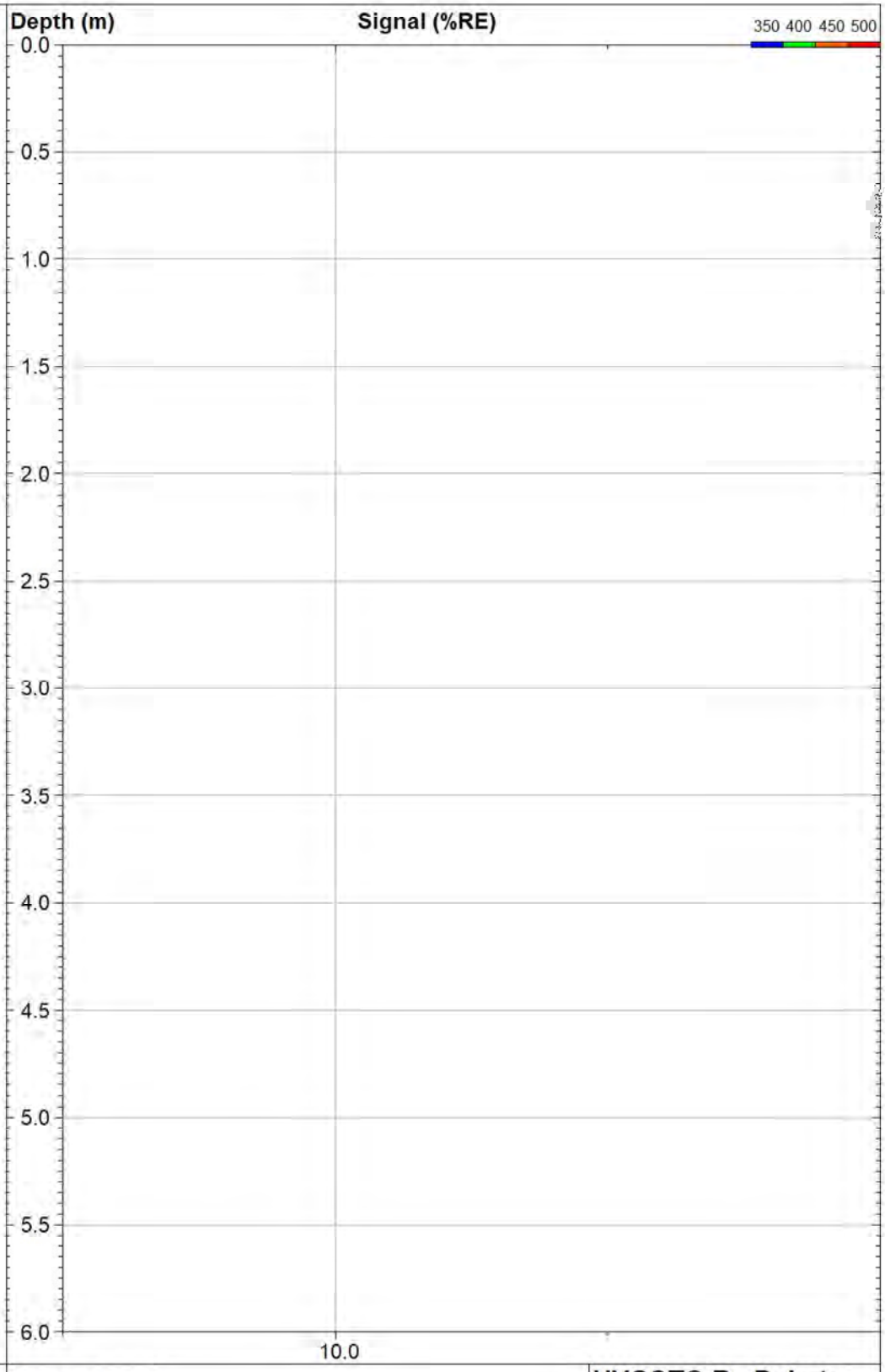
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761985.338 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385858.9519 /**	*Max signal:* **43.3 %RE @ 1.98 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-07 09:54 ADT**

Callouts



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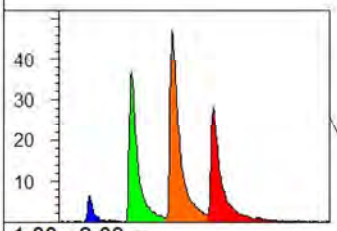
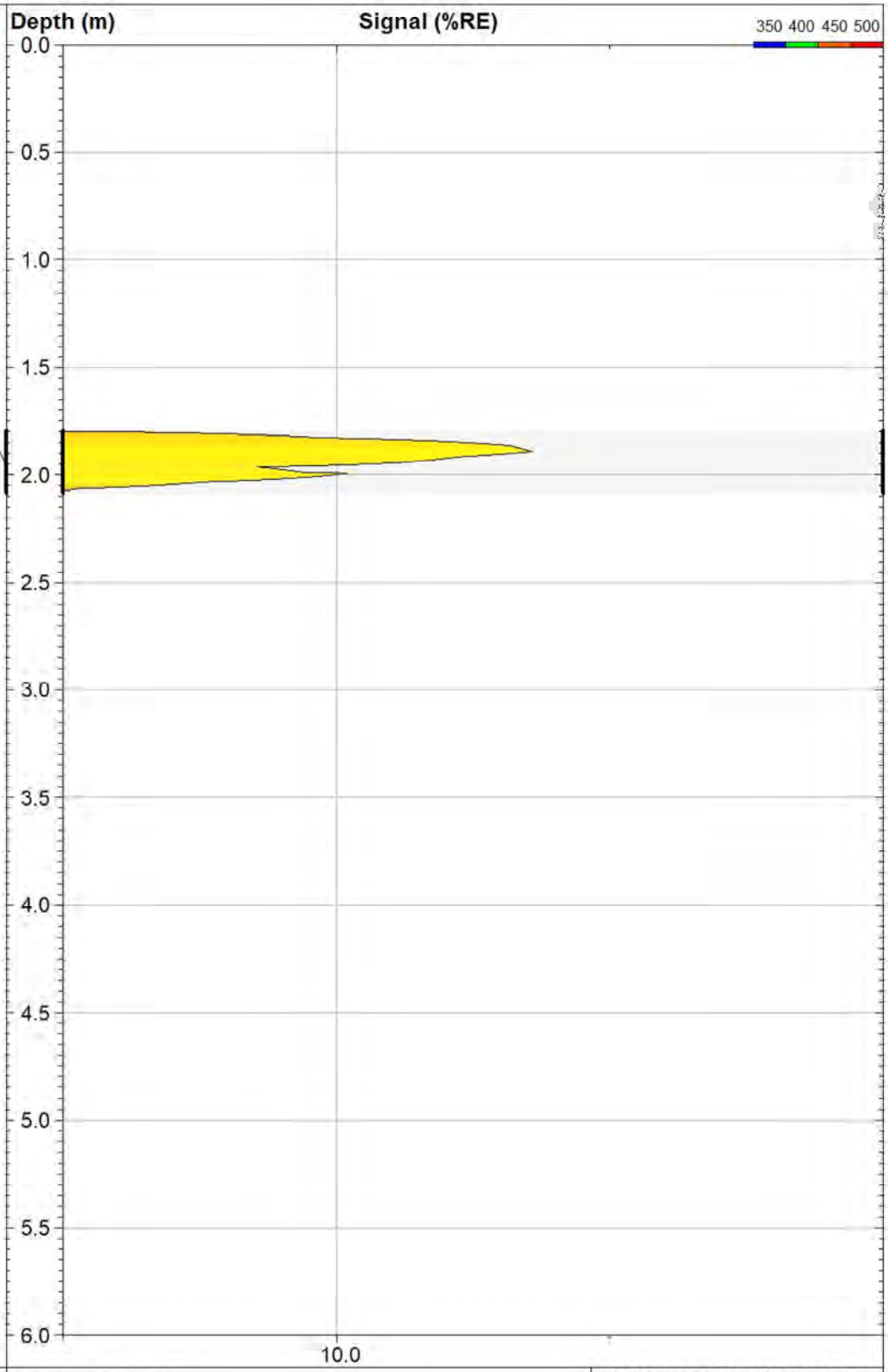
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762000.076 / UTM**	*Final depth:* **3.15 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385871.7353 /**	*Max signal:* **1.3 %RE @ 2.82 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-07 10:09 ADT**

Callouts



1.80 - 2.09 m
15.5 %RE (s 16.6)



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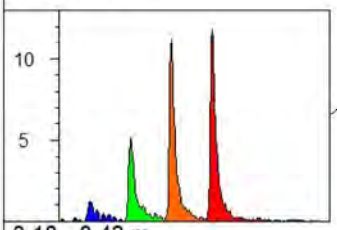
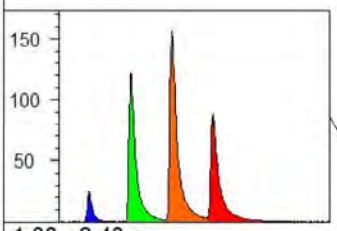
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761997.414 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385879.7885 /**	*Max signal:* **52.6 %RE @ 1.89 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-07 10:21 ADT**

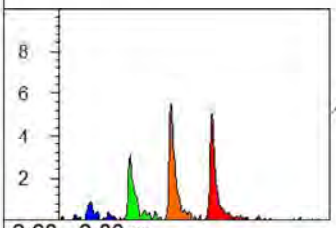
Callouts



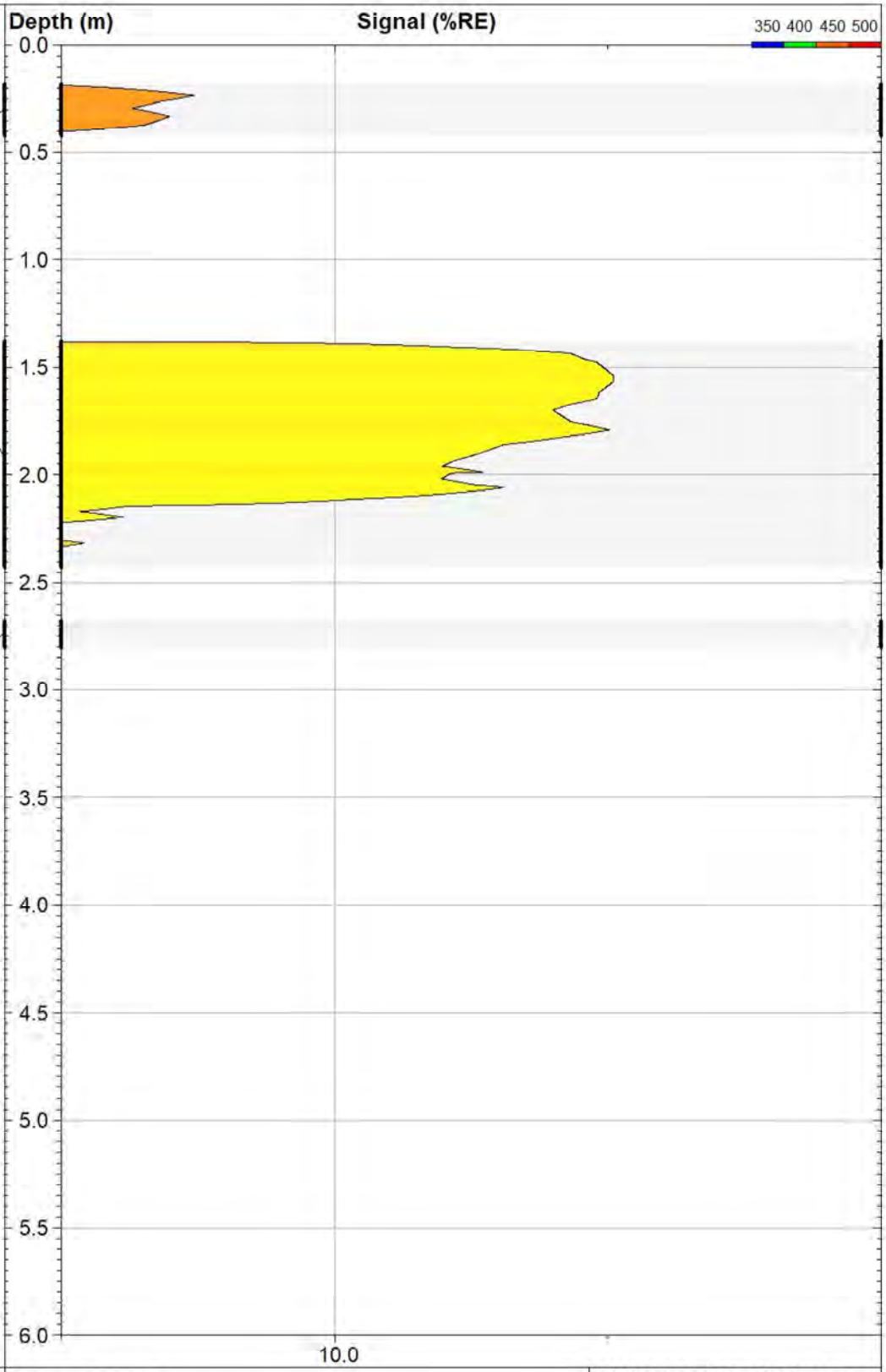
0.18 - 0.42 m
2.8 %RE (s 1.0)



1.38 - 2.43 m
41.5 %RE (s 38.3)



2.68 - 2.80 m
1.4 %RE (s 0.2)



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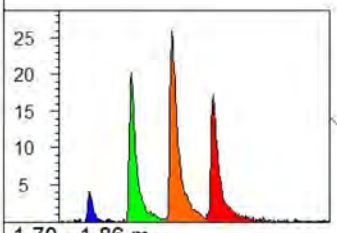
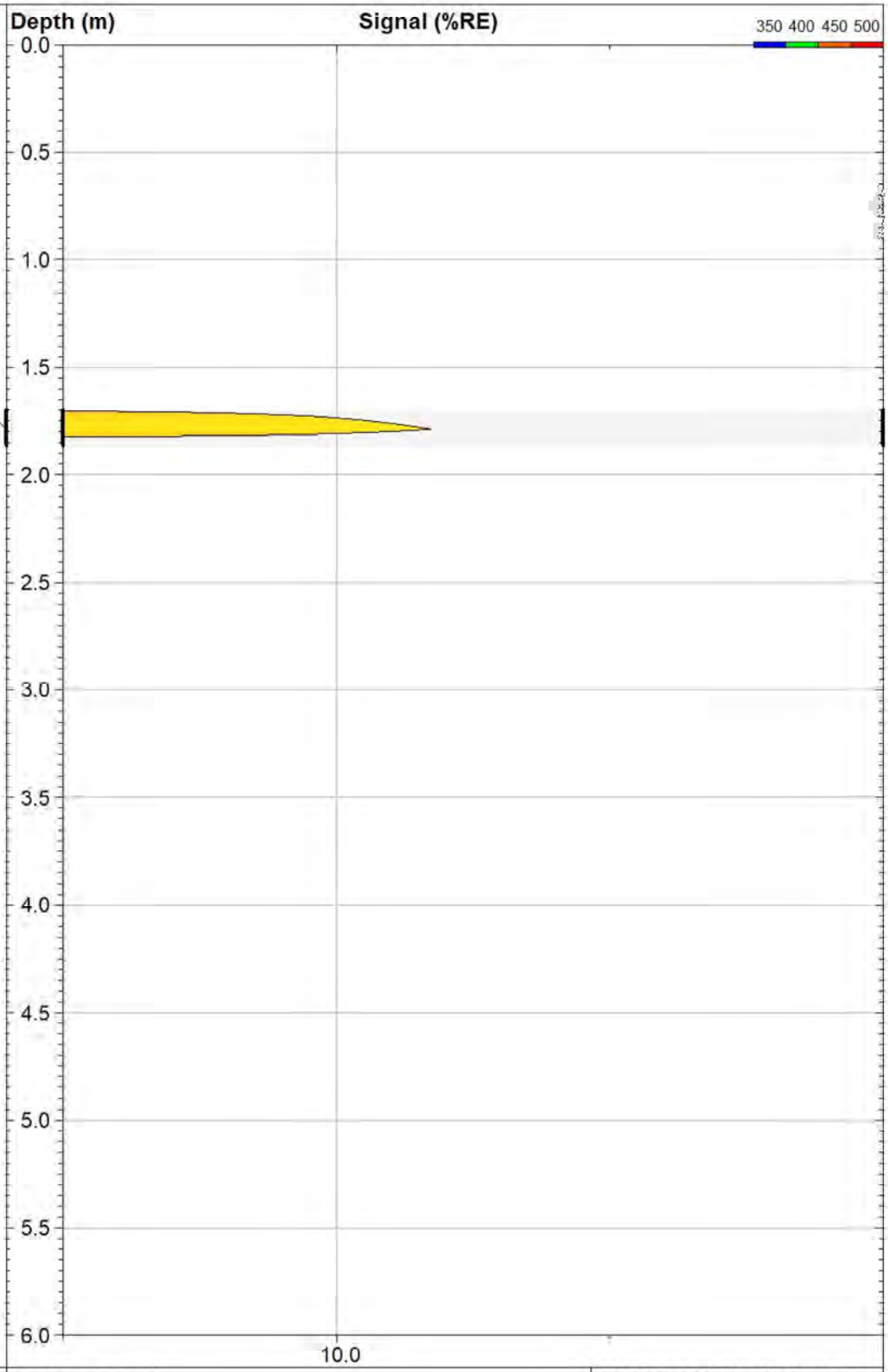
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761999.016 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385893.0157 /**	*Max signal:* **105.7 %RE @ 1.54 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.9 m**	*Date & Time:* **2020-05-29 12:36 ADT**

Callouts



1.70 - 1.86 m
7.2 %RE (s 9.5)



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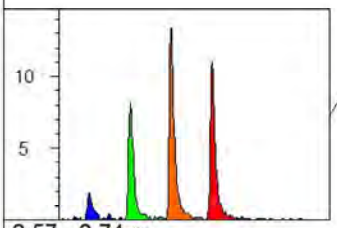
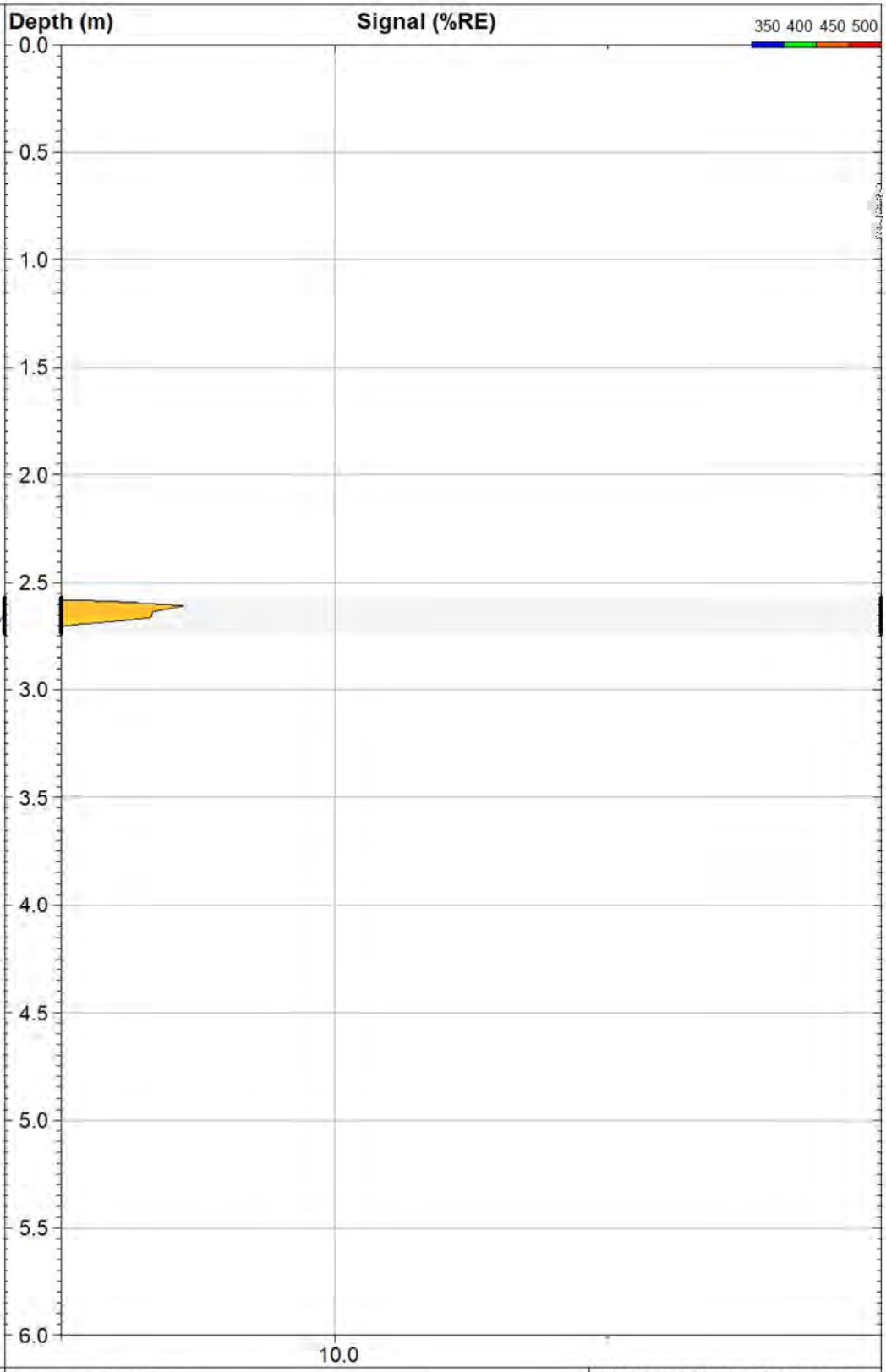
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762001.699 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385873.6343 /**	*Max signal:* **23.1 %RE @ 1.79 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-07 10:44 ADT**

Callouts



2.57 - 2.74 m
2.5 %RE (s 1.0)



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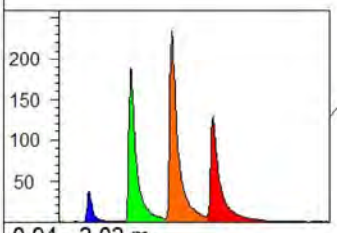
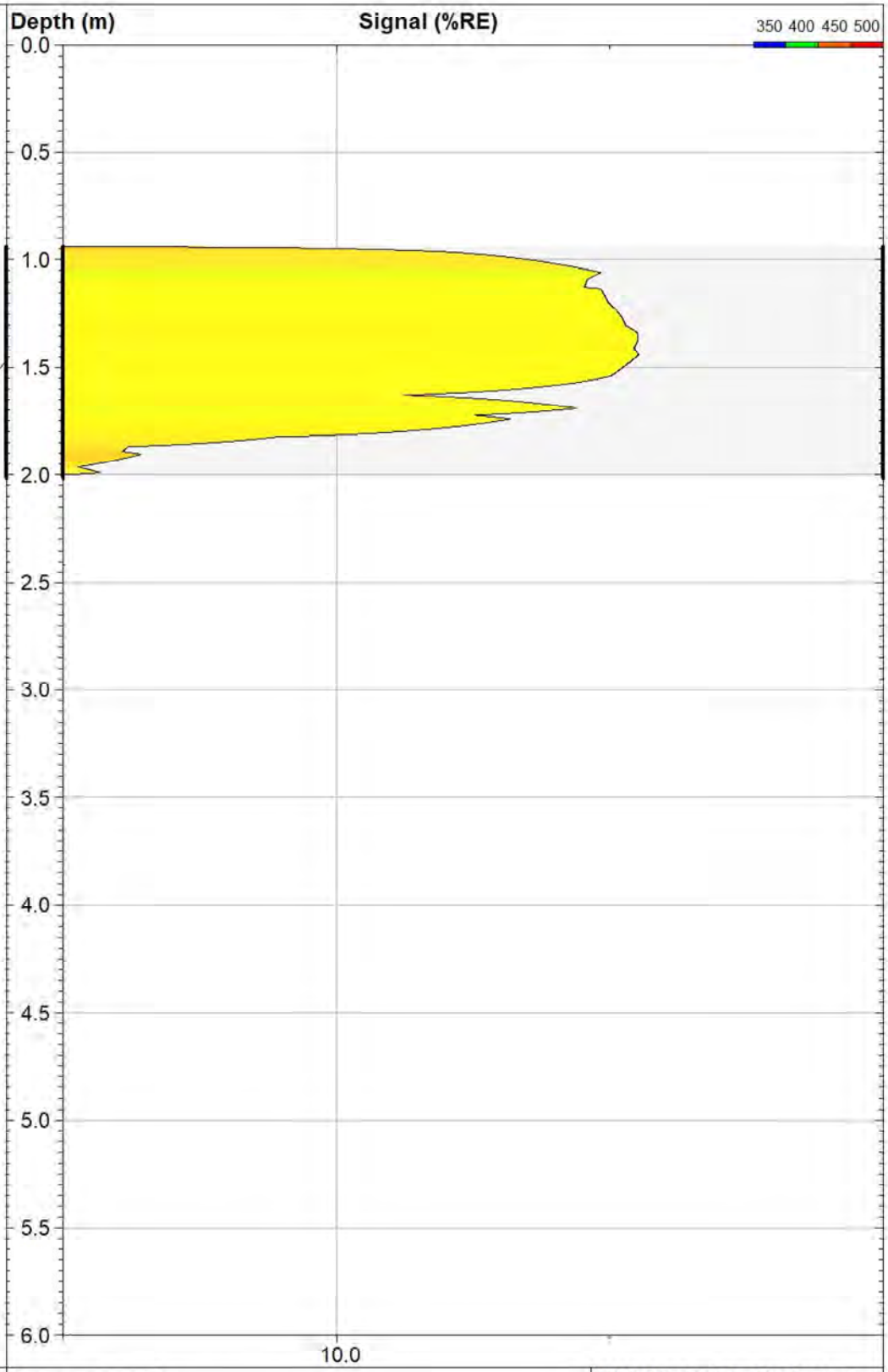
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762000.166 / UTM**	*Final depth:* **3.09 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385865.9612 /**	*Max signal:* **3.8 %RE @ 2.61 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-07 10:59 ADT**

Callouts



0.94 - 2.02 m
64.1 %RE (s 47.4)



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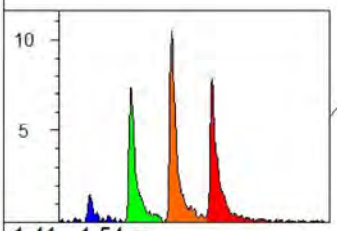
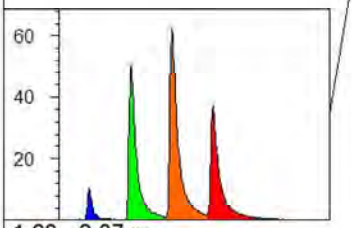
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762007.581 / UTM**	*Final depth:* **3.09 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385871.3607 /**	*Max signal:* **128.7 %RE @ 1.44 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-07 11:10 ADT**

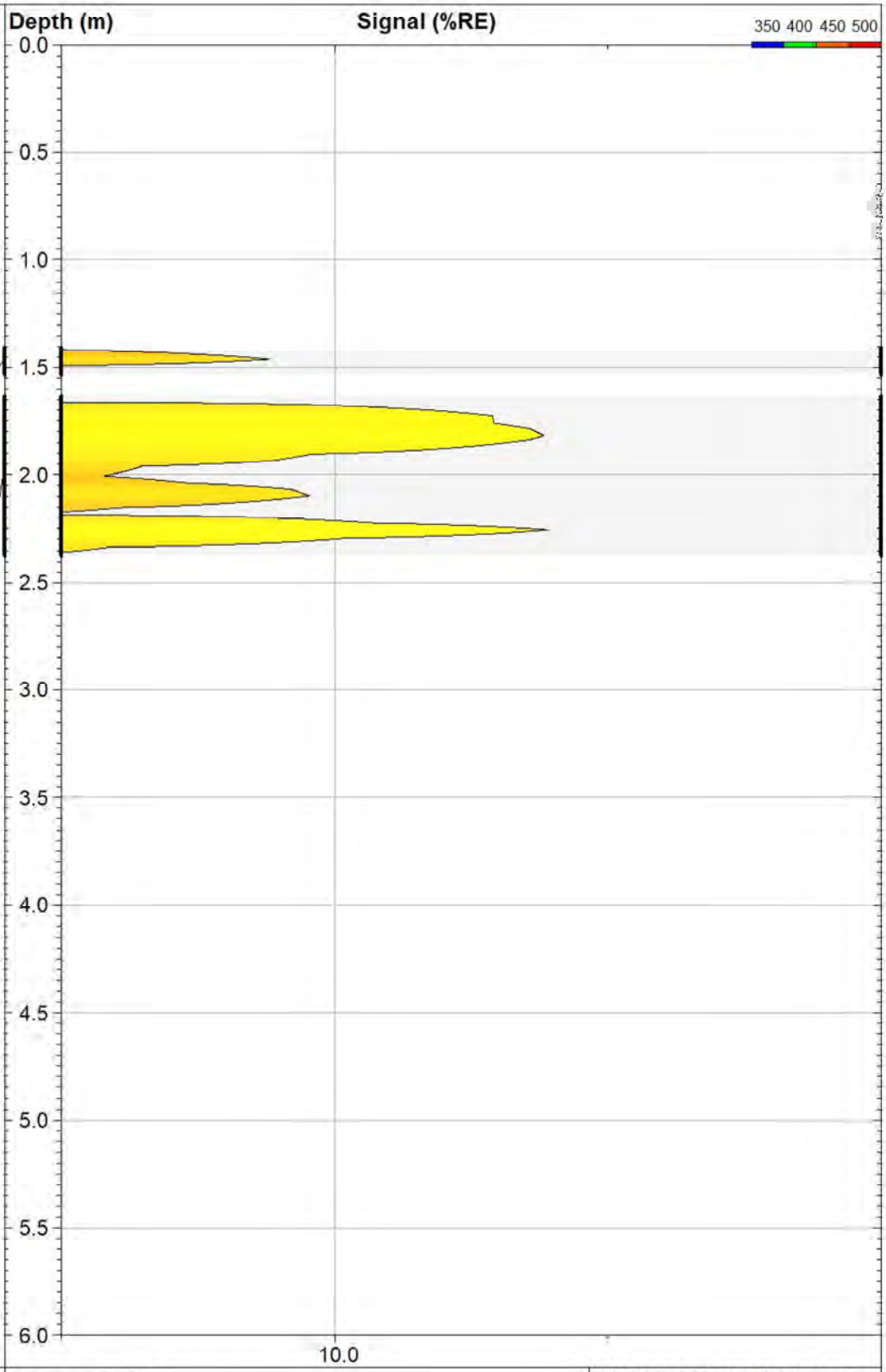
Callouts



1.41 - 1.54 m
2.8 %RE (s 2.7)



1.63 - 2.37 m
17.8 %RE (s 21.1)



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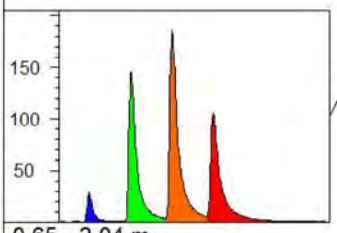
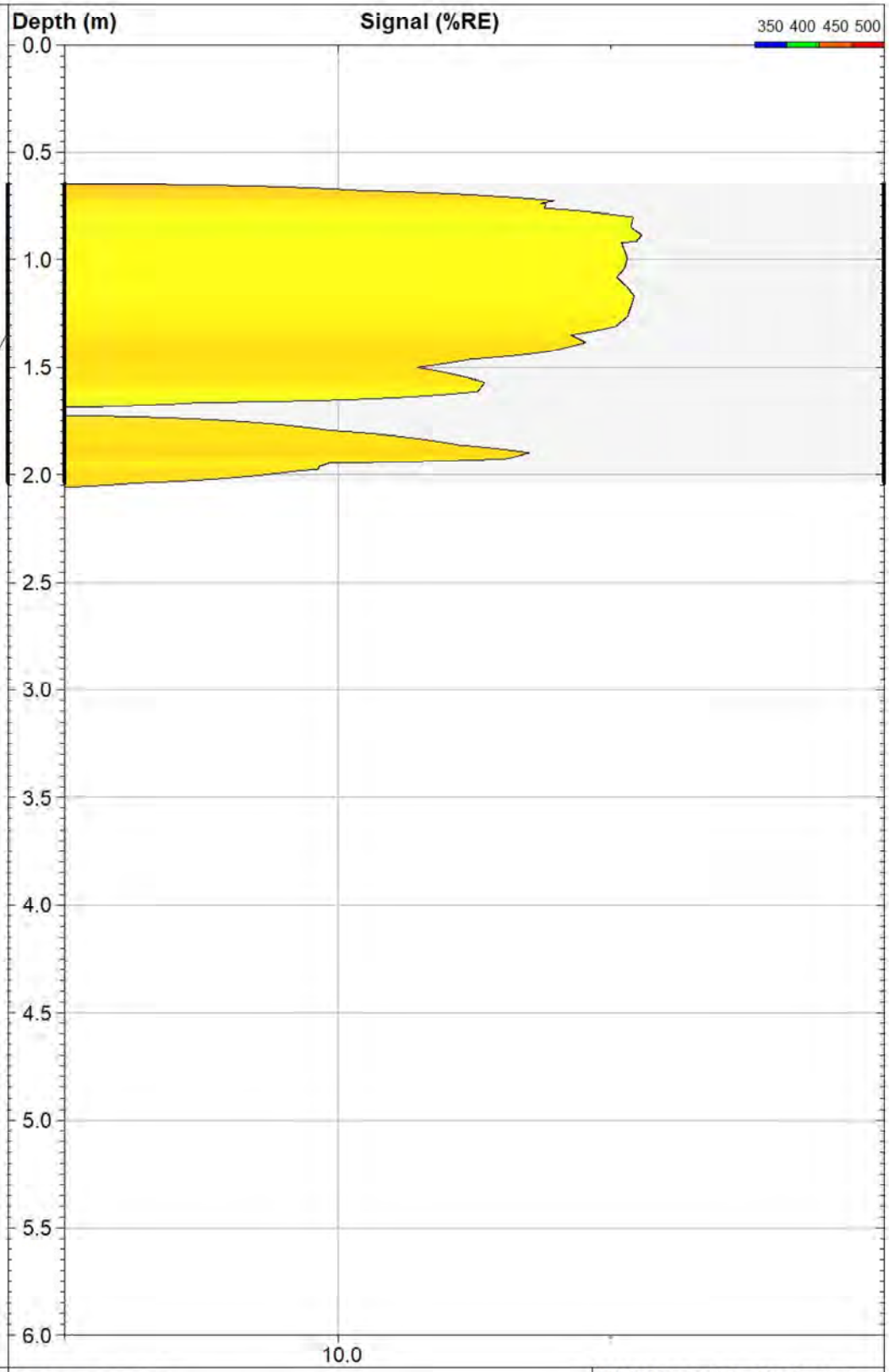
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762013.136 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385867.2096 /**	*Max signal:* **61.3 %RE @ 2.26 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-29 12:40 ADT**

Callouts



0.65 - 2.04 m
58.0 %RE (s 45.6)



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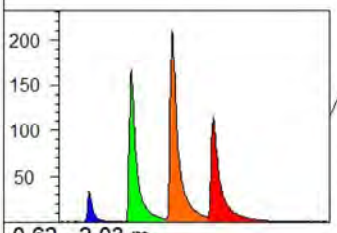
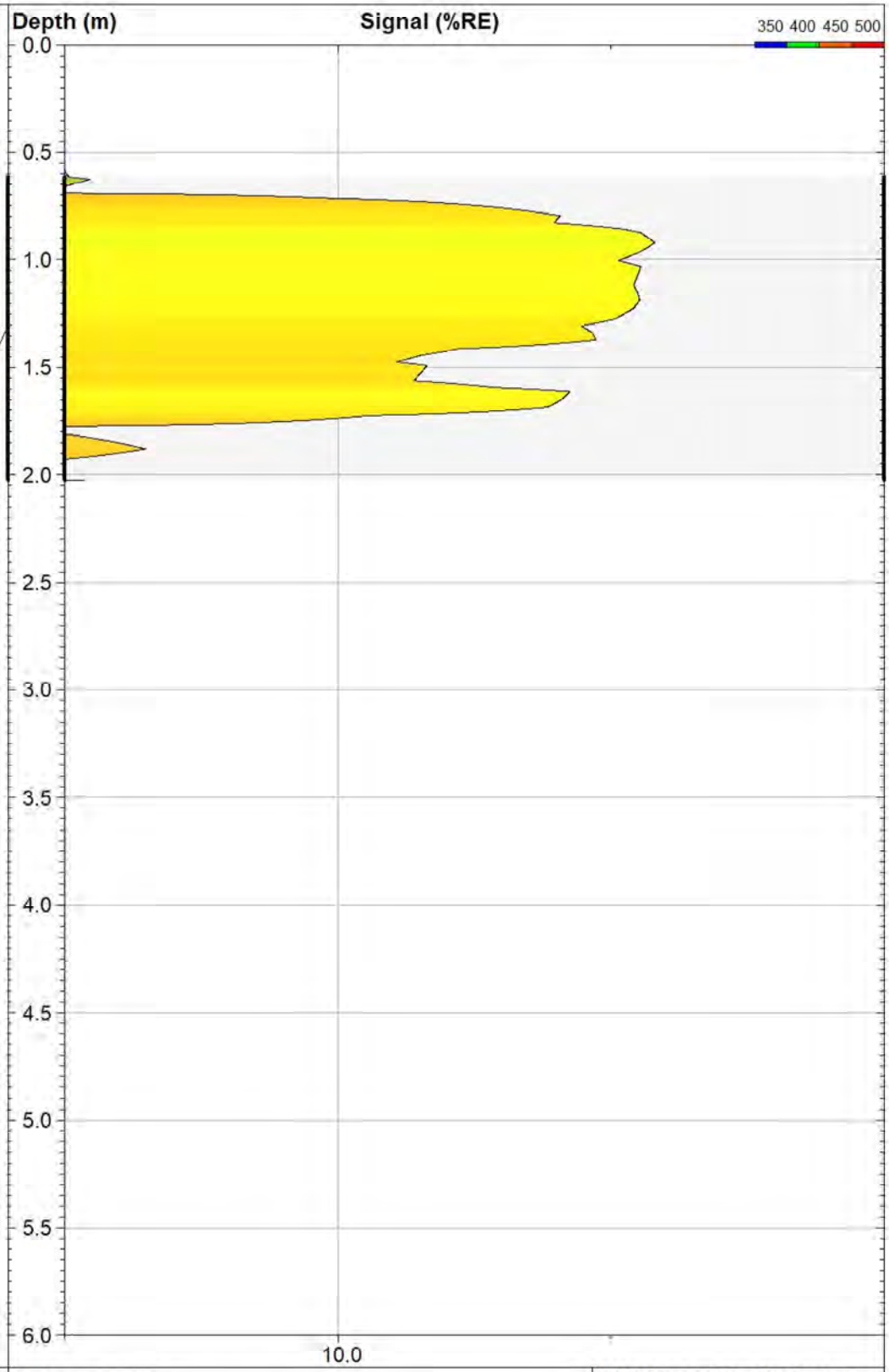
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762019.006 / UTM**	*Final depth:* **3.10 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385873.5853 /**	*Max signal:* **130.4 %RE @ 0.88 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-07 11:40 ADT**

Callouts



0.62 - 2.03 m
58.8 %RE (s 49.6)



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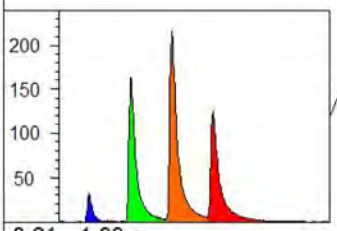
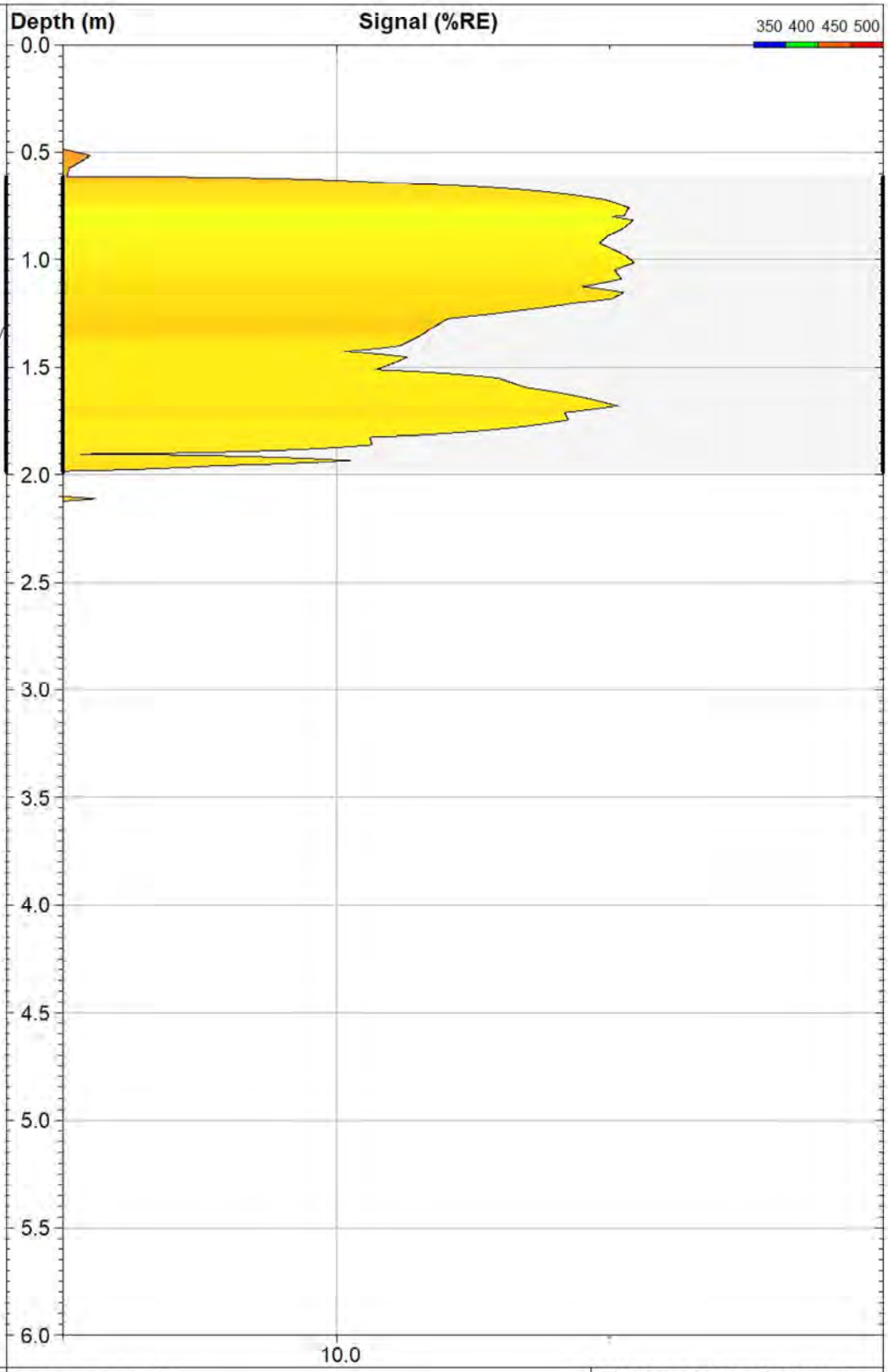
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762021.256 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385870.9177 /**	*Max signal:* **145.2 %RE @ 0.92 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-29 12:42 ADT**

Callouts



0.61 - 1.99 m
60.8 %RE (s 43.9)



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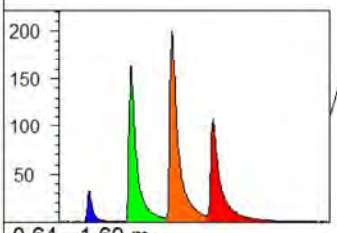
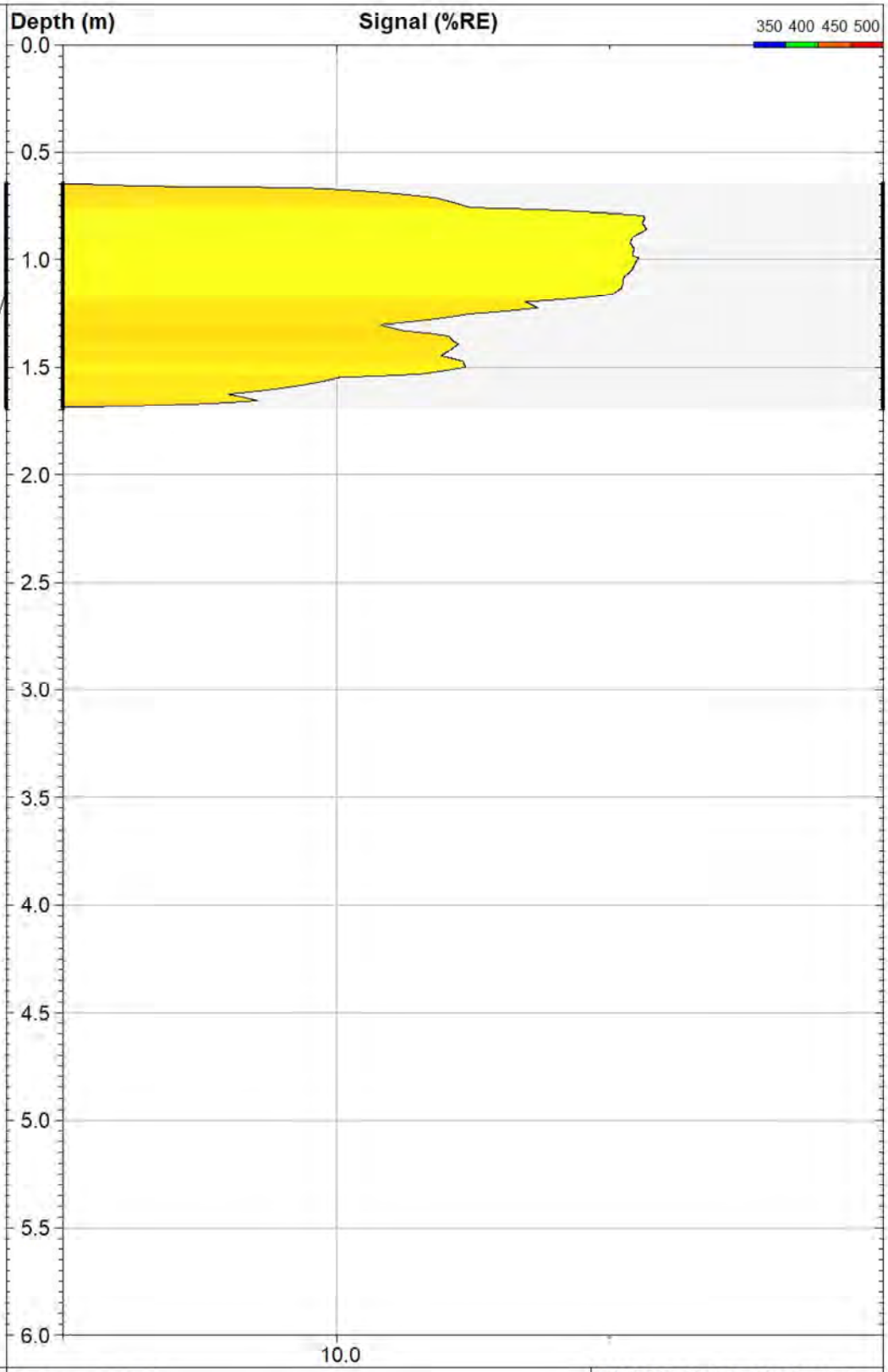
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762027.277 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385866.9513 /**	*Max signal:* **123.8 %RE @ 1.01 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-29 12:42 ADT**

Callouts



0.64 - 1.69 m
62.5 %RE (s 51.1)



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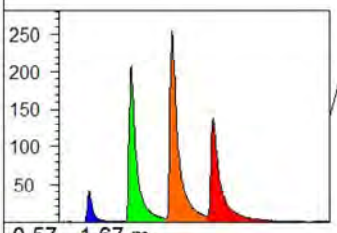
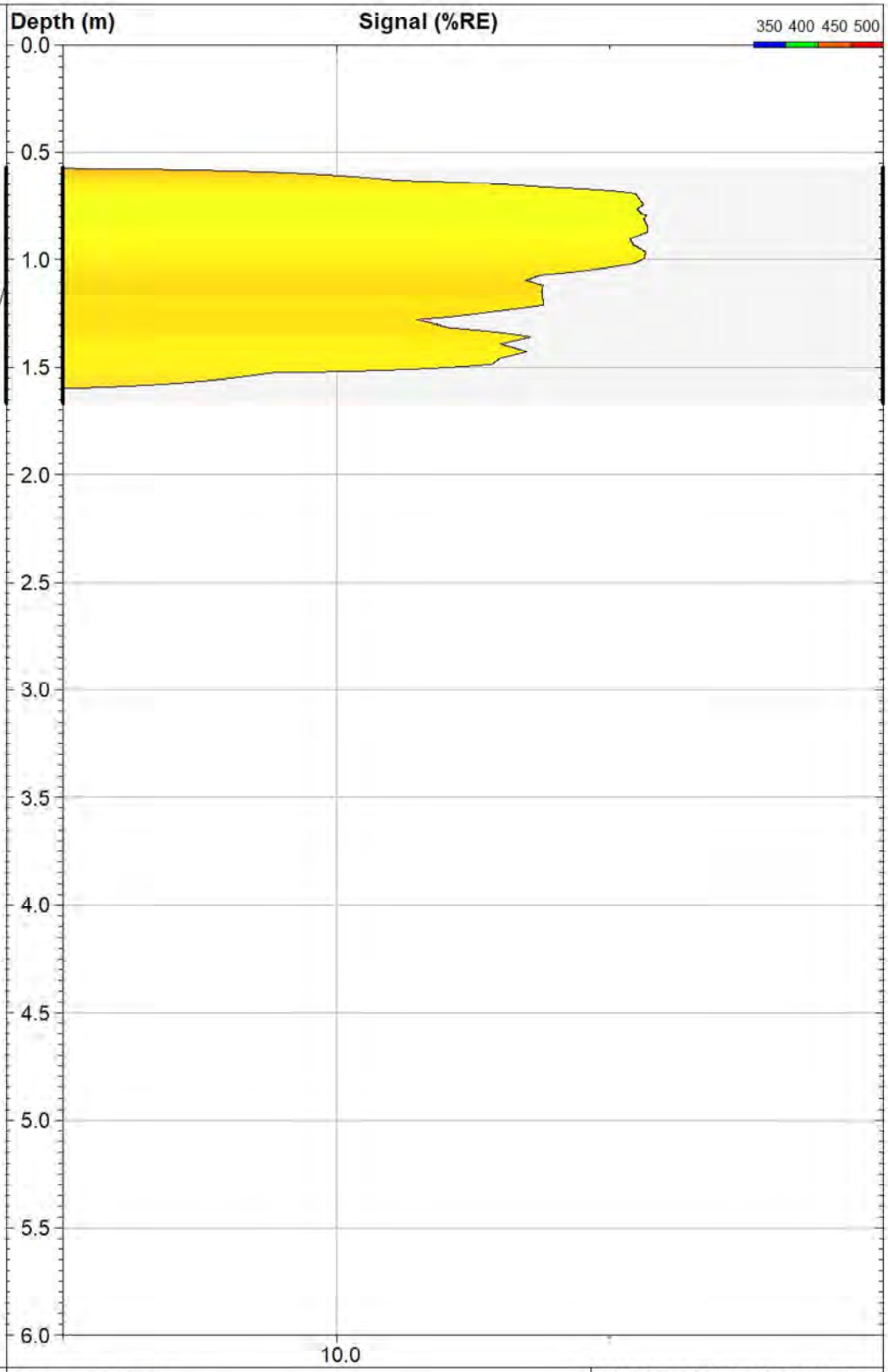
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762030.663 / UTM**	*Final depth:* **3.09 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385871.2041 /**	*Max signal:* **137.1 %RE @ 0.86 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-07 12:21 ADT**

Callouts



0.57 - 1.67 m
76.5 %RE (s 51.3)



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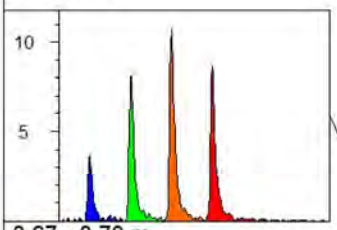
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762024.499 / UTM**	*Final depth:* **3.09 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385873.9663 /**	*Max signal:* **138.0 %RE @ 0.84 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-07 12:38 ADT**

Callouts



0.67 - 0.79 m
2.5 %RE (s 0.5)

Depth (m) **Signal (%RE)** 350 400 450 500

0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
10.0

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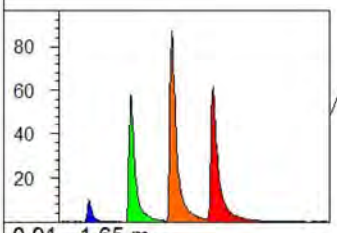
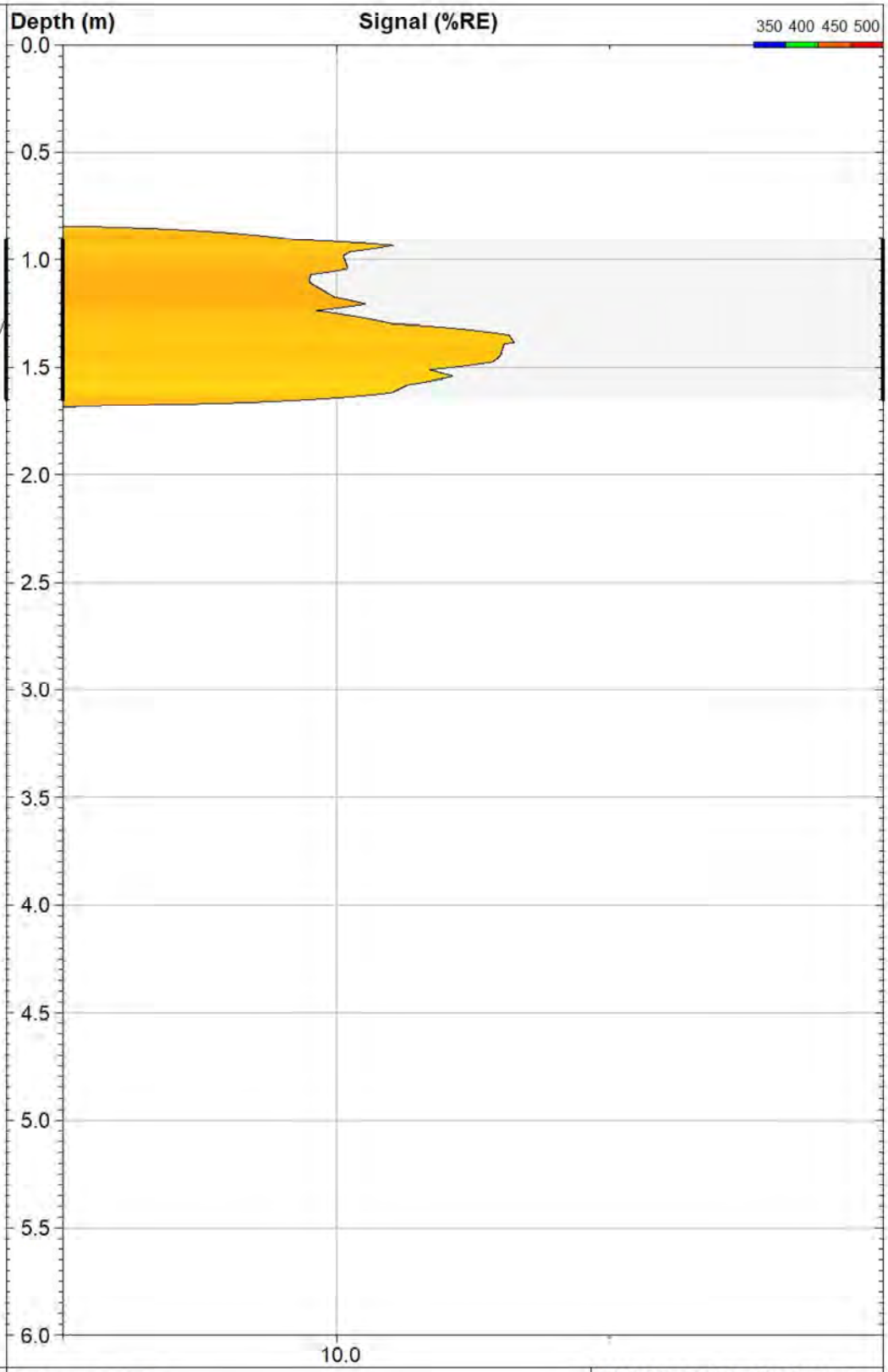
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762028.336 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385878.0758 /**	*Max signal:* **3.4 %RE @ 0.74 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-07 13:19 ADT**

Callouts



0.91 - 1.65 m
20.2 %RE (s 13.1)



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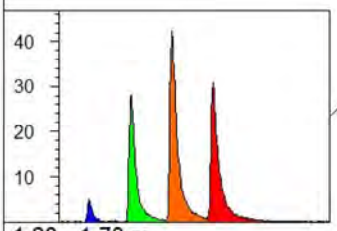
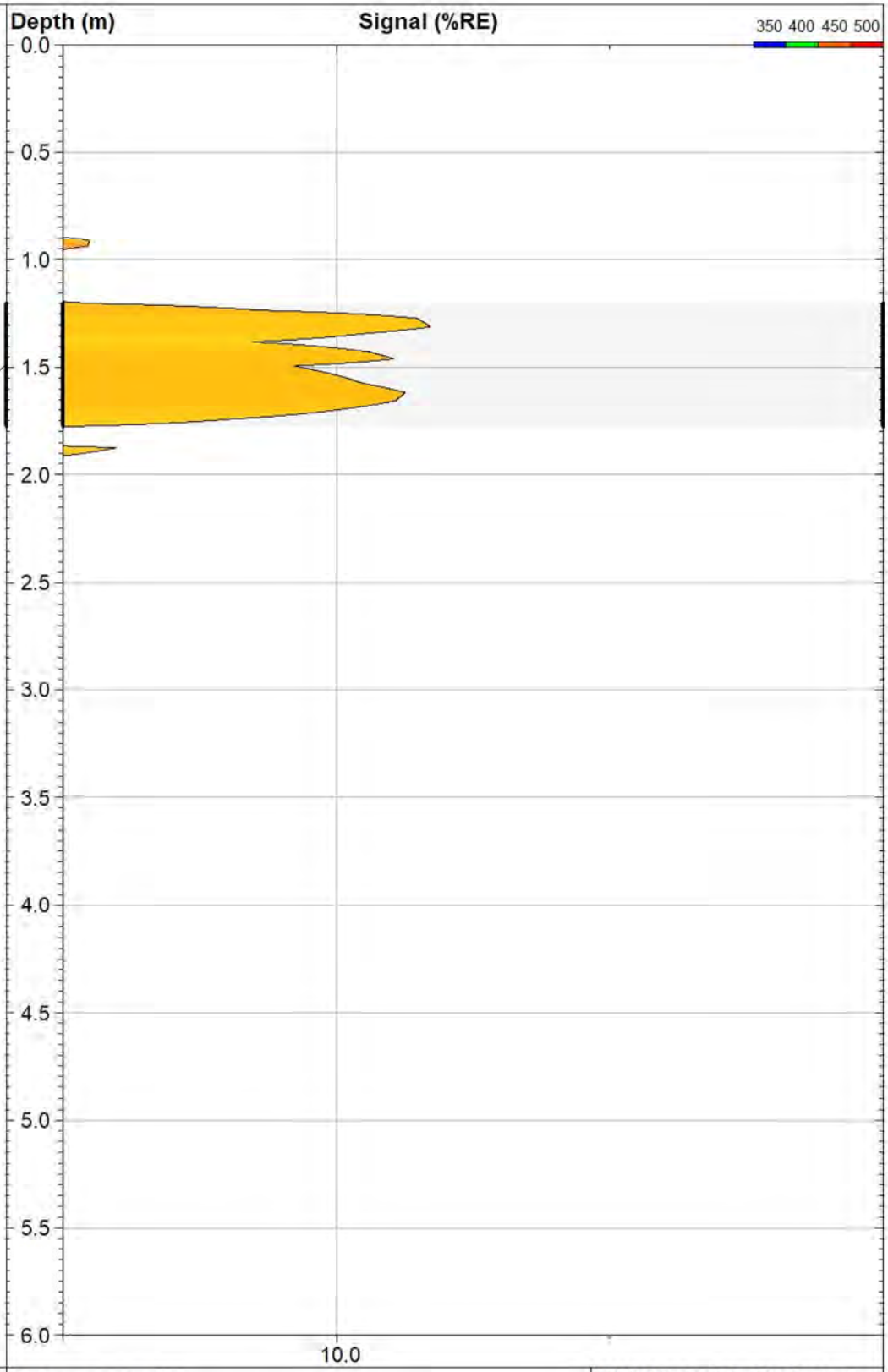
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762030.793 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385886.4385 /**	*Max signal:* **45.6 %RE @ 1.38 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.2 m**	*Date & Time:* **2020-05-07 13:35 ADT**

Callouts



1.20 - 1.78 m
12.0 %RE (s 7.0)



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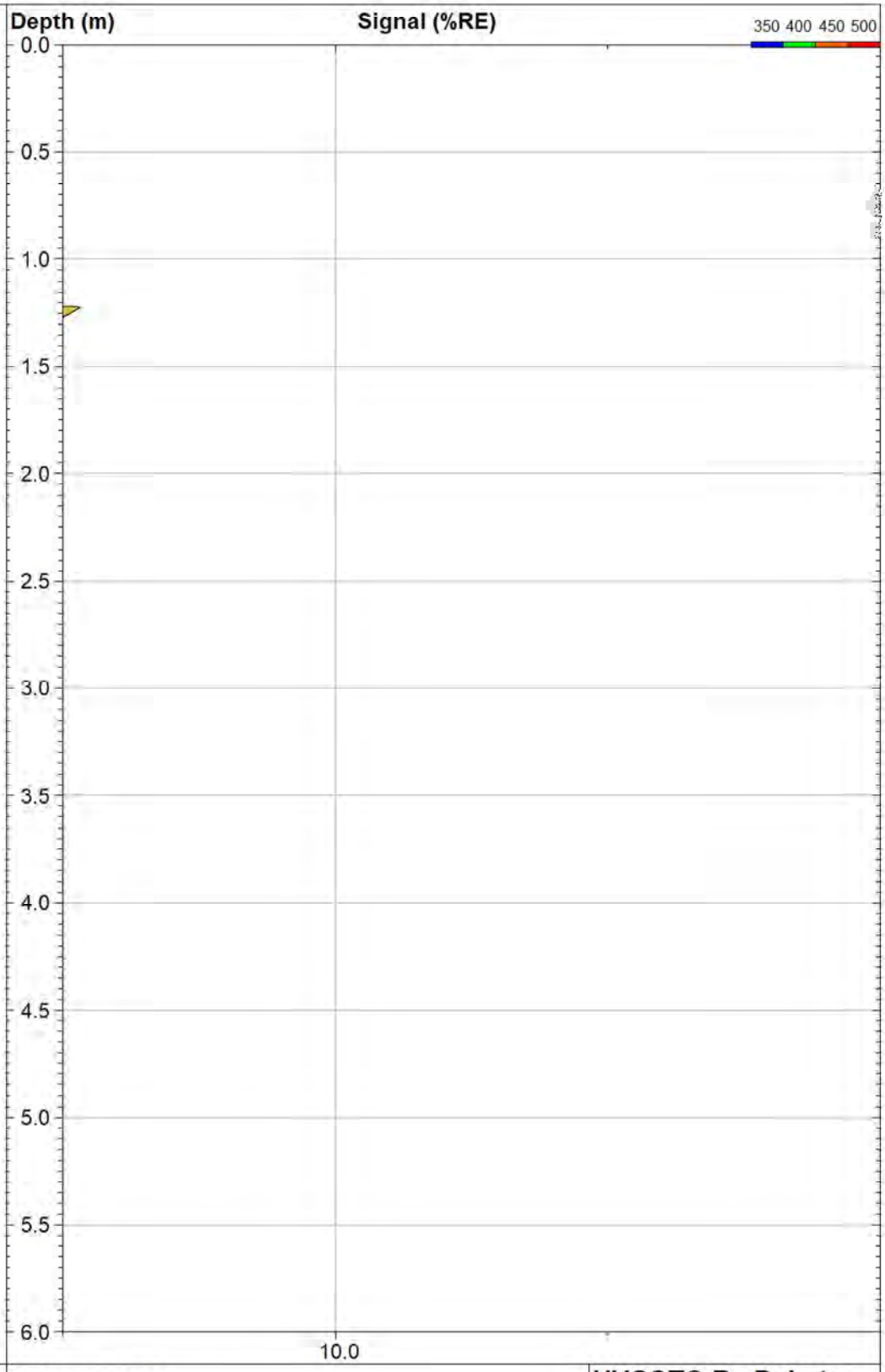
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762035.168 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385883.3864 /**	*Max signal:* **23.1 %RE @ 1.31 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.2 m**	*Date & Time:* **2020-05-07 13:47 ADT**

Callouts



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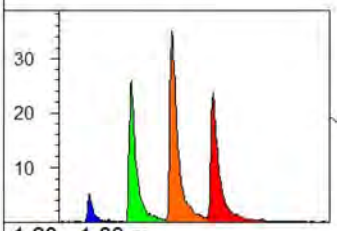
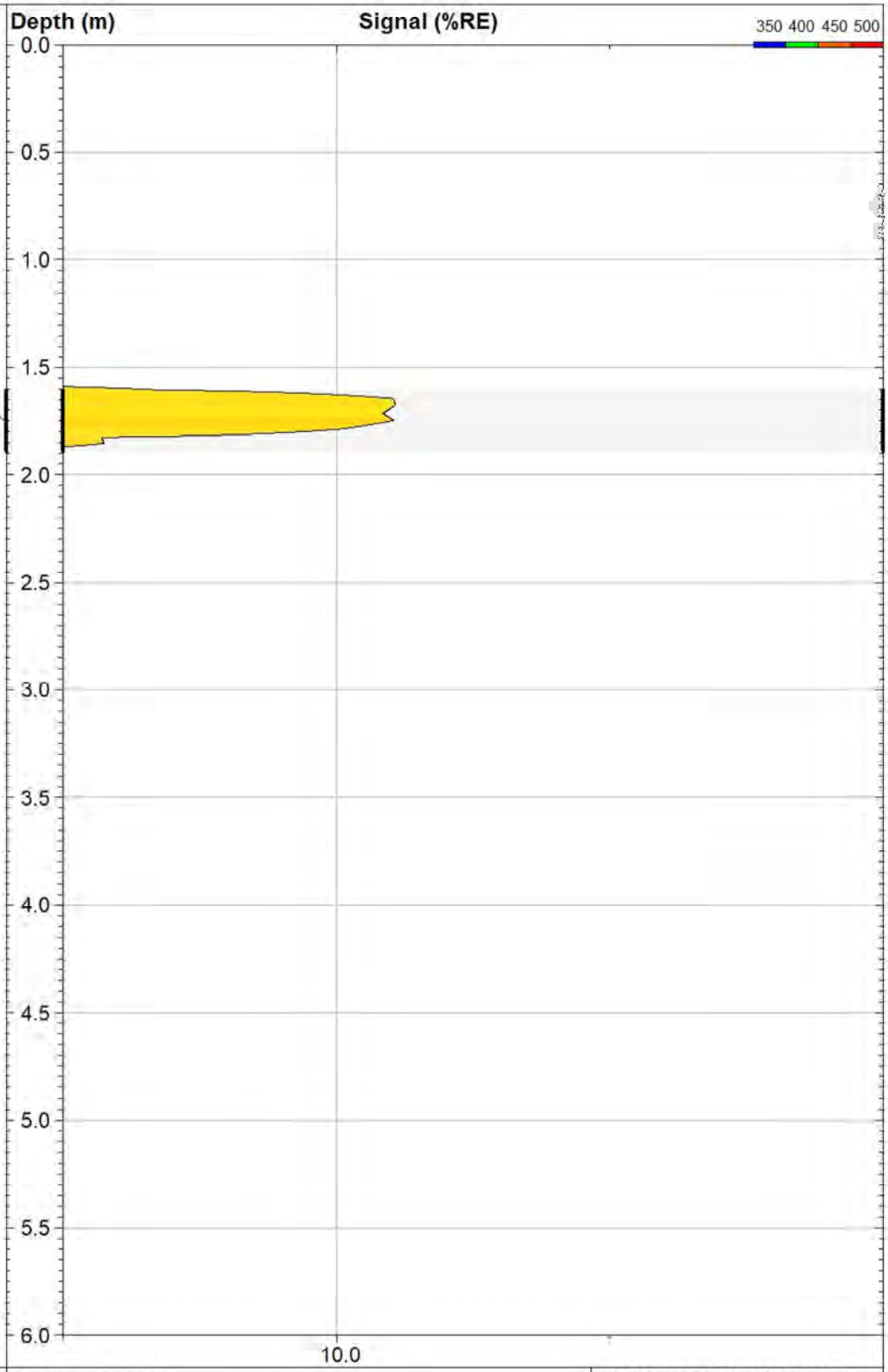
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762038.931 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385880.748 /**	*Max signal:* **2.2 %RE @ 1.22 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.3 m**	*Date & Time:* **2020-05-07 14:01 ADT**

Callouts



1.60 - 1.89 m
9.8 %RE (s 7.3)



