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GIANT MINE REMEDIATION PROJECT

Review and Update of Arsenic Stope and Chamber Stability Assessments

Submitted to:
Public Works and Government Services Canada
5101 – 50th Ave
P.O. Box 518 Yellowknife, NT
X1A 2N4

Attention: Dave Colbourne

REPORT

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1.0 INTRODUCTION

Giant Mine consists of an inactive gold mine located approximately 5 km north of the centre of Yellowknife, Northwest Territories (see key plan in Figure 1.1). During its operation between 1948 and 1999, the mine produced approximately 7 million ounces of gold. Underground mining was carried out from within a few metres of surface to a maximum depth of approximately 650 m. Approximately 237,000 tonnes of arsenic trioxide dust (dust) produced as waste from roasting gold ore extracted from the Giant Mine Project Site (the Site) was stored underground in mined-out stopes and purpose-built chambers between 1951 and 1999. This dust is hazardous to both people and the environment, and the long-term remediation plan is to freeze the dust. The project is described as the Giant Mine Remediation Project (GMRP).

Remediation plans were outlined in the "Giant Mine Remediation Plan" (RAP, SRK 2007), and implementation of the remediation was described in the "Giant Mine Remediation Project Developer's Assessment Report" (DAR, INAC 2010). Mine geometry information in these reports was forwarded to Golder Associates Ltd. (Golder) in digital form at the start of the preliminary design processes. Other previous underground mine geometry project work by SRK Consulting (Canada) Inc. (SRK) is described in various sections below.

Golder is developing a preliminary design and cost estimate to implement the design concepts associated with underground workings outlined in the RAP and the DAR for Public Works and Government Services Canada (PWGSC). The work is described in the "Underground Preliminary Design Report" (Underground PDR) (Golder 2012a).

A glossary of terms and associated schematic drawings explaining common nomenclature for the underground aspects of the Site is included in Appendix A (Golder 2012a). The following excerpts are most pertinent to this report:

- Stopes: a large underground excavation from which ore was extracted
  - Non-arsenic Stope:
    - These may remain open or are backfilled with classified tailings or occasionally with waste rock.
  - Arsenic Stope:
    - Stopes that were partially filled with arsenic dust.
- Arsenic Chambers: a large underground excavation built specifically to store arsenic dust. They are partially filled with arsenic dust

In order to complete the preliminary design and cost estimate, it was necessary to review and update assessments of arsenic stope and chamber stability. This report presents the results of this work. Golder reviewed the following assessments of arsenic stope and chamber stability as part of this work:

- "Geotechnical Review of Giant Yellowknife Mine" (Golder 1993);
- "Report on Geotechnical Assessment of the #15 Chamber Giant Mine" (Golder 1998);
- "Giant Mine – Geotechnical Assessment" (SRK 2000a); and
- "Crown Pillar Stability Evaluation: Arsenic Trioxide Dust Storage Chambers and Stopes" (SRK 2005a).

SRK 2005a is the last and most comprehensive assessment of the stability of the arsenic stopes and chambers and is the focus of Golder's review. Updates to the stability analyses were executed by Golder when the approach taken in earlier work was deemed inappropriate, insufficient, or unclear as described herein.

New predictions of the probability of failure for the arsenic stopes and chambers are outlined in this report. Changes to the project site risk register are suggested where appropriate. Recommendations to address immediate public and worker health and safety as well as short-term mitigation and monitoring requirements are made by means of an assessment of the likelihood of failure. Future investigations, surveys, and testing to support detailed design studies are outlined in general terms.

Long-term in the context of the discussion is a period of 200 years.

2.0 GEOMETRY OF ARSENIC STOPES AND CHAMBERS

Golder was provided with mine geometry data at the start of the preliminary design and cost estimation project, much of which was in the form of a three-dimensional (3-D) GEMS (Gemcom) model. The accuracy and completeness of all the available mine geometry information available to Golder, a description of two-dimensional (2-D) mine plans and sections, and 3-D models developed from the plans and sections are outlined in technical support documents (Golder 2012b).

Golder's preliminary design work will be developed based on a careful interpretation of the 3-D mine model and other currently available mine geometry and backfill information. However, it will not be possible to verify that the model is a complete, true, and accurate representation of the underground until further work is completed.

Key mine geometry information utilized in the review of arsenic stope and chamber stability includes the items outlined below:

- 3-D models of the arsenic stopes and chambers, nearby underground development openings and non-arsenic stopes; these models were developed using the mine geometry cross-sections and engineered level plans by INAC (Indian and Northern Affairs Canada) and SRK;
- Digitized geology cross-sections that show underground development and stoping; and
- Cavity monitoring surveys (CMS) carried out in the voids at the top of select arsenic stopes and chambers and in some nearby non-arsenic stopes.

Figure 2.1 shows the location of each arsenic stope and chamber and other important underground openings projected to surface.

The arsenic stopes and chambers are shown as red solids in the figures, and the shape shown represents the largest extent of the opening. There are a total of 15 arsenic stopes and chambers, but one of these (arsenic Chamber B-15) was never filled with dust.

Stopes containing arsenic include C2-12, B2-08, and B2-12/13/14. The latter stope was previously described as three separate stopes, but current information suggests they are connected and are assessed as one arsenic stope. This has not been verified to date. The remaining arsenic-containing openings are purpose-built chambers excavated in waste rock (i.e., no gold ore was produced). The tops of the arsenic stopes range in elevation from as little as 3 m from the bedrock/overburden contact (arsenic Stope B2-12/13/14 as discussed later in this report) to a typical maximum depth of 75 m below surface.

Additional detail on the geometry of the arsenic stopes and chambers and the estimated position of the dust in each is outlined in Golder technical support documents (Golder 2012b).

The 3-D geometry models of the arsenic stopes and chambers are suitably accurate for the purposes of this preliminary stability assessment, but some errors and omissions exist and that must be taken into account. For example, mine plans, sections, and anecdotal evidence suggests that arsenic Stopes B2-12, B2-13, and B2-14 are no longer separated by the pillars indicated on mine plans and should be considered as one opening for the purposes of stability assessment. The 3-D models of nearby development openings and non-arsenic stopes are less accurate and complete than those for the arsenic stopes and chambers. Golder made some updates to the 3-D model where required for assessment of stability of critical elements.

Appendix B contains a set of various section views of the arsenic stopes and chambers that were developed using the updated 3-D model (Golder 2012b). The sections are in metric units and were used to develop assumptions for arsenic stope and chamber geometry used in the stability assessment. These sections contain the following information:

- Current topography (surface);
- Sections of all 3-D mine geometry entities;
- The estimated position of the open pits prior to any backfilling;
- The position of historical surface exploration boreholes and the amount of overburden present in the logging database;
- The estimated overburden/bedrock contact; and
- Geotechnical data from SRK's 2004 (SRK 2005b) boreholes (described in more detail later).

These sections are termed oblique sections because they differ from, and were cut oblique to, the standard Giant Mine geology sections, which were spaced 25 ft. apart on a fixed orientation. SRK used the geology sections, and the limited version of the 3-D model that existed in 2005, to derive mine geometry information for its stability analysis. The sections used by Golder and included in Appendix B were cut both perpendicular and parallel to the long axis of the arsenic stopes and chambers so direct measurements of the span could be made.

Table 2.1 summarizes the range of geometry of each arsenic stope and chamber derived from the 3-D model. Additional geometric details, including crown pillar thickness and hydraulic radii, are summarized later in the report.

These dimensions have been used in the stability analyses carried out by Golder, which are presented later in this report.

SRK summarized arsenic stope and chamber sizes derived from geology cross-sections and models used in their initial assessment of all arsenic stopes and chambers. Golder's updated assessment (Table 2.1) yielded generally smaller stope sizes, in particular stope back span (width). SRK updated the arsenic stope and geometry estimates after an investigation of select openings was carried out. Differences between the opening geometry values ultimately used by SRK in its stability assessments and the values derived by Golder (Table 2.1) for the updated crown pillar stability assessments are outlined in Table 7.4, which is described in detail in Section 7.3.

Table 2.1: Range of Geometry of Arsenic Stopes and Chambers

AREA	Arsenic Stope or Chamber	Opening Vertical Height (m)			Opening Span (m)			Opening Length Along Strike (m)			Opening Dip (deg)
		Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	
AR1	B11	20	20	20	13	13	13	38	38	38	90
	B12	33	33	33	13	14	13	62	62	62	90
	B14	22	22	22	11	13	13	54	54	54	90
	B15	31	31	31	13	15	14	60	60	60	90
AR2	B9	47	52	51	9	11	11	30	30	30	90
	B10	39	55	52	3	8	6	26	26	26	90
	C2-12	30	50	45	4	11	8	48	92	80	75
AR3	B2-08	10	42	40	10	23	15	50	65	58	80
	B2-30	16	20	18	3	7	6	22	22	22	90
	B2-33	34	44	40	6	8	8	34	34	34	90
	B2-34	41	44	43	7	10	8	34	34	34	90
	B2-35	42	48	45	10	12	11	35	35	35	90
	B2-36	42	48	45	7	12	10	35	35	35	90
	B2-35/B2-36	45	45	45	29	29	29	35	35	35	90
AR4	B2-12	58	58	58	6	16	11	55	55	55	70
	B2-13	24	35	30	18	22	20	23	23	23	61
	B2-14	24	25	25	23	27	25	22	22	22	90
	B2-13 / B2-14	23	23	23	18	27	22	45	45	45	80
	Combined B2-12, B2-13, B2-14 Back	42	42	42	12	20	17	100	100	100	70

3.0 GEOLOGY

The geology of the Giant Mine has been discussed in several project-related documents (INAC 2010; Golder 2012a, c, d, and e; SRK 2002), and the information presented in this section is summarized from these. The geotechnical investigation considered the surface bedrock geology of the site based on the "Royal Oak Mines, Regional Geology Plan" (Royal Oak 1995) that was provided to Golder by PWGSC as shown in Figure 3.1.

The Site is bounded by a series of major Proterozoic faults and lies within altered volcanic rocks of the north-trending Yellowknife Greenstone Belt. The two main bounding faults near the mine are the West Bay fault, which bounds the Giant Mine site to the west, and the Akaitcho fault, which bounds the mine site to the east. The volcanic rocks are bounded to the west by granodioritic plutonic rocks that are in fault contact, and bounded to the east by unconformably overlying sedimentary rocks along the shoreline of Yellowknife Bay.

The gold mineralization historically mined at the Site was hosted within a major brittle-ductile shear that crosscuts massive and pillowed mafic volcanic rocks (basalt) that are variably altered to chlorite schist. The basalt represents the majority of the rocks in the project area, with metamorphic sediments, volcanic tuffs, and diabase dikes comprising minority lithologies. The basalt has been altered to greenstone through chloritization of the original basalt.

The underground stoping targeted gold-bearing quartz-carbonate-sericite schist zones located within the main shear zone noted in Figure 3.1. The Giant Yellowknife Mines Ltd. 2-D geology sections show lithological changes, detailed information on the distribution of ore grade, and an approximation of underground mine geometry. The 2-D geology sections are not included with this report as they remain in Imperial units, but they were used in the stability assessment.

The chlorite and sericite altered rocks associated with the periphery of the mineralized bodies (e.g., the arsenic stope walls) can lose strength over the long term when subjected to freeze-thaw action and changes in water content. This will have a degrading effect on the backs and walls of the arsenic stopes over the long term. It is expected that the long-term degradation of strength in the arsenic chambers will be less pronounced than predicted for the arsenic stopes.

Figures 3.2 and 3.3 show an estimation of the distribution of rock type on the 1st and 2nd levels, respectively, in the arsenic remediation (AR) areas. These figures were developed from Royal Oak digital level plan geology drawings provided by PWGSC. Geotechnical investigation boreholes drilled by SRK (2005a) are also shown and the data collected is discussed in Section 4.0.

3.1 Major Structure

Previous workers developed structural geology models for the project (SRK 2002). They developed a series of lithostructural domains that exhibit similar structural characteristics and dominant rock types (Figure 3.4). Major faults, including the major bounding faults in the area noted above, are also shown in Figure 3.4. The arsenic stopes and chambers are all located in lithostructural domain 4, and the characteristics of rock structures in this zone described by SRK are as follows:

- "Domain 4 hosts the arsenic chambers and much of the ore sequence in the Giant mine. The dominant fault directions here are parallel to the volcanic stratigraphy and the penetrative tectonic fabric that encloses the ore. This NNE-SSW trend also dominates in Domain 7, where the penetrative fabrics associated with the mineralization are also well-developed. The NNW-SSE trend is therefore interpreted to have been strongly controlled by the orientation of the pre-existing fabrics and the deformed stratigraphy."

AutoCAD geology files provided by PWGSC also contained layers that made reference to structural geology work by Kirkham (reference unknown). The Kirkham geology information suggested that the only major structure that may be present in the arsenic remediation areas is the Ole Fault (shown north of arsenic Chambers B12 and B15; see Figure 3.2). Although not shown in Figure 3.2, the Kirkham information suggested that the Ole Fault might intersect arsenic Chamber 15. Arsenic Chamber B15 experienced substantial water inflows in the spring after it was excavated, possibly resulting from the presence of this nearby fault, and arsenic dust was never placed in it (i.e., it is empty).

3.2 Rock Mass Fabric

The rock mass fabric in the area is parallel to the volcanic stratigraphy and the folded foliation that encloses the ore as described above. Therefore, the dominant structural trend will be parallel to the trend of the ore in any particular area. Northwest–southeast-trending steeply dipping structures were also observed by SRK (2000a). Structural mapping carried out by Golder (Golder 2011a) suggests similar rock mass fabric. Key observations include the following:

- The dominant structure is the foliation, which trends roughly towards 015°. The foliation dipped steeply to the east in AR2, steeply to the west in AR3, and moderately west near arsenic Stope B2-12/13/14 in AR4.
- Moderately, south, northeast, east, west, and northwest dipping joint sets were observed in AR2.
- Shallow east, southeast, and north dipping sets were observed in upper AR4, which is interpreted to be near a fold nose where foliation structures will be shallow.

3.3 Overburden/Bedrock Contact

The surface conditions vary considerably between the various locations above the arsenic-filled chambers and stopes, ranging from boggy to bedrock outcrops. Current conditions are generally dominated by either bedrock or fill material, with the original vegetative cover and organic layer having generally been stripped. The surficial deposits that are present above some of the arsenic filled chambers and stopes consist primarily of clay and silt with some sand and gravel. These deposits reach a thickness of 32 m in some areas as described in the DAR.

Because overburden soils are not considered in the estimate of crown pillar strength, the position of the overburden/bedrock contact is a critical input to assessment of the geometry of the rock crown pillar, specifically thickness.

The overburden/bedrock contact is often sketched on the Giant Yellowknife Mines Ltd. 2-D geology sections, and this information was often used to determine the geometry (thickness) of the rock crown pillar. In some cases, the overburden/bedrock contact delineated in the geology section appears to have been based on drilling information, but in others it is not. In some cases, the section does not include an estimate or interpretation of the position of the overburden/bedrock contact.

The existing historical drillhole database was used to develop 3-D overburden/bedrock contact surfaces near the arsenic stopes and chambers for the purposes of this stability assessment update. These new surfaces are shown in the cross-sections contained in Appendix B. The updated crown pillar geometry derived from the new 3-D bedrock/overburden surface will be used in detailed stability assessments described later.

Assessment of these data has led to some differences in the assumed thickness of the crown pillar in previous stability assessments relative to those assumed in this report. In particular, the estimation of the crown pillar thickness for the following arsenic stopes varies markedly:

- B2-08 Golder update = 8.0 m; previous assumption = 12.2 m
- B2-12 Golder update = 4.5 m; previous assumption = 10.4 m

The position of the bedrock/overburden contact was not confirmed or investigated for the purposes of this review. Improvements in the confidence of the probability of failure presented later in the report would require a geotechnical investigation.

3.4 In Situ Stress

In situ stress testing was carried out in deep (1,065 m and 1,735 m below surface) portions of the nearby Con Mine (INTERA 1997). These tests suggested that the major principal stress (σ_1) is sub-horizontal and is oriented east–west, the intermediate principal stress (σ_2) is sub-horizontal and is oriented north–south, and the minor principal stress (σ_3) is near vertical. The ratio of σ_1 / σ_3 measured ranged from 1.5 to 2, and the ratio of σ_2 / σ_3 ranged from 1.1 to 1.4. It is unknown if these deep stress testing results at Con Mine reflect conditions in the shallow regions of the Site as no stress testing has been carried out there. The data suggests that crustal stress conditions near Yellowknife are similar to those encountered elsewhere in the Canadian Shield and shallow stress conditions observed in other regions can be applied to the Site.

3.5 Hydrogeology

The mine water is currently maintained at the bottom of 750 level (5th level), which is approximately 240 m deep. The stability assessments presented herein assume that the water level will remain constant during the remediation period. At some point in the future, after the remediation is complete, the mine will be allowed to flood to the base of the deepest open pit.

4.0 MINING METHODS AND BACKFILLING

During its operation between 1948 and 1999, the mine produced approximately 7 million ounces of gold.

Early mining was dominated by shrink-stoping methods and some cut-and-fill stoping (Giant 1968). The mine was mechanized in the late 1960s and ramp development was used to carry out primarily mechanized cut-and-fill stoping. Room-and-pillar mining was also encountered during Golder's underground inspections. Underground stoping was carried out from within a few metres of surface to a maximum depth of approximately 650 m.

Records on stope backfilling are rare and/or have not yet been gleaned from the existing extensive historical geology and engineering drawing database present in digital format or at the mine site itself in paper or linen format. Most cut-and-fill and room-and-pillar stopes inspected were filled with classified tailings (sand) to within 3 m to 5 m from the stope back, with an open void remaining on top of the sand fill (i.e., the back is not supported). Although not observed during Golder's inspections, fill barricades, likely made of waste rock or wood, were used to keep classified sand tailings in the stopes. Shrink and longhole stopes may be partially filled but many likely remain as open voids.

Initial development of the historical mine was carried out by driving drifts and crosscuts 2.4 m by 2.4 m in size up to the late 1960s. Mechanized drifts were typically excavated with dimensions 4.0 m wide by 3.5 m high. The existing accessible development is supported with a mix of different ground support types due to historical practices when the openings were first excavated. Most of the openings excavated for the tracked mining style in place when the mine opened were small (2.4 m by 2.4 m), and the backs were spot bolted with mechanical end-anchored rock bolts. Recent mechanized development openings were larger (4.0 m wide by 3.5 m high), and backs were spot bolted using mechanical end-anchored rock bolts, though in some places the rock bolting was systematic. The backs of the cut-and-fill and room-and-pillar stopes inspected by Golder were typically systematically supported by mechanical end-anchored rock bolts (length unknown).

The arsenic stopes and chambers were excavated using a mixture of shrink cut-and-fill and longhole open stoping mining methods prior to filling with dust. The excavation methods depended on the most common mining practices at the time the stopes were excavated.

Examination of historical level plans and recently interpreted 3-D mine geometry for the arsenic stopes and chambers suggest the following mining methods were employed to mine the various arsenic stopes and chambers:

- Shrink stoping
  - Arsenic Stope B2-12/13/14 (some longhole drawpoint pillar recovery at end of mining shown)
  - Arsenic Chambers B2-30, B2-33, B2-34, B2-35, B2-36
- Cut-and-fill stoping
  - Arsenic Stope C2-12

- Longhole stoping
  - Arsenic Stope B2-08
  - Arsenic Chambers B9 and B10
  - Arsenic Chambers B11, B12, B13, B14, and B15.

Blast damage to the rock walls of the openings would tend to be the least for shrink stoping, where relatively small blasts at the top stope (crown pillar) are used, and the most for longhole methods. It is unlikely that any ground support was utilized in the mining of the arsenic stopes and chambers, although a bolting plan does exist for the rib pillar between arsenic Chambers B235 and B236.

5.0 GEOTECHNICAL CHARACTERIZATION

Golder's underground geotechnical mapping data and geological inspection (Golder 2011a) combined with previous work by SRK suggests the following general geomechanical domains are present:

- The ore, and to some extent the inner portion of the sericite altered shear zone that envelopes the ore, can be described as very strong massive rock. The crown pillars over the arsenic stopes are in this domain.
- The immediate hanging wall and footwall of the stopes are composed of the outer portion of the sericite altered shear zone that envelopes the ore zones and the chlorite altered shear zone and can be described as strong foliated and blocky rock.
- The distal hanging wall and footwall is composed of mafic volcanic country rocks described as very strong massive rock.

SRK 2005a contains a detailed description of a geotechnical drilling and core logging program conducted to collect information on the rock forming key pillars near the arsenic stopes and chambers. These boreholes are shown superimposed on the geology level plans in Figures 3.2 and 3.3. Note that the entire borehole trace is shown and the location of the intersection with the particular level in each figure is not shown.

The locations of the boreholes drilled to investigate arsenic Stope C2-12, arsenic Stope B2-08, arsenic Stope B2-12/13/14, and arsenic Chambers B2-235/236 and B2-33 are shown in Figures 5.1, 5.2, 5.3, and 5.4 respectively. The rock mass quality values shown plotted on the borehole traces are described later in Section 5.2.

5.1 Intact Rock Strength

SRK (2005a) logged intact rock strength in the investigation boreholes according to the International Society of Rock Mechanics (ISRM) method (ISRM 1981) as outlined in Table 5.1.

Ranges and typical intact rock strength logged for various geotechnical domains at each arsenic stope or chamber targeted during the 2004 investigation are outlined in Table 5.2.

Table 5.1: ISRM Range of Uniaxial Compressive Strength for R Grades

Grade	Description	Field Identification	Approx. Range of Uniaxial Compressive Strength MPa and (psi)
R0	Extremely weak rock	Indented by thumbnail	0.25 to 1.0
R1	Very weak rock	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	1.0 to 5.0
R2	Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	5.0 to 25
R3	Medium strong rock	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	25 to 50
R4	Strong rock	Specimen requires more than one blow of geological hammer to fracture it	50 to 100
R5	Very strong rock	Specimen requires many blows of geological hammer to fracture it	100 to 250
R6	Extremely strong rock	Specimen can only be chipped with geological hammer	>250

Table 5.2: Range and Typical Intact Rock Strength for 2004 Investigation

Arsenic Stope or Chamber and Geotechnical Domain	Range of Intact Rock Strength Logged	Typical Rock Strength Logged
C2-12 crown	R2 to R5/R6	R4
C2-12 immediate HW*	R3 to R5	R4/R5
C2-12 distal HW*	R4 to R5/R6	R5
B2-08 crown	R2 to R4	R3
B2-08 immediate HW*	R2 to R4	R3/R4
B2-08 distal HW*	R3 to R5	R3/R4
B2-12 crown	R2 to R5	R4
B2-13 crown	R2 to R5	R4
B2-14 crown	R2 to R5	R4
Combined B2-12, B2-13, B2-14 crown	R2 to R5	R4
B2-35/2-36 crown	R2 to R5/R6	R4/R5
B2-35/2-36 rib pillar	R2 to R5/R6	R4
B2-33 crown	R3/R4 to R5	R4
All holes in waste	R2 to R5/R6	R4/R5

*Note: The immediate hanging wall (HW) is defined to be within 10 m of the ore/waste contact perpendicular to true-dip, with the distal hanging wall behind this distance. The range of uniaxial compressive strength values for the ISRM R values outlined in Table 5.2 are shown in Table 5.1.

5.2 Rock Mass Quality

Barton (1974) developed a relationship between rock mass quality (Q), opening size and support requirements. Input to the relationship includes the opening's dimensions, the estimated rock quality, and the predicted effect of mining-induced stress (through adjustments to the stress reduction factor [SRF]). The equation used to determine the Q is as follows:

$$Q = \left(\frac{RQD}{Jn}\right) x \left(\frac{Jr}{Ja}\right) x \left(\frac{Jw}{SRF}\right) \quad (5.1)$$

Where:

RQD is the Rock Quality Designation

Jn is the Joint Set Number

Jr is the Joint Roughness Number

Ja is the Joint Alteration Number

Jw is the Joint Water Reduction Factor

The final two parameters, Jw and SRF, are related to water and ground stress respectively and are typically included when completing engineering design calculations. When these parameters are omittedfrom the description, the rock mass quality is referred to as Q'.

Golder re-calculated Q' (Barton 1974) and Rock Mass Rating (RMR_{B76}) (Bieniawski 1976) from the raw SRK geotechnical core logging database (Golder 2011b). Concerns regarding the Q values used in the SRK (2005b) stability analyses included the following:

- Observations of the rock mass underground influenced, to some degree, the core logging methodology carried out by SRK. Specifically, SRK did not believe foliation parallel discontinuities strongly influenced stability of the arsenic stopes and chambers, and therefore neglected many of them in the logging. Golder attempted to remove this bias from the core logging using similar observations during post-processing. Some key parameters were re-logged using core photographs.
- Rock mass classification values (e.g., Q and RMR_{L90}) derived from the core logging data influenced, but were not directly correlated to, the equivalent parameters used as stability analysis input. Golder used statistical distributions of re-calculated rock mass quality values as direct input into the stability analyses.
- Q' values were quoted in SRK 2005b, but there was a lack of clarity on how they were derived. Golder re-calculated, as well as possible, RMR_{B76} and Q' values directly from the raw core logging data and compiled a detailed document outlining the methodology used (Golder 2011b).

The re-calculated Q' values are shown on the borehole traces in Figures 5.1 through 5.4 for the SRK borehole geotechnical data. These data are also shown in the oblique cross-sections included in Appendix B.

The distribution of recalculated Q' values for each area targeted in the investigation is shown in Figures 5.5 to 5.10. The figures show the following:

- The Cumulative distribution of Q' in the updated borehole database for a particular area near a particular arsenic stope (e.g., crown pillar, immediate hanging wall);
- SRK's Q' values used in stability assessment (SRK 2005b);
- Golder's underground geotechnical mapping; and
- The estimated distribution of intact rock strength derived from the borehole database.

Table 5.3 summarizes the distribution of rock mass quality synthesized by Golder from the 2004 arsenic chamber geotechnical drilling database and the range of values outlined by SRK.

Table 5.3: Range of Rock Mass Quality (Q') Values Derived by Golder and SRK from 2004 Investigation Data

Arsenic Stope or Chamber and Area	SRK Range of Q'	SRK Range of Q	Golder Range of Q' and Q		
			Q' 20%	Q' 50%	Q' 80%
C2-12 Crown	18.9 to 52.8	7.6 to 21.3	8	30	65
C2-12 Immediate HW*	n/a	n/a	15	40	100
C2-12 Distal HW*	n/a	n/a	17	35	90
B2-08 Crown	4.3 to 11.3	4.3 to 11.3	5.5	12	30
B2-08 Immediate HW*	n/a	n/a	5	10	50
B2-08 Distal HW*	n/a	n/a	8	12	40
B2-12 Crown	17.8 to 45	7.1 to 18	6	15	35
B2-13 Crown	7.6 to 19	7.6 to 19	4.5	12	25
B2-14 Crown	16.7 to 45	6.7 to 18	6	25	65
Combined B2-12, B2-13, B2-14 Crown	16.7 to 45	6.7 to 18	5.5	16.5	38
B2-35/2-36 Crown	18.9 to 47.5	7.6 to 19	8	13	22
B2-35/2-36 Rib Pillar	n/a	n/a	5	8	18
B2-33 Crown	n/a	n/a	10	17	25
All Holes in Waste	n/a	n/a	7.5	14	23

*Note: The immediate HW is defined to be within 10 m of the ore / waste contact perpendicular to true-dip, with the distal HW behind this distance.

n/a = not available, was not provide.

The Q' values developed by Golder are generally less than SRK's (2005b). This difference will be reflected in the empirical assessment of open span stability described later in the report as Q' values are used as input.

The empirical crown pillar stability assessment, used by both Golder and SRK, employed the full Q value as input to the assessment. SRK assumed an SRF of 2.5 in the calculation of Q to reflect low-stress, near-surface conditions that often promote instability (see equation 5.1). Golder observed few open fractures in multiple openings near the arsenic stopes and chambers and has followed Barton's advice that an SRF of 2.5 is valid only when open fractures are observed. Golder assumed an SRF value of 1.0 for all calculations of Q where required to assess the current stability of the arsenic stopes and chambers.

Since the mine water has been depressurised by drawing the water table down to the 750 Level, a Jw value of 1.0 was assumed for all calculations of Q by both Golder and SRK. This assumption may not be valid for areas subjected to future mine flooding.

Given the assumptions used for SRF and Jw, all values of Q' presented in Table 5.2 are equal to the Q values used in stability calculations carried out by Golder outlined below. The Q values reported by SRK reflect the lower end of those developed by Golder (Table 5.2). SRK's maximum Q values are similar to the Golder 50th percentile Q values and their minimum values are similar to the Golder 20th percentile Q.

The distribution of rock quality is not uniform throughout any one pillar, and the minimal rock quality reported could dominate stability depending on the failure mechanism present as noted by SRK. However, Golder will focus on the median (Q 50%) values when summarizing conclusions from the stability assessment.

5.3 Rock Structure

The dominant rock fabric described in Section 4.2 will control kinematic stability issues. In particular, foliation parallel structures appear to dominate wedge formation near the ore zones. Structures of high persistence (up to 10 m) parallel to the orientation of the hanging wall of the arsenic stopes were visible nearby. These structures are anticipated to dominate arsenic stope hanging wall and footwall stability given the low ratio of ground stress to intact rock strength.

It was reported in SRK 2000b that in the chlorite schist, joints and fractures rarely exist in more than one or two regular sets. They are commonly curved and discontinuous. Mine workings in this unit typically require limited ground support. The sericite schist, on the other hand, appears to coincide with regions where wedge failure has occurred in the backs, and more effort is required to stabilize the drifts. These areas are characterized by at least three pervasive joint sets.

6.0 OBSERVED GROUND CONDITIONS

Golder carried out underground inspections in October 2010 and February 2011. In general, the rock exposed in accessible openings near all arsenic stopes and chambers showed no sign of stress-induced spalling or fracturing, and few open discontinuities were observed. These observations suggest that neither excessively high nor low ground stresses that would tend to promote instability are present. An observation in near-surface non-arsenic stopes suggest that time dependant degradation of the rock is minimal, but does occur. Slabs were noted to have spalled off the back and walls of some stopes, but the deterioration is minimal and is likely to have occurred over the last 10 to 15 years. Rock that includes micaceous minerals, including chlorite and sericite, which is present at the Site has shown a tendency to degrade over the long term when exposed to changing atmospheric (ventilation), temperature (freeze-thaw), and groundwater (percolation in spring) conditions.

Borehole videos collected during cavity monitoring efforts by SRK in 2004 show some information pertinent to ground conditions in the crown pillars of the arsenic stopes and chambers. The following observations of the video data were made:

- Borehole C212-2: solid rock with no discontinuities observed, slightly jagged breakthrough into stope back, solid rock wall (uncertain which wall) visible, dust visible about 5 m below breakthrough and no loose fallen rock observed on dust.
- Borehole B208-1: generally solid rock, no open cracks observed, some jagged rock at entry to stope, dust position approximately 1.5 to 2.0 m below stope back, no loose or fallen rock was observed on the surface of the dust.
- Borehole B208-2a: open moderately dipping discontinuity encountered; ice was apparently encountered in this hole and hot water was poured down to clear it.
- Borehole B208-2b: some open discontinuities observed prior to breakthrough into stope; large block detached from the back and visible lying on dust / east upper wall of the stope.
- Borehole B212-1: solid rock prior to breakthrough with slightly jagged back, dust visible 1 m below breakthrough.
- Borehole B212-3: solid rock prior to breakthrough with slightly jagged back, dust visible 2 m below breakthrough.
- Borehole B212-4a, b, and c: large open discontinuities observed prior to top of stope, some loose open rock visible in the top of the stope but no loose fallen rock visible in the dust 2 m below top of stope.
- Borehole B213-1: solid rock prior to breakthrough with slightly jagged back, dust visible 0.5 m below breakthrough; possibly some loose on the floor or wall rock visible.
- Borehole B214-1: open joints observed above stope back, rubble in borehole at breakthrough, dust not visible.
- Borehole B214-3: solid rock prior to breakthrough with slightly jagged back, dust visible 3 to 4 m below breakthrough.
- Borehole B214-5: open joints observed above stope back, jagged at stope breakthrough; large loose block that appears to be wall slough observed in the stope laying on dust.