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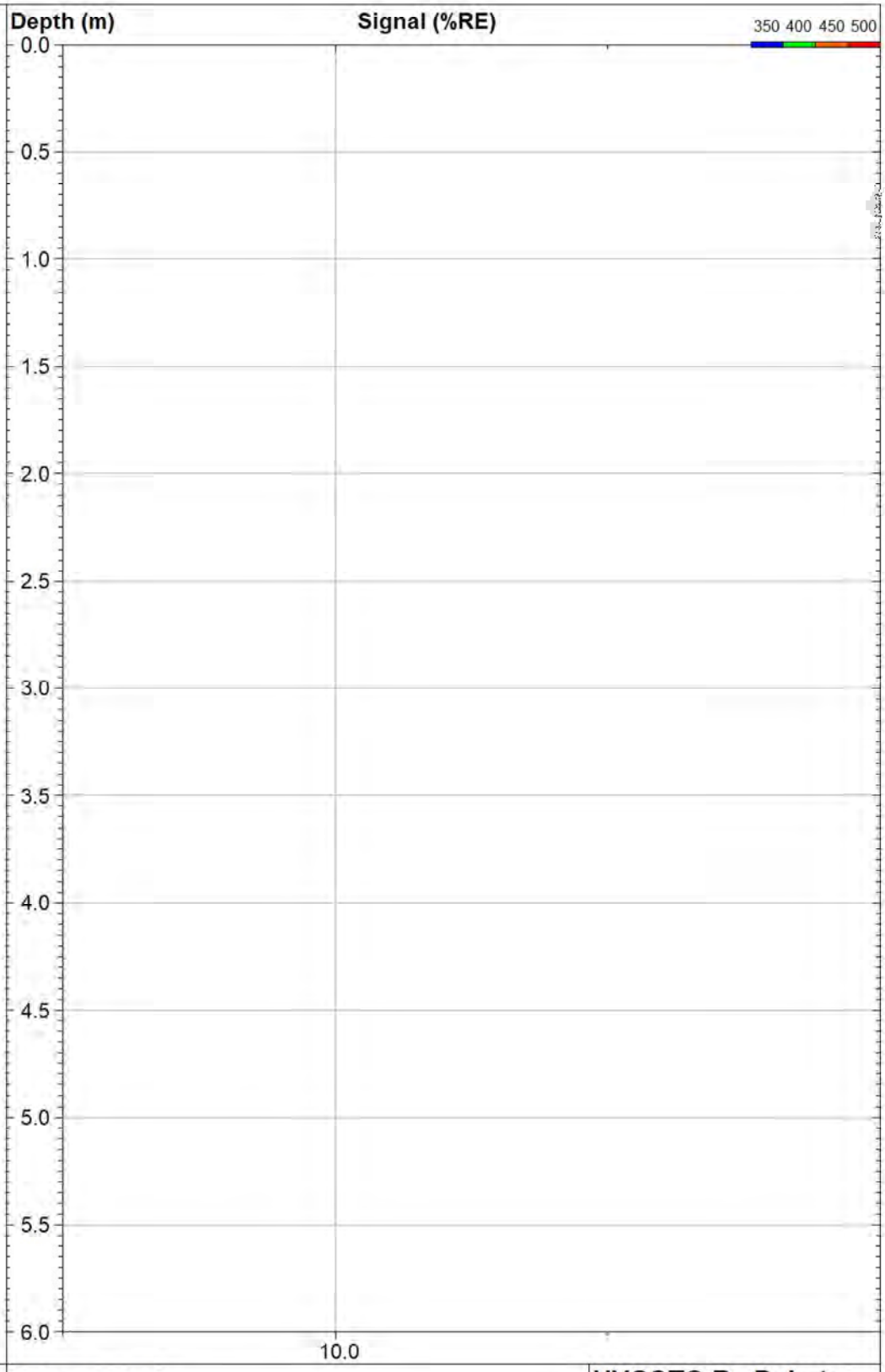
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762036.516 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385860.0563 /**	*Max signal:* **17.5 %RE @ 1.68 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-07 14:21 ADT**

Callouts



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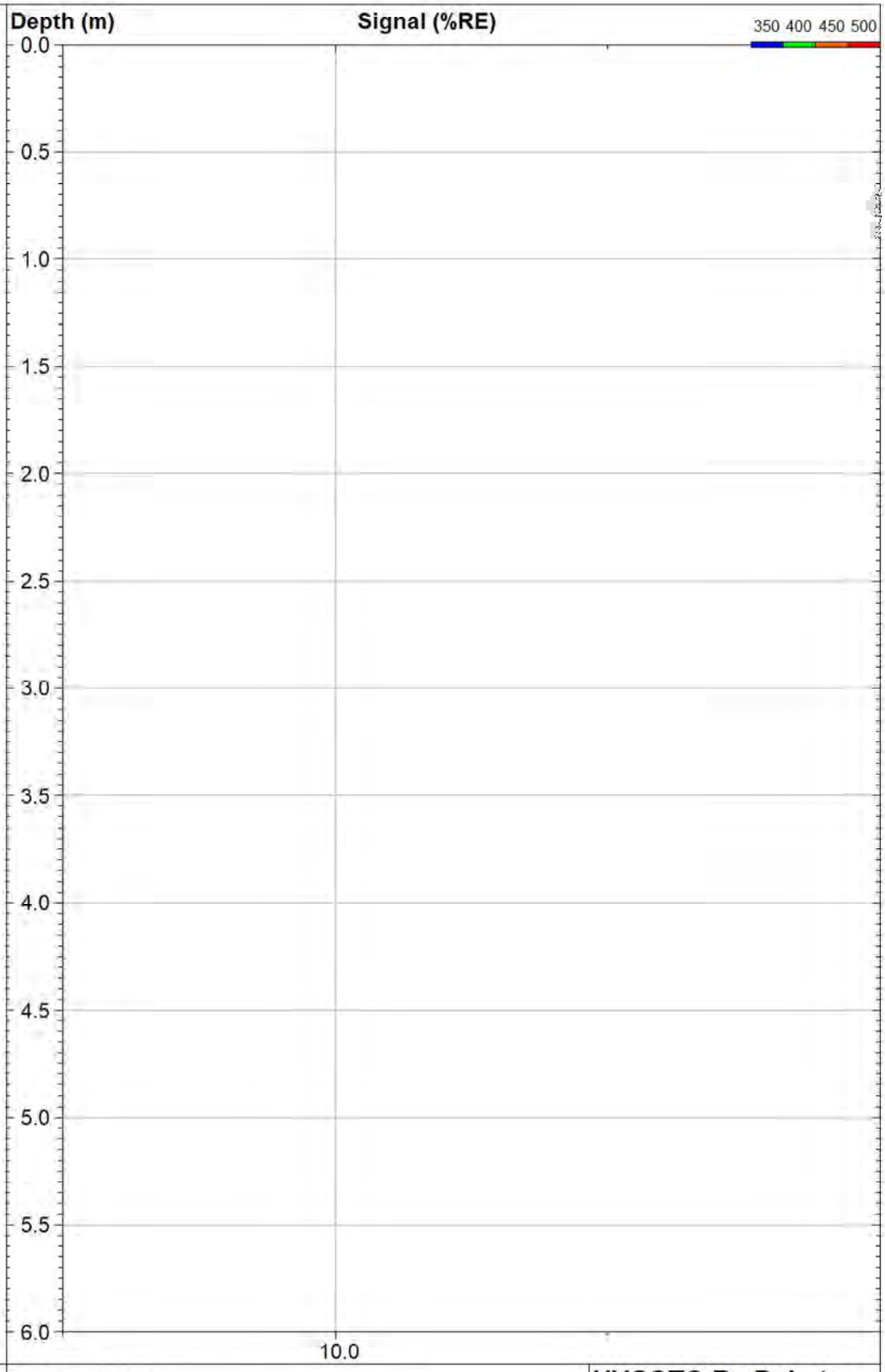
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762040.506 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385858.7205 /**	*Max signal:* **1.7 %RE @ 0.53 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **177.8 m**	*Date & Time:* **2020-05-07 14:45 ADT**

Callouts



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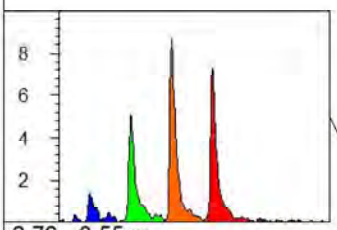
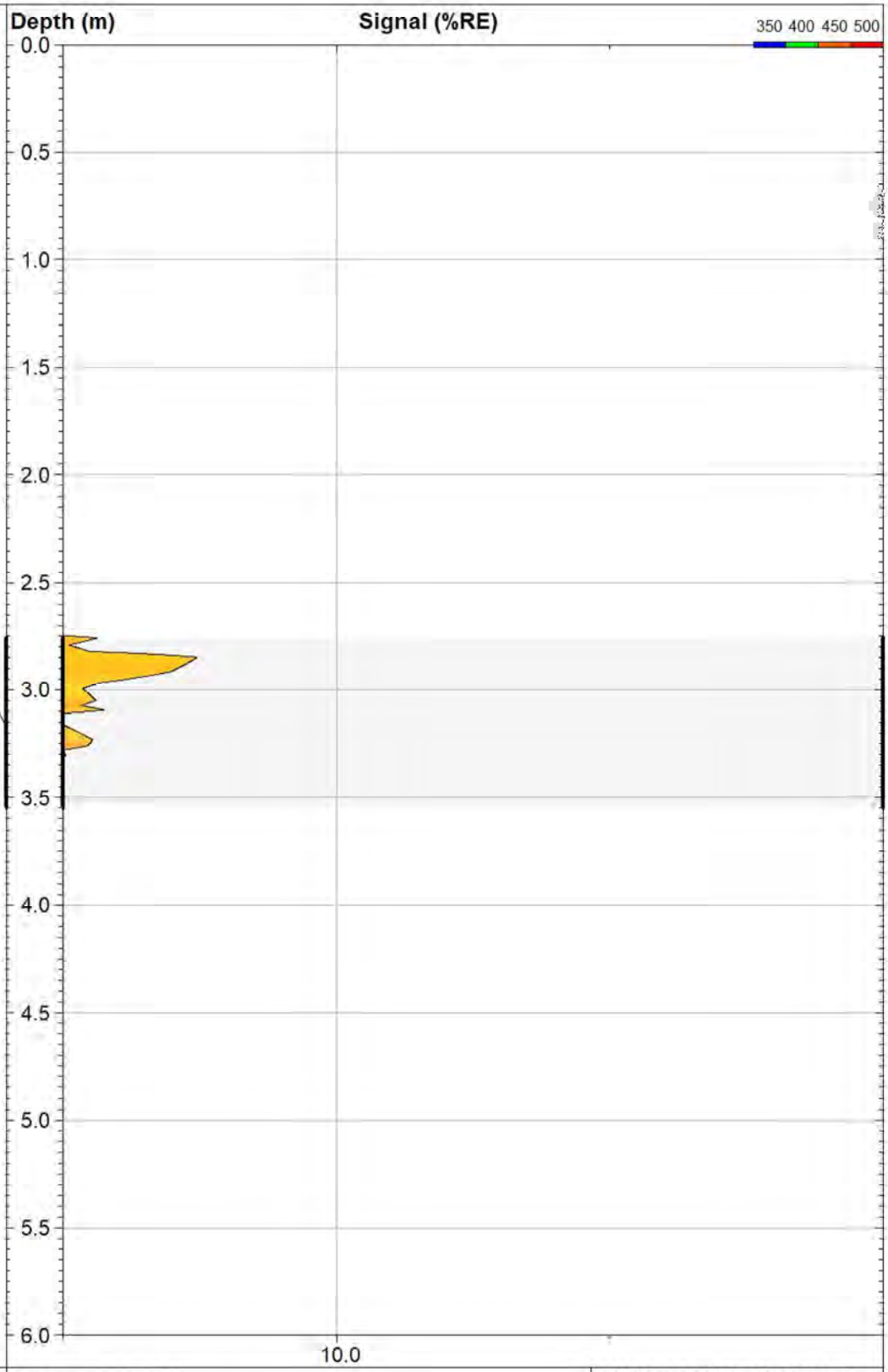
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762041.641 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385863.9704 /**	*Max signal:* **1.6 %RE @ 0.88 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-07 15:00 ADT**

Callouts



2.76 - 3.55 m
2.2 %RE (s 0.6)



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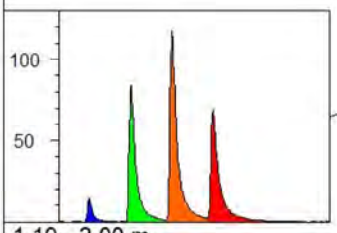
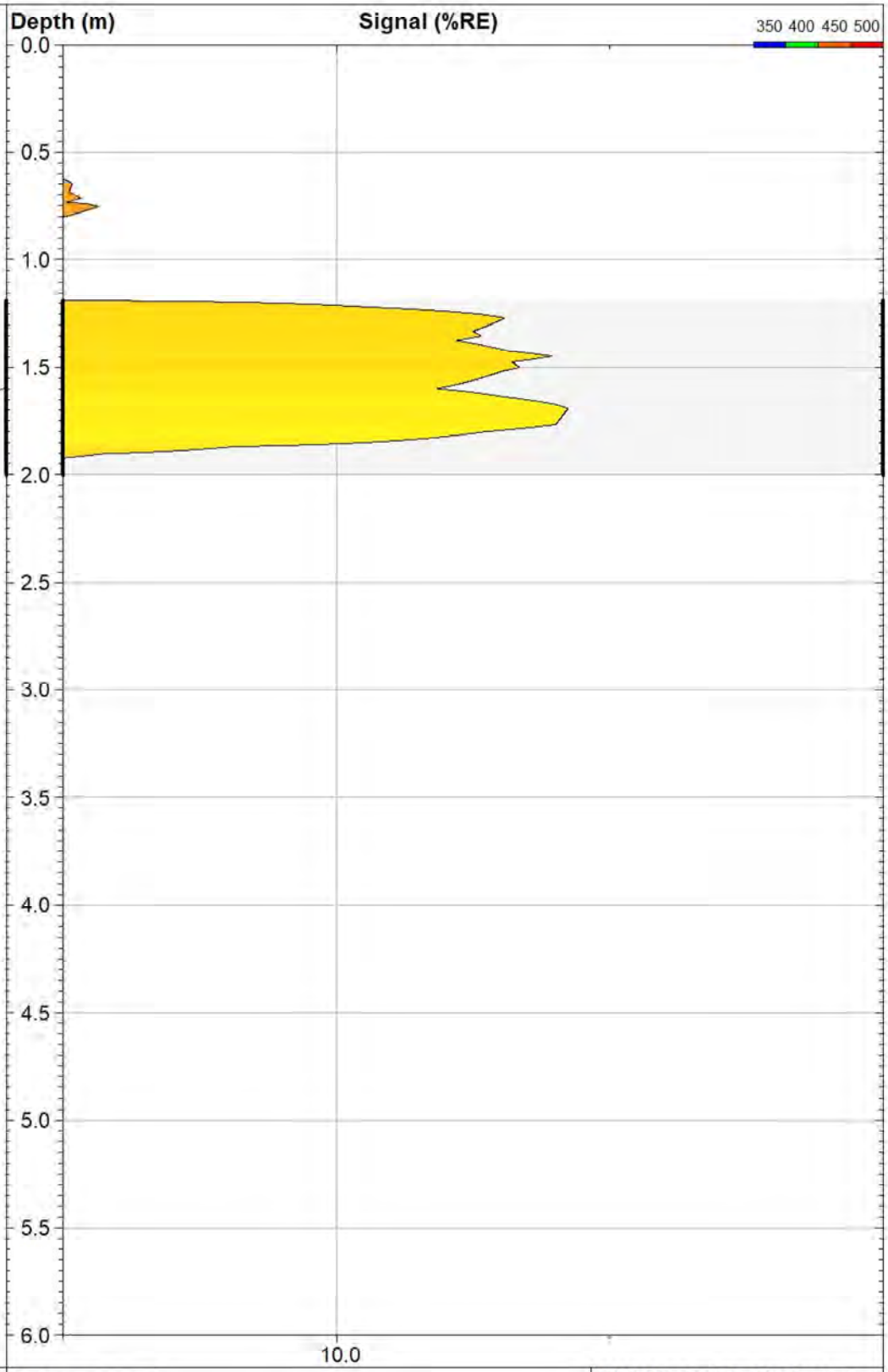
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762033.461 / UTM**	*Final depth:* **3.72 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385856.7605 /**	*Max signal:* **4.1 %RE @ 2.85 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-07 15:13 ADT**

Callouts



1.19 - 2.00 m
31.0 %RE (s 22.8)



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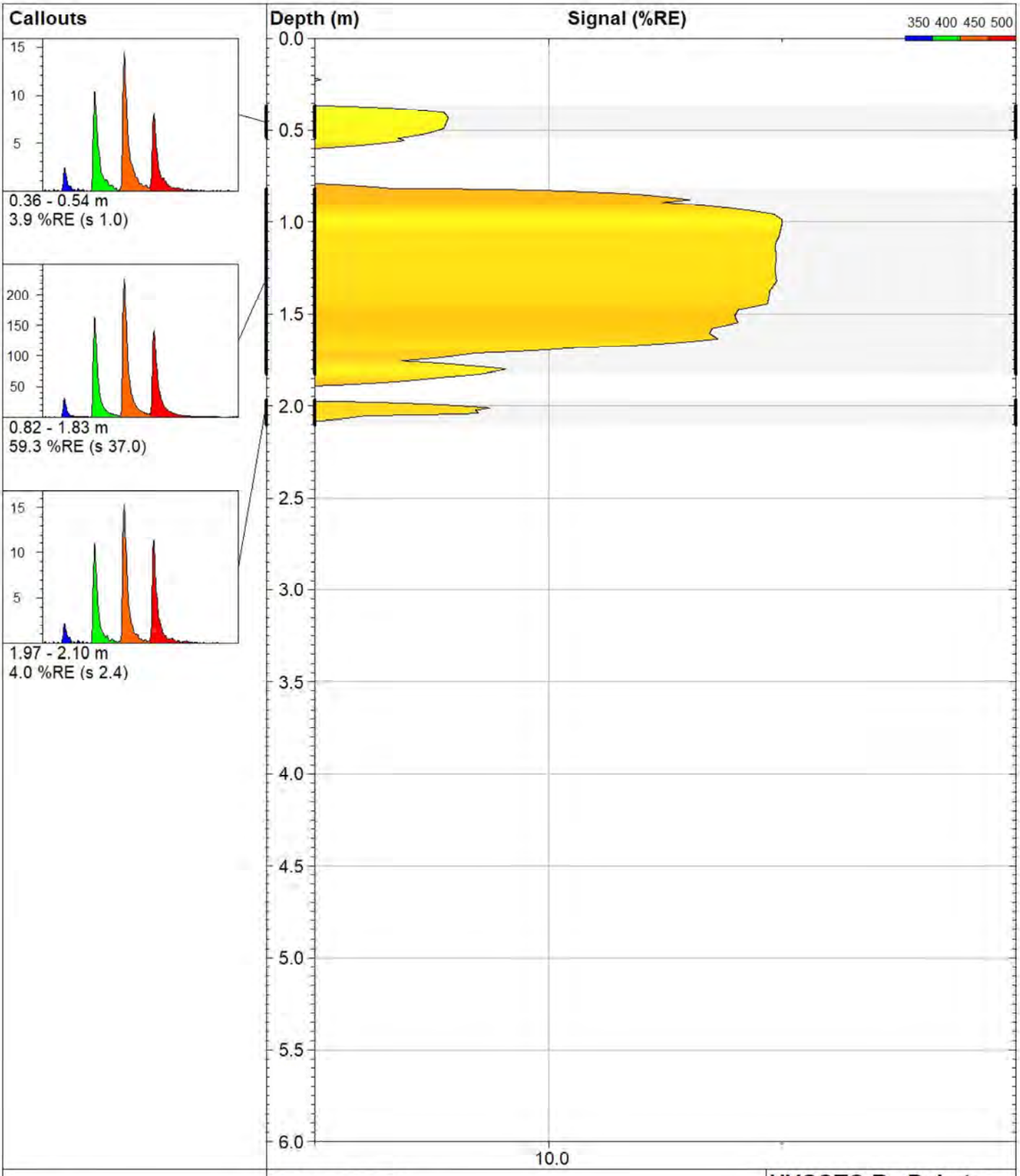
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762034.155 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385862.6031 /**	*Max signal:* **71.2 %RE @ 1.69 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-07 15:29 ADT**



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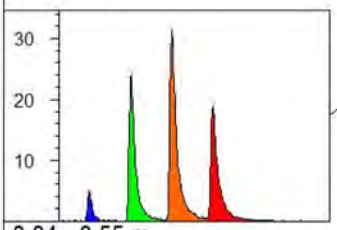
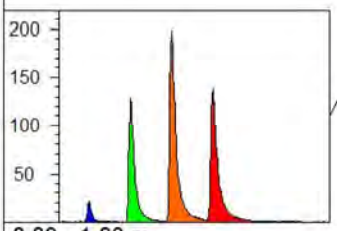
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762021.95 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385882.2455 /**	*Max signal:* **100.7 %RE @ 1.01 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-07 15:49 ADT**

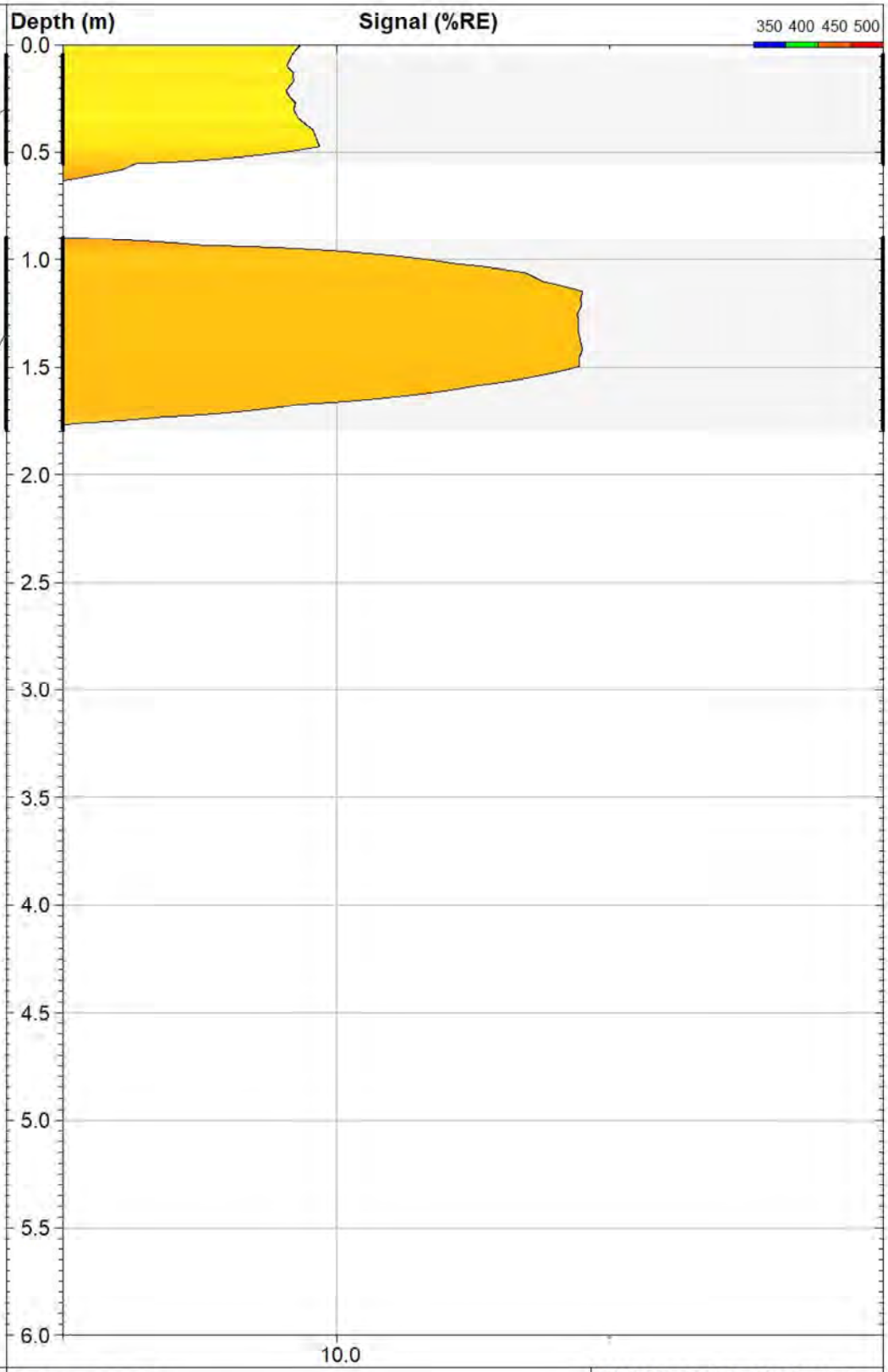
Callouts



0.04 - 0.55 m
7.9 %RE (s 1.6)



0.89 - 1.80 m
45.8 %RE (s 33.8)



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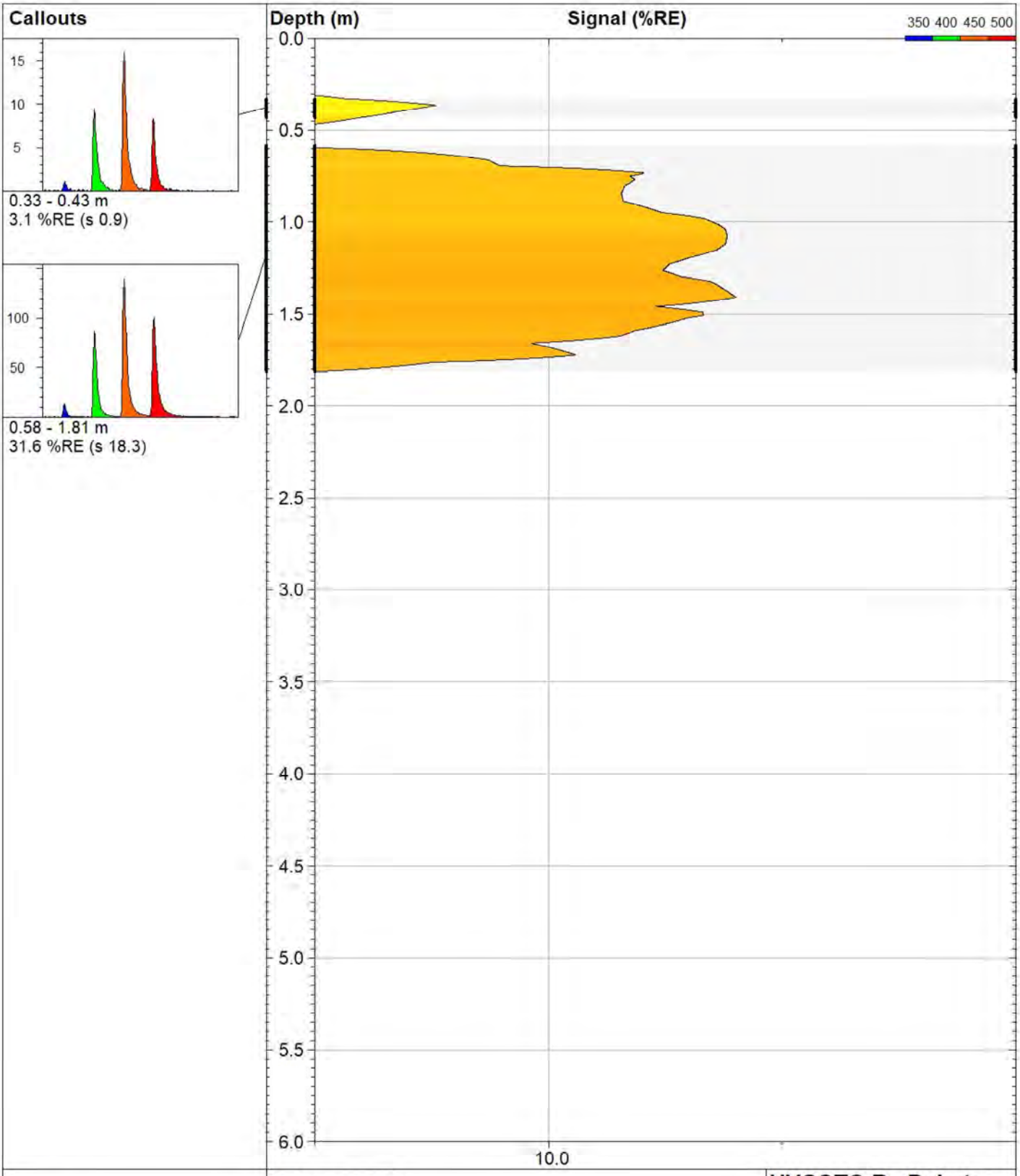
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762025.796 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385891.3619 /**	*Max signal:* **80.5 %RE @ 1.15 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.5 m**	*Date & Time:* **2020-05-07 15:58 ADT**



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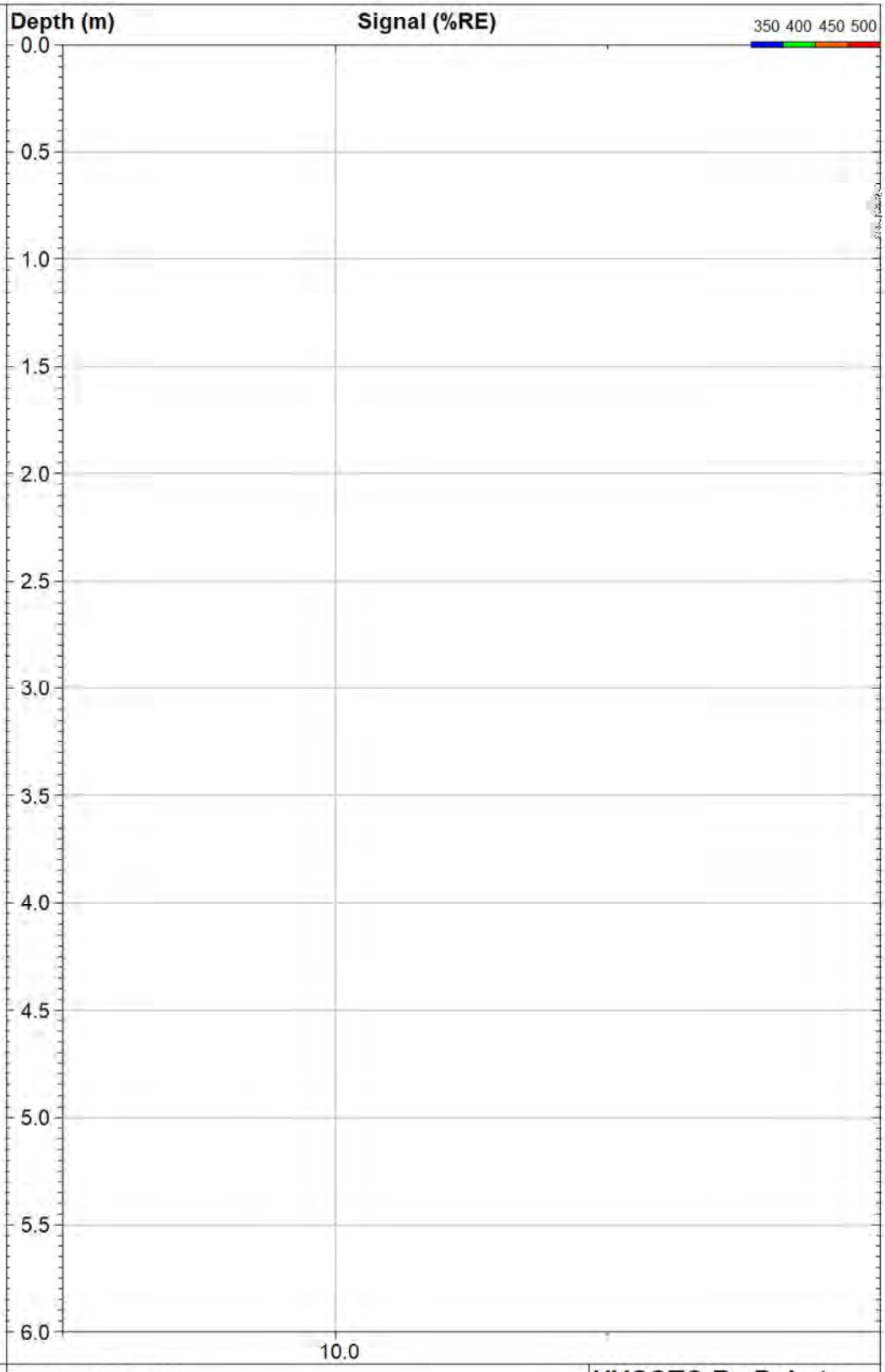
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762031.014 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385900.2459 /**	*Max signal:* **64.4 %RE @ 1.41 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-07 16:11 ADT**

Callouts



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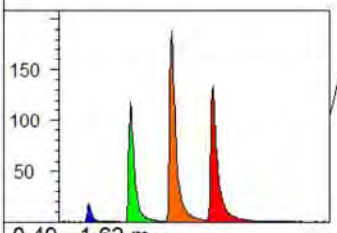
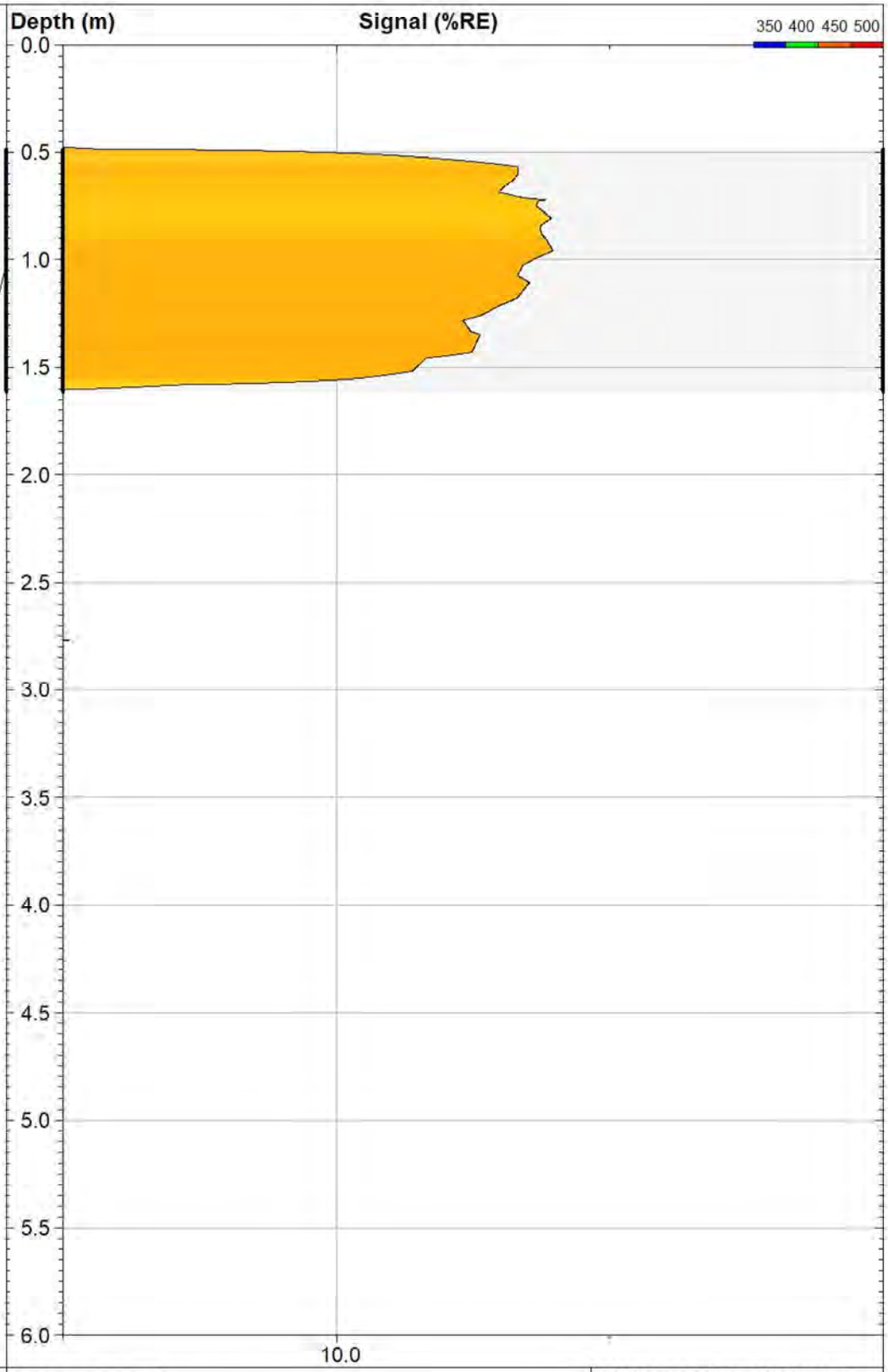
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762042.304 / UTM**	*Final depth:* **3.09 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385897.2373 /**	*Max signal:* **1.7 %RE @ 0.87 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-07 16:21 ADT**

Callouts



0.49 - 1.62 m
39.9 %RE (s 18.2)



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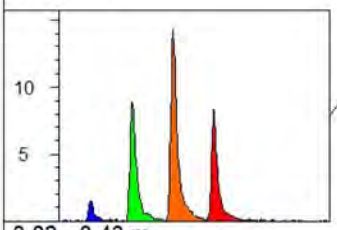
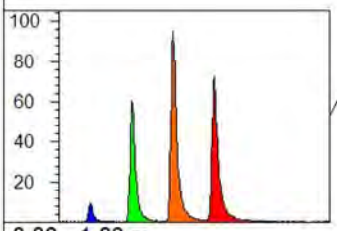
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762037.601 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385899.9326 /**	*Max signal:* **62.8 %RE @ 0.96 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.3 m**	*Date & Time:* **2020-05-07 16:31 ADT**

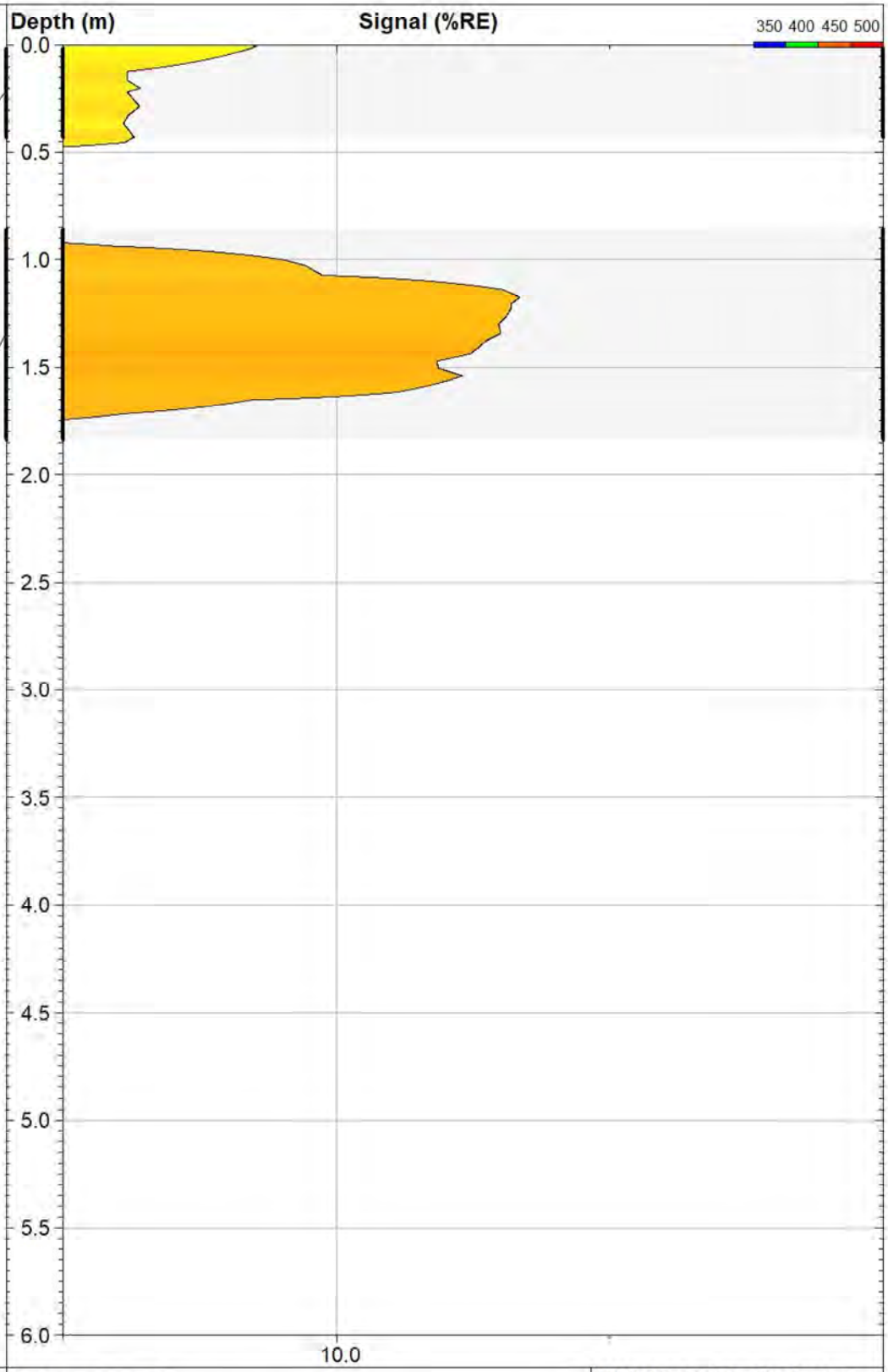
Callouts



0.02 - 0.43 m
3.1 %RE (s 1.0)



0.86 - 1.83 m
20.1 %RE (s 17.5)



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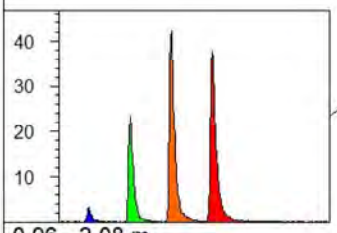
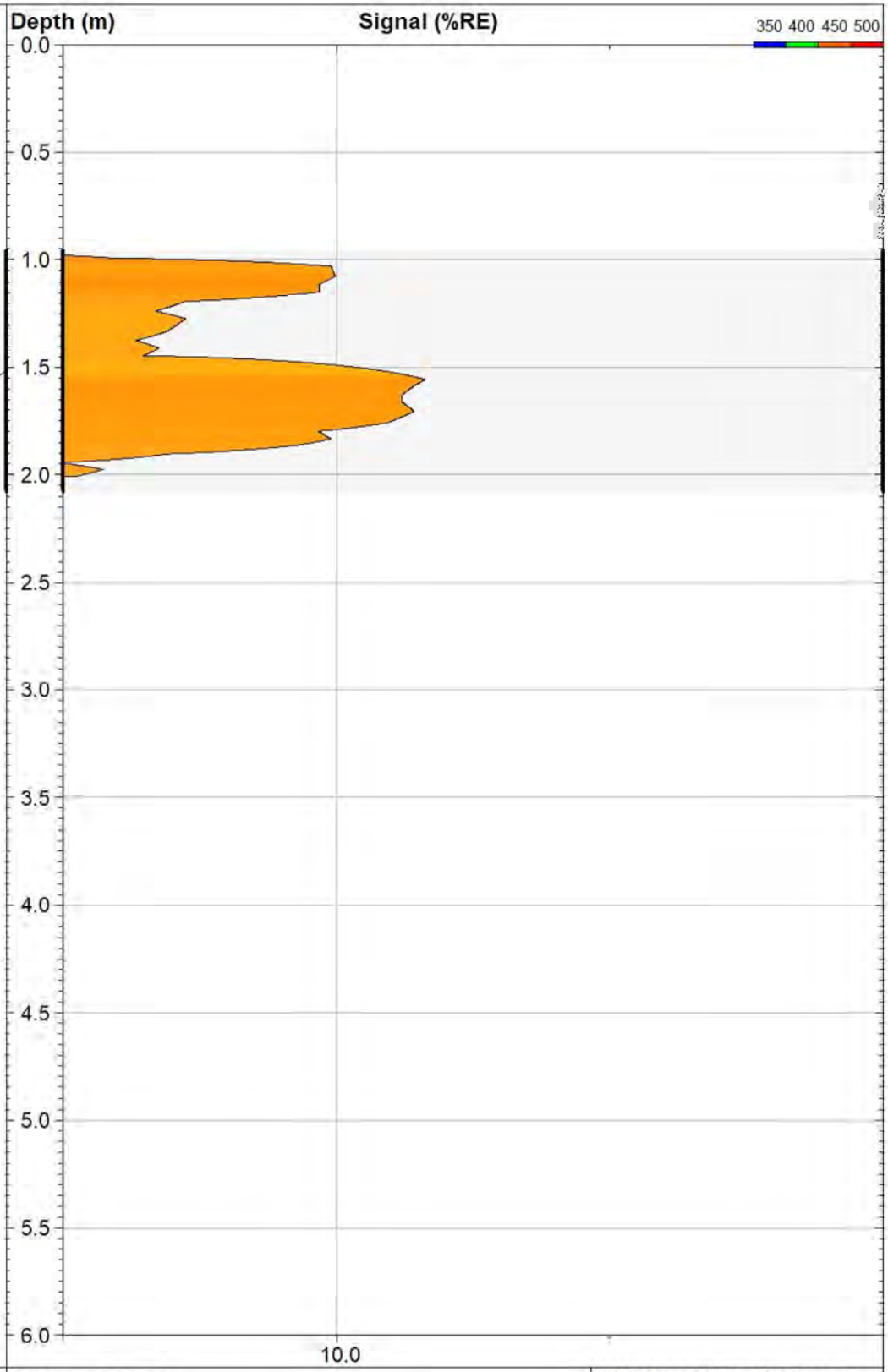
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762029.951 / UTM**	*Final depth:* **3.17 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385919.6021 /**	*Max signal:* **47.8 %RE @ 1.17 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-29 14:34 ADT**

Callouts



0.96 - 2.08 m
8.1 %RE (s 6.8)



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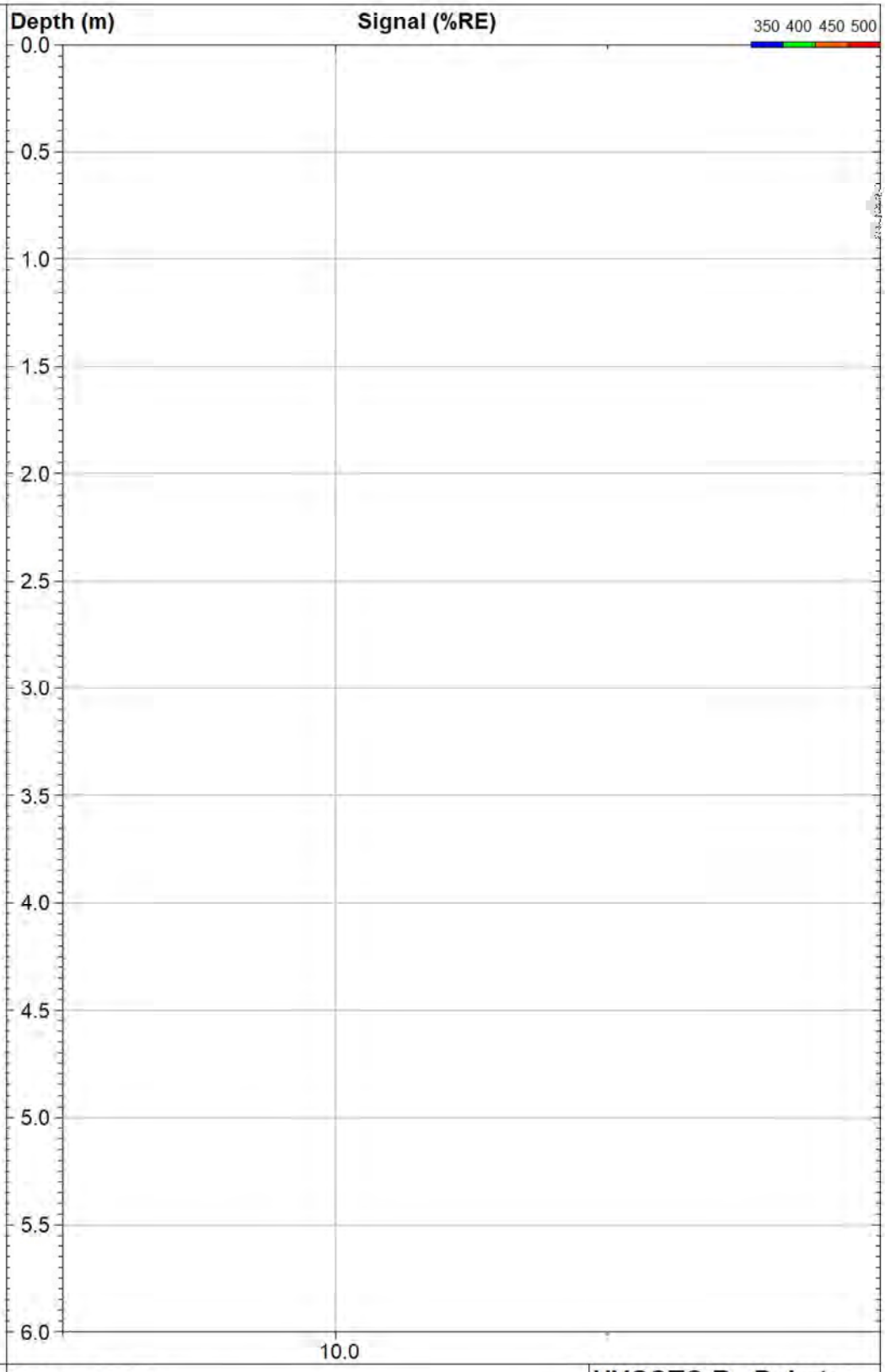
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762020.346 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385943.8863 /**	*Max signal:* **22.0 %RE @ 1.56 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-29 14:35 ADT**

Callouts



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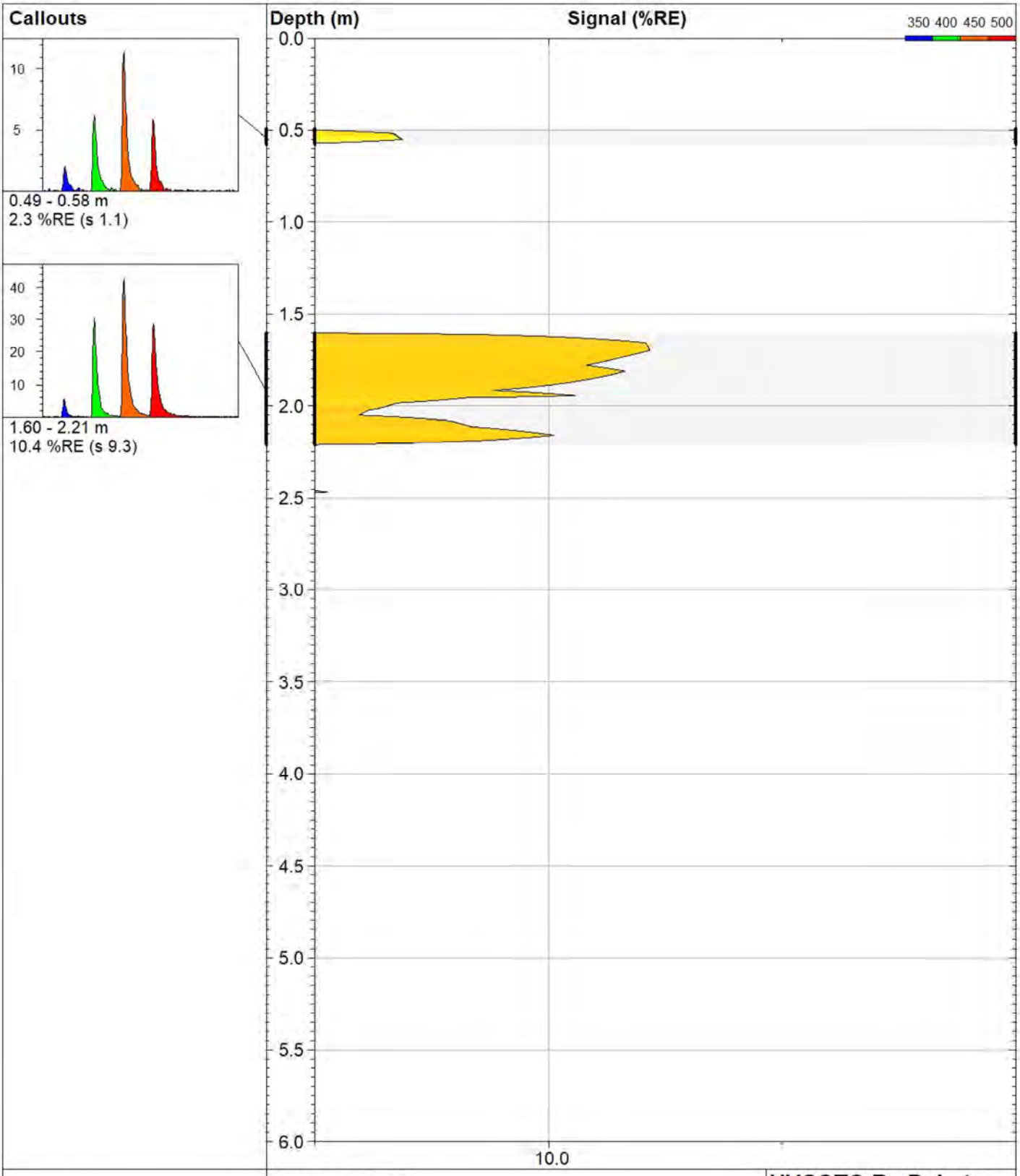
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762025.969 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385945.8649 /**	*Max signal:* **1.9 %RE @ 2.93 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-29 14:35 ADT**



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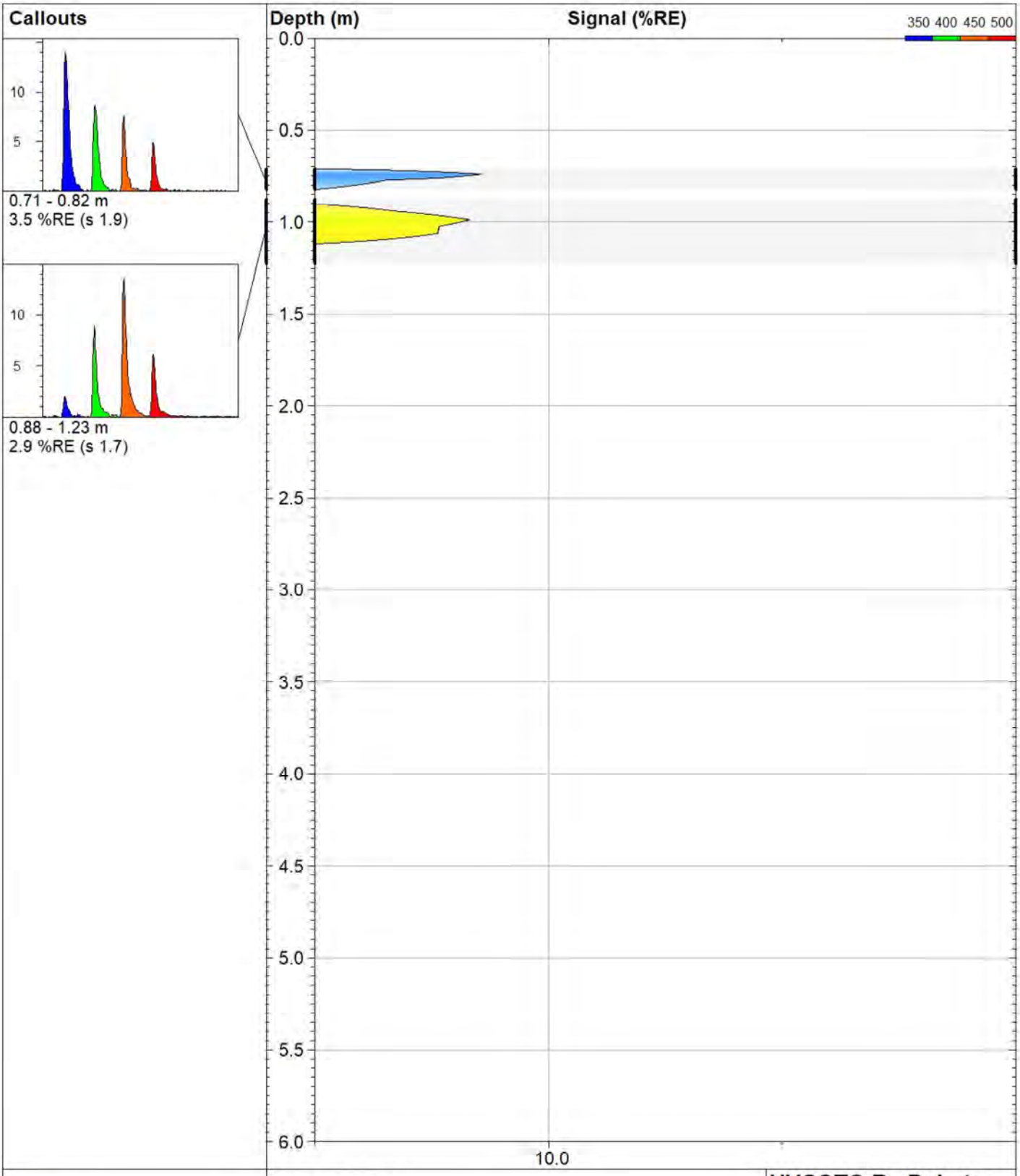
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762013.169 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385965.3517 /**	*Max signal:* **28.1 %RE @ 1.70 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-07 17:24 ADT**



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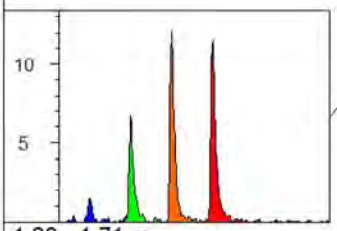
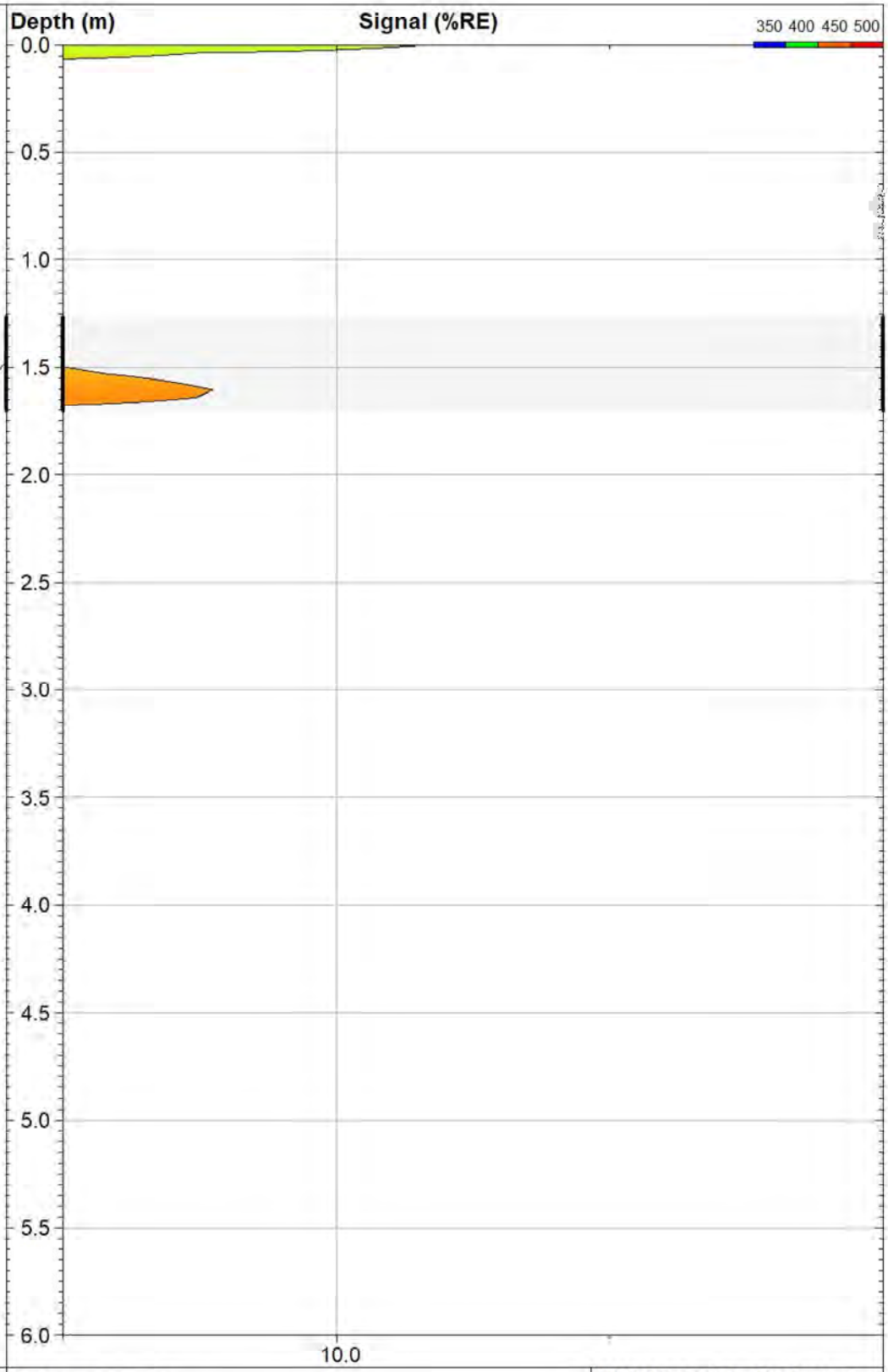
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762008.774 / UTM**	*Final depth:* **3.05 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385972.2216 /**	*Max signal:* **6.2 %RE @ 0.74 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.0 m**	*Date & Time:* **2020-05-07 17:36 ADT**

Callouts



1.26 - 1.71 m
2.1 %RE (s 1.0)



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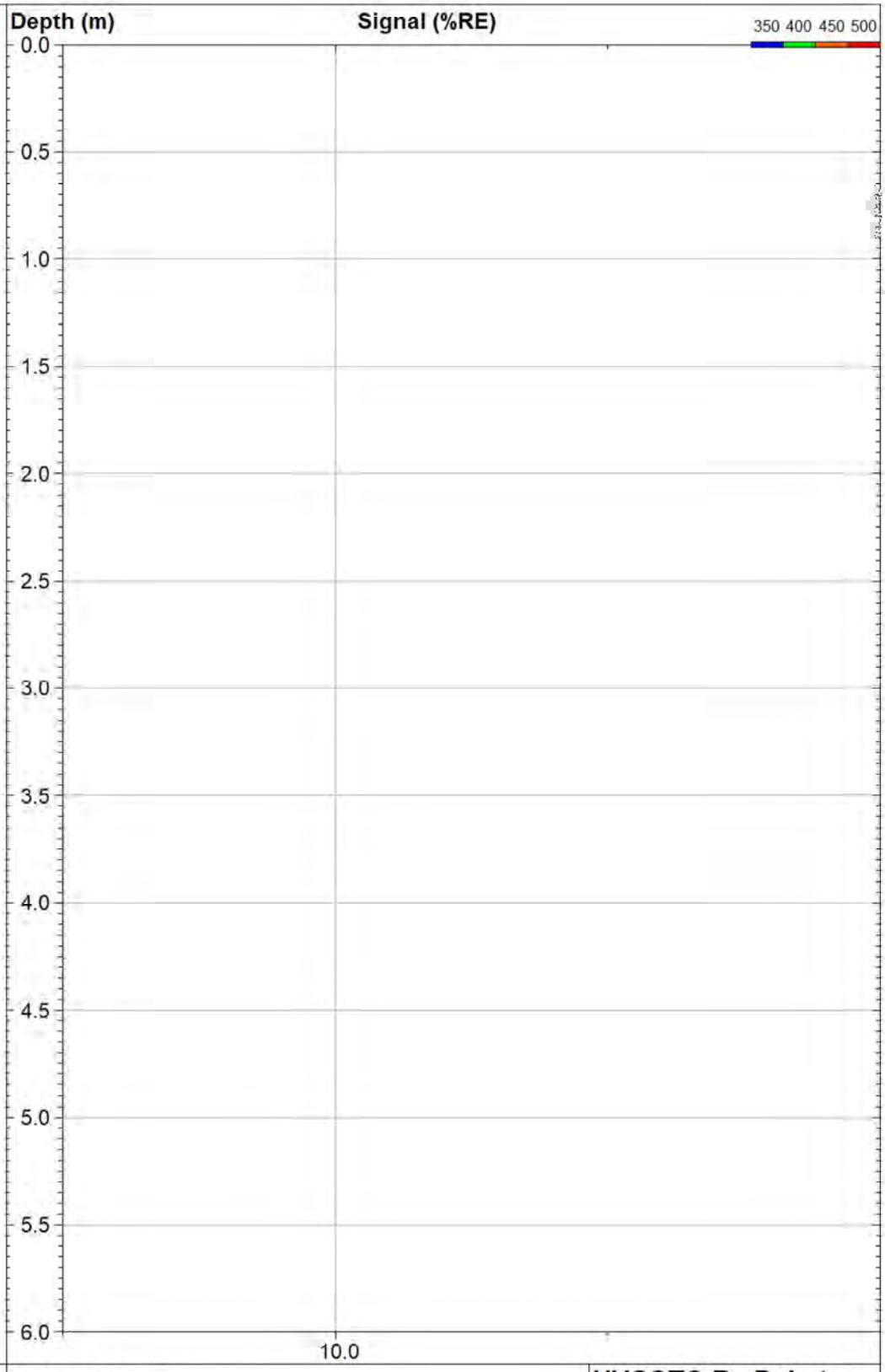
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762007.993 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385975.9924 /**	*Max signal:* **22.6 %RE @ 0.00 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.1 m**	*Date & Time:* **2020-05-08 09:11 ADT**

Callouts



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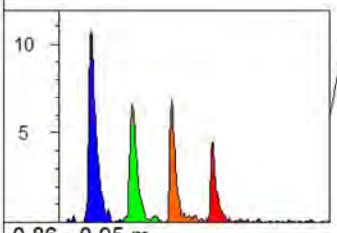
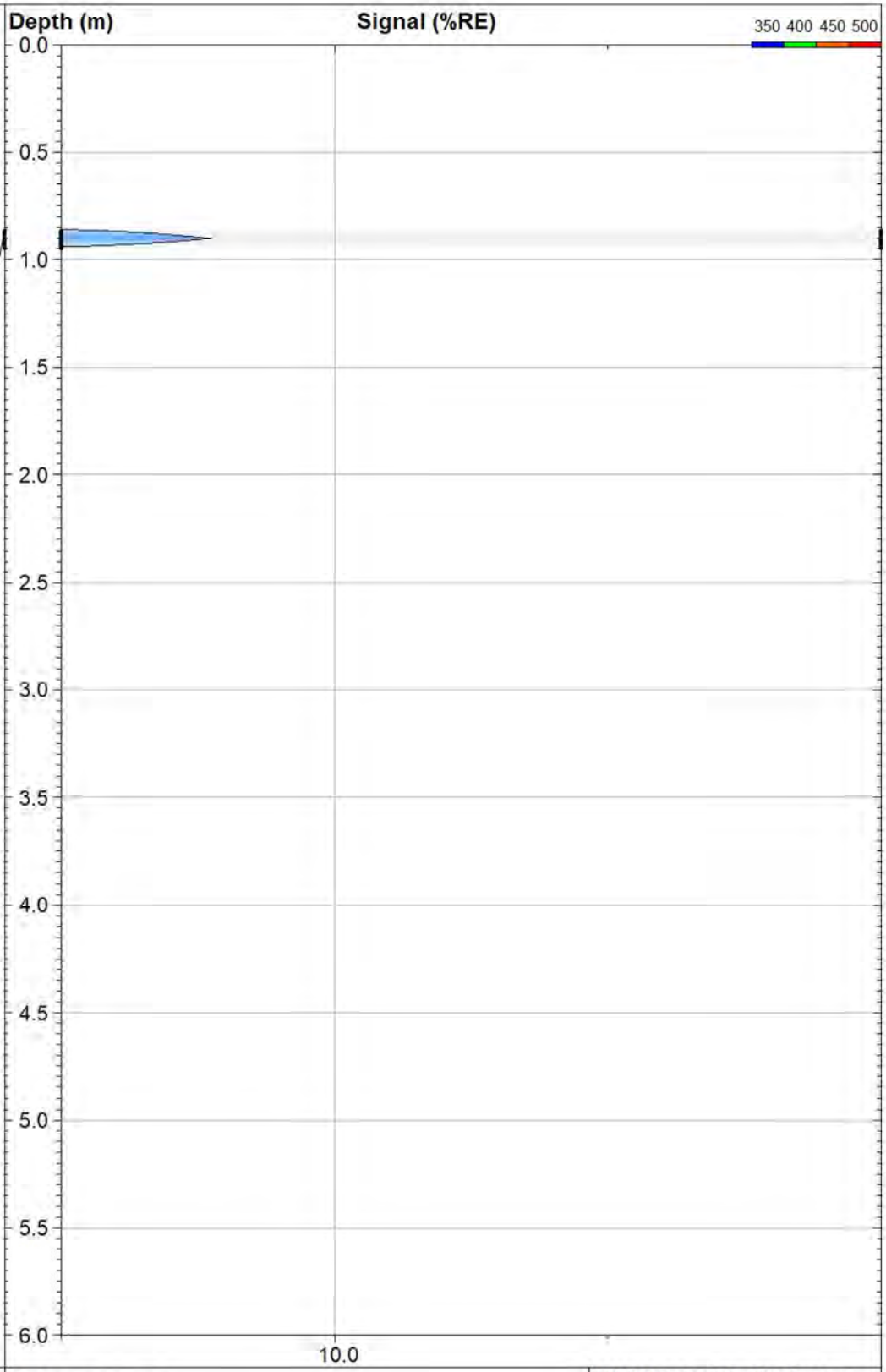
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762011.731 / UTM**	*Final depth:* **3.12 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385972.963 /**	*Max signal:* **1.8 %RE @ 2.64 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-08 09:26 ADT**

Callouts

First 0.7 m invalid, log started prior to being set at ground surface.



0.86 - 0.95 m
2.8 %RE (s 1.5)



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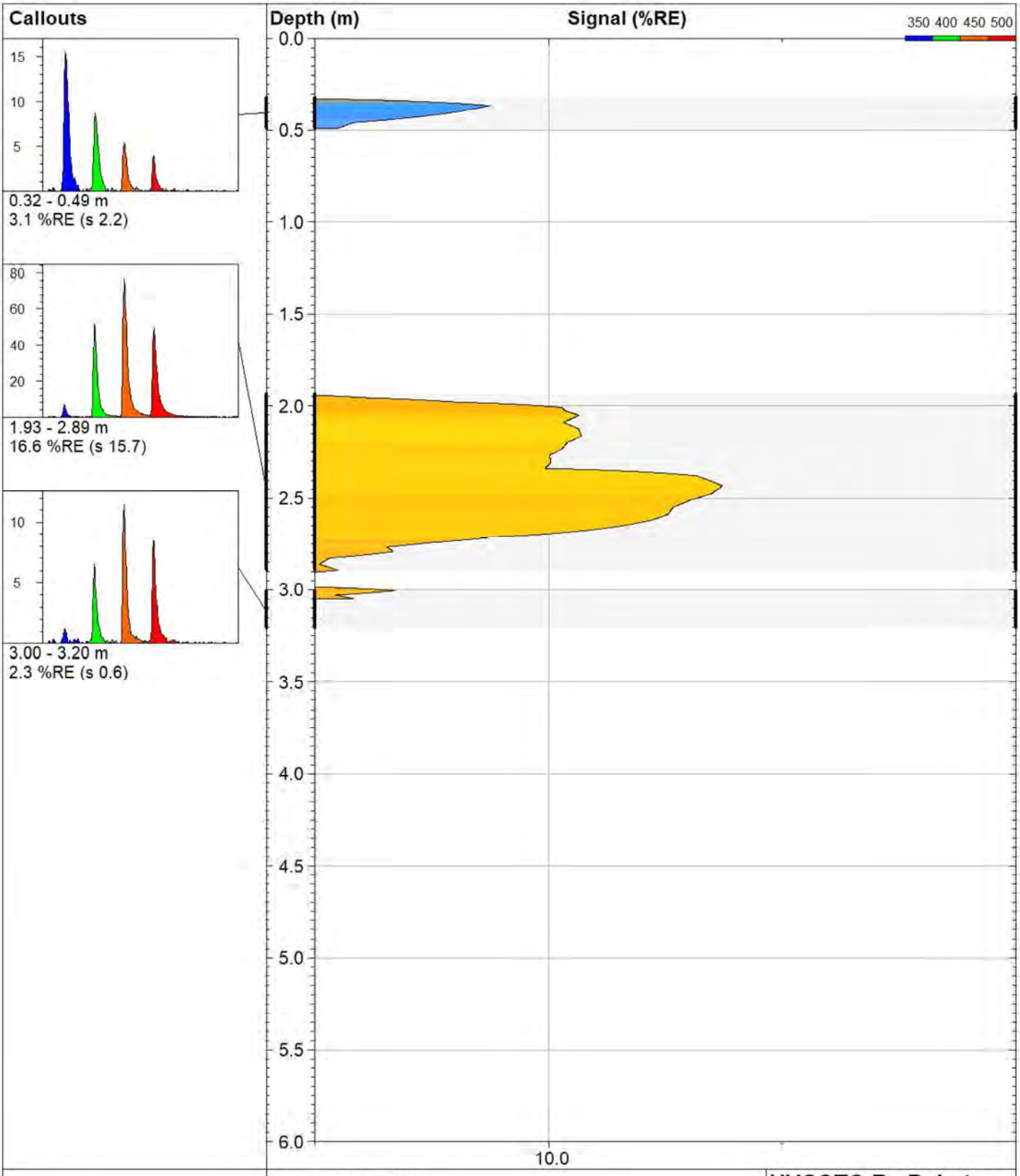
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762007.162 / UTM**	*Final depth:* **3.37 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385970.5633 /**	*Max signal:* **4.5 %RE @ 0.90 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-08 09:38 ADT**



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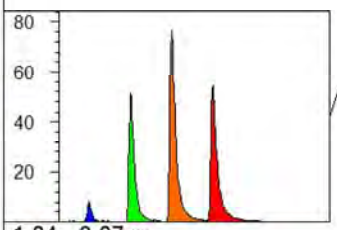
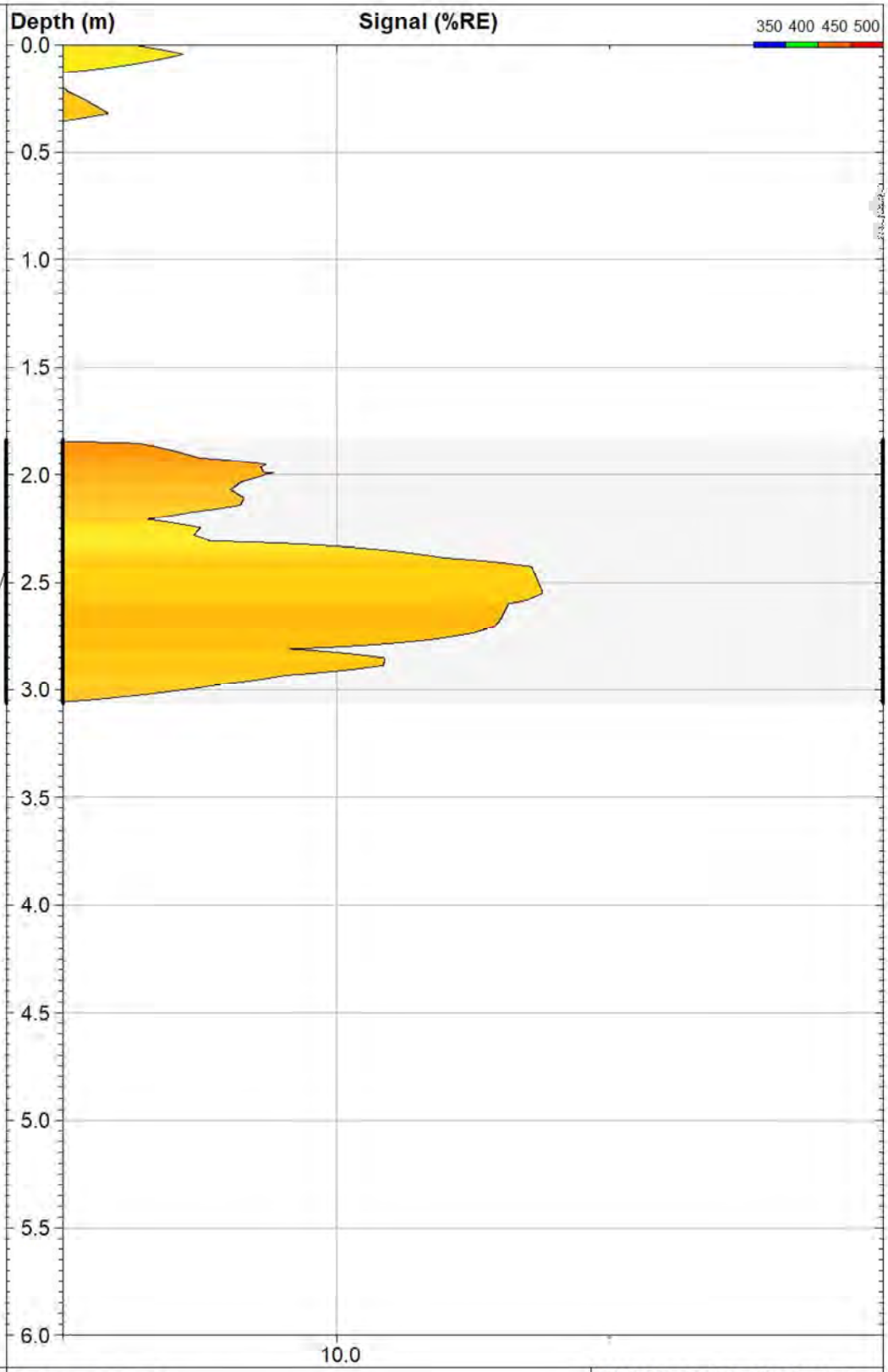
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762003.331 / UTM**	*Final depth:* **3.74 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385968.4196 /**	*Max signal:* **56.3 %RE @ 2.43 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-08 09:55 ADT**

Callouts



1.84 - 3.07 m
16.9 %RE (s 18.8)



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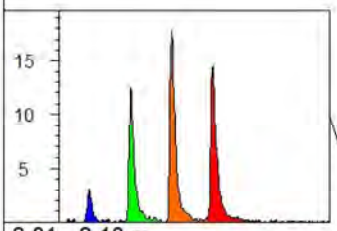
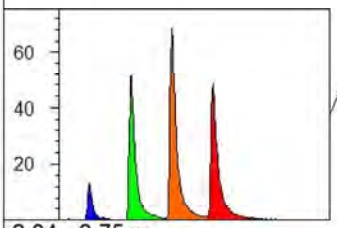
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761987.042 / UTM**	*Final depth:* **3.70 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385967.0762 /**	*Max signal:* **57.8 %RE @ 2.55 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-29 14:44 ADT**

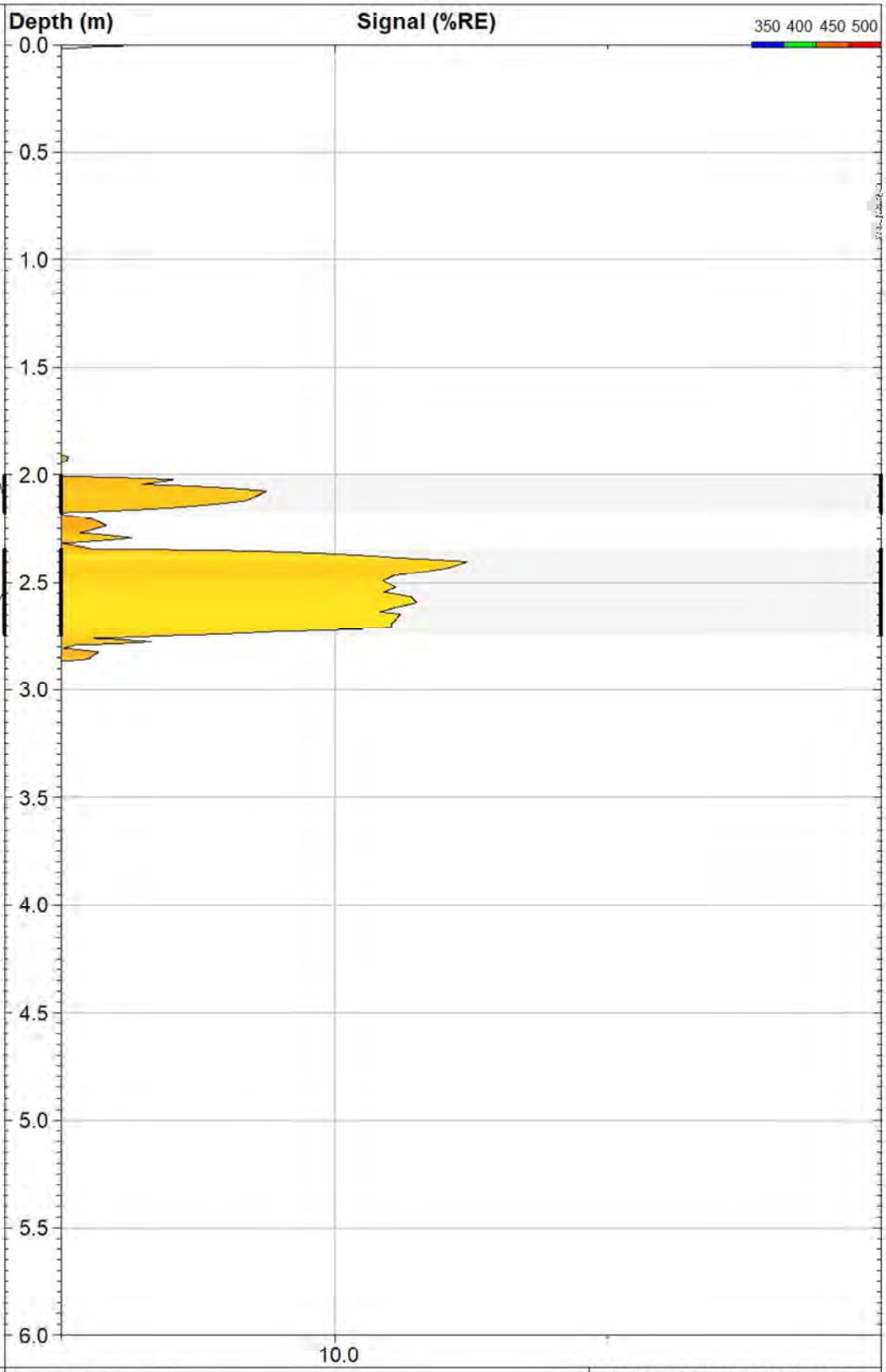
Callouts



2.01 - 2.18 m
3.8 %RE (s 2.0)



2.34 - 2.75 m
16.7 %RE (s 7.2)



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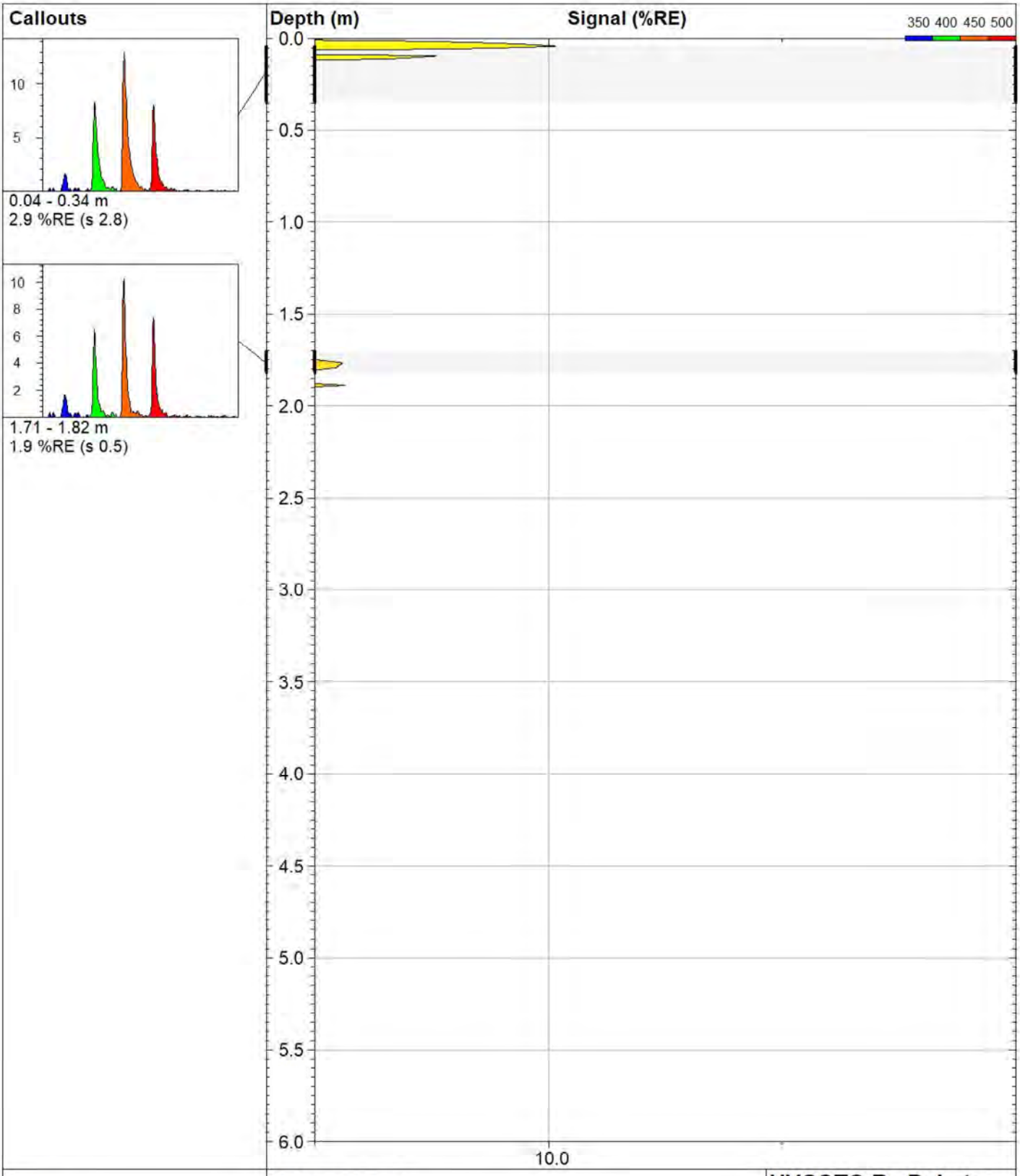
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761985.693 / UTM**	*Final depth:* **3.19 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385982.0031 /**	*Max signal:* **31.5 %RE @ 2.40 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-08 10:26 ADT**



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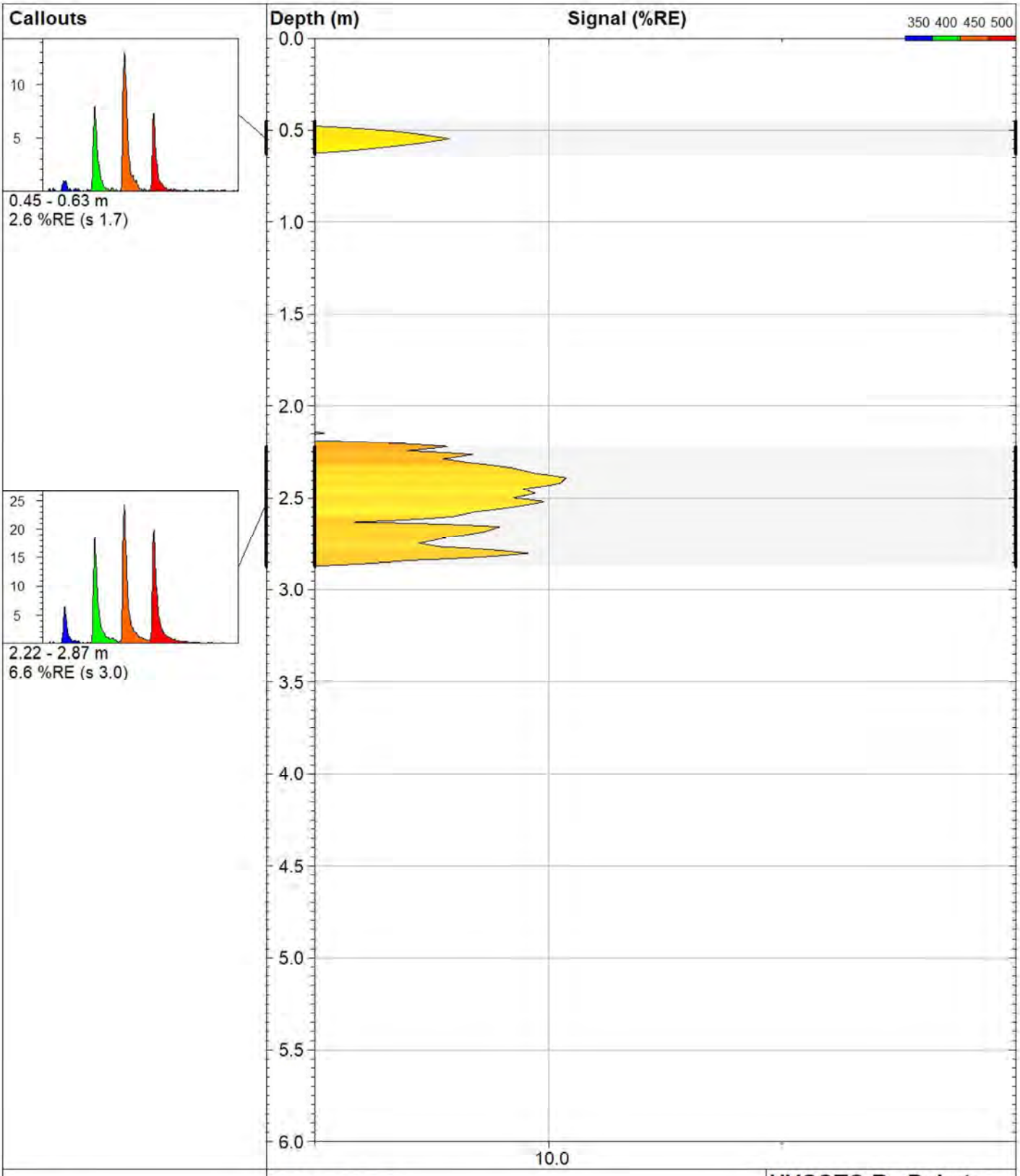
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761995.787 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385979.9666 /**	*Max signal:* **11.8 %RE @ 0.04 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.5 m**	*Date & Time:* **2020-05-29 14:46 ADT**



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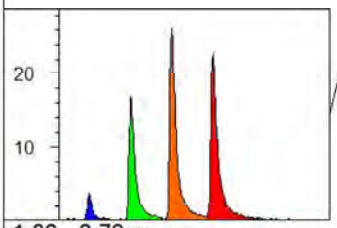
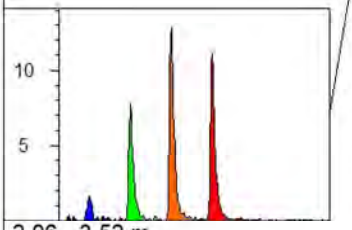
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761985.314 / UTM**	*Final depth:* **3.67 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385993.8129 /**	*Max signal:* **12.9 %RE @ 2.39 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-29 14:47 ADT**

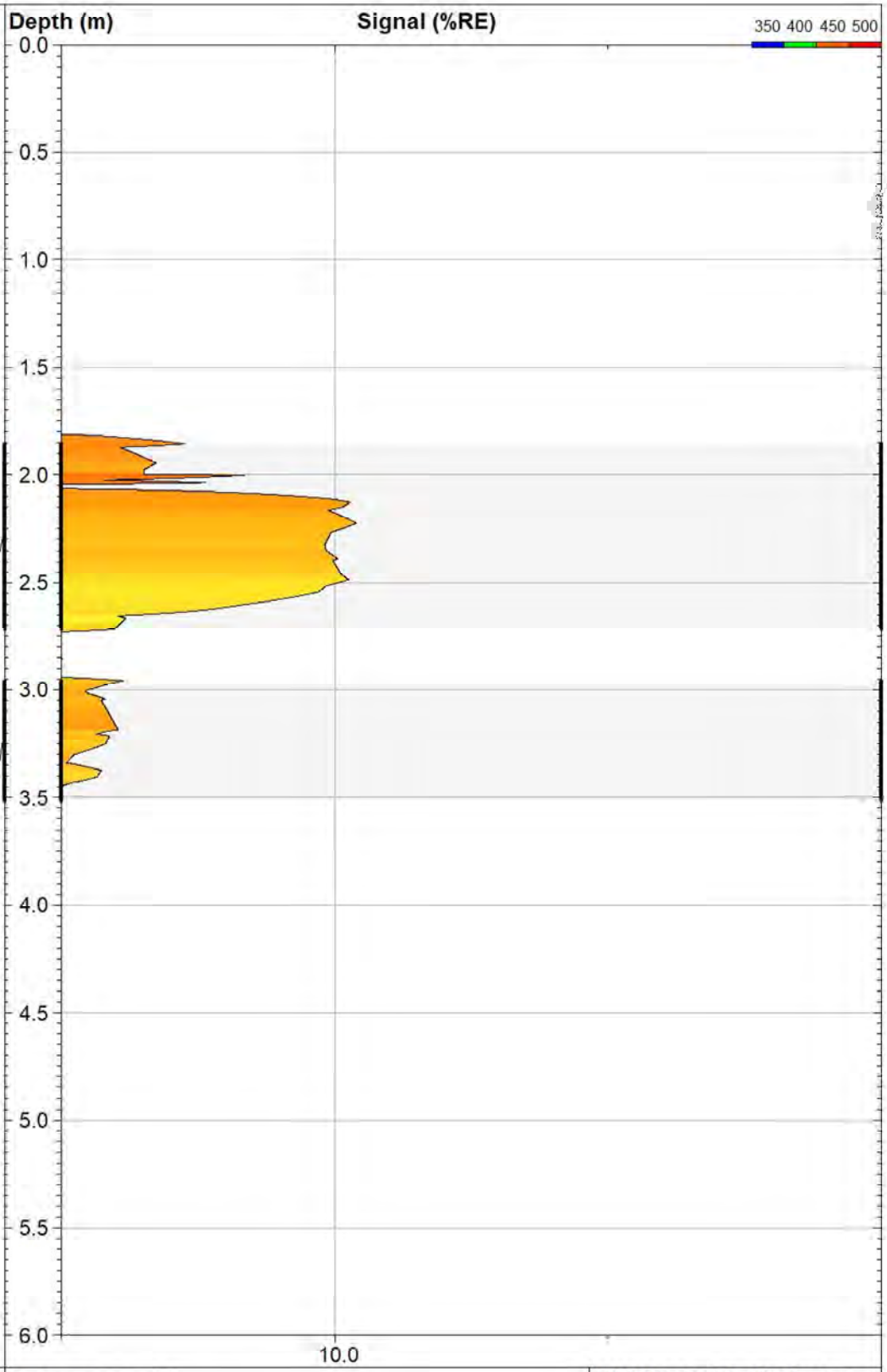
Callouts



1.86 - 2.72 m
6.8 %RE (s 4.1)



2.96 - 3.52 m
2.3 %RE (s 0.2)



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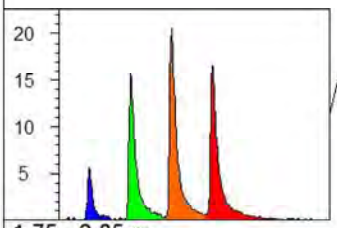
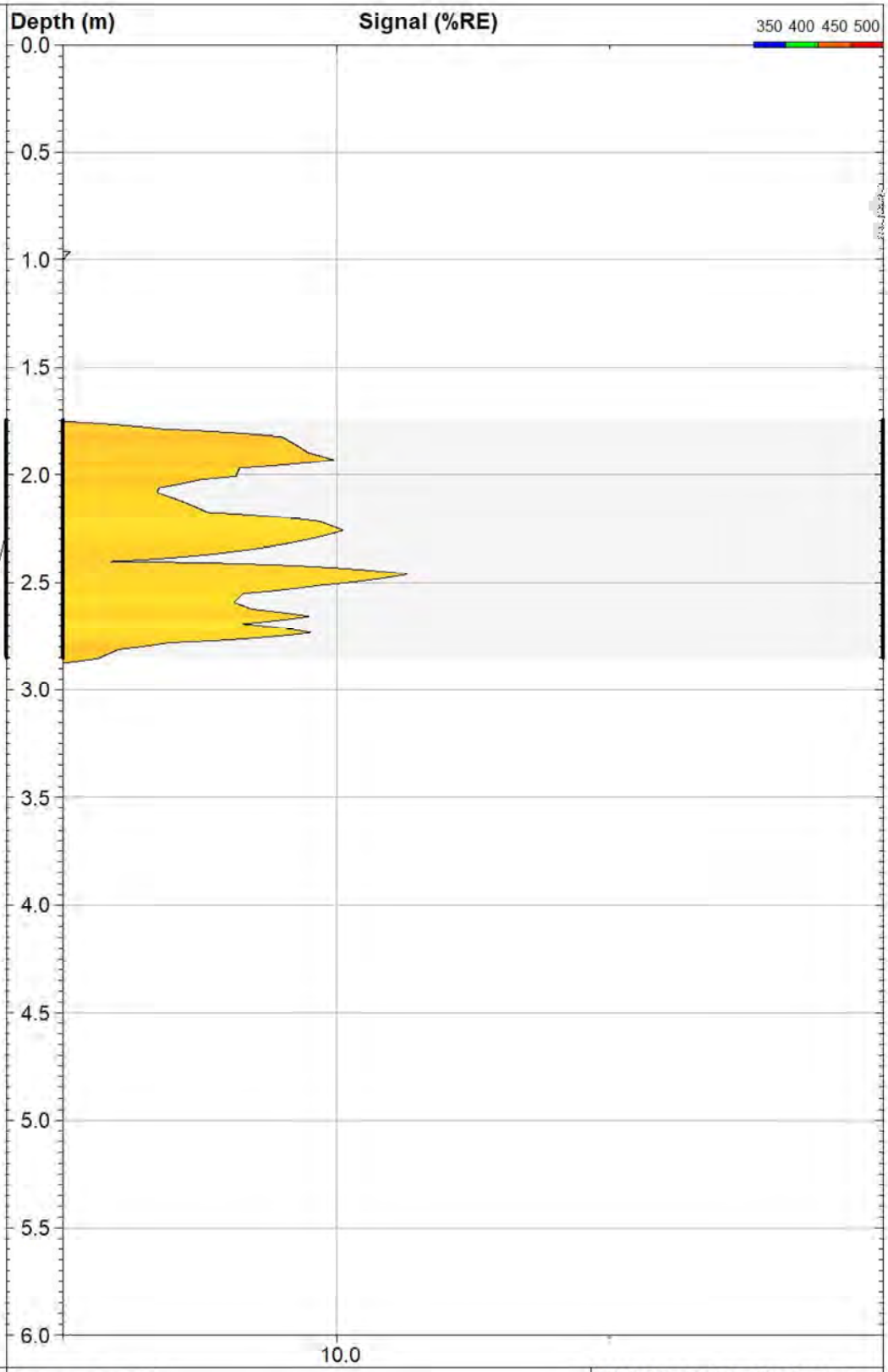
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761986.75 / UTM**	*Final depth:* **3.99 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386005.5005 /**	*Max signal:* **13.0 %RE @ 2.22 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-08 11:13 ADT**

Callouts



1.75 - 2.85 m
6.3 %RE (s 3.8)



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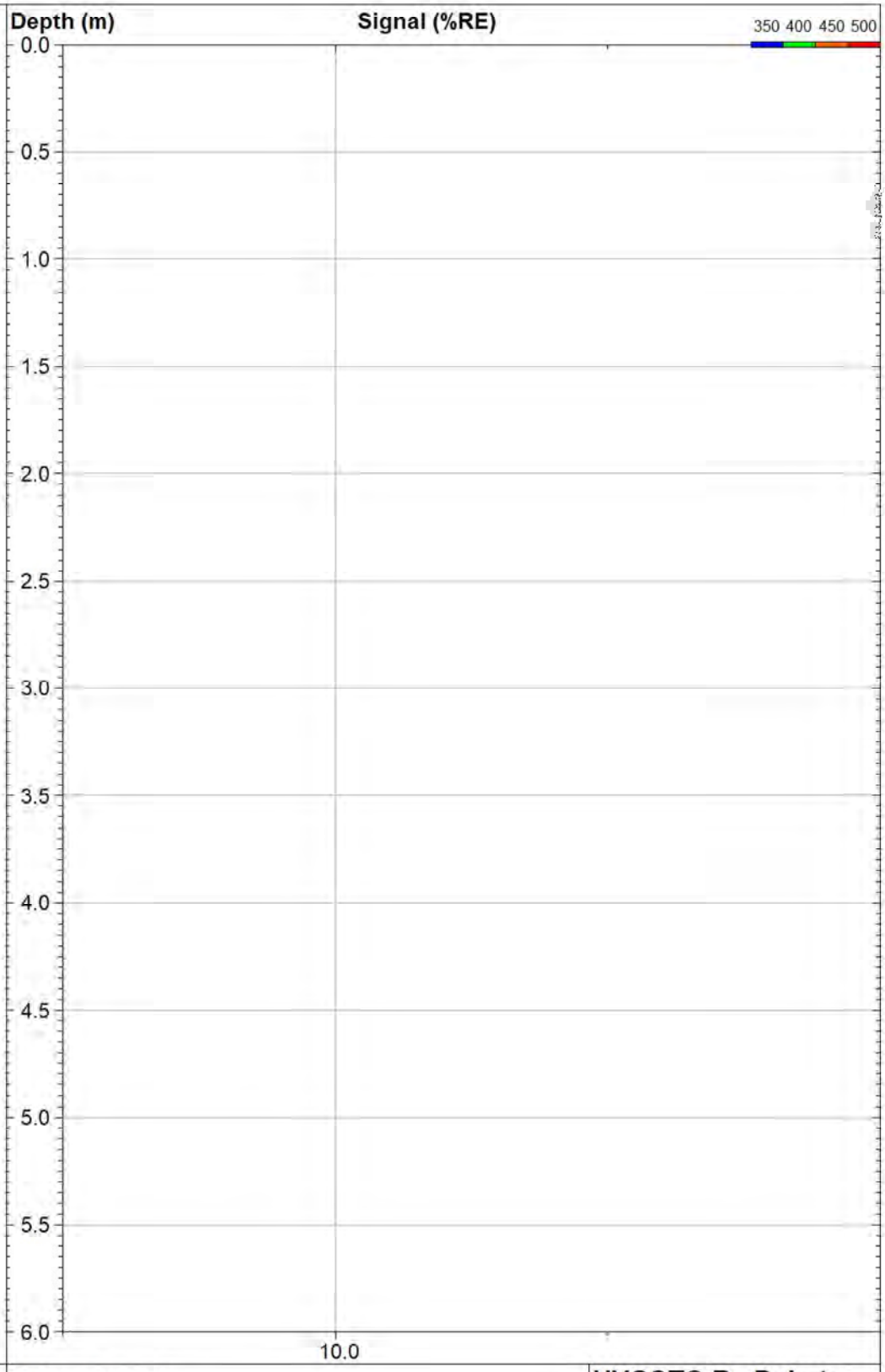
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761990.718 / UTM**	*Final depth:* **3.70 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386027.6311 /**	*Max signal:* **19.1 %RE @ 2.46 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.2 m**	*Date & Time:* **2020-05-08 11:42 ADT**

Callouts



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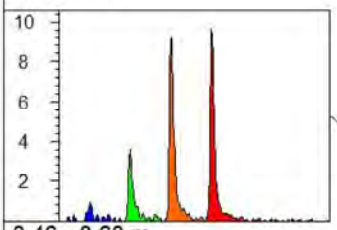
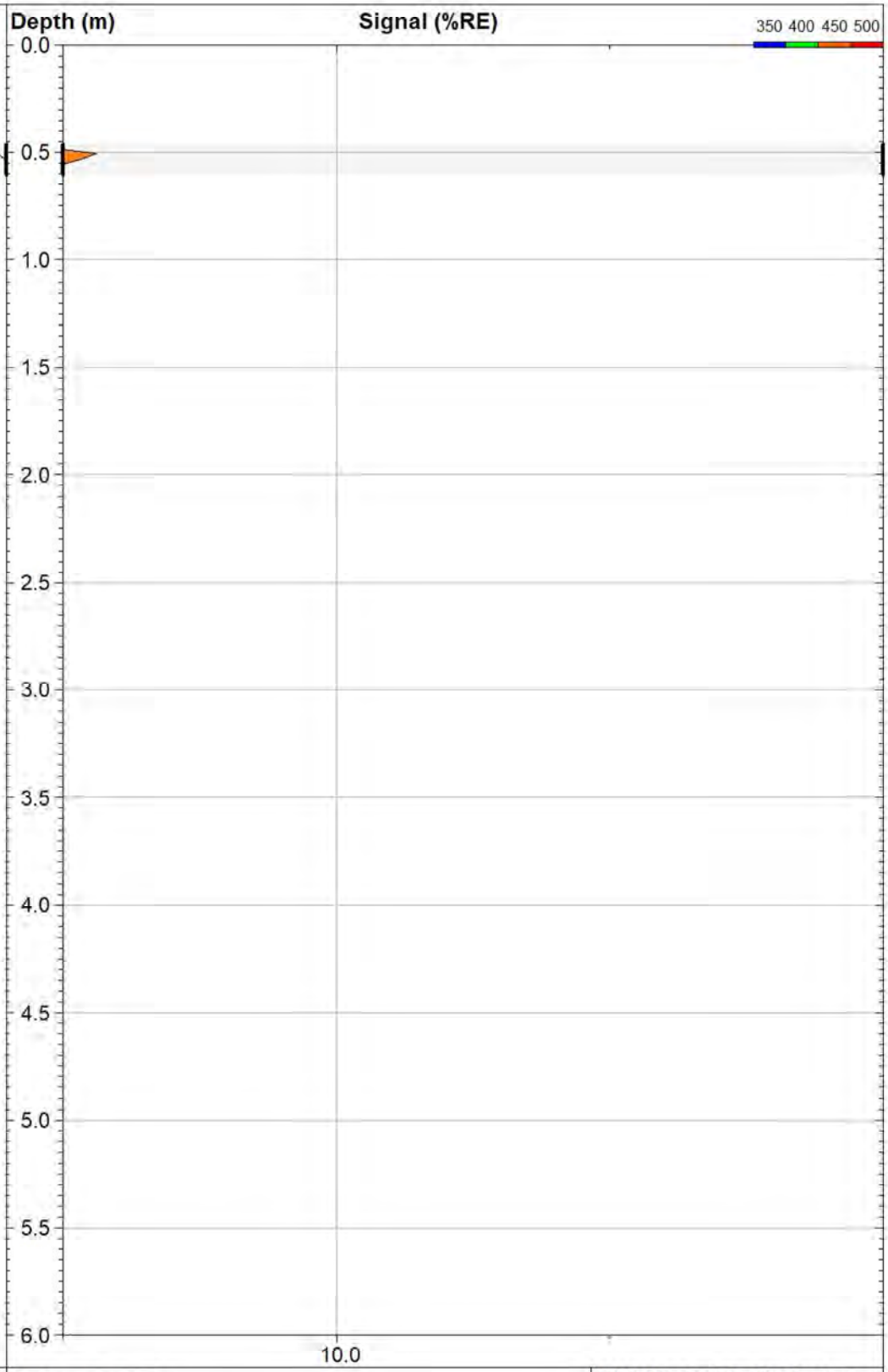
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761994.097 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386050.2051 /**	*Max signal:* **1.9 %RE @ 2.26 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.2 m**	*Date & Time:* **2020-05-08 12:26 ADT**

Callouts



0.46 - 0.60 m
1.8 %RE (s 0.4)



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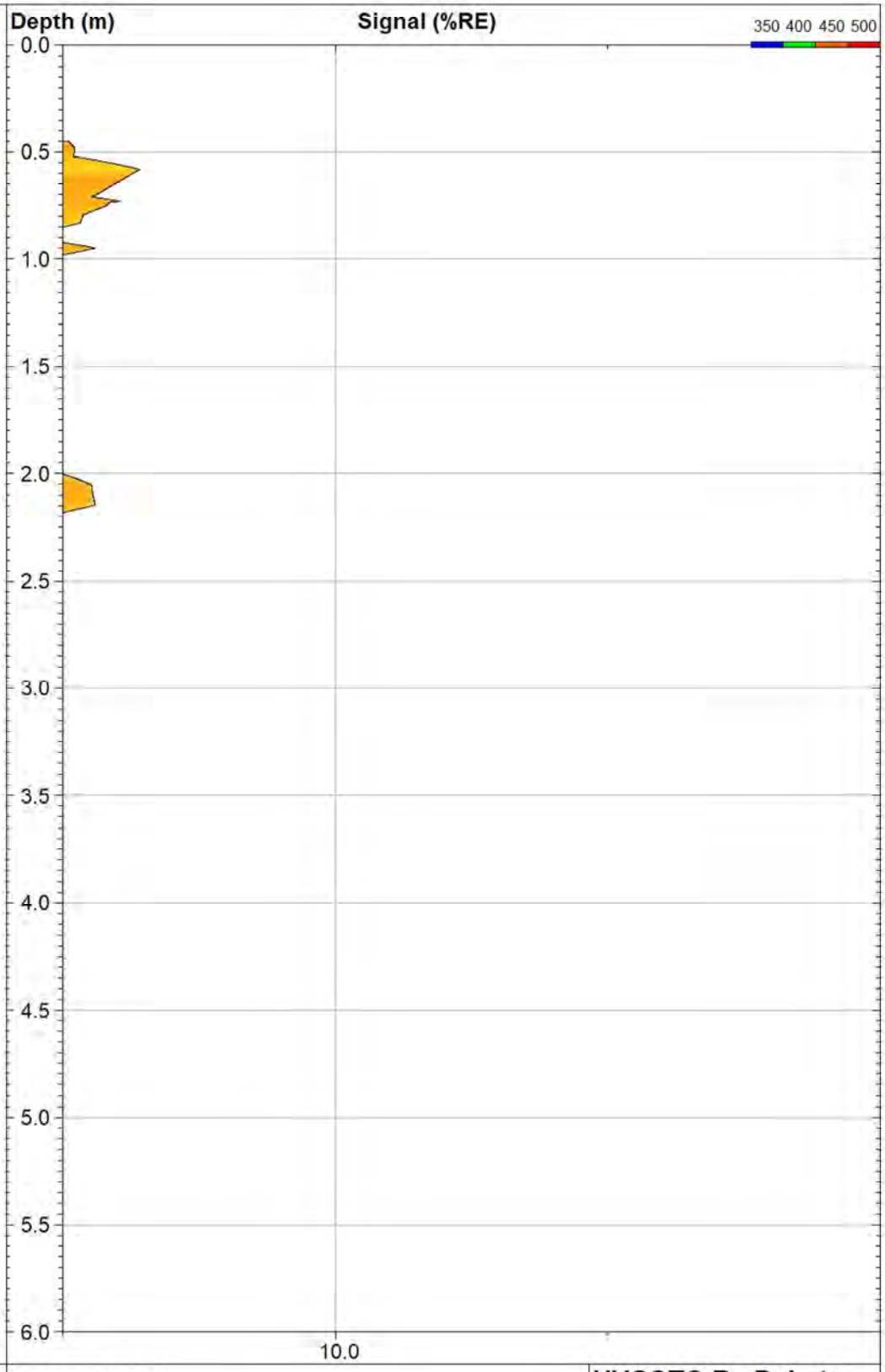
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761992.399 / UTM**	*Final depth:* **3.05 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386039.9138 /**	*Max signal:* **2.3 %RE @ 0.51 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.1 m**	*Date & Time:* **2020-05-29 14:52 ADT**

Callouts



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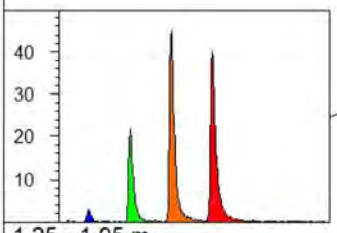
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762007.154 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386025.8004 /**	*Max signal:* **2.9 %RE @ 0.58 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-08 12:51 ADT**

Callouts



1.25 - 1.95 m
7.8 %RE (s 3.0)

Depth (m) **Signal (%RE)** 350 400 450 500

0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
10.0

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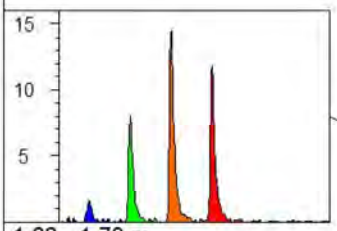
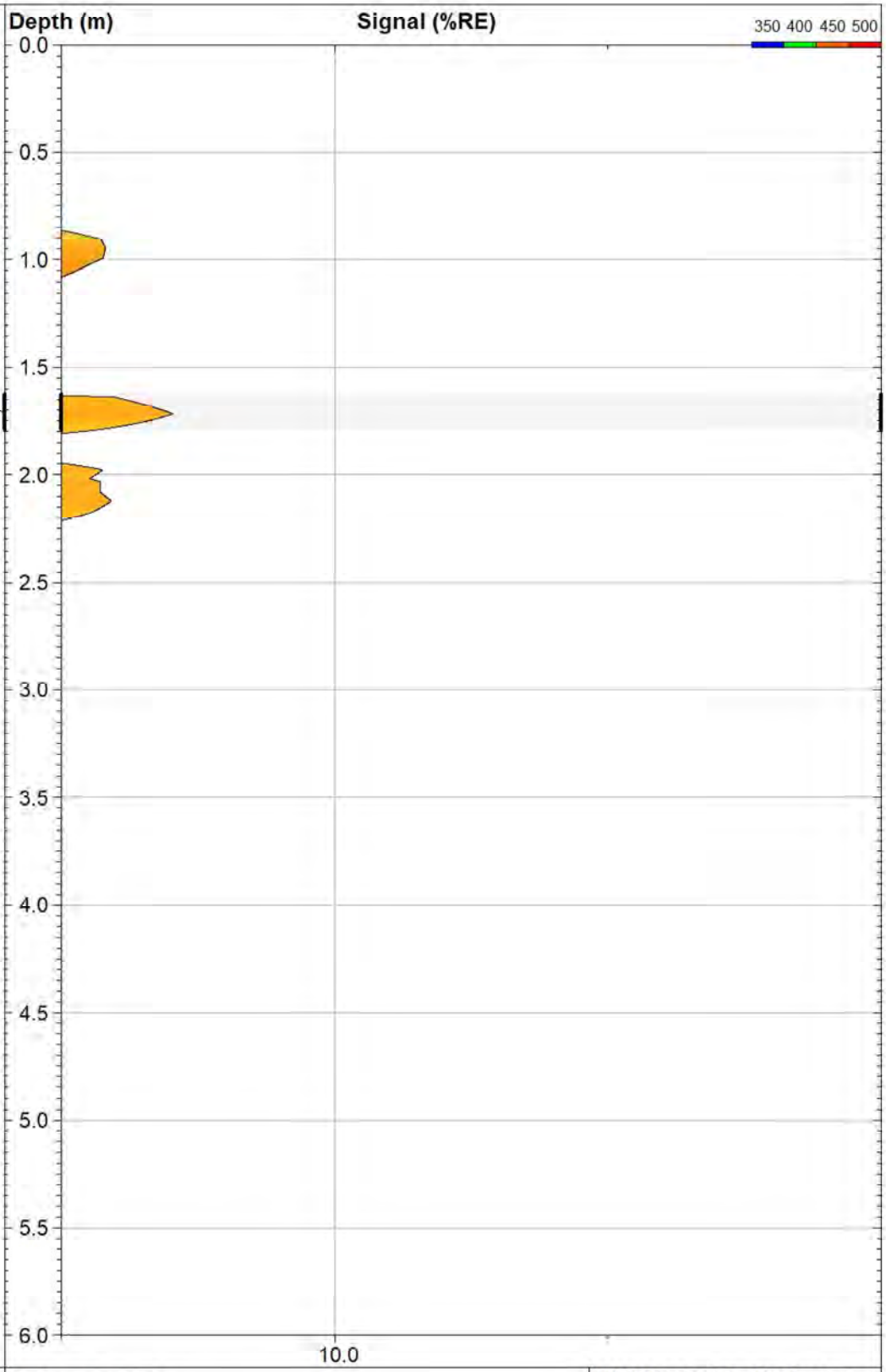
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762003.797 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386007.1875 /**	*Max signal:* **14.5 %RE @ 1.62 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.0 m**	*Date & Time:* **2020-05-08 13:16 ADT**

Callouts



1.62 - 1.79 m
2.6 %RE (s 0.8)



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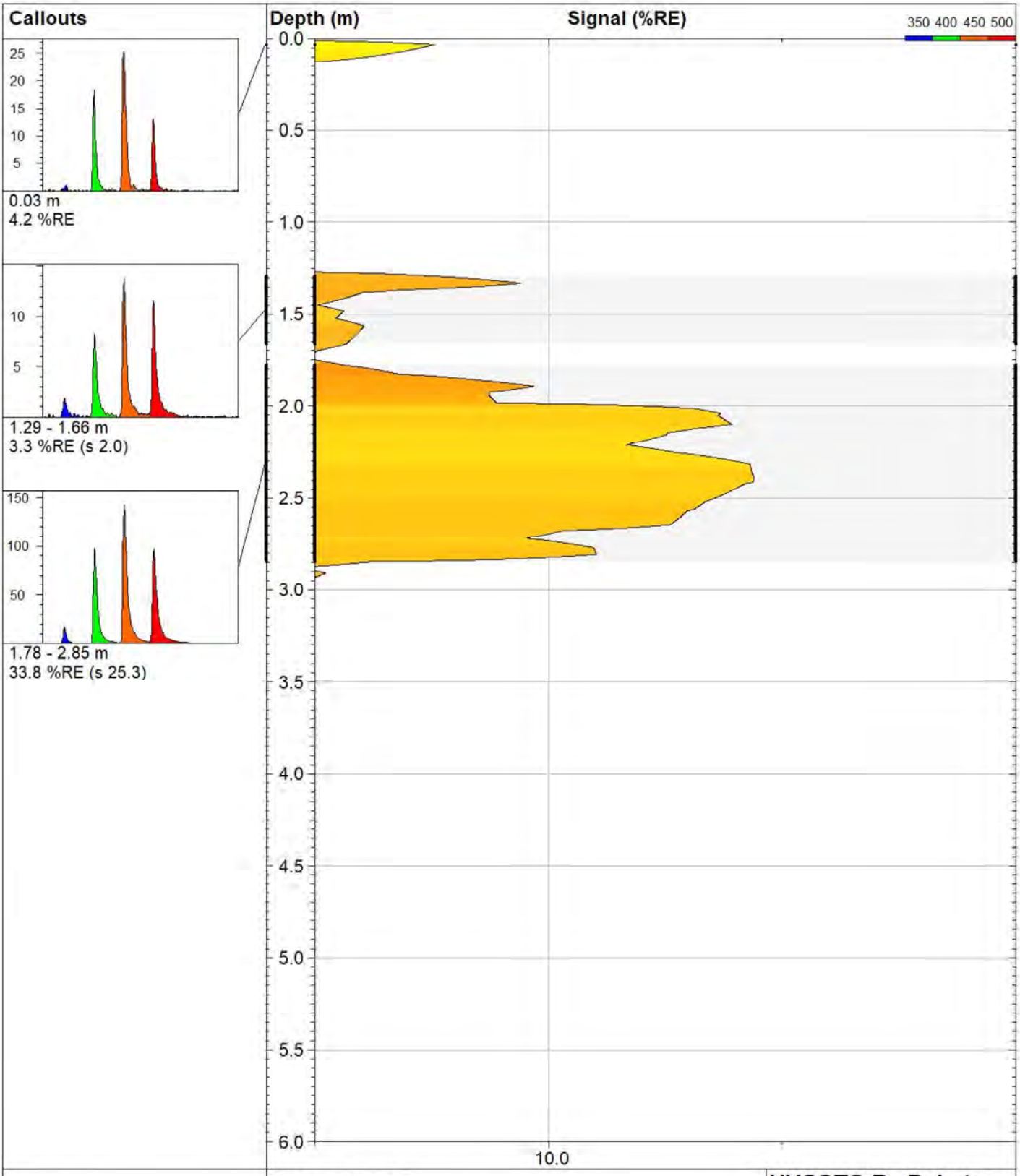
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4762005.759 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386003.9843 /**	*Max signal:* **3.6 %RE @ 1.72 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-08 13:28 ADT**



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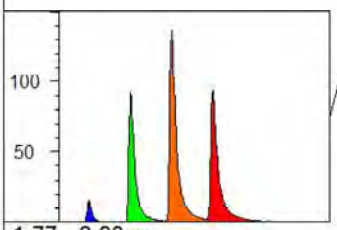
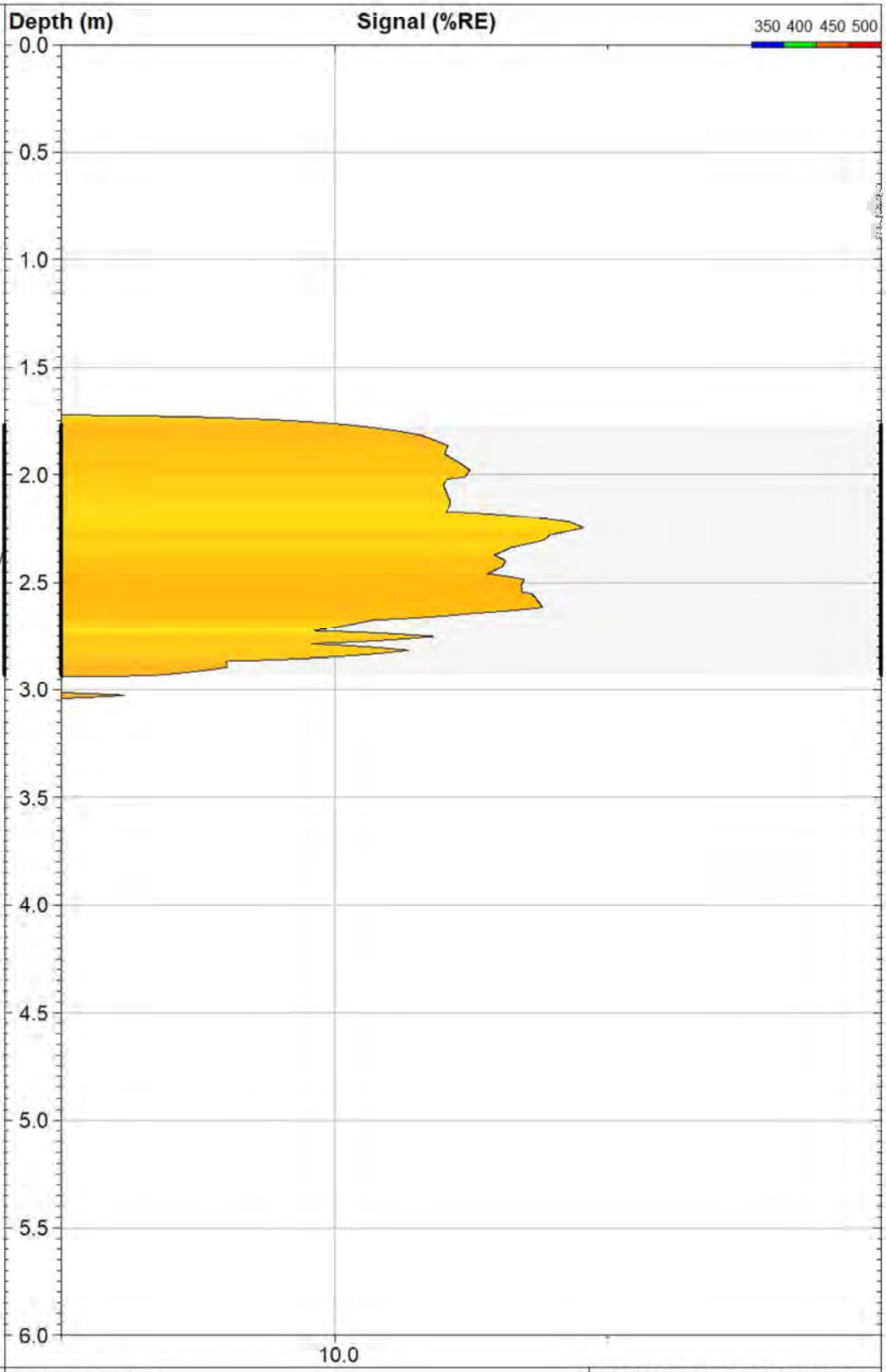
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761993.425 / UTM**	*Final depth:* **3.69 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385939.53 /**	*Max signal:* **76.2 %RE @ 2.38 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.4 m**	*Date & Time:* **2020-05-08 13:43 ADT**

Callouts



1.77 - 2.93 m
33.9 %RE (s 19.8)



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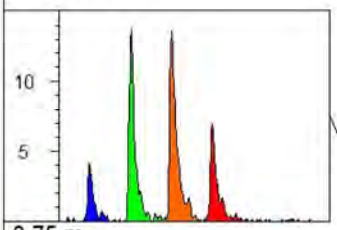
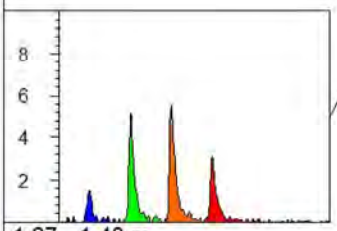
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761980.682 / UTM**	*Final depth:* **3.67 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385942.636 /**	*Max signal:* **82.5 %RE @ 2.24 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-08 13:59 ADT**

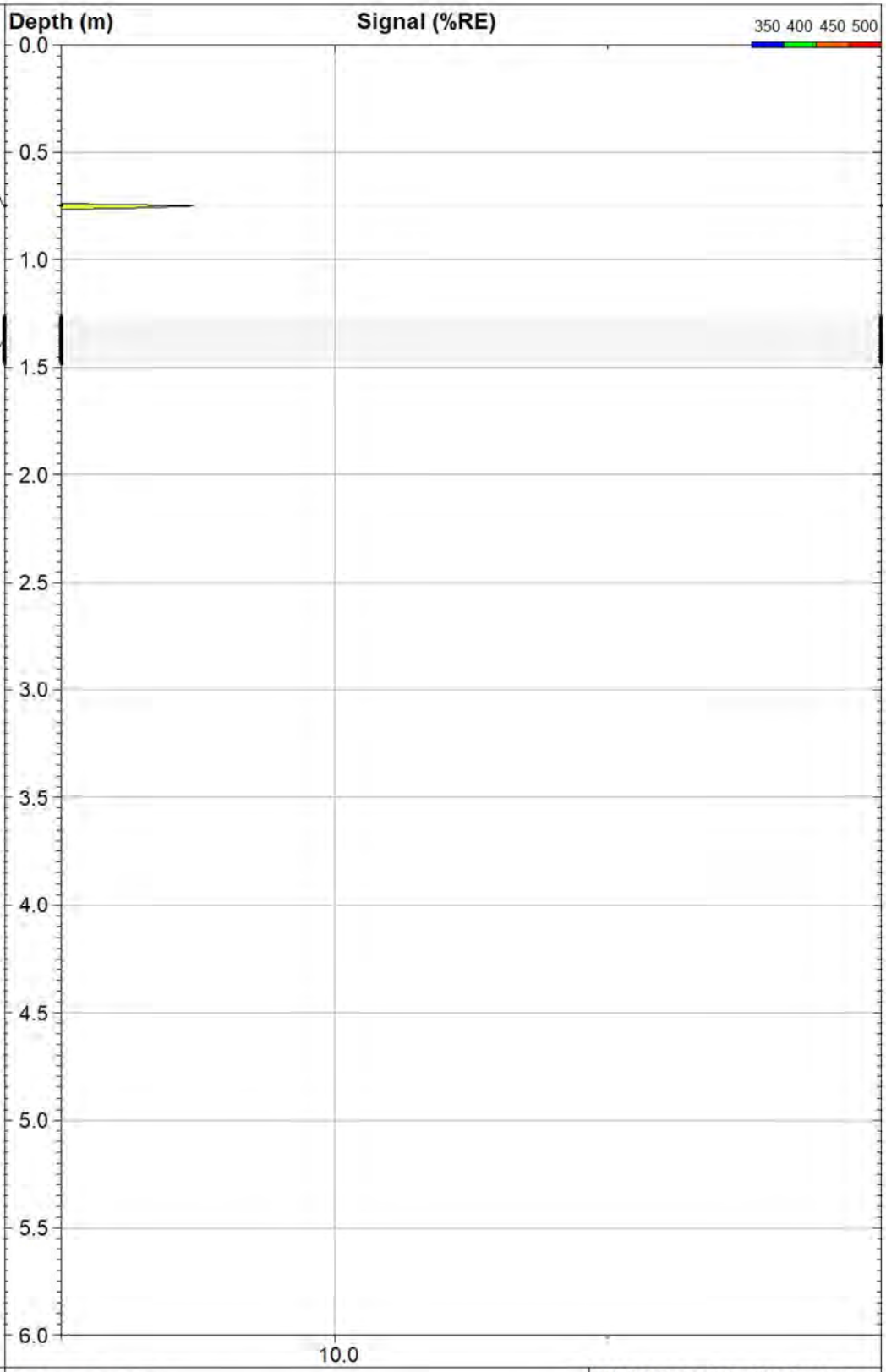
Callouts



0.75 m
3.4 %RE



1.27 - 1.48 m
1.3 %RE (s 0.3)



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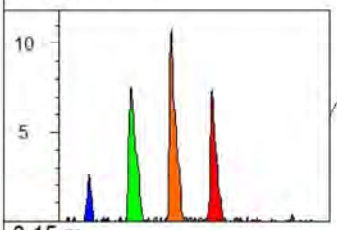
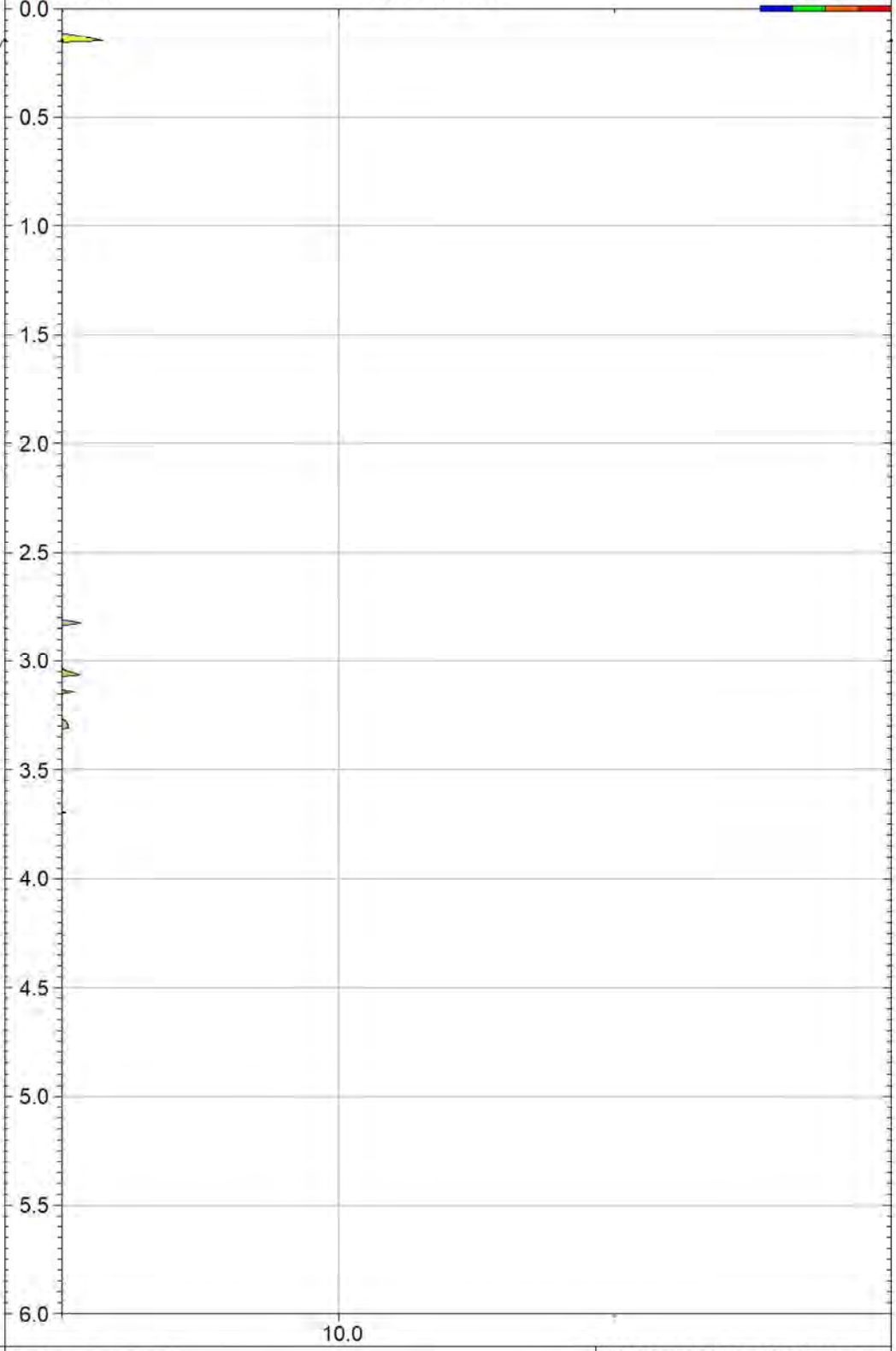
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761968.577 / UTM**	*Final depth:* **3.05 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386025.7044 /**	*Max signal:* **4.0 %RE @ 0.75 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.5 m**	*Date & Time:* **2020-05-08 14:15 ADT**

Callouts



0.15 m
2.4 %RE

Depth (m) **Signal (%RE)** 350 400 450 500



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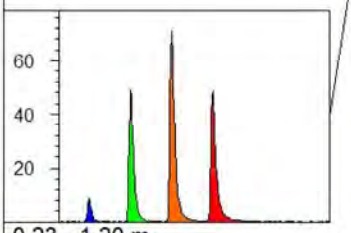
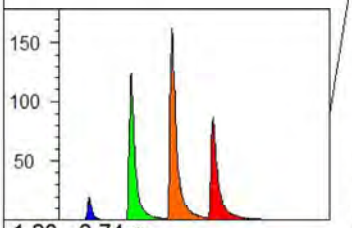
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761966.055 / UTM**	*Final depth:* **3.76 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386008.0975 /**	*Max signal:* **2.4 %RE @ 0.15 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.5 m**	*Date & Time:* **2020-05-08 14:26 ADT**

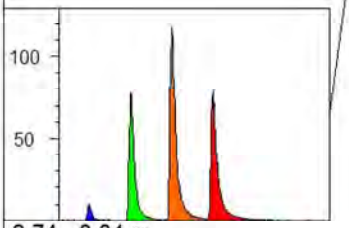
Callouts



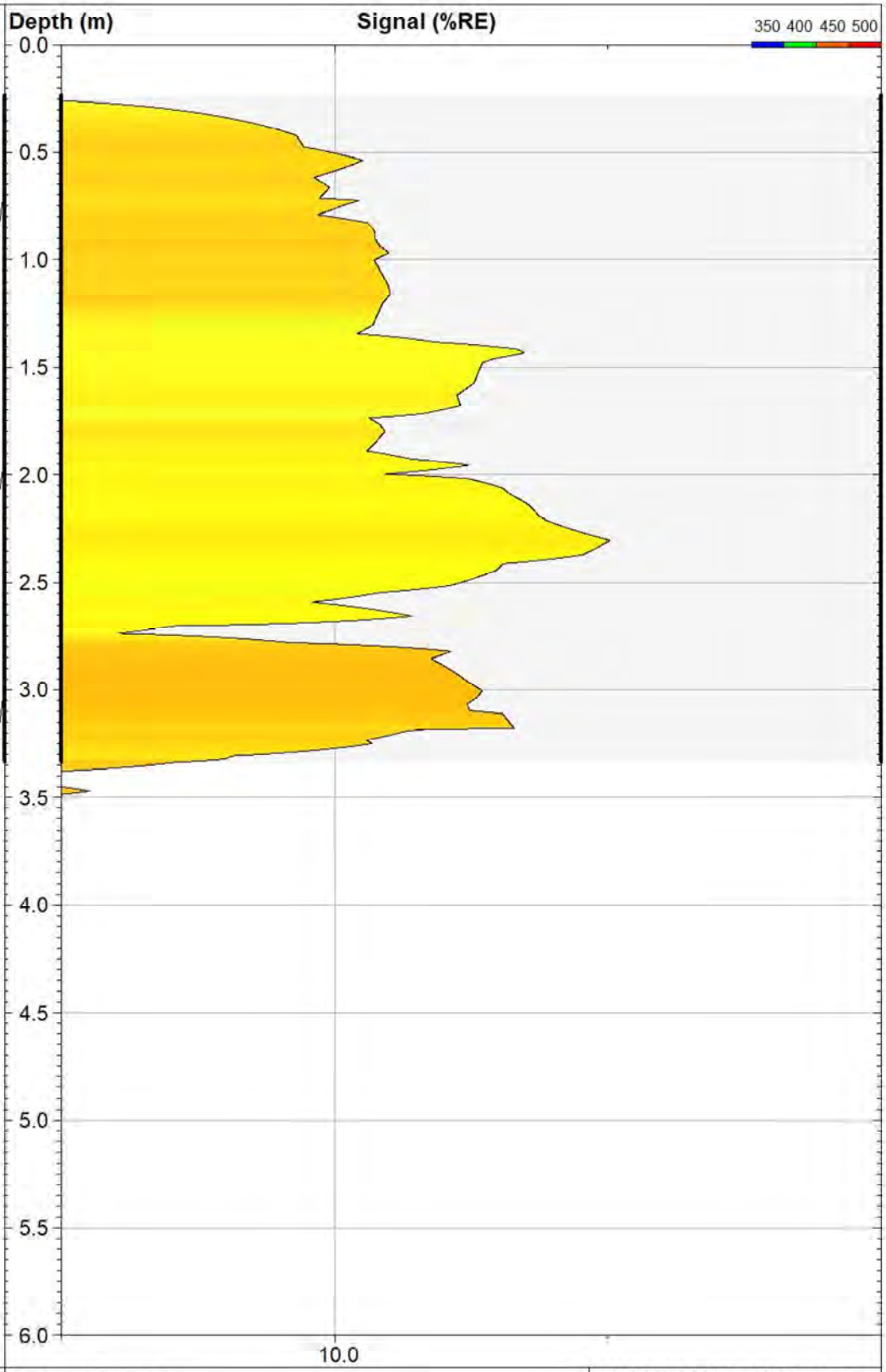
0.23 - 1.20 m
12.2 %RE (s 4.4)



1.20 - 2.74 m
35.0 %RE (s 23.0)



2.74 - 3.34 m
23.7 %RE (s 13.5)



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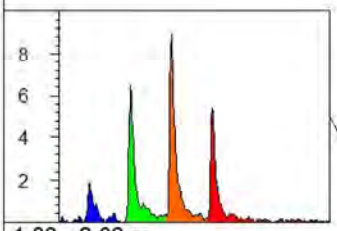
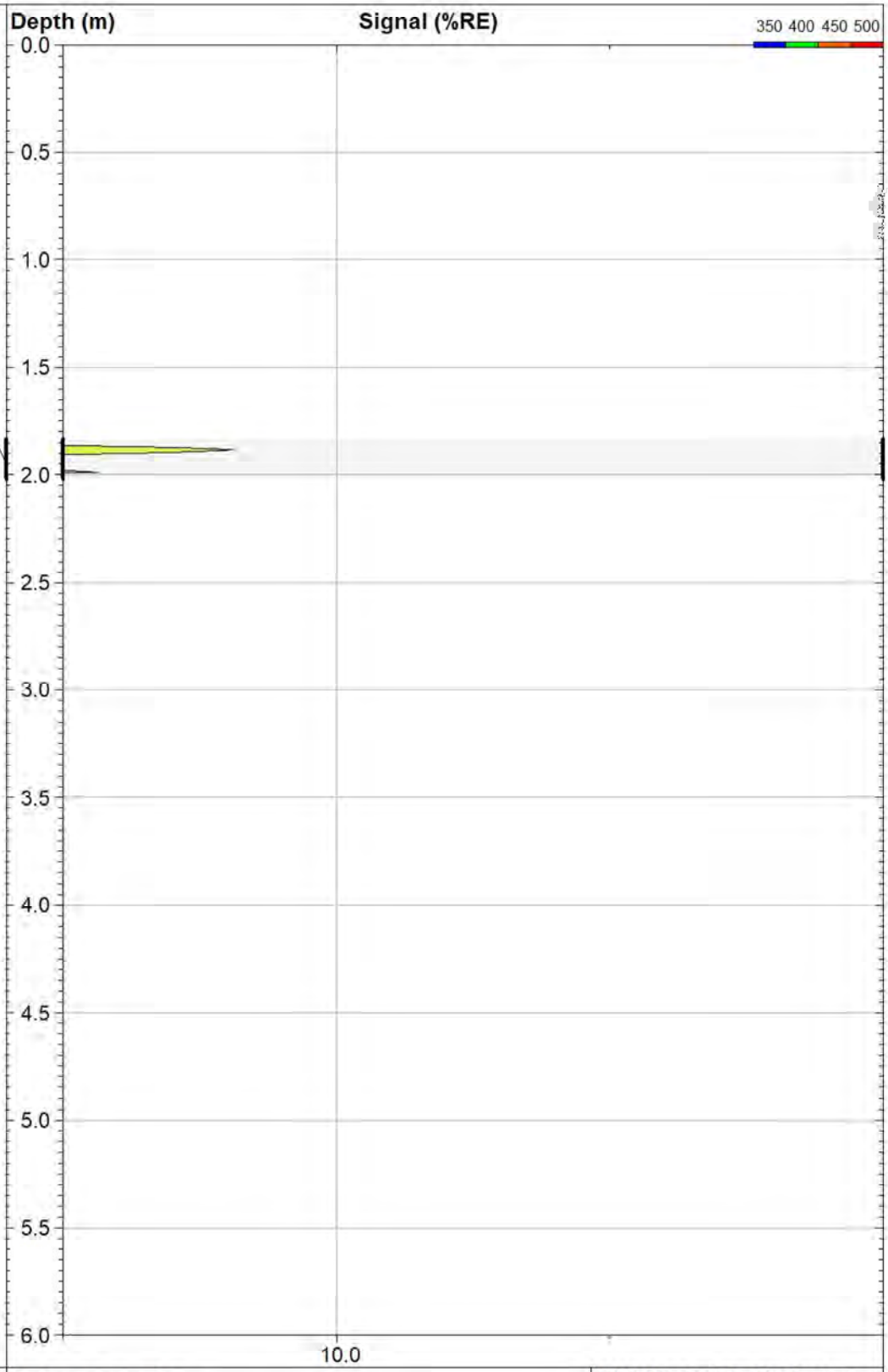
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761964.392 / UTM**	*Final depth:* **4.29 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385990.3248 /**	*Max signal:* **102.8 %RE @ 2.30 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.7 m**	*Date & Time:* **2020-05-08 14:38 ADT**