Borehole videos B214-1 and B214-5 both suggest some back and wall instability in arsenic Stope B2-14, but the extent of it cannot be determined from this information. However, the borehole videos broadly present a picture similar to that gathered from Golder's underground observations.

No obvious evidence of crown pillar failure has been observed in exposure rock in B1 pit or in nearby underground openings. However, there is some evidence suggesting that crown pillar above arsenic Stope B2-12/13/14 has exhibited some deformation. This includes the following:

- Comparison of a level survey carried out on the B1 pit access road in 2011 and contours derived from air photos taken in 2003 suggests up to 1.0 m of subsidence within the zone outlined in Figure 2.1 over the last 8 years. This road is on soil backfill placed in the pit.
- Surface soil cracking observed well back from the crest of B1 pit could be related to subsidence of the crown pillar. The locations of these tension cracks are shown in Figure 8.3, which is described later. The surface cracks shown in Figures 8.3 and 8.4 above arsenic Stope B2-08 are thought to be related to movement of overburden slopes towards B1 open pit.
- Spalling of rock from the walls was observed in the B2-12/13/14 upper arsenic drift that could indicate changing ground stresses (and possible movement) in the nearby crown pillar. It was also reported that this drift was subjected to recent scaling effort that would remove some of this potential evidence.
- There is very little space between the back of the stope and the dust (possibly indicative of local back sag) in a borehole drilled in 2004 into the top of arsenic Stope B2-13.
- Recent surveying of prisms placed on surface above the crown pillars of arsenic Stopes B2-12/13/14 and B2-08 do show some movement that may be attributed to the crown pillars, but the dataset is too small to confirm that conclusion at this time.

Confirmation that these observations and surveys represent a failing crown pillar has not been made. For example, confirmation that the survey base station is fixed has not been obtained, and survey pins on bedrock have not been established in the area.

7.0 STABILITY ASSESSMENT UPDATE

Golder reviewed SRK's (2005b) approach to the stability assessment and determined certain aspects required revisiting. Golder carried out underground inspection of the rock as near as safely possible to the arsenic stopes and chambers. For reasons described below, Golder has revisited the stability assessments using its own updated interpretation of the input parameters. The intact rock strength and rock mass quality values outlined in Tables 5.2 and 5.3 have been used as input to the stability assessments. This will include making use of the statistical distribution of rock mass quality developed.

The stability assessment described in SRK 2005b included the following approaches:

- Assessment of the stability of the open spans of the all the arsenic stopes and chambers using the stability graph empirical methods proposed by Laubscher and Potvin (Laubscher 1990; Potvin et al. 1989);
- Assessment of stability of the crown pillars of all the arsenic stopes and chambers using the empirical scaled span approach (Carter 1992; Carter et al. 2008); and
- Numerical stress analyses of the narrow rib pillar between arsenic Chambers B2-35 and B2-36.

Golder's preferred empirical approach to stability assessment includes using stability graph methods similar to those employed by SRK, but also includes the similar Mathews-type approach (Golder 1981; Stewart and Forsyth 1995) and the scaled span approach to assess crown pillar stability.

More detailed stability assessments would include kinematic stability assessments based on a model of the discontinuities present in the back of the arsenic stope or chamber and estimates of their strength characteristics. These are not deemed necessary at this stage of the design process.

7.1 Open Stope Stability Assessment

Secure containment of arsenic requires that stopes do not collapse in a way that creates connections to surface or to adjacent excavations. This requires that walls and backs are stable, and that instability of one does not cause instability of the other. For example, crown pillar collapses have resulted from hanging wall failure that increases the span of the back of a stope, leading to crown pillar collapse. For this reason it is important to assess the stability of all unsupported surfaces in a stope.

The Mathews method is an empirical approach that involves comparing proposed stope dimensions to both stable and unstable cases elsewhere in similar rock conditions. Using a chart, the hydraulic radius (area/perimeter of the exposed surface) of a particular wall (e.g., back or hanging wall) is plotted versus the stability number, N. N is calculated using the Q rock mass classification value, which is factored to account for stress condition, joint orientations, and failure mechanism according to the following relationship:

$$N = Q' \times A \times B \times C \quad (7.1)$$

Where:

A = Rock Stress Factor

B = Rock Defect Orientation Factor

C = Design Surface Factor

The following assumptions with regard to in situ stress were made in the analyses:

- Vertical stress is equivalent to overburden load (e.g., overburden and rock).
- The ratio of horizontal to vertical stress (K) is assumed to be 1.5, both perpendicular and parallel to the long axis of the openings.

The Mathews approach is valid for unsupported spans only and therefore only the potential condition of the backs of the arsenic stopes and chambers are assessed. The approach assesses the potential stability of a stope in isolation and does not take into account the potential stress effects from nearby openings.

The conditions predicted for end walls, hanging walls, and footwalls are conservative as the arsenic dust likely provides some confinement to the walls. The type of rock present at the Site needs limited confinement to develop strength and the dust likely improves the strength of the walls, reducing the potential for gravity induced spalling of existing wedges.

Table 7.1 summarizes the input used in the Mathews open span analysis for the arsenic stopes and chambers.

After SRK carried out geotechnical investigations and cavity monitoring surveys on select arsenic stopes and chambers, it derived hydraulic radii values for the backs of these openings to be used in the stability assessments. For the open span stability assessment, SRK only published hydraulic radius values for the backs of the select arsenic stopes and chambers as it presumed that the arsenic dust was providing support to the walls of the openings. SRK's back hydraulic radii values tended to be slightly higher compared to those calculated by Golder as shown in Table 7.1.

Appendix C show the resulting Mathews stability charts for the arsenic stopes and chambers and select adjacent non-arsenic stopes. Table 7.2 presents example results shown as a range of predicted stability from typical anticipated rock quality and average stope spans (i.e., anticipated typical conditions), to lower bound rock qualities with the widest stope spans (i.e., worst conditions). Due to the variability in rock quality and complicated stope shapes, a definitive stability assessment is not possible. Hazard assessments will make use of the anticipated typical conditions, but the potential for worse conditions exists. Stope backs with common stability assessment output are shaded similarly.

Definitions of stable, unstable, and major failure shown on the design charts are given in Stewart and Forsyth (1995) but they are made in the context of an open, stope mined using remotely operated equipment at an active mining operation and are primarily used for dilution estimates and the short-term potential for caving. Stope surfaces plotting in the unstable zone would be subjected to local failure that would quickly reach a stable configuration. Surfaces plotting in the major failure zone would exhibit larger scale failures that may eventually reach a stable configuration. Surfaces plotting in the caving zone could exhibit an uncontrollable caving situation that could propagate to surface under certain conditions.

Stope surfaces plotting in the stable zone would generally be considered stable in an unsupported condition over the long term. Surfaces plotting in the unstable zone would typically be supported with regular cable bolts to ensure long-term stability in a mining context. Support of large stope walls that will last decades to centuries is extremely expensive, and backfilling the void to limit the progression of failure is standard practice for mine closure.

Regular observation of the condition of the backs of the arsenic stopes and chambers is not possible, so a direct check on the applicability of the Mathews analyses is not possible. Indirect observations through an inspection hatch on the top of arsenic Stope B2-08 were possible and it was inferred that that the back is relatively stable.

Additionally, ground support can be anticipated to have been installed in some of the arsenic stopes and chambers. Evolving standards in mining suggest that stopes excavated in the 1950s and 1960s would have little to no support installed, whereas from the 1970s on man-entry top-cuts of stopes are likely supported. Observations of stopes excavated after the 1980s at the Site suggest systematic back support was applied.

The back of arsenic Chamber B15 was observed by Golder to be supported with cable bolts and systematic pattern bolting using 6 ft. long end-anchored rock bolts. Historical ground support practices at the mine (personnel communication with Ben Nordham, AANDC) suggest that: arsenic Chambers B9, B11, B12, and B13 which made use of top-cuts for drilling longholes can be anticipated to be spot bolted with end-anchored rock bolts, and; arsenic Chambers B2-30, B233, B2-34, B2-35, B2-36, and arsenic Stopes C2-12, B2-08, C2-12, B2-12, B2-13, and B2-14 were excavated in the 1950s and 1960s and likely no ground support was installed.

The ground support types observed at the Site, with the possible exception of the cable bolts installed in the back of arsenic Chamber B15, cannot be relied upon to provide any long-term support and are not considered in conclusions drawn from the analyses presented.

The analysis predicts that the backs of several stopes will exhibit marginal long-term stability if the lower bound of rock conditions (20%Q) and the potentially higher bound of opening geometry are representative of a large portion of the stope back. The stope backs of concern, in order of highest concern first are outlined below:

- Arsenic Stope B2-12/13/14;
- Arsenic Stope B2-08;
- Non-arsenic Stope C5-09, which is connected to non-arsenic Stope C3-12 and is adjacent (under and beside) arsenic Chamber B9;
- Arsenic Chamber B2-35 and B2-36 if the rib pillar between them has failed (there is no evidence for this but it should be monitored);
- Non-arsenic Stope B3-06, which is immediately adjacent to (underneath) arsenic Stope B2-08; and
- Non-arsenic Stope C3-12, which is immediately adjacent to (underneath) arsenic Stope C2-12 and arsenic Stope B10 (underneath and beside).

Instability of any of the arsenic stope or chamber walls would tend to reduce the stability of the crown pillars.

SRK's conclusions from its open span assessment were similar.

Table 7.1: Summary of Input to Mathews Open Span Stability Assessment, Arsenic Stopes and Arsenic Chambers, GMRP

Table 7.2: Mathews Open Span Stability Assessment for Arsenic Stopes and Arsenic Chambers

Area	Opening	Distribution of Stope Back Rock Mass Quality *			Range of Back Span Hydraulic Radius (H.R.)			SRK Back H.R.	HW/ Footwall H.R.	Stability Assessment Chart, Anticipated Typical Rock Conditions and Average Geometry	Stability Assessment Chart, Lower Bound Rock Conditions and Largest Geometry
		Q' 20%	Q' 50%	Q' 80%	Min.	Avg.	Max.				
AR1	B11	5.9	14	25	4.8	4.8	4.9		6.4	Back stable, walls stable	Back stable, walls stable
	B12	5.9	14	25	5.2	5.4	5.6		10.7	Back stable, walls stable	Back stable to unstable, walls unstable
	B14	5.9	14	25	4.4	5.1	5.3		7.7	Back stable, walls stable	Back stable to unstable in largest spans, walls stable
	B15	5.9	14	25	5.4	5.7	6.1		10.2	Back stable, walls stable	Back stable to unstable, walls unstable
AR2	C2-12	15	30	65	1.9	2.8	4.9	3.4	14.4	Back stable, walls stable	Back stable, walls unstable in unconfined
	B9	7.5	14	12	3.6	3.9	4.1		9.5	Back stable, walls stable	Back stable, walls stable
	B10	7.5	14	12	1.5	2.5	3.2		8.5	Back stable, walls stable	Back stable, walls stable
AR2 Adjacent	C3-12	8	30	65	4.6	5.9	7.1		13.8	Back stable, walls stable	Back unstable in largest spans, walls unstable if unconfined
	C5-09	8	30	65	6.7	7.8	8.9		18.1	Back stable to unstable, walls unstable if unconfined	Back unstable to major failure in widest spans
AR3	B2-08	5.5	12	30	4.2	5.9	8.5	6.5	11.8	Back unstable in largest spans, walls stable to unstable if unconfined	Back unstable in largest spans, walls unstable if unconfined
	B2-35/2-36 combined (if rib pillar not intact)	8	13	22	7.9	7.9	7.9	8.6	9.9	Back unstable, walls stable to unstable if unconfined	Back unstable, walls unstable if unconfined
	B2-30	7.5	14	23	1.2	2.2	2.5		4.9	Back stable, walls stable	Back stable, walls stable
	B2-33	10	17	25	2.4	3.1	3.4		9.2	Back stable, walls stable	Back stable, walls stable
	B2-34	7.5	14	23	2.9	3.3	3.8		9.9	Back stable, walls stable	Back stable, walls stable to unstable if unconfined
	B2-35	8	13	22	3.8	4.2	4.3	5.3	9.9	Back stable, walls stable to unstable if unconfined	Back stable, walls unstable if unconfined

Area	Opening	Distribution of Stope Back Rock Mass Quality *			Range of Back Span Hydraulic Radius (H.R.)			SRK Back H.R.	HW/ Footwall H.R.	Stability Assessment Chart, Anticipated Typical Rock Conditions and Average Geometry	Stability Assessment Chart, Lower Bound Rock Conditions and Largest Geometry
		Q' 20%	Q' 50%	Q' 80%	Min.	Avg.	Max.				
AR3	B2-36	8	13	22	3	4	4.4		9.9	Back stable, walls stable to unstable if unconfined	Back stable, walls unstable if unconfined
AR3 Adjacent	B3-06	8	20	50	4.6	5.0	5.7		11.3	Back stable to unstable, walls unstable if unconfined	Back stable to unstable, walls unstable if unconfined
AR4	Back of combined B2-12, B2-13, B2-14	5.5	16.5	38	5.5	8.2	6.8	8.5	18.4	Back stable to unstable	Back unstable to major failure in widest spans
	Back of combined B2-13, B2-14	4.5	12	25	6.4	7.4	8.3		7.6	Back unstable, walls stable	Back unstable to major failure, walls stable to unstable if unconfined
	B2-12	5	14	50	2.6	4.4	6.2	4.7	14.1	Back stable, walls unstable if unconfined	Back stable to unstable, walls unstable to major failure if unconfined
	B2-13	4.5	12	25	5.6	5.8	6.0	4.4	6.5	Back stable, walls stable if unconfined	Back stable to unstable, walls stable to unstable if unconfined
	B2-14	6	25	65	5.6	5.8	6.0	5.6	5.8	Back stable, walls stable	Back unstable, walls stable
AR4 Adjacent	2-02/2-18	6	9	23	6.2	13.2	10.1		18.4		

*Note: HW and footwall rock mass quality may vary from the values noted in the table above but are outlined in the figures presenting the Mathews charts.

7.2 Scaled Span Crown Pillar Stability Assessment

Golder checked the stability of the arsenic stopes and crown pillars using the approach outlined in Carter (1992) as SRK had, but used updated estimates of rock mass quality and stope size and crown pillar thickness information based on updates to the 3-D model.

Carter looked for geotechnical relationships distinguishing crown pillars that had failed from those that had not. He found that crown pillar instability would occur if the scaled crown pillar span (Cs) was greater than the critical span (Sc). A scaled span (Cs) is determined by scaling the actual span to account for the influence of various parameters (e.g., horizontal stress, rock quality, etc.). The Cs is determined as follows:

Scaled crown pillar span, Cs:

$$C_s = S\left[\frac{\gamma}{t(1+S_r)(1-0.4\cos\theta)}\right]^{0.5} \quad (7.2)$$

Where:

S = crown pillar span (m)

γ = specific gravity of the rock mass

t = crown pillar thickness (m)

S_r = span ratio = S / L (crown pillar span / crown pillar strike length)

L = crown pillar length (m)

θ = orebody/foliation dip (degrees)

To make the scaled span applicable to defining crown pillar stability, a critical scaled span (Sc), defined as a non-linear function of varying rock mass competence (equation 7.3).

$$S_c = 3.3Q^{0.43}\sinh(Q)^{0.0016} \quad (7.3)$$

By comparing the scaled span to the critical scaled span a factor of safety (Fc), the factor of safety can be derived.

In 2008, Carter et al. proposed that by plotting the Sc/Cs ratios as a cumulative frequency distribution, the variability was approximately normally distributed, which then enabled an error distribution function to be applied. The probability of failure over the very long term is given in equation 7.4.

$$P_f = 1 - erf\left[\frac{2.9Fc-1}{4}\right] \quad (7.4)$$

Where:

$Fc = Sc / Cs$

Therefore, if Fc is approximately equal to 1, the probability of failure is equal to 50%.

All the arsenic stopes and chambers were assessed using the scaled span empirical approach. The input is summarized in Table 7.3. Additionally, the sill pillar between arsenic Stope C2-12 and underlying non-arsenic Stope C5-09 and the sill pillar between arsenic Stope B2-08 and underlying non-arsenic Stope B3-06 were also assessed using the scaled span approach. These input parameters are also summarized in Table 7.3. The rock crown thicknesses presented in Table 7.3 were derived from measurements taken from the oblique sections included in Appendix B.

The range of opening sizes summarized in Table 2.1 and again in Table 7.3 generally include the single values assumed by SRK. Relative to Golder's averages, SRK's stope length is similar and its stope span and rock crown thickness values tend to be higher.

The results of the scaled span crown pillar stability analyses for each arsenic stope and chamber are presented in Appendix D. The plots summarize the input parameters and show the results superimposed on an empirical database of crown pillars from other mines and the iso-probability contours developed using Equation 7.4.

Example ranges of the predicted probability of failure *(P_f)* for each arsenic stope and chamber crown pillar are presented in Table 7.4. The P_f of key pillars between arsenic stopes and immediately adjacent non-arsenic stopes is also presented. Some stopes with complex back shapes were sub-divided (e.g., north and south) as indicated in the particular figure in Appendix D for the arsenic stope or chamber in question. The results shown in Table 7.4 are presented for ranges of rock mass quality (Q) and crown pillar geometry. Both *average* and *worst* crown pillar geometry conditions (e.g., largest span, longest strike length, thinnest crown pillar, shallowest depth) are represented. The shading shown in Table 7.4 is explained in Section 7.2.1.

Due to the variability in rock quality, the complicated stope shapes, and the irregular bedrock/overburden surface shape, a definitive stability assessment is not possible. Hazard assessments will make use of the anticipated *average* crown pillar geometry and the median (Q 50%) rock mass quality values, but the potential for worse conditions exists.

The following pillars represent the highest probability of exhibiting instability according to the scaled span analysis, in order probability of failure beginning with the highest.

- The sill pillar between arsenic Stope B2-08 and underlying non-arsenic Stope B3-06;
- The crown pillar over arsenic Stope B2-12/13/14;
- The crown pillar over arsenic Stope B2-08;
- The crown pillar over arsenic Chamber B2-35 and B2-36, hypothetically assuming the rib pillar between them has failed and they are acting as one stope, though there is no evidence for this at this time; and
- The sill pillar between arsenic Stope C2-12 and immediately adjacent non-arsenic Stope C3-12.

Relative to SRK, Golder predicts similar stability conditions for the crown pillar above arsenic Stope B2-12/13/14 and slightly better conditions for arsenic Stope B2-08. SRK did not report the resulting factor of safety or probability of failure of its scaled span analyses, but its overall conclusions are similar.

Table 7.3: Input into Scaled Span Crown Pillar Stability Assessment for Arsenic Stopes and Chambers

Area	Arsenic Stope or Chamber	Opening Vertical Height (m)			Opening Span (m)			SRK Span (m)	Opening Length Along Strike (m)			SRK Len. (m)	Dip (deg)	Intact Rock Unconfined Compressive Strength (MPa)	Opening Depth Below Surface (m)			Overburden Thickness (m)			Bedrock Crown Thickness (m)			SRK Crown Thick (m)	Q		
		Min.	Max.	Avg.	Min.	Max.	Avg.		Min.	Max.	Avg.				Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.		20% q	50% q	80% q
AR1	B11	19.5	19.5	19.5	12.9	13.2	13.0		37.5	37.5	37.5		90	100	18.2	22.8	20.3	5.0	5.0	5.0	13.2	17.8	15.3		5.9	**14.0**	25.0
	B12	32.9	32.9	32.9	12.5	13.7	13.2		61.6	61.6	61.6		90	100	22.8	24.1	23.5	0.0	0.0	0.0	22.8	24.1	23.5		5.9	**14.0**	25.0
	B14	21.6	21.6	21.6	10.6	13.1	12.6		54.0	54.0	54.0		90	100	21.4	27.1	24.4	0.0	0.0	0.0	21.4	27.1	24.4		5.9	**14.0**	25.0
	B15	30.8	30.8	30.8	13.3	15.2	14.1		60.0	60.0	60.0		90	100	22.3	26.3	25.1	0.0	0.0	0.0	22.3	26.3	25.1		5.9	**14.0**	25.0
AR2	B9	46.6	52.4	51.4	9.3	11.4	10.6		29.9	29.9	29.9		90	100	28.0	34.0	30.0	5.4	11.2	8.3	16.8	28.6	21.7		7.5	**14.0**	23.0
	B10	38.8	54.9	51.7	3.4	8.3	6.3		25.5	25.5	25.5		90	100	26.8	27.2	27.0	2.9	7.8	5.2	19.0	24.4	21.8		7.5	**14.0**	23.0
	C212	30.0	50.0	45.0	4.0	11.0	8.0	7.6	48.1	92.0	80.0	70.1	75	75	30.7	36.2	30.8	5.0	14.3	10.8	16.4	31.2	20.0	19.5	15.0	**30.0**	65.0
AR3	B208	10.0	42.3	40.0	10.0	23.0	15.0	18.3	50.0	65.0	57.5	45.7	80	38	11.0	29.6	18.3	9.1	13.1	10.6	8.1	11.0	10.3	11.6	5.5	**12.0**	30.0
	B230	16.3	19.8	17.9	2.7	6.6	5.5		22.1	22.1	22.1		90	100	61.0	65.0	63.6	6.1	6.1	6.1	54.9	57.5	55.4		7.5	**14.0**	23.0
	B233	33.5	43.7	39.5	5.7	8.4	7.6		34.3	34.3	34.3		90	100	35.0	41.0	37.8	0.7	0.7	0.7	33.1	33.1	33.1		10.0	**17.0**	25.0
	B234	41.0	44.2	42.7	6.9	9.6	8.3		34.4	34.4	34.4		90	100	31.4	32.5	32.0	9.2	9.2	9.2	22.2	23.3	22.8		7.5	**14.0**	23.0
	B235	42.2	48.2	45.4	9.7	11.5	11.1	15.2	35.0	35.0	35.0	35.0	90	100	28.5	31.4	30.1	6.4	7.5	7.0	22.7	23.9	23.3	27.4	8.0	**13.0**	22.0
	B236	41.7	48.2	45.1	7.4	11.6	10.3		35.0	35.0	35.0		90	100	33.7	38.9	36.2	7.5	7.5	7.5	26.2	31.4	28.7	23.5	8.0	**13.0**	22.0
	B235/B236	45.2	45.2	45.2	28.9	28.9	28.9	32.6	35.0	35.0	35.0	35.0	90	100	28.5	38.9	33.5	6.4	7.5	7.1	21.0	31.4	26.0		8.0	**13.0**	22.0
AR4	B212	58.0	58.0	58.0	5.8	15.9	10.5	10.7	55.0	55.0	55.0	52	70	75	12.0	15.5	13.9	11.0	7.5	7.9	4.5	12.0	6.0	10.4	6.0	**15.0**	35.0
	B213	24.3	35.0	29.6	17.8	22.1	19.9	11.9	23.0	23.0	23.0	30.5	61	75	24.6	26.3	25.5	18.3	16.6	17.5	8.0	8.0	8.0	10.4	4.5	**12.0**	25.0
	B214	24.3	25.3	24.8	22.9	26.5	24.7	15.2	22.0	22.0	22.0	36.6	90	75	20.4	34.0	25.9	18.3	16.6	17.5	7.0	8.0	8.0	8.5	6.0	**25.0**	65.0
	B213 / B214	23.0	23.0	23.0	17.8	26.5	22.2		45.0	45.0	45.0		80	75	22.5	30.2	25.7	18.3	16.6	17.5	8.0	10.0	9.0		4.5	**12.0**	25.0
	Combined B2-12, B2-13, B2-14 back	42.0	42.0	42.0	12.3	19.7	16.5	19.8	100.0	100.0	100.0	85.3	70	75	18.1	30.1	23.6	8.0	19.9	15.6	6.5	15.6	8.9	10	5.5	**16.5**	38.5

Sill Pillars when non-arsenic stope adjacent		Opening span (m)			SRK span (m)	Opening length along strike (m)			SRK Len. (m)	Opening Dip (deg)	Sill Pillar Thickness (m)			SRK Thick (m)	Rock Mass Quality		
			South	North		South	North				South	North			20% Q	50% Q	80% Q
C5-09	Under C2-12		11	16	11	135	135		134.0	70	11	18		15.0	8	15	65
B3-06	Under B2-08		15	15		40	20			80	5	4			8	15	65

Table 7.4: Results of the Scaled Span Crown Pillar Stability Assessment

Area	Arsenic Stope or Chamber	Probability of Failure for Range of Rock Mass Quality and *Average* Opening Geometry			Probability of Failure for Range of Rock Mass Quality and *Worst* Opening Geometry		
		Q 20%	Q 50%	Q 80%	Q 20%	Q 50%	Q 80%
AR1	B11	9%	3%	1.6%	12%	4%	2%
	B12	6%	2%	1.3%	7%	3%	1.5%
	B14	5%	2%	1.2%	7%	2%	1.4%
	B15	7%	2%	1.4%	10%	3%	1.8%
AR2	B9	2.2%	1.3%	0.9%	3.2%	1.7%	1.1%
	B10	1.0%	0.7%	0.5%	1.6%	1.0%	0.7%
	C212	1%	0.7%	0.5%	2%	1.1%	0.7%
AR3	B208 South	37%	10%	3%	71%	24%	6%
	B208 North	36%	10%	3%	58%	17%	5%
	B230	0.5%	0.4%	0.4%	0.6%	0.5%	0.4%
	B233	0.8%	0.6%	0.5%	0.9%	0.7%	0.6%
	B234	1.4%	0.9%	0.7%	1.8%	1.1%	0.8%
	B235	2.3%	1.5%	1.0%	2.7%	1.7%	1.1%
	B236	1.6%	1.1%	0.8%	2.1%	1.4%	1.0%
	B235/B236*	22%	10%	5%	32%	15%	7%
AR4	Combined B2-12/13	37%	9%	3%	87%	33%	9%
	B214	68%	8%	2.4%	90%	16%	4%
	Combined B213/B214	82%	24%	7.5%	96%	48%	15%
		North			South		
Area	Sill Pillar	Q 20%	Q 50%	Q 80%	Q 20%	Q 50%	Q 80%
AR2	Sill pillar between C2-12 and C3-12	18%	7%	1.2%	12%	5%	1.2%
AR3	Sill pillar between B2-08 and B3-06 South	70%	30%	3%	74%	33%	4%

*Combined stope if rib pillar failed, (drilling indicates it has not); monitoring recommended below.

The scaled span approach compares the arsenic stopes and chambers from the Site to a database of case histories at other sites, but all individual sites are unique. The approach cannot be thought of as a definitive assessment of whether any one crown pillar at the Site will fail or not given the uncertainties in the critical factors of rock stress, strength, opening geometry (which is complex and incompletely defined), and the orientation and nature of critical discontinuities. Engineering judgement when using the predictions provided by the approach is required. One such judgement relates to the nature of the rock mass. Two basic, quite different crown pillar rock mass behavioural characteristics are suggested:

- Non-degradable competent rock types (igneous and metamorphic types as well as cemented sedimentary units) that appear very durable; while
- The degradable, weathering-susceptible, weak or highly fragmented rock types most commonly fail in due course after degrading because of weathering and stress-induced strength loss.

The majority of the rock at the Site is likely in the first category. However, some time-dependant degradation of the rock mass was observed in non-arsenic stopes, and the rock mass may degrade slowly elsewhere. Areas subjected to percolating groundwater during the spring freshet and frost action during winter will degrade faster. Some of the shallow and thin crowns noted above may experience these conditions. Although crown pillar failure has not yet been observed, as discussed in Section 6.0 some evidence exists that some of these crown pillars may be in distress. This has not been confirmed, and additional work outlined in Section 10.0 is required prior to the planning of any necessary mitigative measures.

The estimated probability of crown pillar failure presented here do not provide definitive conclusions as to the state of critical excavations. Rather they should be used together with other information such as stope wall or pillar stability assessments presented earlier. To estimate risks in a way that is useful for mitigation planning, Engineering judgement must be applied to combine the result of analyses in an appropriate way with assessments of land use and human exposure.

7.2.1 Significance of Probability of Crown Pillar Failure Estimates

Carter and Miller (1995) developed long-term closure guidelines for post-closure public access over crown pillars as outlined in Table 7.5. There is elevated level of concern with increasingly onerous limitations on access and monitoring requirements as the probability of crown pillar failure increases. Public access restrictions are recommended for crown pillars with > 5% P_f.

Calculations of the probability of failure of arsenic stope and chamber crown pillars outlined in Table 7.4 are shaded according to the guidelines outlined in Table 7.5.

The guidance is not used for active mines, which often have different approaches to dealing with the potential failure of crown pillars. Many mines design crown pillars to Fc values of about 1.2, with corresponding probability of failure values in the 10% to 20% range. These values are similar to those for arsenic Stopes B2-08 and B2-12/13/14. The elevated probability of failure is accepted in an operating mine because in-house mining, engineering and technical services expertise, historical knowledge, and the ability to react quickly and decisively when required mitigates the risks of damage or injury. Although the Site is under care and maintenance, only some of the in-house capacity required to manage a complex and dynamic situation like a crown pillar movement exists. The presence of arsenic dust in the stopes below the crown pillars in question also elevates the risk.

Table 7.5: Guidelines Relating Probability of Crown Pillar Failure to Public Access Restrictions

Class	*Pf* (%)	Reliability (%)	Min F of S	Design Criteria for Acceptable Probability of Failure				
				Serviceable Life of Crown Pillar (Years)		Public Access	Regulatory Closure Attitude	Operating Surveillance Required
A	50 to 100	0 to 50	<1	Effectively zero	<0.5	Forbidden	Totally unacceptable	Ineffective
B	20 to 50	50 to 80	1.0	Very very short term (temporary mining purposes only – untenable risk of failure for temporary civil portals)	1.0	Forcibly prevented	Not acceptable	Continuous sophisticated monitoring
C	10 to 20	80 to 90	1.2	Very short term (quasi-temporary stope crowns – undesirable risk of failure for temporary civil works)	2 to 5	Actively prevented	Very concerned	Continuous monitoring with instruments
D	5 to 10	90 to 95	1.5	Short term (semi-temporary crowns, e.g., under non-sensitive mine infrastructure)	5 to 10	Prevented	Concerned	Continuous simple monitoring
E	1.5 to 5	95 to 98.5	1.8	Medium term (semi-permanent crowns, possibly under structures)	15 to 20	Discouraged	Somewhat concerned	Conscious superficial monitoring
F	0.5 to 1.5	98.5 to 99.5	2	Long term (quasi-permanent crowns, civil portals, near-surface sewer tunnels)	50 to 100	Allowed	Of limited concern	Incidental superficial monitoring
G	Less than 0.5	Greater than 99.5	>2	Very long term (permanent crowns over civil tunnels)	>100	Free	Of no concern	Monitoring not required

8.0 POTENTIAL FOR INTERACTION BETWEEN ARSENIC STOPES AND ADJACENT NON-ARSENIC STOPES, OPEN-PITS, AND SURFACE

SRK (2005b) provided comment on the potential for non-arsenic stopes to influence the stability of adjacent to arsenic stopes and chambers. The following potential opening interactions were commented on by SRK:

- Interaction between arsenic Stope C2-12 and underlying non-arsenic Stope C3-12 (also called C5-09);
- Rib-pillar failure that would result in arsenic Chambers B2-35 and B2-36 becoming one larger opening;
- Interaction between non-arsenic Stope B3-06 and underlying arsenic Stope B2-08;
- Interaction between arsenic Stope B2-08 and B1 open pit;
- Interaction between individual arsenic Stopes B2-12, B2-13, and B2-14;
- Interaction between arsenic Stope B2-14 and B1 open pit; and
- Interaction between arsenic Stope B2-12 and adjacent non-arsenic Stope 2-02/2-04/2-18 stope complex.