Callouts



1.83 - 2.02 m
2.1 %RE (s 1.2)



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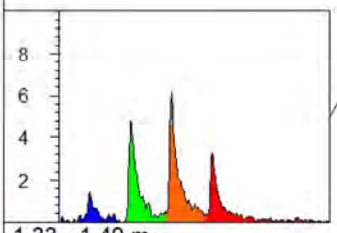
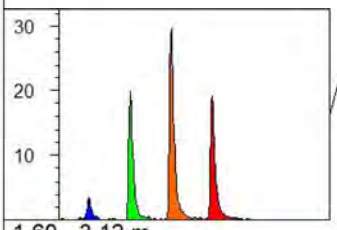
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761935.797 / UTM**	*Final depth:* **3.20 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385992.6923 /**	*Max signal:* **5.2 %RE @ 1.88 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.8 m**	*Date & Time:* **2020-05-11 11:14 ADT**

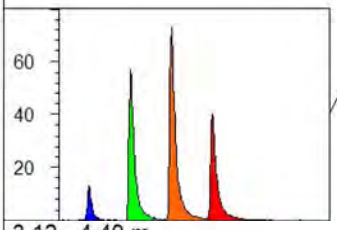
Callouts



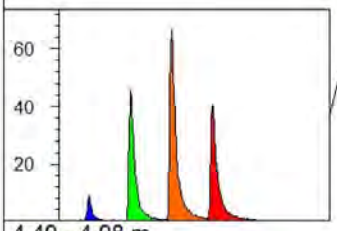
1.33 - 1.49 m
2.2 %RE (s 0.9)



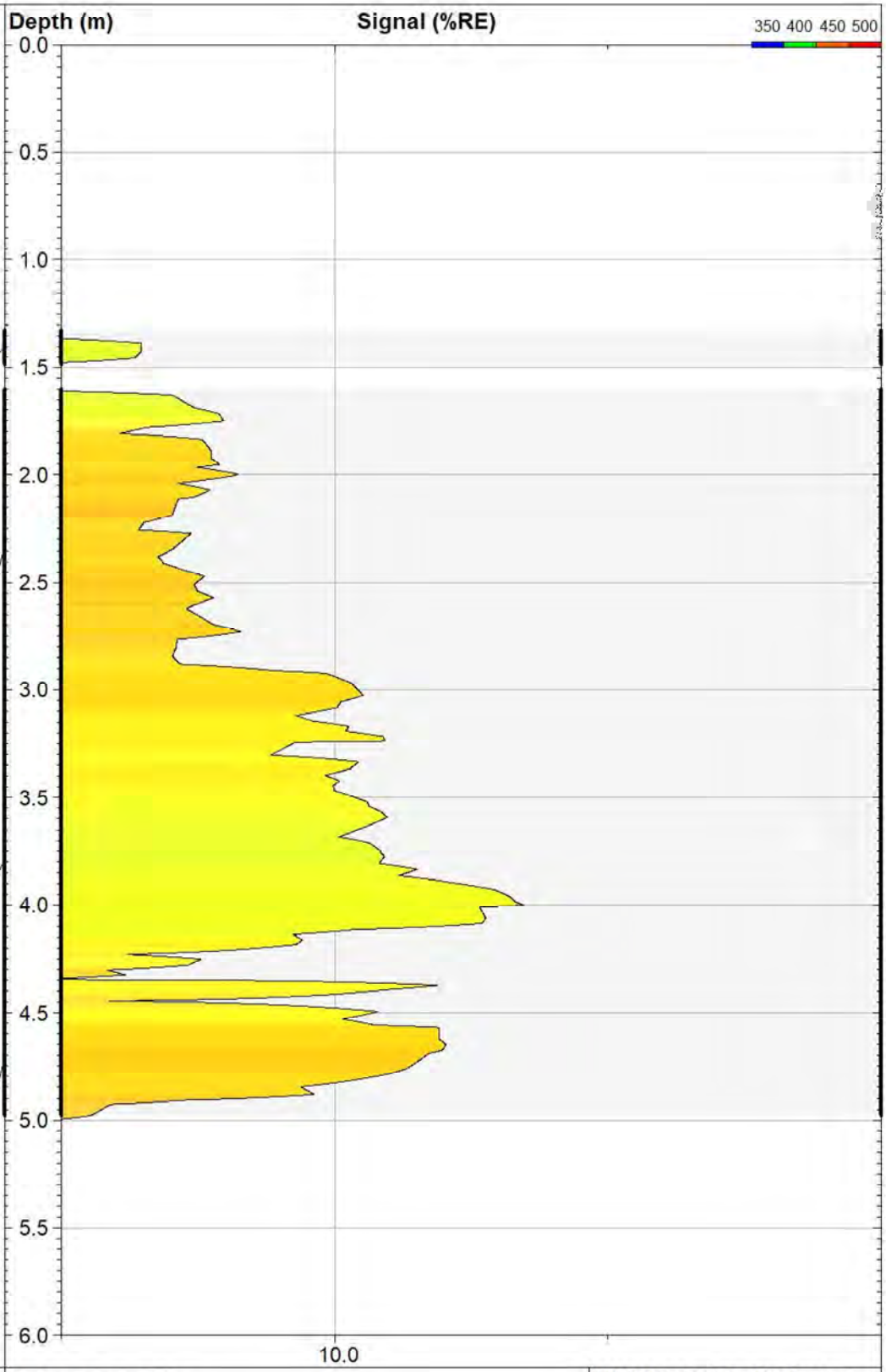
1.60 - 3.12 m
5.1 %RE (s 2.9)



3.12 - 4.49 m
15.9 %RE (s 11.8)



4.49 - 4.98 m
15.4 %RE (s 8.7)



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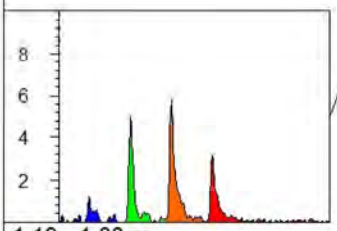
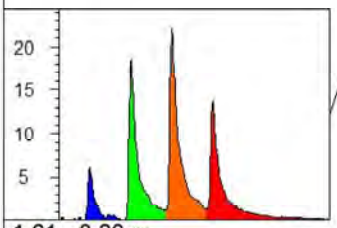
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761928.106 / UTM**	*Final depth:* **5.52 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385968.8943 /**	*Max signal:* **50.1 %RE @ 4.00 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **181.3 m**	*Date & Time:* **2020-05-11 11:34 ADT**

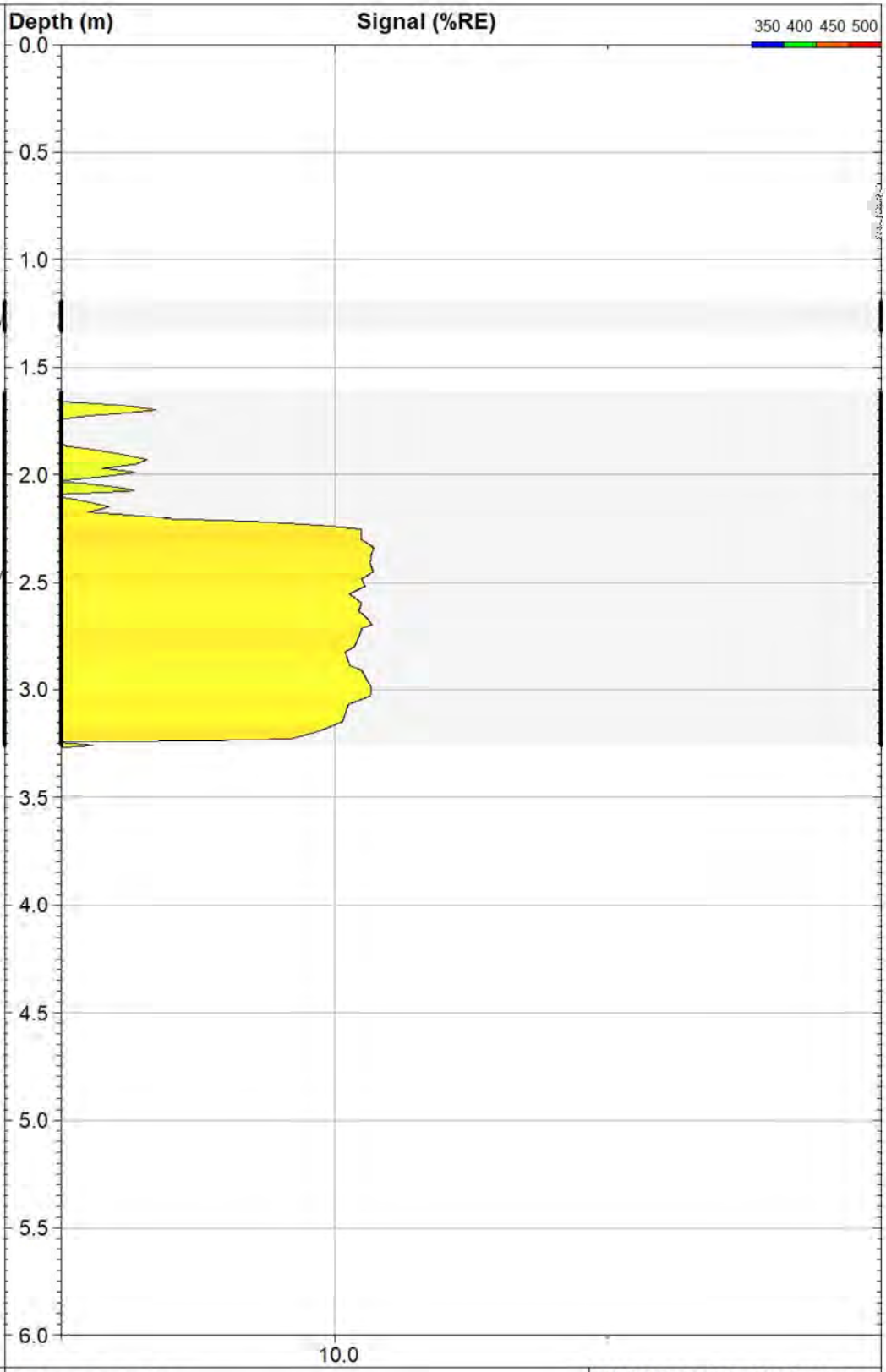
Callouts



1.19 - 1.33 m
1.3 %RE (s 0.3)



1.61 - 3.26 m
8.1 %RE (s 5.6)



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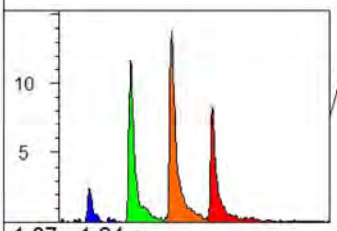
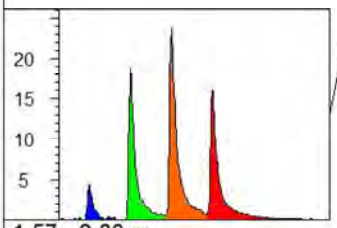
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761906.373 / UTM**	*Final depth:* **3.97 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385976.7547 /**	*Max signal:* **14.9 %RE @ 2.34 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **181.8 m**	*Date & Time:* **2020-05-29 15:03 ADT**

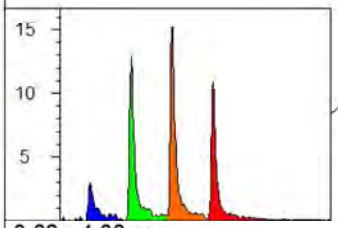
Callouts



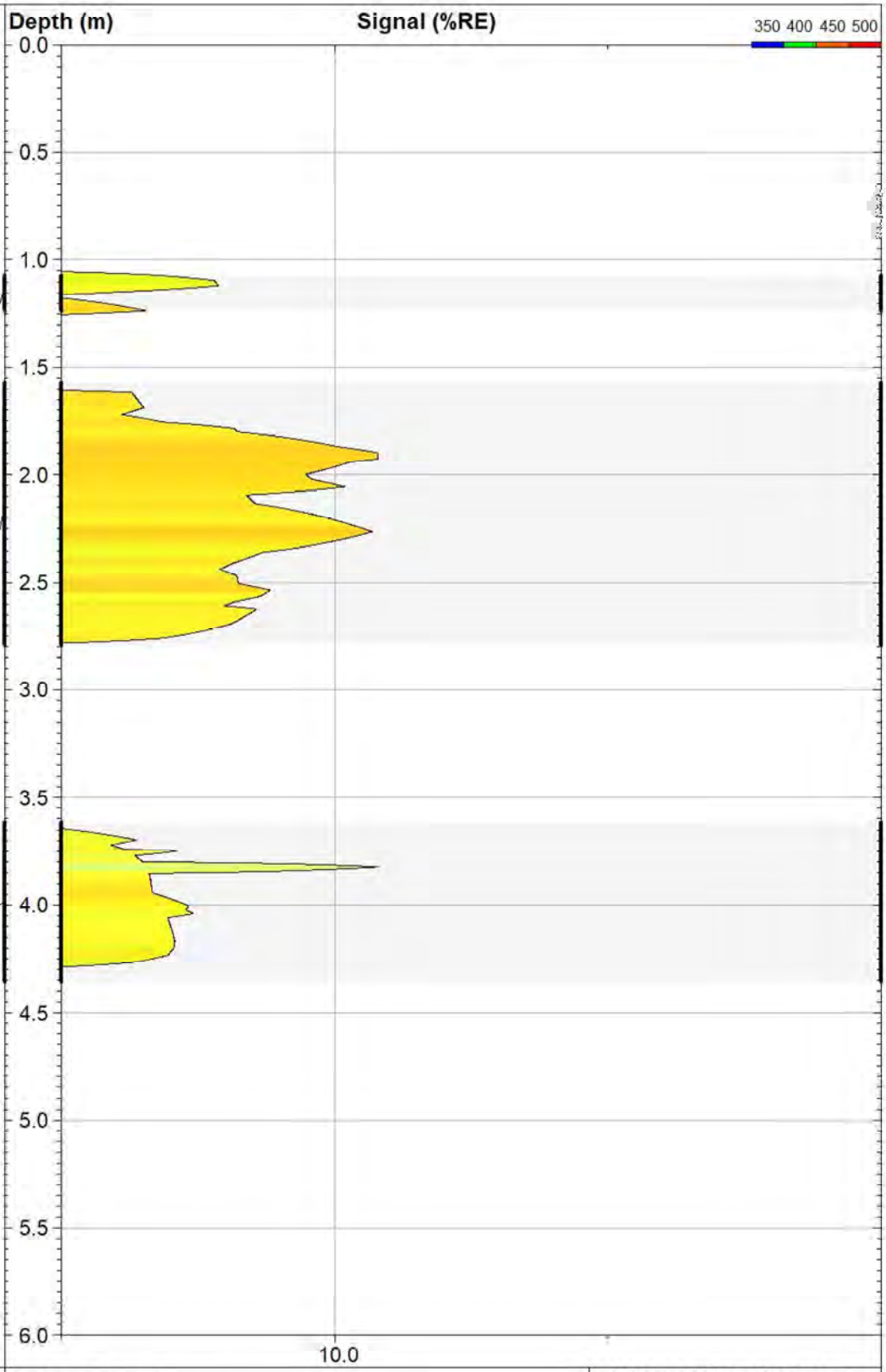
1.07 - 1.24 m
3.3 %RE (s 1.2)



1.57 - 2.80 m
6.6 %RE (s 4.0)



3.62 - 4.36 m
3.5 %RE (s 2.8)



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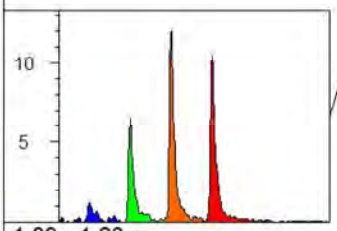
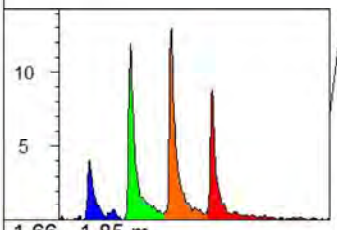
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761908.357 / UTM**	*Final depth:* **5.51 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385997.773 /**	*Max signal:* **15.4 %RE @ 1.93 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **182.0 m**	*Date & Time:* **2020-05-29 15:05 ADT**

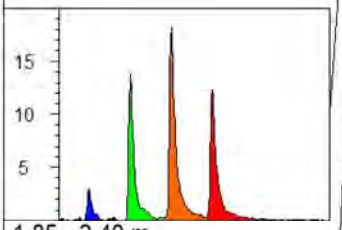
Callouts



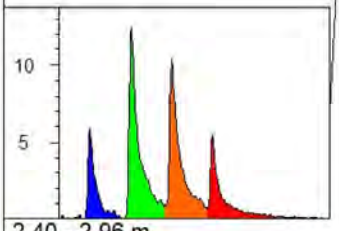
1.09 - 1.23 m
2.5 %RE (s 0.9)



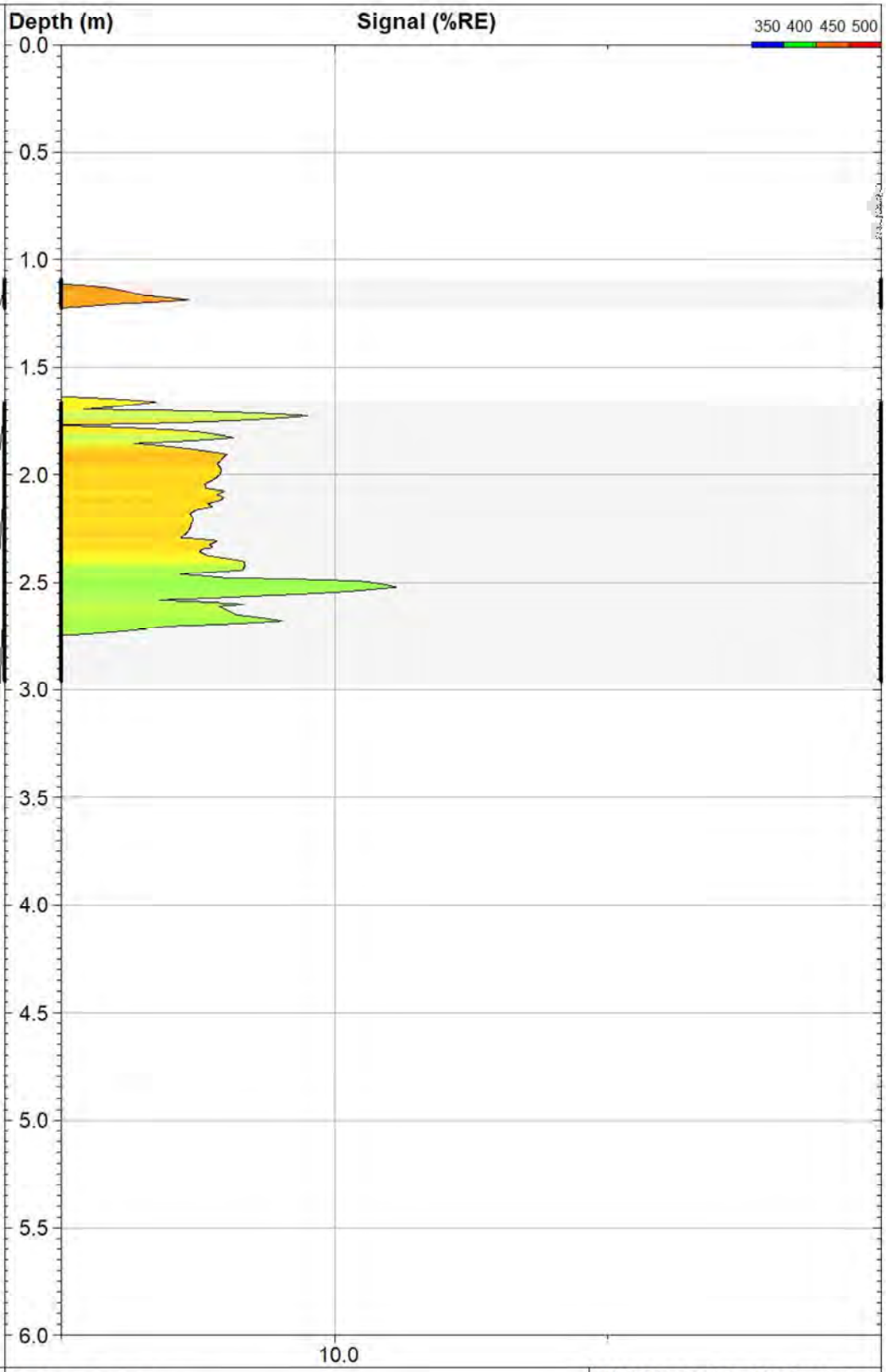
1.66 - 1.85 m
4.1 %RE (s 2.5)



1.85 - 2.40 m
4.4 %RE (s 0.5)



2.40 - 2.96 m
5.0 %RE (s 4.6)



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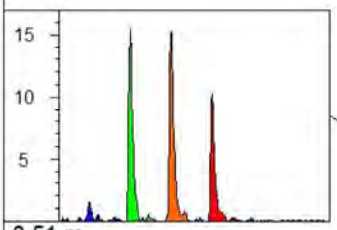
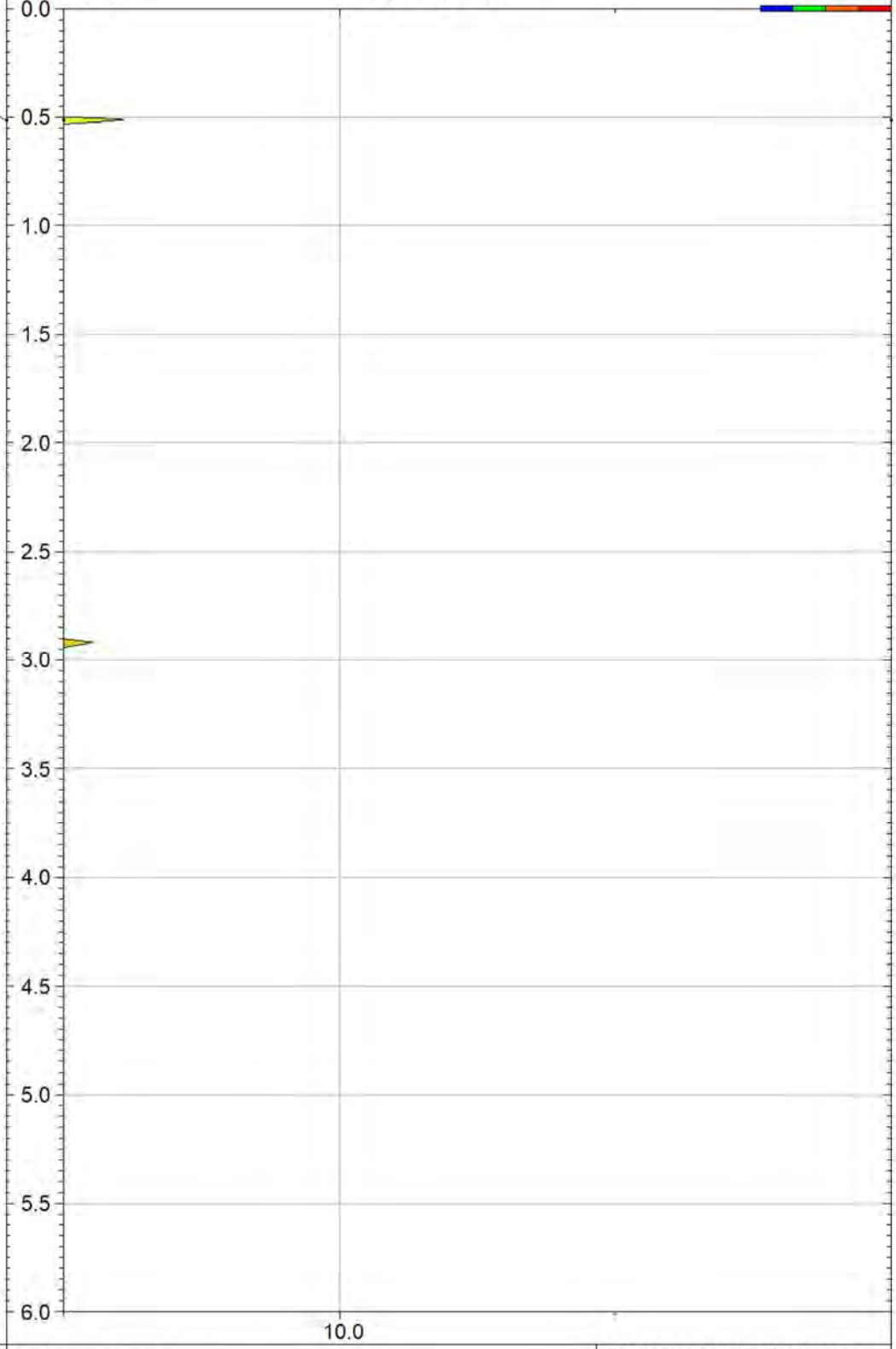
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761912.065 / UTM**	*Final depth:* **4.32 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386023.7224 /**	*Max signal:* **17.8 %RE @ 2.52 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **182.1 m**	*Date & Time:* **2020-05-29 15:05 ADT**

Callouts



0.51 m
2.7 %RE

Depth (m) **Signal (%RE)** 350 400 450 500



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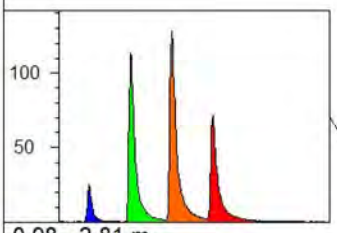
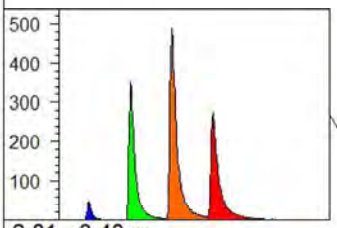
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761919.135 / UTM**	*Final depth:* **4.31 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **386044.8849 /**	*Max signal:* **2.7 %RE @ 0.51 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **182.3 m**	*Date & Time:* **2020-05-11 13:14 ADT**

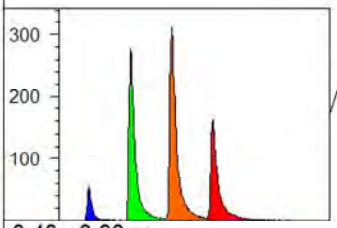
Callouts



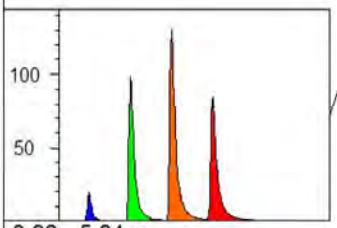
0.98 - 2.81 m
31.9 %RE (s 34.9)



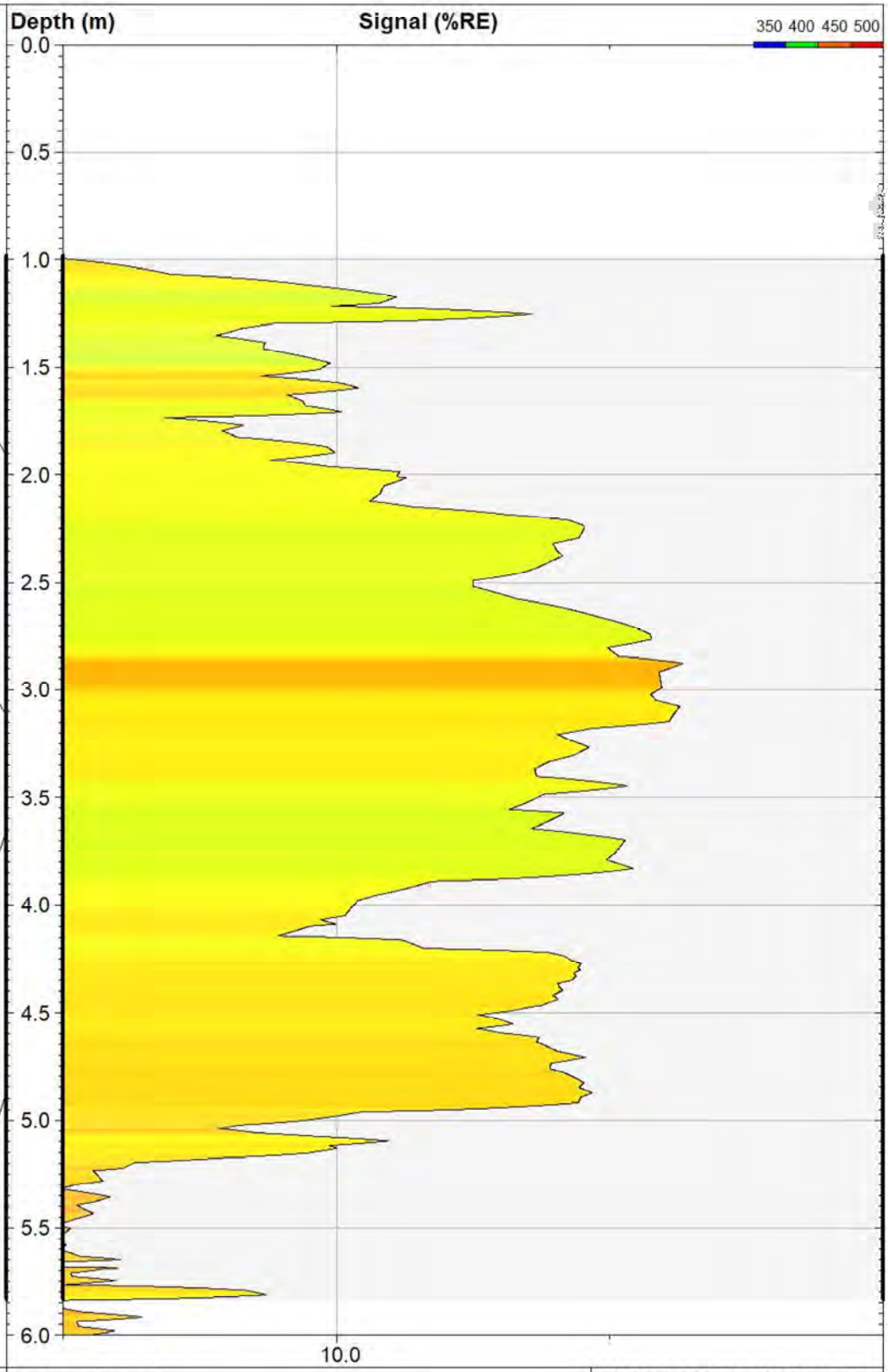
2.81 - 3.40 m
114.6 %RE (s 46.7)



3.40 - 3.96 m
74.4 %RE (s 35.3)



3.96 - 5.84 m
28.5 %RE (s 30.2)



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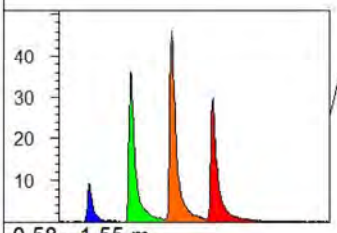
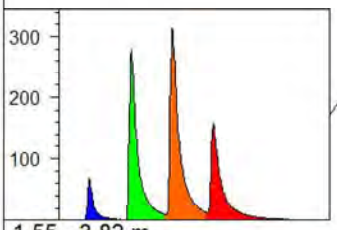
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761919.586 / UTM**	*Final depth:* **6.00 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385932.3798 /**	*Max signal:* **185.9 %RE @ 2.88 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.9 m**	*Date & Time:* **2020-05-29 15:08 ADT**

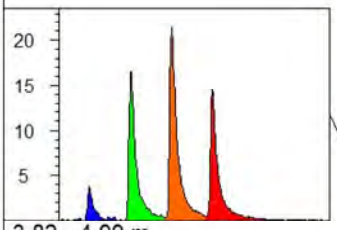
Callouts



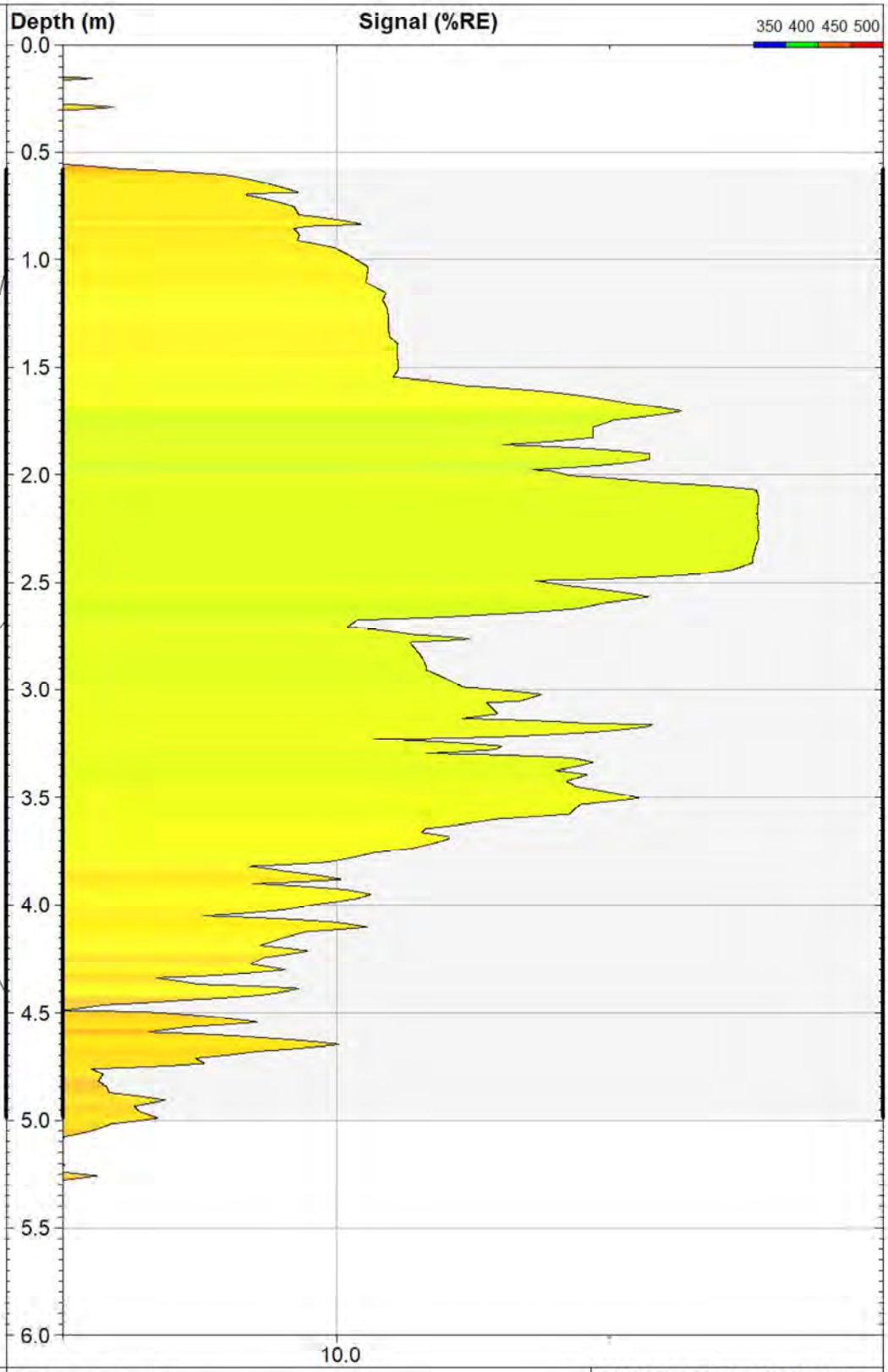
0.58 - 1.55 m
11.6 %RE (s 4.8)



1.55 - 3.82 m
106.0 %RE (s 107.0)



3.82 - 4.99 m
6.1 %RE (s 3.5)



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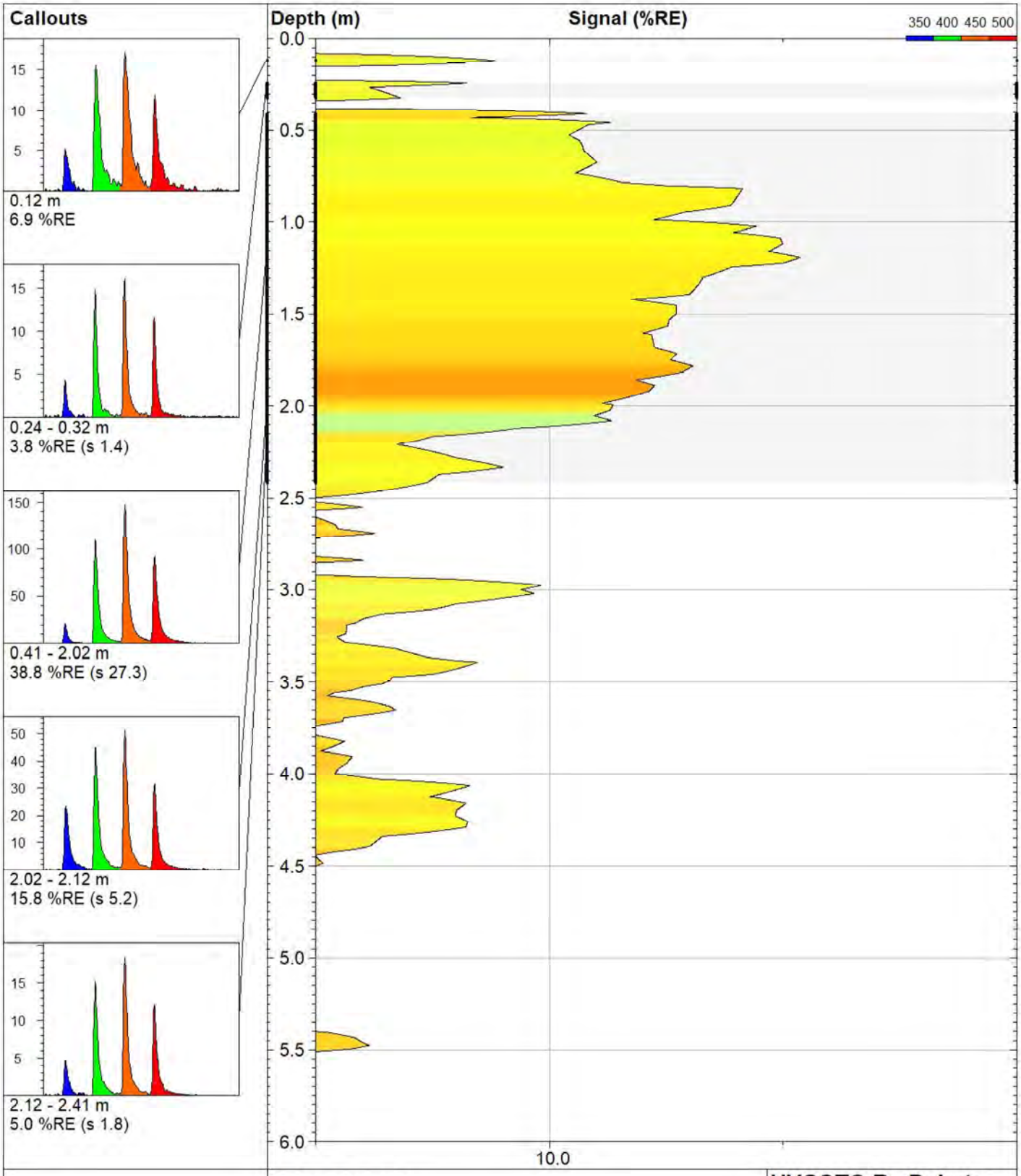
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761941.651 / UTM**	*Final depth:* **5.49 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385800.3155 /**	*Max signal:* **351.0 %RE @ 2.10 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.9 m**	*Date & Time:* **2020-05-11 14:22 ADT**



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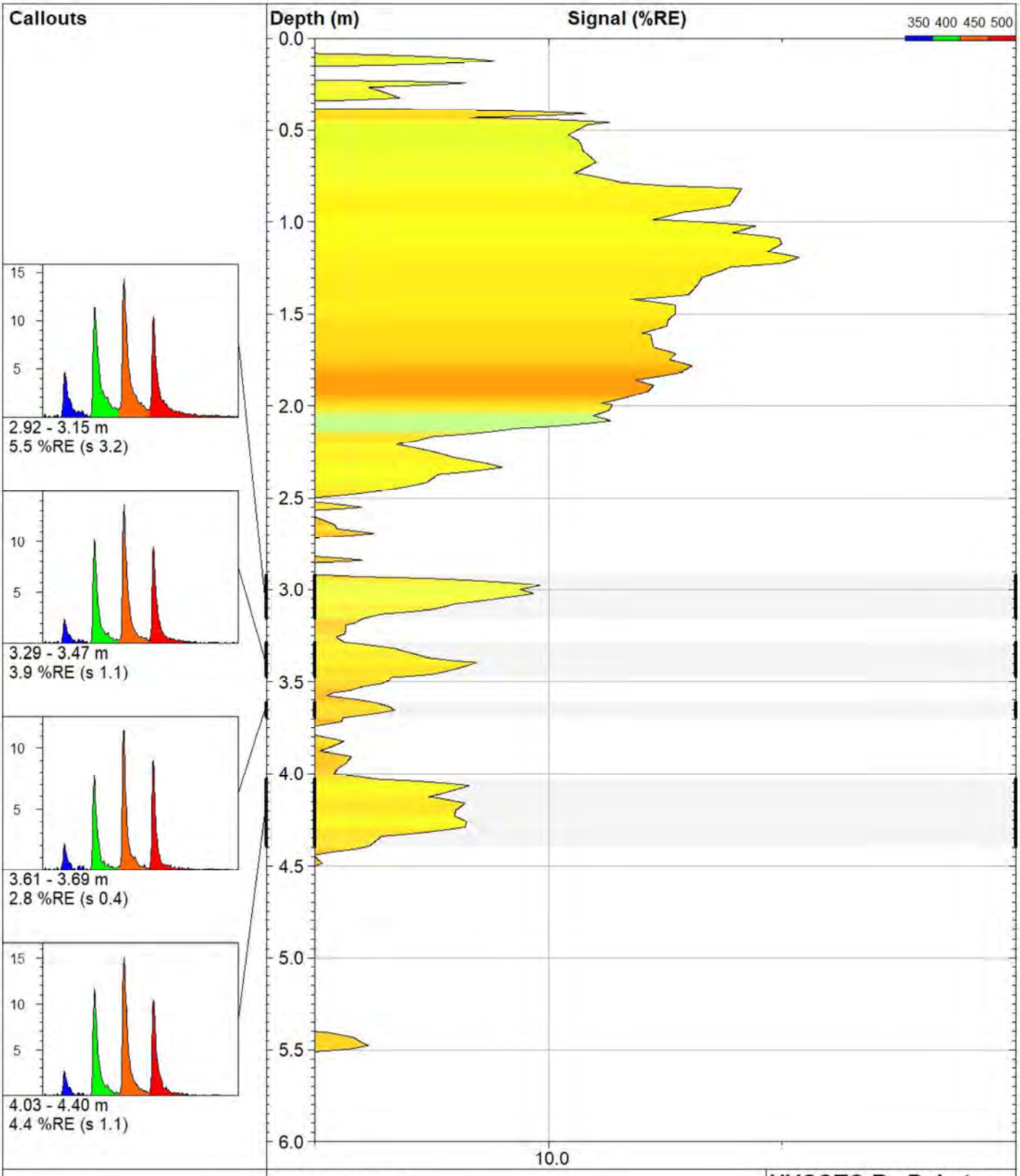
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761941.634 / UTM**	*Final depth:* **5.51 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385773.6082 /**	*Max signal:* **119.1 %RE @ 1.19 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.8 m**	*Date & Time:* **2020-05-11 14:44 ADT**



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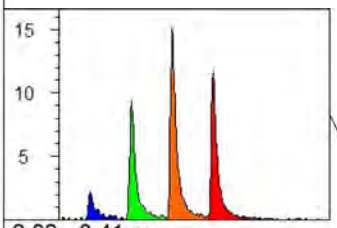
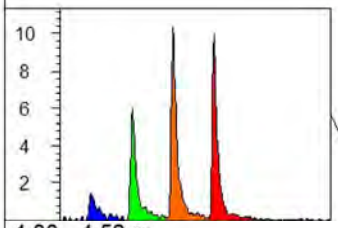
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761941.634 / UTM**	*Final depth:* **5.51 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385773.6082 /**	*Max signal:* **119.1 %RE @ 1.19 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.8 m**	*Date & Time:* **2020-05-11 14:44 ADT**

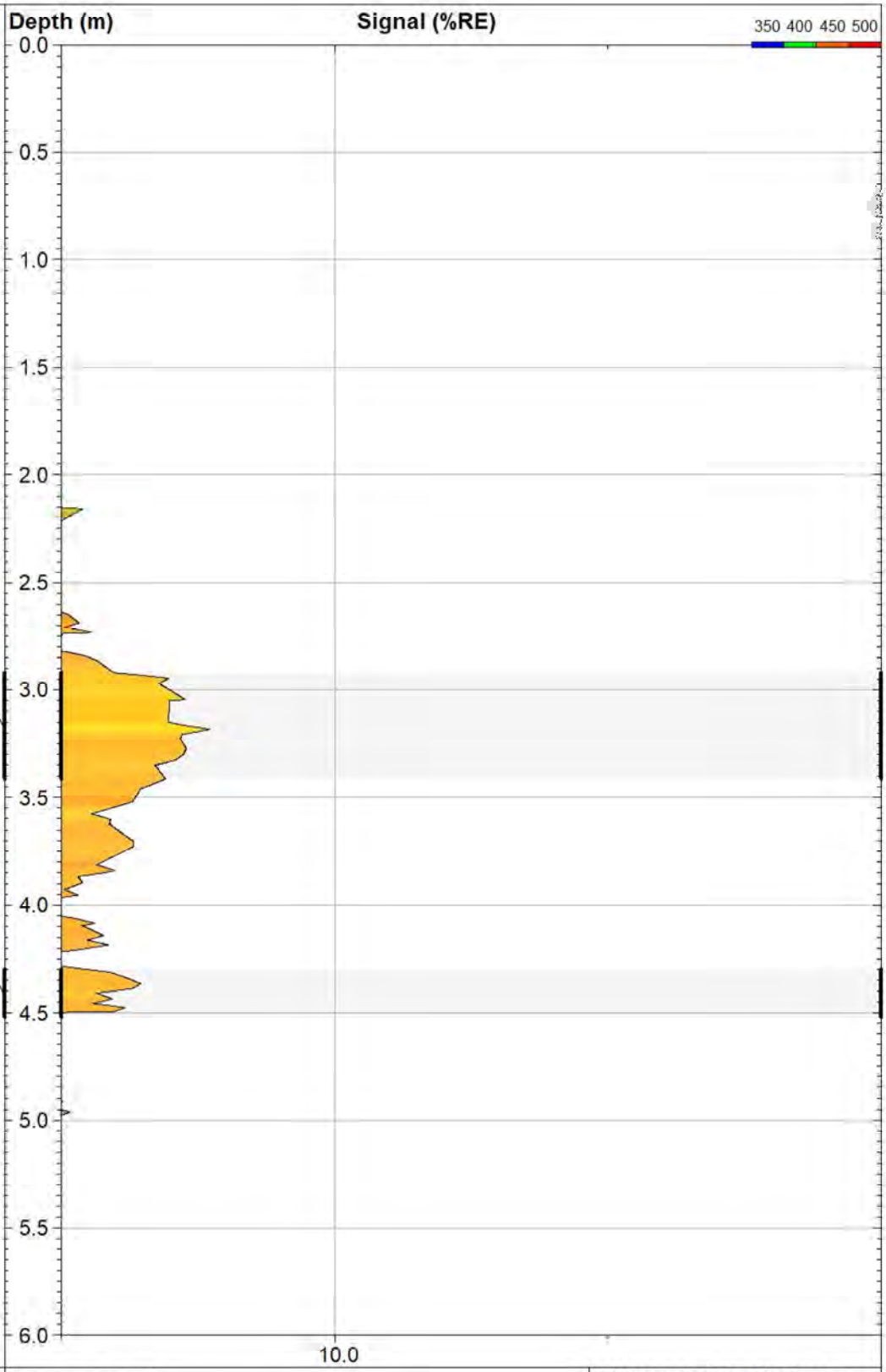
Callouts



2.92 - 3.41 m
3.6 %RE (s 0.4)



4.30 - 4.52 m
2.4 %RE (s 0.3)



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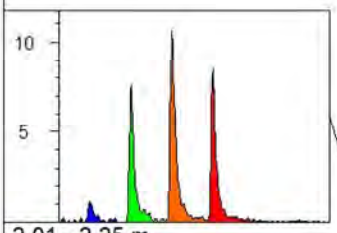
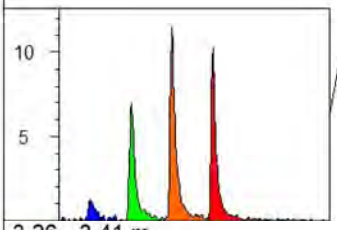
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761956.897 / UTM**	*Final depth:* **5.48 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385757.3546 /**	*Max signal:* **4.5 %RE @ 3.18 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.2 m**	*Date & Time:* **2020-05-11 16:23 ADT**

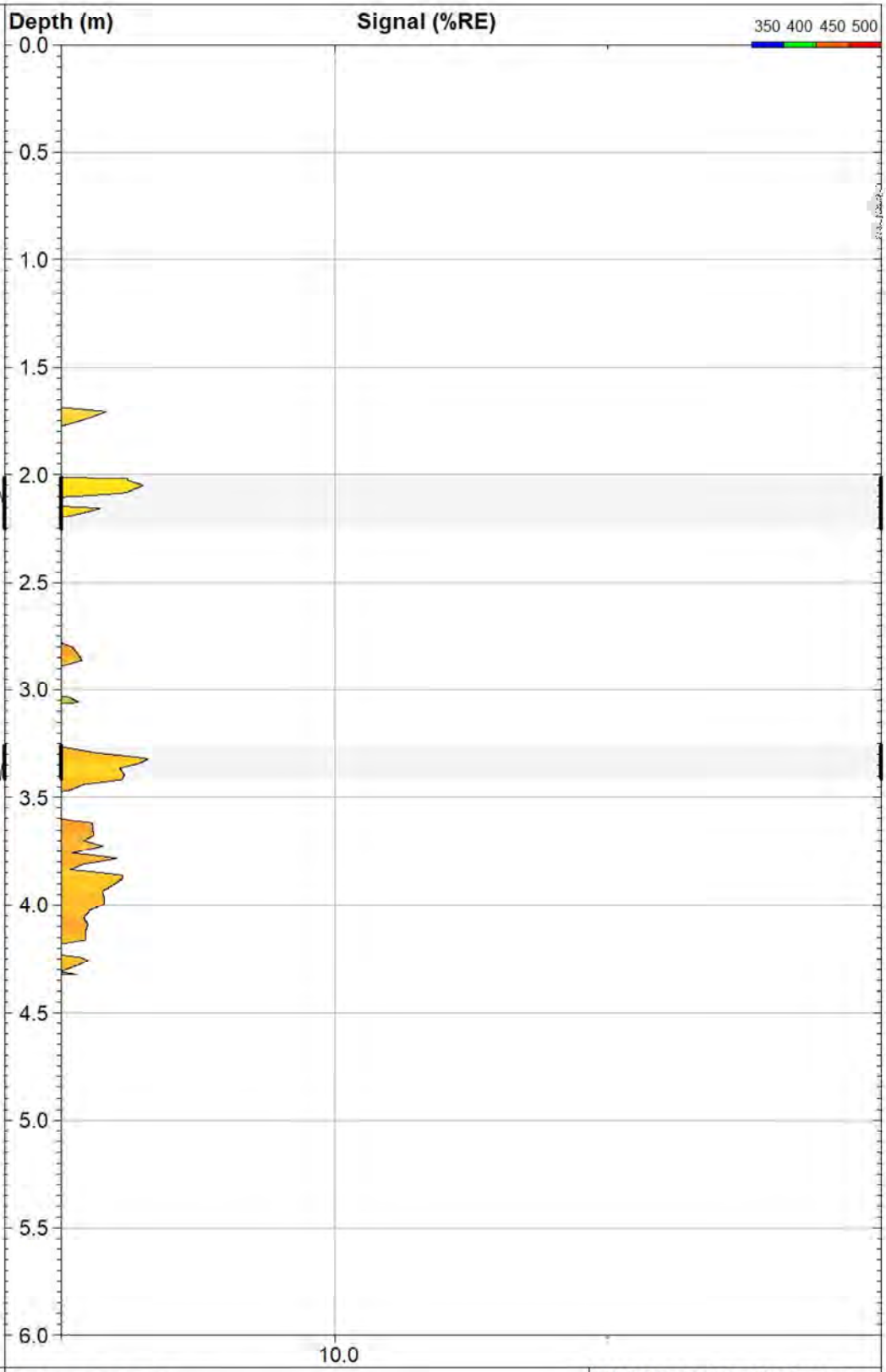
Callouts



2.01 - 2.25 m
2.3 %RE (s 0.6)



3.26 - 3.41 m
2.5 %RE (s 0.4)



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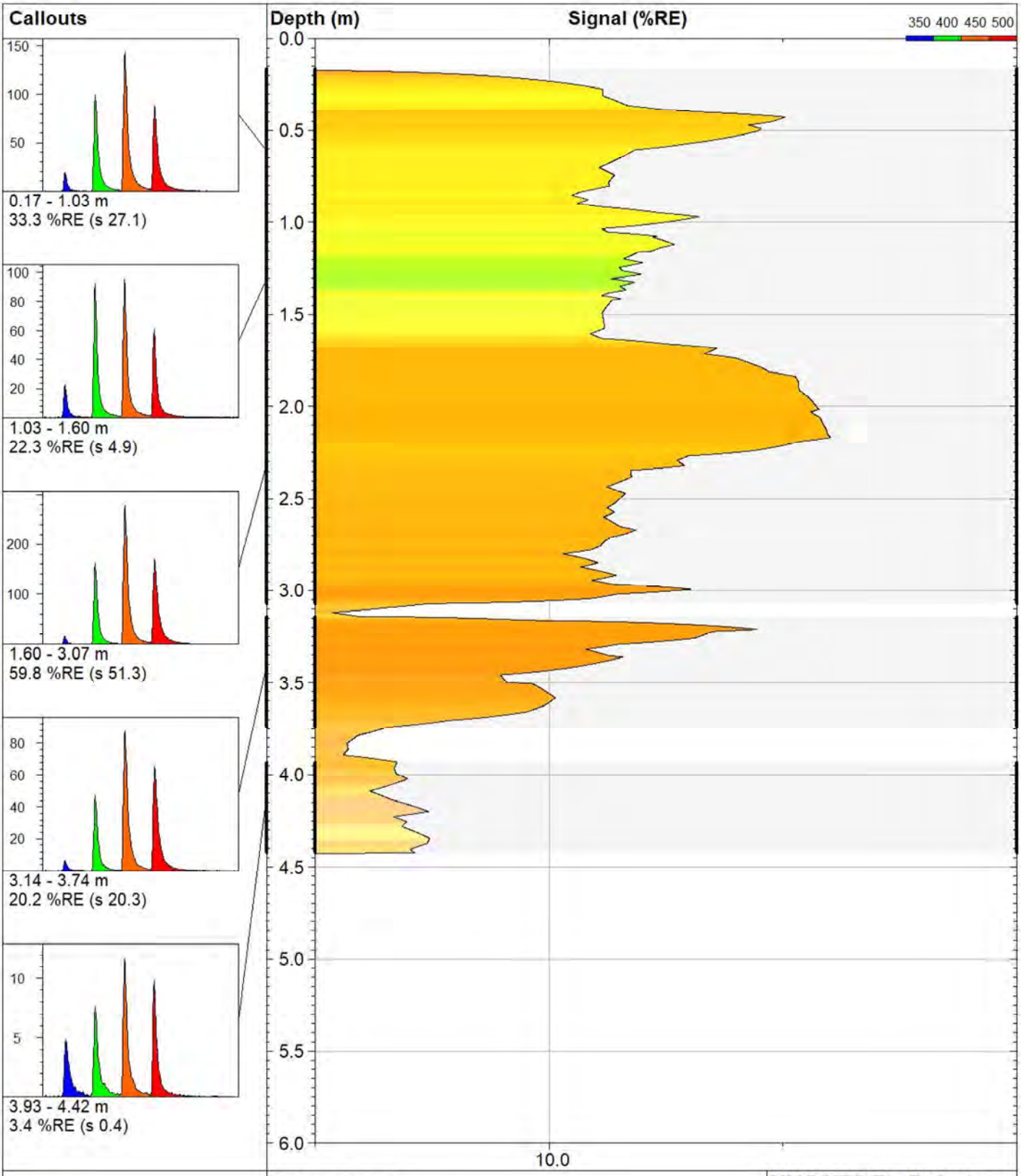
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761952.424 / UTM**	*Final depth:* **4.32 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385741.432 /**	*Max signal:* **3.1 %RE @ 3.32 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.5 m**	*Date & Time:* **2020-05-11 16:39 ADT**



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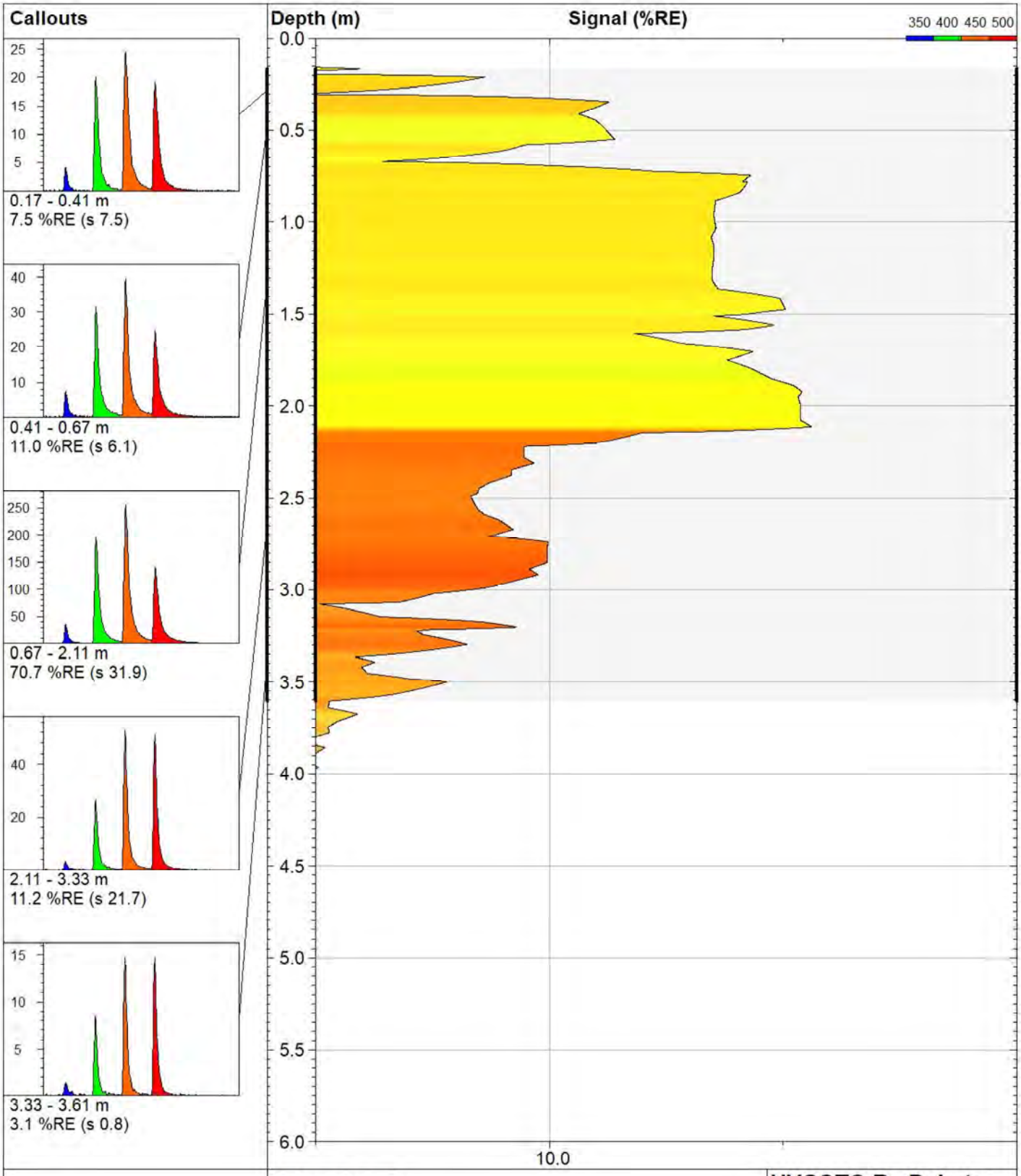
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761934.781 / UTM**	*Final depth:* **4.42 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385745.4114 /**	*Max signal:* **160.3 %RE @ 2.17 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.8 m**	*Date & Time:* **2020-05-11 16:55 ADT**



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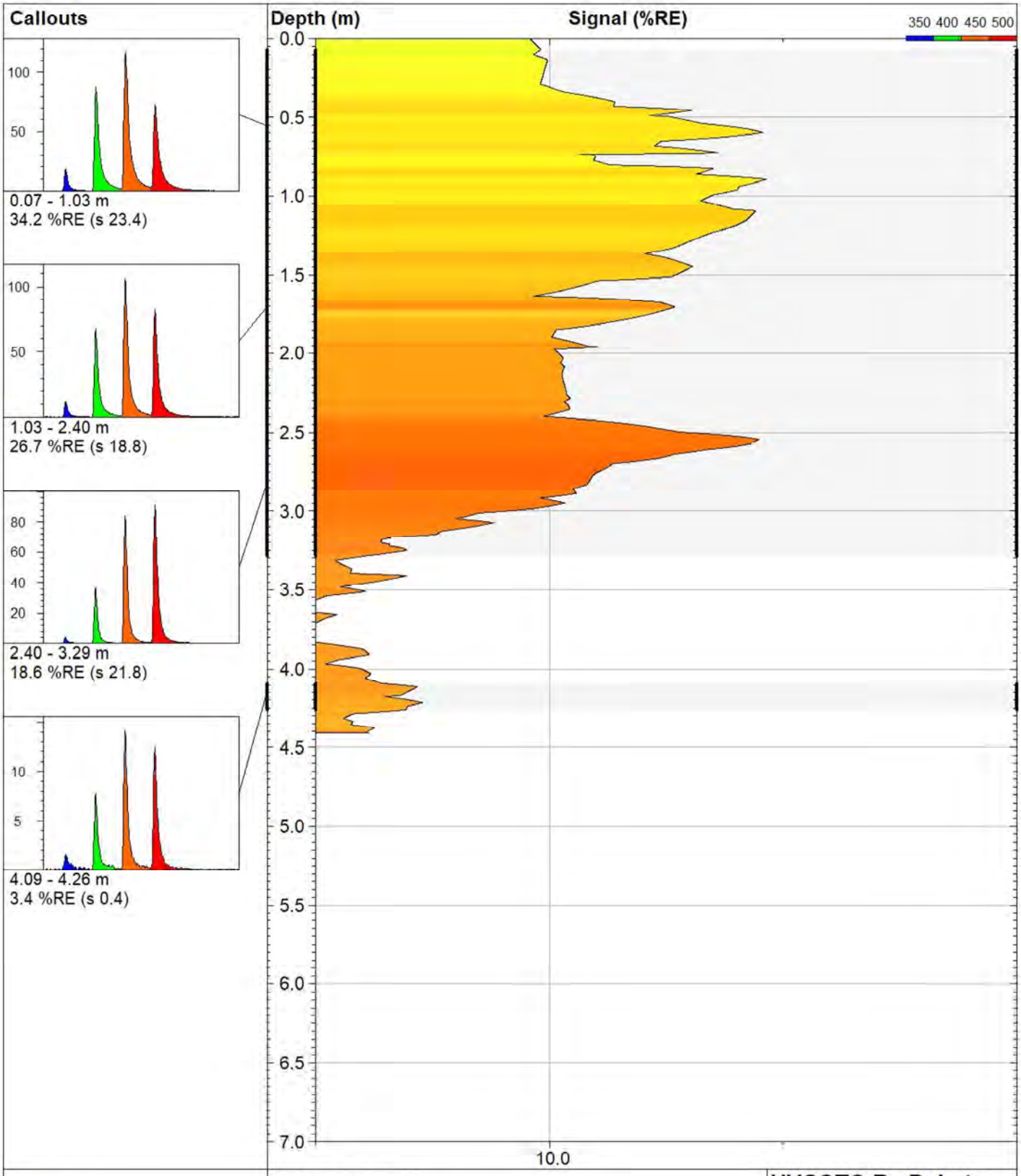
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761937.958 / UTM**	*Final depth:* **4.29 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385727.8521 /**	*Max signal:* **133.2 %RE @ 2.11 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.7 m**	*Date & Time:* **2020-05-11 17:15 ADT**



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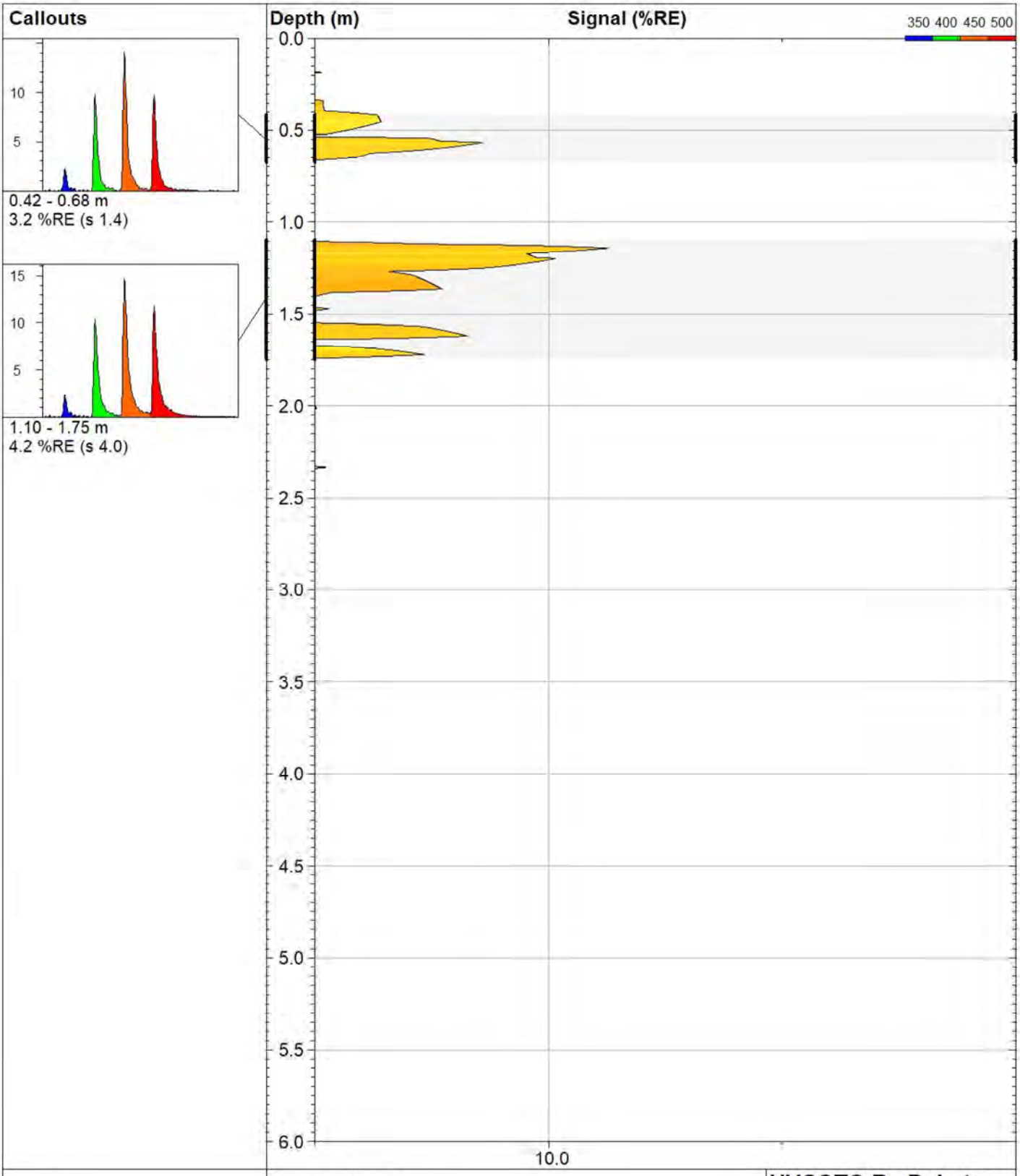
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761934.544 / UTM**	*Final depth:* **4.41 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385715.453 /**	*Max signal:* **85.6 %RE @ 0.90 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.8 m**	*Date & Time:* **2020-05-11 17:32 ADT**



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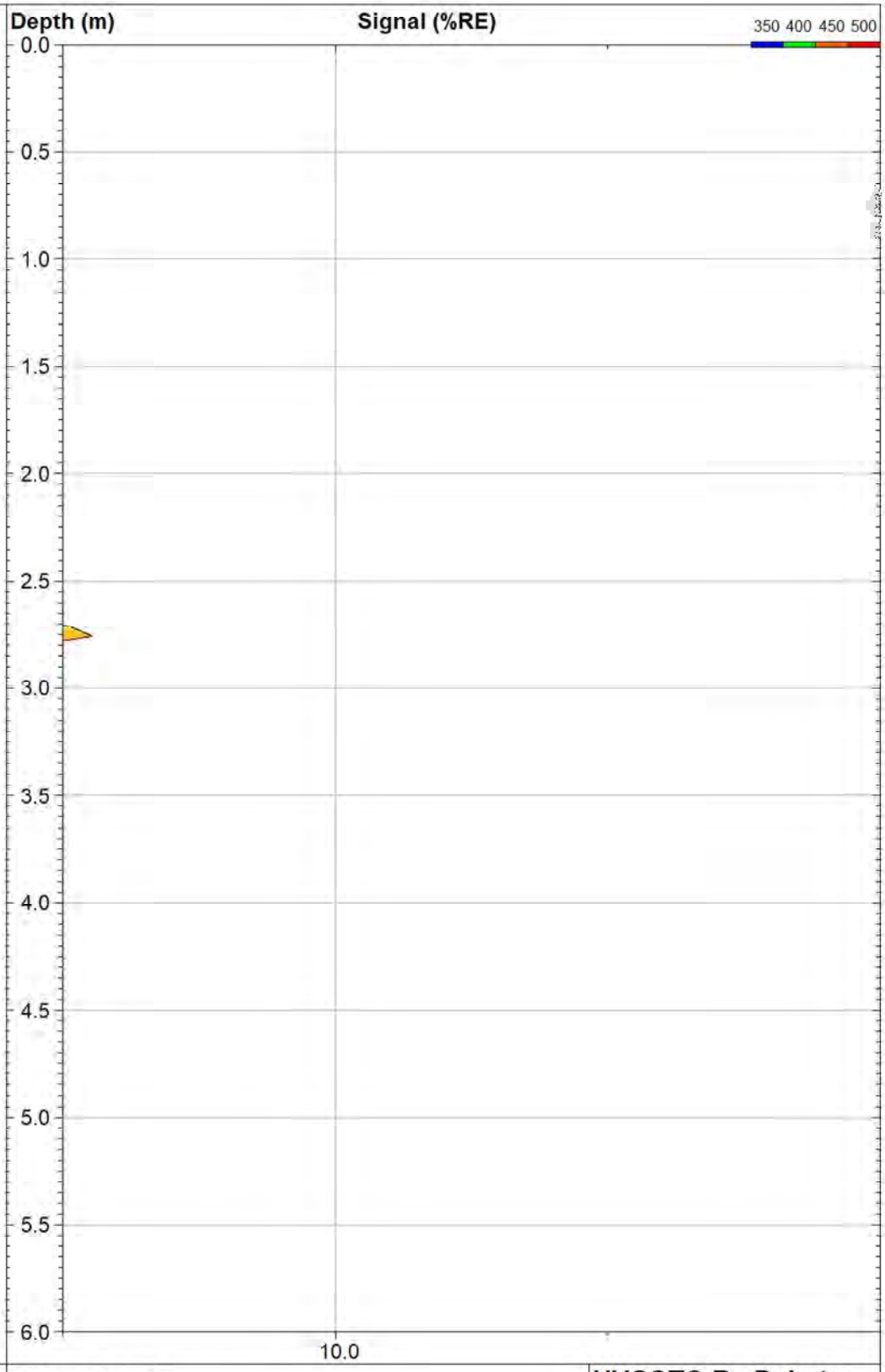
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761931.319 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385698.8606 /**	*Max signal:* **19.0 %RE @ 1.14 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-29 15:22 ADT**

Callouts



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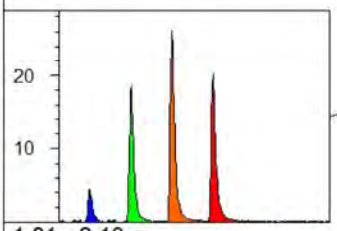
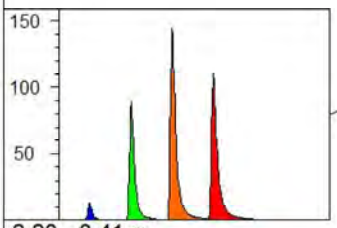
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761956.504 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385718.9316 /**	*Max signal:* **2.3 %RE @ 2.76 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.7 m**	*Date & Time:* **2020-05-11 18:04 ADT**

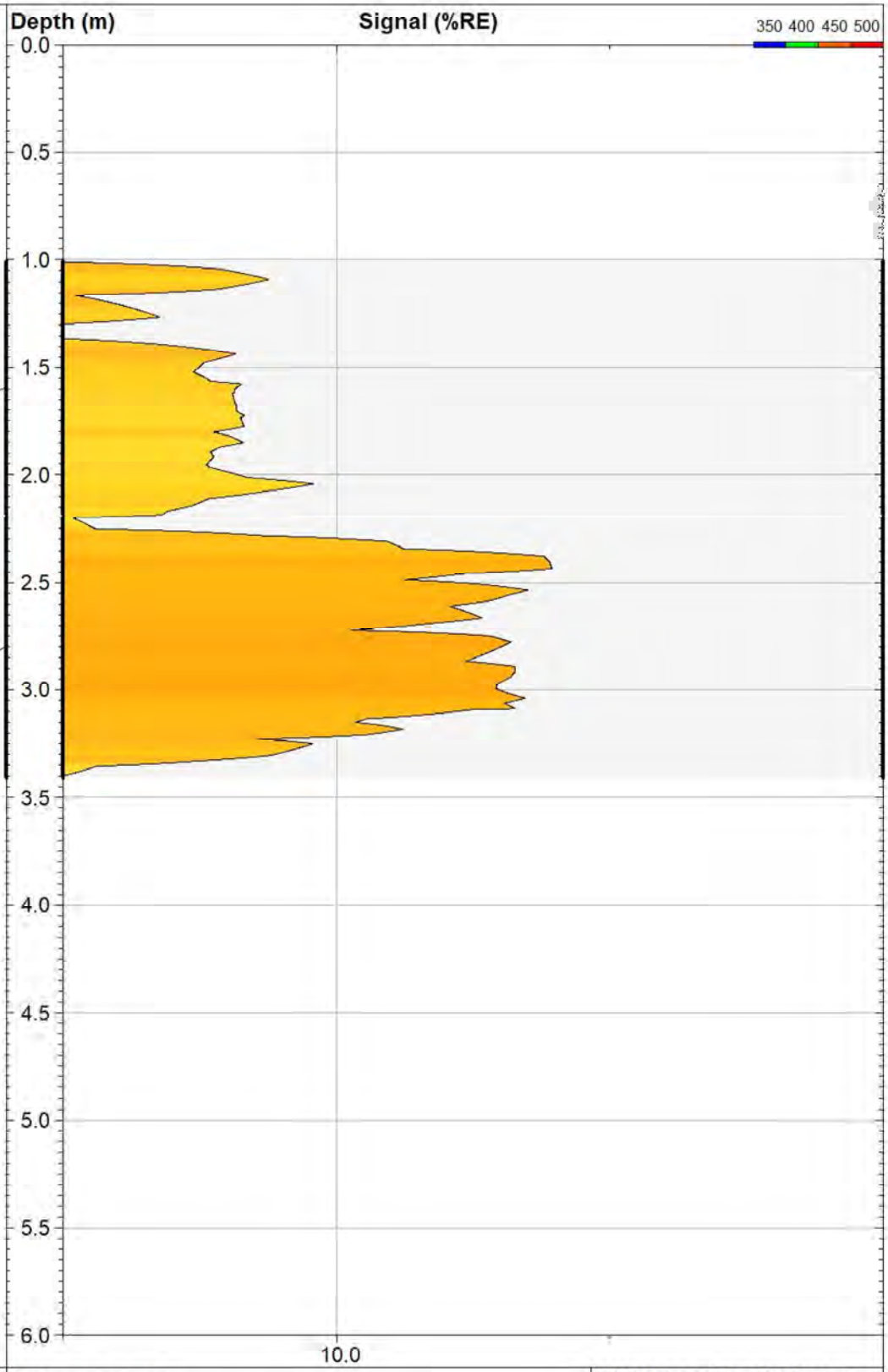
Callouts



1.01 - 2.19 m
4.7 %RE (s 1.4)



2.20 - 3.41 m
28.4 %RE (s 17.7)



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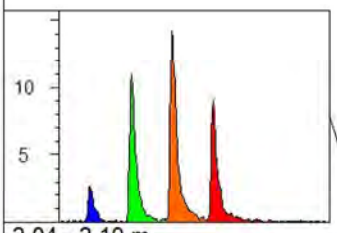
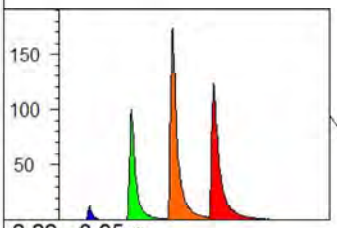
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761557.838 / UTM**	*Final depth:* **4.31 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385705.4971 /**	*Max signal:* **62.4 %RE @ 2.43 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.7 m**	*Date & Time:* **2020-05-29 15:23 ADT**

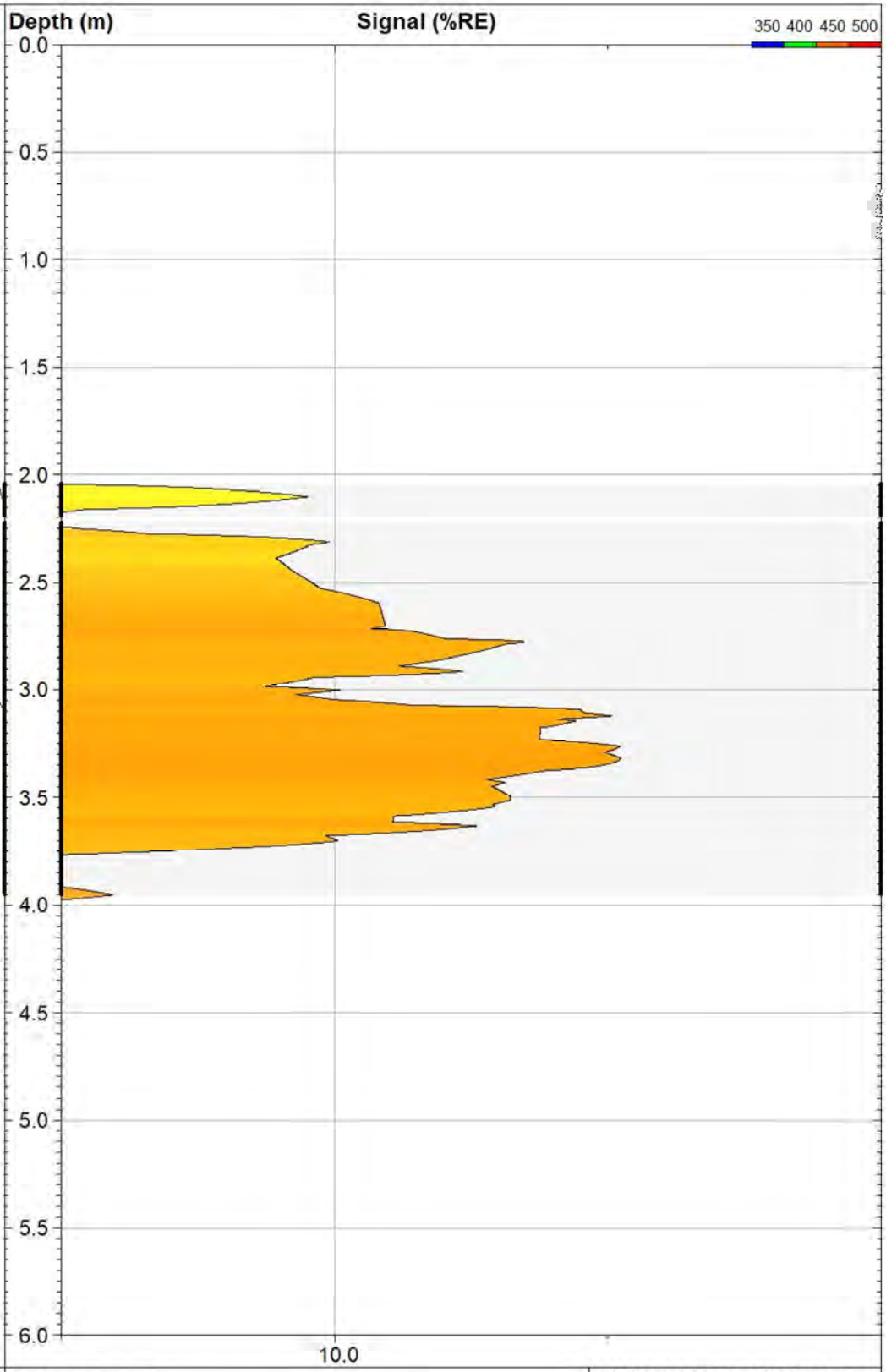
Callouts



2.04 - 2.19 m
3.6 %RE (s 3.6)



2.22 - 3.95 m
40.9 %RE (s 35.6)



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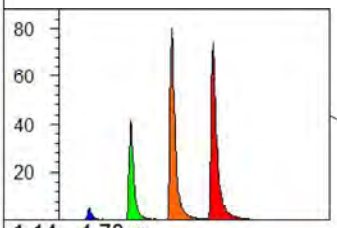
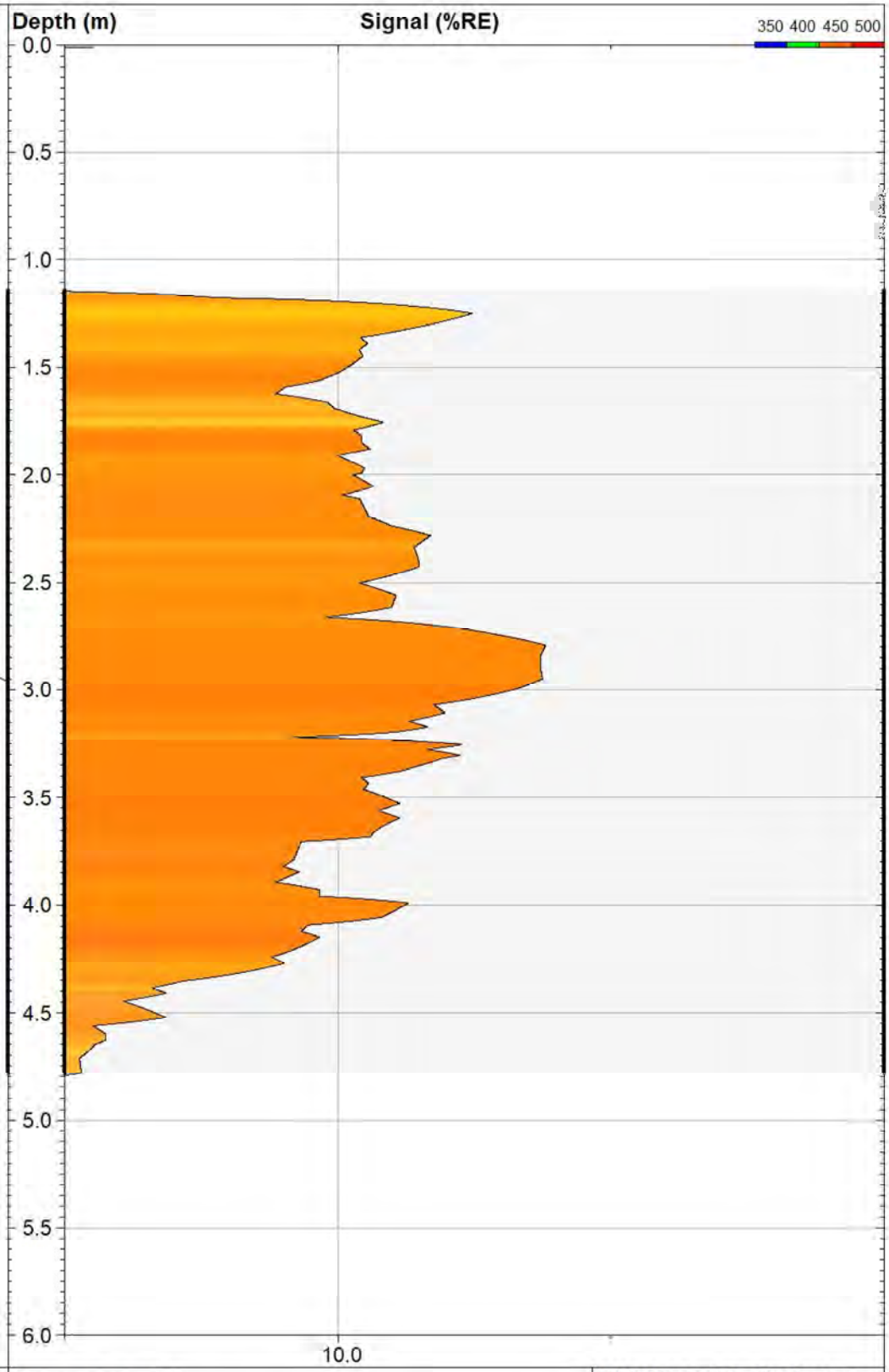
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761555.931 / UTM**	*Final depth:* **4.29 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385728.8603 /**	*Max signal:* **112.5 %RE @ 3.32 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.8 m**	*Date & Time:* **2020-05-12 09:32 ADT**

Callouts



1.14 - 4.78 m
15.0 %RE (s 12.0)



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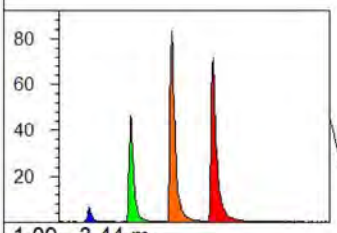
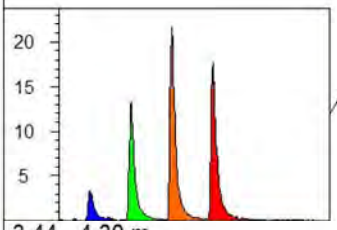
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761554.891 / UTM**	*Final depth:* **5.52 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385752.7735 /**	*Max signal:* **58.6 %RE @ 2.79 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.9 m**	*Date & Time:* **2020-05-29 15:25 ADT**

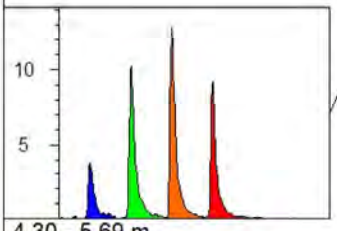
Callouts



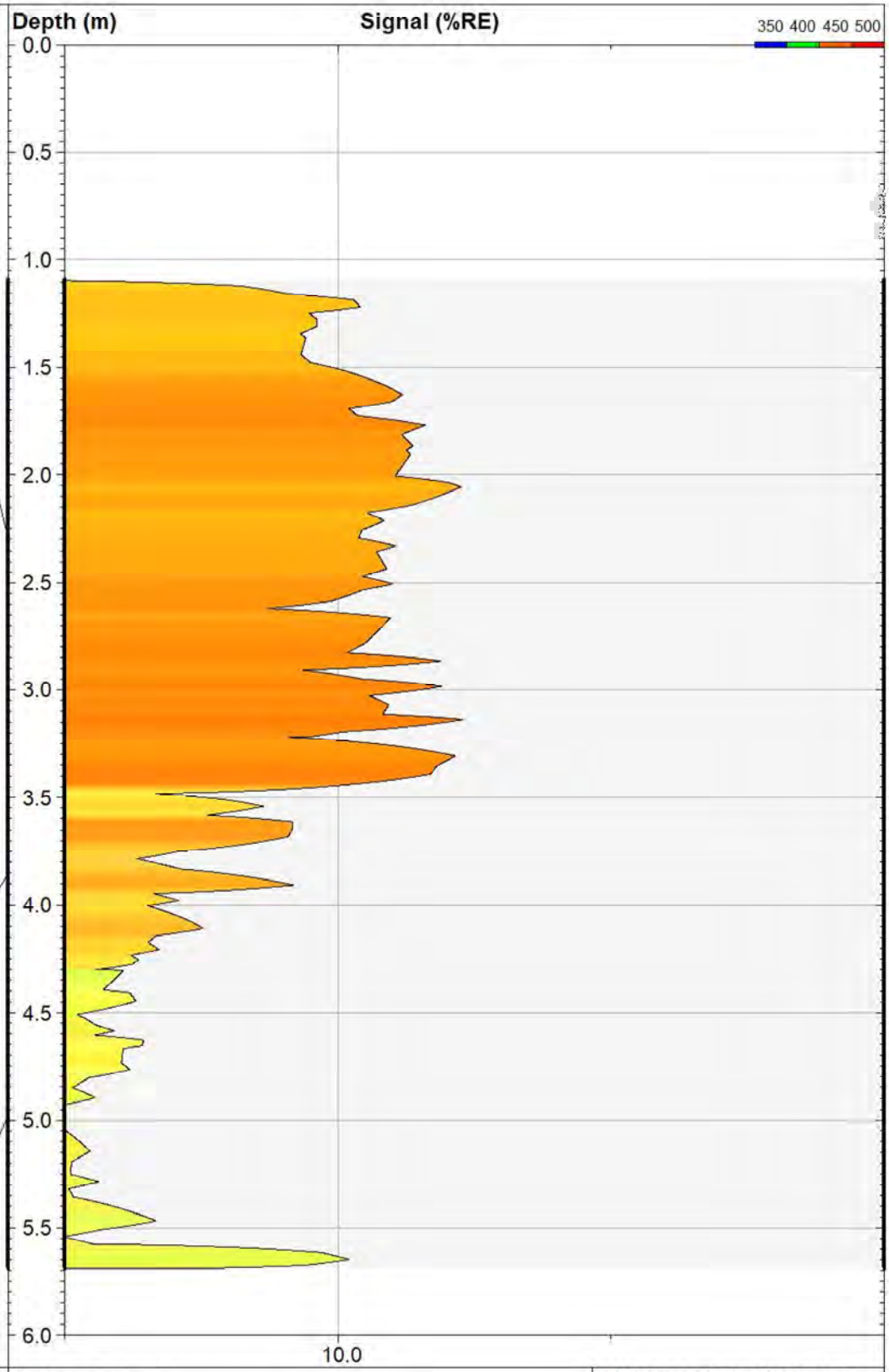
1.09 - 3.44 m
14.9 %RE (s 6.0)



3.44 - 4.30 m
4.5 %RE (s 2.4)



4.30 - 5.69 m
3.1 %RE (s 2.2)



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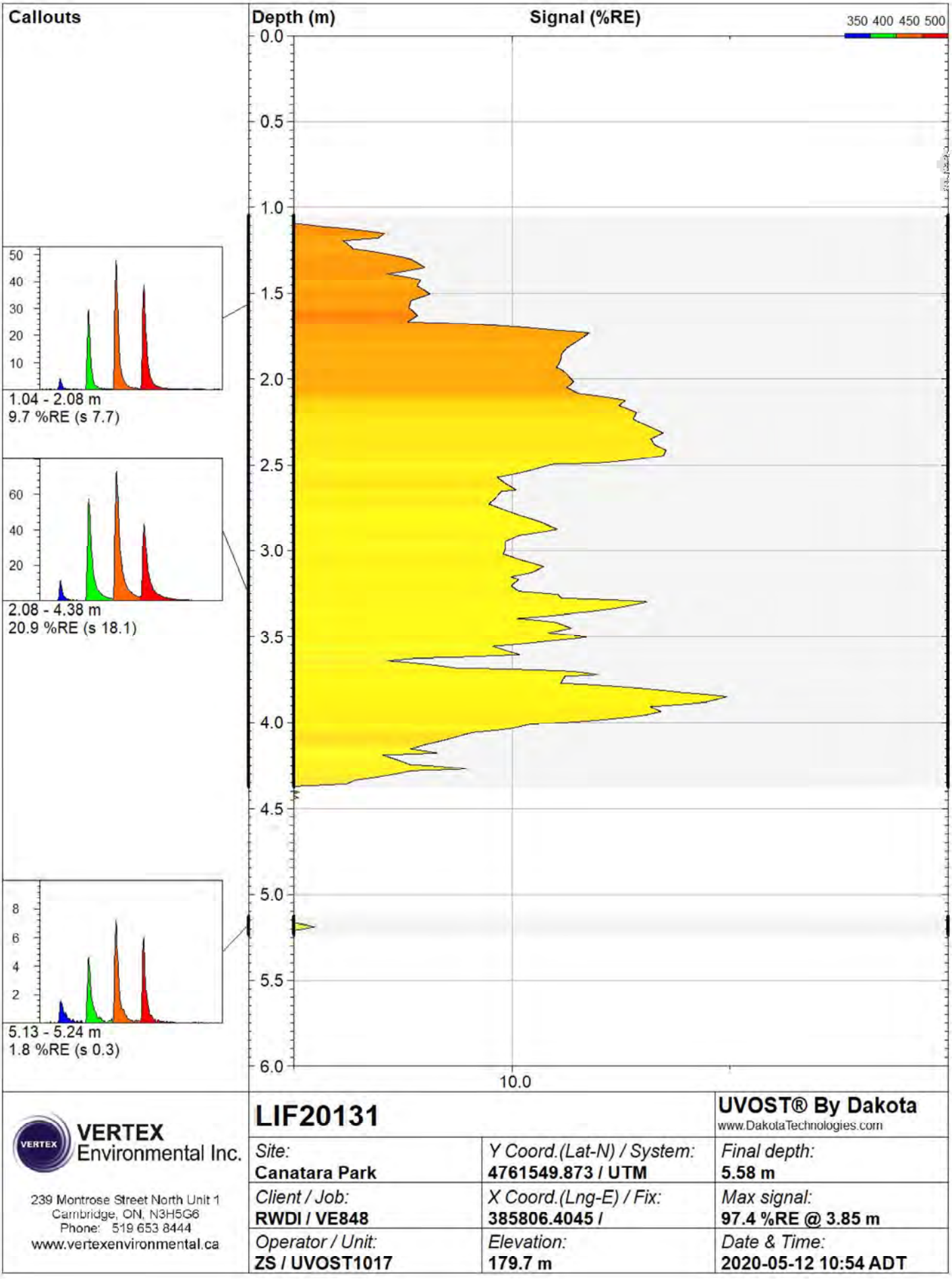
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761551.043 / UTM**	*Final depth:* **5.69 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385778.7868 /**	*Max signal:* **29.8 %RE @ 3.14 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.8 m**	*Date & Time:* **2020-05-12 10:09 ADT**



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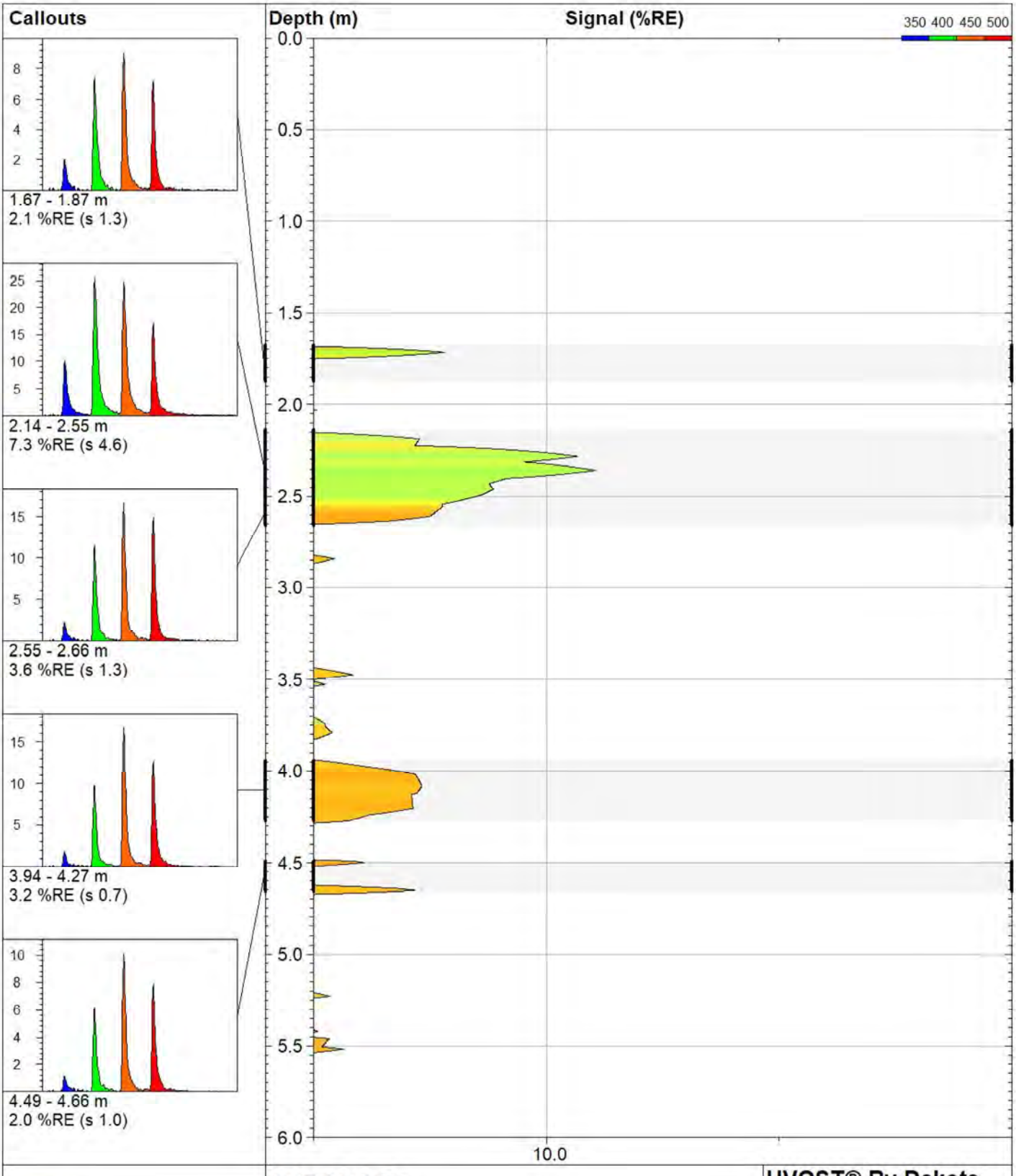
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761549.873 / UTM**	*Final depth:* **5.58 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385806.4045 /**	*Max signal:* **97.4 %RE @ 3.85 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.7 m**	*Date & Time:* **2020-05-12 10:54 ADT**



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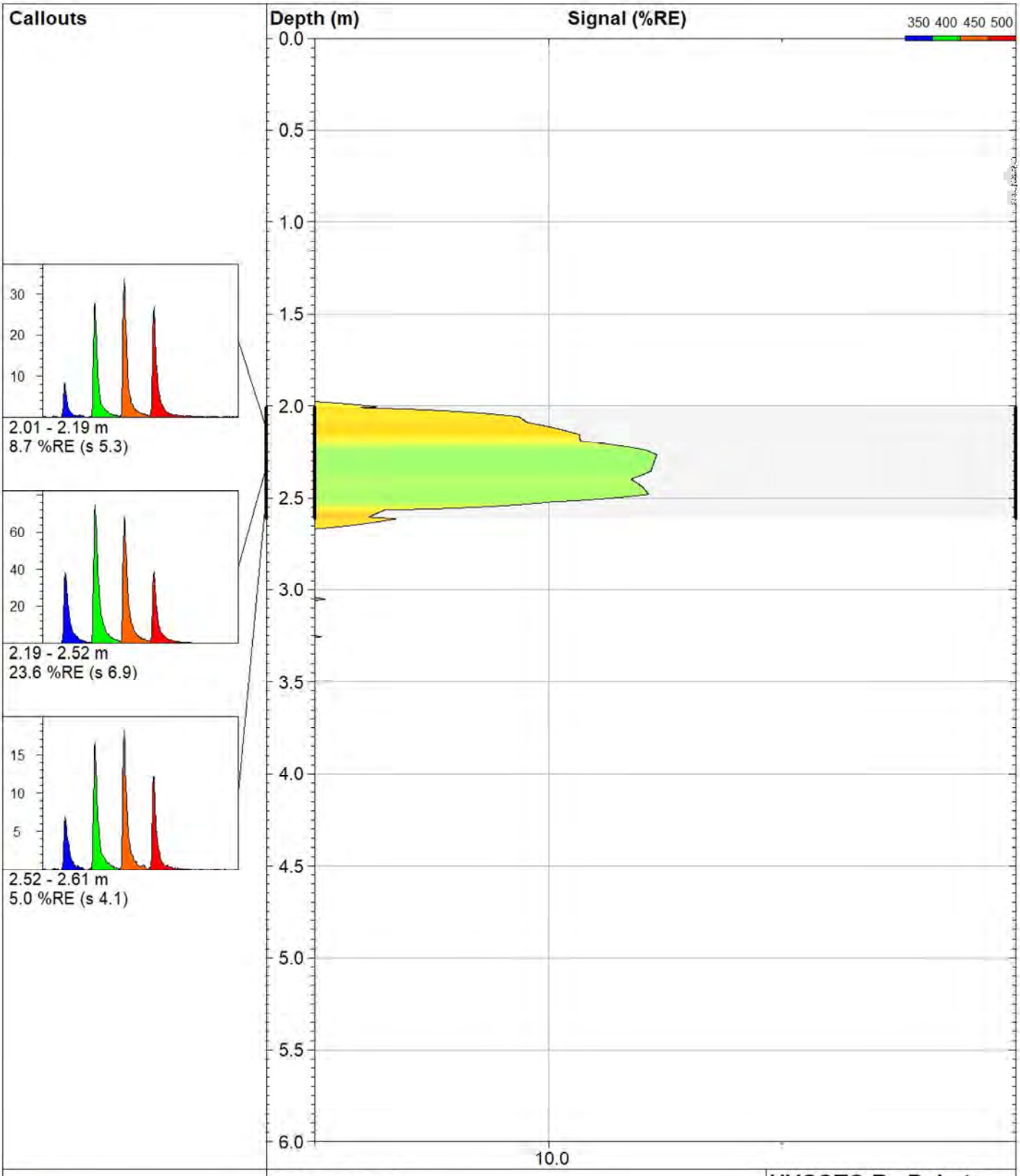
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761547.142 / UTM**	*Final depth:* **5.68 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385835.4622 /**	*Max signal:* **17.3 %RE @ 2.36 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.9 m**	*Date & Time:* **2020-05-12 11:35 ADT**



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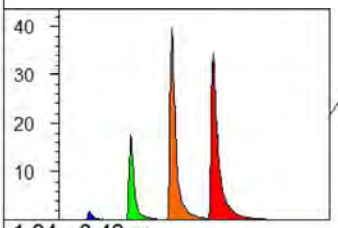
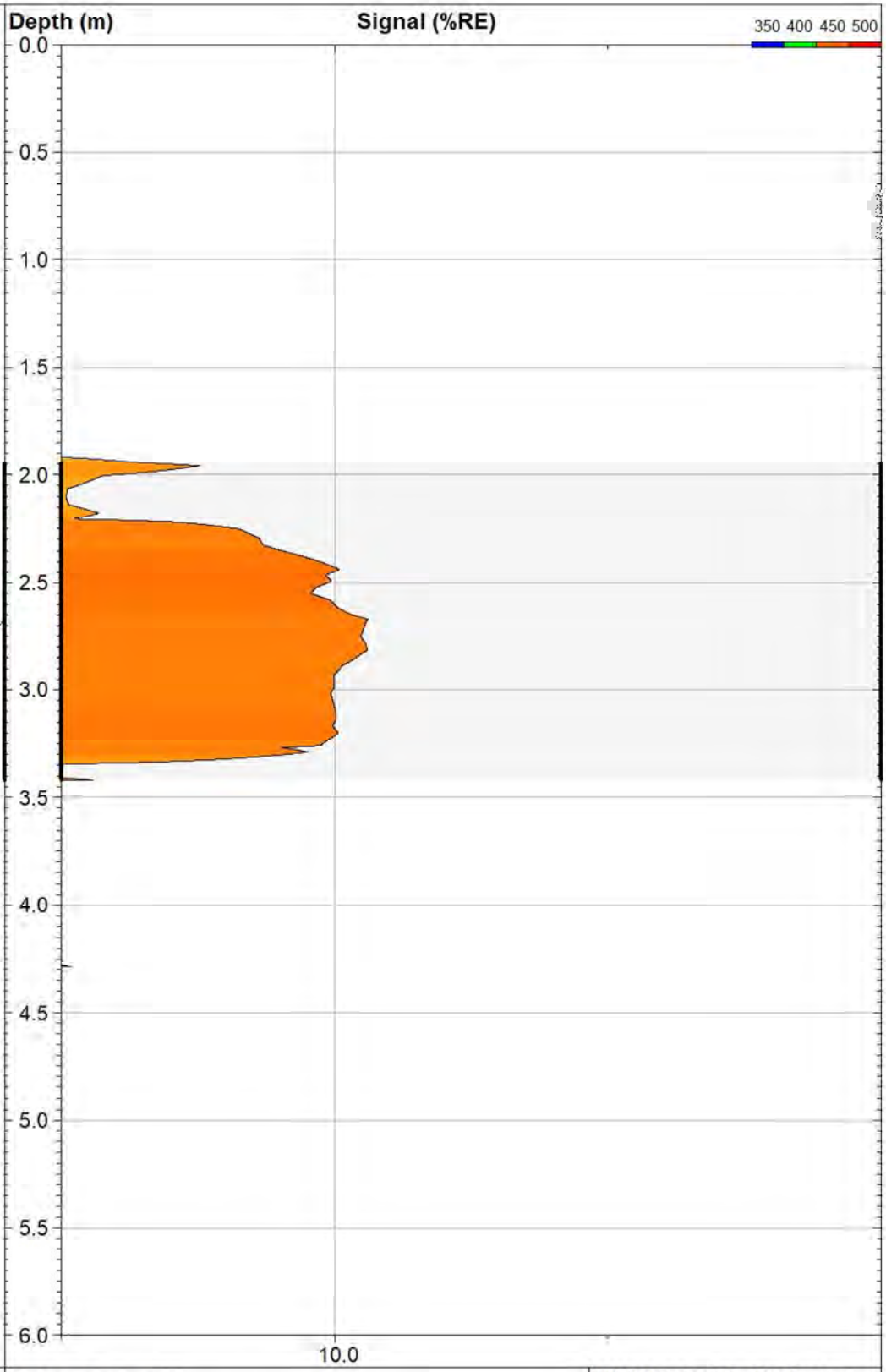
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761541.632 / UTM**	*Final depth:* **4.30 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385844.7795 /**	*Max signal:* **30.0 %RE @ 2.26 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.7 m**	*Date & Time:* **2020-05-12 11:55 ADT**

Callouts



1.94 - 3.42 m
8.2 %RE (s 4.2)



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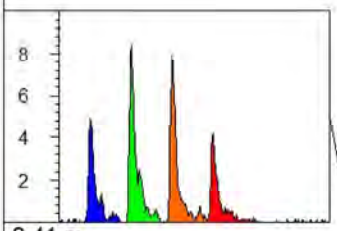
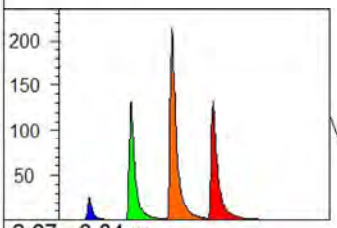
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761567.763 / UTM**	*Final depth:* **4.29 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385837.93 /**	*Max signal:* **14.2 %RE @ 2.67 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.5 m**	*Date & Time:* **2020-05-12 12:31 ADT**

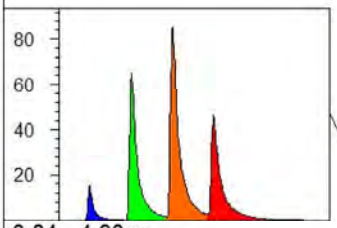
Callouts



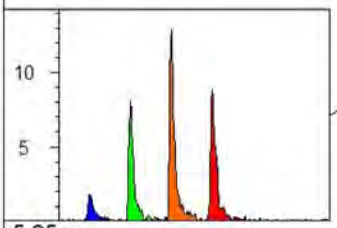
2.41 m
2.4 %RE



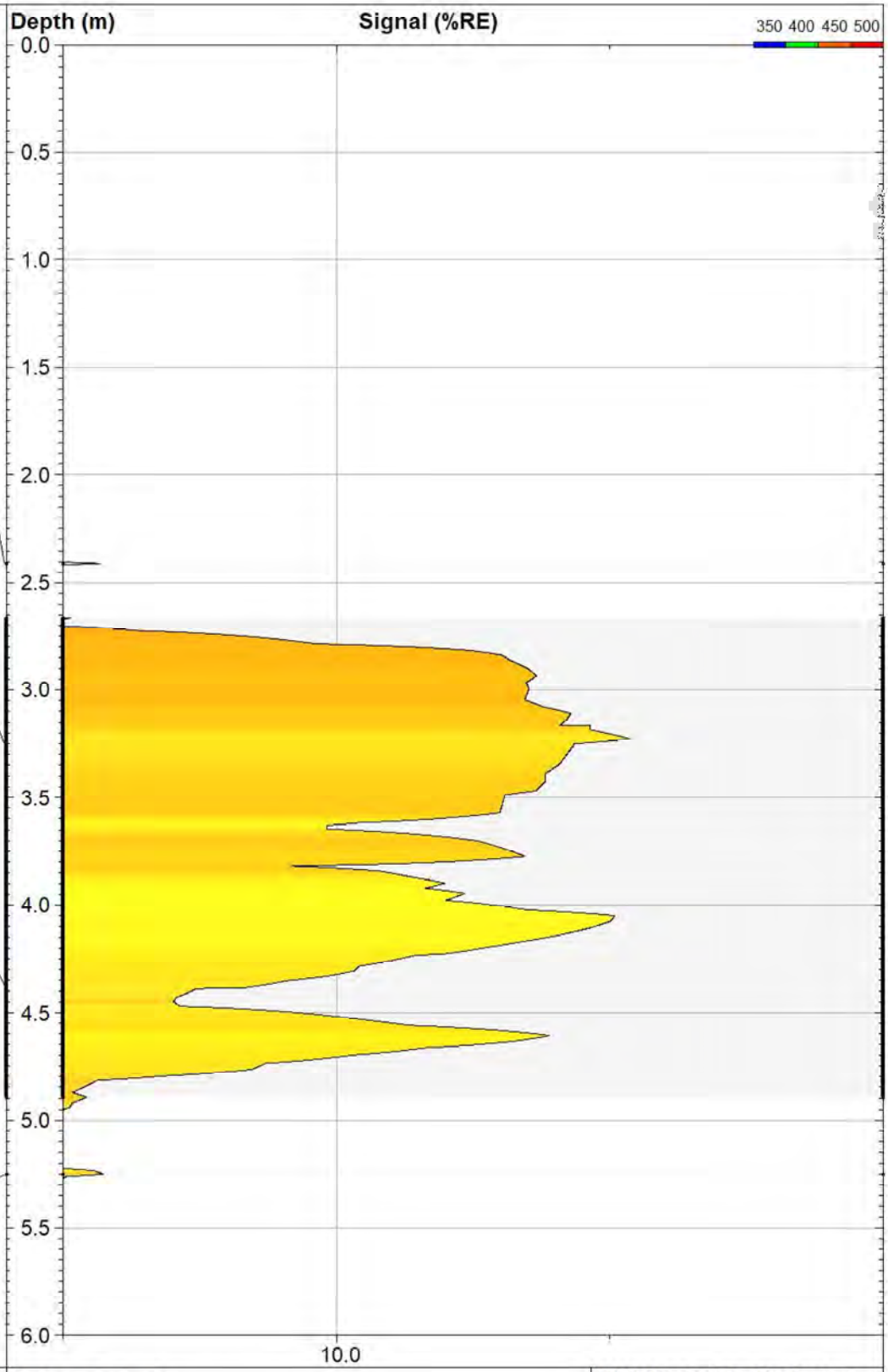
2.67 - 3.84 m
43.8 %RE (s 28.9)



3.84 - 4.90 m
25.1 %RE (s 27.2)



5.25 m
2.4 %RE



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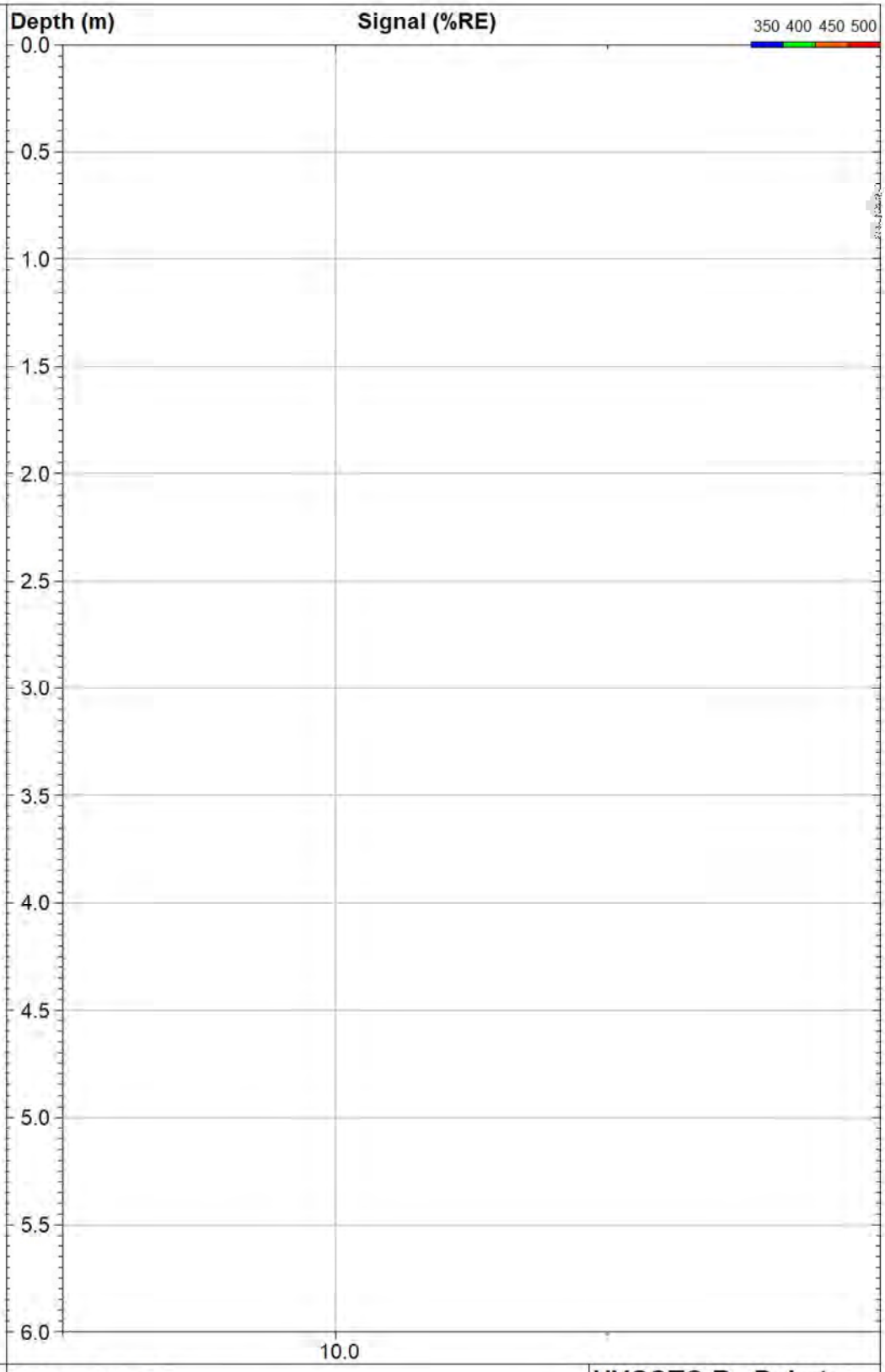
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761916.439 / UTM**	*Final depth:* **5.49 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385772.5772 /**	*Max signal:* **120.2 %RE @ 3.23 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.8 m**	*Date & Time:* **2020-05-12 13:44 ADT**

Callouts



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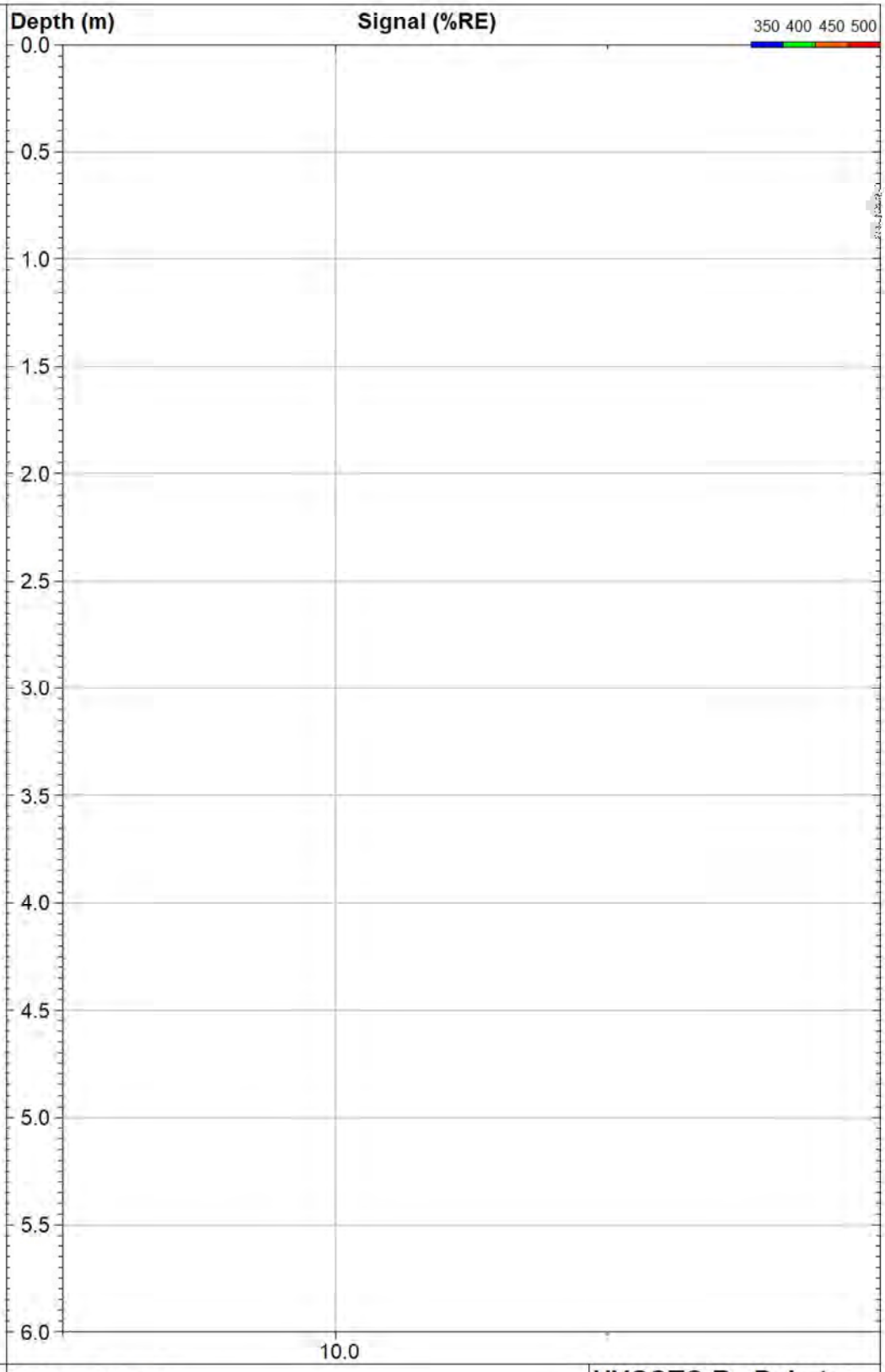
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761909.584 / UTM**	*Final depth:* **4.27 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385707.3251 /**	*Max signal:* **1.2 %RE @ 4.20 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.8 m**	*Date & Time:* **2020-05-12 14:05 ADT**

Callouts



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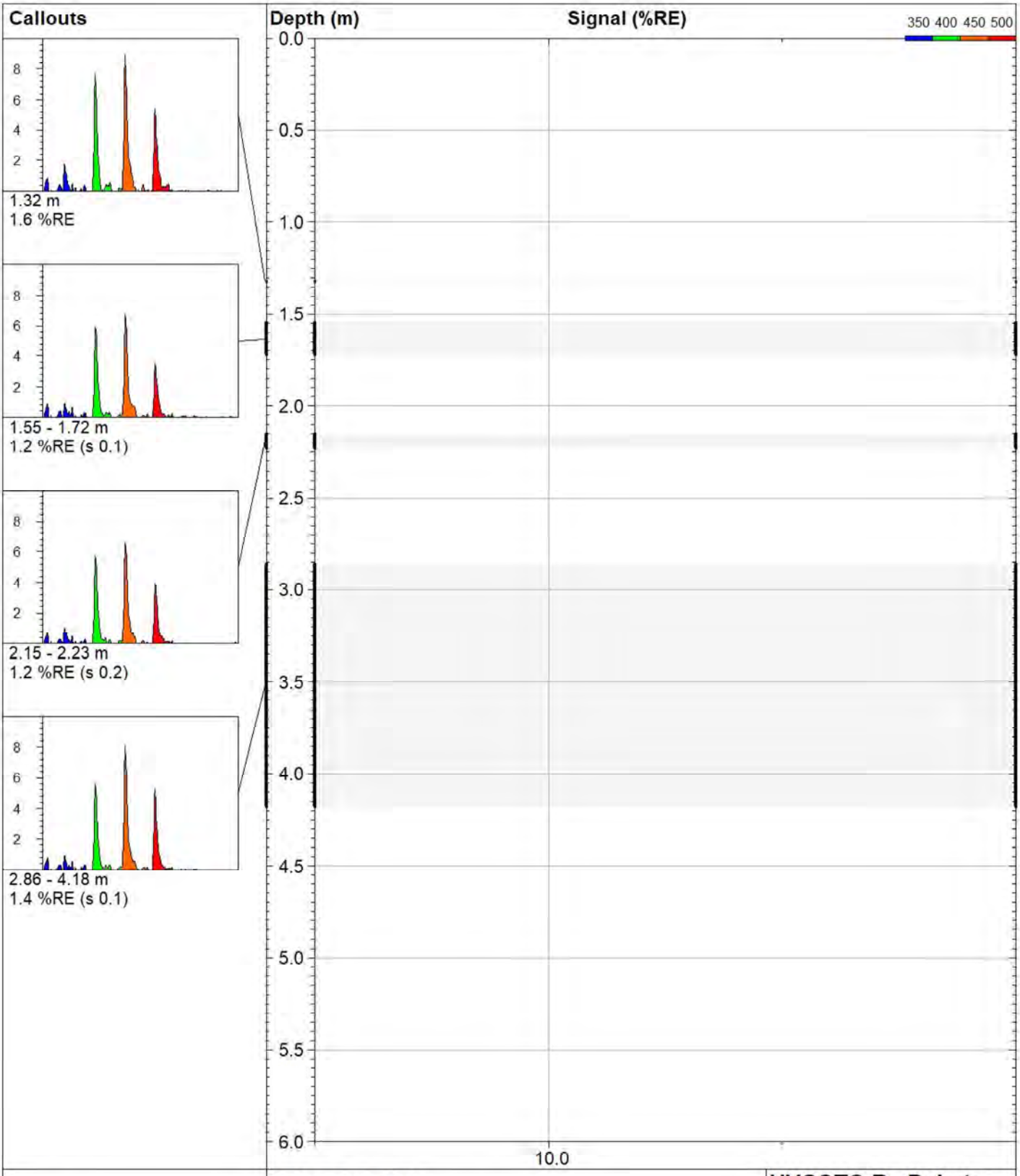
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761911.29 / UTM**	*Final depth:* **3.70 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385717.9934 /**	*Max signal:* **1.2 %RE @ 2.78 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.8 m**	*Date & Time:* **2020-05-12 14:25 ADT**



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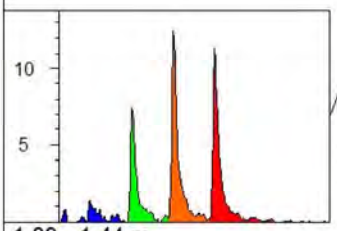
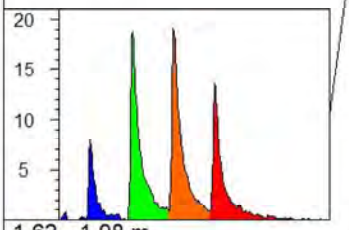
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761913.53 / UTM**	*Final depth:* **4.28 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385729.2992 /**	*Max signal:* **1.7 %RE @ 3.66 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.5 m**	*Date & Time:* **2020-05-12 16:23 ADT**

Callouts

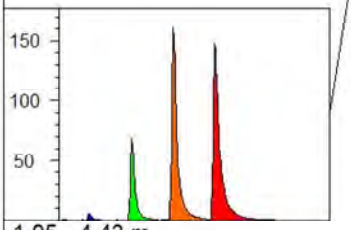
First 0.3 m invalid, log was started prior to being at ground surface.



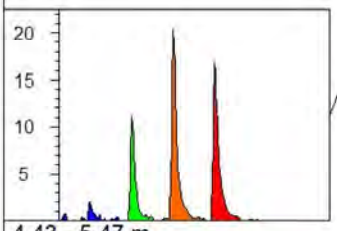
1.09 - 1.44 m
3.3 %RE (s 2.2)



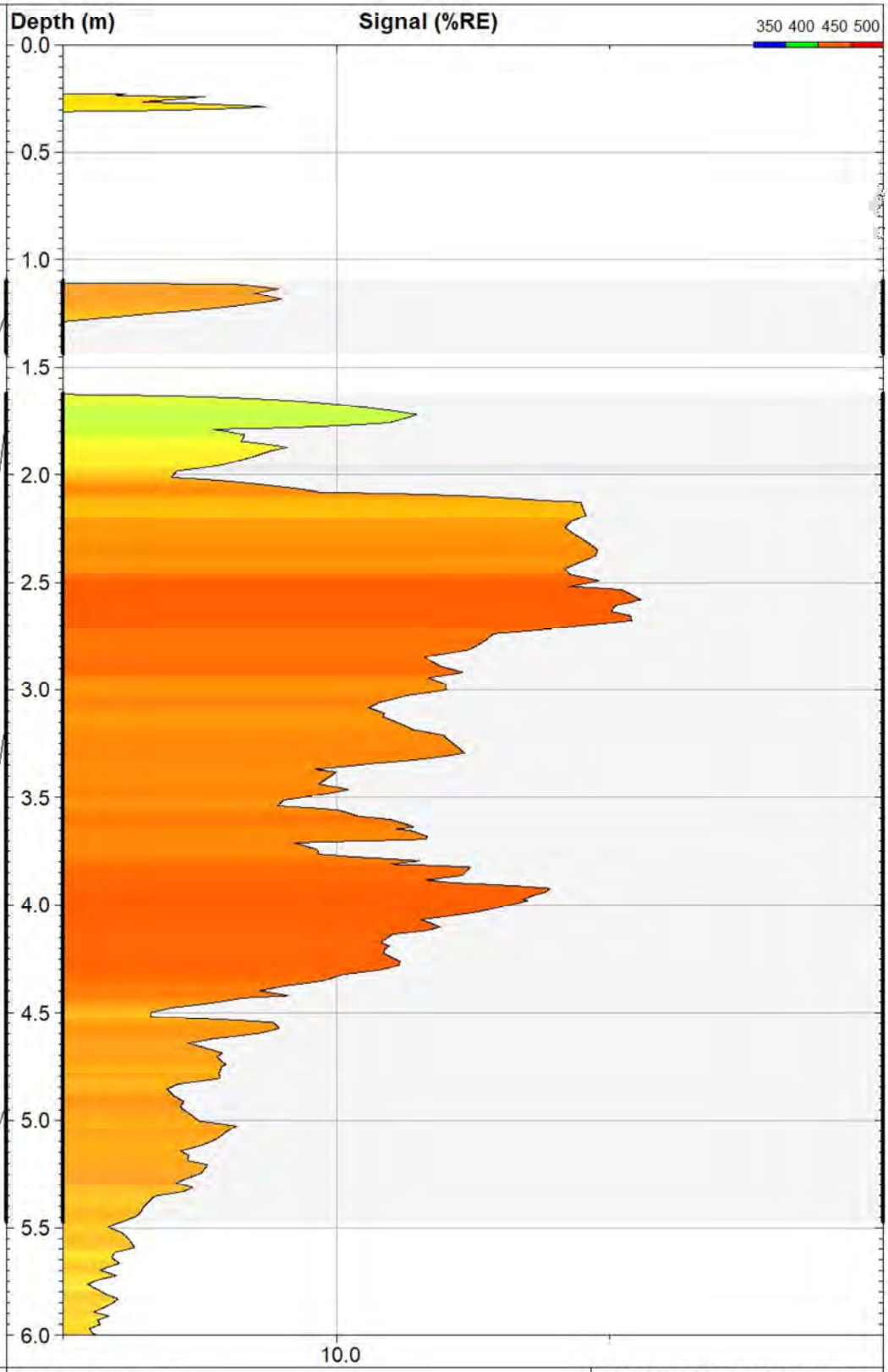
1.62 - 1.98 m
8.2 %RE (s 6.1)



1.95 - 4.43 m
33.7 %RE (s 31.0)



4.43 - 5.47 m
4.2 %RE (s 1.0)



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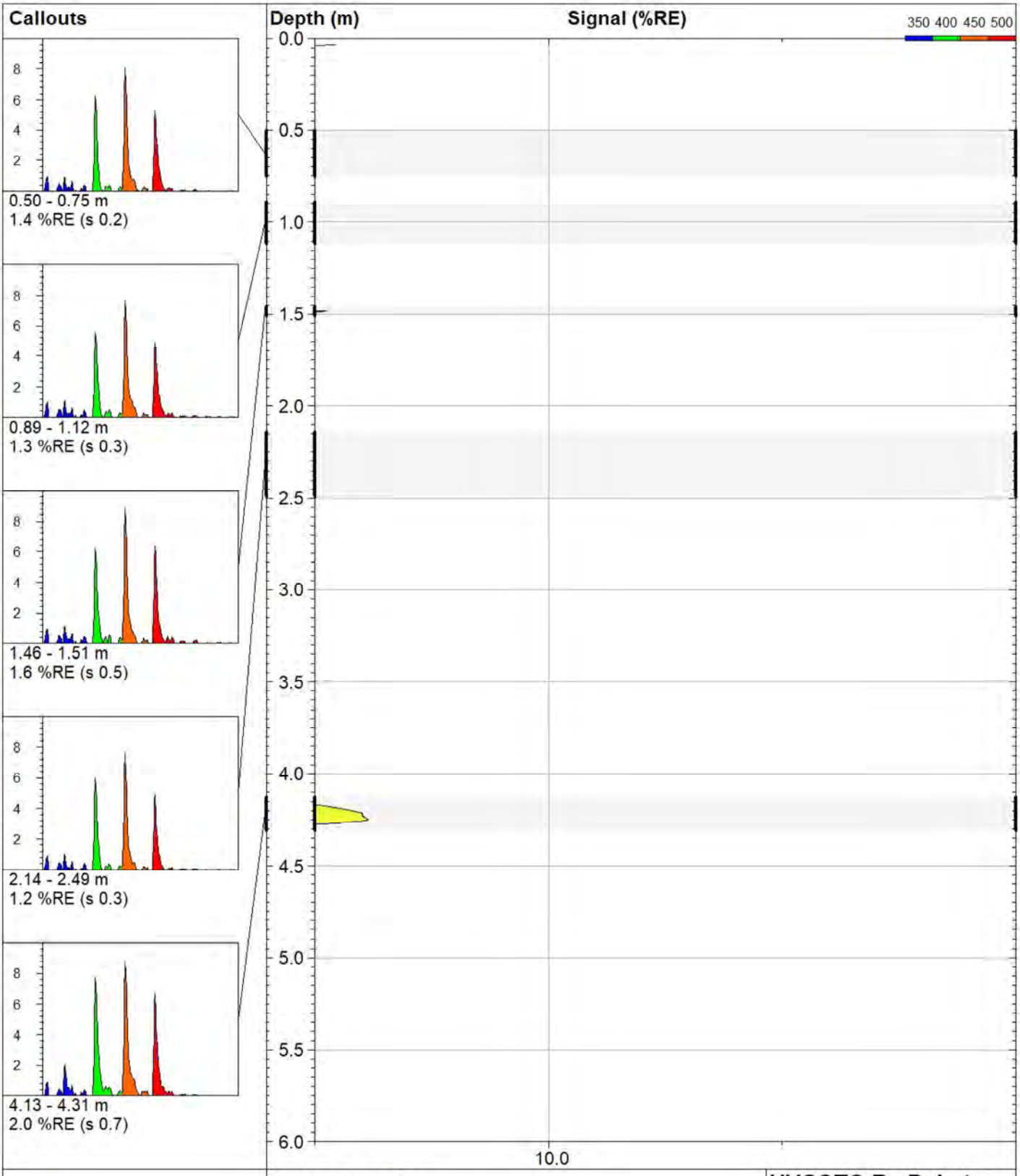
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761915.151 / UTM**	*Final depth:* **6.01 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385740.7969 /**	*Max signal:* **130.5 %RE @ 2.58 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.8 m**	*Date & Time:* **2020-05-12 16:39 ADT**



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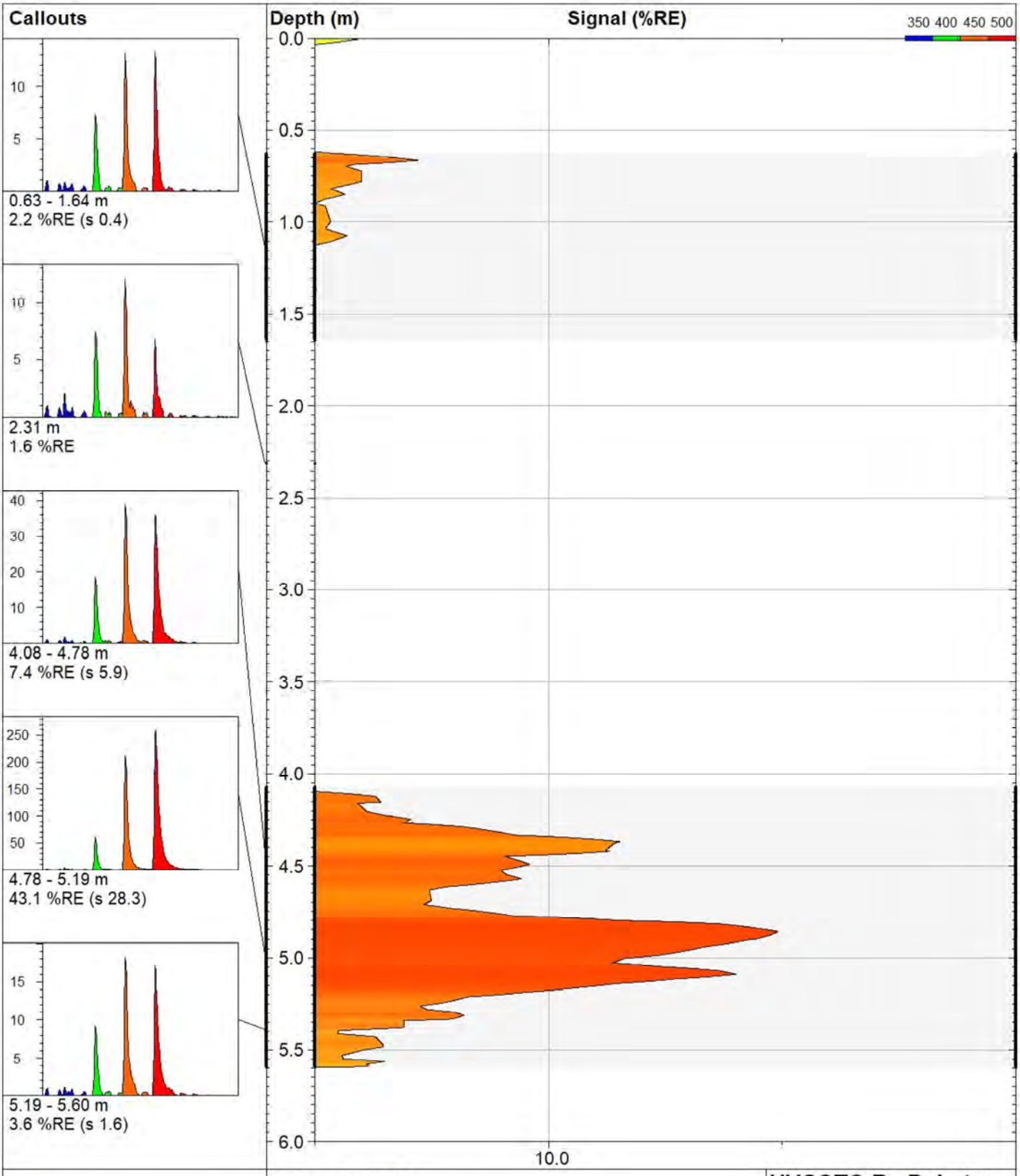
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761882.644 / UTM**	*Final depth:* **5.50 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385734.0653 /**	*Max signal:* **2.7 %RE @ 4.25 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **181.7 m**	*Date & Time:* **2020-05-12 17:09 ADT**