Comments on the information and conclusions provided by SRK and comparisons between SRK stability analyses and those carried out by Golder (and presented above) are made below.

8.1 Arsenic Stope C2-12 and Non-arsenic Stopes C3-12/C5-09

SRK predicted that the crown pillar between C2-12 and C3-12 was stable (SRK 2005a).

As reported above, Golder checked the stability of the sill pillar between arsenic Stope C2-12 and underlying non-arsenic Stope C3-12 using the scaled span crown pillar chart and the stability of the back of non-arsenic C3-12 stope using the Mathews stope stability chart method. These results are shown in Appendix C in Figures C-5 and D-9 respectively. These assessments suggest that the sill pillar directly under arsenic Stope C2-12 is stable, but the stability of the back of non-arsenic Stope C3-12 relies upon the areas of large span not coinciding with areas of lower rock quality. The stope is only partially filled, and the hanging wall and footwall stability assessments suggest that instability can be expected over the long term.

Non-arsenic Stope C3-12 is connected to the much larger non-arsenic Stope C5-09 to the north of arsenic Stope C2-12. Non-arsenic Stope C5-09 is a very large and could extend to a depth of up to 450 m. Figure 8.1 shows the location of these two non-arsenic stopes relative to arsenic stopes and chambers in AR2. Backfill previously placed to fill non-arsenic Stopes C3-12 and C5-09 is understood to have dropped unexpectedly in late2007 and up to 50 m of hanging wall and footwall was exposed. Spalling from the exposed walls of the C5-09 stope complex was observed and heard (SRK 2008). Some historical slabbing (pre-2007) of the footwall of C5-09 destroyed the tracked openings on the level requiring a local bypass to be built. A monitoring program to check for additional rock failure (using a vibration monitor) and the level of the backfill (using laser range finders) was developed, but it is understood that the monitoring program is not currently active.

The back of the Stope C5-09 is large and represents one of the potentially least stable open spans assessed in this report. Estimates of typical rock quality and geometry place it at the transition between Stable and Unstable on the Mathews chart, and, if poor rock conditions dominate in areas of wider span the span may plot in the Major Failure area of the stability chart. If the backfill present in the stope dropped further, hanging wall failure and caving may occur, with potential consequences that include widening of the back span and the initiation of caving. Although failure in non-arsenic Stope C5-09 would not immediately directly impact a nearby arsenic stope or chamber, significant ground movements could impact arsenic Chamber B9. Despite this concern, it is anticipated that failure would progress sufficiently gradually that it would be identified, allowing mitigation measures (e.g., backfilling) to be implemented, thus limiting the impact on nearby critical mine infrastructure and arsenic stopes and chambers.

8.2 Arsenic Stope B2-08 and Non-arsenic Stope B3-06

SRK suggested that this sill pillar (between arsenic Stope B2-08 and the underlying non-arsenic Stope B306) represented an area of potential instability requiring additional investigation and potential mitigation. Golder checked the stability of this sill pillar using the scaled span crown pillar chart as well as the stability of the back of the B3-06 stope using the Mathews stope stability chart method. These results are shown in Figures C-9 and D-14, respectively. Figure 8.2 shows the geometry of the sill pillar and raises between the two stopes that contain bulkheads to isolate arsenic dust in them.

The scaled span crown pillar assessment predicts a relatively high probability of failure for this sill pillar as outlined in Table 7.4. The open span assessment for the same location predicts stability of the back of non-arsenic Stope B3-06. Thus there is uncertainty in the assessment. A conservative approach to risk mitigation in this location is justified due to the complex shape of the stope and the presence of bulkheads in the back that retain arsenic dust in the overlying arsenic Stope B2-08.

The stope is partly backfilled, which would tend to enhance the stability of the stope walls, but backfill was robbed from the bottom of the stope and there is a potential that it could have arched and that the fill could move lower.

8.3 Arsenic Stope B2-12/13/14 and B1 Open Pit

SRK suggested that there was minimal evidence of failure of the pillar between arsenic Stope B2-14 and B1 open pit. It did have concerns with the stability of the overall arsenic Stope B2-12/13/14 complex.

As described earlier, some mine drawings suggest that the vertical rib pillars between individual arsenic Stopes B2-12, B2-13, and B2-14 are not present or may be so thin that they are ineffective. Golder has assessed these stopes both as individual openings and as one large opening, termed arsenic Stope B2-12/13/14. Additionally, the updated overburden/bedrock contact 3-D model suggests thinner rock crowns exist over these arsenic stopes than were previously thought to exist (SRK 2005b), and the probability of failure of this crown is now elevated relative to SRK's conclusions.

8.4 Arsenic Stope B2-08 and B1 Open Pit

SRK suggested that there was minimal evidence of failure of the pillar between arsenic Stope B2-08 and B1 open pit.

The crown pillar stability assessment described above for arsenic Stope B2-08 suggests that the pillar is probably stable, but potential for failure in the long term exists. If crown pillar failure were to initiate, it would likely start where the pillar was thinnest, which is between the stope and B1 pit.

8.5 Arsenic Chamber B2-35 and B2-36

As noted above, crown pillar and open span stability assessments suggest that if the pillar between arsenic Stope B2-35 and B2-36 were to fail, then the resulting spans might not be stable. Historical mine plans and sections show that this pillar was bolted (details unknown), but it is not known if this was undertaken because of concerns for its stability or for worker safety.

SRK (2005b) carried out numerical stress analysis of this pillar. Its modelling approach and input parameters are reasonable. Its conclusion that the pillar could be unstable without the stabilizing effect of the dust appears reasonable.

Golder carried out an empirical stress/strength assessment of the rib pillar assuming that it is not confined by dust. This calculation is highly sensitive to the input intact rock strength, and, as shown in Figure 5.8, the range of logged intact rock strength in the investigation borehole drilled though the pillar ranged from R2 to R5/R6 (according to ISRM). The typical rock strength in the lower portion of the pillar was logged as R3 to R3+, which is assumed to represent an intact rock strength range of 50 to 75 MPa. Using this range of intact strength, the lower portion of the rib pillar exhibits factors of safety ranging from 0.98 to 1.47. Although empirical assessment of pillar stability is usually conservative it supports SRK's assessment.

The likely failure mechanism of this pillar will be kinematic block movement that reduces the effective cross-sectional area of the pillar to the point where it can no longer support the stresses to which it is subjected. Given the slenderness of this pillar and the lack of detailed structural orientation data for it, little confidence can be placed in any kinematic stability assessment. As a result the pillar likely cannot be relied upon to provide support to the combined back of the two stopes in the long-term. It is likely that the confining effect of the dust contributes to pillar stability and that without it there would be a risk of failure. If this effect is jeopardized by wetting and subsequent consolidation of the dust during remedial work there is a risk of stope instability. The potential behaviour of the dust during wetting has not yet been assessed. Some in situ investigation and laboratory testing of the dust was carried out in the past (Geocon 1981), but the testing results do not provide the information required to determine the consolidation potential of the dust upon wetting.

8.6 Arsenic Stope B2-12/13/14 and Adjacent Non-arsenic Stopes 2-02/2-18

The potential for the pillar (rib pillar) failure between the complex of non-arsenic stopes, which includes 2-02, 2-04, 2-18, 2-14 and possibly others, and arsenic Stope B2-12/13/14 was assessed. Figure 8.3 shows the geometry of the rib pillar between these openings and the thickness of the rib pillar, which ranges from 7 m to 10 m. Inspection of this pillar is not possible at this time. The shape of the stope is complex and contains internal pillars, is partially backfilled, and both the ore dip and thickness are variable.

A stability assessment of this stope suggests that the likelihood of back failure is high (Figure C-29). Portions of the stope are currently backfilled, but the position of the backfill and its ability to limit the progression of any future back failure are unknown.

SRK suggested that failure of the back of this stope would progress at a cave angle of 65° and would not impact arsenic Stope B2-12. This conclusion was partly based on the assumption that failure would quickly choke off and not influence the adjacent arsenic stope. Golder partly agrees with this assessment, but due to the likely marginal stability of the hanging wall of arsenic Stope B2-12 given its large height and span, any disturbance or stress change around it may induce a wider instability zone in the region.

Potential recent ground movement in the area of the 2-02/2-18 stope complex area was observed during a recent underground site visit. A large block of rock of approximately 2 to 3 m in size was visible on the western edge of 2-18 stope directly above bulkhead 34, which is approximately 40 m north of the pillar between non-arsenic Stope 2-18 and arsenic Stope B2-12. An Aboriginal Affairs and Northern Development Canada representative (Ben Nordham) with experience in the area suggested that this block movement was recent.

9.0 CONCLUSIONS

Before starting review of excavation stability assessments prepared by SRK it was necessary to develop a consistent and auditable process to use the geotechnical core logging data, historical lithology logging data, and the existing mine geometry information. No new information was available to Golder with the exception of observations made. Additional work suggested by SRK was implemented by Golder to update what they had accomplished previously.

Golder's estimates of key input parameters that differed slightly from SRK's included the following:

- Golder's rock crown pillar thicknesses were generally less than SRK's.
- Golder measured smaller stope spans (and resulting lower hydraulic radii) for typical stope geometry, but the SRK values fall within the range of stope geometry used in the updated stability assessment.
- The rock quality (Q) values used by Golder were generally higher than those derived from the same dataset used by SRK. SRK's maximum Q values are similar to the Golder 50th percentile Q values and their minimum values are similar to the Golder 20th percentile Q.

A comprehensive assessment of arsenic stopes and chambers and adjacent non-arsenic stopes that pose a potential stability concern is ultimately an exercise in engineering judgement guided by the predictions presented in Section 7.1, 7,2, and 8.0. For stopes that do not form an obvious crown pillar, (e.g., the stope is too deep) the predicted condition of the stope back according to Mathews is noted. No probability of failure is derived from the Mathews approach, but the potential for instability in the long-term was taken into account in the assessment of potential concerns.

The updated stability analysis suggests that all arsenic stope and chamber crown pillars are currently stable. However, some stability concerns exist for the areas outlined in Table 9.1, arranged in general order of the potential for failure to occur. The consequences of such failure and how that might change over time is not specifically used in the ranking although the table does comment on some potential consequences.

Ultimately, Golder developed similar conclusions to SRK regarding the stability of arsenic stopes and chambers and non-arsenic stopes adjacent to them, including the potential to impact open pits and surface. One distinction in the updated stability assessment is that it includes probabilistic analyses which can be used in risk assessments to guide future decisions.

Instability that could impact surface and thereby the public and/or surface workers is noted. Underground instability that could impact underground workers and allow the release of large amounts of arsenic dust into the mine and potentially ultimately the mine water pool is also noted.

The anticipated probability of the crown pillar or sill pillar failure associated with a particular arsenic stope or chamber is noted using terminology from the INAC NCSP Project Risk Management Guidance Document (date unknown) outlined in Table 9.2.

Table 9.1: Summary of Stability Concerns Associated with Arsenic Stopes and Chambers and Non-arsenic Stopes Immediately Adjacent to Them

Opening	Open Span Stability Condition, Potential for Back Failure	Anticipated Probability of Failure of Crown or Sill Pillar	Potential Affect of Failure	Potential Concern to Public or Worker Health and Safety	Potential Concern To Remediation Plan	Possibility of Likelihood (Using INAC System)	Comments
Arsenic Stope B2-08, Adjacent Non-arsenic Stope B3-06 Sill Pillar	Back of B3-06 stable to unstable, local spalling expected over long term	30 to 35%	Release of arsenic dust locally into the adjacent openings	Underground workers	Arsenic dust released into mine pool	***Possible***	Situation not well understood and needs additional investigation. Release of dust into B3-06 could possibly be partly contained on 3rd level.
Arsenic Stope B2-12/13/14 Crown Pillar	Back unstable, local spalling expected over long term	10 to 35%	Impact B1 open pit and surface with release of dust to environment	Surface and underground workers, public	Minimal	***Possible***	Some unconfirmed evidence of surface impact of crown pillar movement exists. Possibly some evidence of ground movement on upper arsenic drift but not confirmed.
Arsenic Stope B2-08 Crown Pillar	Back unstable, local spalling expected over long term	10 to 25%	Impact B1 open pit and surface with release of dust to environment	Surface and underground workers, public	Minimal	***Possible***	No strong evidence for movement underground or on surface noted.
Arsenic Stope B2-12/13/14, Adjacent Non-arsenic Stope 2-02/2-18 Rib Pillar	Back unstable to major failure, not suitable for long term	n/a	Release of arsenic dust locally underground into the adjacent openings	Underground workers	Arsenic dust released into mine pool	***Possible***	Local pillars and backfill assumed for this conclusion but this has not been investigated and the situation could be worse. There is some evidence of block movement distal to the rib pillar but in the 2-02/2-18 stope. Release of dust into 2-02/2-18 stopes could possibly be partly contained on 3rd level but it would likely move deeper into the mine.
Non-arsenic Stope C5-09* Back	Back unstable to major failure, not suitable for long term	n/a	If failure large and sudden, could impact arsenic Chamber B9	Underground workers	Arsenic dust released into mine pool	***Unlikely***	Failure would likely develop slowly enough that it could be halted with backfilling prior to impacting arsenic Stope C2-12 or arsenic Chamber B9.
Arsenic Stope C2-12 / Adjacent Non-arsenic Stope C3-12* Sill Pillar	Back stable	5 to 7%	Release of arsenic dust distal from arsenic stope	Underground workers	Arsenic dust released into mine pool	***Unlikely***	Non-arsenic Stope C3-12 is attached to C5-09, which although partially filled is a very deep opening, and release of dust into C5-09 would be difficult to contain and would move deeper into the mine and possibly into the mine water pool.
Arsenic Chamber B2-35/36 Crown Pillar		10 to 15%*	Surface impact with release of dust to environment	Surface and underground workers, public	Minimal	***Unlikely***	This prediction is only for the instance where the rib pillar between stopes fails and is predicted to be stable to marginally stable.

*Note: Non-arsenic Stope C5-09 is connected to non-arsenic Stope C3-12, the different names represent northern and southern extents respectively.

Table 9.2: Definitions of Likelihood

Assigned Likelihood	Descriptive	Frequency of Occurrence for Other Events	Health Events Only
Almost Certain	Happens often	High frequency (more than once every 5 years)	1 case / 100 person-years
Likely	Could easily happen	Event does occur, has a history, once every 15 years	1 case / 1,000 person-years
Possible	Could happen and has happened elsewhere	Occurs once every 30 years	1 case / 10,000 person-years
Unlikely	Hasn't happened yet but could	Occurs once every 100 years	1 case / 100,000 person-years
Very Unlikely	Conceivable, but only in extreme circumstances	Occurs once every 1000 years	1 case / 1,000,000 person-years

Golder did not apply the ranges of serviceable crown pillar life outlined in Table 7.5 as these are made in the context of a closed mine with full public access.

The potential for pillar instability to impact the arsenic stopes and chambers outlined above include the local influence of adjacent development and partially backfilled non-arsenic stopes. The conclusions are based on the assumption that the overall stability of the area will not be compromised by instability resulting from issues much deeper in the mine. Significant amounts of mining were carried out under the arsenic stope and chamber areas. Most of these non-arsenic stopes were likely backfilled, but that is unknown and is difficult to assess because the mine is flooded to the 5th level (750 Level). Although the historical mine plans have not been fully incorporated into the dataset, and this should be done, the presence of backfill in the stopes does not appear to have been well documented. Timber barricades were commonly used to hold the classified un-cemented mine tails that were the primary backfill material in the early days of mining and these cannot be relied upon to remain stable over the long term. Backfill will move, as evidenced recently in C5-09 stope, and instability will result. It is difficult to predict how far, if at all, that instability could propagate.

Because there is no evidence at this time that the rib pillar between arsenic Chambers B2-35 and B2-36 is unstable, the stopes are not mentioned for future mitigation, but monitoring is recommended.

10.0 RECOMMENDATIONS

Recommendations to deal with the crown pillars, rib pillars, sill pillars, and stope backs that present a stability concern are outlined in Sections 10.1 and 10.2. Recommended changes to the site risk register items associated with these underground entities are provided in Section 10.3. General recommendations for mitigation work to be implemented prior to the overall project remediation are summarized in Section 10.4.

To date, the preferred contractual relationship proposed by PWGSC has been one in which a contractor would construct according to detailed drawings and very specific contract specifications developed by the project team. Such an approach requires a definitive design for the bidding process. Recommendations for future work are based upon this project procurement approach and are significantly influenced by uncertainty related to the freeze methodology and errors and omissions identified in the current underground mine geometry information.

Recommended investigations, testing, surveying, and monitoring to further enhance the understanding of arsenic stope and chamber stability and to develop detailed mitigation and remediation plans are outlined later in this section.

10.1 Concerns with Public and Worker Safety on Surface

Although no obvious evidence of crown pillar failure has been observed near arsenic Stopes B2-12/13/14 and B2-08, the potential for failure is high enough that surface access controls and monitoring should be implemented.

Table 10.1 lists potential surface effects of the two potentially unstable arsenic stope crown pillars and lists possible future mitigation, investigation, and monitoring requirements. Additional discussion on future work is outlined later in this section.

Table 10.1: Arsenic Stope Crown Pillars That Could Affect Surface and Pose a Concern to Public or Worker Health and Safety

Stope of Concern	Potential Impact of Failure	Recommended Mitigation, Investigation, Monitoring
Arsenic Stope B2-12/13/14 Crown Pillar	Failure would impact surface near B1 open pit, mine access roads, and possible release of dust to environment	Backfill stope void. Investigation and design required. Monitoring (in place): survey monitoring and visual monitoring. Access controls and signage in place on mine access roads.
Arsenic Stope B2-08 Crown Pillar	Failure would impact surface near B1 open pit, Public Highway 4, mine access roads, and possible release of dust to environment	Backfill stope void. Investigation and design required. Monitoring (in place): survey monitoring and visual monitoring Access controls and signage in place on mine access roads. Fencing of hazardous area to exclude public access from Highway 14 in place.

Failure of any of the crown pillars noted in Table 10.1 would pose an immediate concern to any surface or underground workers in or near the stopes due to ground movements, release of arsenic dust and possible underground air-blast. Recommendations for surface access controls for each stope are discussed below.

Mitigation of these arsenic stopes will be required prior to the implementation of the overall remediation (e.g., wetting and freezing). Potential future mitigation approaches, which may include adding stabilizing backfill to the void between the arsenic dust and the back (top) of the arsenic stopes, have been summarized in Section 10.4.

10.1.1 Immediate Access Controls for Arsenic Stope B2-12/13/14

The potential zone of surface impact due to failure of the arsenic Stope B2-12/13/13 crown pillar was determined by drawing the following subsidence cones from the top of the stope to surface:

- Dipping portion of the stope (B2-12/13)
  - 55° on the footwall (east) side
  - 75° on the hanging wall (west side)
- Vertical portion of the stope (B2-14)
  - 65° on all sides.

With time, this failure would shallow in the overburden soil slopes, and an outer subsidence cone was drawn at 45° from the overburden/bedrock contact and 45° to surface. These subsidence cones are shown in a surface plan of the B1 pit area. Surface monitoring points, which are surveyed regularly and reviewed by project engineers, are also shown in Figure10.1.

Golder recommends that all vehicles stay off the area above B2-12/13/14 within the inner potential subsidence zone shown in Figure 10.1, particularly during the spring thaw period. Foot access could be allowed if a procedure for checking monitoring point survey data and a thorough inspection for surface cracking is carried out prior to access within this zone. Appropriate signage and briefings of mine staff should be implemented. Monitoring in addition to the current system is required to determine whether the crown pillar is deforming, the extent of the deformation, and the movement mechanisms involved.

10.1.2 Immediate Access Controls for Arsenic Stope B2-08

The potential zone of surface effects due to failure of the arsenic Stope B2-08 crown pillar was determined by drawing a 65° subsidence cone from the top of the stope to surface. This zone would represent the possible early surface manifestation of failure of the entire crown pillar. With time, this failure would break back in the overburden soil slopes, and an outer subsidence cone was drawn at 45° from the overburden/bedrock contact to surface to reflect this breakback. These potential surface effect zones are shown in Figure 10.2. Surface survey monitoring points, which are surveyed regularly and reviewed by project engineers, are also shown in Figure 10.2.

It is recommended that public access to the area above arsenic Stope B2-08 be restricted as soon as practical. A possible solution is to erect a fence between the crest of B1 open pit near arsenic Stope B2-08 and Highway 4 as shown in concept in Figure 10.2. The actual location should be confirmed in the field by project staff. Unnecessary vehicle and foot access by mine personnel near arsenic Stope B2-08 should be avoided, particularly during the spring thaw period. Foot access could be allowed only after suitably trained personnel have reviewed the most recent survey of monitoring points and checked for surface cracking. Appropriate signage and briefings of mine staff should be implemented. Monitoring in addition to the current system is required to determine whether the crown pillar is deforming, the extent of the deformation, and the movement mechanisms involved.

10.2 Concerns with Underground Worker Safety and Project Remediation Plan

Although no obvious evidence of failure associated with a non-arsenic stope immediately adjacent to an arsenic stope or chamber has been observed, the potential for failure is high enough that surface access controls and monitoring should be implemented. The failure of a pillar between an arsenic stope and an adjacent non-arsenic stope would lead to the release of dust to the mine, possibly complicating the current remediation plan if a large amount of arsenic were to enter the mine water pool.

Table 10.2 lists potential effects of failure of such a stope or pillar and lists possible future mitigation, investigation, and monitoring requirements. Additional discussion on future work is outlined later in this section.

Table 10.2: Potentially Pillar Failures That Could Allow Arsenic Dust into the Mine If Failure Occurred

Stope of Concern	Potential Impact of Failure	Recommended Mitigation, Investigation, Monitoring
B2-08 Arsenic Stope / B3-06 Adjacent Non-arsenic Stope Sill Pillar	Release of dust locally into the adjacent openings	Backfill stope void. Investigation and design required. Develop monitoring system including regular stope inspection.
B2-12/13/14 Arsenic Stope / B2-02/2-18 Adjacent Non-arsenic Stope Rib Pillar	Release of dust locally underground into the adjacent openings	Backfill stope void. Investigation and design required. Develop monitoring system including regular stope inspection.
C5-09* Adjacent Non-arsenic Stope Back	If failure large and sudden, could impact arsenic Chamber B9, resulting in release of dust deep into the mine	Backfill stope void. Investigation and design required. Develop monitoring system including regular stope inspection.
C2-12 Arsenic Stope / C3-12* Adjacent Non-arsenic Stope Sill Pillar	Release of dust deep into the mine	Backfill stope void. Investigation and design required. Develop monitoring system including regular stope inspection.

*Note: Adjacent Non-arsenic Stope C5-09 and C3-12 are connected; the different names represent northern and southern extents respectively.

Note that failure of any of the pillars noted in Table 10.2 would pose an immediate concern to any underground workers in or near the stopes due to release of arsenic dust and possible underground air-blast. Access to the development openings near these non-arsenic stopes should be limited until some form of systematic monitoring program is implemented.

Mining staff should refrain from entering non-arsenic Stope B3-06 until the situation is better understood. Concerns include the lack of ground support in the back and upper walls and the potential for the fill to drop following loss of material into deeper workings. Securing the backfill with cementitious grout and supporting the back of the stope with rock bolts and/or cable bolts (possibly done remotely from B3-06 access drift) is one example solution to secure the stope temporarily to allow construction of the new drift plugs, after which the stope void will be tightly backfilled. These details will need to be developed during future detailed design phases.

10.3 Recommended Changes to Project Risk Register Document

Golder suggests that, due to the stability assessment for the sill pillar between arsenic Stope B2-08 and B3-06 and the potential for the 2-02/2-18 non-arsenic stope complex to impact arsenic Stope B2-12 (Table 9.1), that the existing project site risk register (INAC 2011) be reviewed. Specifically, the likelihoods shown in the Risk Scenario Event Sequences Chart Underground System (Appendix B of INAC 2011), Short Term, ID UGS 3, UGS 4, and UGS 5 should be re-evaluated.

10.4 Mitigation Requirements

All arsenic stopes and chambers and near-surface non-arsenic stopes are currently proposed to be backfilled to enhance long-term stability as outlined in the Underground Preliminary Design Report. However, several arsenic stopes and non-arsenic stopes (Table 10.1) immediately adjacent to them (Table 10.2) pose concerns to public and worker health and safety and to the remediation plan. These openings should be mitigated prior to the implementation of the overall remediation plan. The priority for mitigation of adjacent non-arsenic Stopes C5-09/C3-12 is somewhat lower than the others listed in Table 10.2. The main reason for this is the ease of access for inspection and the ease with which waste rock or cemented rockfill (CRF) backfill could be added to the stope if any stability concerns were noted.

The current approach to stabilizing these stopes is to backfill them. Some of the openings to be backfilled are partially filled with dust or waste rock or classified sand tailings and thus require only topping up. Backfill options for the entire site were discussed in previous work (SRK 2009).

One important requirement of any underground mitigation is that it conforms to and supports the remediation strategies outlined in the DAR. Some elements of the remediation plan associated with the in situ freezing concept have not yet been fully developed, specifically the plan to add water (wetting) to the dust and freeze it. At this time, it is recommended that engineered plugs required to allow wetting of arsenic dust in the arsenic stopes and chambers be installed prior to any backfilling activities are undertaken.

Backfill materials proposed for the arsenic stopes include foam concrete and cemented paste tailings backfill. The preliminary design assumed cemented paste backfill would be used to stabilize arsenic stopes. These backfill materials will be placed through cased boreholes drilled from surface to intersect the arsenic stope. It is anticipated that the dust on which the backfill will be founded may consolidate during backfilling and again during initial saturation. However, its behaviour under load and during wetting is not well understood at this time. Additional work is required predict the behaviour of the dust as discussed in the Underground Preliminary Design Report.

The stopes that do not contain dust will be backfilled with either lightly cemented non-potentially acid-generating paste tailings backfill (cemented paste) or non-potentially acid-generating waste rock (waste rock). The waste rock can only be used as backfill in underground areas that are safely accessible by underground mobile equipment. The preliminary design assumed that cemented paste backfill would be used during the mitigation to stabilize non-arsenic stopes.

The cemented paste will be placed through cased boreholes drilled from surface to intersect the underground opening to be backfilled. Non-arsenic stopes adjacent to arsenic stopes will be backfilled as tight to the back as possible. Other non-arsenic stopes do not need to be backfilled completely and uniformly to the back (top) of the stope.

Placing foam concrete as backfill is currently the fastest way to backfill the void below a failing crown pillar. Once development of the cemented paste backfilling system required for the overall site remediation is in place, this material can be used for rapid void filling as required.

A stabilization implementation plan for areas posing short- and medium-term hazards that includes investigation and monitoring discussed in further detail below should be prepared. An emergency response stabilization plan should also be developed.

Reinforcing existing arsenic raise bulkheads #10, #11, and #12 by installing new plugs in the raises where they are located, then tight backfilling non-arsenic Stope B3-06 should be a priority in the project mitigation work. To enhance safety during plug construction, early mitigation could include securing the existing backfill in the stope with cementitious grout and supporting the back of the stope with rock bolts and/or cable bolting (possibly done remotely from B3-06 access drift). However, there are uncertainties that prevent a detailed mitigation design being developed and an investigation of the area is required.

10.5 Long Term Remediation Requirements

Some form of backfill material will be placed in the void on top of the dust in all the arsenic stopes and chambers (topping up) for long-term safety and security reasons after the wet arsenic dust is frozen. The backfill will be placed as tight to the back as possible so that any rock crown pillar failures are halted before surface or other nearby openings are affected. This backfill has been accounted for in the quantities outlined in the Underground PDR.

10.6 Geotechnical Investigations and Surveys

At least one geotechnical borehole for each arsenic stope and chamber is required to confirm the data collected by SRK in 2004 (SRK 2005b) and to close data gaps for those arsenic chambers that were not investigated at that time. This information will confirm overburden thickness and rock quality information to be used in future detailed design studies but it is not anticipated that it will improve confidence in the stability assessments, as past investigations were thorough.

Investigations related to development of a stabilization implementation plan for areas posing short and medium-term hazards that require mitigation should be prioritized using the information in Tables 9.1, 10.1, and 10.2.

Geotechnical drilling into the voids to be backfilled is required for an assessment of the void shape. Specifically the shape of the stope back, should be determined using borehole based CMS and camera surveys. These are required to check for instability and to assess the shape of the back for efficient placement of void filling backfill holes, and to assess the geometry of the top of the dust for determination of wetting requirements and the magnitude of dust consolidation. It may be possible to carry out some CMS from upper arsenic drift inspection hatches.

As discussed previously, if alternative procurement strategies such as a design-build approach were adopted, then investigative drilling requirements would be reduced. The first backfill delivery borehole, anticipated to be 200 to 250 mm in diameter, could provide a conduit for the CMS. The CMS information would then be used in a tactical manner to determine the location of the other boreholes required to achieve tight backfilling.

As noted above in Section 10.4, geotechnical data requirements will be highest when large equipment such as drill rigs need to be parked on potentially unstable crown pillars. Any drilling into these crown pillars should make use of coring methods so that rock cores can be collected and geotechnically logged to verify the previously assumed rock mass conditions used in the stability assessments.

Regular systematic visits by personnel familiar with ground conditions and ground control at the Site should be undertaken for all safely accessible underground openings near the arsenic stopes and chambers. A photographic record and database should be kept of any changing conditions.

Geophysical surveys over the arsenic stopes and crowns could be carried out to confirm the thickness of the rock crown pillar over each of them. Light seismic (e.g., a sledgehammer), resistivity, or electrical methods could all potentially provide useful information on the position of the bedrock/overburden contact. This work could reduce the requirement for drilling noted above, and the information could be used to update the stability assessment if deemed necessary.

10.7 Testing

The potential for changes in the level of dust in each chamber, and therefore the amount of confinement it provides, should be taken into account during future remedial activities such as wetting of the dust. If the dust exhibits major consolidation during wetting, additional stope walls will be exposed and confinement reduced. This could have stability implications for not only the walls of the stope and any associated pillar, but also the crown pillar if stope spans increase due to spalling of the walls. Test work to assess the dust consolidation should be included in future design assessments.

Backfill testing, as discussed in the Underground PDR, is required prior to implementation of the mitigation and remediation work described in this report.

10.8 Monitoring

The monitoring program for C5-09 is important and if it has lapsed, it should be re-started. Backfilling both non-arsenic Stopes C3-12 and C5-09 should be a priority in the project remediation schedule, and some consideration of mitigating them prior to the start of remediation should be made.

Improving the monitoring of the behaviour of the bedrock near the stopes discussed in this report should be a priority. The existing survey of shallow monitoring points only measures the movement of overburden, and the behaviour of the rock cannot be determined. The existing monitoring points should be replaced with more permanent pins or posts embedded securely in the ground and topped with survey prisms. The accuracy of the survey system, the frequency of surveying, the timeliness of the analysis of the data, and communication of any changes in stope behaviour need to be reviewed as part of the overall monitoring of this area.

An augmented monitoring plan should be developed that may include borehole based strain measurement. Such instrumentation includes multi-point borehole extensometers (MPBXs) or time-domain-reflectrometry (TDR) cables. Measurement of strain in the rock crowns will allow analyses to be performed to augment the empirically based stability assessments. The confidence provided by these analyses is required before access of heavy vehicles on top of the crowns can be allowed.