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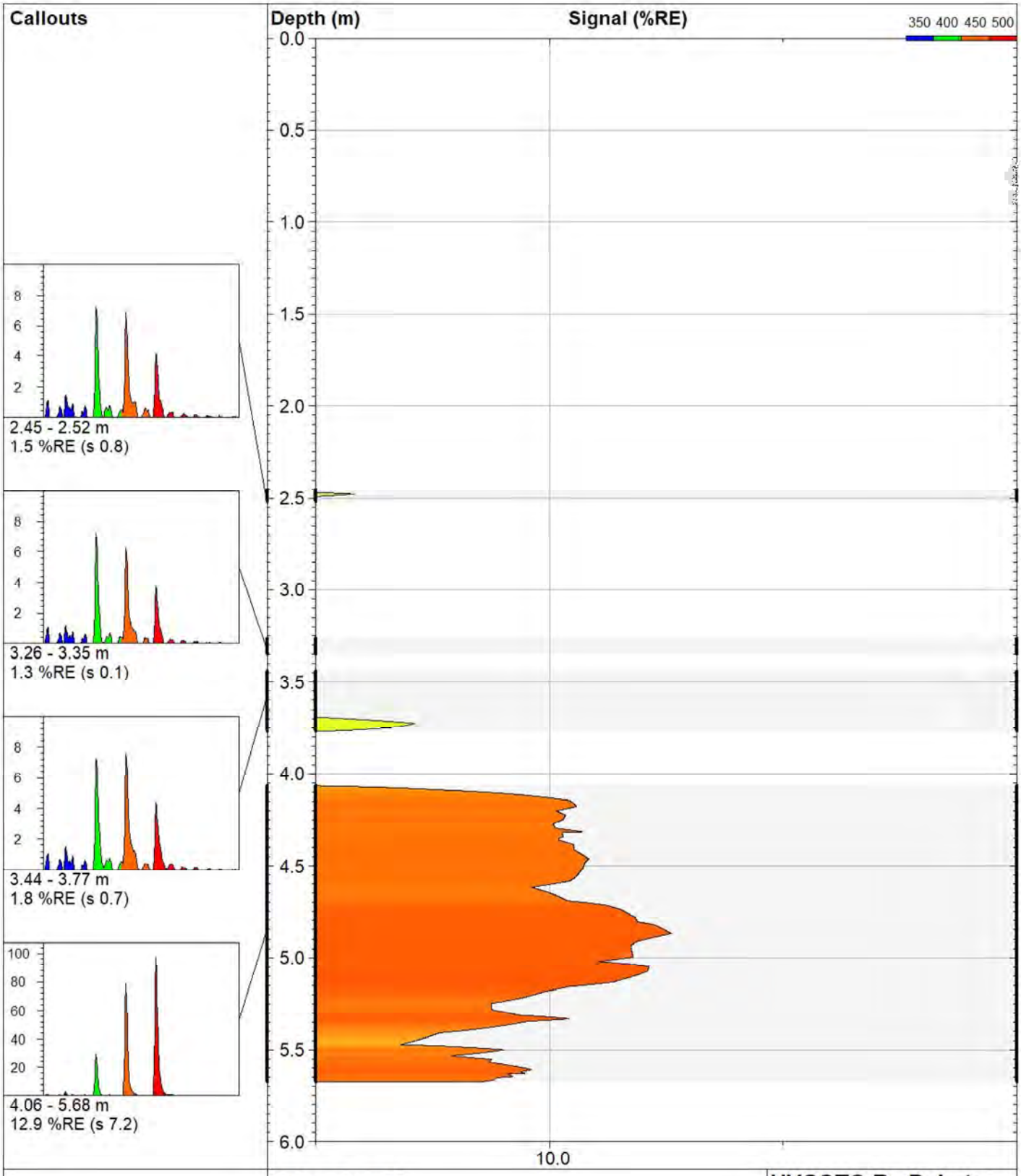
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761883.298 / UTM**	*Final depth:* **5.60 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385745.6121 /**	*Max signal:* **97.3 %RE @ 4.86 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **181.8 m**	*Date & Time:* **2020-05-12 18:18 ADT**



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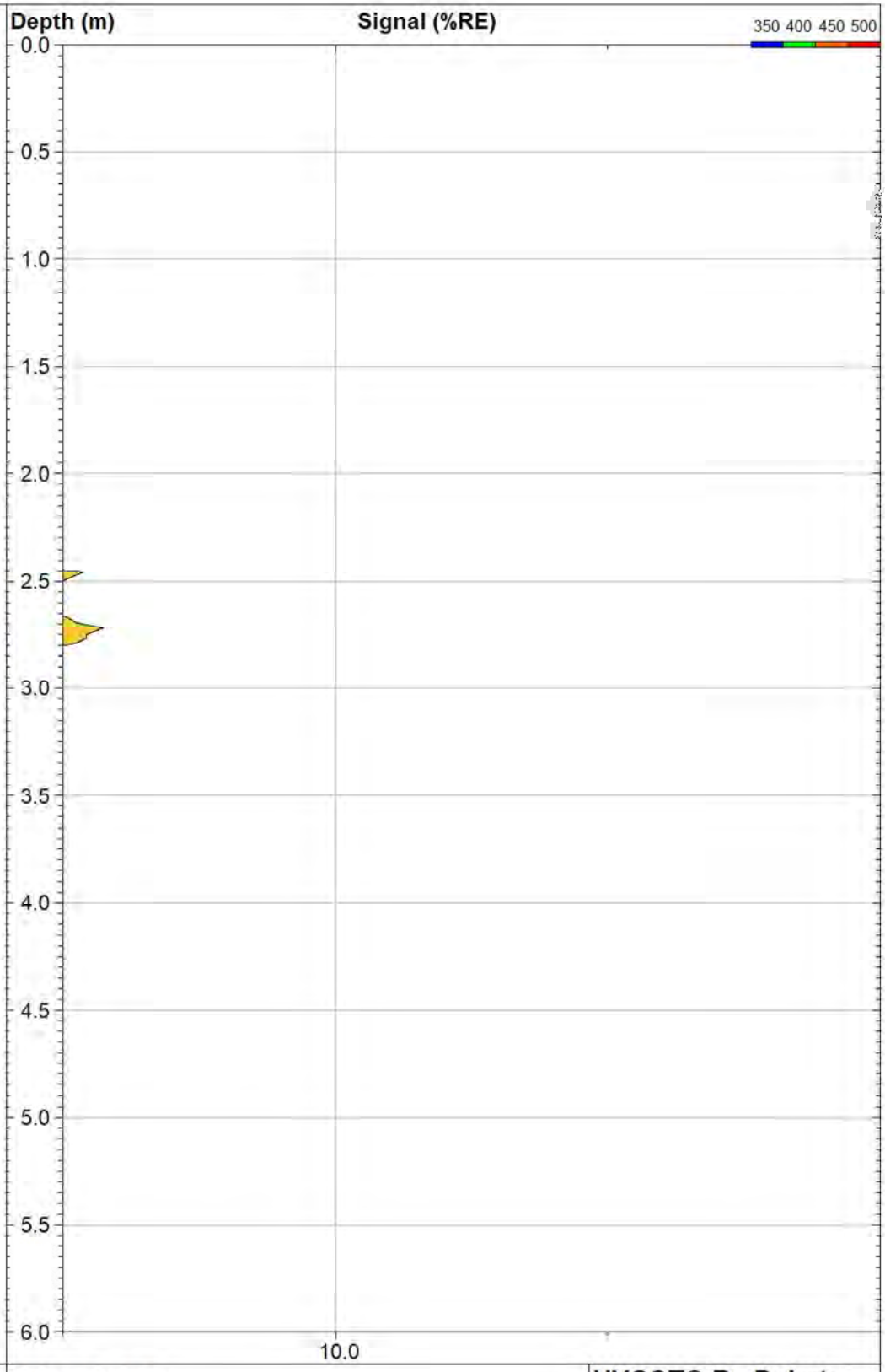
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761885.437 / UTM**	*Final depth:* **5.68 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385762.6479 /**	*Max signal:* **34.1 %RE @ 4.87 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **181.6 m**	*Date & Time:* **2020-05-12 17:57 ADT**

Callouts



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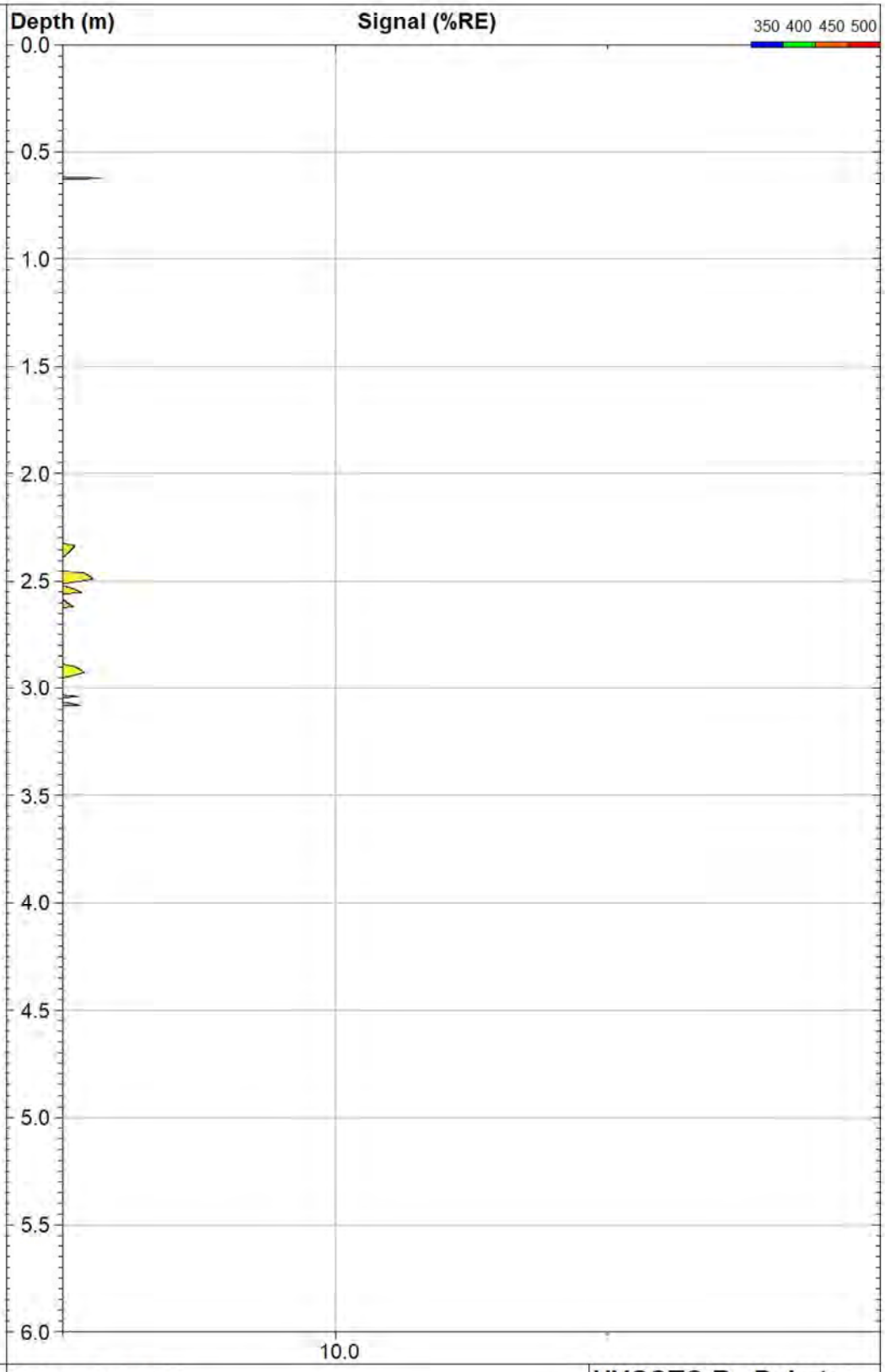
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761679.354 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385618.1025 /**	*Max signal:* **2.4 %RE @ 2.72 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-13 08:05 ADT**

Callouts



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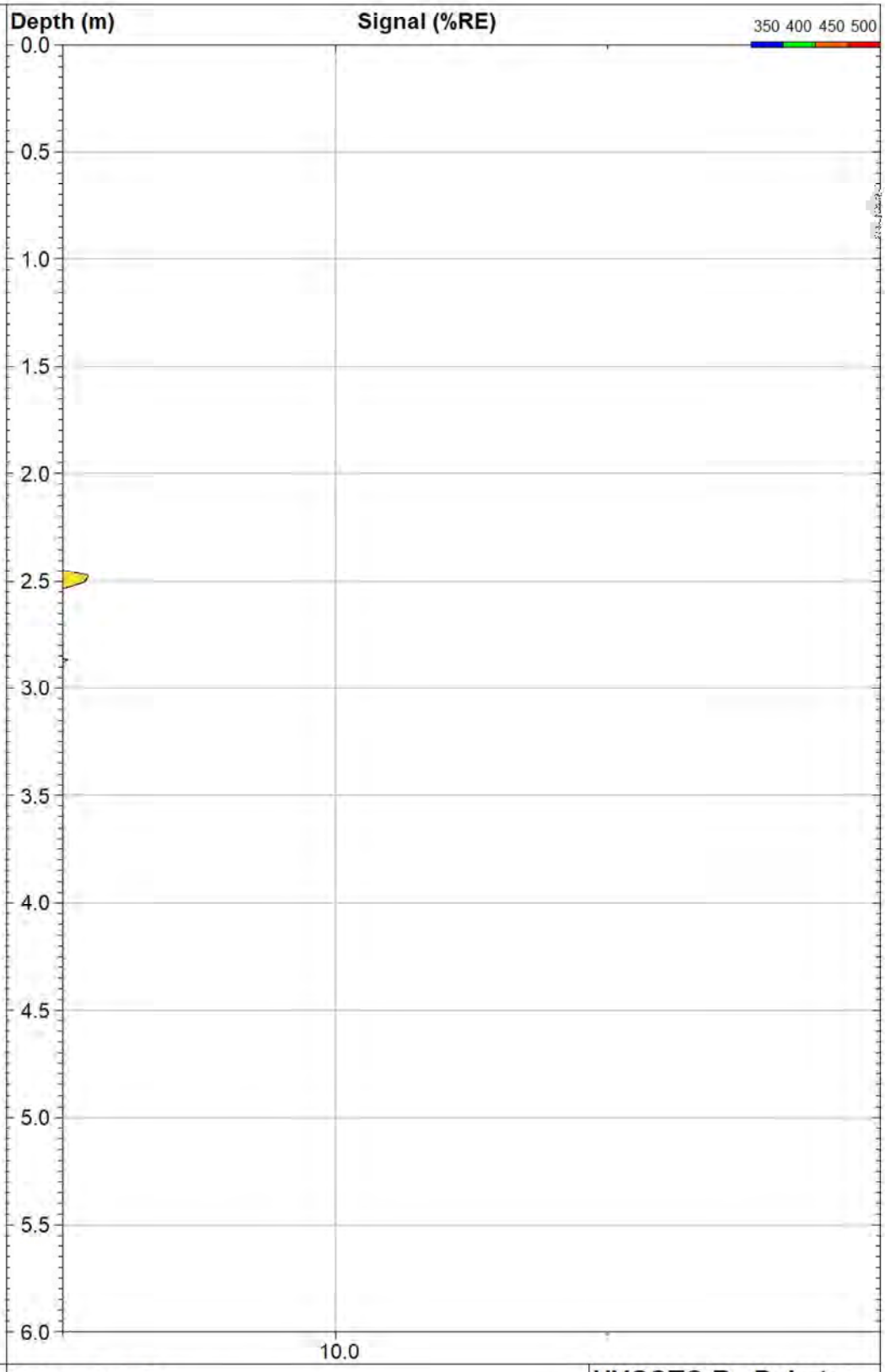
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761686.496 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385616.4517 /**	*Max signal:* **2.4 %RE @ 0.62 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-13 08:22 ADT**

Callouts



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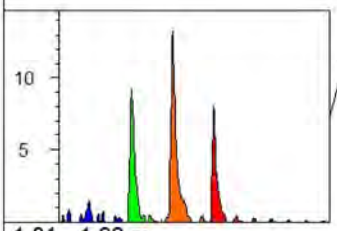
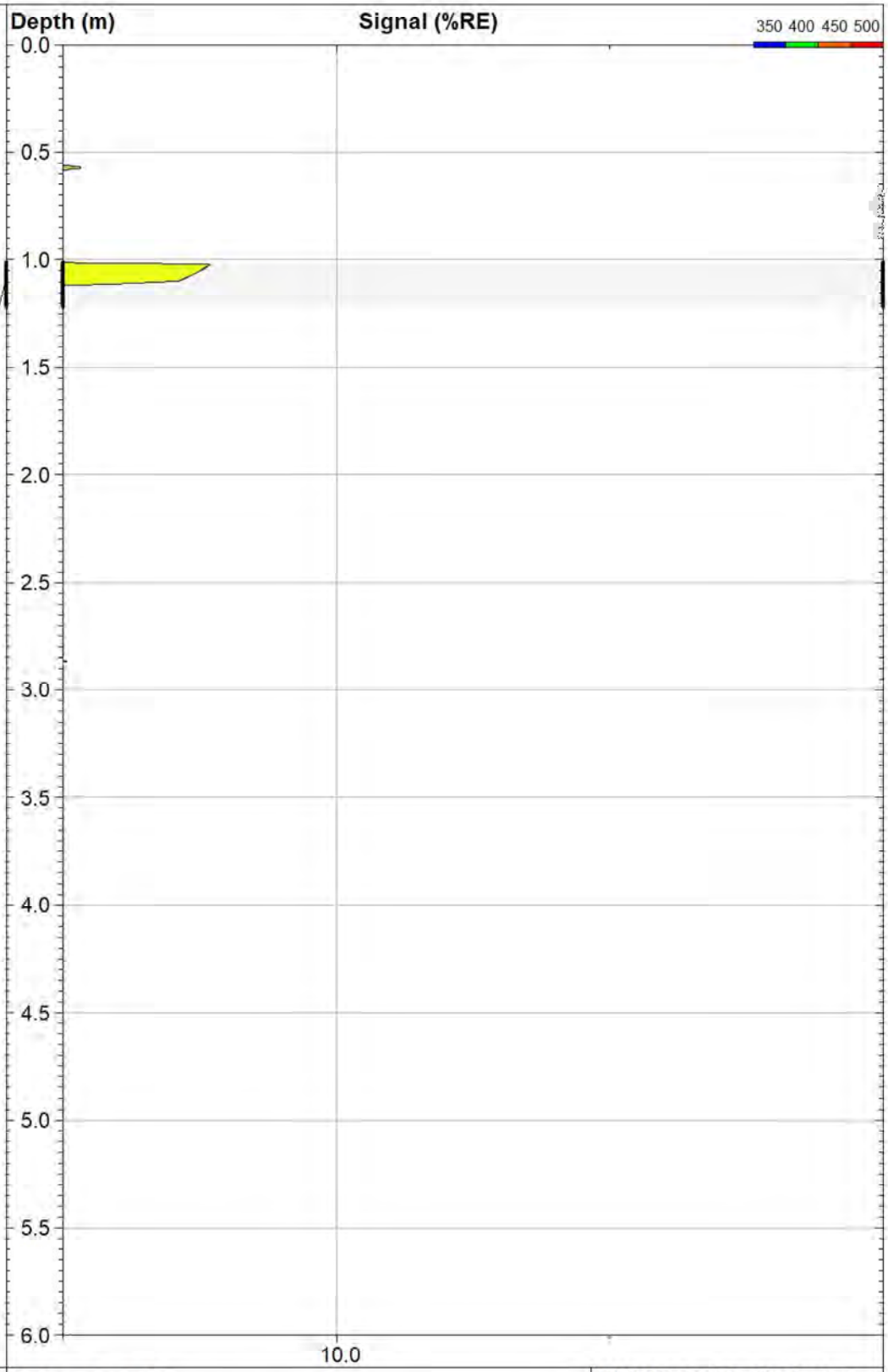
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761703.073 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385612.7213 /**	*Max signal:* **2.2 %RE @ 2.47 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.1 m**	*Date & Time:* **2020-05-13 08:34 ADT**

Callouts



1.01 - 1.22 m
2.2 %RE (s 1.5)



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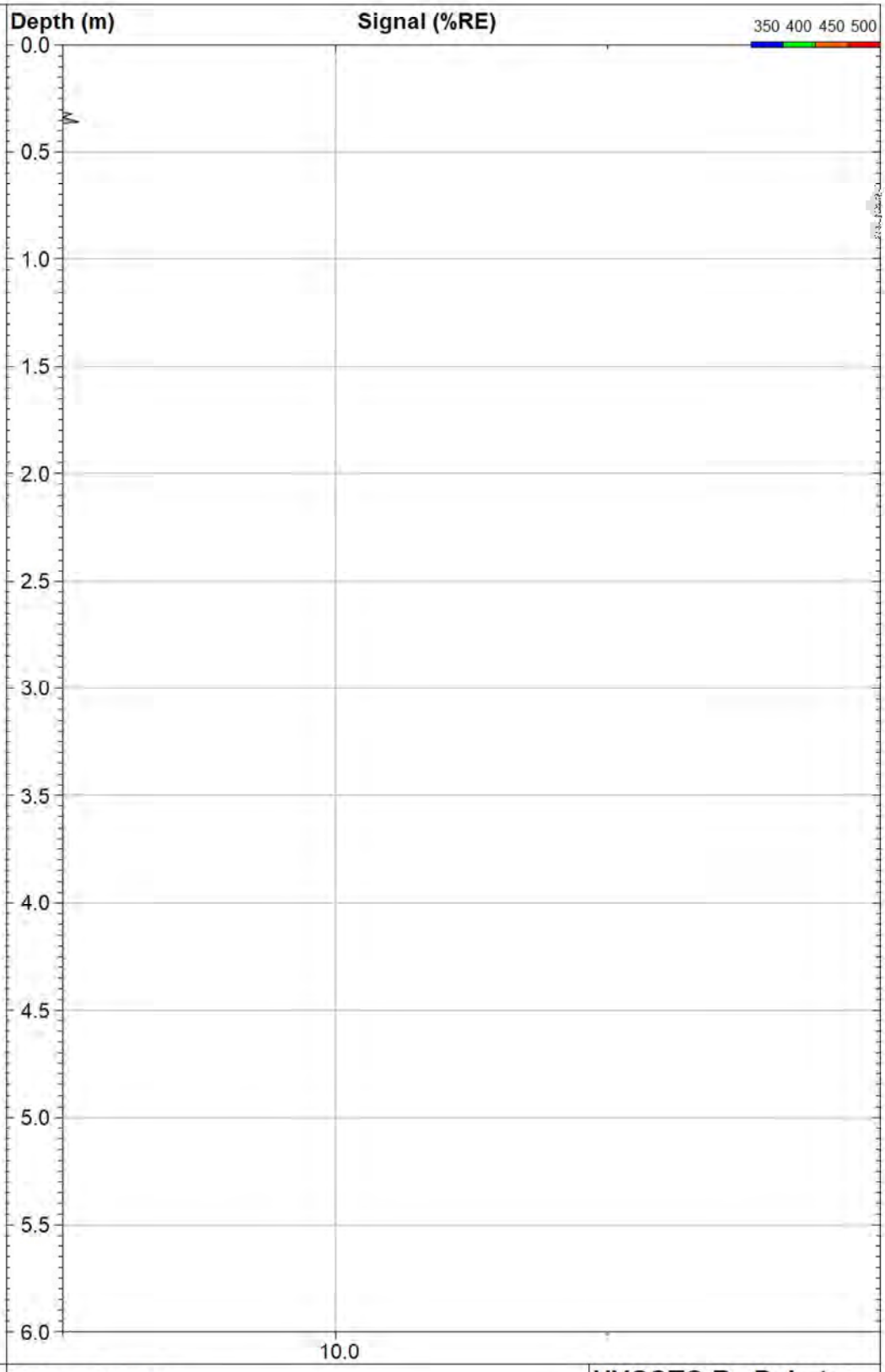
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761730.745 / UTM**	*Final depth:* **3.15 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385600.1766 /**	*Max signal:* **4.5 %RE @ 1.02 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.0 m**	*Date & Time:* **2020-05-13 08:49 ADT**

Callouts



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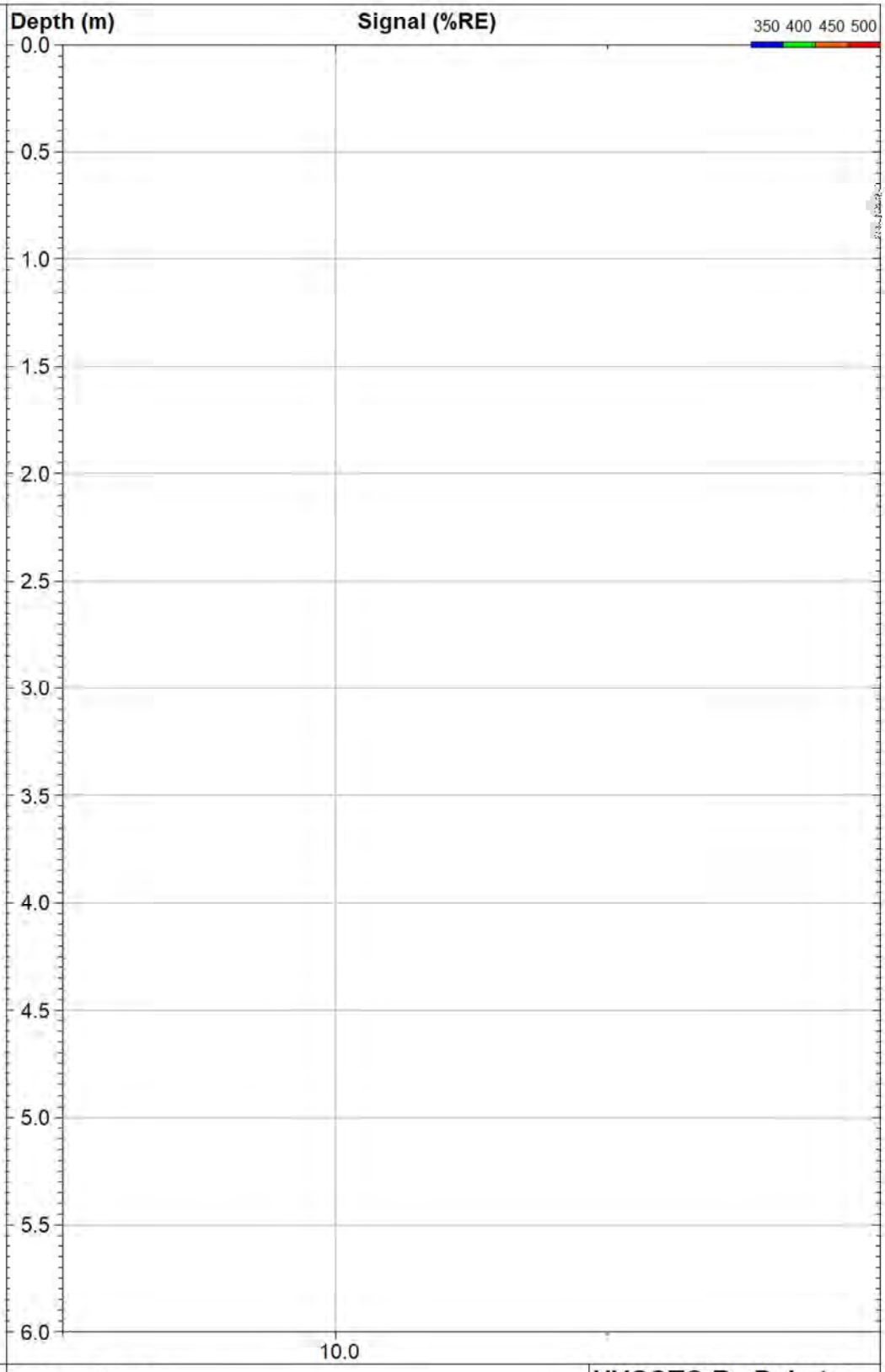
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761726.436 / UTM**	*Final depth:* **3.15 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385595.5053 /**	*Max signal:* **2.1 %RE @ 0.36 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-13 09:09 ADT**

Callouts



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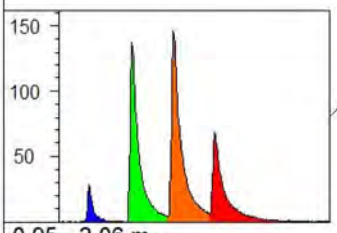
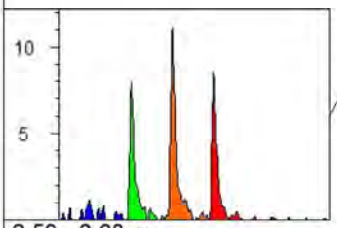
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761744.234 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385595.2149 /**	*Max signal:* **1.7 %RE @ 2.37 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-13 09:24 ADT**

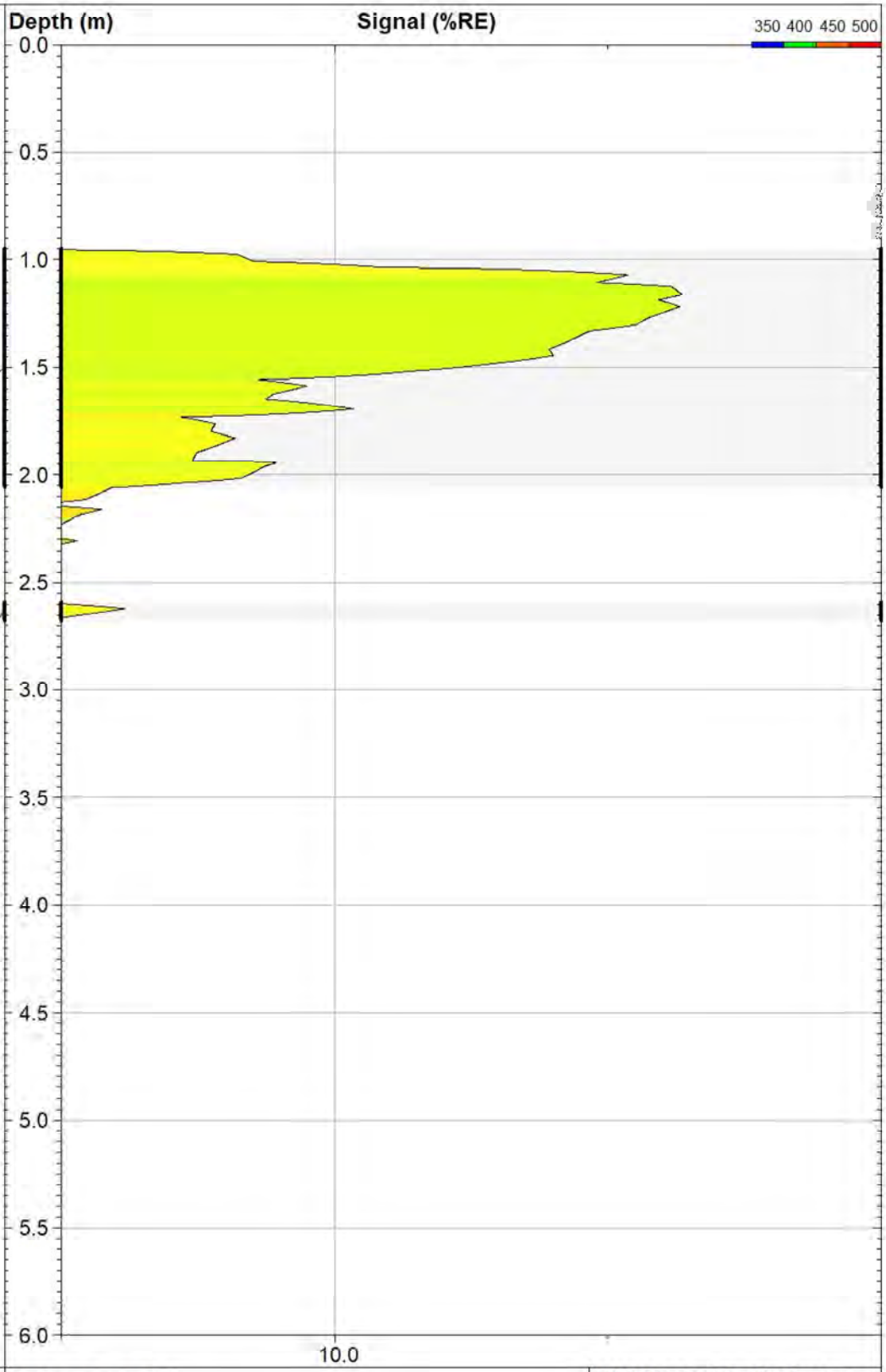
Callouts



0.95 - 2.06 m
48.3 %RE (s 62.6)



2.59 - 2.68 m
2.1 %RE (s 0.4)



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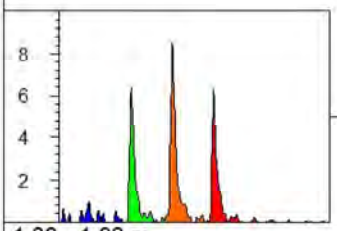
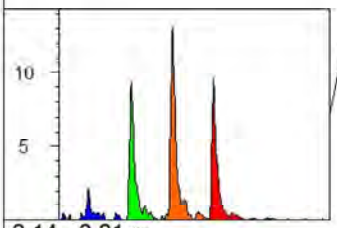
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761774.907 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385578.9879 /**	*Max signal:* **187.8 %RE @ 1.16 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-13 09:40 ADT**

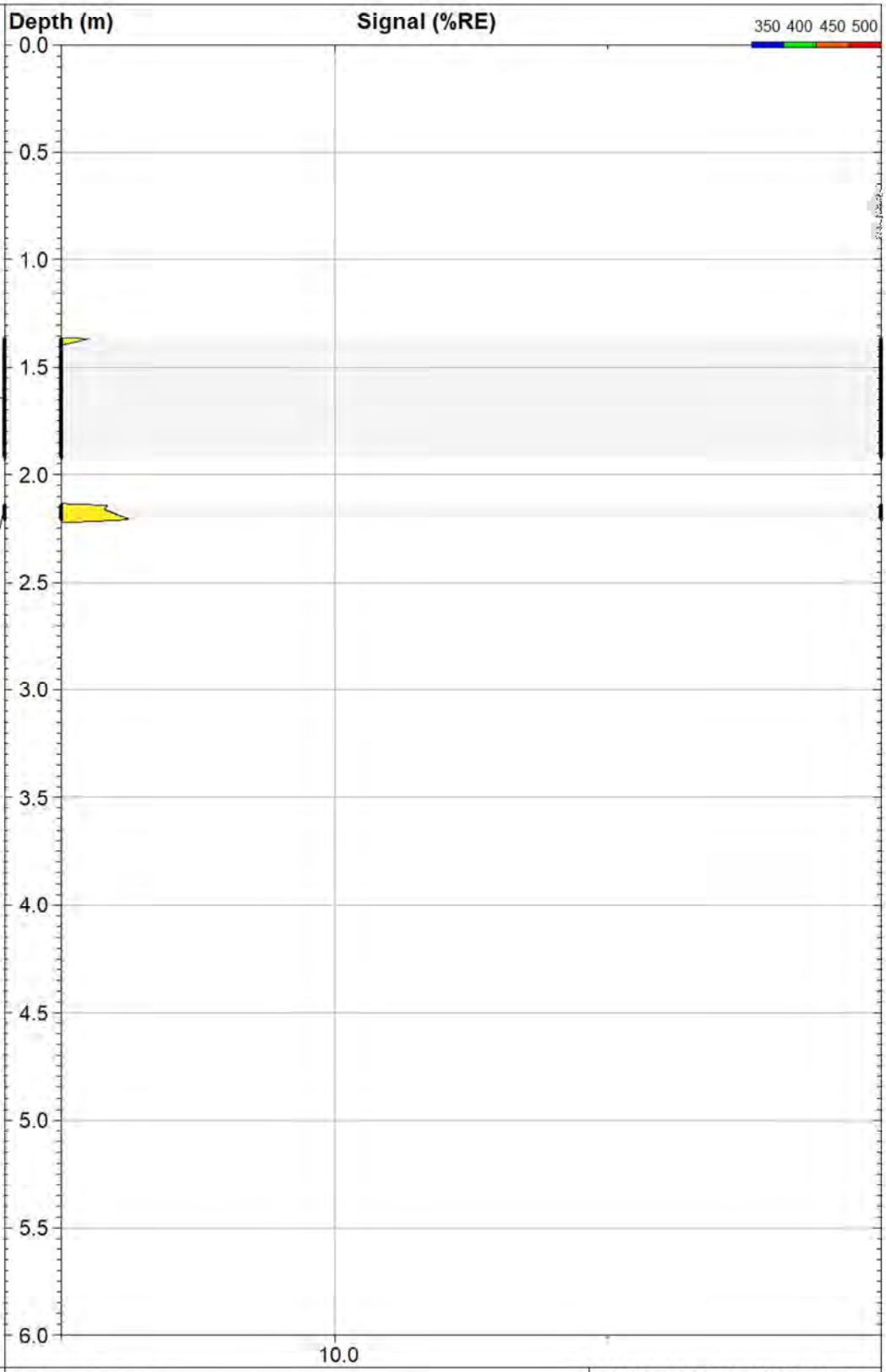
Callouts



1.36 - 1.92 m
1.6 %RE (s 0.3)



2.14 - 2.21 m
2.6 %RE (s 0.2)



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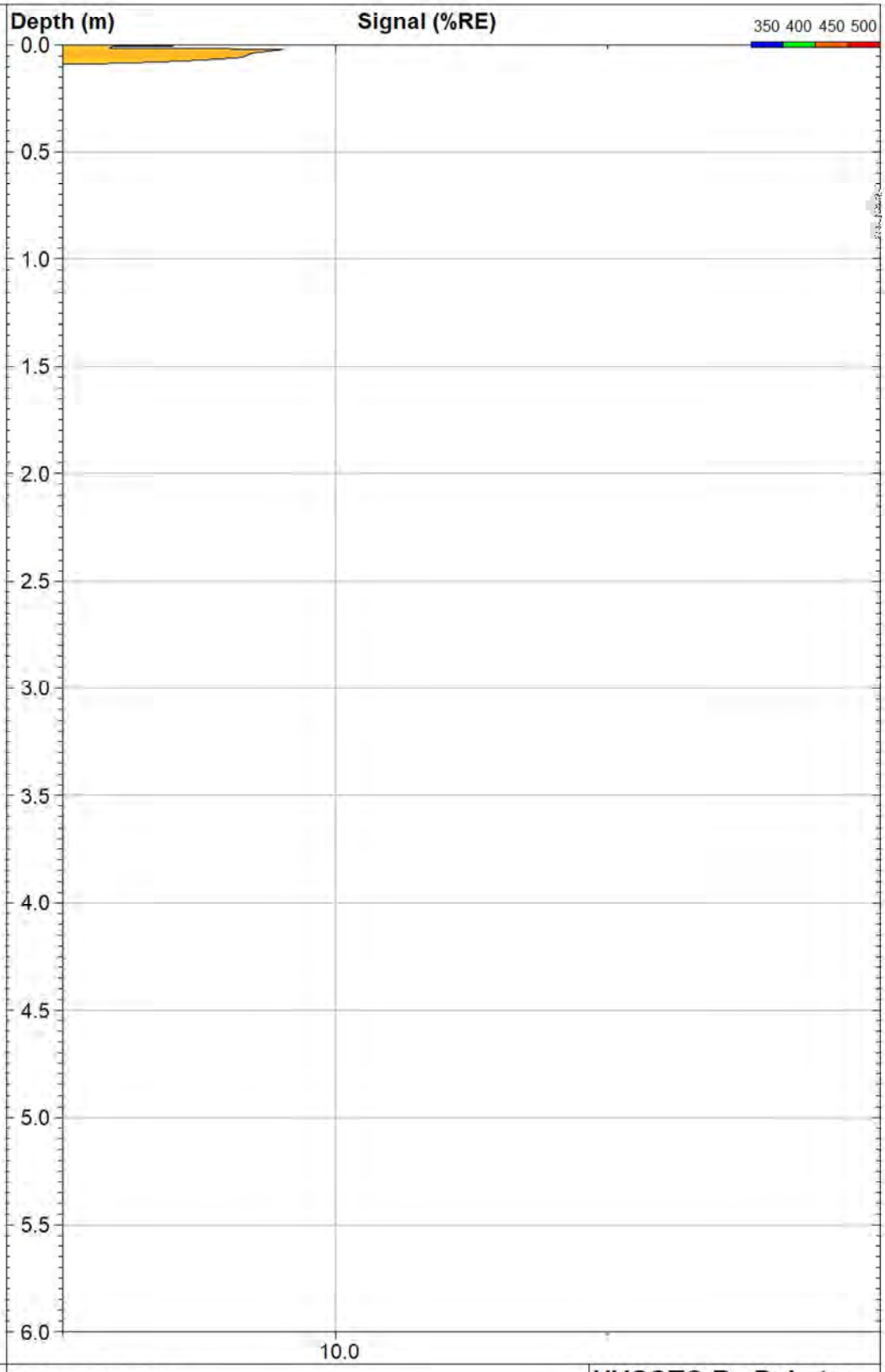
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761775.404 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385576.1475 /**	*Max signal:* **2.8 %RE @ 2.21 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.4 m**	*Date & Time:* **2020-05-13 09:56 ADT**

Callouts



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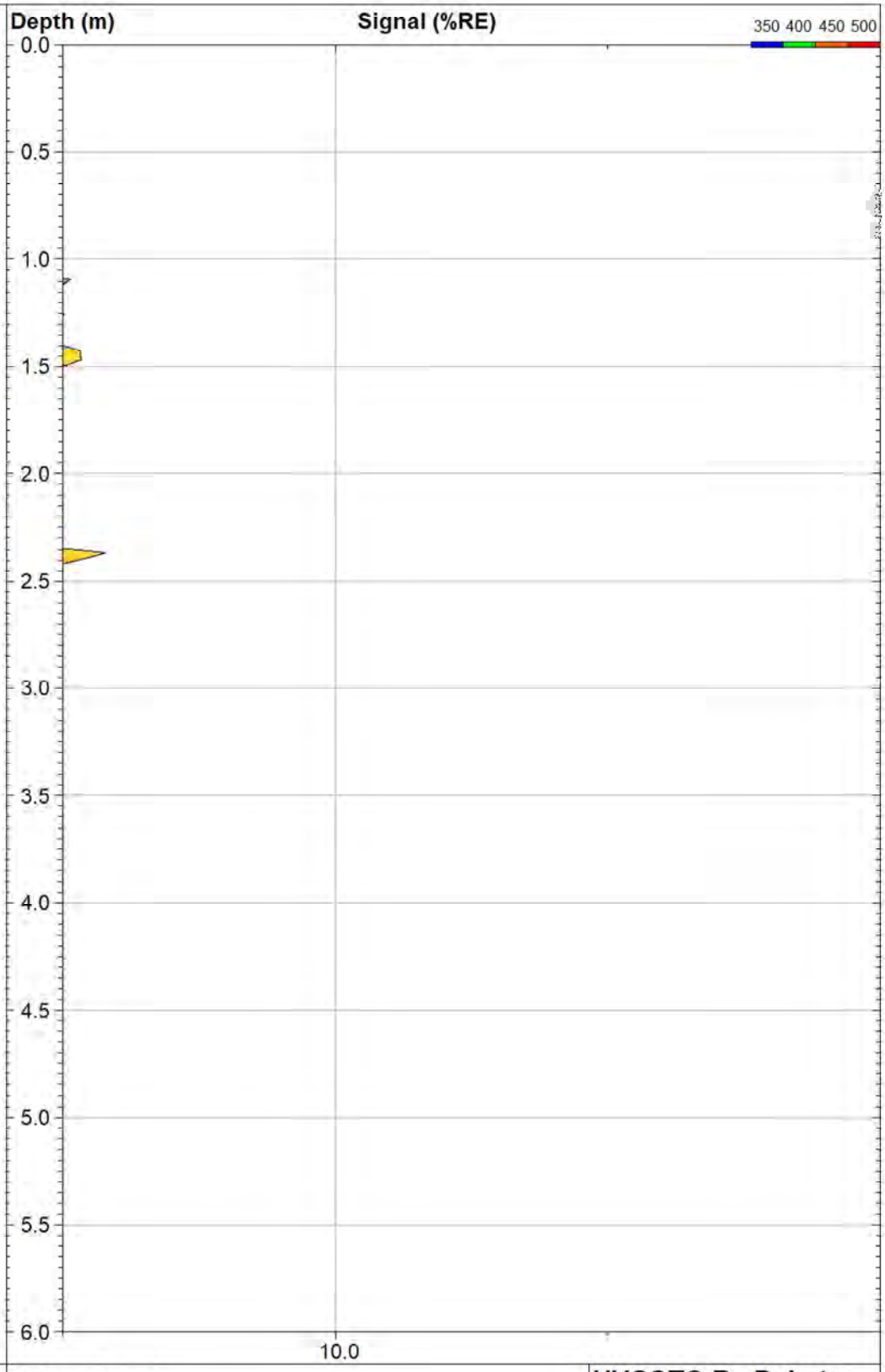
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761768.797 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385578.81 /**	*Max signal:* **7.5 %RE @ 0.02 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.3 m**	*Date & Time:* **2020-05-13 10:14 ADT**

Callouts



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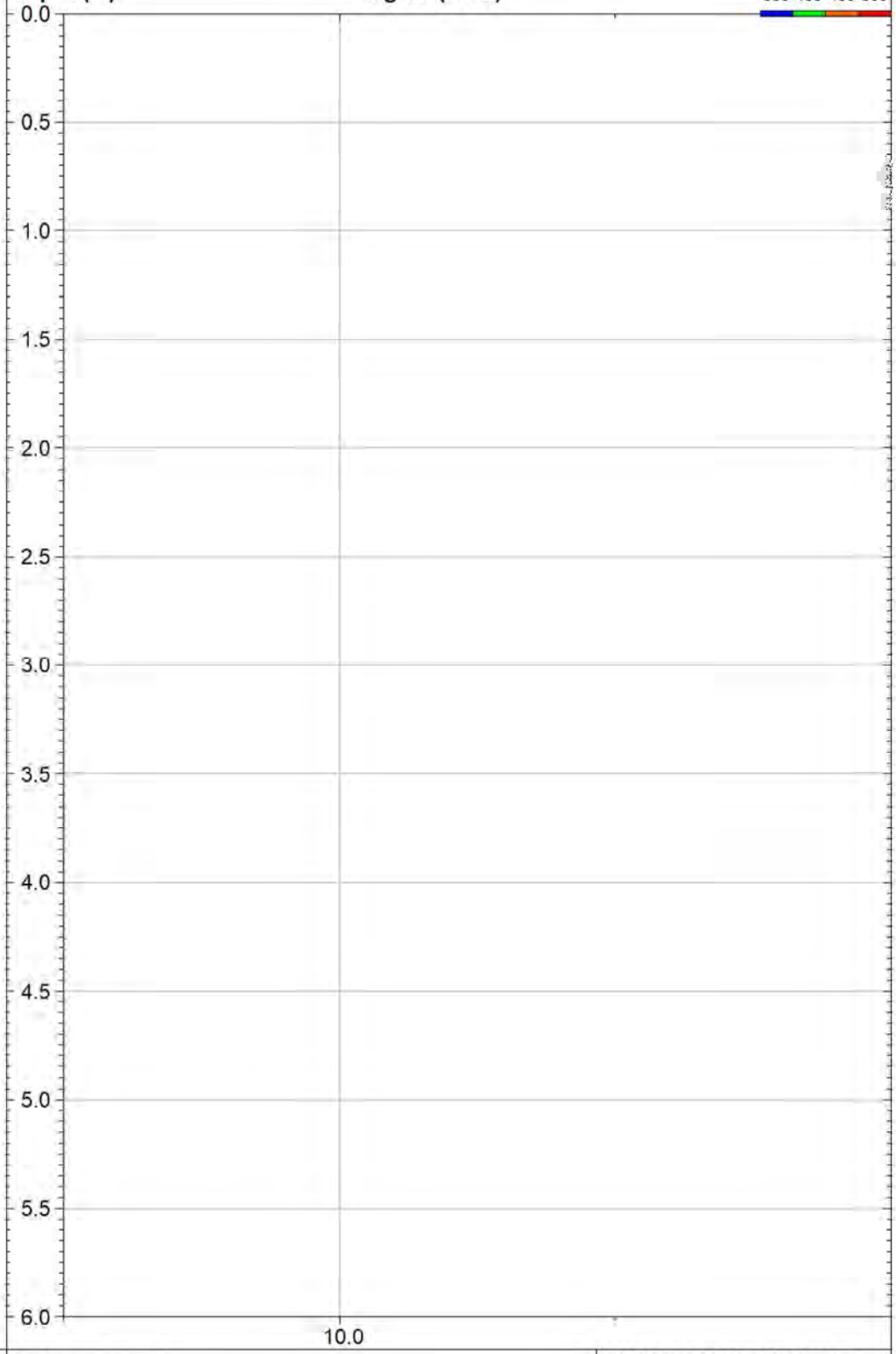
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761786.285 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385572.1345 /**	*Max signal:* **2.4 %RE @ 2.37 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.5 m**	*Date & Time:* **2020-05-13 10:31 ADT**

Callouts	Depth (m)	Signal (%RE)	350 400 450 500



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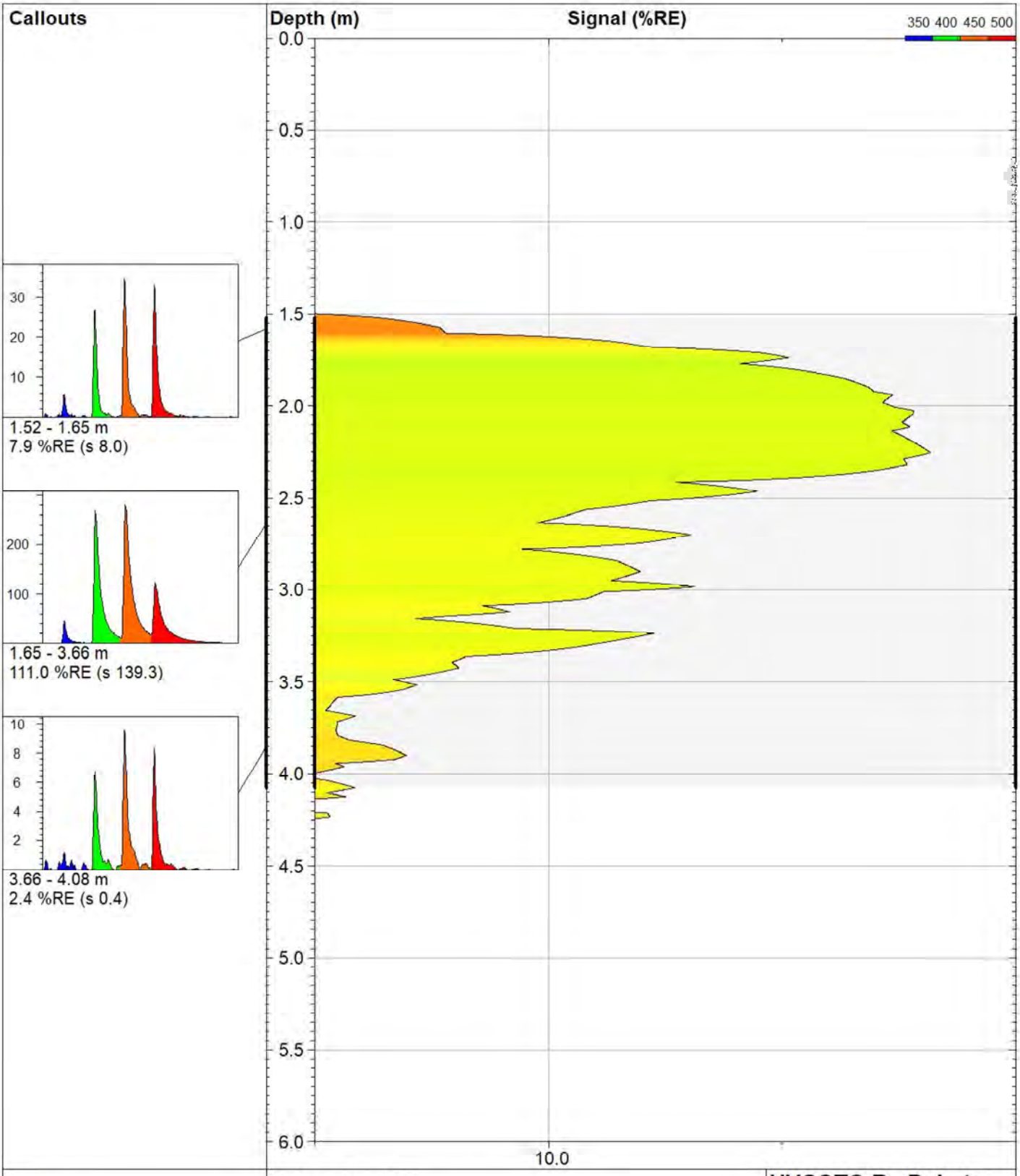
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761792.552 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385570.39 /**	*Max signal:* **1.5 %RE @ 1.44 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-13 10:45 ADT**



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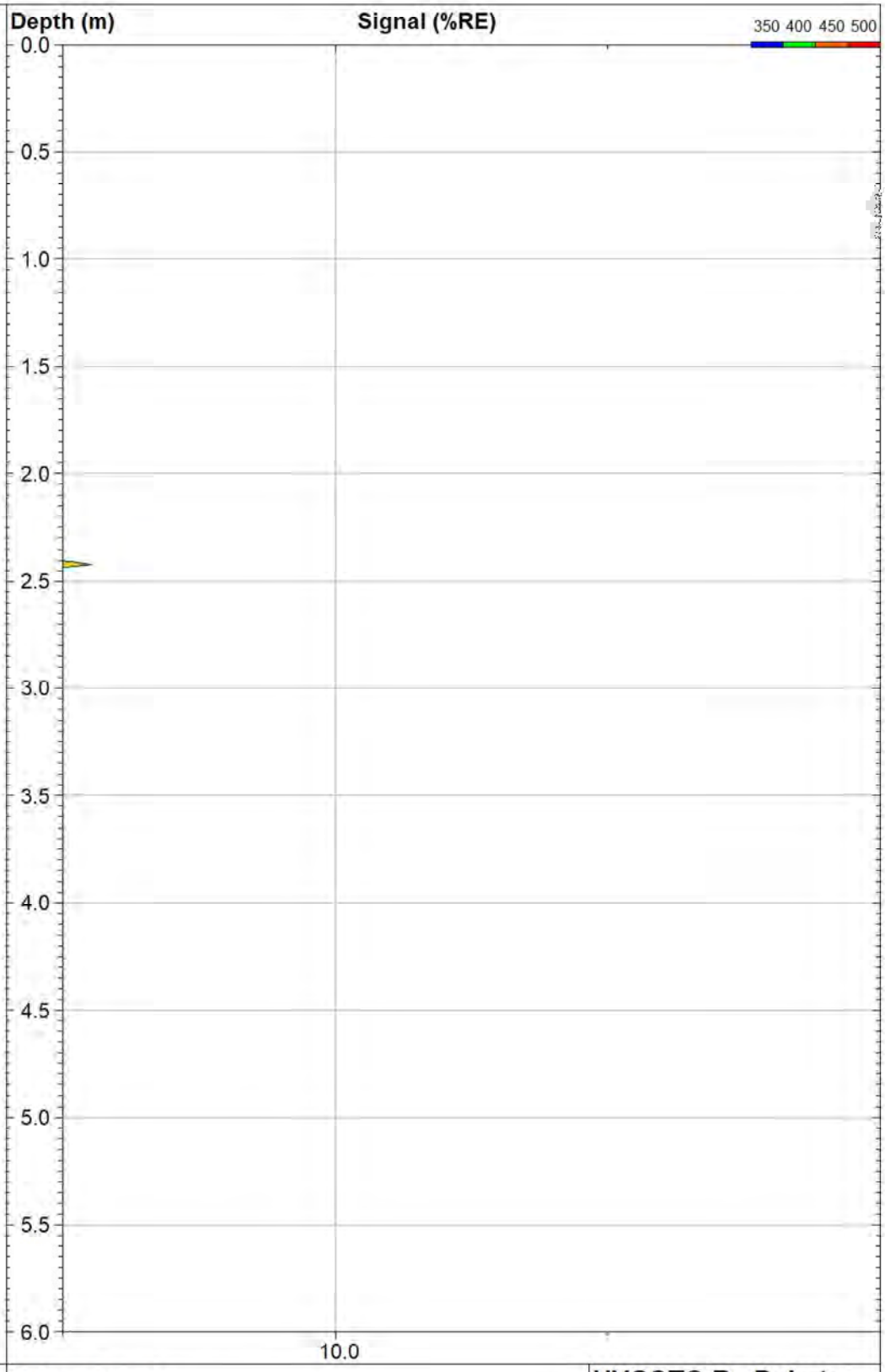
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761805.068 / UTM**	*Final depth:* **4.28 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385613.1665 /**	*Max signal:* **432.9 %RE @ 2.25 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.0 m**	*Date & Time:* **2020-05-13 11:03 ADT**

Callouts



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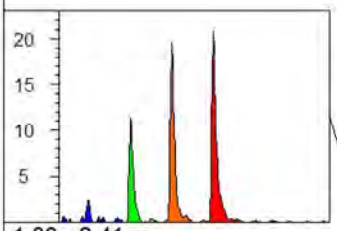
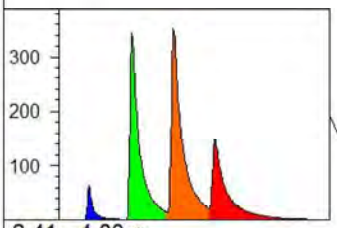
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761821.426 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385613.1944 /**	*Max signal:* **2.3 %RE @ 2.42 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-13 11:22 ADT**

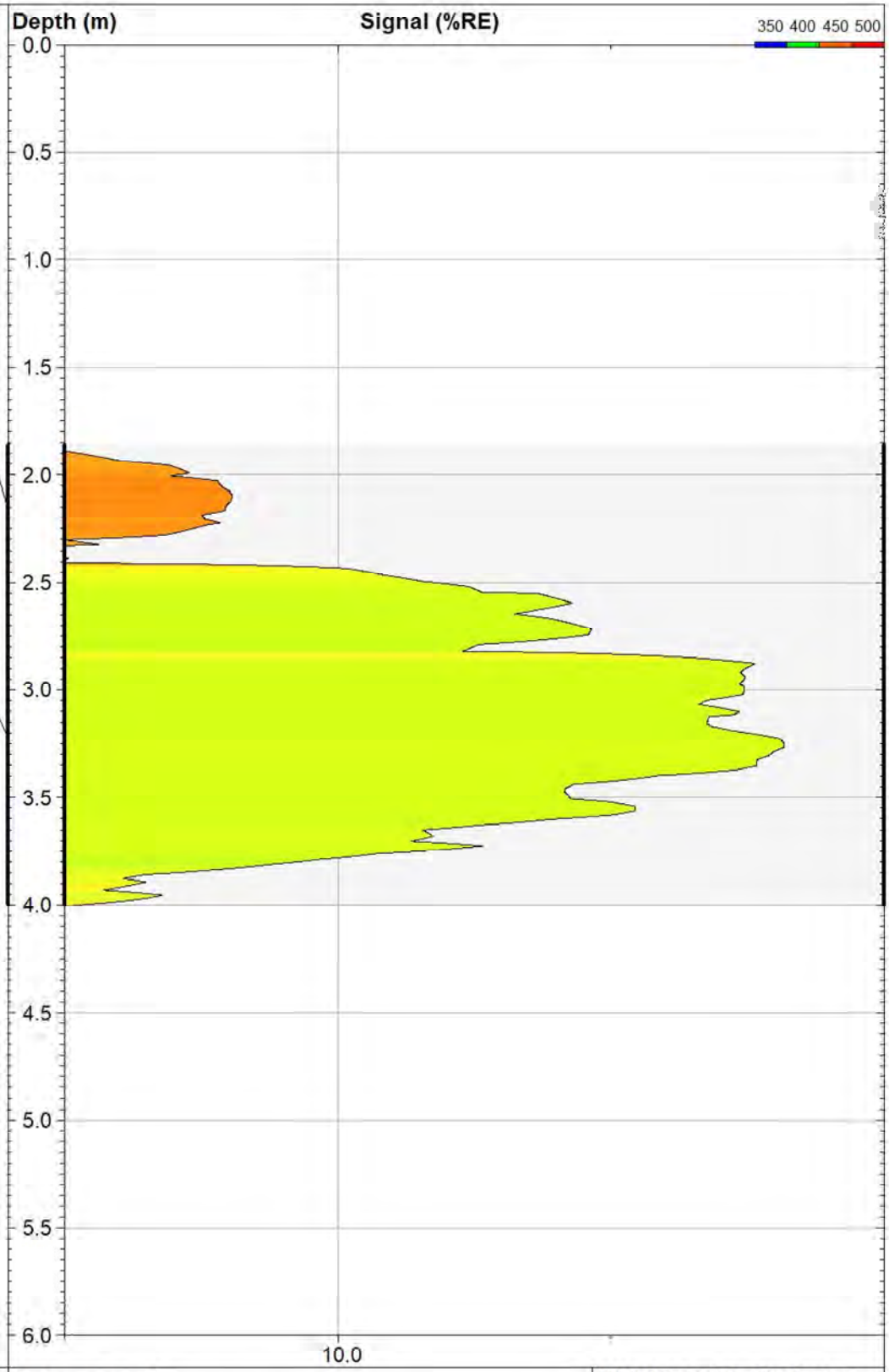
Callouts



1.86 - 2.41 m
3.5 %RE (s 1.3)



2.41 - 4.00 m
142.3 %RE (s 136.9)



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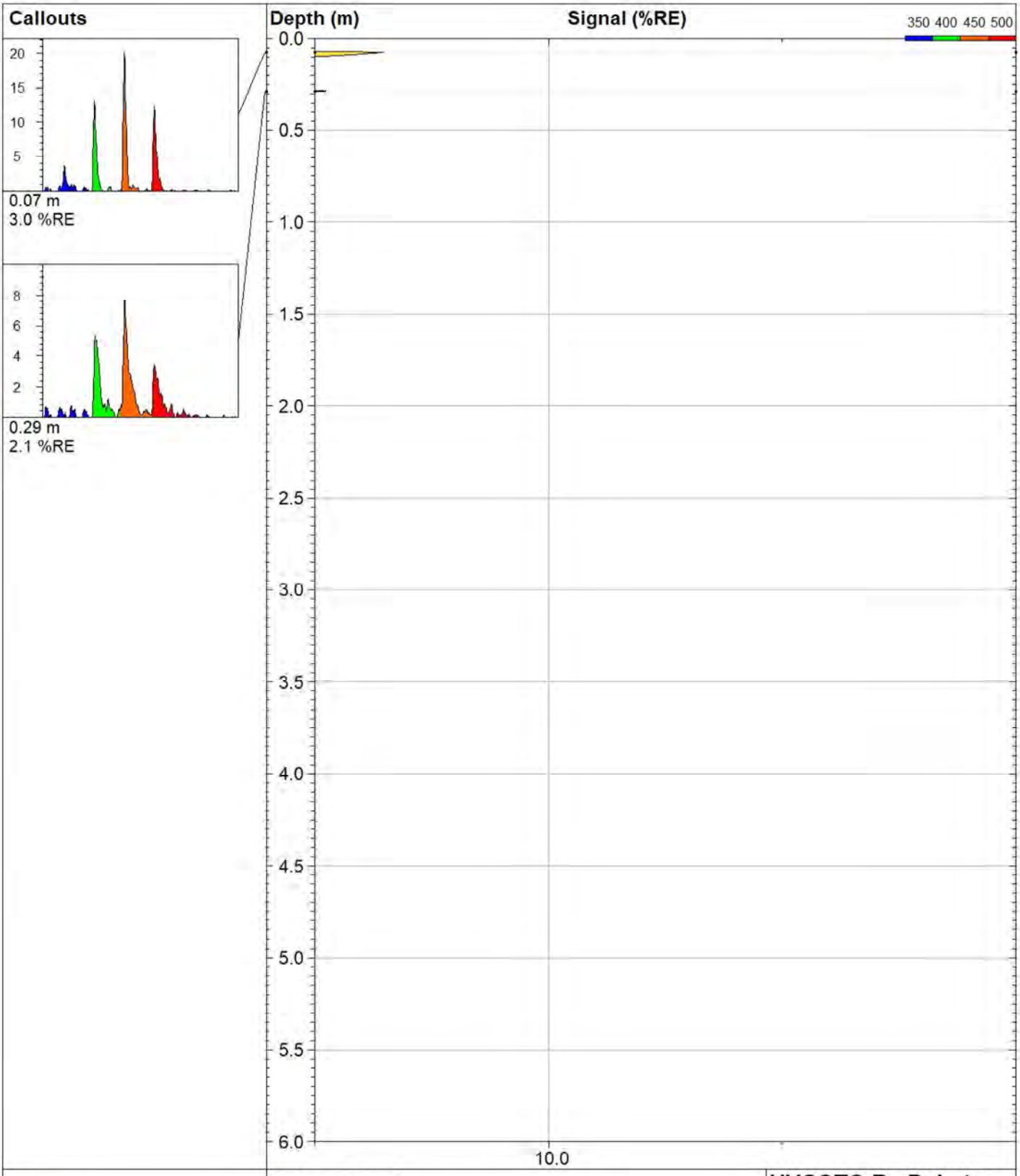
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761818.366 / UTM**	*Final depth:* **4.27 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385636.5822 /**	*Max signal:* **431.4 %RE @ 3.27 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.1 m**	*Date & Time:* **2020-05-13 11:34 ADT**



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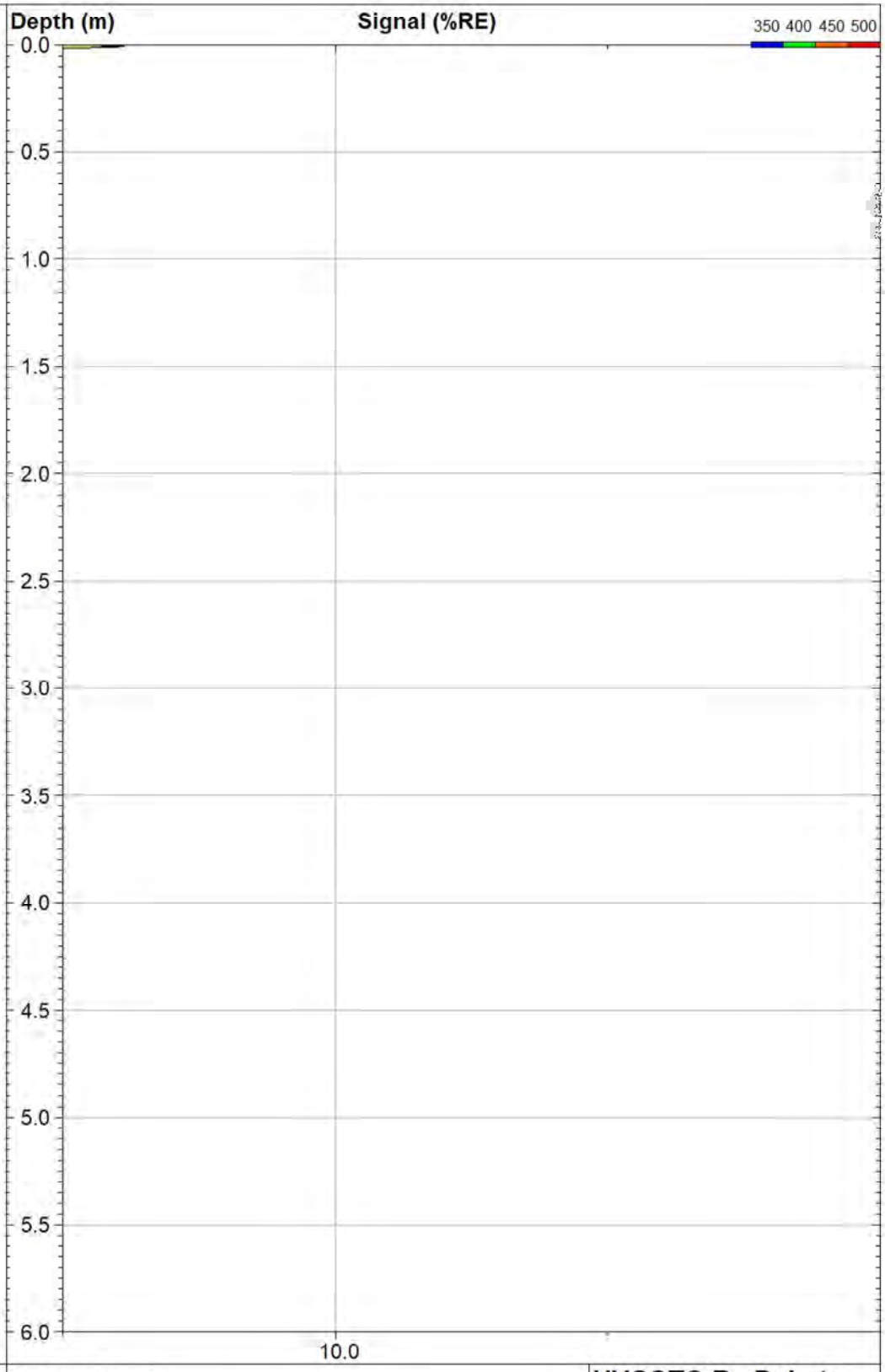
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761840.411 / UTM**	*Final depth:* **3.69 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385633.4307 /**	*Max signal:* **3.0 %RE @ 0.07 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.2 m**	*Date & Time:* **2020-05-13 11:47 ADT**

Callouts



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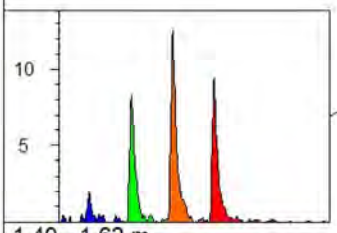
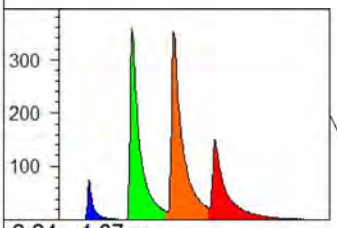
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761842.162 / UTM**	*Final depth:* **3.71 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385647.618 /**	*Max signal:* **2.7 %RE @ 0.01 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.4 m**	*Date & Time:* **2020-05-13 12:00 ADT**