TDR cables and/or multi-point borehole extensometers should be installed into all pillars noted above in Section 9.0. Failure of the brittle rock found at the Site will likely happen quickly, and the system may see limited movement prior to failure depending on the frequency of measurement and assessment of the data. However, with additional investigation information, the potential failure mechanisms may be better understood and this type of monitoring information will be useful during execution of investigation, mitigation, and ultimately remedial activities over and near the crown pillars.

Development of a simple microseismic monitoring system should be discussed. These systems can be complex and expensive, but they provide one of the few possible means to identify any deep seated rock failure or movements in currently inaccessible areas of the mine. Such a system would be particularly useful during any eventual flooding of the mine.

Any boreholes drilled into the arsenic stopes and chambers for CMS or other purposes should be cased into bedrock and locking caps installed. Accessible boreholes all periodic comparative monitoring of the condition of the stope back and walls using CMS to be carried out. This is a form of monitoring that could be used to augment and validate the stability analyses as well as to assist operational health and safety management when work is undertaken near these openings.

11.0 CLOSING

We trust that the above meets your requirements at this time. If you have any questions regarding the included material, please do not hesitate to contact us.

GOLDER ASSOCIATES LTD.

ORIGINAL SIGNED

Darren Kennard, P.Eng. (BC)
Associate

ORIGINAL SIGNED AND SEALED

Richard Beddoes, P.Eng.
Principal

Reviewed by:

ORIGINAL SIGNED

John A. Hull, P.Eng.
Principal, Mining Division

THE ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOLOGISTS and GEOPHYSICISTS OF THE NORTHWEST TERRITORIES
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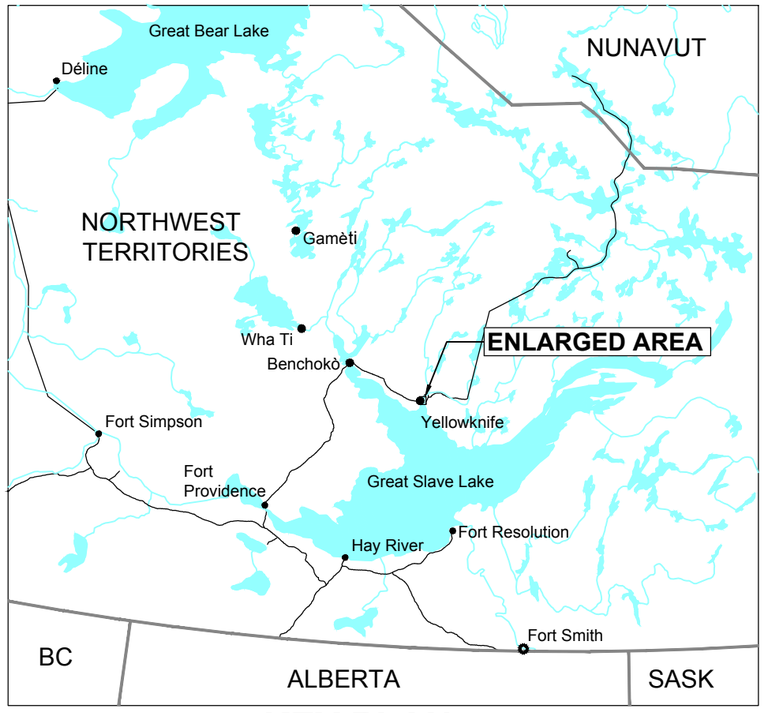

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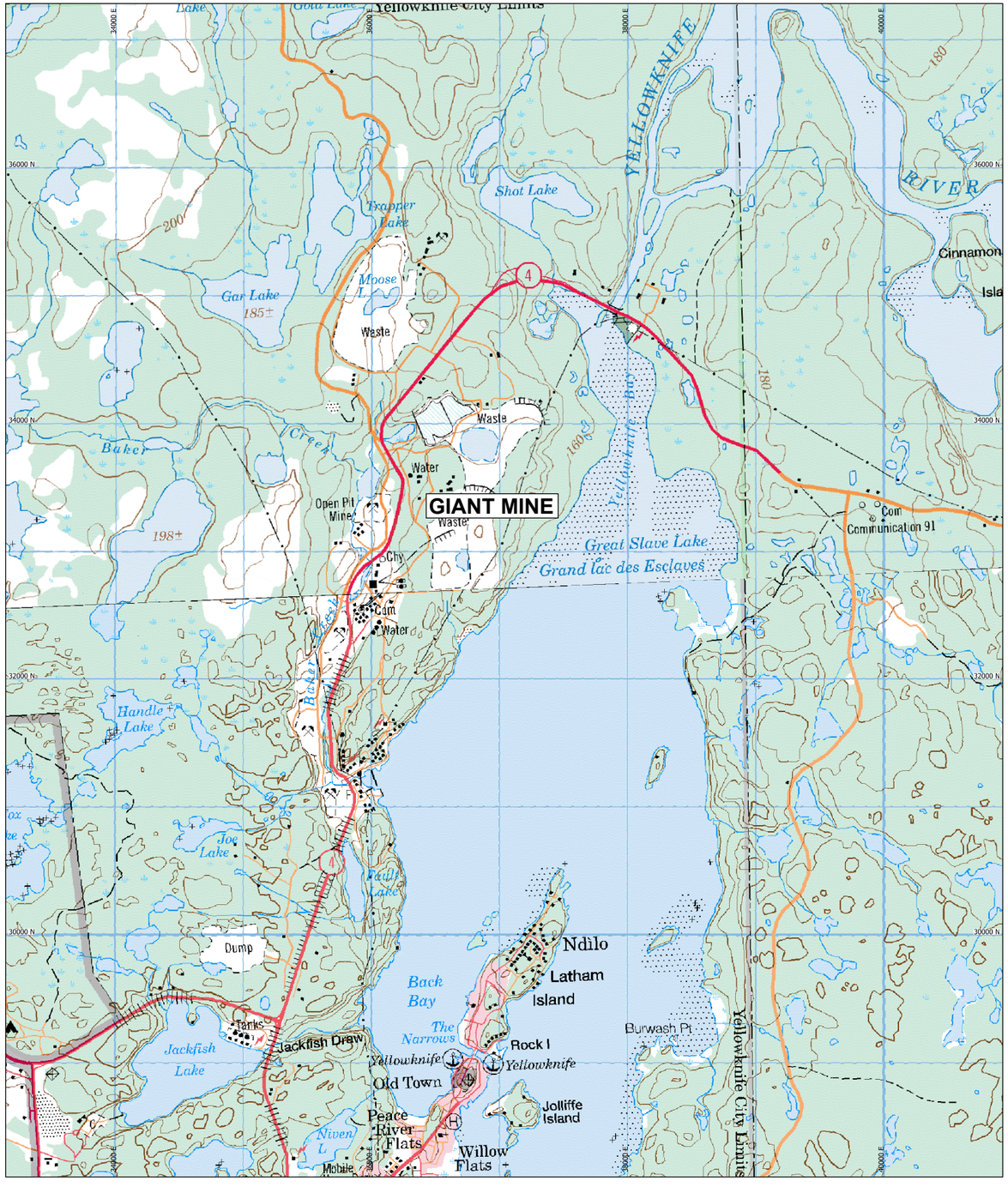

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SCALE IN METRES

NOTES
COORDINATES SHOWN ARE IN METRES GMRP GRID.

REFERENCE
TOPOGRAPHIC MAPS 85J08 AND 85J09 © 2002 HER MAJESTY THE QUEEN IN RIGHT OF CANADA. DEPARTMENT OF NATURAL RESOURCES. ALL RIGHTS RESERVED. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 11.

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Western Region
SERVICES IMMOBILIERS
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PRELIMINARY
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Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: AS

Drawn by/Dessine par: JK

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

KEY PLAN

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 1.1	0

KEY PLAN

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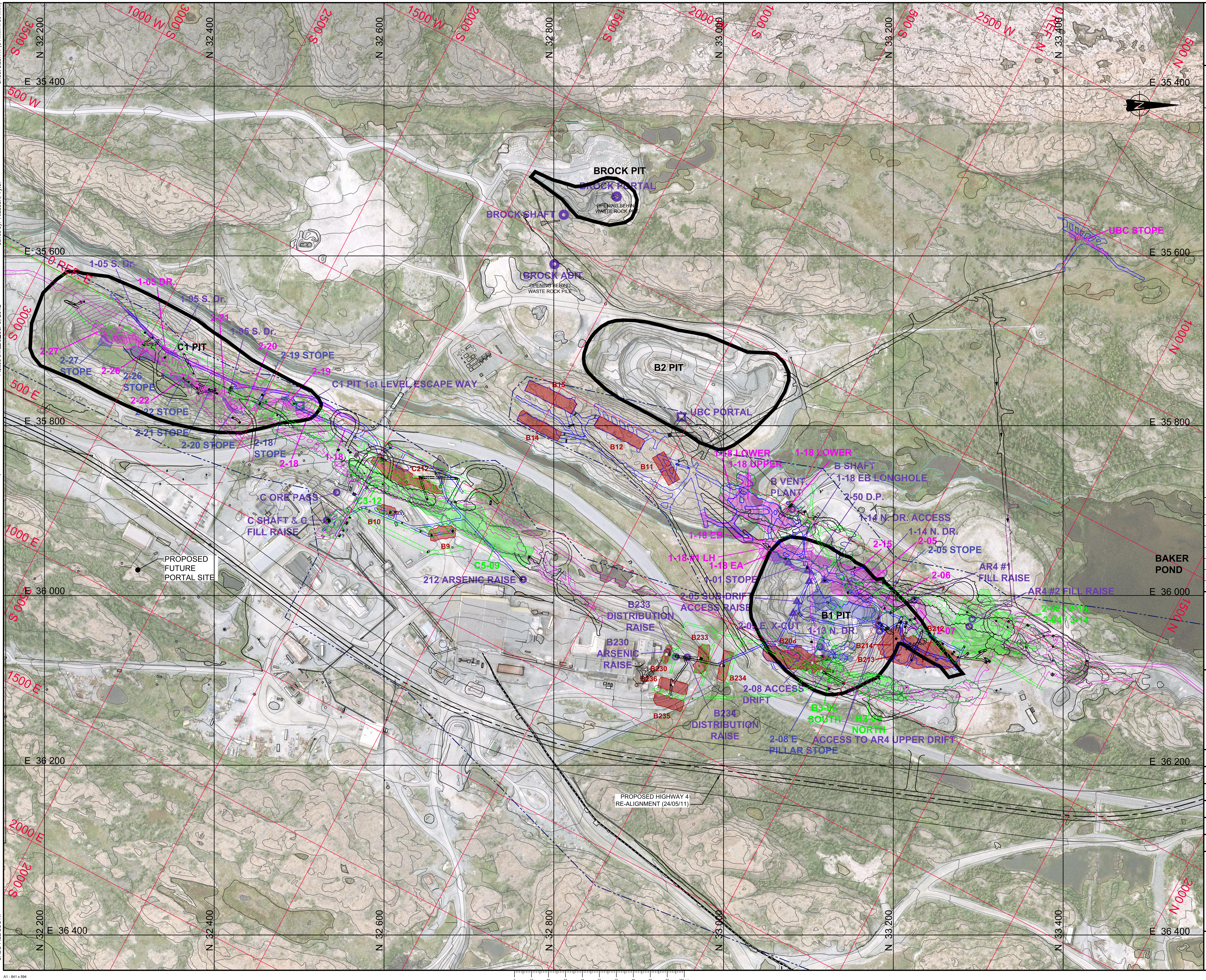

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LEGEND

- 33000 N — GMRP COORDINATE SYSTEM
- 600 S — IMG COORDINATE SYSTEM
- ARSENIC CHAMBERS AND STOPES MAXIMUM EXTENT
- NON-ARSENIC STOPES NEAR SURFACE (<35m DEPTH)
- NON-ARSENIC STOPES ADJACENT TO AN ARSENIC STOPE
- PITS CREST OUTLINE (2009)
- APPROXIMATE MAXIMUM STOPING EXTENT AT DEPTH
- 1st LEVEL (100) UG. DEVELOPMENT
- 2nd LEVEL (250) UG. DEVELOPMENT
- 3rd LEVEL (425) UG. DEVELOPMENT
- UG. RAMPS, DECLINES AND INCLINES
- INTERMEDIATE DEVELOPMENT BETWEEN LEVELS
- NON-ARSENIC STOPE BREAKTHROUGH TO OPEN-PIT, BACKFILLED WITH UNKNOWN FILL
- CURRENT ACCESS POINT TO UNDERGROUND
- OPENING TO SURFACE
- OPENING UNDER WASTE ROCK PILE

NOTES

1. ALL UNITS ARE IN METERS UNLESS OTHERWISE NOTED. COORDINATE SYSTEM IS THE GMRP COORDINATE SYSTEM.
2. IMG GRID DISPLAYED IS IN IMPERIAL UNITS AND SHOWN FOR INFORMATION ONLY.
3. THE UNDERGROUND MINE GEOMETRY INFORMATION SHOWN CONTAINS ERRORS AND OMISSIONS WHICH NEED TO BE CONSIDERED WHEN USING IT FOR DESIGN PURPOSES.
4. DEEPER MINING LEVELS EXIST BUT ARE NOT SHOWN (FIGURES 5,6,7 AND 14,15,16)

REFERENCES

1. COMPOSITE LEVEL PLANS AND MINE LAYOUT PROVIDED BY "PWGSC"
2. AERIAL PHOTO AND EXISTING GROUND TOPOGRAPHY DATED 2009, PROVIDED BY "PWGSC"

0 20 40 60 80 100
SCALE IN METERS

DO NOT SCALE DRAWINGS

Revision/ Revision	Description/Description	Date/Date
1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: NSO

Drawn by/Dessine par: NSO

PWGSC Project Manager/Administrateur de Projets TPSGC: DAVE COLBOURNE

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

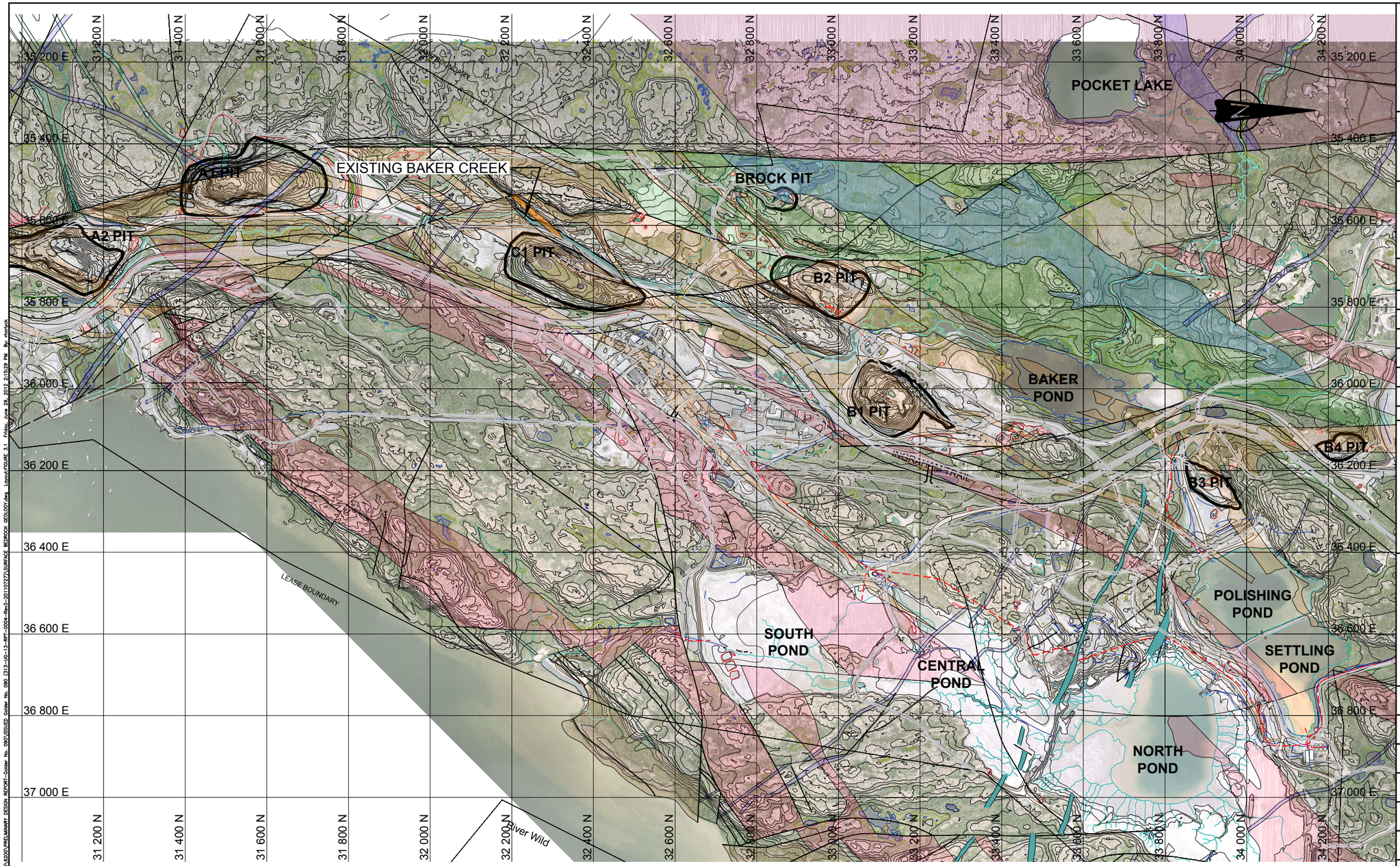
Client/client: PWGSC

Drawing title/Titre du dessin

GENERAL SURFACE MAP B1, B2 AND C1 OPEN PIT AREA WITH UNDERGROUND DEVELOPMENT (LEVEL 1 TO 3) AND NEAR SURFACE STOPES

Project No./ No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 2.1	1

60162479_R-014204-313-RPT-0003_CF06-R2



LEGEND

- SHEAR ZONE
- MASSIVE AND PILLOWED MAFIC VOLCANIC ROCKS
- INTERFLOW SEDIMENTS AND TUFFS
- DIABASE
- VARIOLITIC PILLOWED MAFIC VOLCANIC ROCKS
- BROCK FM: DACITE FLOWS AND TUFFS

0 100 200 300 400 500
SCALE IN METRES

NOTES

1. TOPOGRAPHIC CONTOURS SHOWN ARE IN METRES TO GMRP DATUM AT 25m INTERVALS.
2. COORDINATES SHOWN ARE IN METRES GMRP GRID.
3. FAULT TRACES AND GEOLOGICAL CONTACTS BASED ON REGIONAL GEOLOGY PLAN. LOCATIONS MAY NOT BE ACCURATE.

REFERENCES

1. PWGSC, TOPOGRAPHIC CONTOURS, CAD FILES: GM-CONTOURS-pt5m-GRP.DWG, DATED NOVEMBER 16TH, 2009.
2. PWGSC, AERIAL PHOTOGRAPH, IMAGE FILE: GIANTMINE_GRP.SID, DATED NOVEMBER 24TH 2009.
3. ROYAL OAK MINES, REGIONAL GEOLOGY PLAN, CAD FILE: GIANT MINESITE GEOLOGY AND TOPO.DWG, DATED 1995.

Public Works and Government Services Canada
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REAL PROPERTY SERVICES
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Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: AS

Drawn by/Dessine par: DT

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

SURFACE BEDROCK GEOLOGY

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 3.1	0

A0 – PWGSC – ANSI B–L1 – 11X17

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LEGEND

- GMRP COORDINATE SYSTEM
- IMG COORDINATE SYSTEM
- IME COORDINATE SYSTEM
- ARSENIC CHAMBERS AND STOPES MAXIMUM EXTENT
- PITS CREST OUTLINE (2009)
- APPROXIMATE STOPING EXTENT AT DEPTH
- 1st LEVEL (100) UG. DEVELOPMENT
- UG. RAMPS, DECLINES AND INCLINES
- INTERMEDIATE DEVELOPMENT BETWEEN LEVELS
- ORE - QUARTZ, ARSENOPYRITE, PYRITE AND STIBNITE IN SERCITE SCHIST
- SHEAR ZONE - SERICITE ALTERED
- SHEAR ZONE - CHLORITE ALTERED
- MAFIC VOLCANICS - MASSIVE AND PILLOWED
- METAGABBRO
- BROCK DACITE
- BROCK TUFFS
- GRANODIORITE
- FAULT
- 2004 SRK GEOTECHNICAL INVESTIGATION BOREHOLE

NOTES

1. ALL UNITS ARE IN METERS UNLESS OTHERWISE NOTED. COORDINATE SYSTEM IS THE GMRP COORDINATE SYSTEM.
2. IMG GRID DISPLAYED IS IN IMPERIAL UNITS AND SHOWN FOR INFORMATION ONLY.
3. THE UNDERGROUND MINE GEOMETRY INFORMATION SHOWN CONTAINS ERRORS AND OMISSIONS WHICH NEED TO BE CONSIDERED WHEN USING IT FOR DESIGN PURPOSES.

REFERENCES

1. COMPOSITE LEVEL PLANS AND MINE LAYOUT PROVIDED BY PWGSC
2. ROYAL OAK MINING GEOLOGY DRAWING FROM PWGSC, TITLED: GIANT MINE 100 LEVEL GEOLOGY PLAN VIEW. DATED: MAR. 27,1998, FILE NAME: ARS15TLEVGEOORE.DWG.

0 15 30 45 60 75
SCALE IN METERS

DO NOT SCALE DRAWINGS

Revision/ Revision	Description/Description	Date/Date
1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
NSO

Drawn by/Dessine par
NSO

PWGSC Project Manager/Administrateur de Projets TPSGC
DAVE COLBOURNE

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client
PWGSC

Drawing title/Titre du dessin

GEOLOGY, RMR DRILLHOLES AND MAPPING SCANLINES LEVEL 100 (1ST LEVEL)

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 3.2	1

PWGSC – A1 – 841X594

0 10 20 30 40 50 60 70 80 90 100mm

SCANLINES LEVEL 100

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REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

LEGEND

- GMRP COORDINATE SYSTEM
- IMG COORDINATE SYSTEM
- IME COORDINATE SYSTEM
- ARSENIC CHAMBERS AND STOPES MAXIMUM EXTENT
- PITS CREST OUTLINE (2009)
- APPROXIMATE STOPING EXTENT AT DEPTH
- 2nd LEVEL (250) UG. DEVELOPMENT
- UG. RAMPS, DECLINES AND INCLINES
- INTERMEDIATE DEVELOPMENT BETWEEN LEVELS
- INTERMEDIATE DEVELOPMENT BETWEEN LEVELS
- ORE - QUARTZ, ARSENOPYRITE, PYRITE AND STIBNITE IN SERCITE SCHIST
- SHEAR ZONE - SERICITE ALTERED
- SHEAR ZONE - CHLORITE ALTERED
- MAFIC VOLCANICS - MASSIVE AND PILLOWED
- METAGABBRO
- BROCK DACITE
- BROCK TUFFS
- GRANODIORITE
- FAULT
- 2004 SRK GEOTECHNICAL INVESTIGATION BOREHOLE

NOTES

1. ALL UNITS ARE IN METERS UNLESS OTHERWISE NOTED. COORDINATE SYSTEM IS THE GMRP COORDINATE SYSTEM.
2. IMG GRID DISPLAYED IS IN IMPERIAL UNITS AND SHOWN FOR INFORMATION ONLY.
3. THE UNDERGROUND MINE GEOMETRY INFORMATION SHOWN CONTAINS ERRORS AND OMISSIONS WHICH NEED TO BE CONSIDERED WHEN USING IT FOR DESIGN PURPOSES.

REFERENCES

1. COMPOSITE LEVEL PLANS AND MINE LAYOUT PROVIDED BY PWGSC.
2. ROYAL OAK MINING GEOLOGY DRAWING FROM PWGSC, TITLED: GIANT MINE 250 LEVEL GEOLOGY PLAN VIEW; DATED: MAR. 22,1998; FILE NAME: ARSNDLEVGEOORE.DWG.

0 15 30 45 60 75
SCALE IN METERS

DO NOT SCALE DRAWINGS

Revision/ Revision	Description/Description	Date/Date
1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
NSO

Drawn by/Dessine par
NSO

PWGSC Project Manager/Administrateur de Projets TPSGC
DAVE COLBOURNE

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client
PWGSC

Drawing title/Titre du dessin

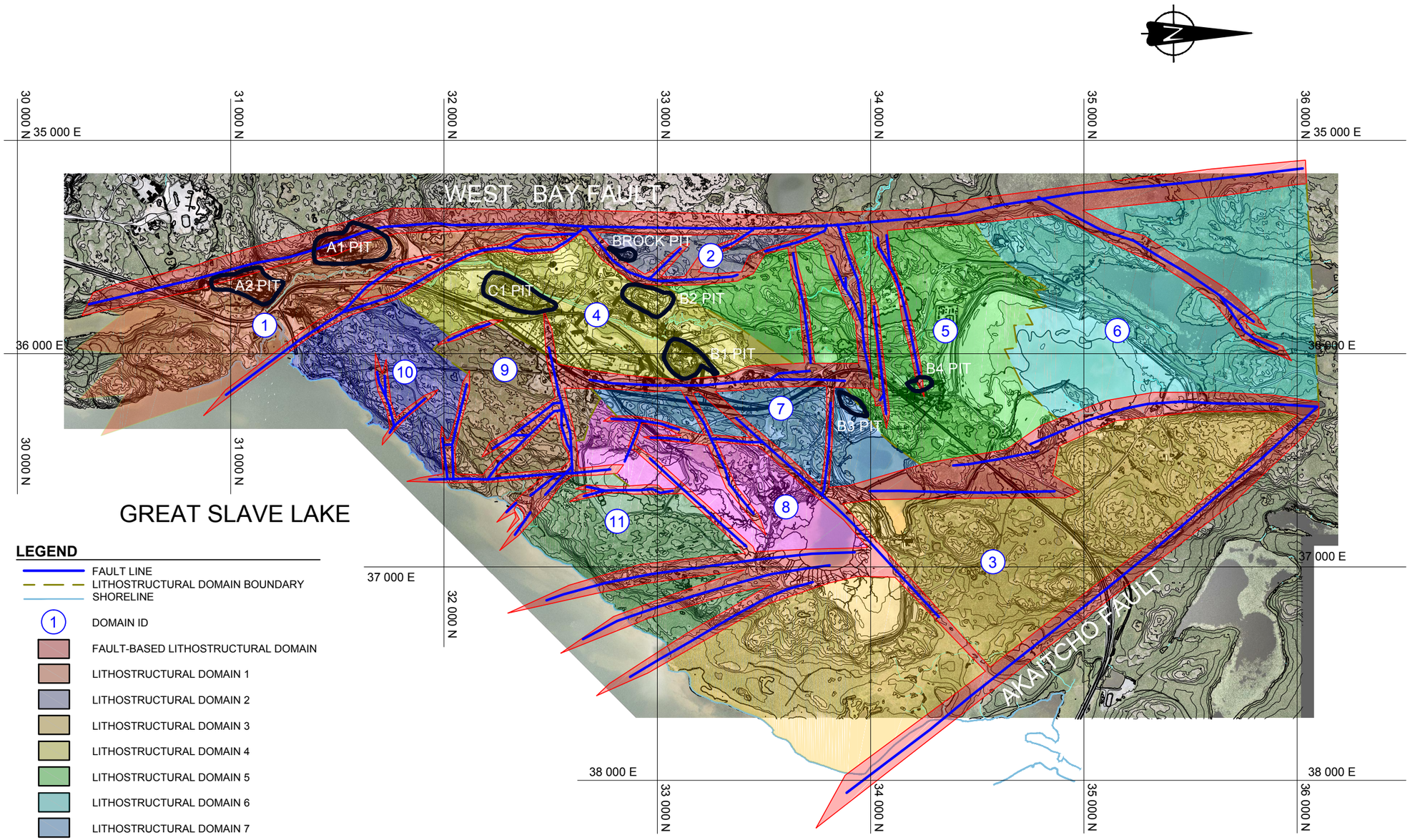
GEOLOGY, RMR DRILLHOLES AND MAPPING SCANLINES LEVEL 250 (2ND LEVEL)

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 3.3	1

PWGSC – A1 – 841X594

0 10 20 30 40 50 60 70 80 90 100mm

SCANLINES LEVEL 250



LEGEND

- FAULT LINE
- LITHOSTRUCTURAL DOMAIN BOUNDARY
- SHORELINE
- (1) DOMAIN ID
- FAULT-BASED LITHOSTRUCTURAL DOMAIN
- LITHOSTRUCTURAL DOMAIN 1
- LITHOSTRUCTURAL DOMAIN 2
- LITHOSTRUCTURAL DOMAIN 3
- LITHOSTRUCTURAL DOMAIN 4
- LITHOSTRUCTURAL DOMAIN 5
- LITHOSTRUCTURAL DOMAIN 6
- LITHOSTRUCTURAL DOMAIN 7
- LITHOSTRUCTURAL DOMAIN 8
- LITHOSTRUCTURAL DOMAIN 9
- LITHOSTRUCTURAL DOMAIN 10
- LITHOSTRUCTURAL DOMAIN 11

REFERENCES

1. PWGSC, TOPOGRAPHIC CONTOURS, CAD FILES: GM-CONTOURS-pt5m-GRP.DWG, DATED NOVEMBER 16TH, 2009.
2. PWGSC, AERIAL PHOTOGRAPH, IMAGE FILE: GIANTMINE_GRP.SID, DATED NOVEMBER 24TH 2009.
3. SRK, LITHOSTRUCTURAL DOMAIN INTERPRETATION IMAGE FROM REPORT "Giant Mine Arsenic Trioxide Project, Structural Geology." PREPARED FOR DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT, DECEMBER 2002.

0 200 400 600 800 1000
SCALE IN METRES

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Western Region
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Région de l'ouest

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Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

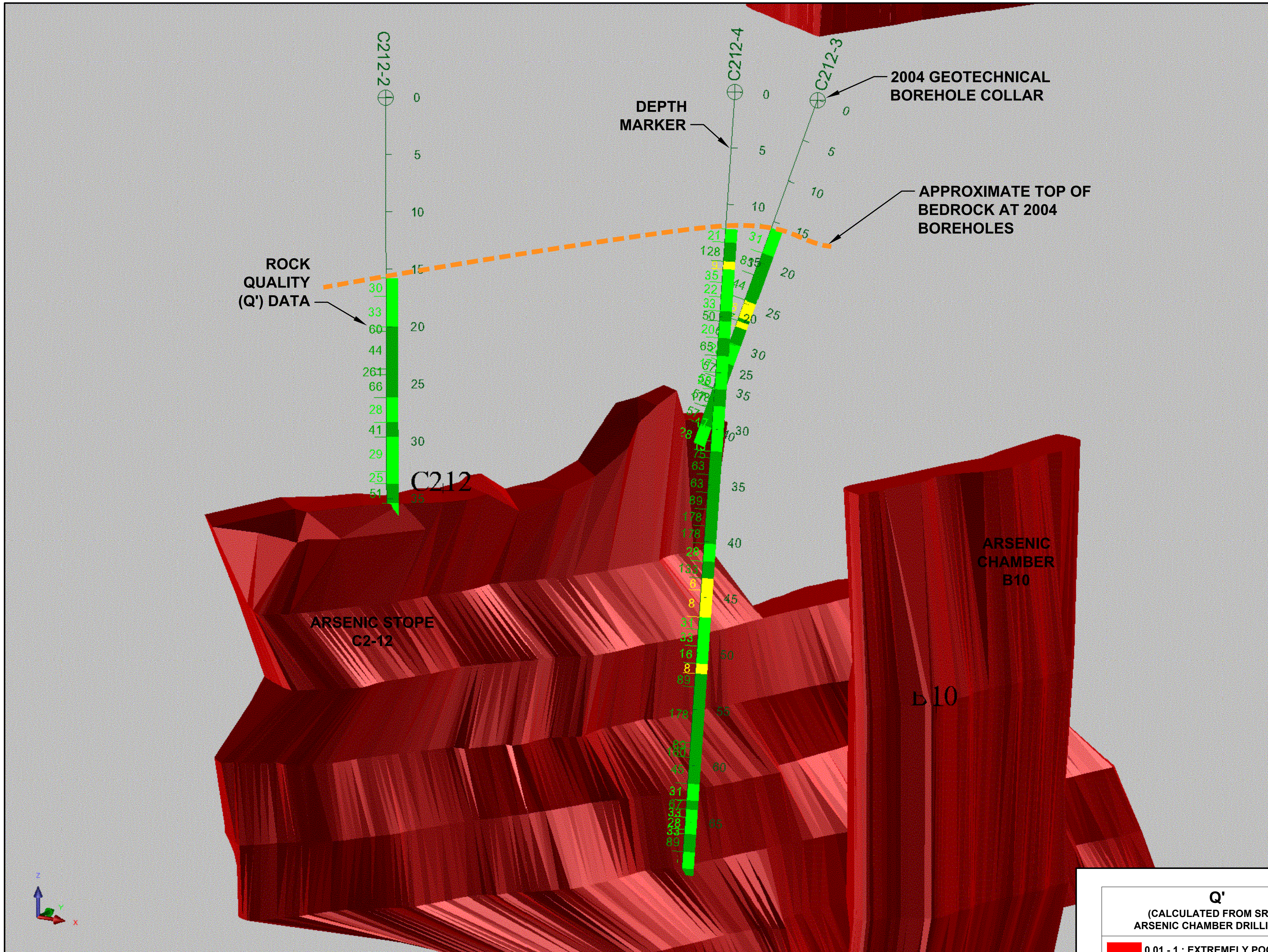
Approved by/Approuve par: DTK
Designed by/Concept par: JMM
Drawn by/Dessine par: MSH
PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC:
Client/client: PWGSC
Drawing title/Titre du dessin

LITHOSTRUCTURAL DOMAINS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 3.4	0

Drawing File: N:\Burnaby\Projects\2009\1427-09-1427-0006\Drafting\0000\6200\PRELIMINARY DESIGN REPORT-Golder No. 090\ISSUED Golder No. 090 (313-UG-13-RPT-0004-Rev3-20110727)\LITHOSTRUCTURAL DOMAINS.dwg Layout:F34 Friday, June 29, 2012 2:15:21 PM By: rhorlyck

A0 – PWGSC – ANSI B–L1 – 11X17



ISOMETRIC VIEW OF 3-D MODEL (LOOKING NORTHWEST)

Q'
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

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1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client
PUBLIC WORKS GOVERNMENT SERVICES CANADA

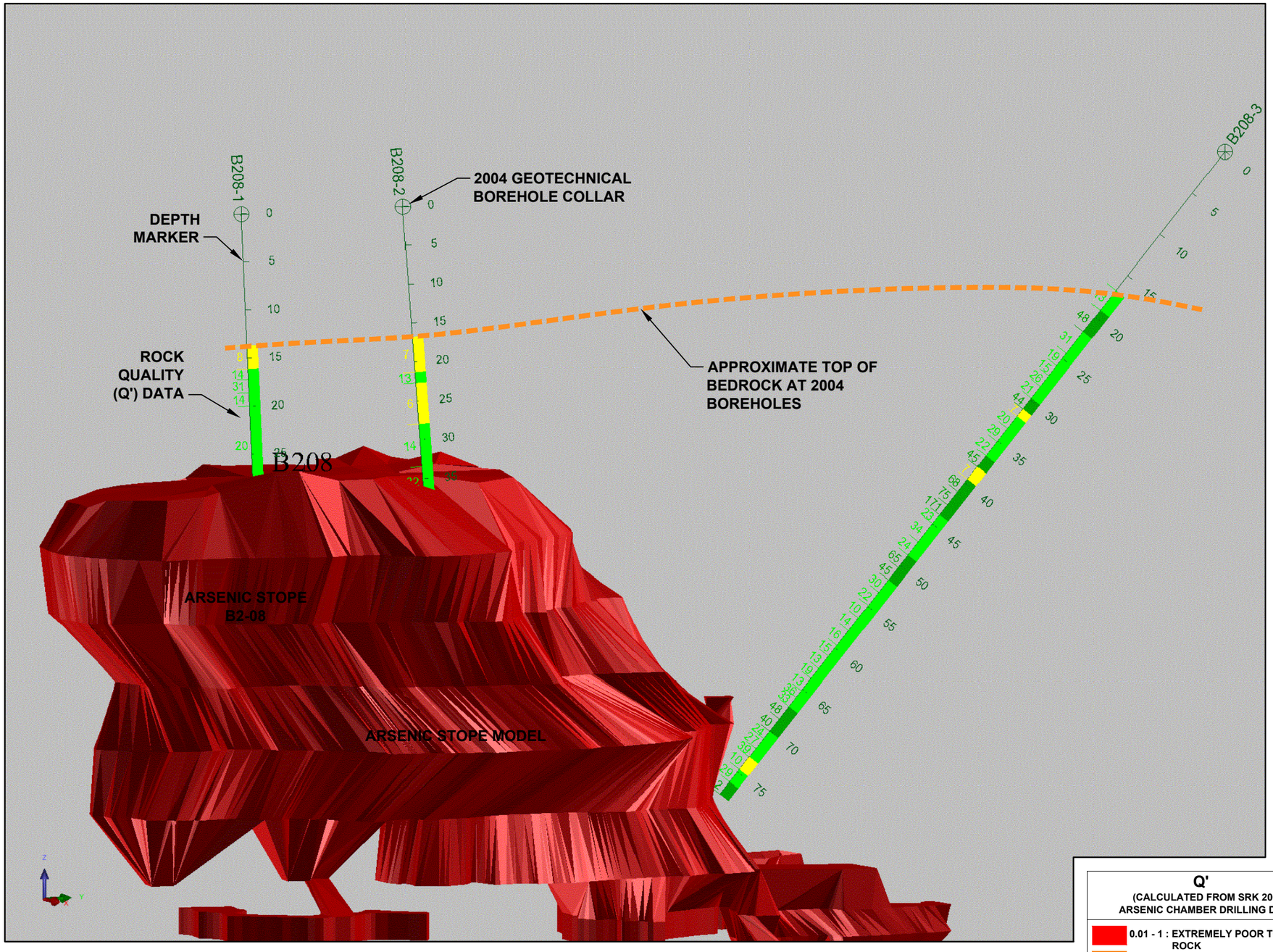
Project title/Titre du projet
GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
UNDERGROUND

Approved by/Approuvé par: DTK
Designed by/Concept par: NSO
Drawn by/Dessiné par: NSO
PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC
PWGSC, Architectural and Engineering Resources Manager/Ressources Architectural et de Directeur d'ingénierie, TPSGC
Client/client: PWGSC

Drawing title/Titre du dessin
LOCATION OF 2004 INVESTIGATION BOREHOLES FOR ARSENIC STOPE C2-12

Project No./No. du projet	Sheet/Feuille	Revision no./La Révision no.
R.014204.313	FIGURE 5.1	1

A0 – PWGSC – ANSI B-L1 – 11X17



ISOMETRIC VIEW OF 3-D MODEL (LOOKING WEST)

Q'
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

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Revision/ Revision	Description/Description	Date/Date
1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **NSO**

Drawn by/Dessine par: **NSO**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

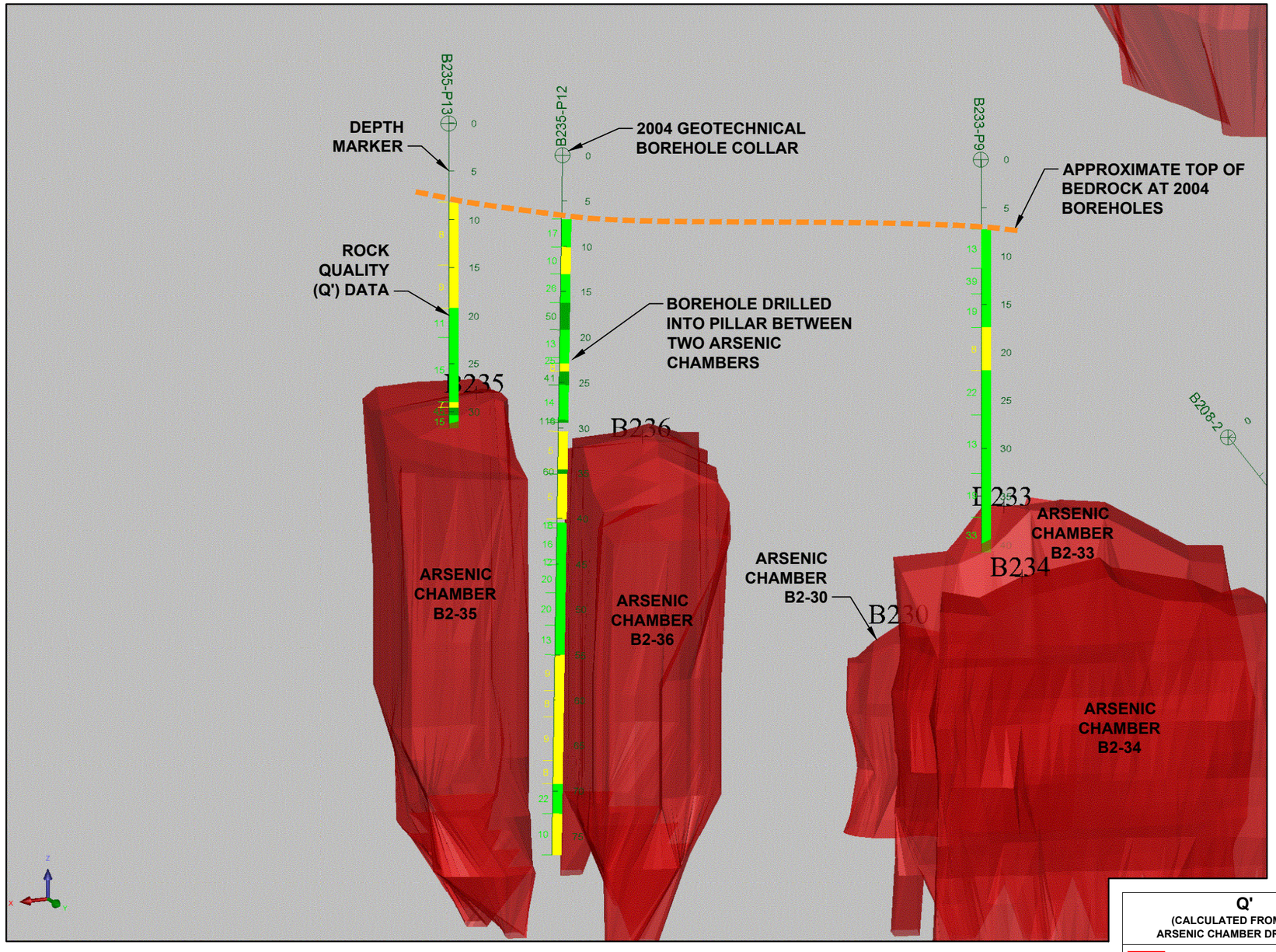
Client/client: **PWGSC**

Drawing title/Titre du dessin

LOCATION OF 2004 INVESTIGATION BOREHOLES FOR ARSENIC STOPE B2-08

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 5.2	1

A0 – PWGSC – ANSI B–L1 – 11X17



ISOMETRIC VIEW OF 3-D MODEL (LOOKING SOUTH)

Q'
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

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Revision/ Revision	Description/Description	Date/Date
1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **NSO**

Drawn by/Dessine par: **NSO**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

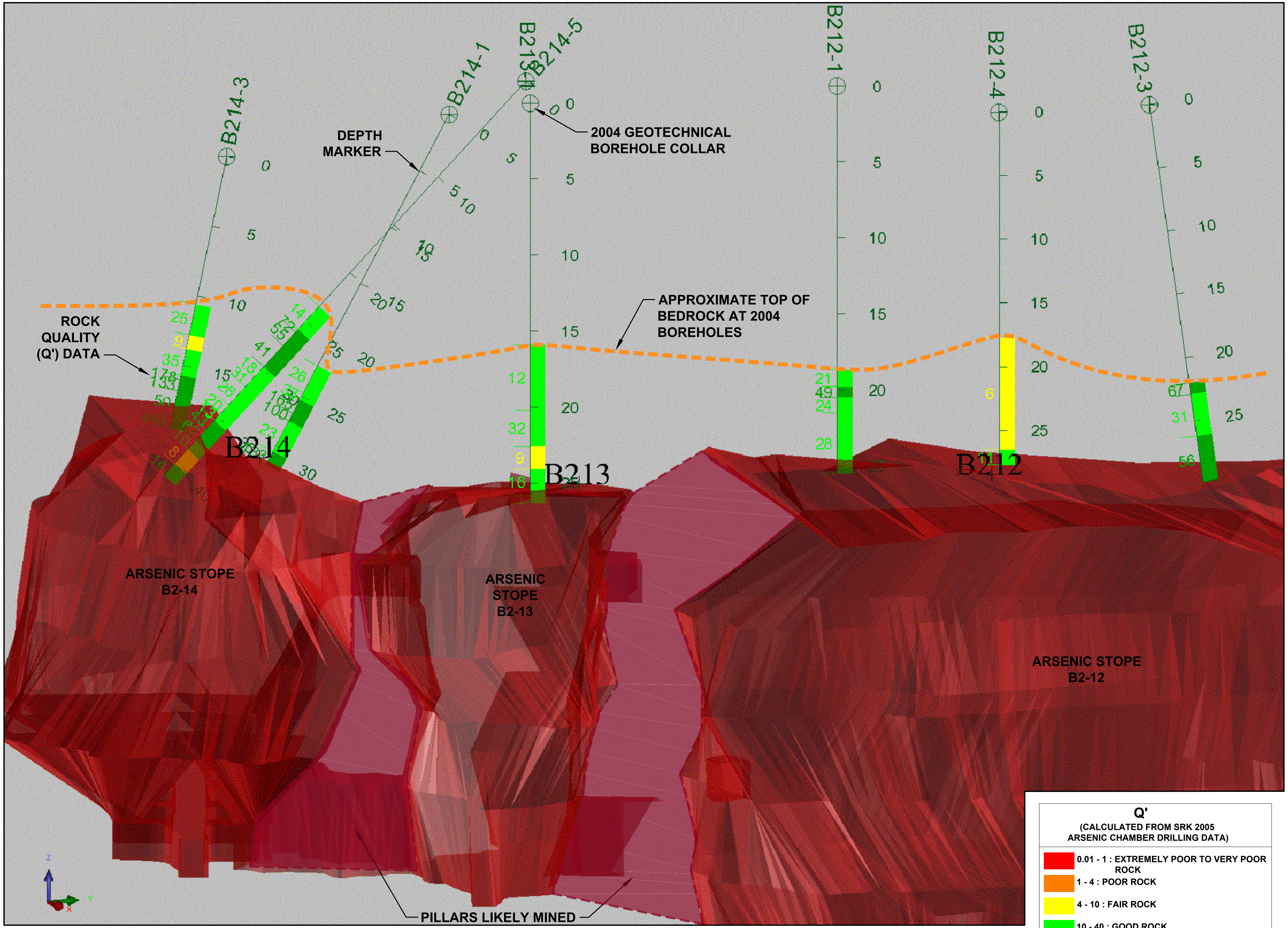
Client/client: **PWGSC**

Drawing title/Titre du dessin

LOCATION OF 2004 INVESTIGATION BOREHOLES FOR ARSENIC CHAMBERS B235/236 AND B233

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 5.3	1

A0 – PWGSC – ANSI B–L1 – 11X17



Q'
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

ISOMETRIC VIEW OF 3-D MODEL (LOOKING WEST)

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Revision/Revision	Description/Description	Date/Date
1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client
PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet
GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

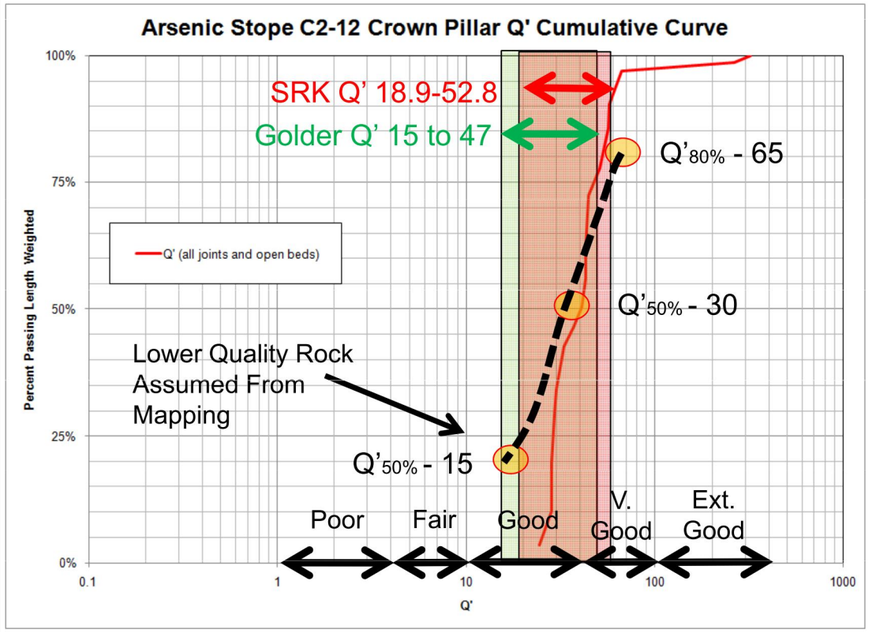
Approved by/Approuve par: DTK
Designed by/Concept par: NSO
Drawn by/Dessine par: NSO
PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC
PWGSC, Architectural and Engineering Resources Manager/Ressources Architectural et de Directeur d'ingénierie, TPSGC
Client/client: PWGSC

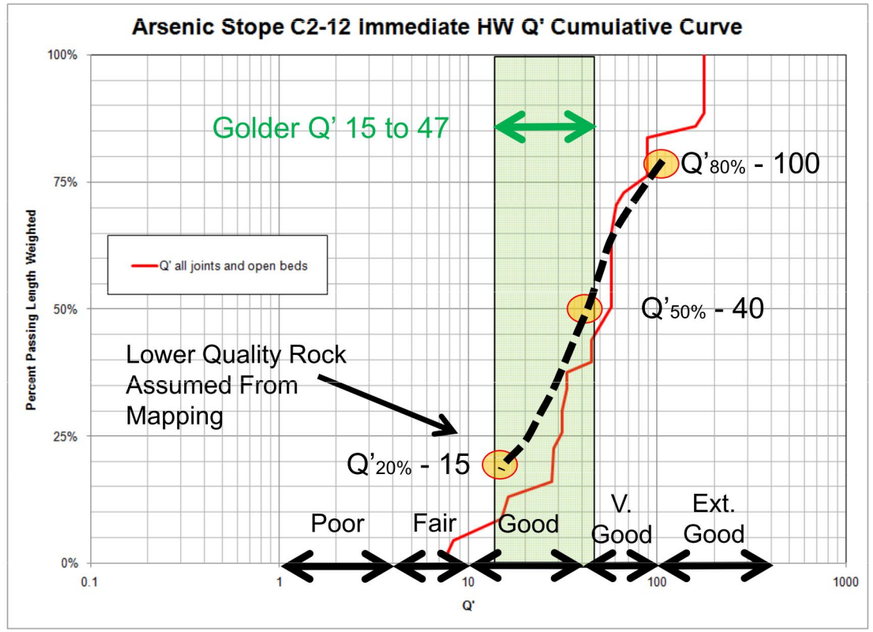
Drawing title/Titre du dessin
LOCATION OF 2004 INVESTIGATION BOREHOLES FOR ARSENIC STOPE B2-12/13/14

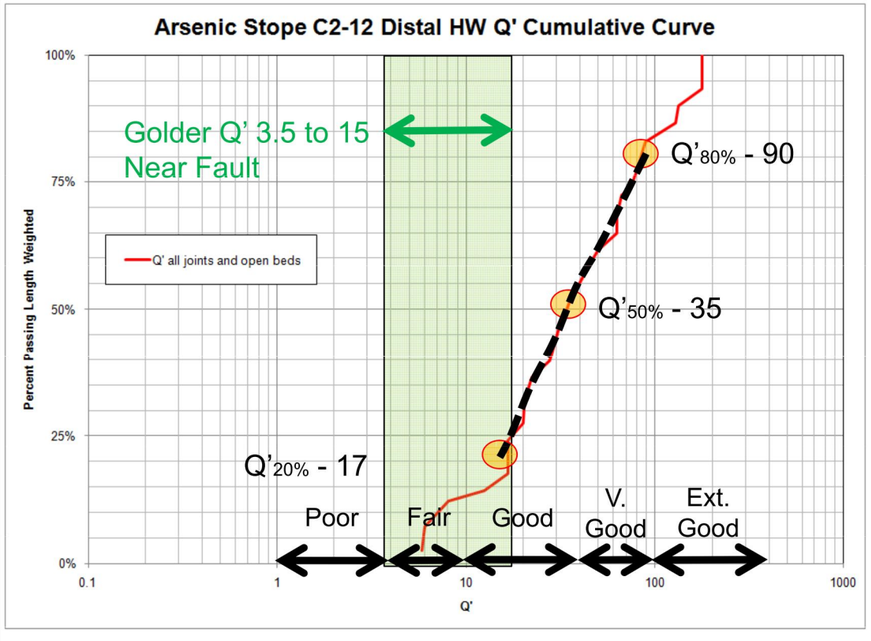
Project No./No. du projet	Sheet/Feuille	Revision no./La Révision no.
R.014204.313	FIGURE 5.4	1

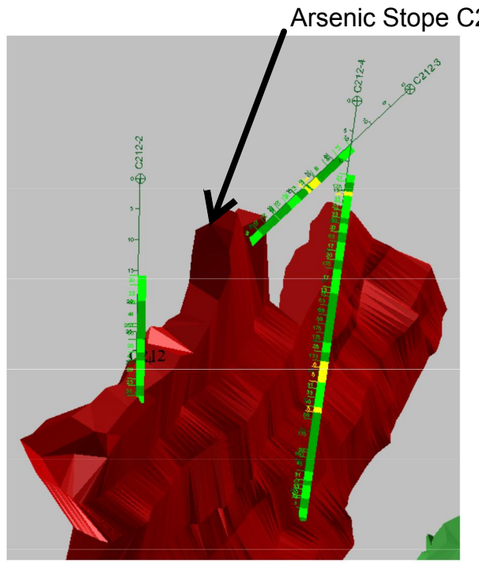
A0 – PWGSC – ANSI B-L1 – 11X17

BOREHOLES FOR ARSENIC STOPE B2-12,13,14









Borehole location shown in isometric view of 3D model (looking down and northwest)

Logged Intact Strength:
Crown Pillar: R2-R5/R6, Typically R4
Immediate HW: R3-R5, Typically R4/R5
Distal HW: R4-R5/R6, Typically R5

Data from following boreholes shown:
C212 - 2
C212 – 3
C212 – 4

Immediate HW is a 10m thick zone extending from the wall of the arsenic stope

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Revision/ Revision	Description/Description	Date/Date
1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-0-808

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuvé par: **DTK**

Designed by/Concept par: **NSO**

Drawn by/Dessiné par: **NSO**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

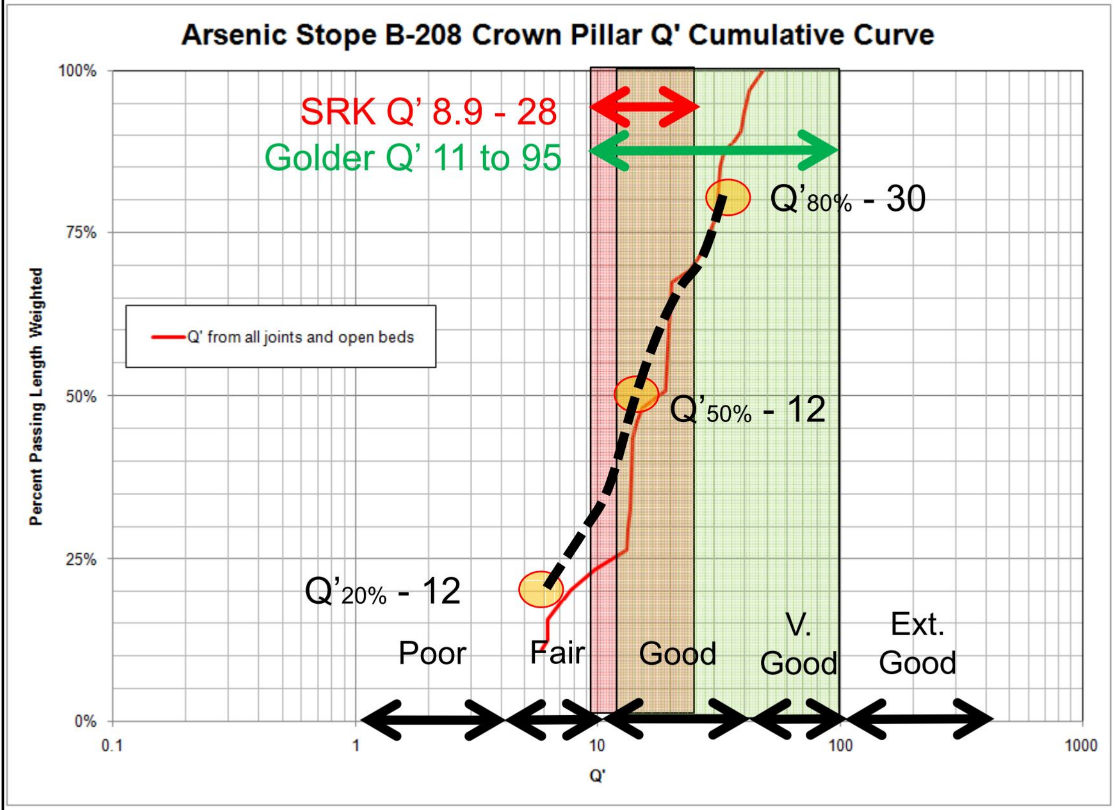
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

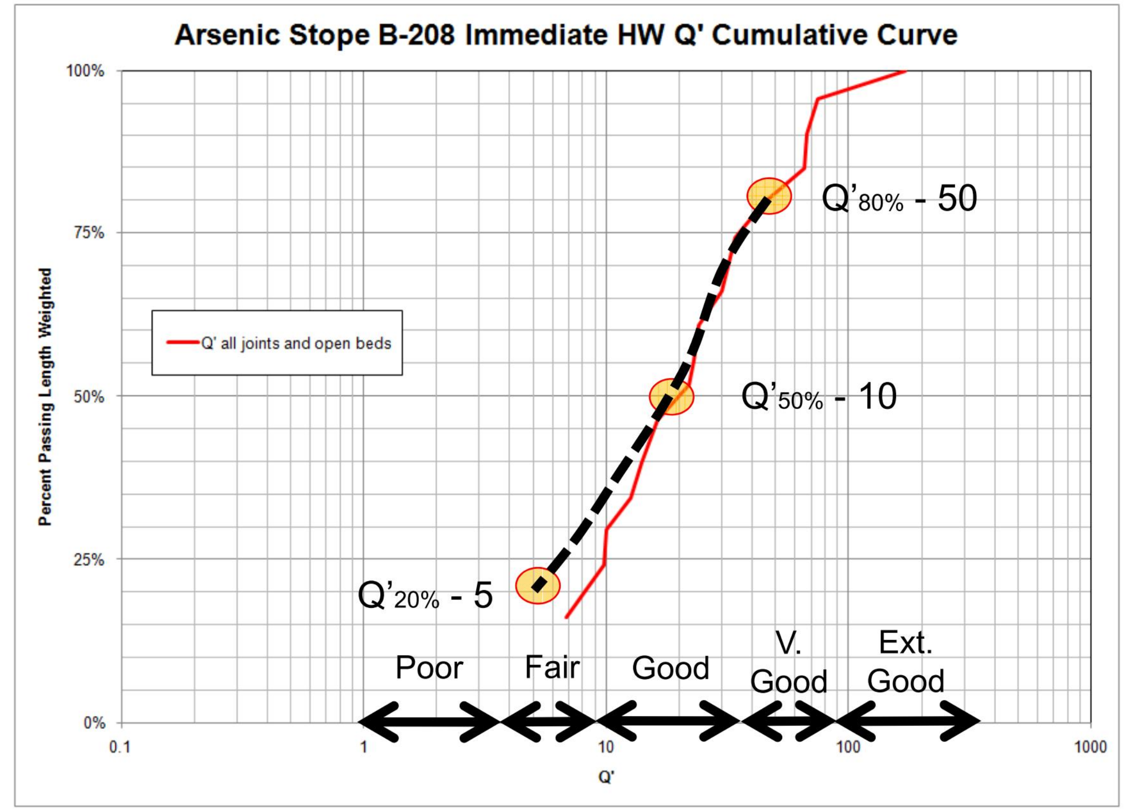
Client/client: **PWGSC**

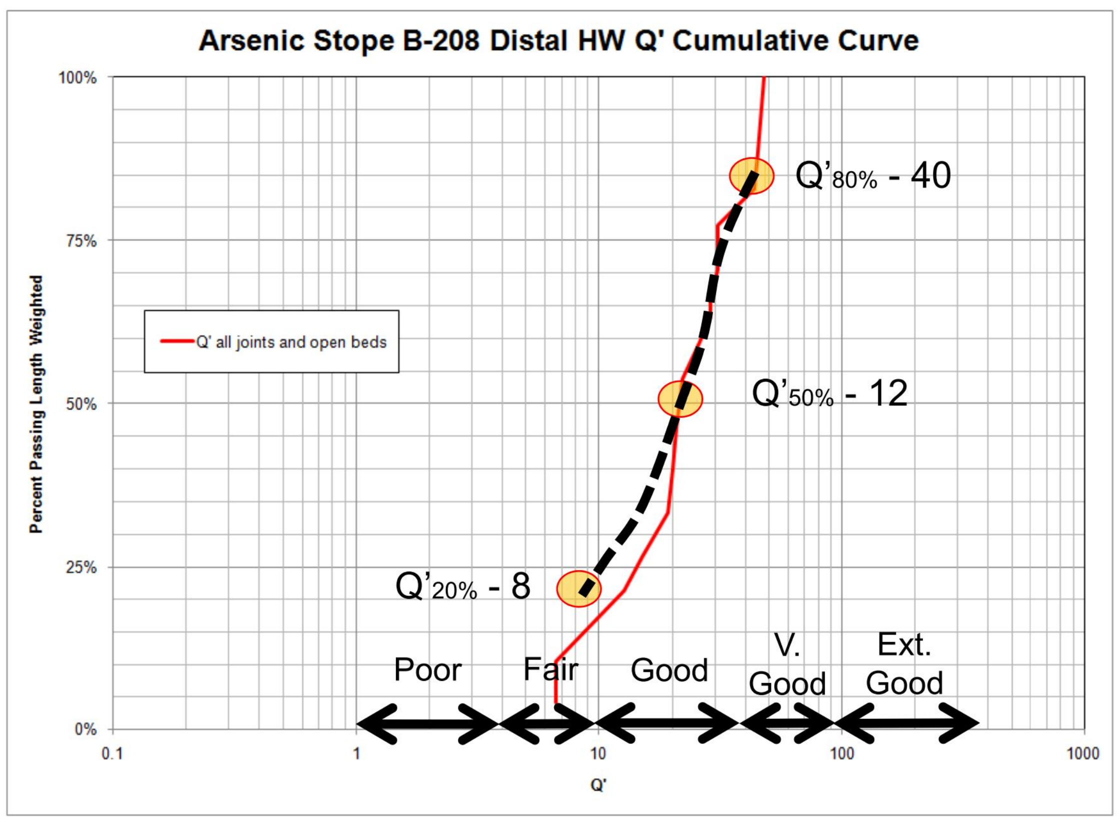
Drawing title/Titre du dessin

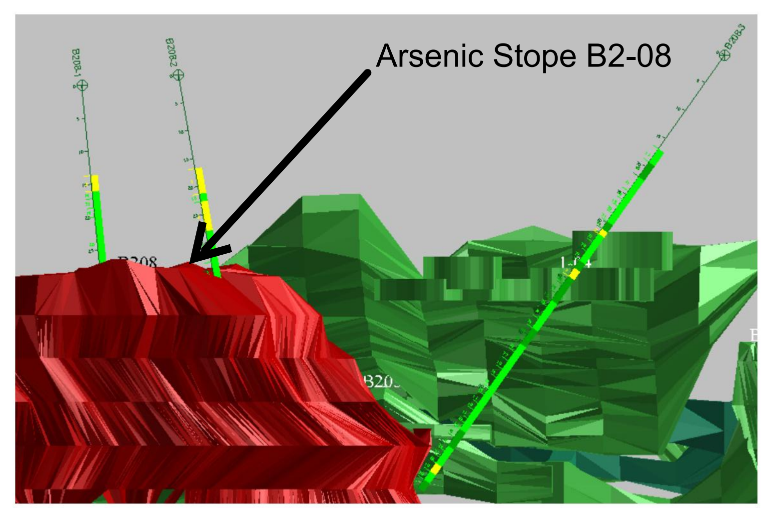
DISTRIBUTION OF Q' AND INTACT ROCK STRENGTH IN ARSENIC STOPE C2-12 GEOTECHNICAL BOREHOLE DATA

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	**FIGURE 5.5**	**1**









Borehole location shown in isometric view of 3D model (looking west)

Logged Intact Strength:
Crown Pillar: R2-R4, Typically R3
Immediate HW: R2-R4, Typically R3/R4
Distal HW: R3-R5, Typically R3/R4

Data from following boreholes shown:
B208-1
B208-2
B208-3

Immediate HW is a 10m thick zone extending from the wall of the arsenic stope

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
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Revision/Révision	Description/Description	Date/Date
1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client
PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet
GIANT MINE REMEDIATION PROJECT
YELLOWKNIFE, N.W.T.