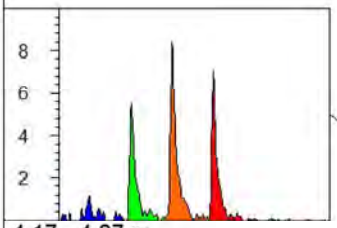
Callouts



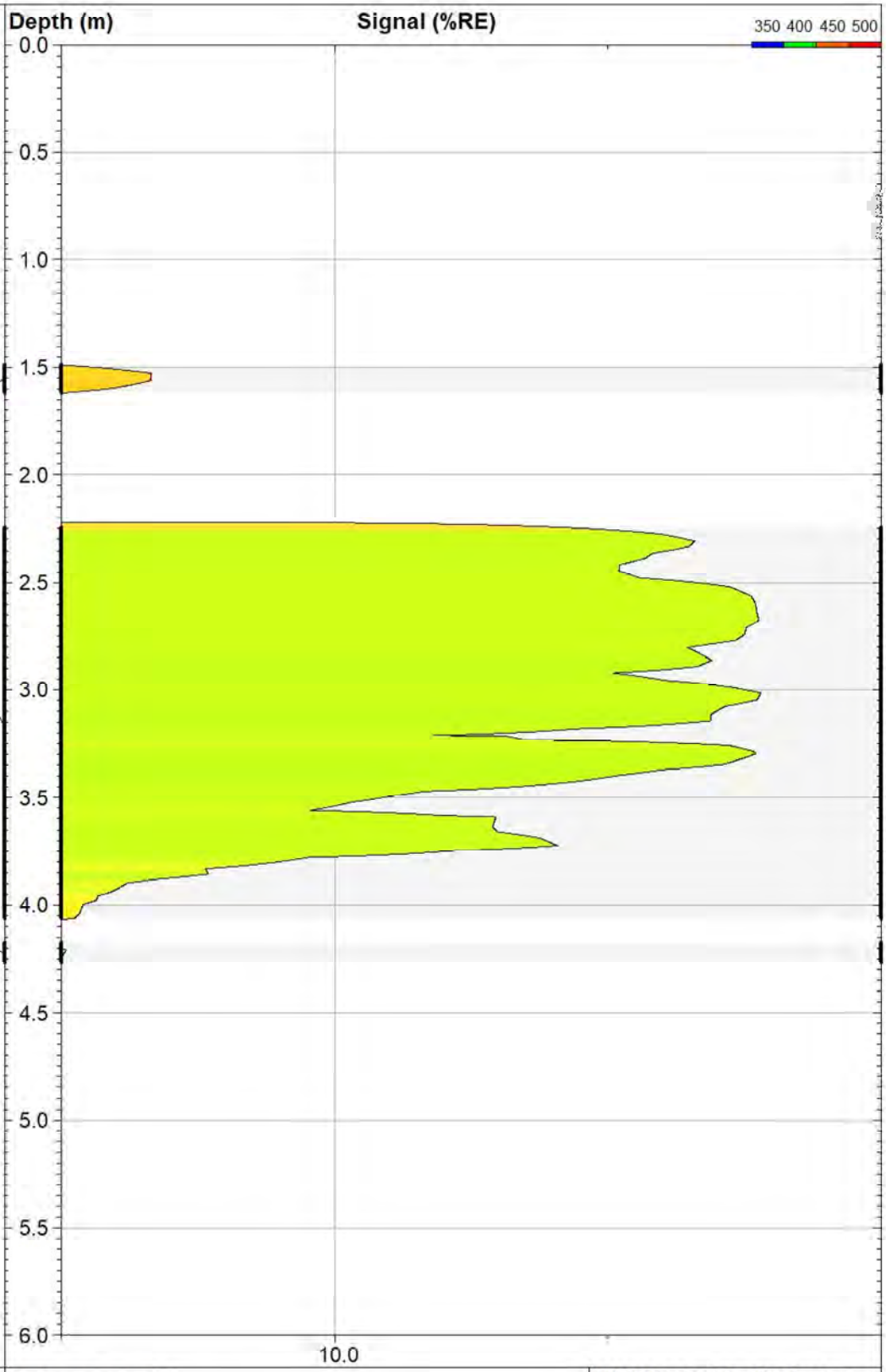
1.49 - 1.62 m
2.6 %RE (s 0.6)



2.24 - 4.07 m
139.5 %RE (s 126.7)



4.17 - 4.27 m
1.9 %RE (s 0.2)



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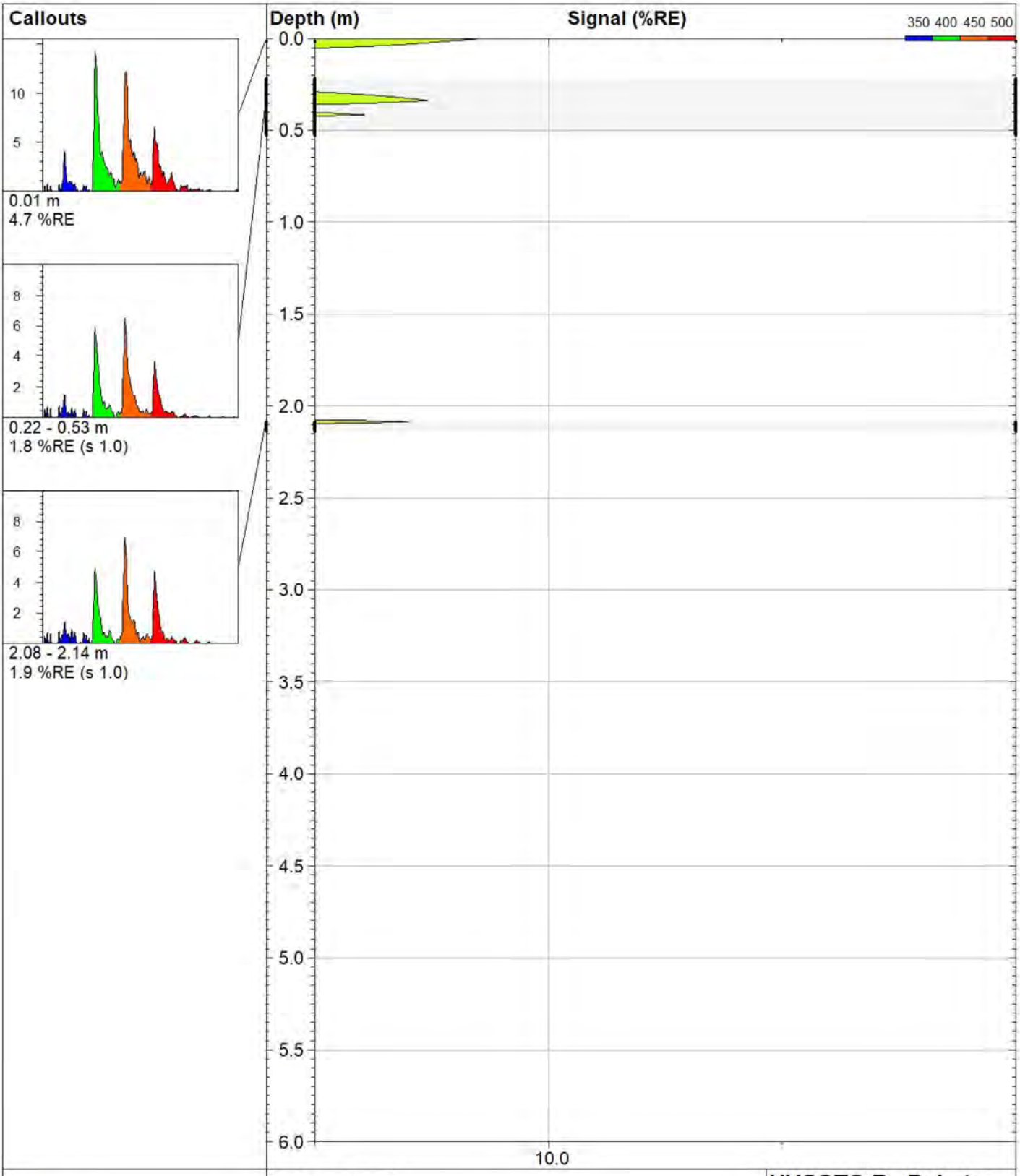
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761820.21 / UTM**	*Final depth:* **4.27 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385648.7352 /**	*Max signal:* **364.0 %RE @ 3.01 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **180.2 m**	*Date & Time:* **2020-05-13 12:35 ADT**



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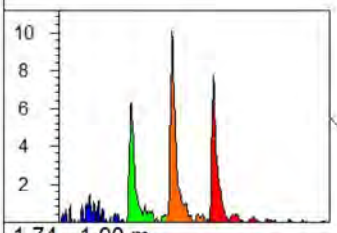
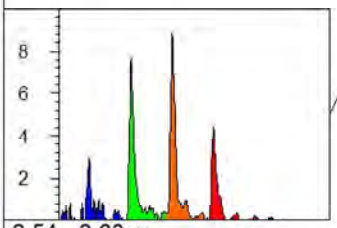
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761849.36 / UTM**	*Final depth:* **5.50 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385714.8243 /**	*Max signal:* **6.3 %RE @ 0.00 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **182.0 m**	*Date & Time:* **2020-05-13 13:08 ADT**

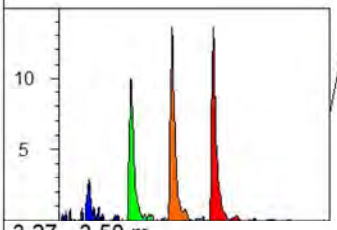
Callouts



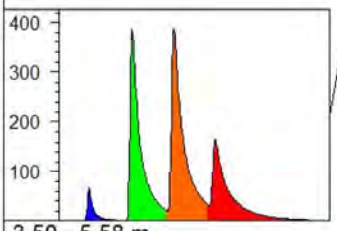
1.74 - 1.90 m
2.0 %RE (s 1.2)



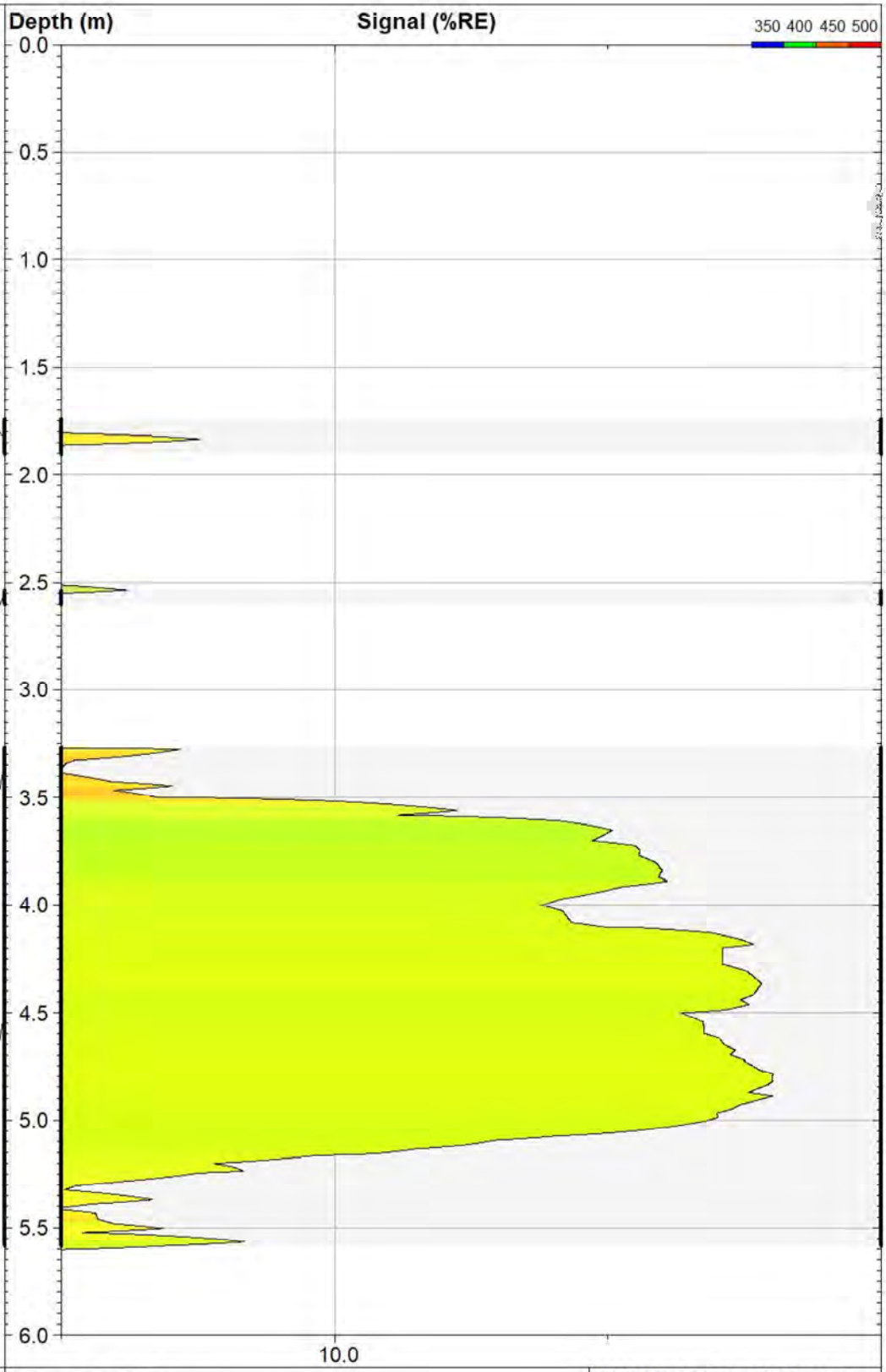
2.54 - 2.60 m
1.7 %RE (s 0.9)



3.27 - 3.50 m
2.5 %RE (s 0.8)



3.50 - 5.58 m
160.8 %RE (s 136.1)



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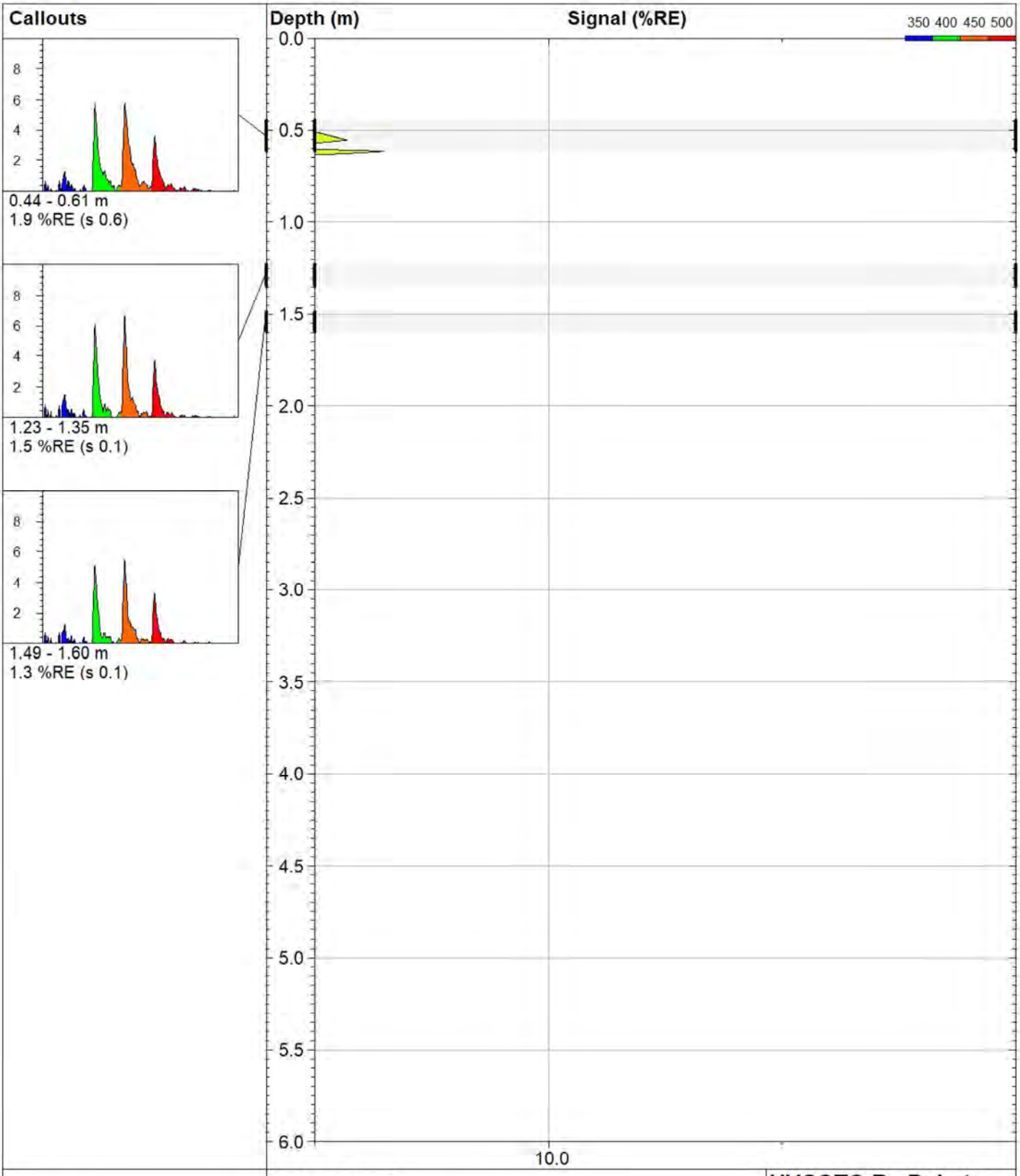
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761841.567 / UTM**	*Final depth:* **5.64 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385726.3997 /**	*Max signal:* **403.2 %RE @ 4.79 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **182.0 m**	*Date & Time:* **2020-05-13 13:27 ADT**



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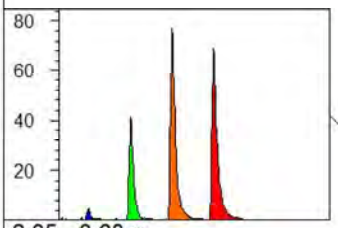
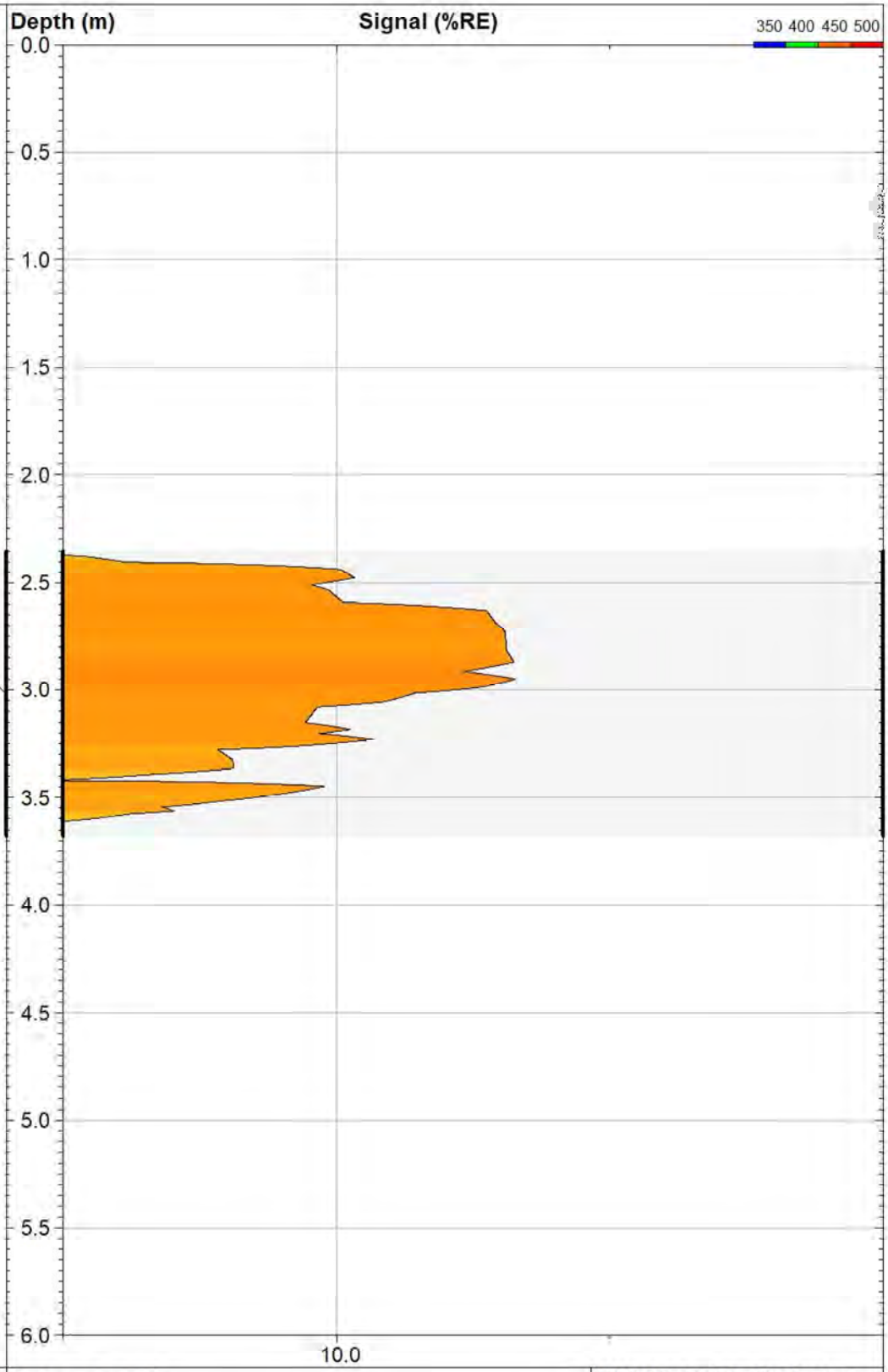
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761537.126 / UTM**	*Final depth:* **4.28 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385670.3406 /**	*Max signal:* **3.0 %RE @ 0.61 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.4 m**	*Date & Time:* **2020-05-13 14:41 ADT**

Callouts



2.35 - 3.68 m
14.2 %RE (s 14.5)



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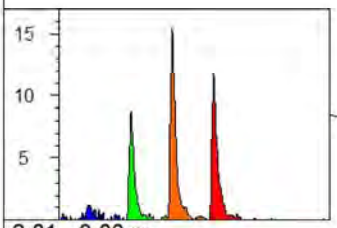
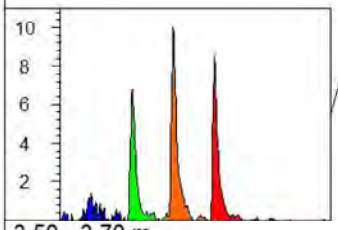
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761539.59 / UTM**	*Final depth:* **4.26 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385680.8819 /**	*Max signal:* **46.2 %RE @ 2.95 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.3 m**	*Date & Time:* **2020-05-13 15:00 ADT**

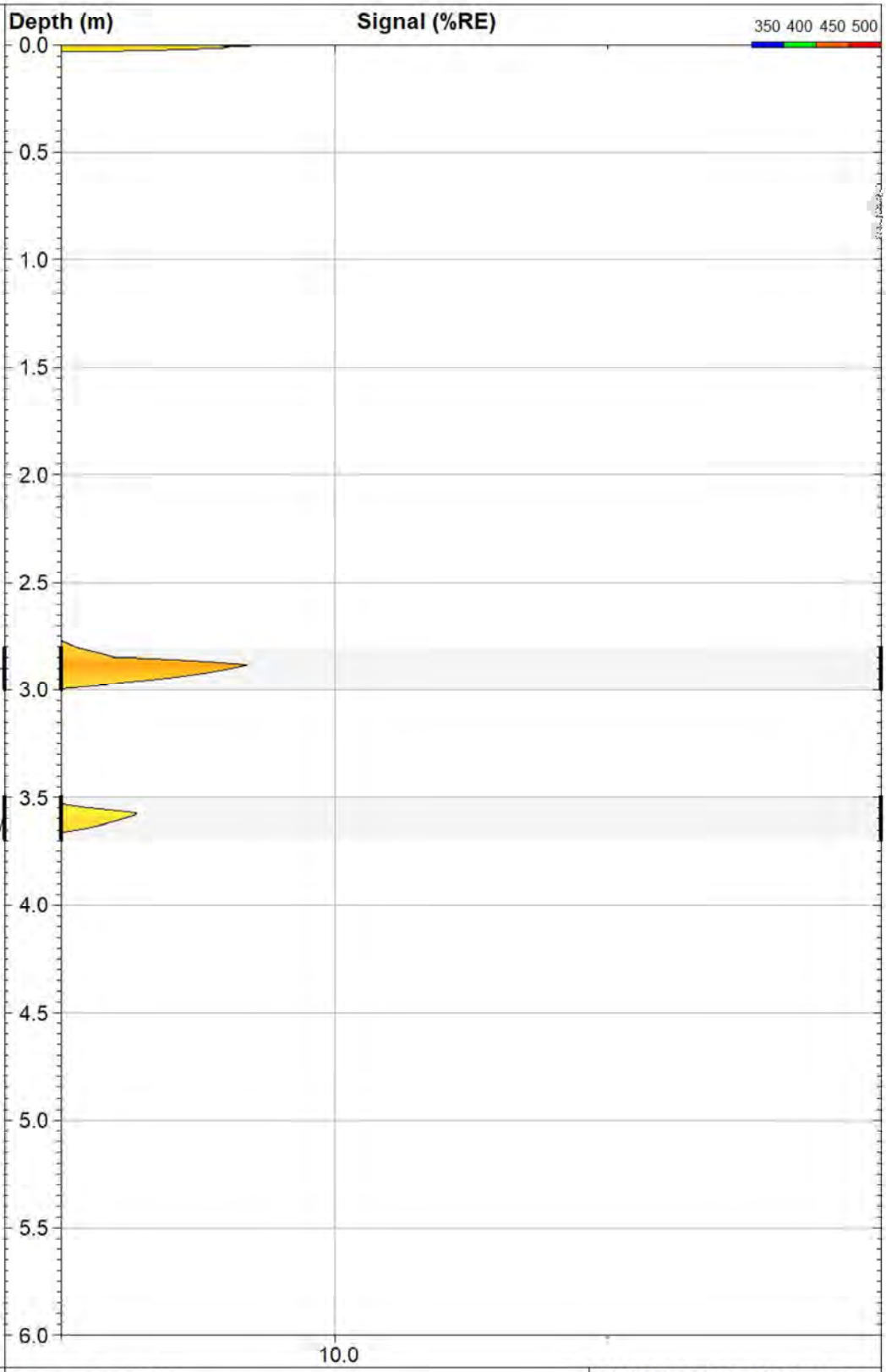
Callouts



2.81 - 3.00 m
3.0 %RE (s 1.6)



3.50 - 3.70 m
2.2 %RE (s 0.4)



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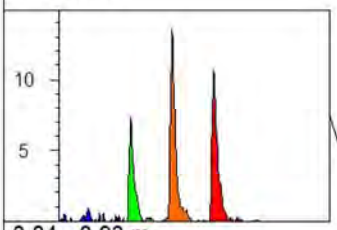
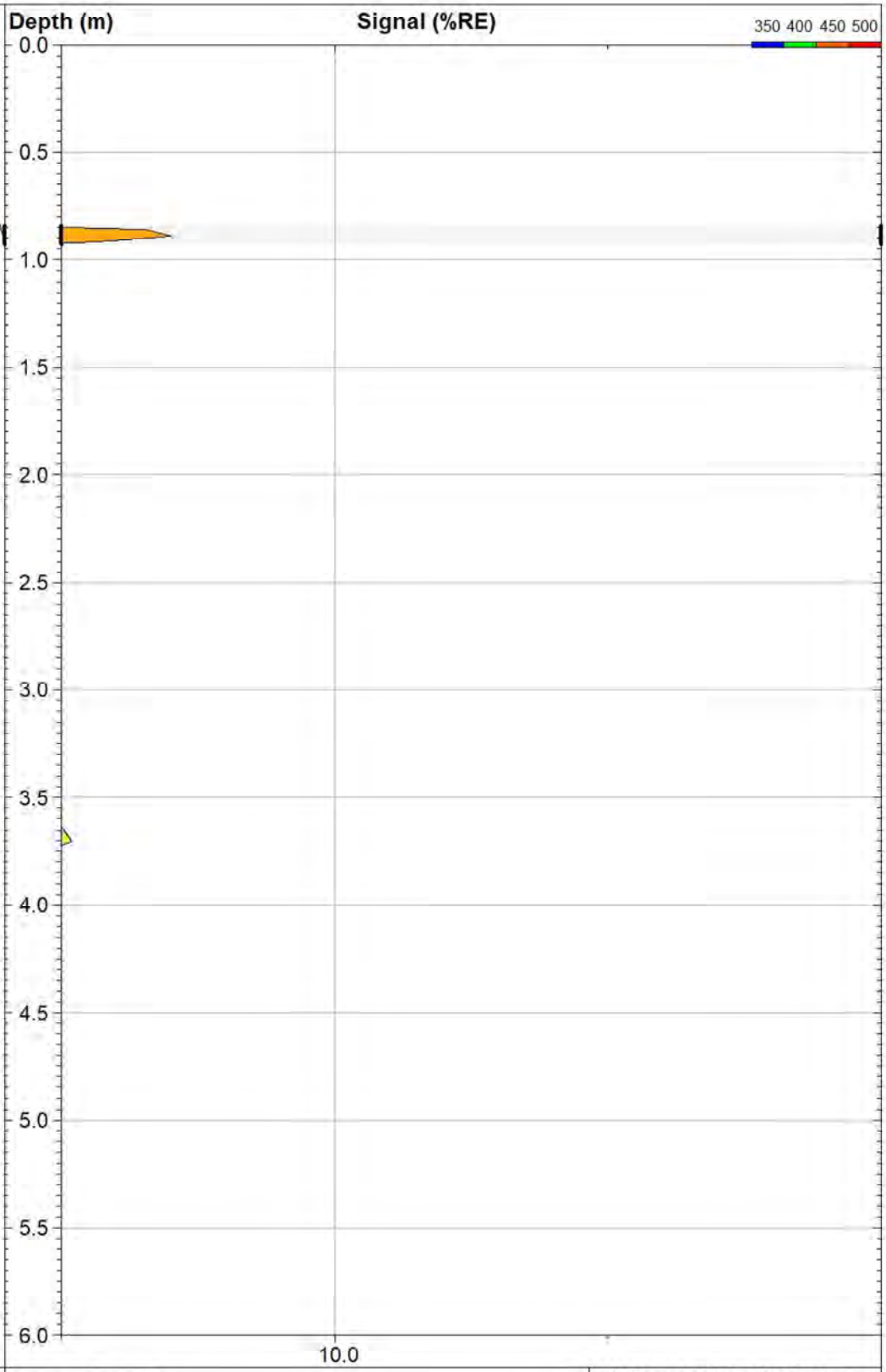
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761515.945 / UTM**	*Final depth:* **4.28 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385671.0102 /**	*Max signal:* **5.8 %RE @ 2.88 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-13 15:15 ADT**

Callouts



0.84 - 0.93 m
2.4 %RE (s 1.1)



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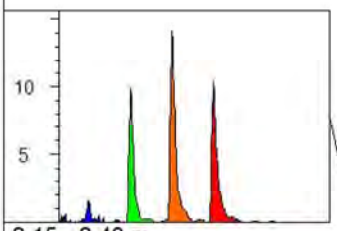
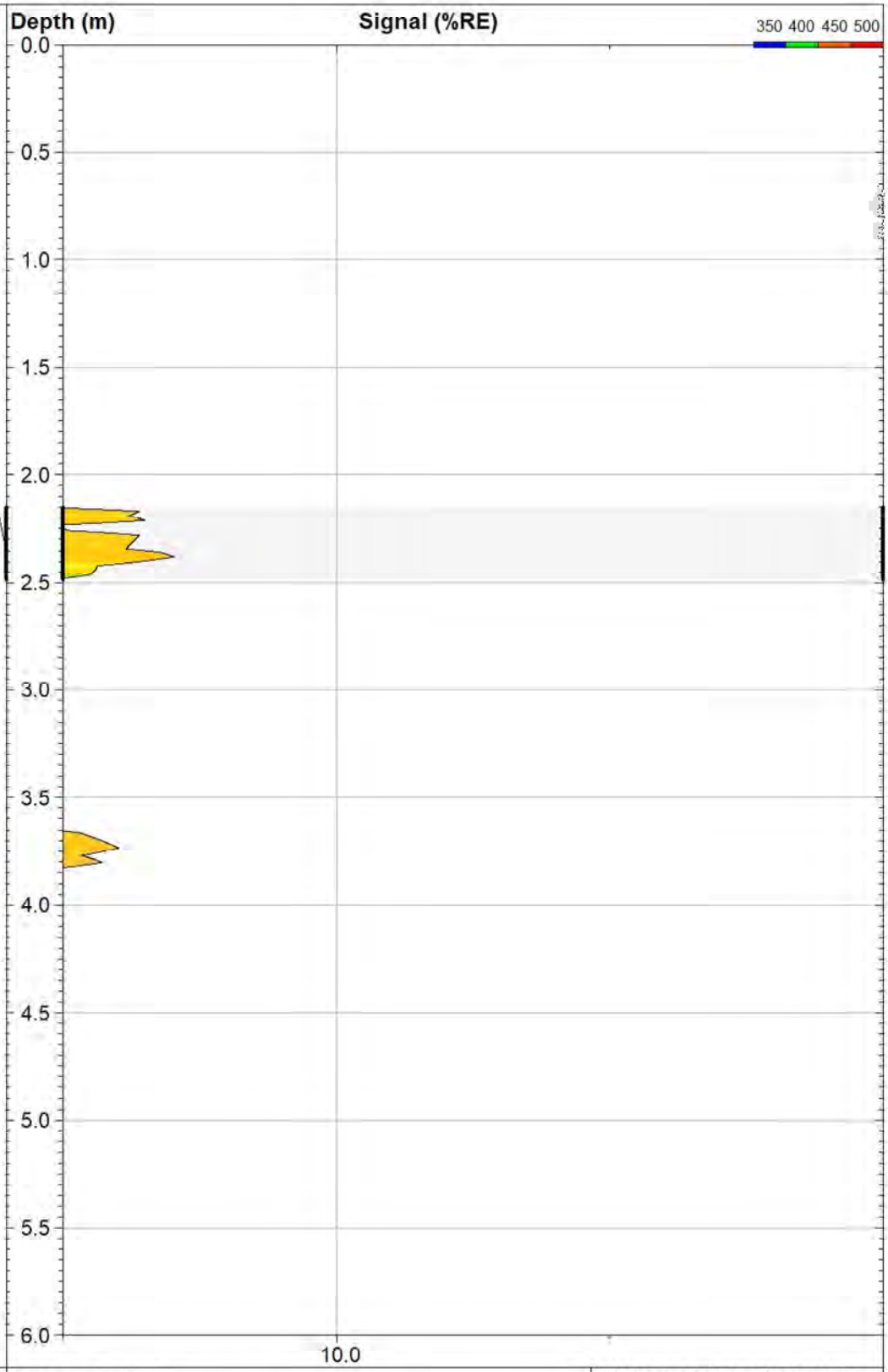
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761515.432 / UTM**	*Final depth:* **4.29 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385680.6587 /**	*Max signal:* **3.5 %RE @ 0.89 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.5 m**	*Date & Time:* **2020-05-13 15:29 ADT**

Callouts



2.15 - 2.49 m
2.6 %RE (s 0.5)



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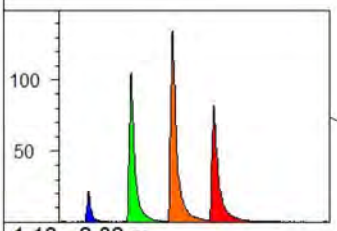
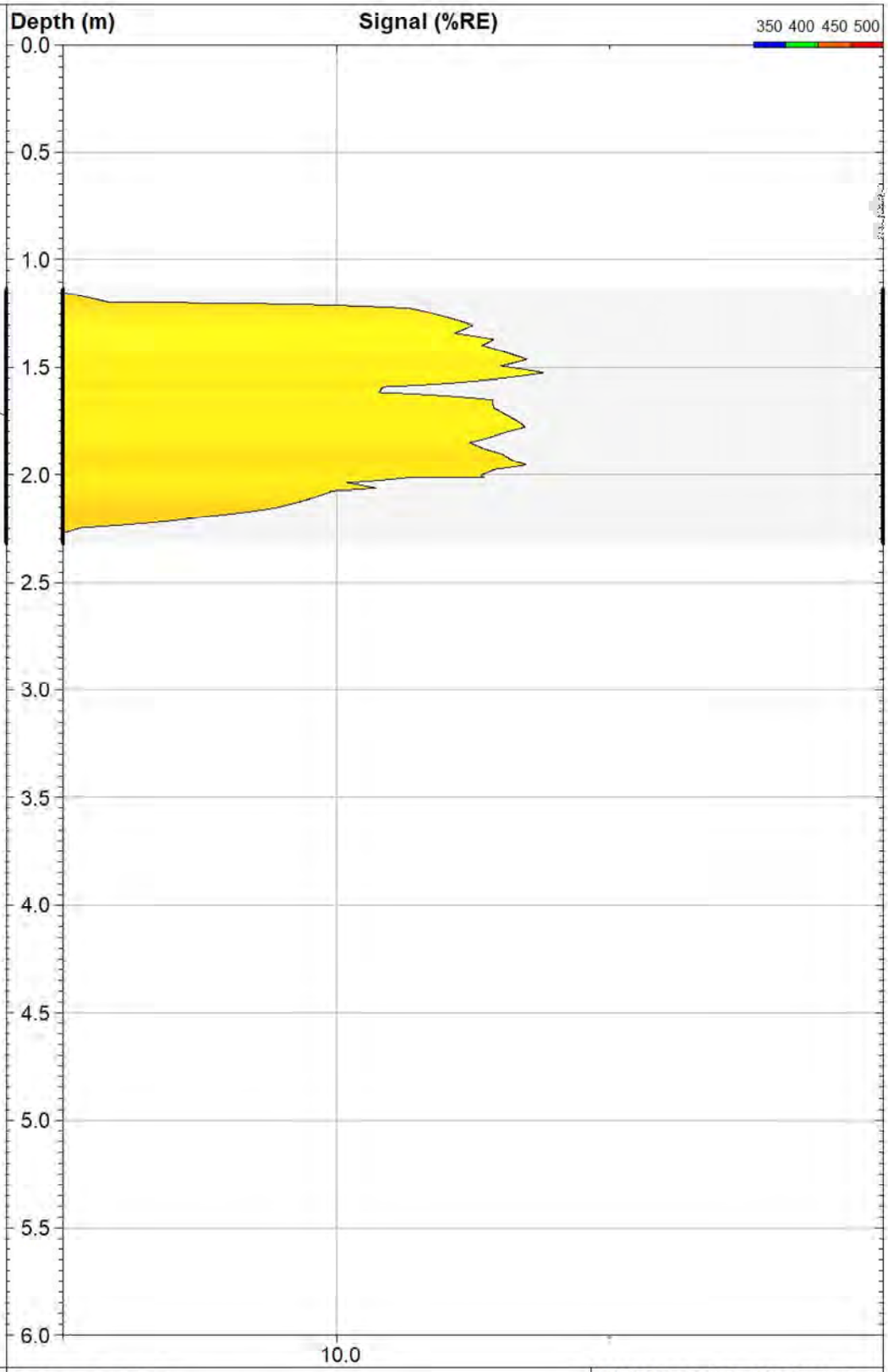
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761513.513 / UTM**	*Final depth:* **4.30 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385693.6439 /**	*Max signal:* **3.5 %RE @ 2.38 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.5 m**	*Date & Time:* **2020-05-13 15:42 ADT**

Callouts



1.13 - 2.32 m
28.4 %RE (s 17.0)



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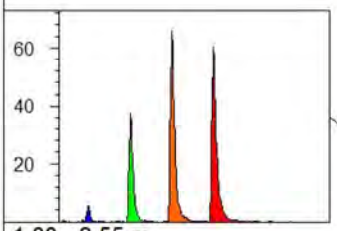
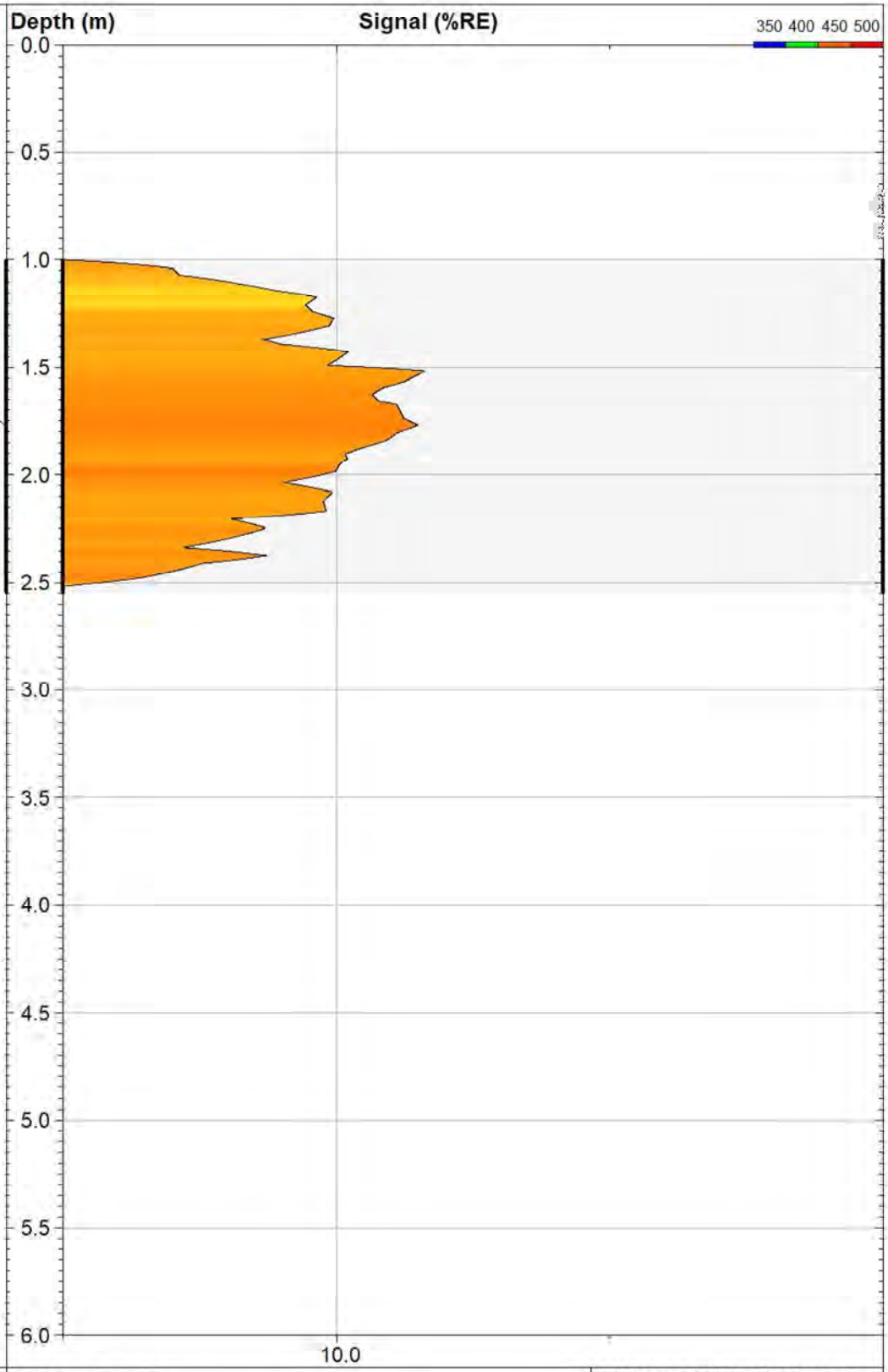
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761512.75 / UTM**	*Final depth:* **3.10 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385704.1509 /**	*Max signal:* **58.3 %RE @ 1.52 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-13 15:57 ADT**

Callouts



1.00 - 2.55 m
10.0 %RE (s 5.3)



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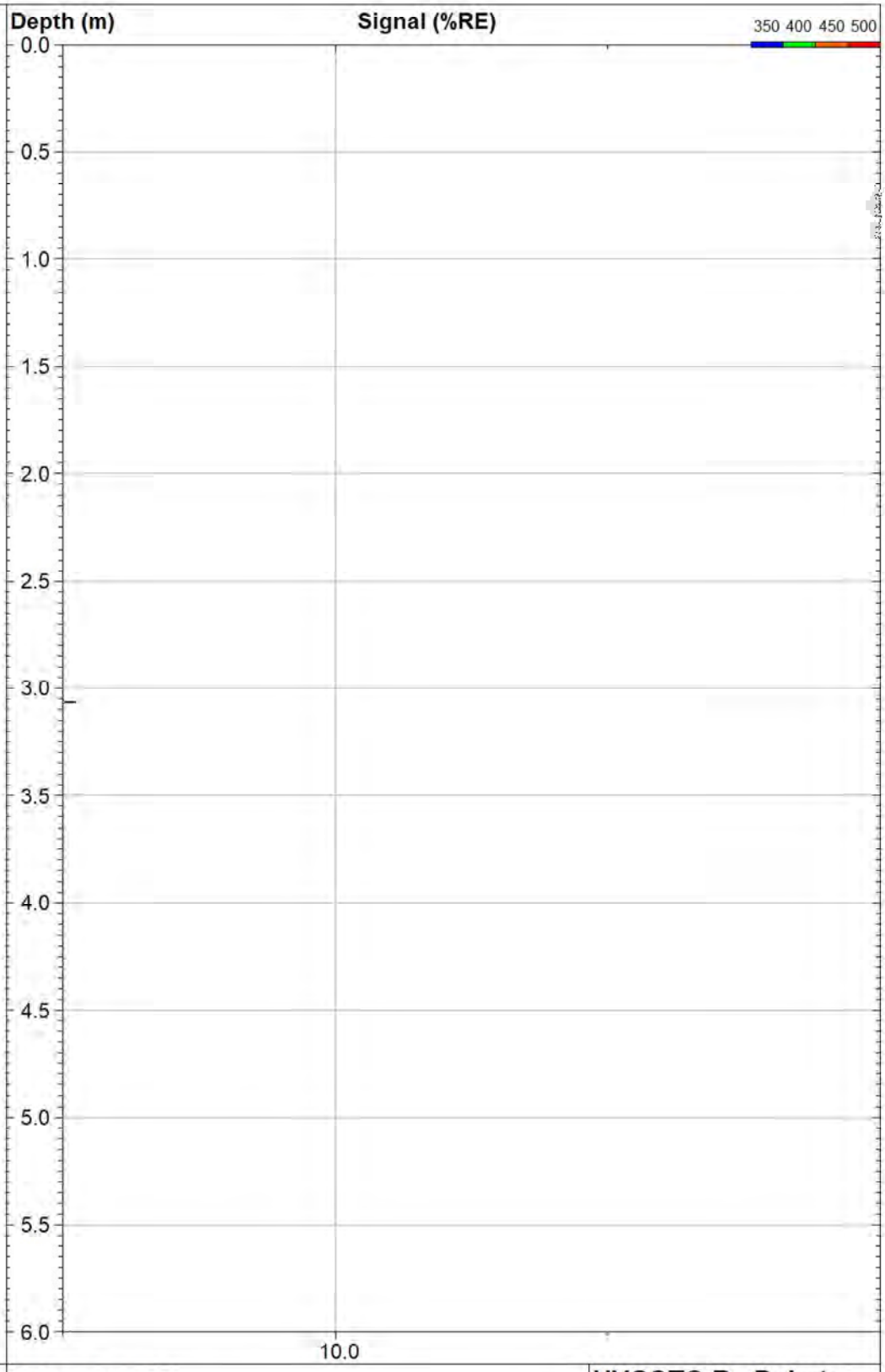
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761525.768 / UTM**	*Final depth:* **3.17 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385816.3689 /**	*Max signal:* **22.0 %RE @ 1.52 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-13 16:33 ADT**

Callouts



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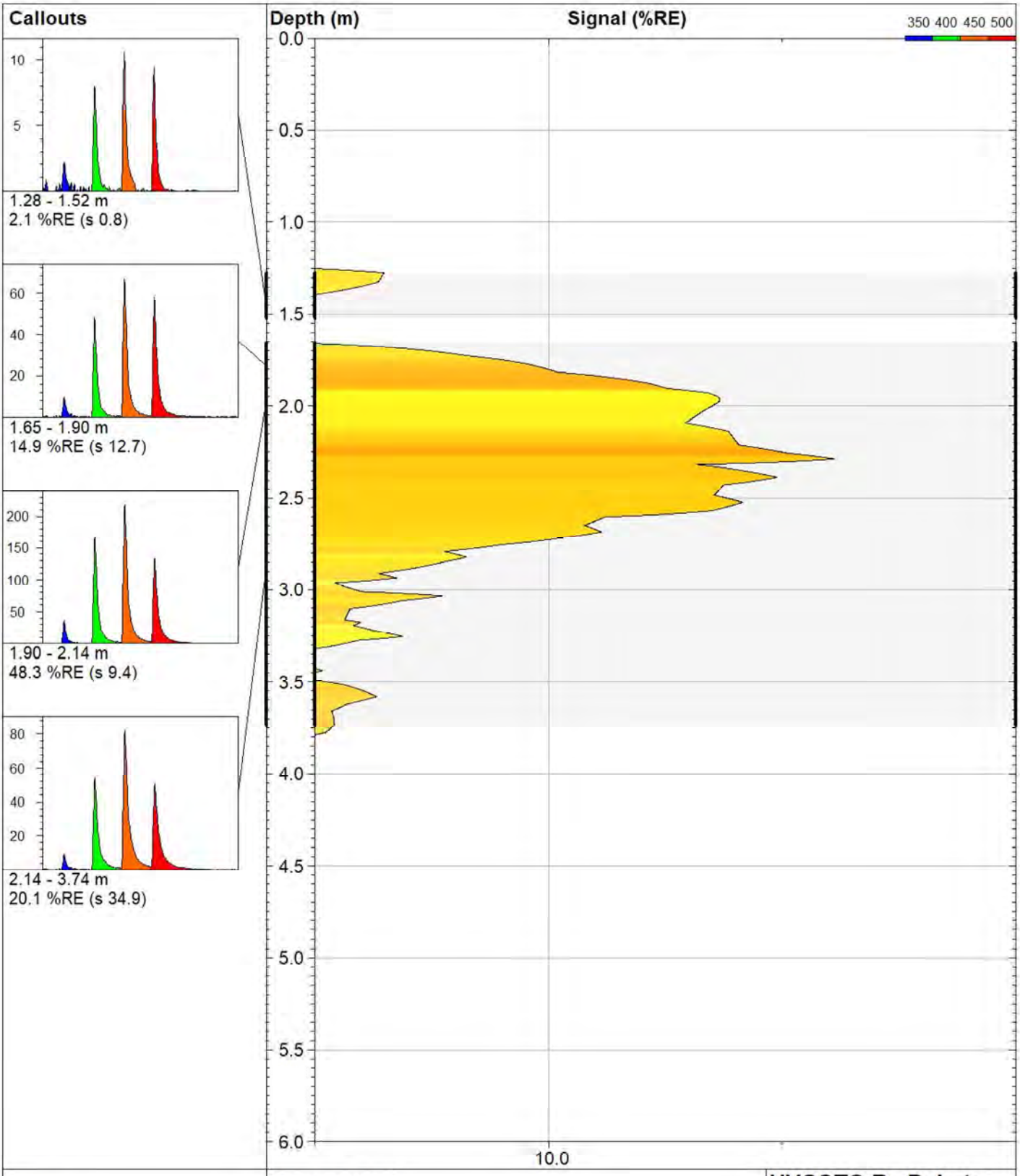
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761522.075 / UTM**	*Final depth:* **3.19 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385830.1904 /**	*Max signal:* **2.1 %RE @ 3.07 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-13 16:44 ADT**



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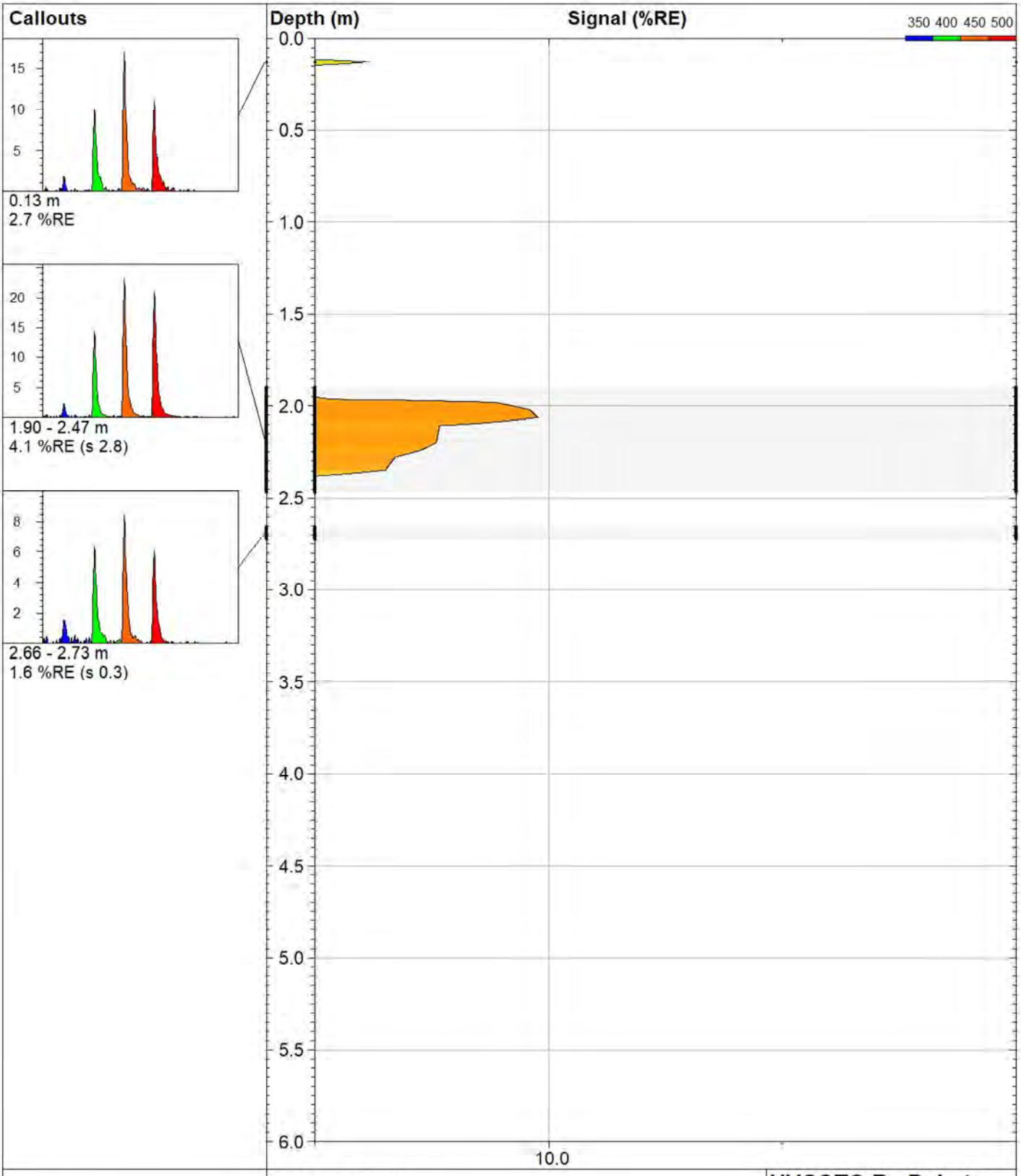
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761529.105 / UTM**	*Final depth:* **4.03 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385837.9491 /**	*Max signal:* **168.3 %RE @ 2.29 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.9 m**	*Date & Time:* **2020-05-13 17:04 ADT**



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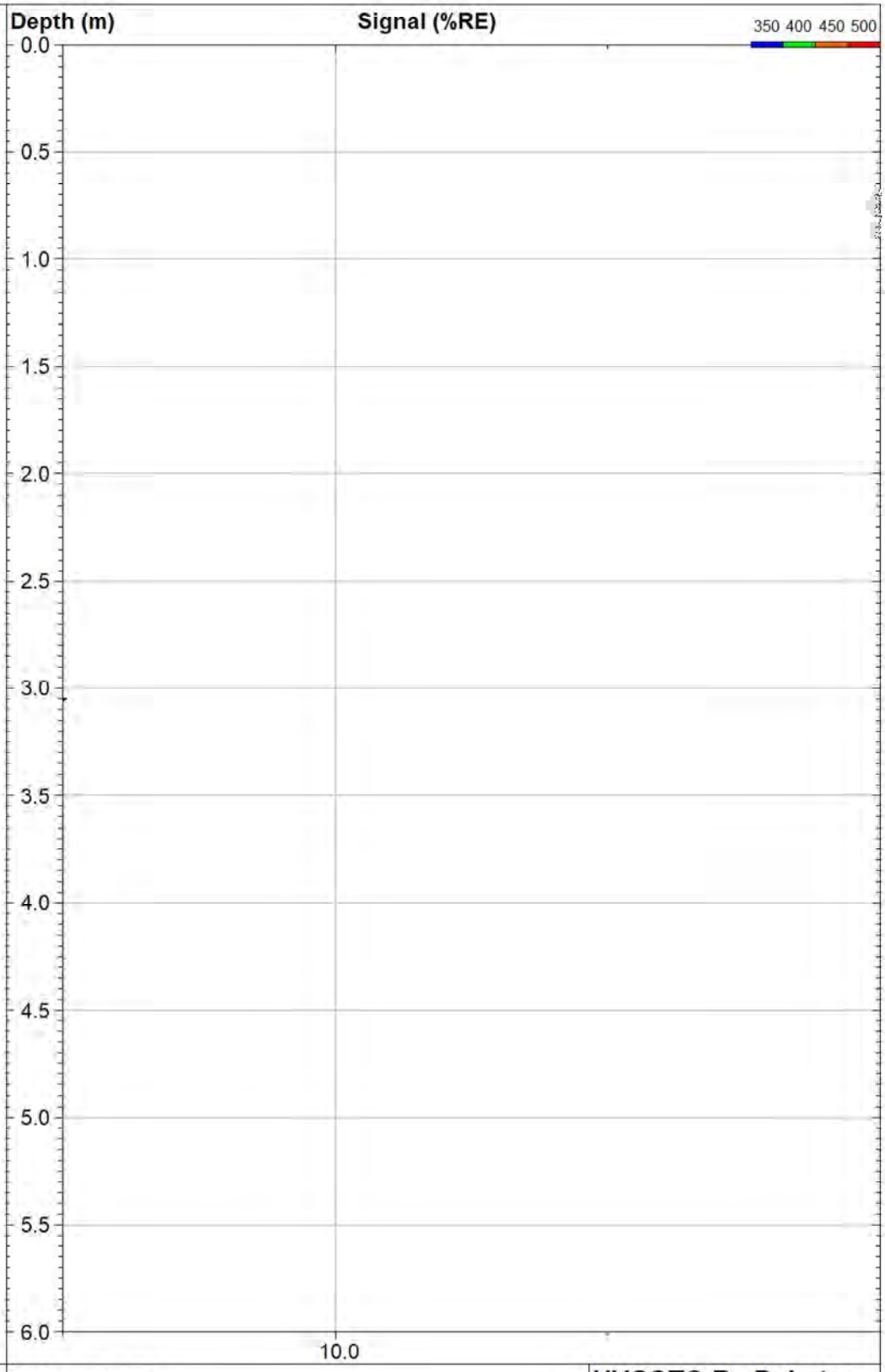
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761520.936 / UTM**	*Final depth:* **3.69 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385850.4844 /**	*Max signal:* **10.0 %RE @ 2.06 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.4 m**	*Date & Time:* **2020-05-13 17:22 ADT**

Callouts



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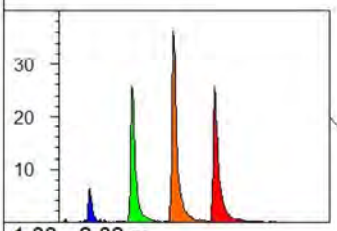
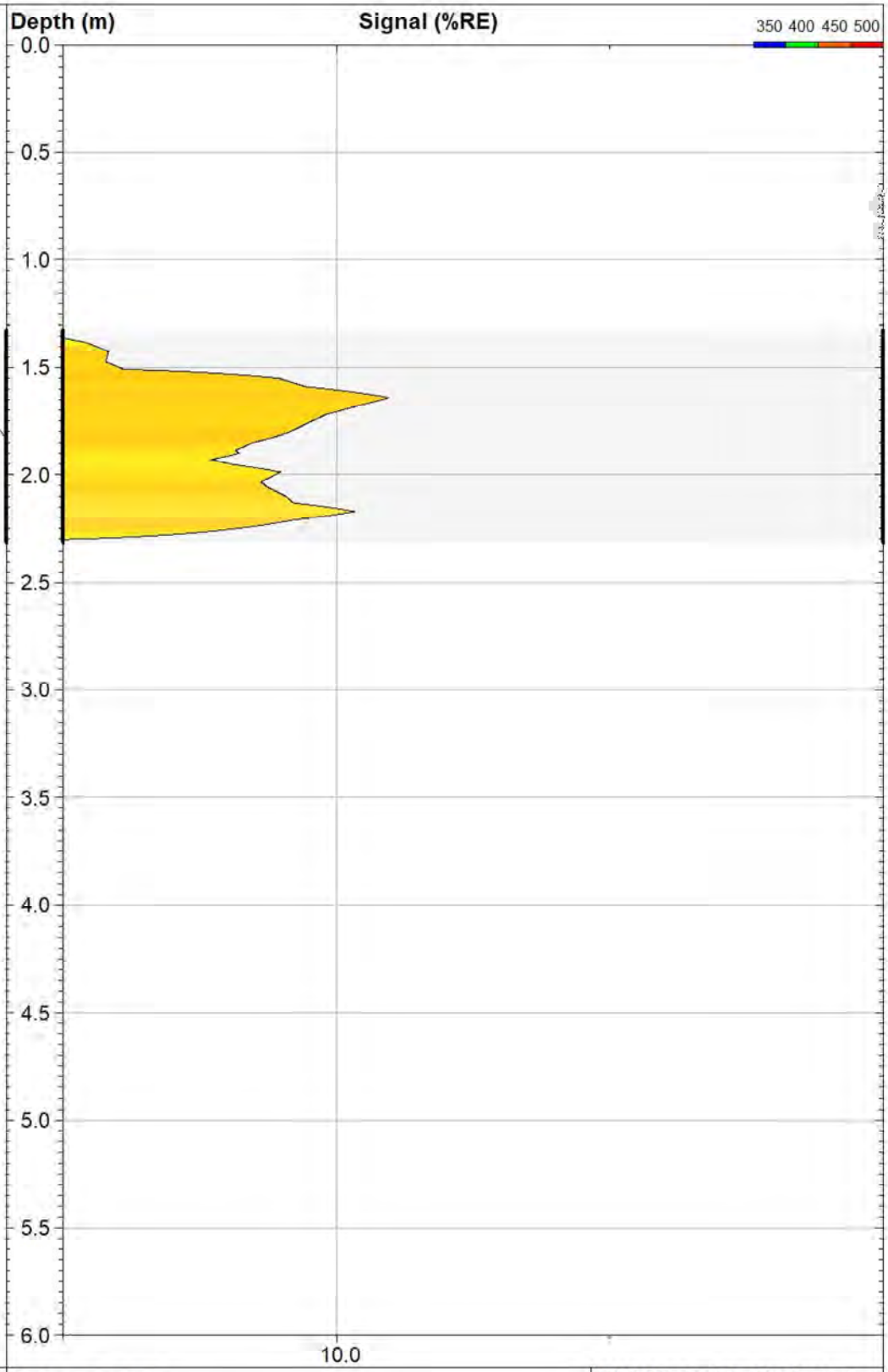
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761520.497 / UTM**	*Final depth:* **3.68 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385857.9987 /**	*Max signal:* **2.0 %RE @ 3.05 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.2 m**	*Date & Time:* **2020-05-13 17:36 ADT**

Callouts



1.33 - 2.32 m
6.6 %RE (s 3.7)



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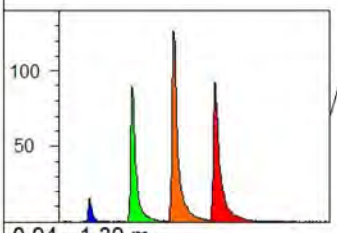
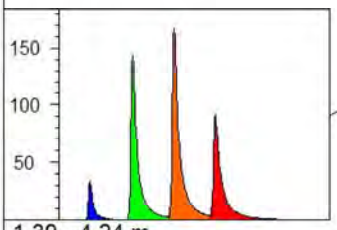
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761529.019 / UTM**	*Final depth:* **3.10 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385799.944 /**	*Max signal:* **16.5 %RE @ 1.64 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.7 m**	*Date & Time:* **2020-05-13 17:59 ADT**

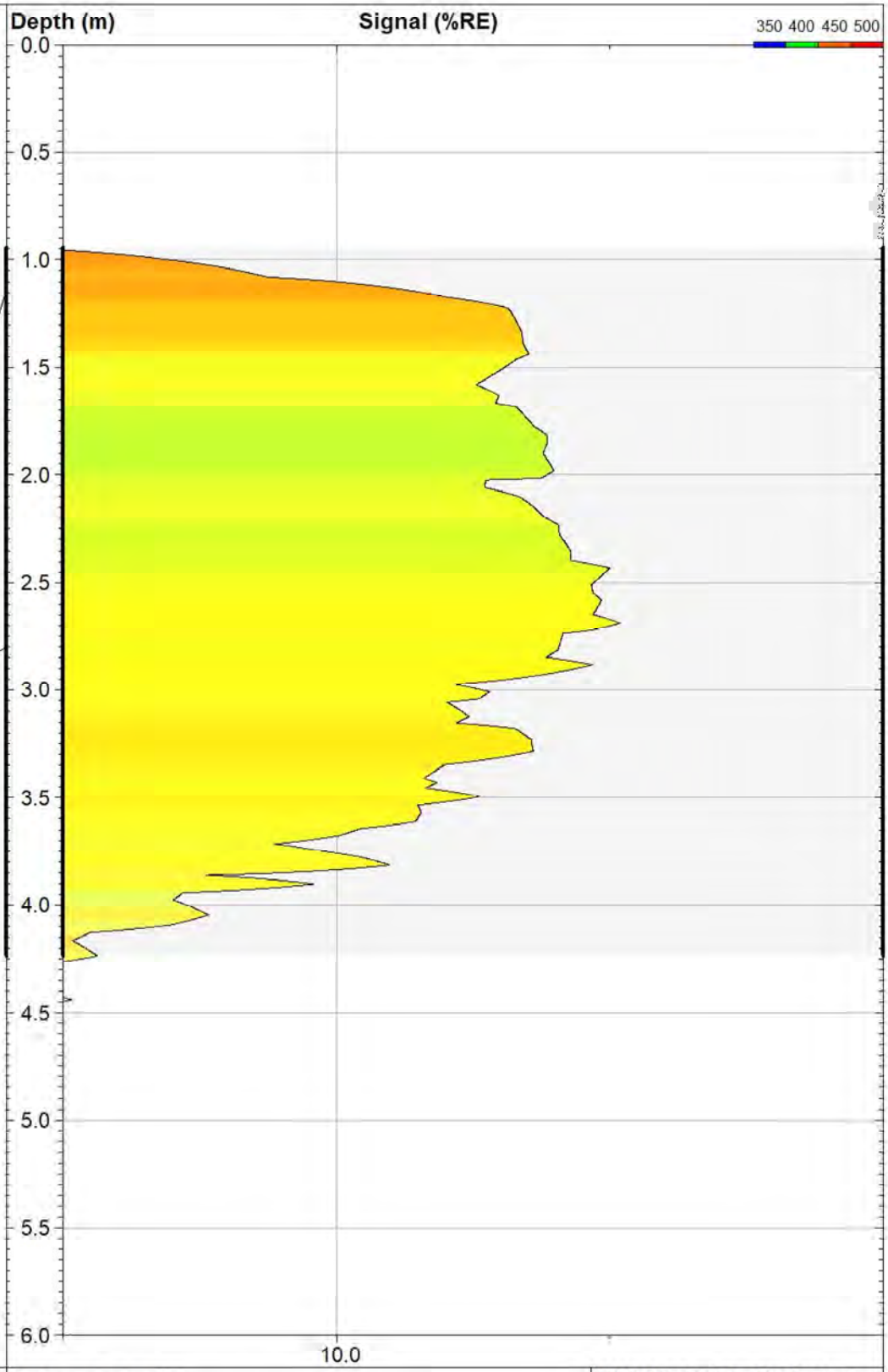
Callouts



0.94 - 1.39 m
26.3 %RE (s 20.0)



1.39 - 4.24 m
43.1 %RE (s 27.5)



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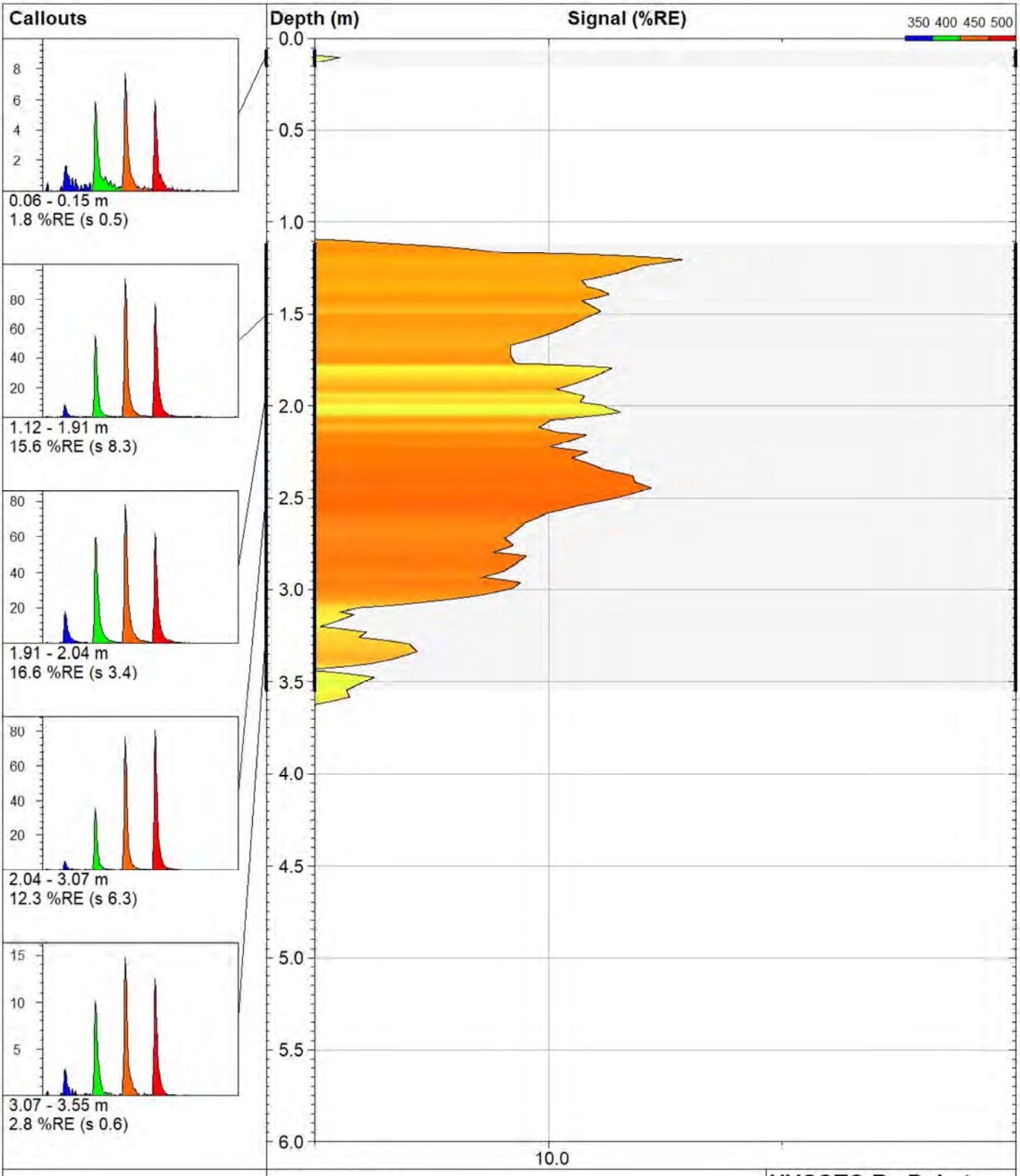
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761529.128 / UTM**	*Final depth:* **4.54 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385782.109 /**	*Max signal:* **110.1 %RE @ 2.69 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-13 18:06 ADT**



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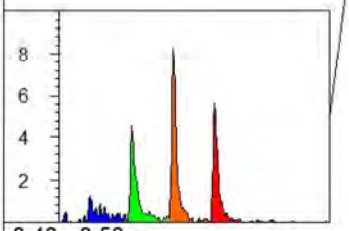
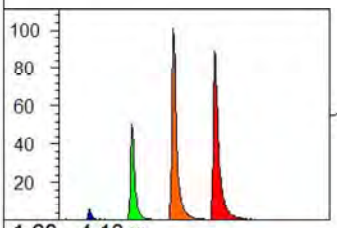
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761529.015 / UTM**	*Final depth:* **3.69 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385763.2659 /**	*Max signal:* **38.3 %RE @ 1.20 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-13 18:16 ADT**

Callouts

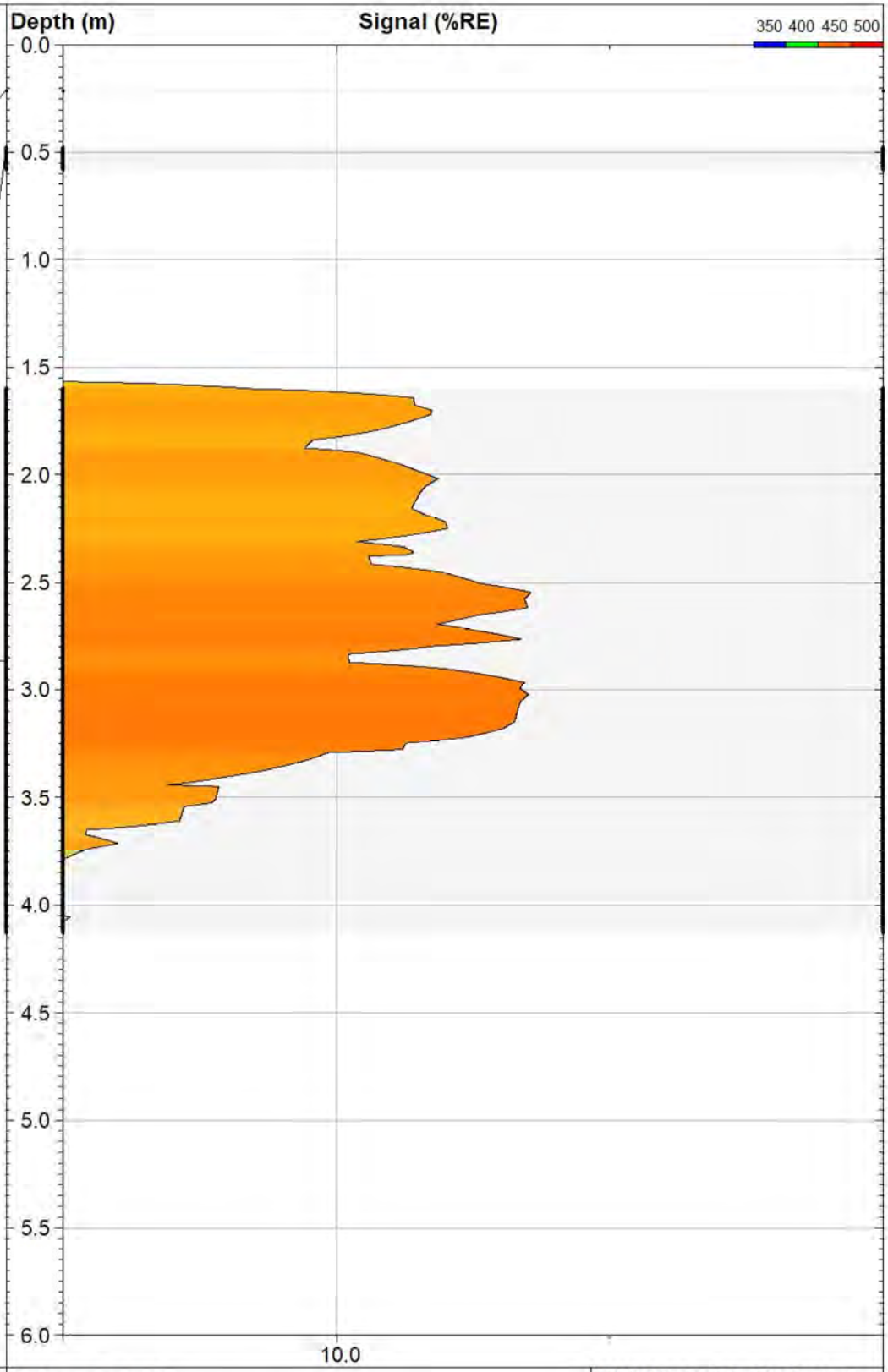
Note 0.21:
First 0.3 m invalid. Log started prior to probe being inserted into the subsurface.