UNDERGROUND

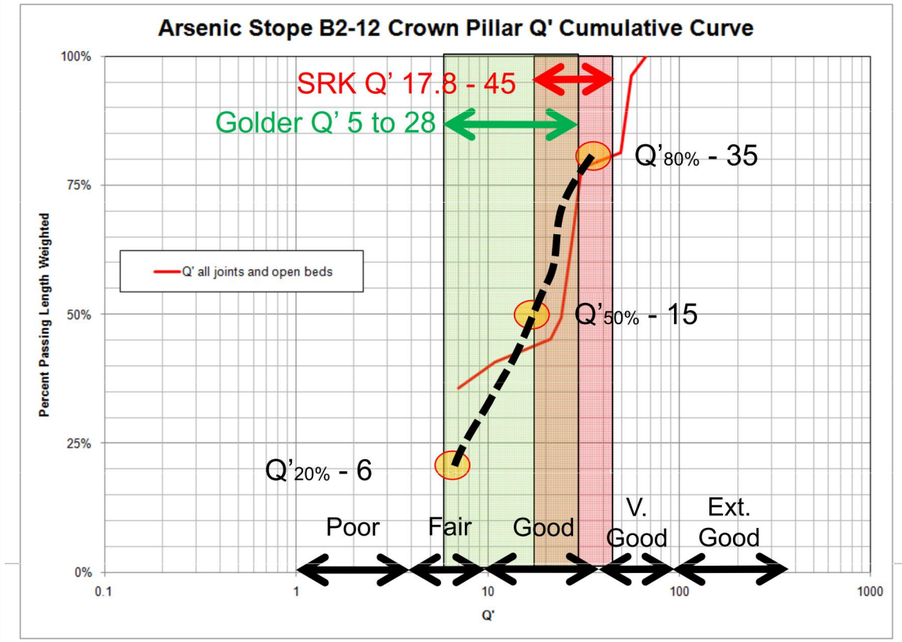
Approved by/Approuvé par: DTK
Designed by/Concept par: NSO
Drawn by/Dessiné par: NSO
PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC
PWGSC, Architectural and Engineering Resources Manager/Ressources Architectural et de Directeur d'ingénierie, TPSGC
Client/client: PWGSC

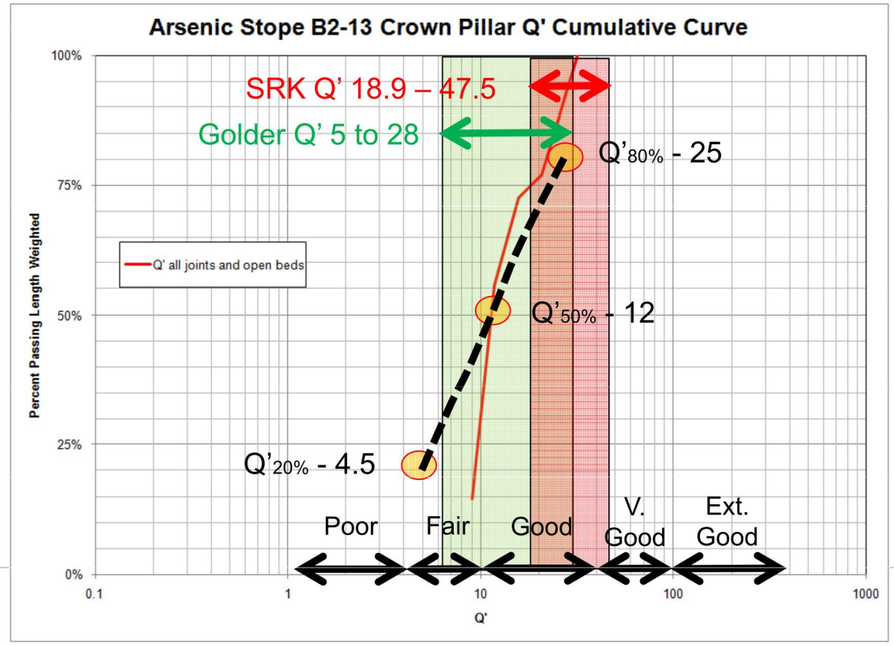
Drawing title/Titre du dessin
DISTRIBUTION OF Q' AND INTACT ROCK STRENGTH IN ARSENIC STOPE B2-08 GEOTECHNICAL BOREHOLE DATA

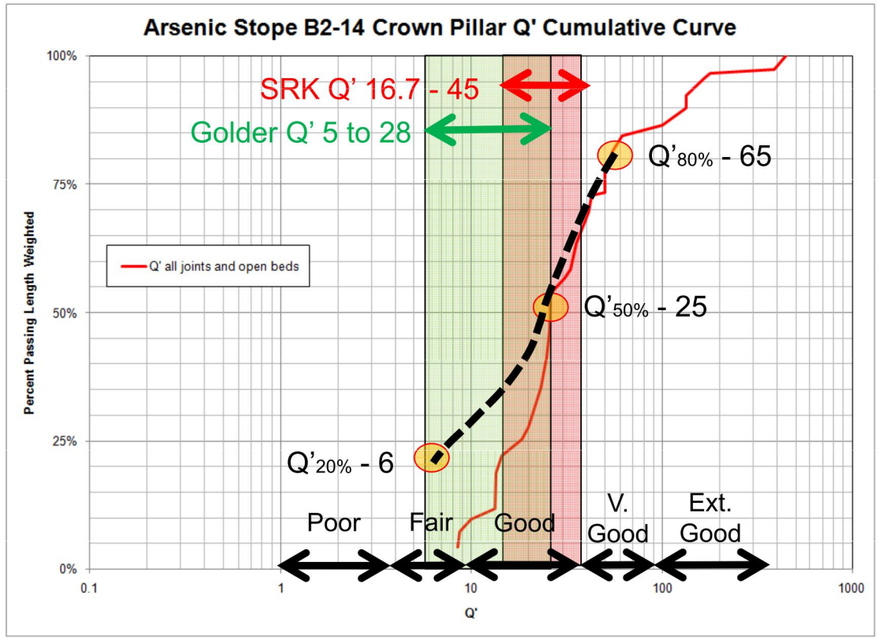
Project No./No. du projet	Sheet/Feuille	Revision no./La Révision no.
R.014204.313	FIGURE 5.6	1

AO – PWGSC – ANSI B-L1 – 11X17

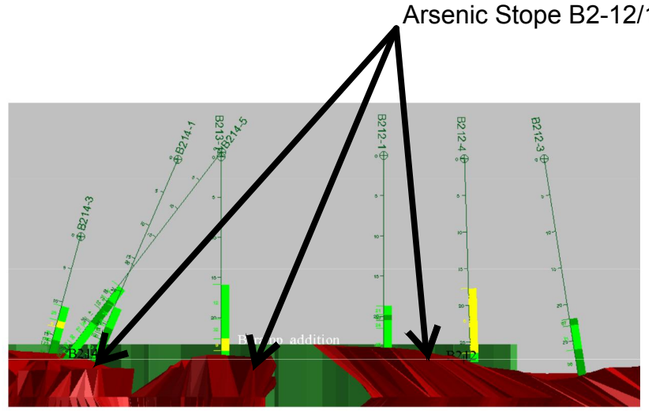
IN ARSENIC STOPE B2-08







Logged Intact Strength:
Crown Pillar: R2-R5, Typically R4



Borehole location shown in isometric view of 3D model (looking west)

Data from following boreholes shown:
B212-1, B212-3, B212-4
B213-1, B214-1, B214-3, B214-5

SRK's range of Q' for the entire stope complex was Q' 16.7 - 45

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1	ISSUED WITH RPT-0004-REV3	2012-10-05
0	ISSUED WITH RPT-0004-REV2	2011-09-07
0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet
GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: **DTK**
Designed by/Concept par: **NSO**
Drawn by/Dessine par: **NSO**
PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**
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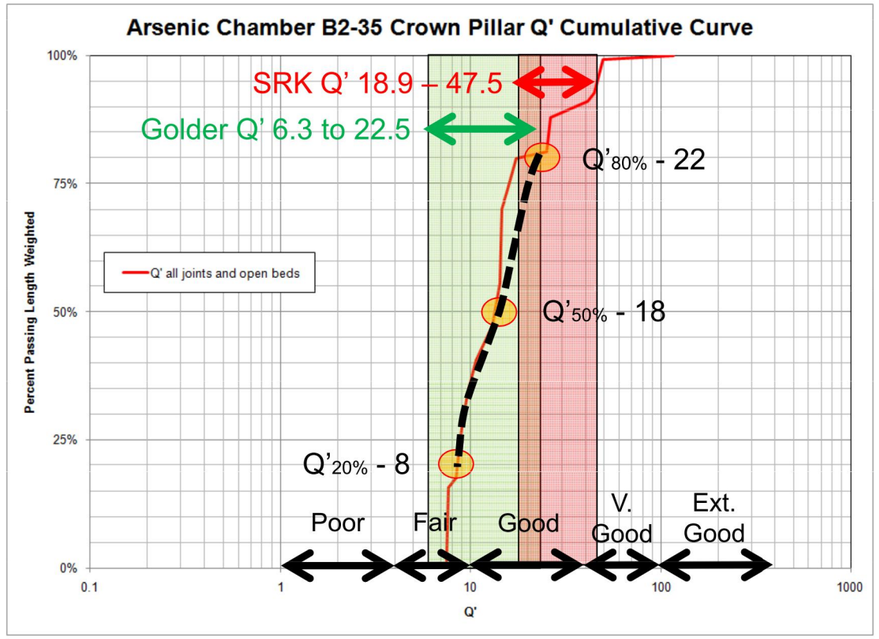
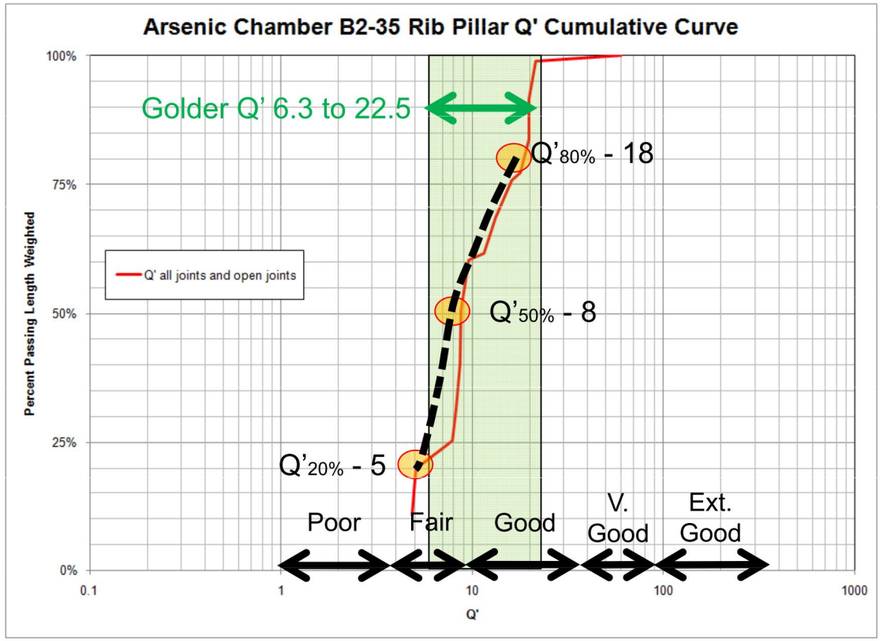
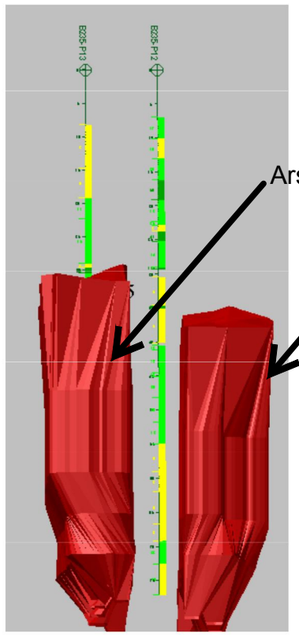
Client/client: **PWGSC**

Drawing title/Titre du dessin
DISTRIBUTION OF Q' AND INTACT ROCK STRENGTH IN ARSENIC STOPE B2-12, B2-13, B2-14 GEOTECHNICAL BOREHOLE DATA

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 5.7	1







Data from following boreholes shown:
B235-P12
B235-P13

Borehole location shown in isometric view of 3D model (looking south)

Logged Intact Strength:
Crown Pillar: R2-R5/R6, Typically R4/R5
Rib Pillar: R2-R5/R6, Typically R4

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0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **NSO**

Drawn by/Dessine par: **NSO**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

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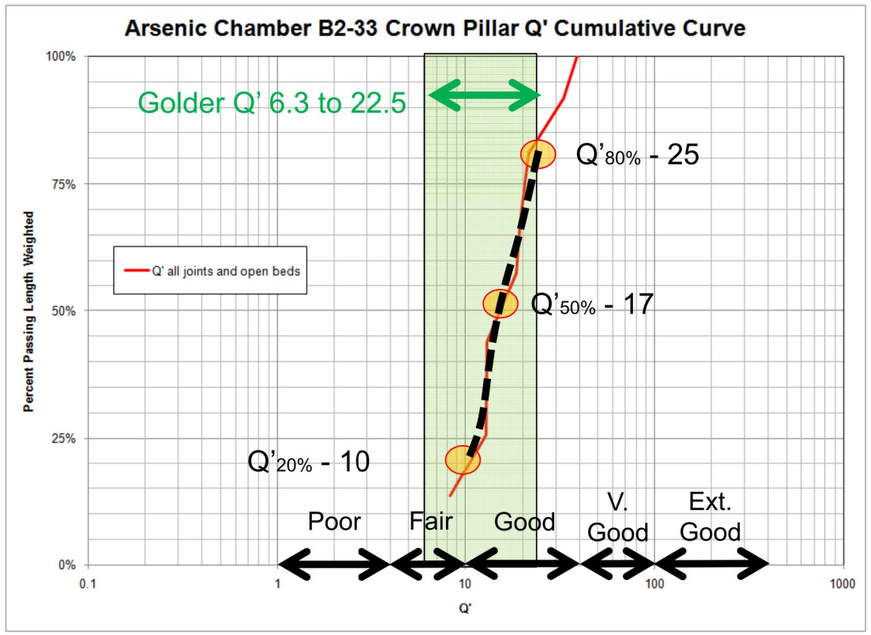
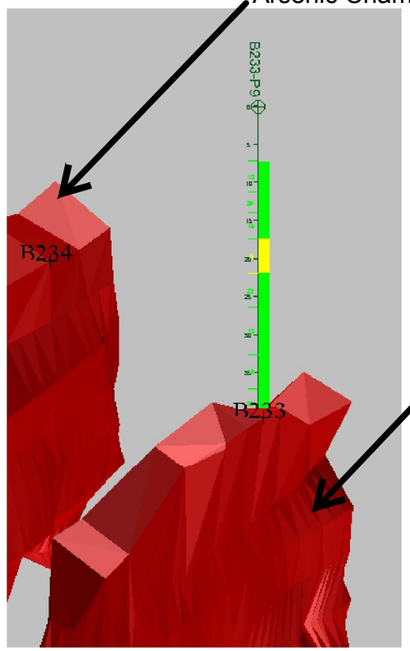
Client/client: **PWGSC**

Drawing title/Titre du dessin

DISTRIBUTION OF Q' AND INTACT ROCK STRENGTH IN ARSENIC CHAMBER B235/B236 GEOTECHNICAL BOREHOLE DATA

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 5.8	1





Borehole location shown in isometric view of 3D model (looking down and northeast)

Logged Intact Strength:
Crown Pillar: R3/R4 to R5, Typically R4

Data from following boreholes shown:
B233-P9

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GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

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Designed by/Concept par: **NSO**

Drawn by/Dessine par: **NSO**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

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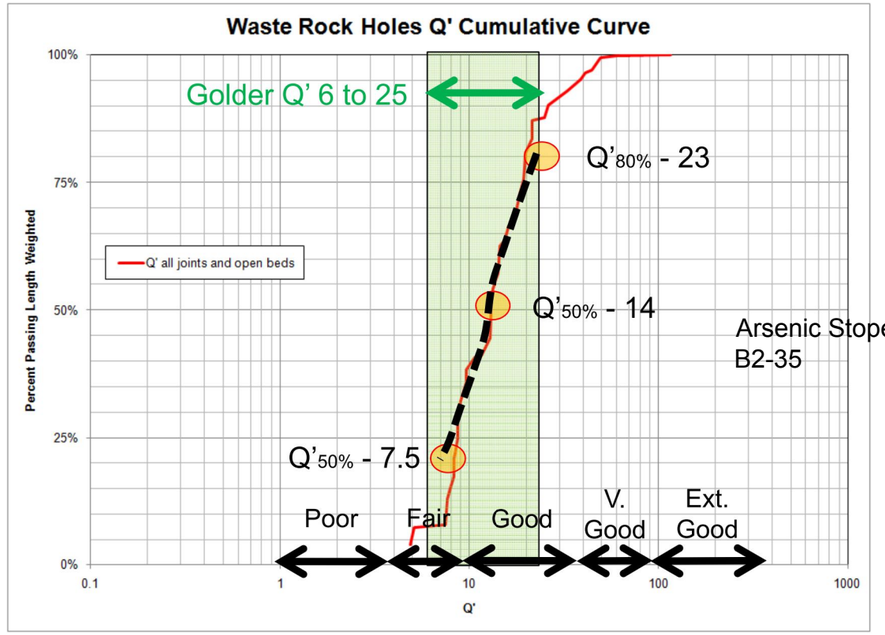
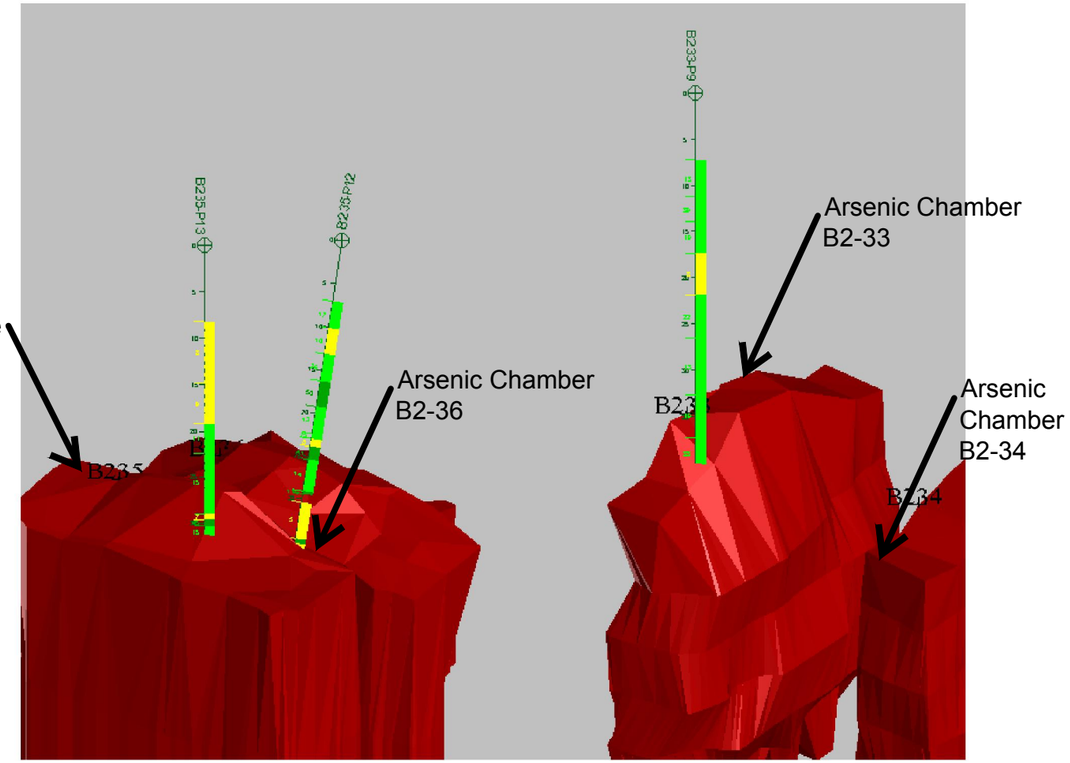
Drawing title/Titre du dessin
DISTRIBUTION OF Q' AND INTACT ROCK STRENGTH IN ARSENIC CHAMBER B233 GEOTECHNICAL BOREHOLE DATA

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 5.9	1

A0 – PWGSC – ANSI B–L1 – 11X17





Borehole location shown in isometric view of 3D model (looking southwest)

Golder Mapping Carried Out Near Bulkhead #58
In Massive Basalt, Q' 6.3 to 22.5

Golder Mapping Carried Out Near Chamber #5
In Massive Basalt (1993), Q' 5.9 to 25

Logged Intact Strength:
Crown Pillar: R2 to R5/R6, Typically R4/R5

Data from following boreholes shown:
B233-P9
B235-P12
B235-P13

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GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

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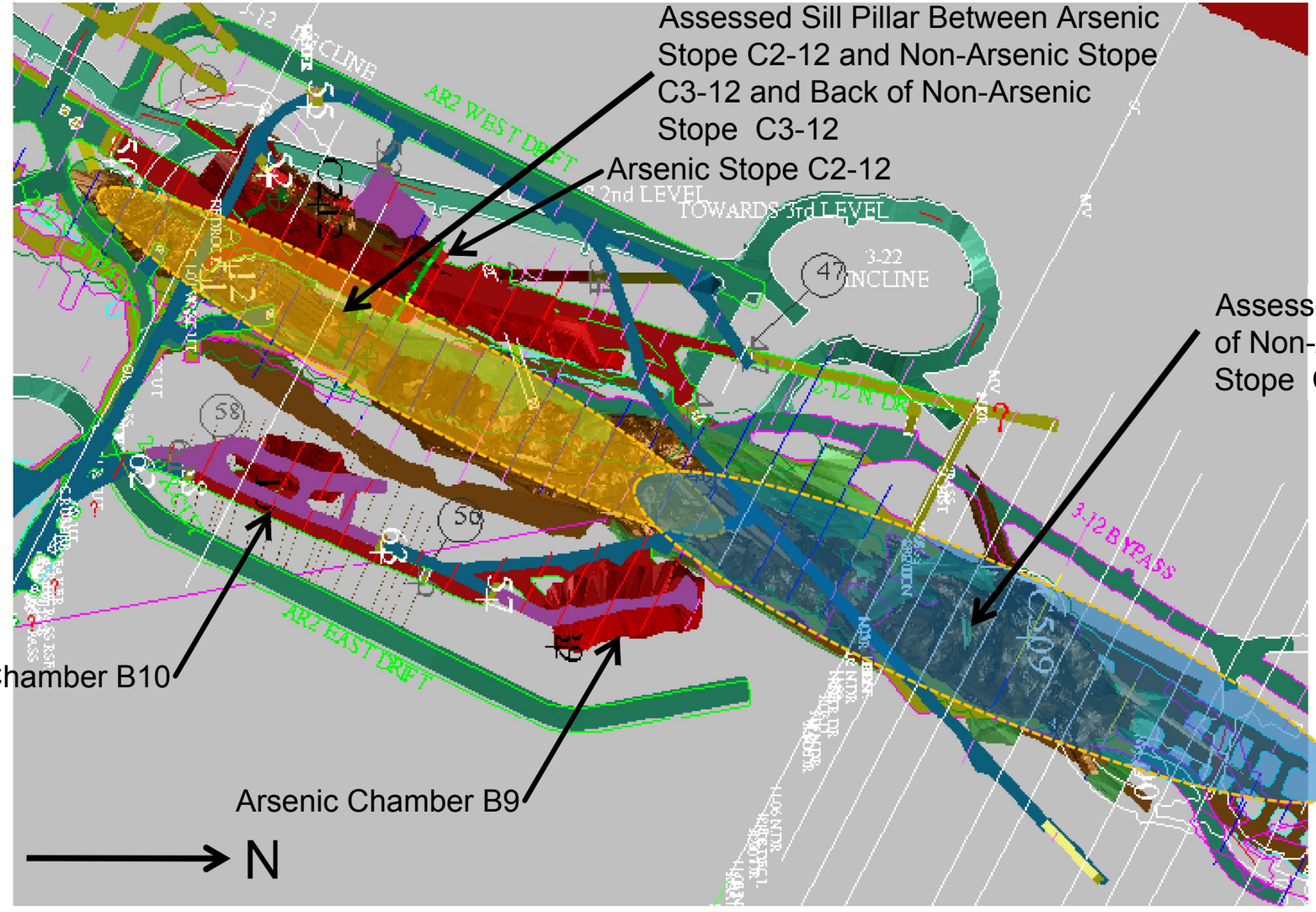
DISTRIBUTION OF Q' AND INTACT ROCK STRENGTH IN ALL HOLES IN WASTE ROCK

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 5.10	1



Plan view of 3D model in AR2

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GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

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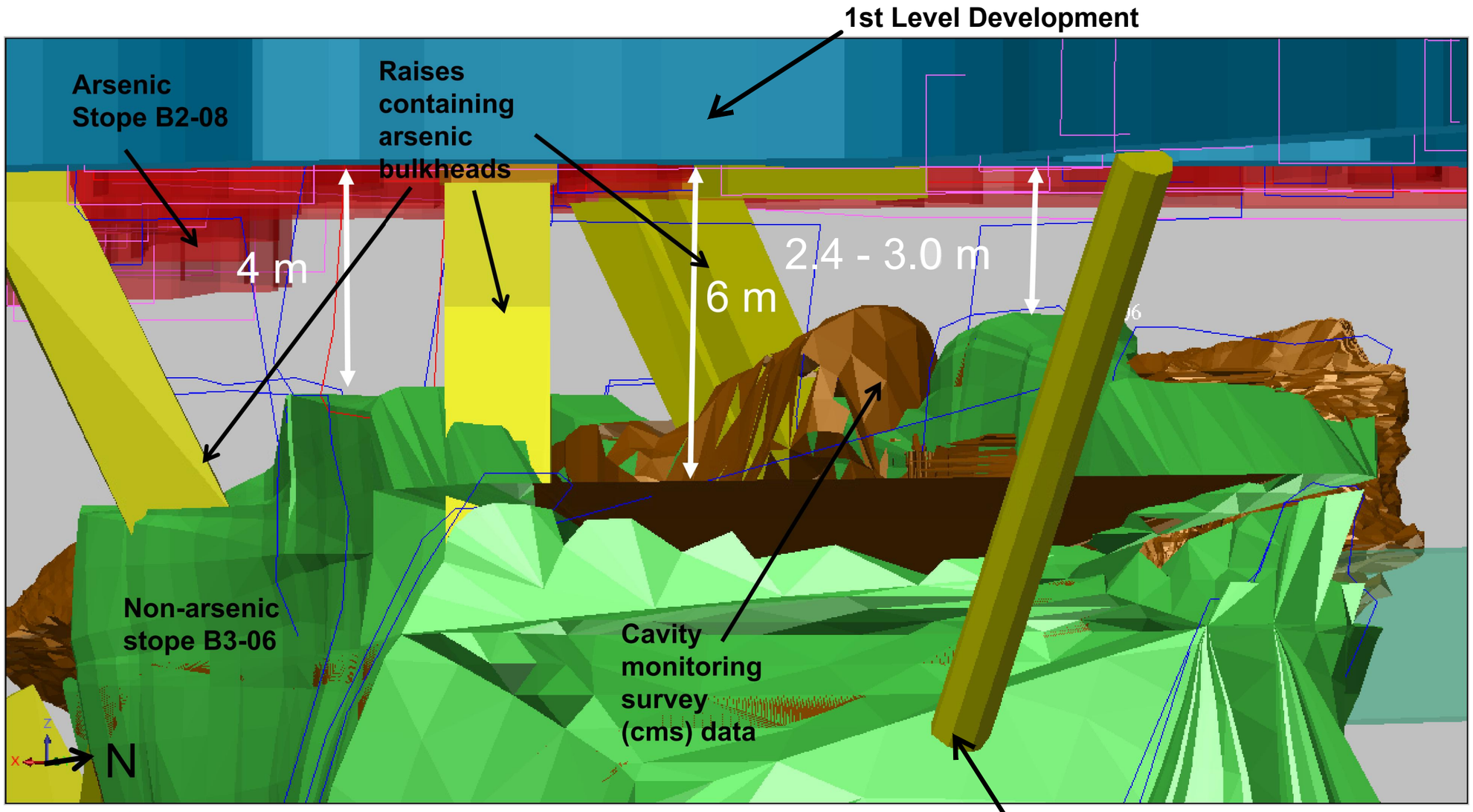
C2-12/C3-12/C5-09 INTERACTION STABILITY ANALYSES COMPLETED

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	**FIGURE 8.1**	**1**



Isometric view of 3D model (looking south)

This is a model of a drop raise that was not blasted (excavated)

Sill Pillar Thickness Between B2-08 and B3-06

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GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

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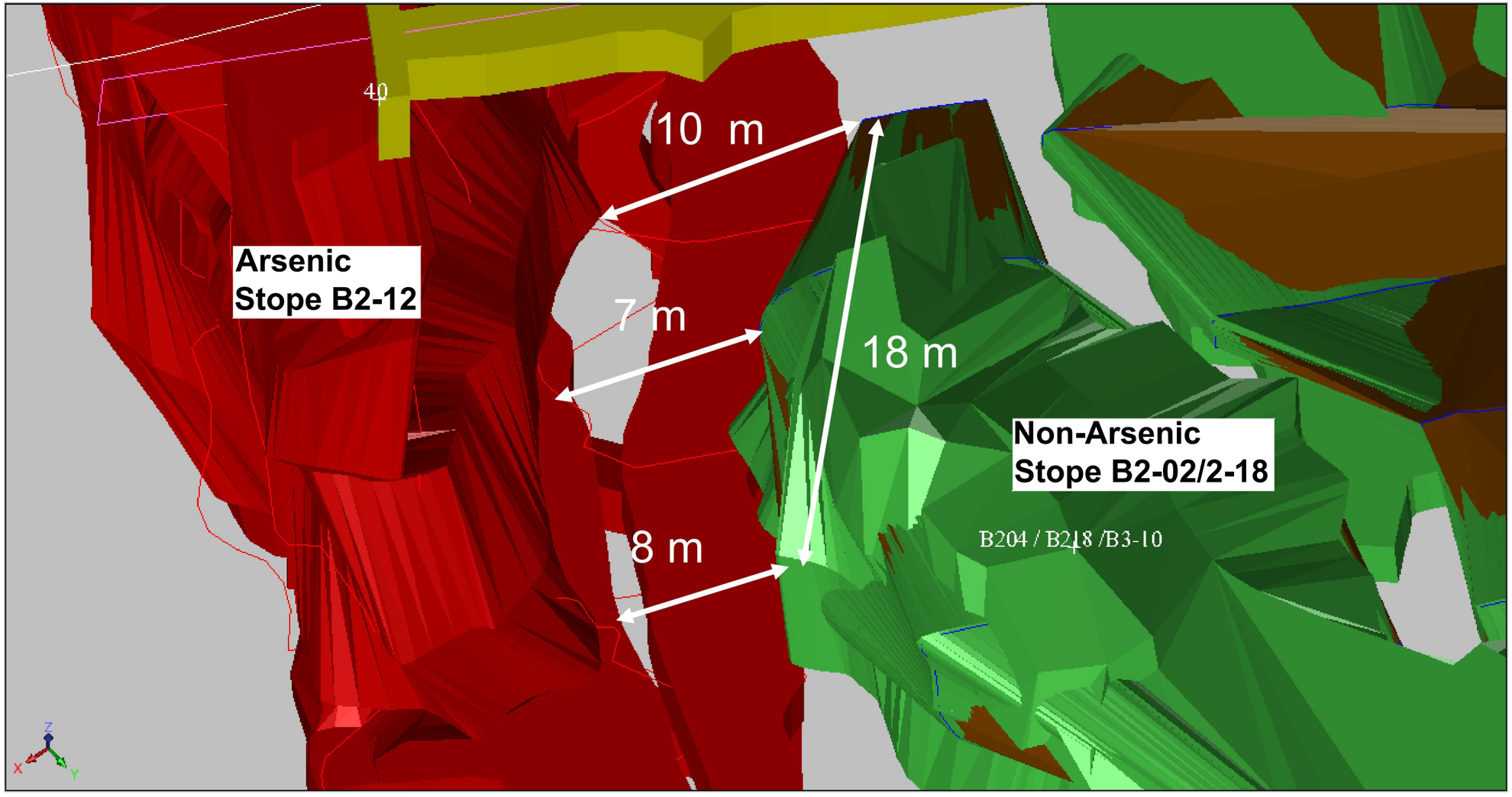
Drawing title/Titre du dessin

THICKNESS OF SILL PILLAR BETWEEN ARSENIC STOPE B2-08 AND NON-ARSENIC STOPE B3-06 NORTH

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 8.2	1

A0 – PWGSC – ANSI B–L1 – 11X17



Isometric view of 3D model (looking down and south)

Pillar Between Arsenic Stope B2-12 and Non-Arsenic Stope B2-02/2-18

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Revision/ Revision	Description/Description	Date/Date

Client/client

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Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

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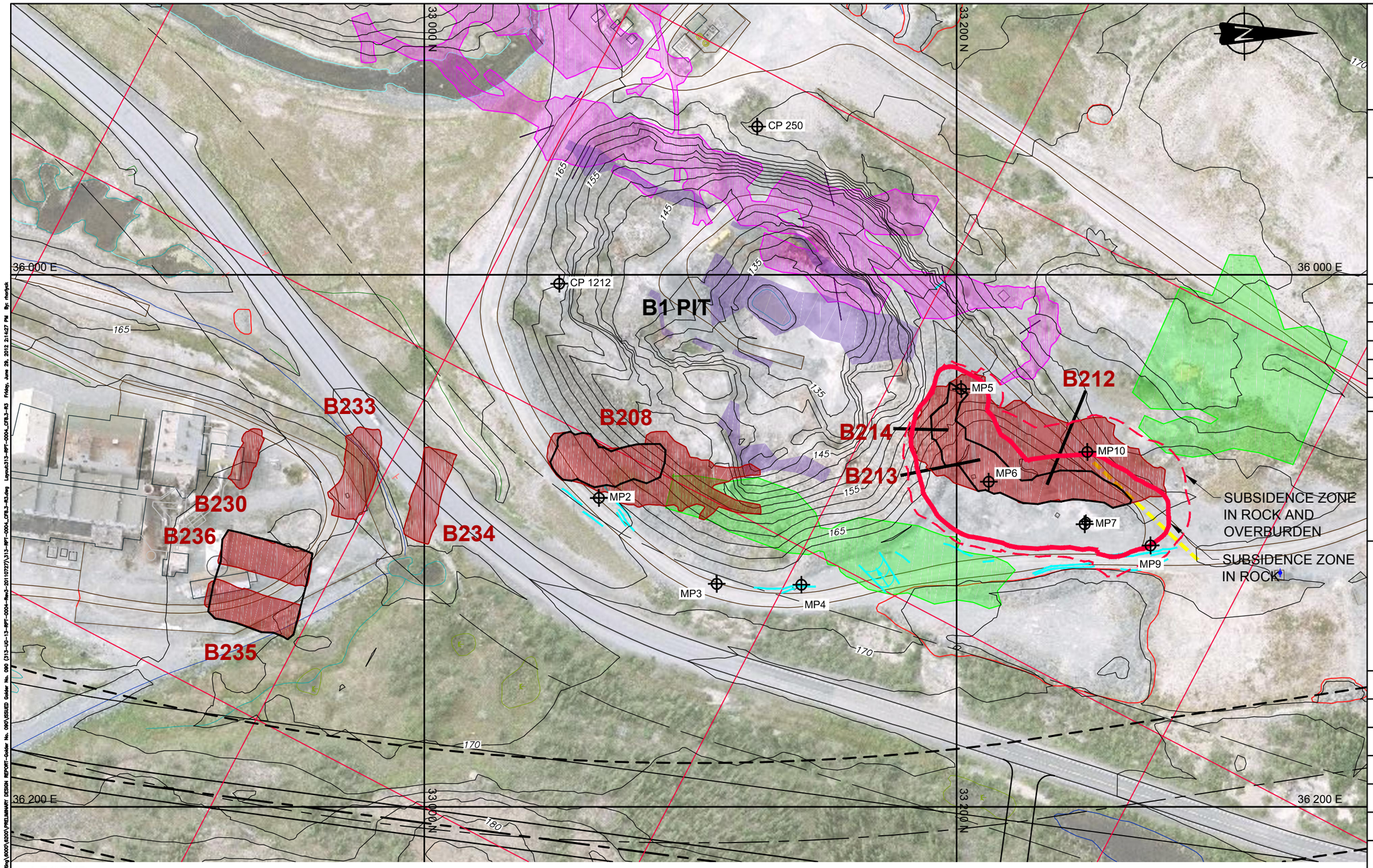
Drawing title/Titre du dessin

GEOMETRY OF RIB PILLAR BETWEEN ARSENIC STOPE B2-12 AND B2-02/2-18 COMPLEX NON-ARSENIC STOPE

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 8.3	1

A0 – PWGSC – ANSI B–L1 – 11X17



LEGEND

- ARSENIC CHAMBERS AND STOPES MAXIMUM EXTENT
- NEAR SURFACE NON-ARSENIC STOPES (< 35m DEPTH)
- NON-ARSENIC STOPES ADJACENT TO AN ARSENIC STOPE
- NON-ARSENIC STOPE BREAKTHROUGH TO OPEN-PIT, BACKFILLED WITH UNKNOWN FILL
- MONITORING POINT LOCATIONS
- CROWN PILLAR SUBSIDENCE ZONE IN ROCK AND OVERBURDEN
- CROWN PILLAR SUBSIDENCE ZONE IN ROCK
- TOP OF STOPE
- SURFACE CRACKING
- B1 PIT RAMP SAG

0 15 30 45 60 75
SCALE IN METRES

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0	ISSUED WITH RPT-0004-REV1	2011-08-08

Client/client

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Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **DTK**

Drawn by/Dessine par: **MP**

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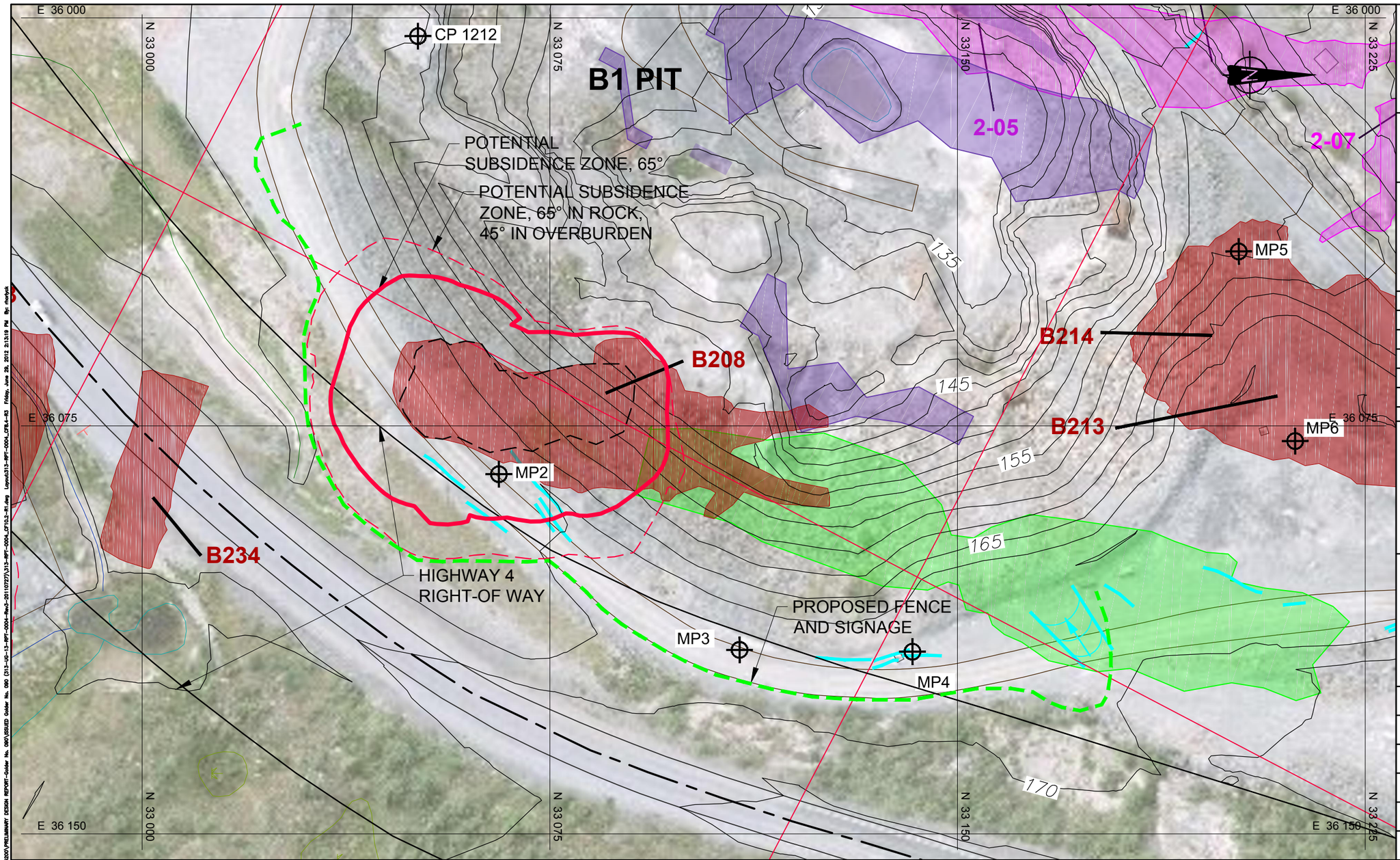
Drawing title/Titre du dessin

POTENTIAL SURFACE SUBSIDENCE B2-12/13/14

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 10.1	1

A0 – PWGSC – ANSI B–L1 – 11X17

313-RPT-0004_CF8.3-R3



LEGEND

- ARSENIC CHAMBERS AND STOPES MINIMUM EXTENT
- NON-ARSENIC STOPES NEAR SURFACE (<35m DEPTH)
- NON-ARSENIC STOPE ADJACENT TO AN ARSENIC STOPE
- NON-ARSENIC STOPE BREAKTHROUGH TO OPEN-PIT, BACKFILLED WITH UNKNOWN FILL
- MONITORING POINT LOCATIONS
- POTENTIAL CROWN PILLAR SUBSIDENCE ZONE, 65° IN ROCK, 45° IN OVERBURDEN
- POTENTIAL CROWN PILLAR SUBSIDENCE ZONE, 65°
- TOP OF STOPE
- OBSERVED SURFACE CRACKING
- PROPOSED FENCE AND SIGNAGE
- HIGHWAY CENTERLINE, ROW

NOTES

TOPOGRAPHIC CONTOUR INTERVAL IS 2.5m

0 7.5 15 22.5 30 37.5
SCALE IN METRES

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0	ISSUED WITH RPT-0004-REV1	2011-08-08

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Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **DTK**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

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Drawing title/Titre du dessin

POTENTIAL SURFACE SUBSIDENCE B208

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 10.2	1

Drawing File: N:\Burnaby\Projects\2008\1427-2008\Drafting\8200\8200\PRELIMINARY DESIGN REPORT-Golder No. 090\ISSUED Golder No. 090 (313-10-15-RPT-0004-Rev3-20110727)\313-RPT-0004_CF10.2-R1.dwg Layout:313-RPT-0004_CF10.2-R1 Friday, June 29, 2012 2:13:19 PM By: rbodyk

A0 – PWGSC – ANSI B–L1 – 11X17

313-RPT-0004_CF10.2-R1

APPENDIX A

Glossary of Underground Terms and Schematic Drawings

TECHNICAL MEMORANDUM

DATE	June 14, 2012	**PROJECT No.**	09-1427-0006/6000/6200
TO	David Colburne Public Works and Government Services Canada	**AECOM DOC. No.**	313-UG-13-MEM-0006-Rev5_20120614
CC	Rudy Schmidtke, AECOM	**GAL DOC. No.**	071
FROM	Darren Kennard	**EMAIL**	dkennard@golder.com

GLOSSARY OF UNDERGROUND TERMS AND SCHEMATIC DRAWINGS

The Giant Mine Remedial Action Plan (SRK, 2007) calls for the arsenic stopes and arsenic chambers to be remediated using the "frozen block" concept. The remediation involves adding water to the arsenic dust in the arsenic chambers and arsenic stopes and then freezing it, not necessarily in that order. Bulkheads were constructed during operations to isolate the dust in each chamber from other underground openings.

The following represents a glossary of underground terms and associated schematic drawings for future reference. An additional glossary of terms can be found in the "Giant Mine Remediation Project, Developer's Assessment Report" dated October 2010[1].

Figure 1 describes the existing underground situation and Figure 2 describes the planned pre-freezing remediation work. Arsenic chamber B-10 was used to illustrate the approach.

The following terminology and description of the current situation pictured in Figure 1 is outlined below.

- *Underground Openings:*
  - *Development Openings (Development):*
    - *Drift:*
      - Horizontal development opening excavated parallel to the strike of the orebody to provide mine access. Often part of the permanent infrastructure of the mine. Generally used for historical tracked mining generally used before the mid 1970's at Giant Mine.
    - *Cross-cut:*
      - Horizontal development opening excavated perpendicular to the strike of the orebody to provide mine access. Often part of the permanent infrastructure of the mine. Generally used for historical tracked mining.

[1] Indian and Northern Affairs Canada and Government of the Northwest Territories. 2010. Giant Mine Remediation Project, Developer's Assessment Report. Yellowknife, NWT.

- *Shaft:*
  - A vertical development opening excavated to provide mine access. Often part of the permanent infrastructure of the mine.
- *Ramp:*
  - Inclined development opening excavated to connect mine openings on different levels. Often part of the permanent infrastructure of the mine. Generally used for modern mechanized mining and at Giant mine often used to connect horizontal drifts used for historical tracked mining.
- *Portal:*
  - The point of connection between surface and underground development openings, or the entrance to underground.
- *Raise:*
  - A vertical to sub-vertical development opening excavated to provide mine access. Often used only during production but some form part of the permanent infrastructure of the mine.
- *Other Development Openings:*
  - Includes scram drifts, mill holes, man ways, ore passes, etc. Often part of the permanent infrastructure of the mine.

- *Arsenic Development Openings:*
  - *Upper Arsenic Drift*:
    - A former development drift that connects to the upper portion of an arsenic chamber or stope. The upper arsenic drifts are isolated from development openings and non-arsenic stopes with bulkheads that incorporate inspection hatches. These drifts were used to distribute arsenic dust to the arsenic stopes and chambers.
  - *Intermediate and Lower Arsenic Drift*:
    - A former development drift that connects to the lower portion of an arsenic chamber or stope. The connection between the lower arsenic drifts and the arsenic stope or chamber is often referred to as a draw point. The arsenic is contained within the drift by existing bulkheads. Lower arsenic drifts are partially or completely filled with arsenic dust.
  - *Other Arsenic Contaminated Drifts:*
    - Some drifts are contaminated with arsenic that are not contained by existing bulkheads. The contamination is primarily in the form of arsenic sludge of the floor or old arsenic dust distribution drifts.
  - *Arsenic Raise*:
    - A vertical or sub-vertical development opening connected to the arsenic stopes and chambers. The arsenic is contained within the raise by existing bulkheads. They are partially or completely filled with arsenic dust.

- Stopes: a large underground open space or cavity left after mineralized rock was extracted. The top or ceiling of a stope is typically referred to as the back.
  - *Non-arsenic Stope:*
    - These may remain open or are backfilled with classified tailings or occasionally waste rock.
  - *Near Surface Non-arsenic Stope:*
    - A stope that is situated within 35 m of the surface or the bedrock / overburden contact where surface soils are present. These may remain open or are backfilled with classified tailings or occasionally waste rock.
  - *Adjacent Non-arsenic Stope:*
    - A general term for a non-arsenic stope immediately adjacent to an arsenic stope or arsenic chamber, separated by a pillar.
  - *Arsenic Stope:*
    - Stopes that were partially filled with arsenic dust.
  - *Arsenic Chambers*:
    - An underground excavation built specifically to store arsenic dust. They are partially filled with arsenic dust.
- *Bulkhead / Plug*:
  - A water-resistant seal used in a mine where a wall is constructed across a mine access opening. Existing bulkheads at Giant were constructed of concrete or cemented tailings structure installed in development openings that are connected to an arsenic chamber or arsenic stope to isolate arsenic dust. Similar structures are also often termed plugs. For the purposes of the preliminary design existing structures will be termed bulkheads and any planned for the future will be termed plugs.
- *Pillar:*
  - *A term used to describe un-mined rock left behind to support the back (roof) and ribs (walls) of an underground opening.*
    - *Crown pillar:*
      - *A rock pillar between to back (roof) of an underground opening and ground surface.*
    - *Rib pillar:*
      - *A rock pillar between the walls of horizontally adjacent underground openings.*
    - *Sill pillar:*
      - *A rock pillar between the walls of vertically adjacent underground openings.*
- *Overburden:*
  - *Weathered rock and/or soil overlying solid bedrock.*

- *Waste Rock:*
  - Rock material that is excavated as part of the mining process but contains no economic mineralization. It usually takes the form of cobbles with sizes varying from cm's in diameter to meters in diameter. It is commonly used for surface and underground construction and backfill in underground voids.
- *Cemented Rock Fill (CRF):*
  - Waste rock material with cement added to create a backfill material with strength.
- *Tailings:*
  - Tailings are a mining waste product created after economically mineralized rock, or ore, is finely ground and processed into sand sized particles.
    - *Classified Tailings*: classified or de-watered tailings is created by reducing the high water content that often results from the milling process. The material is often used as backfill material and construction in the underground mine.
    - *Paste Tailings*: is a material can often be created from tailings by optimizing grain size distribution and water content to create a material that will not easily segregate during transport or pumping.
- *Backfill:*
  - Material used to refill an underground excavation or void. Typical backfill material includes waste rock, classified tailings, cemented paste tailings, cemented rockfill, etc.

Prior to flooding and freezing, the following underground activities will be carried out as shown in Figure 2 (not necessarily in this order):

1) Excavate horizontal freeze drift(s);
2) Backfill / stabilize potentially unstable non-arsenic stopes adjacent to arsenic stopes and chambers;
3) Excavate new development as needed to gain access for construction of plugs as needed;
4) Install lower arsenic drift plugs and arsenic raise plugs;
5) Backfill lower and upper arsenic drifts; and
6) Drill freeze holes.

The following terminology and explanation of the purpose of the various pre-freezing remedial activities is shown and described below.

- *Horizontal Freeze Drifts*:
  - New development openings are required to enable the drilling of horizontal drill holes under the arsenic stopes and chambers.

- *Non-arsenic Stope Backfill*:
  - Some non-arsenic stopes adjacent to arsenic stopes or arsenic chambers may exhibit instability in the long term. Some of these non-arsenic stopes are partially backfilled, some are fully open voids. These non-arsenic stopes will be backfilled (topped up) and/or stabilized to reduce the potential impact of any instability on the adjacent arsenic chambers and/or arsenic stopes.
- *Arsenic Drift Plugs*:
  - Drift plugs will be built to prevent arsenic dust from migrating from arsenic stopes and arsenic chambers. The arsenic drift plugs will be installed within the freeze pipe wall perimeter. The arsenic drift plugs will be designed to structurally withstand a full head of liquefied arsenic dust.
- *Arsenic Raise Plugs*:
  - As above for arsenic drift plugs.
- *Arsenic Drift Backfill:*
  - *Upper Arsenic Drift Backfill*:
    - Some form of backfill material will be placed in the upper arsenic drifts for long term safety and security reasons. It is not necessarily proposed to place the material tight to the back.
  - *Lower Arsenic Drift Backfill*:
    - Some form of backfill material will be placed in the lower arsenic drifts to limit migration of arsenic dust from the arsenic chamber or arsenic stope during the wetting process. It is not necessarily proposed to place the material tight to the back. The lower arsenic drifts may be partially, or in some isolated areas, fully filled with arsenic dust.
- *Freeze Pipe Wall*:
  - The perimeter created around the arsenic chamber and arsenic stopes when the vertical and horizontal freeze pipes are installed.

GOLDER ASSOCIATES LTD.

ORIGINAL SIGNED

Darren Kennard, P.Eng. (BC)
Associate

ORIGINAL SIGNED

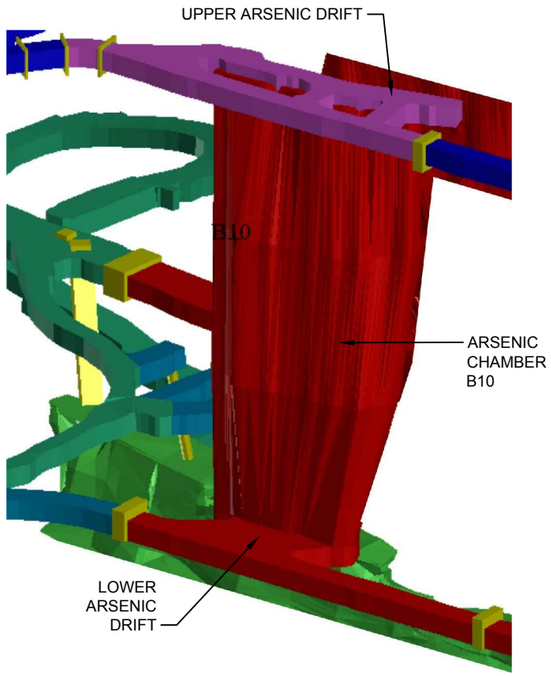
John A. Hull, P.Eng.
Principal

DTK/JAH/rs

Attachments: Figures 1 and 2

o:\final\2009\1427\09-1427-0006\3. correspondence\2 issued documents\word\phase 2\doc 071 tm 0705_11\313-ug-13-mem-0006-rev5_20120614.doc

3-D ISOMETRIC



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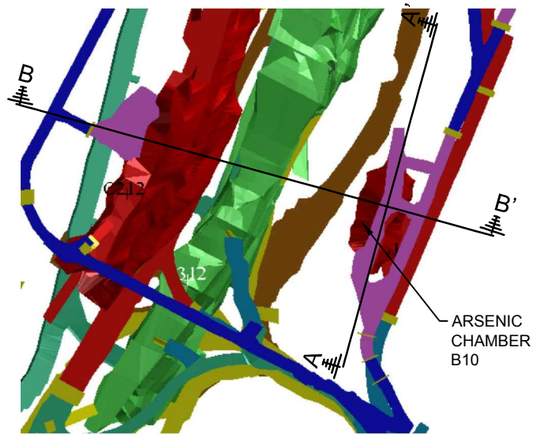

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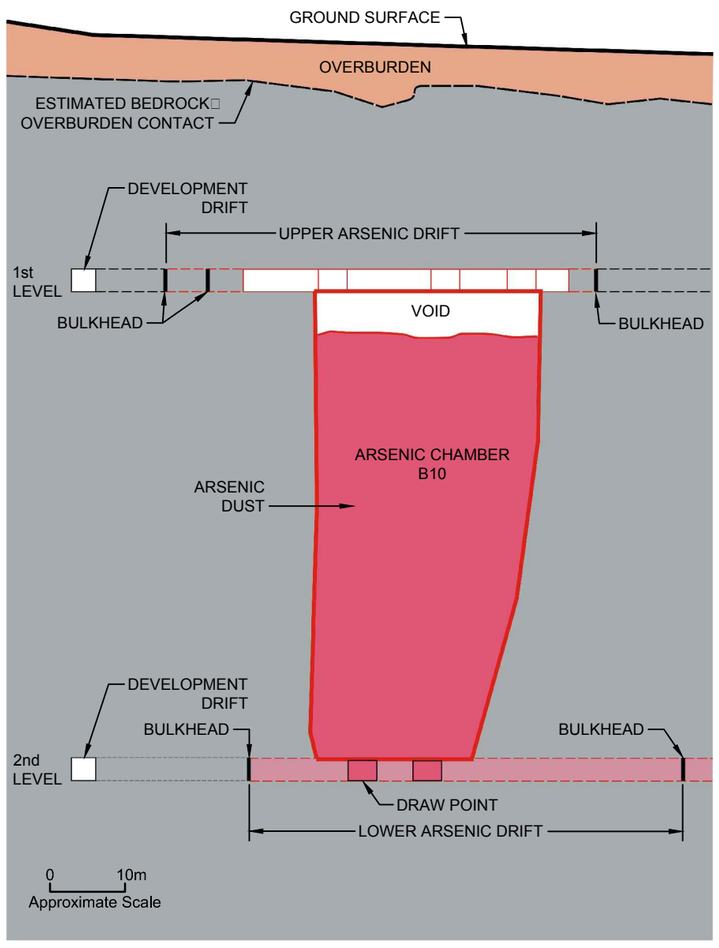

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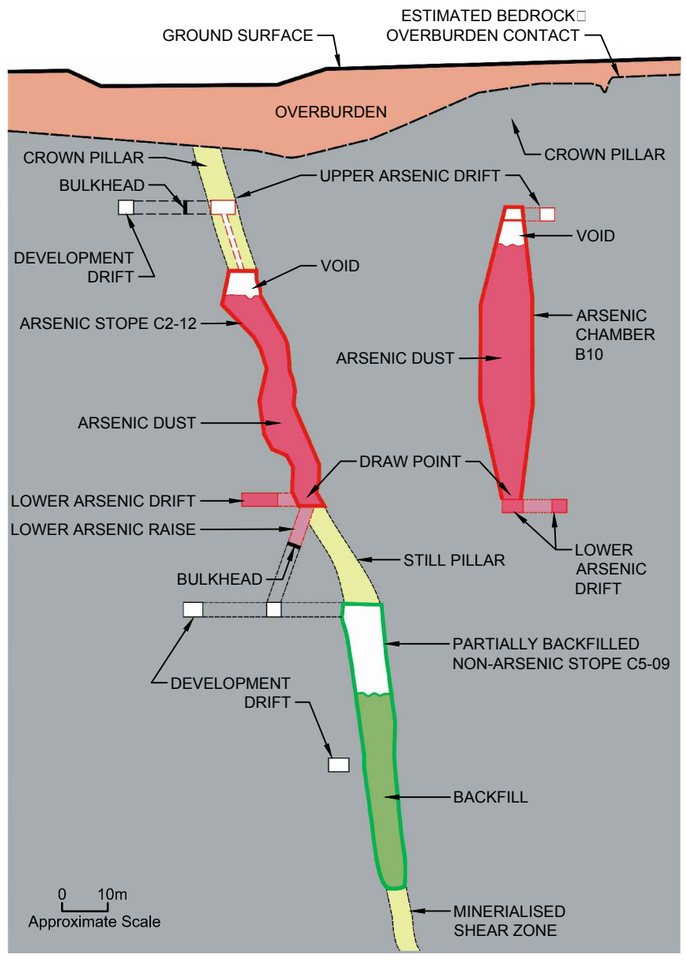

NOTE:
SCHEMATIC DIAGRAM ONLY□SOME ELEMENTS ARE ADDED FOR GENERAL DESCRIPTION.