0.48 - 0.58 m
1.6 %RE (s 0.3)



1.60 - 4.13 m
17.4 %RE (s 15.9)



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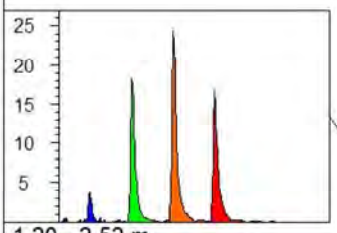
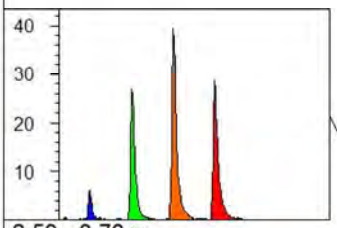
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761523.457 / UTM**	*Final depth:* **4.34 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385744.234 /**	*Max signal:* **52.4 %RE @ 2.55 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.5 m**	*Date & Time:* **2020-05-13 18:30 ADT**

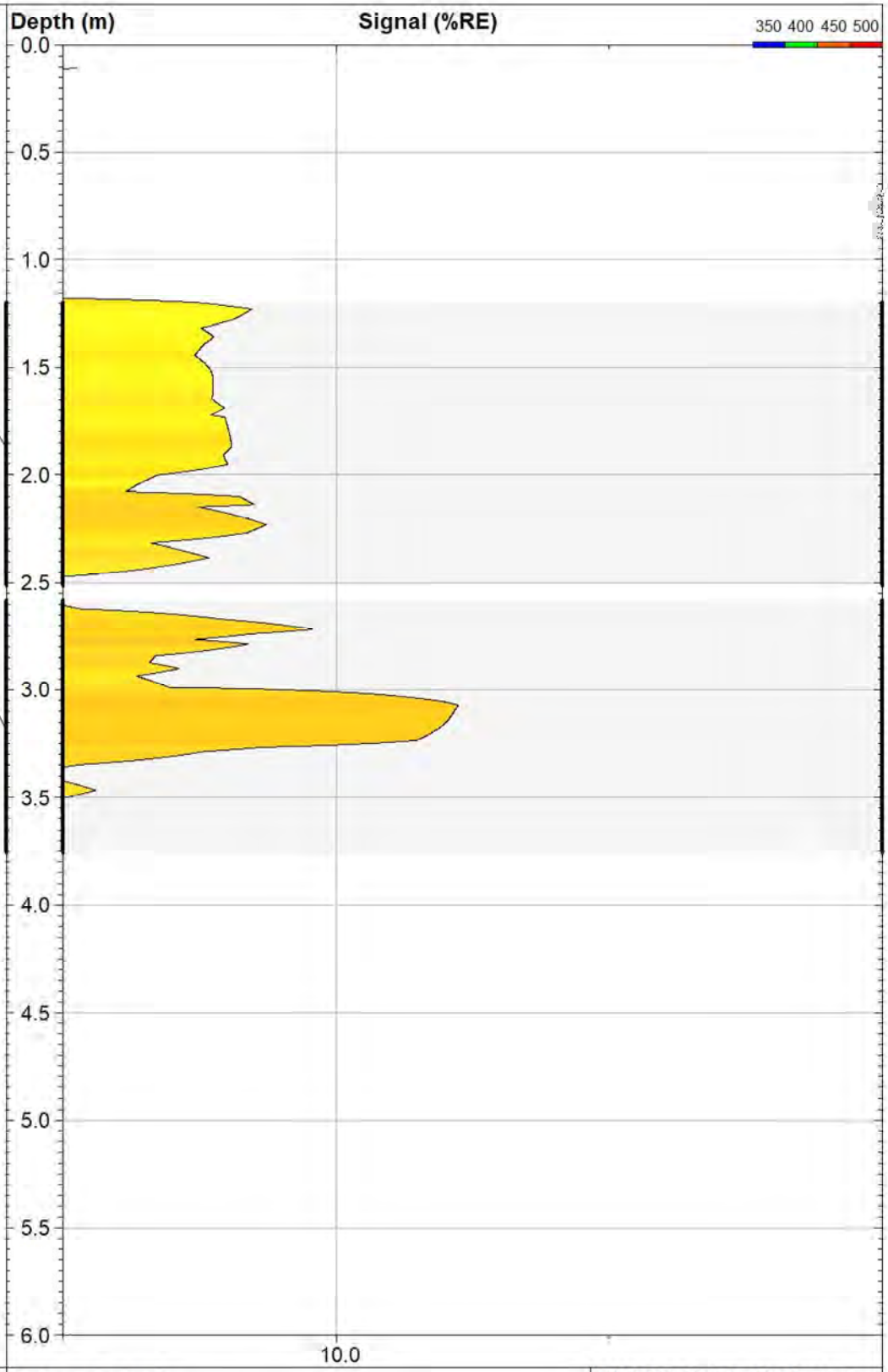
Callouts



1.20 - 2.52 m
4.4 %RE (s 1.1)



2.59 - 3.76 m
7.0 %RE (s 8.4)



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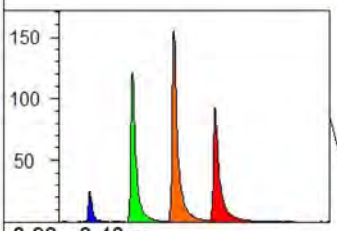
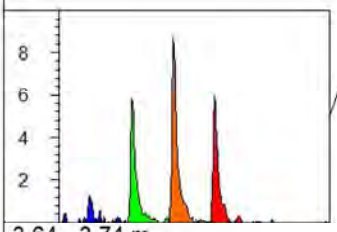
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761522.018 / UTM**	*Final depth:* **3.97 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385726.1572 /**	*Max signal:* **29.0 %RE @ 3.07 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.4 m**	*Date & Time:* **2020-05-13 18:41 ADT**

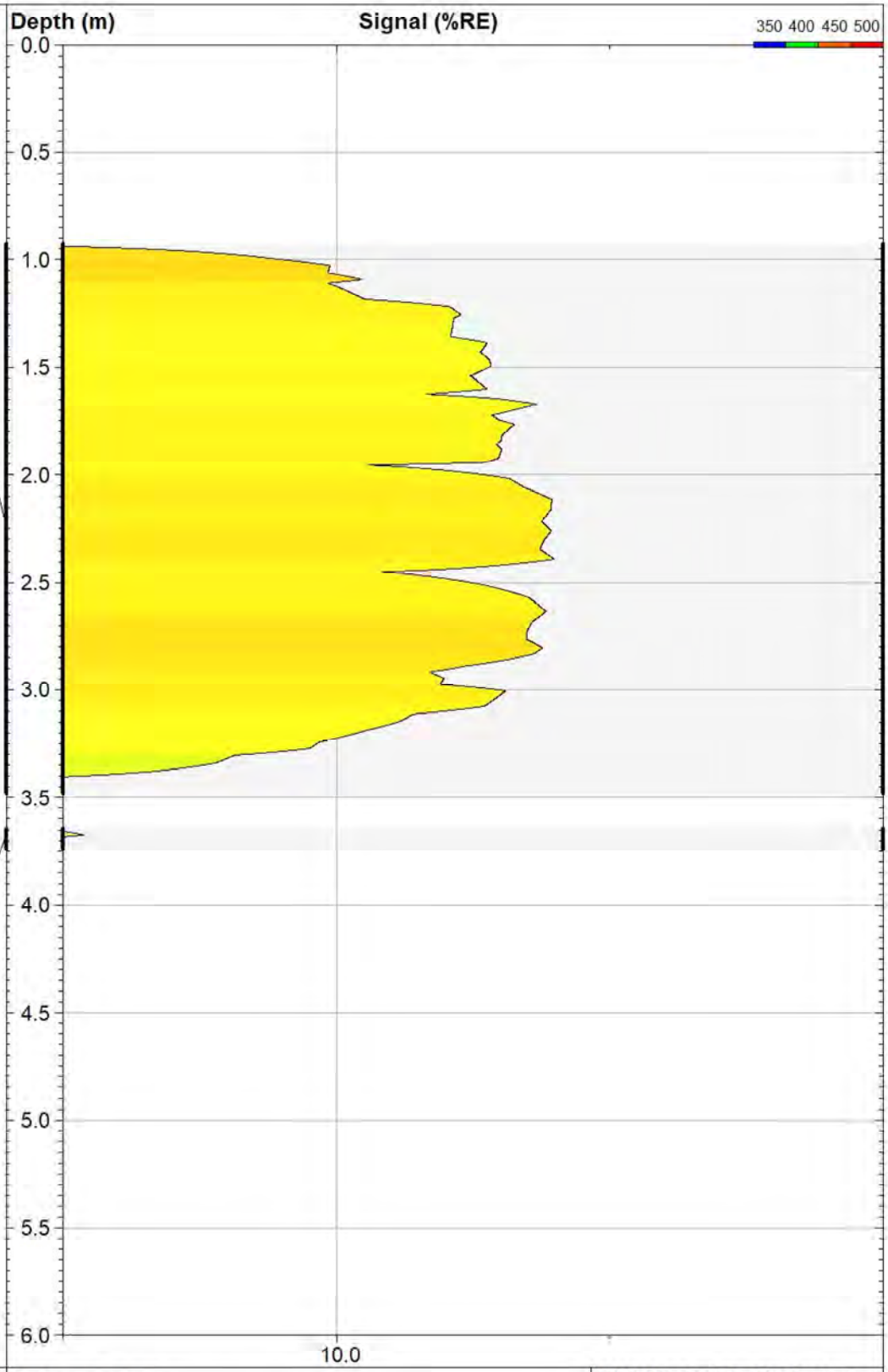
Callouts



0.93 - 3.48 m
32.7 %RE (s 18.4)



3.64 - 3.74 m
1.7 %RE (s 0.4)



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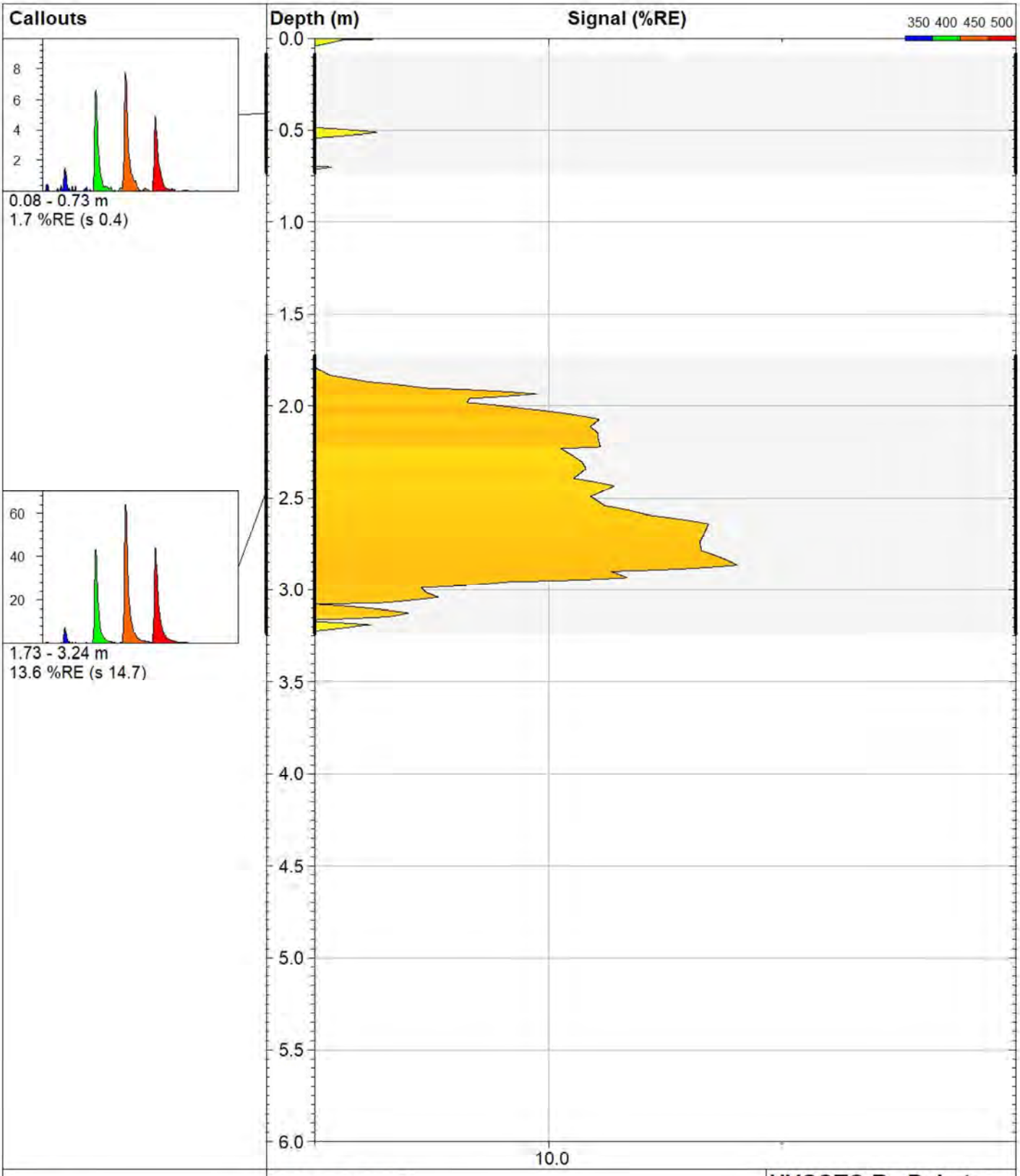
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761522.923 / UTM**	*Final depth:* **3.97 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385708.0681 /**	*Max signal:* **63.5 %RE @ 2.39 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.5 m**	*Date & Time:* **2020-05-13 18:53 ADT**



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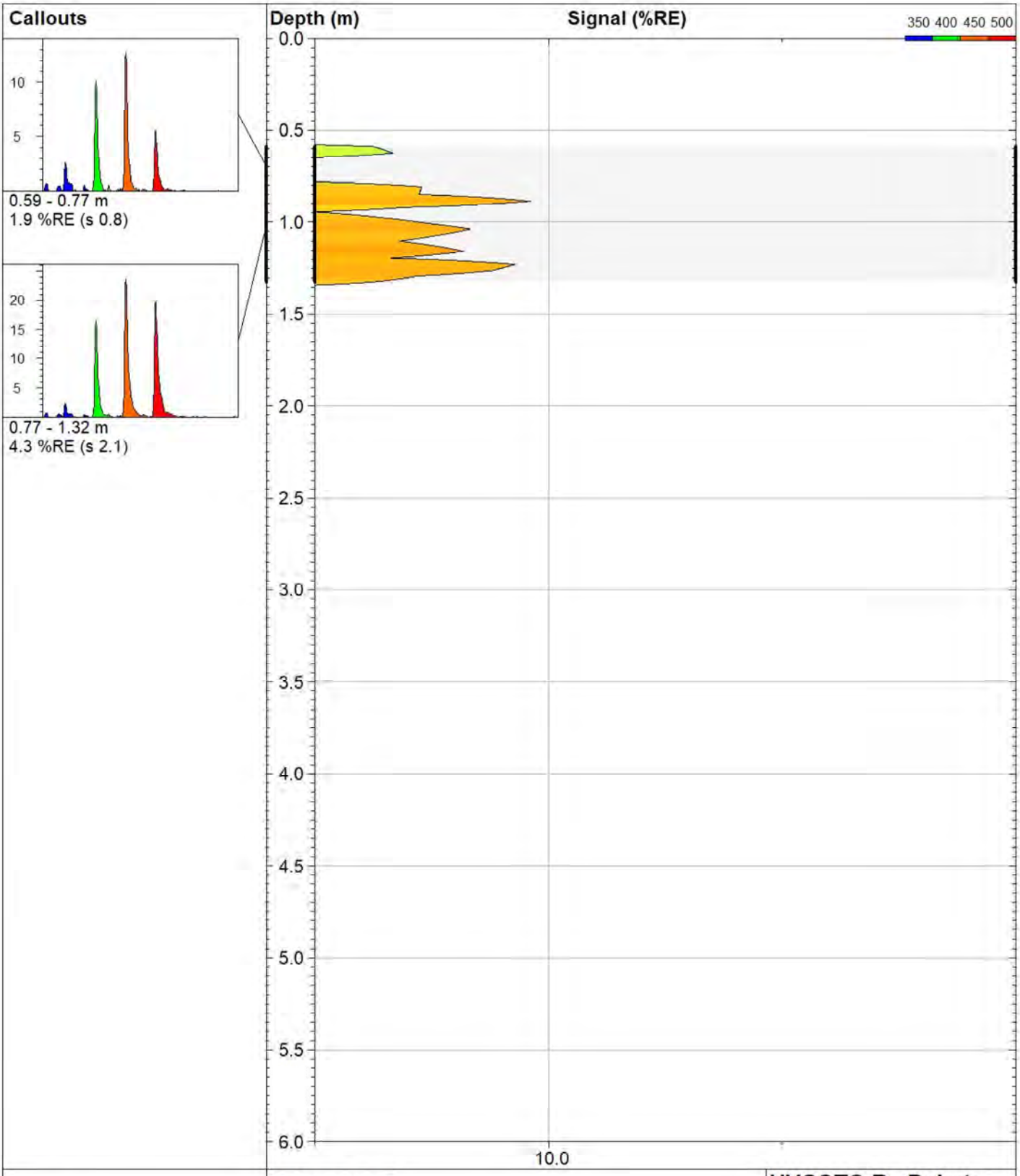
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761526.057 / UTM**	*Final depth:* **3.67 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385694.0759 /**	*Max signal:* **65.2 %RE @ 2.86 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.4 m**	*Date & Time:* **2020-05-13 19:04 ADT**



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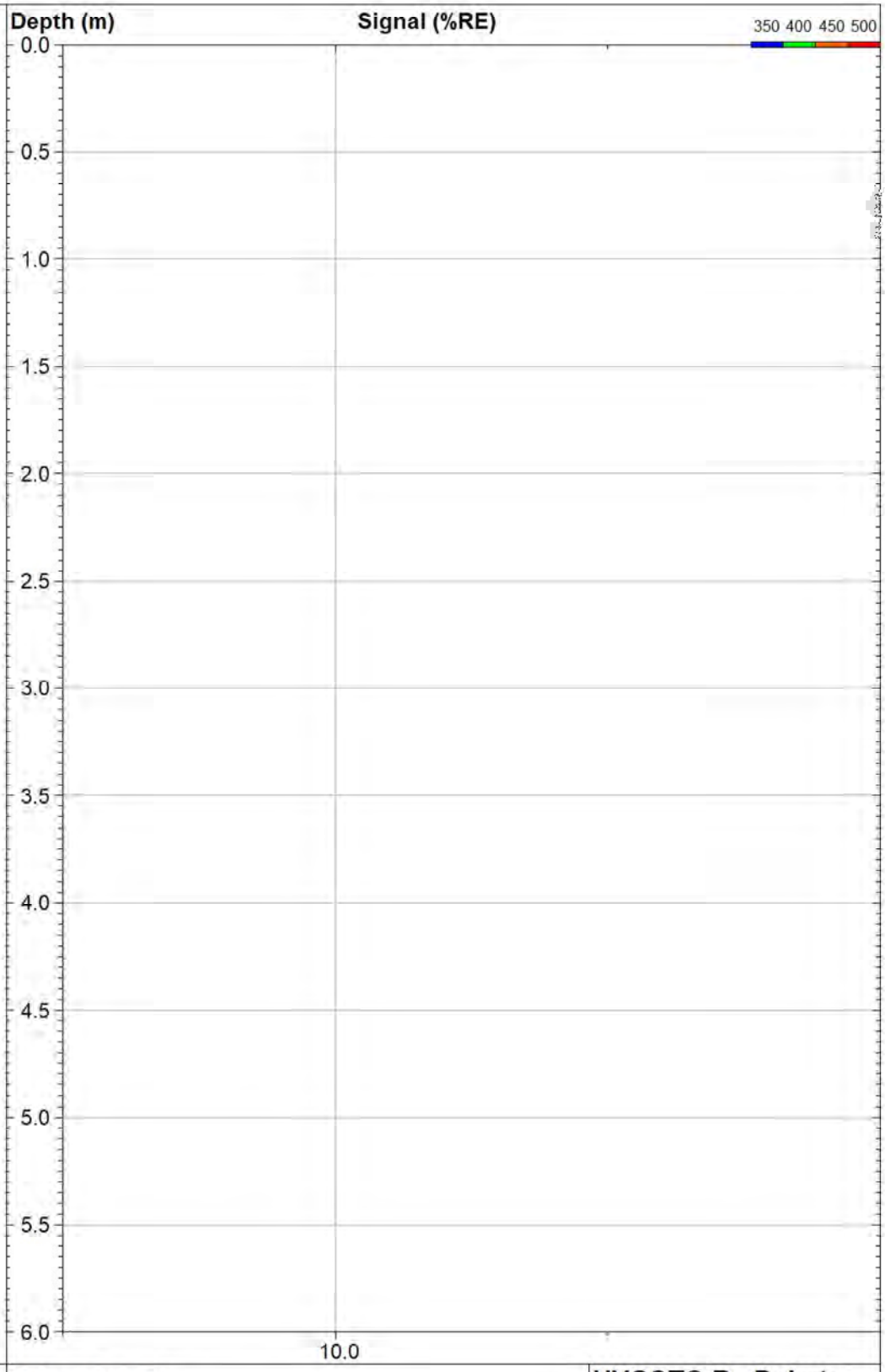
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761507.786 / UTM**	*Final depth:* **3.05 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385850.0417 /**	*Max signal:* **9.4 %RE @ 0.89 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-14 09:19 ADT**

Callouts



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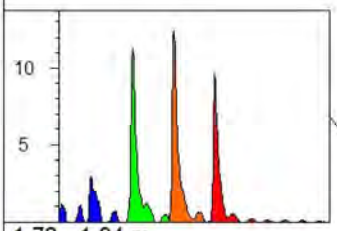
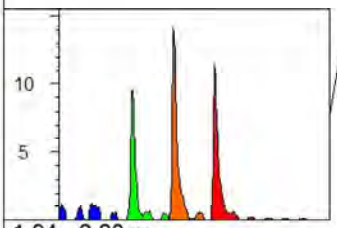
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761507.173 / UTM**	*Final depth:* **3.17 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385856.4084 /**	*Max signal:* **1.9 %RE @ 2.15 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-14 09:30 ADT**

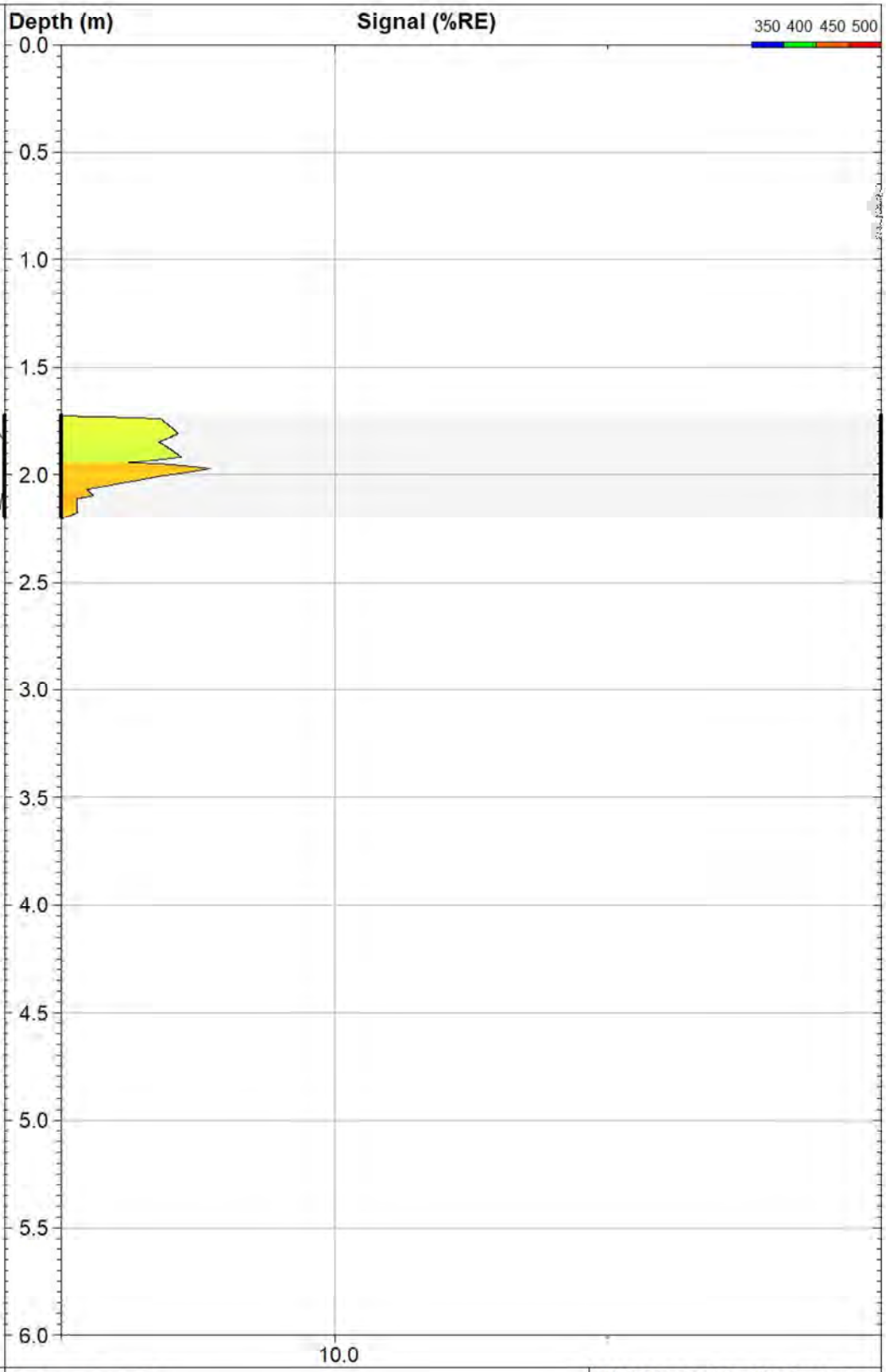
Callouts



1.72 - 1.94 m
3.1 %RE (s 0.8)



1.94 - 2.20 m
2.7 %RE (s 0.8)



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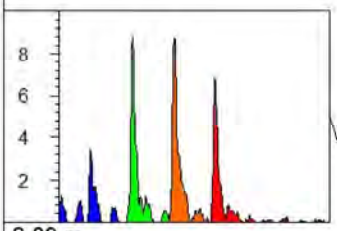
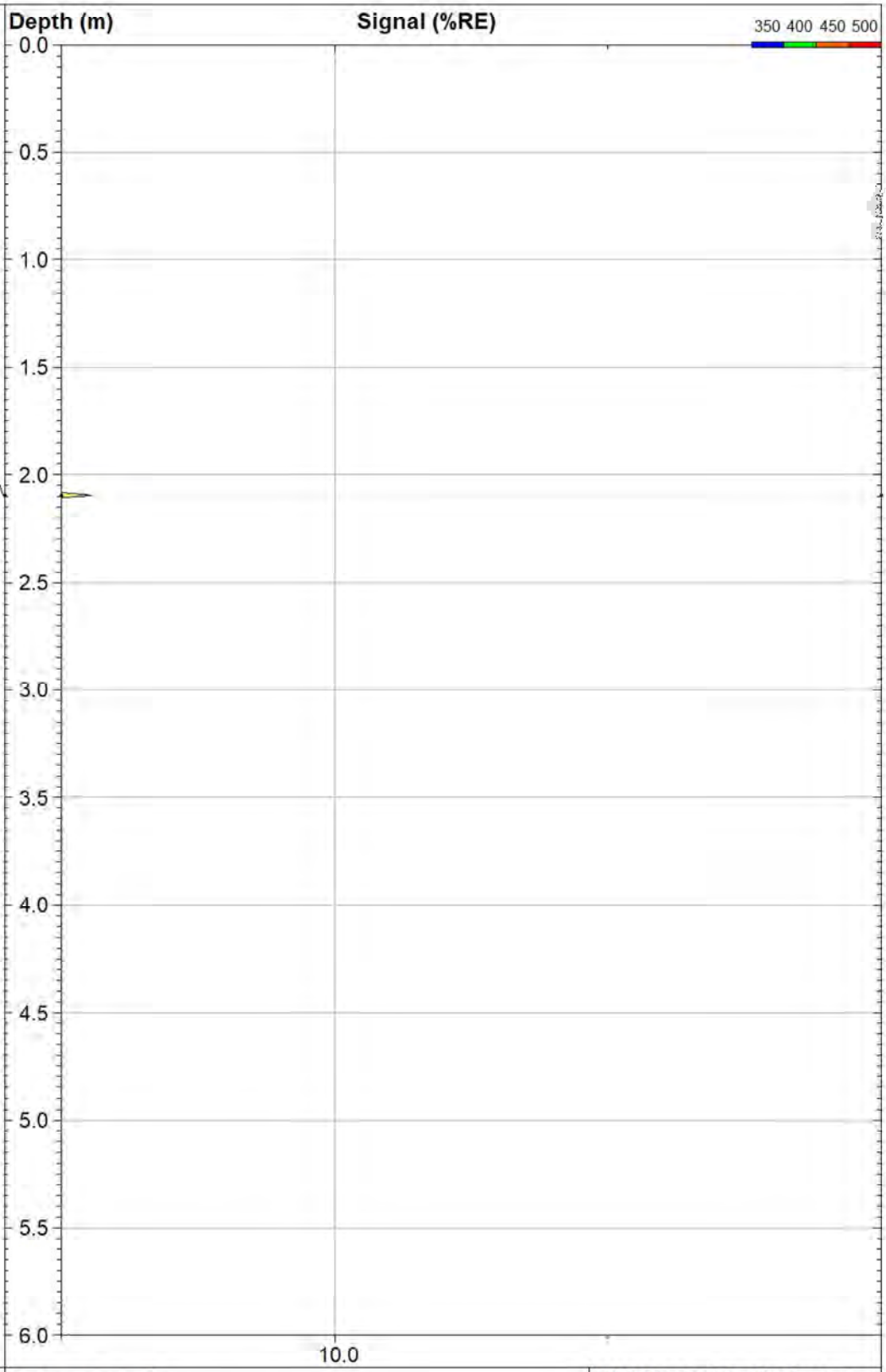
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761521.978 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385837.3712 /**	*Max signal:* **4.5 %RE @ 1.97 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.6 m**	*Date & Time:* **2020-05-14 09:43 ADT**

Callouts



2.09 m
2.3 %RE



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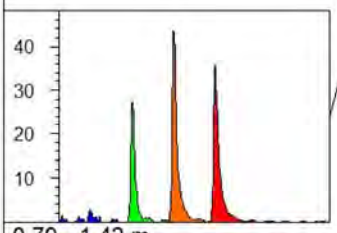
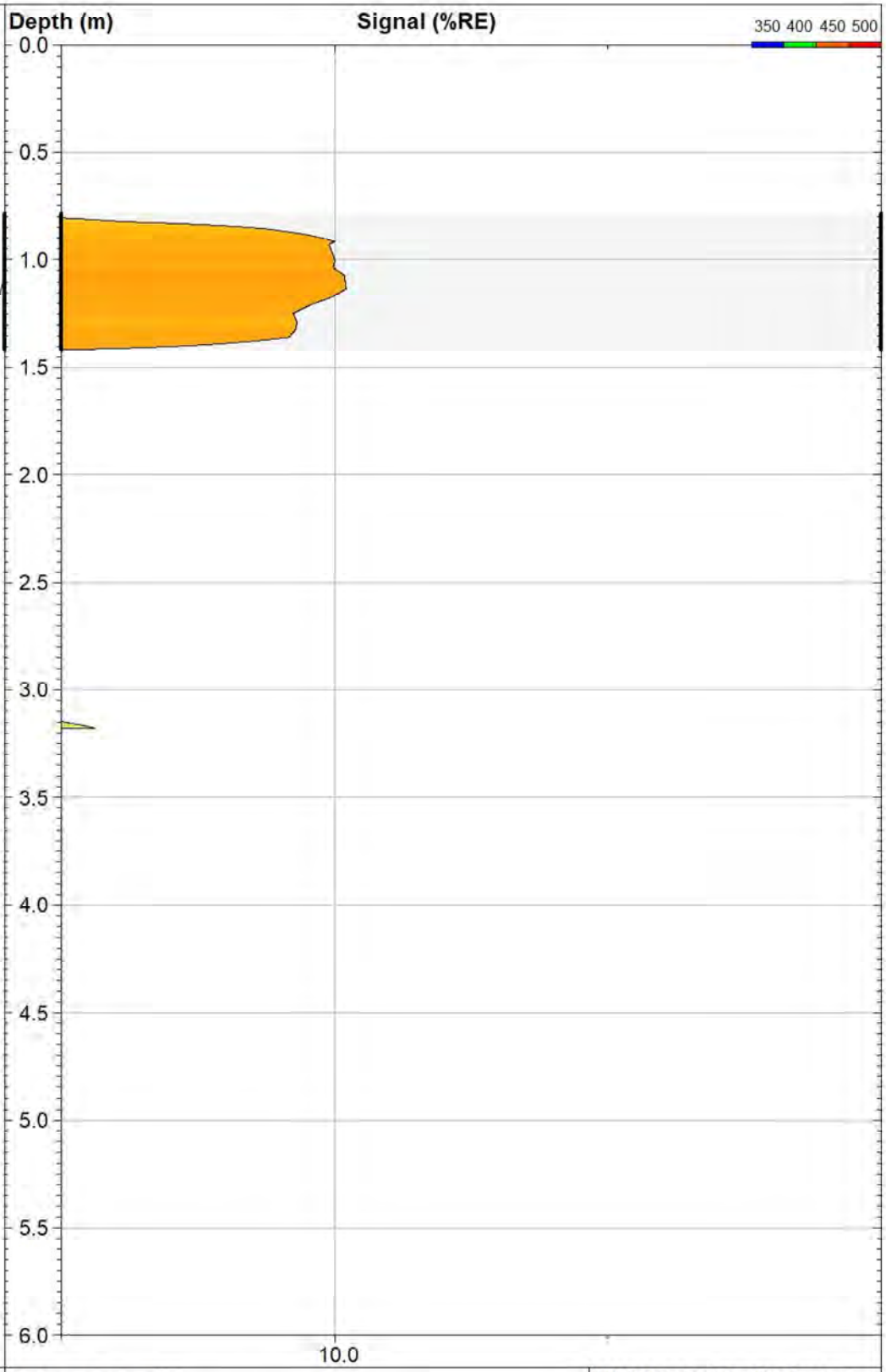
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761529.536 / UTM**	*Final depth:* **3.18 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385848.0912 /**	*Max signal:* **2.3 %RE @ 2.09 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **179.8 m**	*Date & Time:* **2020-05-14 09:55 ADT**

Callouts



0.79 - 1.42 m
8.3 %RE (s 3.4)



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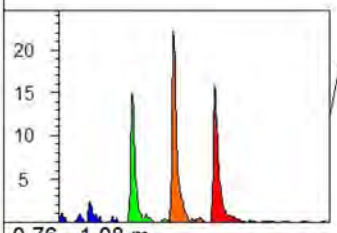
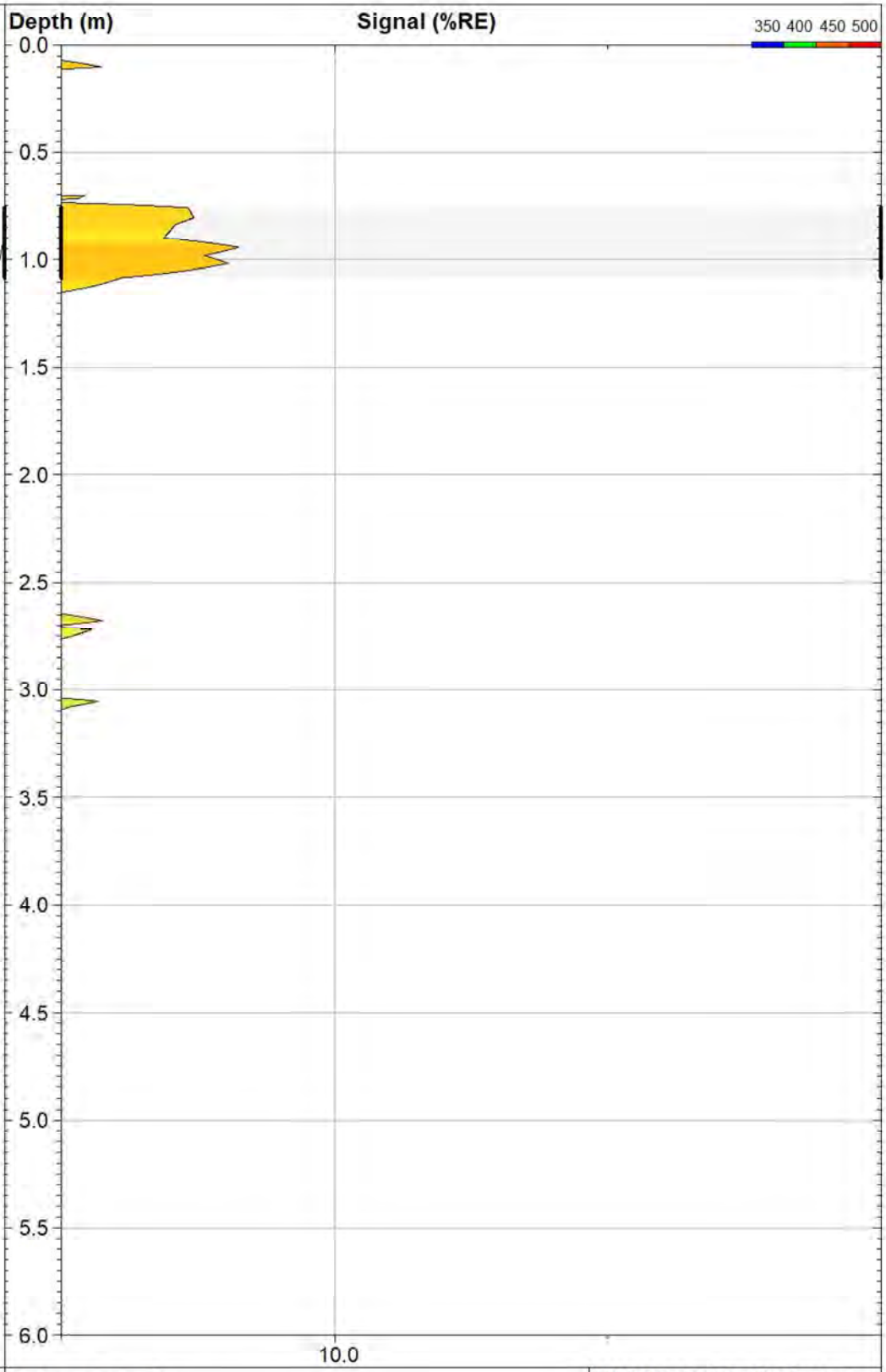
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761508.442 / UTM**	*Final depth:* **3.18 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385826.2931 /**	*Max signal:* **12.0 %RE @ 1.13 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-14 10:08 ADT**

Callouts



0.76 - 1.08 m
4.1 %RE (s 0.9)



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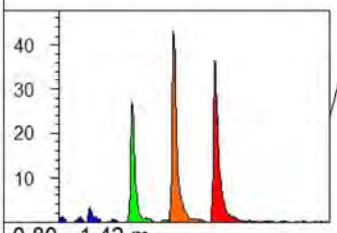
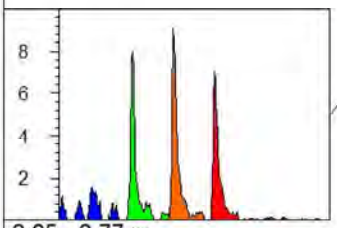
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761509.875 / UTM**	*Final depth:* **3.15 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385802.1726 /**	*Max signal:* **5.5 %RE @ 0.94 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.6 m**	*Date & Time:* **2020-05-14 10:19 ADT**

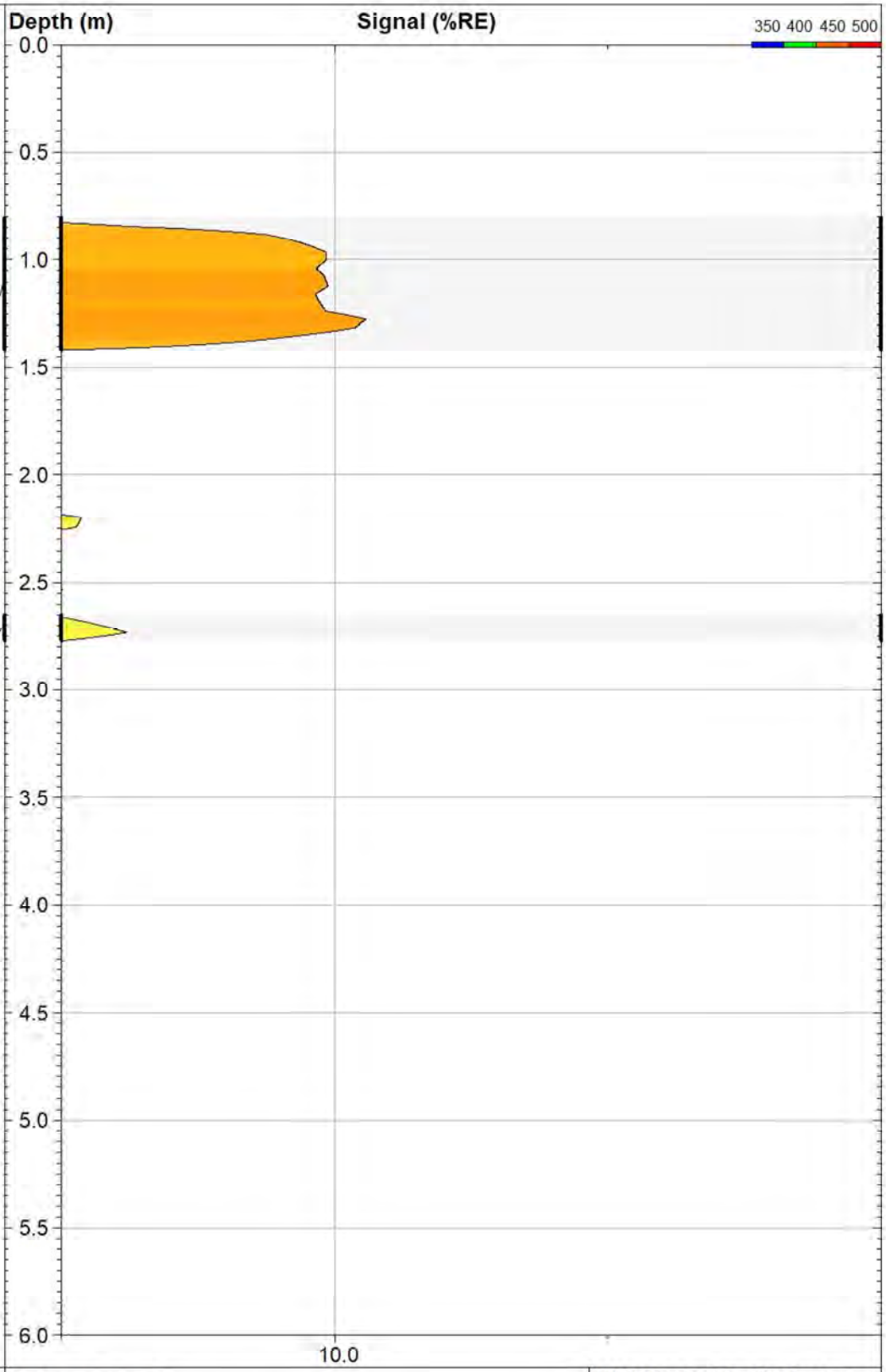
Callouts



0.80 - 1.42 m
8.2 %RE (s 3.8)



2.65 - 2.77 m
2.2 %RE (s 0.5)



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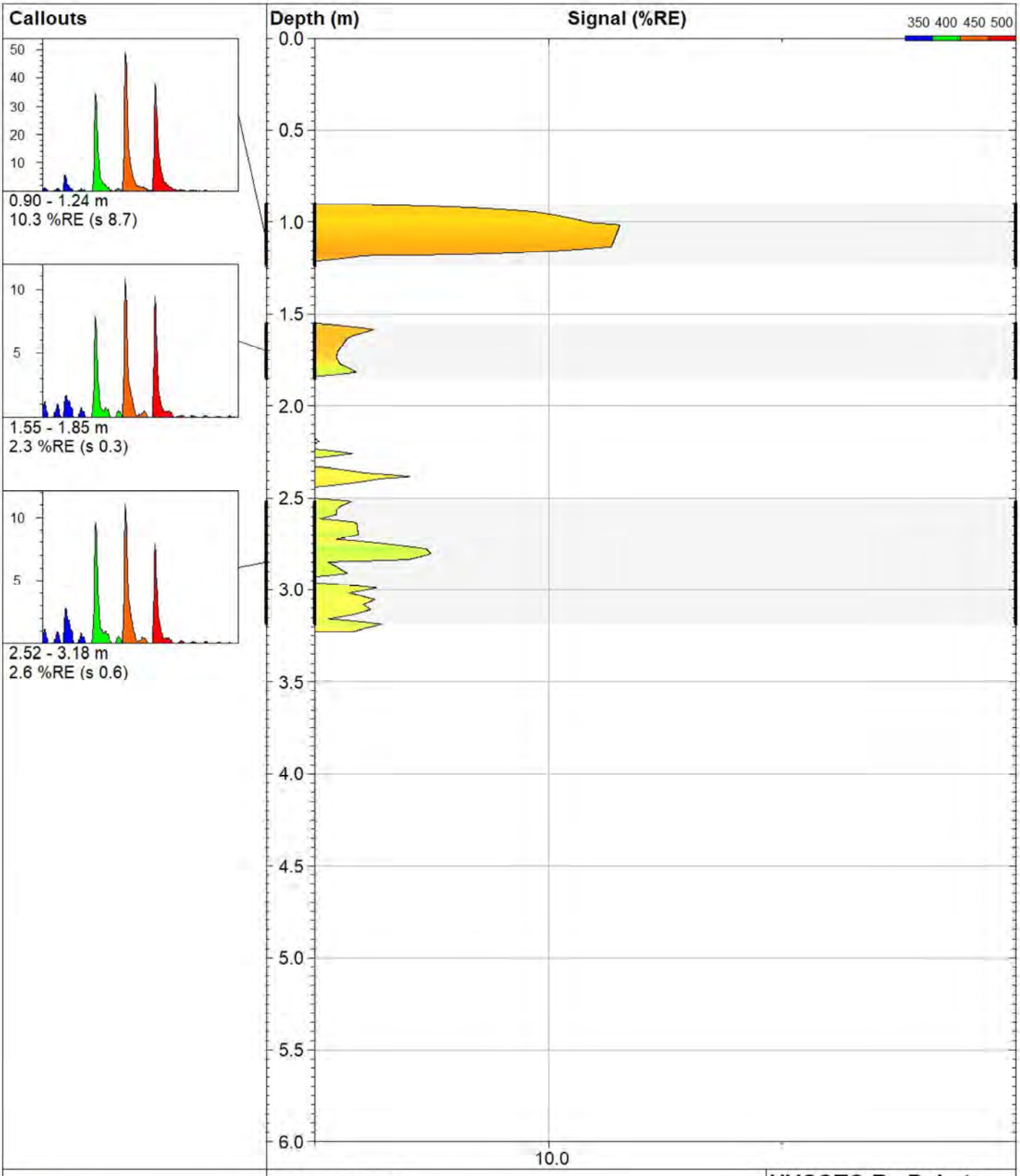
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761509.074 / UTM**	*Final depth:* **3.08 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385779.317 /**	*Max signal:* **14.0 %RE @ 1.27 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-14 10:31 ADT**



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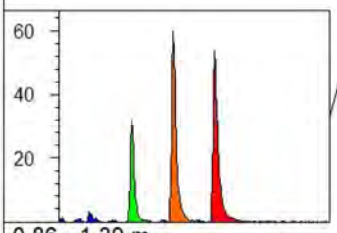
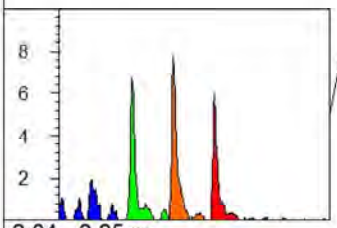
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761510.367 / UTM**	*Final depth:* **3.23 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385758.719 /**	*Max signal:* **21.2 %RE @ 1.02 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.8 m**	*Date & Time:* **2020-05-14 10:46 ADT**

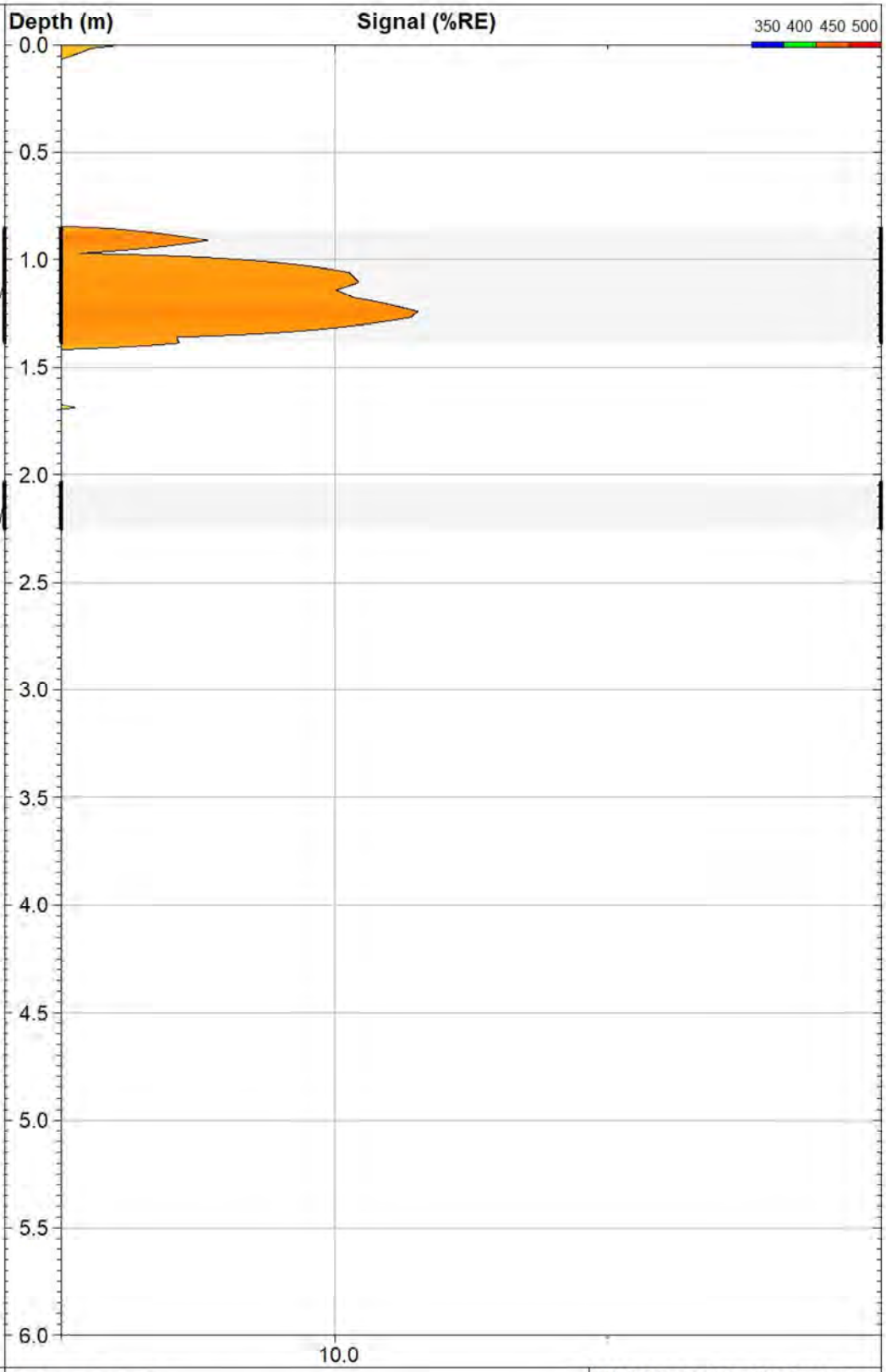
Callouts



0.86 - 1.39 m
9.9 %RE (s 6.6)



2.04 - 2.25 m
1.8 %RE (s 0.1)



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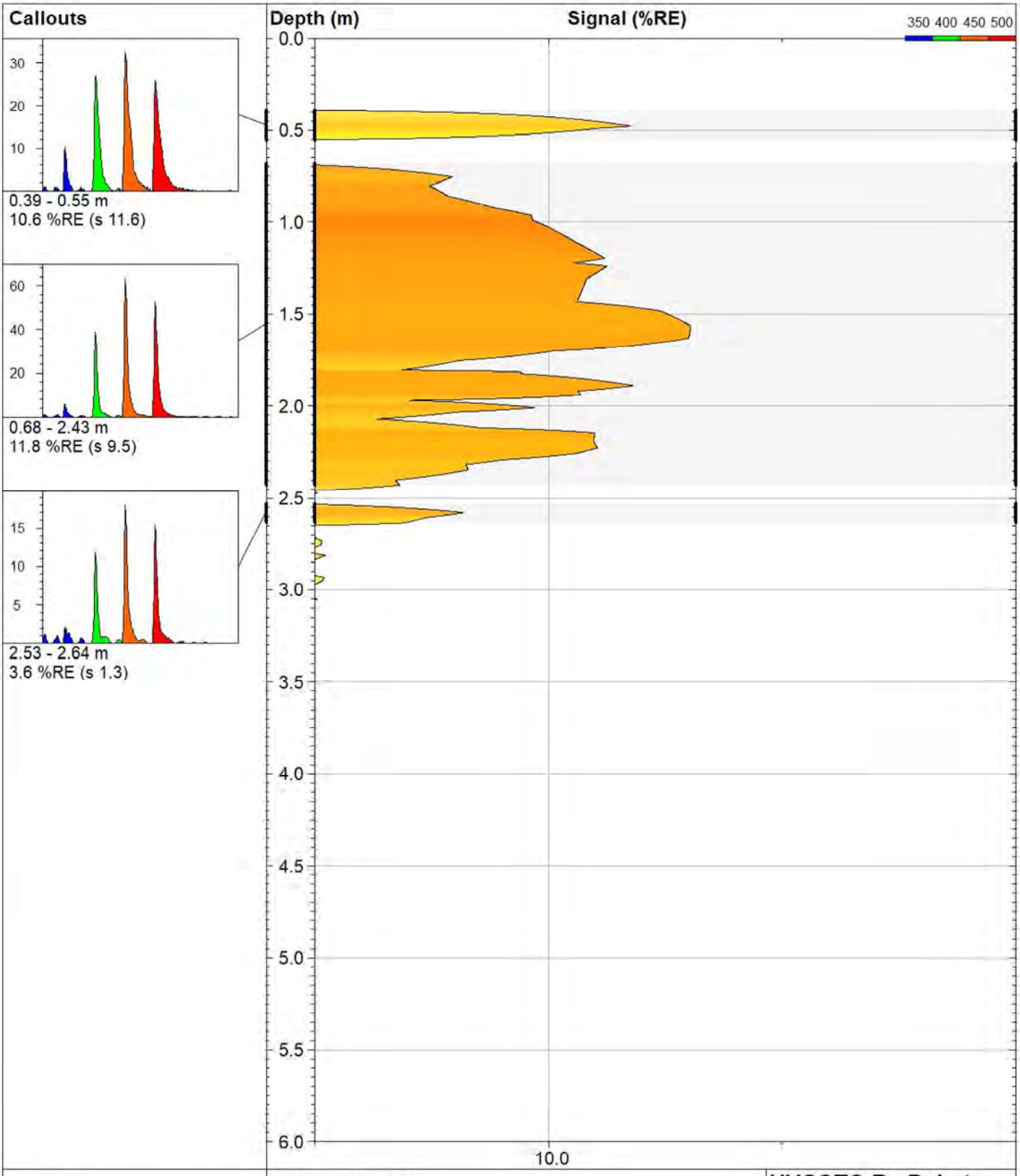
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761510.73 / UTM**	*Final depth:* **3.07 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385746.5476 /**	*Max signal:* **21.1 %RE @ 1.24 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.9 m**	*Date & Time:* **2020-05-14 10:58 ADT**



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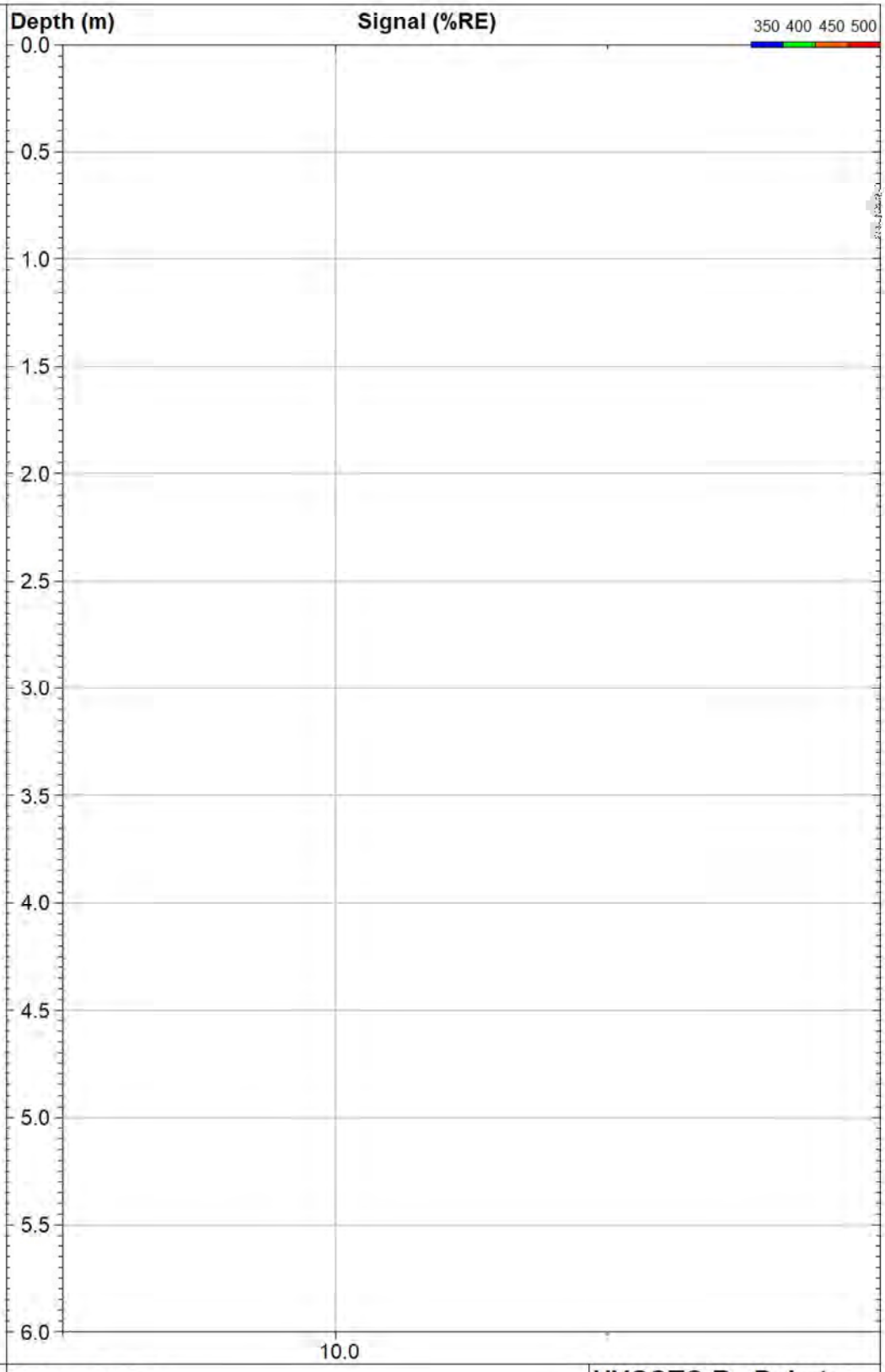
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761512.414 / UTM**	*Final depth:* **3.06 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385727.8461 /**	*Max signal:* **41.6 %RE @ 1.56 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.7 m**	*Date & Time:* **2020-05-14 11:10 ADT**

Callouts



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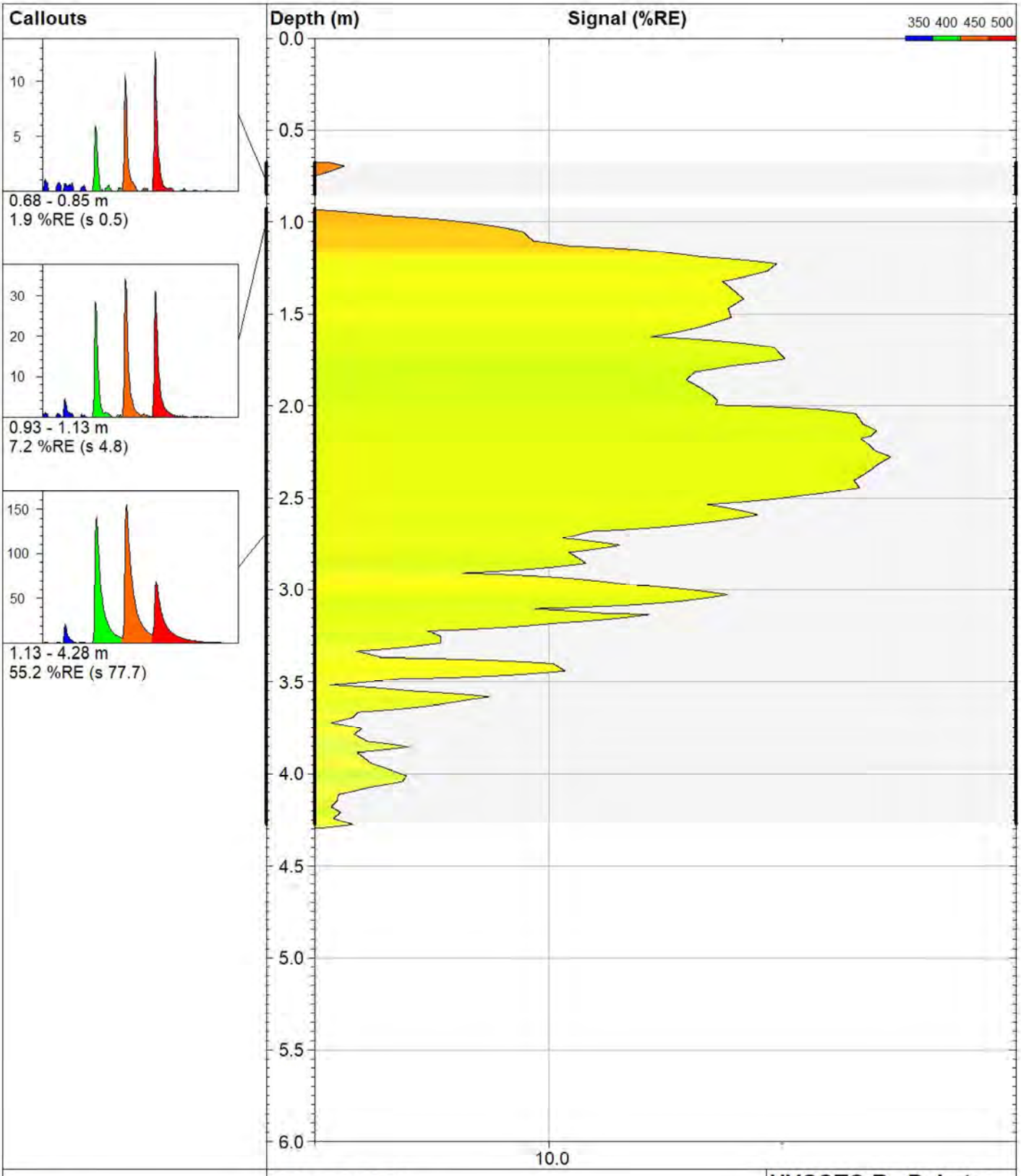
Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761765.494 / UTM**	*Final depth:* **3.11 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385584.9097 /**	*Max signal:* **2.0 %RE @ 1.81 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.2 m**	*Date & Time:* **2020-05-14 11:31 ADT**



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Site: **Canatara Park**	*Y Coord.(Lat-N) / System:* **4761772.018 / UTM**	*Final depth:* **4.29 m**
Client / Job: **RWDI / VE848**	*X Coord.(Lng-E) / Fix:* **385594.9241 /**	*Max signal:* **292.2 %RE @ 2.28 m**
Operator / Unit: **ZS / UVOST1017**	*Elevation:* **178.9 m**	*Date & Time:* **2020-05-14 11:42 ADT**