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1	ISSUED WITH RPT-0006-REV5	2012-06-14
0	ISSUED WITH RPT-0006-REV4	2011-11-10
A	ISSUED WITH RPT-0006-REV3	2011-11-08
A	ISSUED WITH RPT-0006-REV2	2011-11-04
A	ISSUED WITH RPT-0006-REV1	2011-0□-14
0	ISSUED WITH RPT-0006-REV0	2011-0□-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuvé par
DTK

Designed by/Concept par
DTK

Drawn by/Dessiné par
JK

PWGSC Project Manager/Administrateur de Projets TPSGC
DAVE COLBOURNE

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client
PWGSC

Drawing title/Titre du dessin

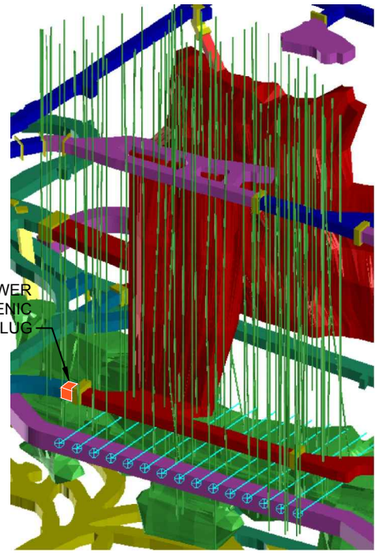
SCHEMATIC OF EXISTING UNDERGROUND SITUATION

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 1 OF 2	1

Drawing File: N:\Bur-Graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\for CAD\601624□9□R-014204-313-MEM-0006-CF01-R0.dwg Layout:FIGURE 1 Thursday, June 14, 2012 2:30:20 PM By: jkownacki

A0 - PWGSC - ANSI B-L1 - 11X17

3-D ISOMETRIC



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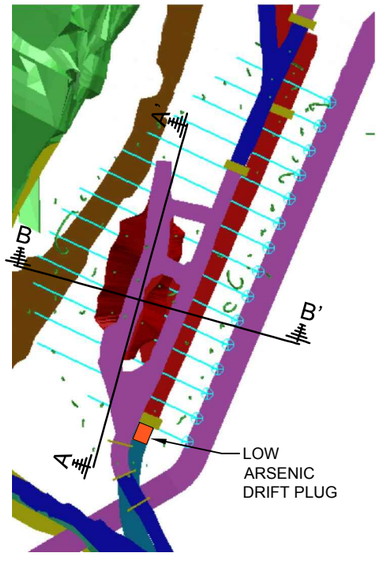

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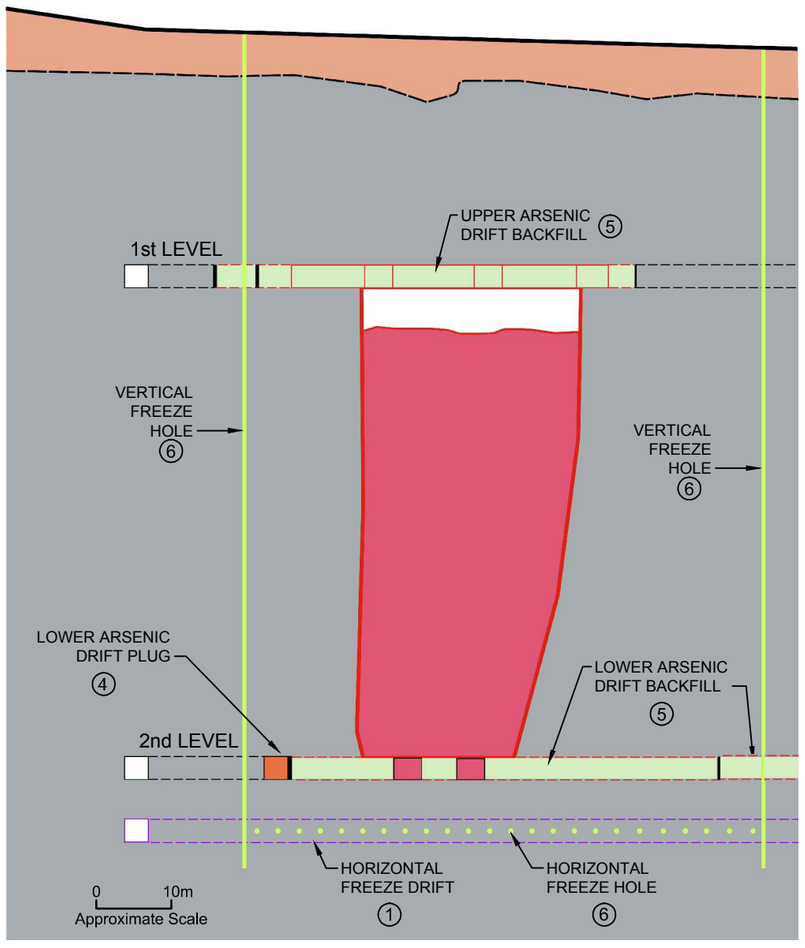

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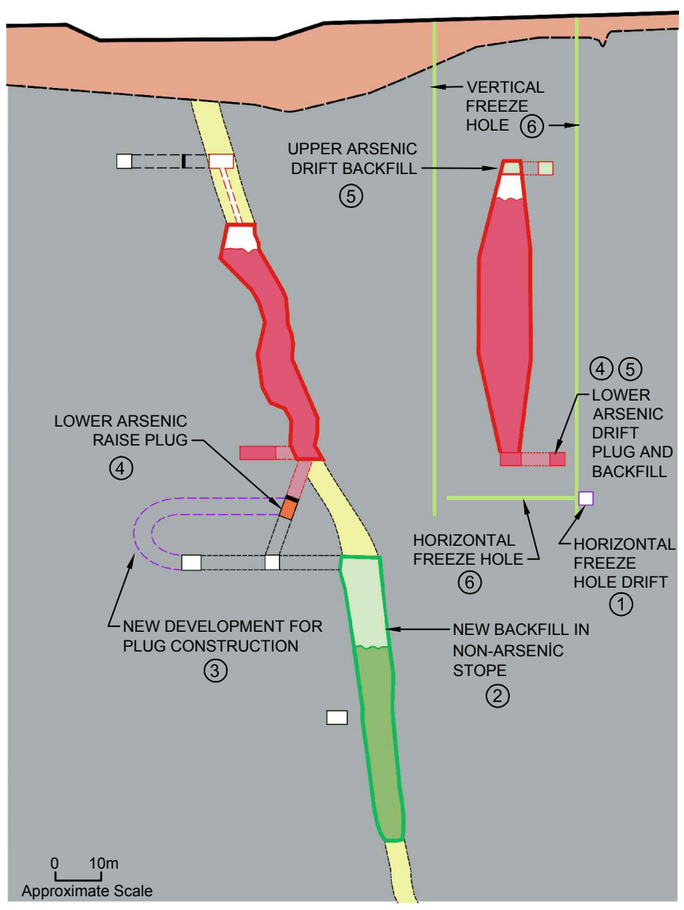

REMEDIATION STEPS PRIOR TO FREEZING □E□AMPLE CHAMBER B10□*

1. E□CAVATE HORIZONTAL FREEZE HOLE DRIFT
2. BACKFILL□STABILIZE POTENTIALLY UNSTABLE NON-ARSENIC STOPES ADJACENT TO ARSENIC STOPES AND CHAMBERS
3. E□CAVATE NEW DEVELOPMENT TO GAIN ACCESS FOR PLUG CONSTRUCTION
4. INSTALL LOWER ARSENIC DRIFT PLUGS AND ARSENIC RAISE PLUGS
5. BACKFILL LOWER AND UPPER ARSENIC DRIFTS
6. DRILL FREEZE HOLES

* WORK FLOW NOT NECESSARILY IN THIS ORDER

NOTE:
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A	ISSUED WITH RPT-0006-REV1	2011-0□-14
0	ISSUED WITH RPT-0006-REV0	2011-0□-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuvé par: DTK
Designed by/Concept par: DTK
Drawn by/Dessiné par: JK
PWGSC Project Manager/Administrateur de Projets TPSGC: DAVE COLBOURNE
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC:
Client/client: PWGSC
Drawing title/Titre du dessin

PRE-FREEZE SCHEMATIC OF UNDERGROUND REMEDIATION STEPS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE 2 OF 2	1

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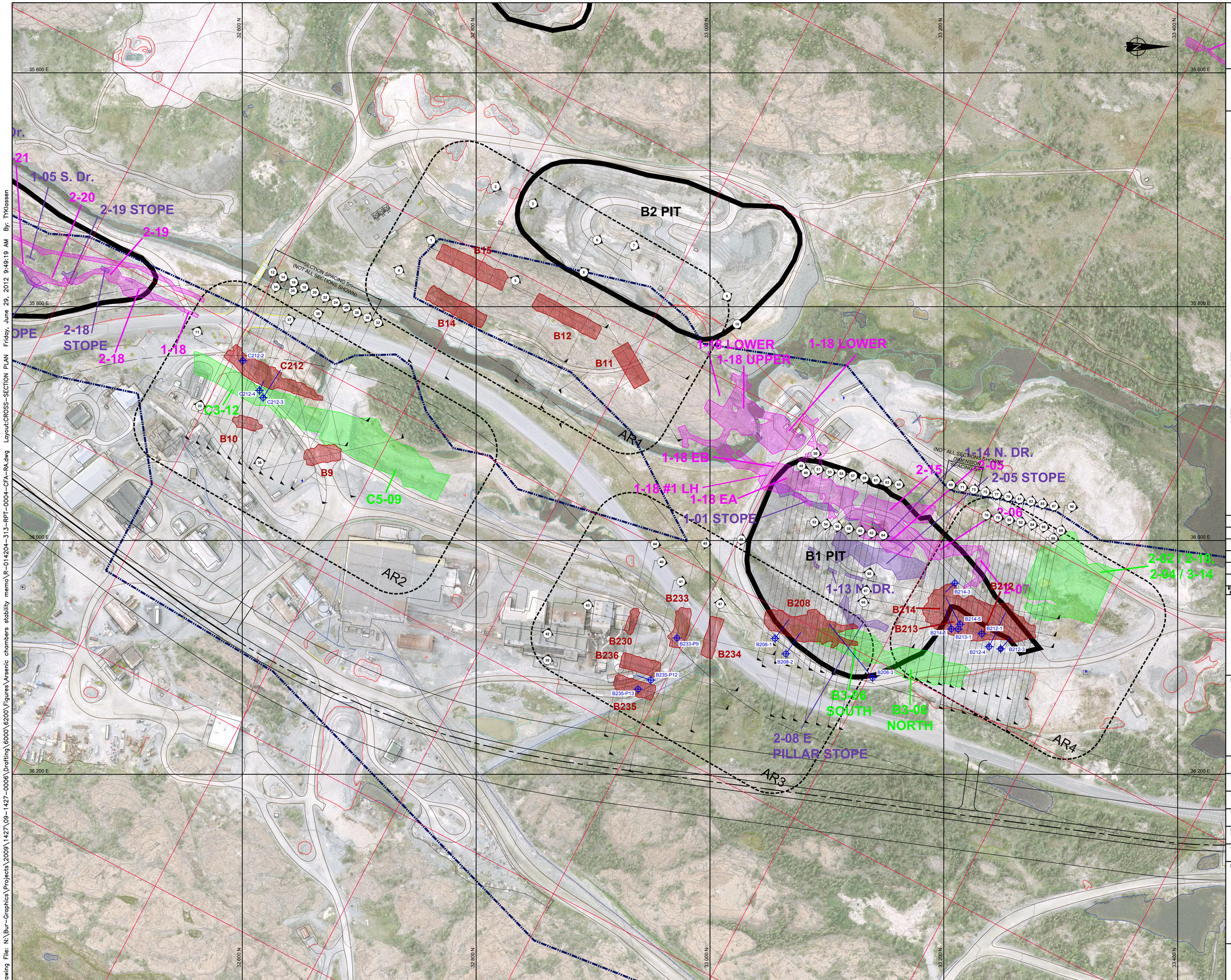
APPENDIX B

Cross-Sections Oblique to Geology Sections in Arsenic Stope and Chamber Area

October 5, 2012
Project No. 09-1427-0006/6000/6100
Doc No. 090



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LEGEND

- 33000 N — GMRP COORDINATE SYSTEM
- 600 E — GEOLOGY SECTIONS COORDINATE SYSTEM
- ARSENIC CHAMBERS AND STOPES MAXIMUM EXTENT
- NON-ARSENIC STOPES NEAR SURFACE
- NON-ARSENIC STOPE UNDER HIGHWAY AND/OR BELOW CREEK DEEPER THAN 30m
- NON-ARSENIC STOPES ADJACENT TO AN ARSENIC STOPE
- NON-ARSENIC UNDERGROUND STOPE BREAKTHROUGH TO OPEN-PIT, BACKFILLED WITH UNKNOWN FILL
- PITS CREST OUTLINE (2009)
- APPROXIMATE STOPING EXTENT AT DEPTH
- RMR DRILLHOLES (SRK, 2005)

NOTES

1. ALL UNITS ARE IN METERS UNLESS OTHERWISE NOTED. COORDINATE SYSTEM IS THE GMRP COORDINATE SYSTEM.
2. GEOLOGY SECTIONS GRID DISPLAYED IS IN IMPERIAL UNITS AND SHOWN FOR INFORMATION ONLY.

REFERENCES

1. COMPOSITE LEVEL PLANS ,EXISTING GROUND TOPOGRAPHY, AERIAL PHOTO AND MINE LAYOUT PROVIDED BY *PWGSC

0 15 30 45 60 75
SCALE IN METRES

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: DTK

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

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CROSS-SECTION LOCATION PLAN

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	FIGURE B	0

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PWGSC – A1 – 841X594

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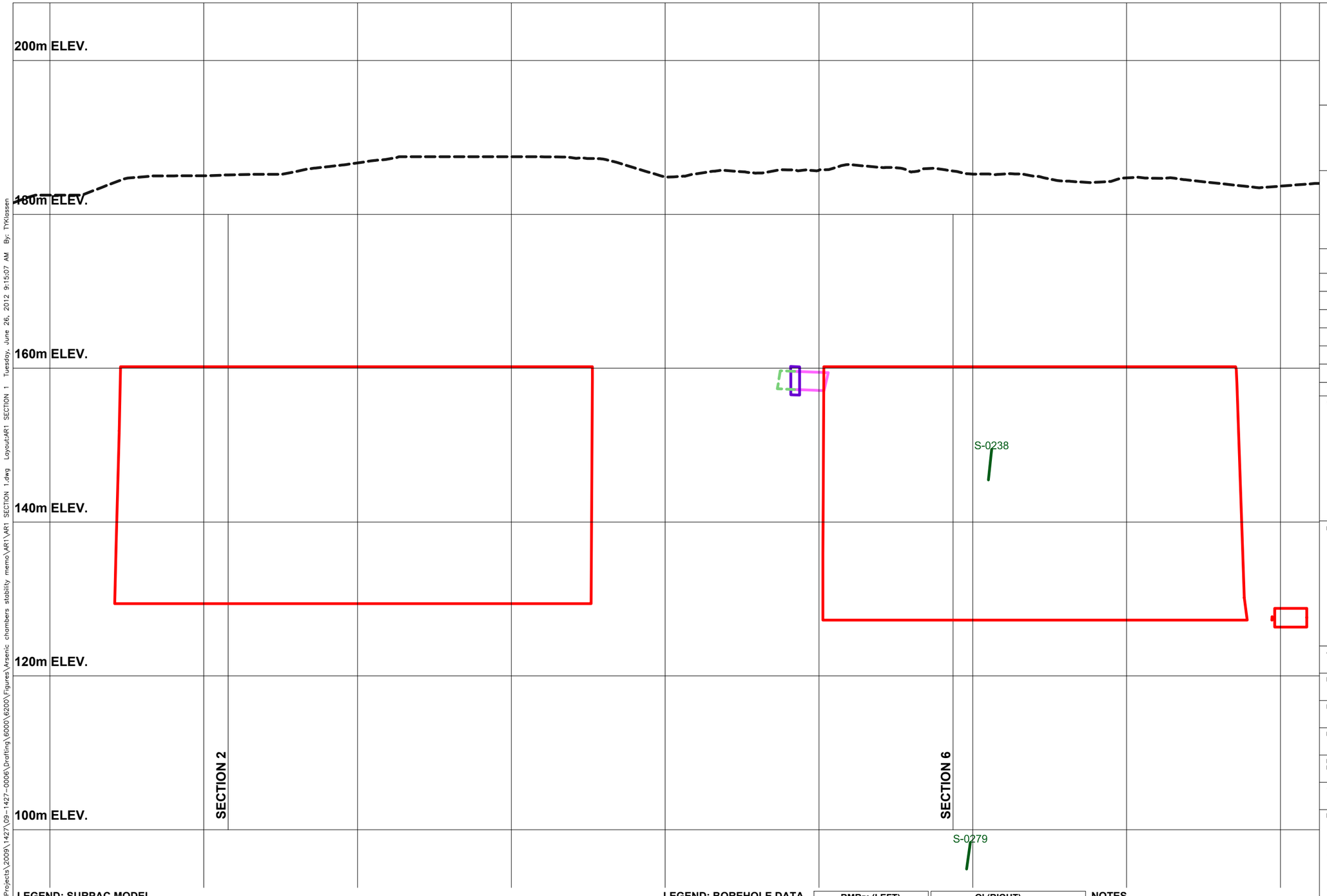

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 294°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: **PWGSC**

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ARSENIC CHAMBER B15 AND B12

AR1 SECTION 1

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-1 OF 90	0

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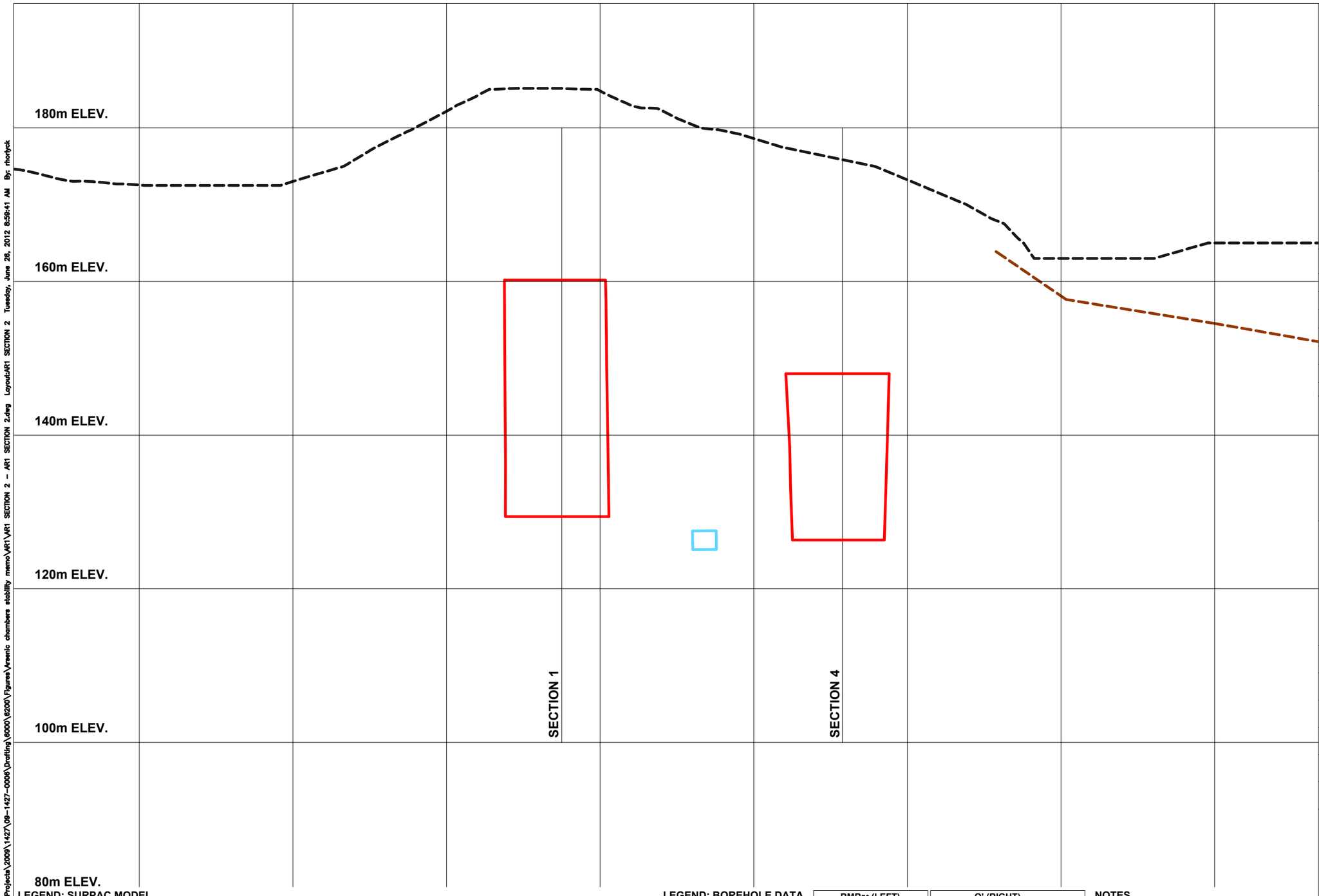
AR1 SECTION 1



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NOTES

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-SECTION FACES 24°

0 2.5 5 7.5 10 12.5
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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B15 AND B14

AR1 SECTION 2

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
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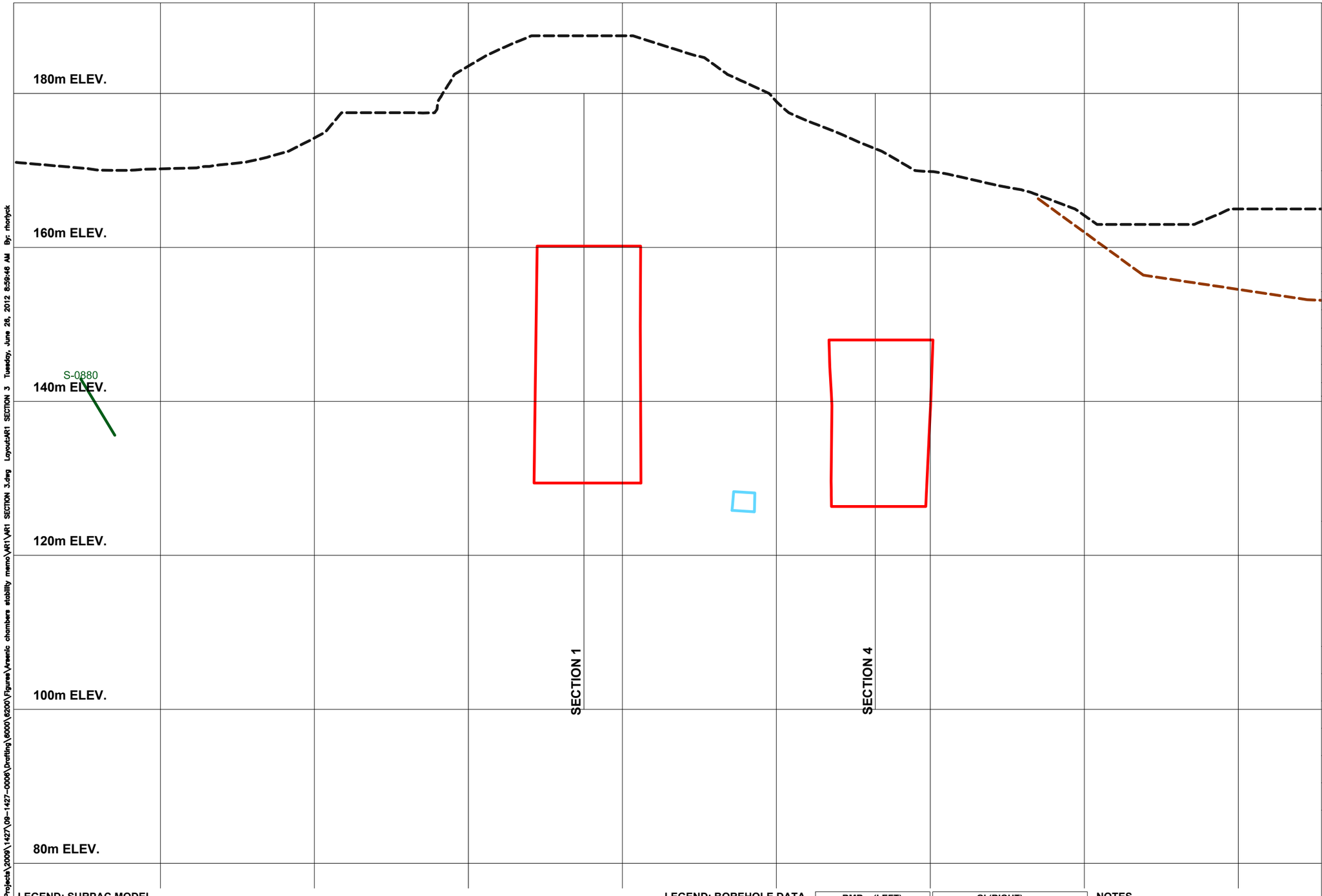

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Région de l'ouest

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NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

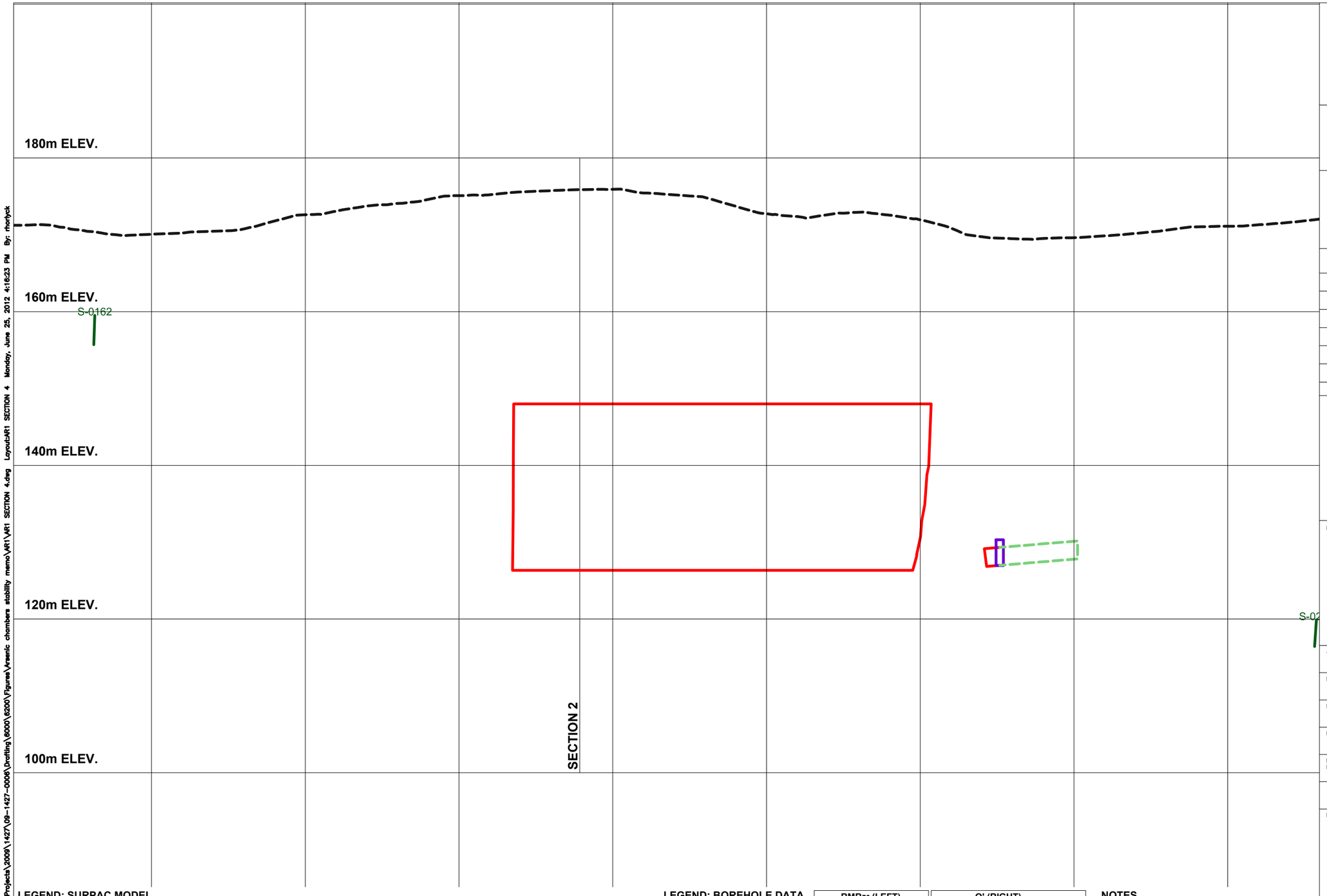
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B15 AND B14

AR1 SECTION 3

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-3 OF 90	0



Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: **PWGSC**

Drawing title/Titre du dessin

ARSENIC CHAMBER B14

AR1 SECTION 4

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-4 OF 90	0

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

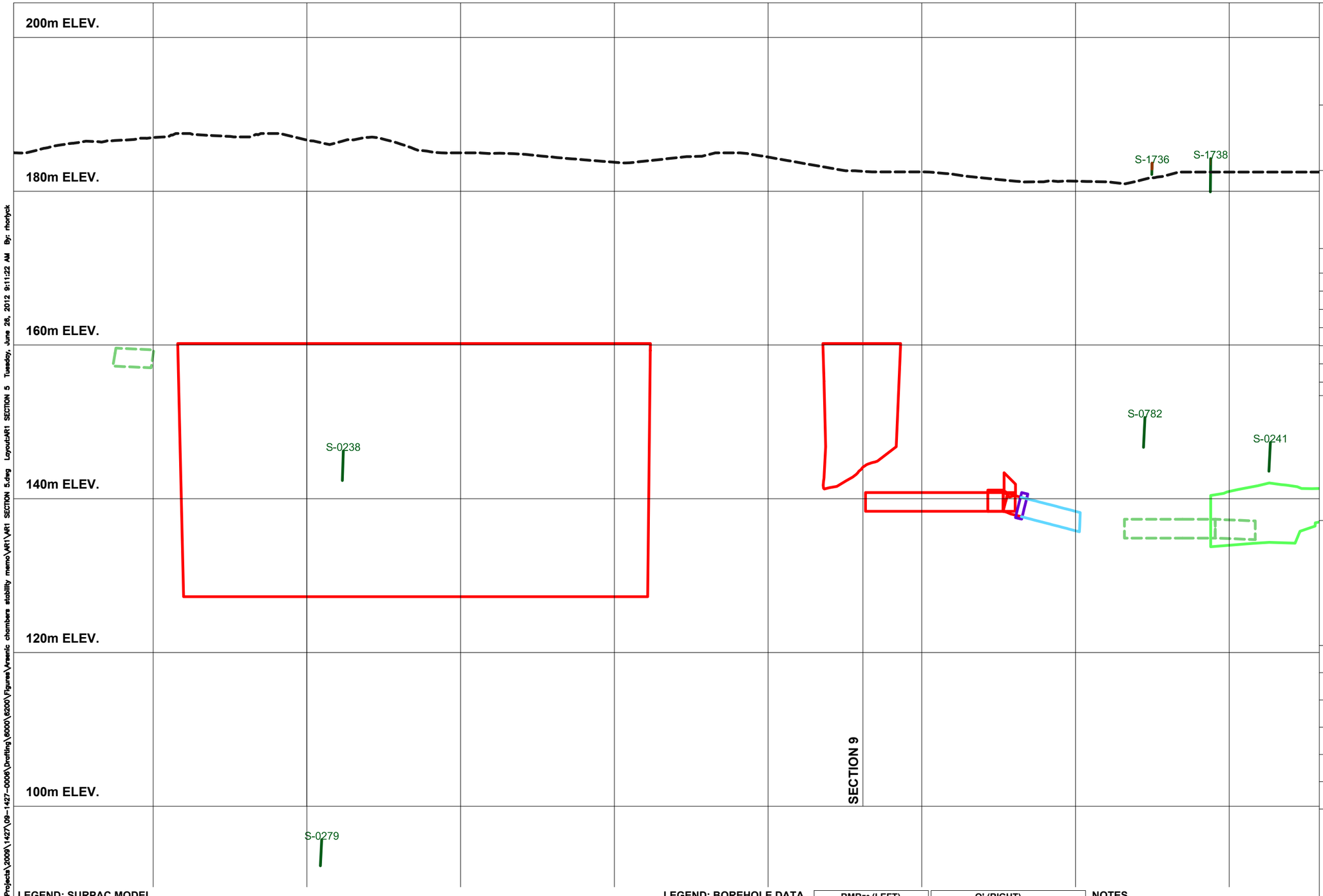
-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 296°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\8000\6200\Figures\Arsenic chambers stability memo\AR1\AR1 SECTION 4.dwg LayoutAR1 SECTION 4 Monday, June 25, 2012 4:16:23 PM By: rhorlyck

A0 – PWGSC – ANSI B–L1 – 11X17



Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: **PWGSC**

Drawing title/Titre du dessin

ARSENIC CHAMBER B12 AND B11

AR1 SECTION 5

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-5 OF 90	0

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

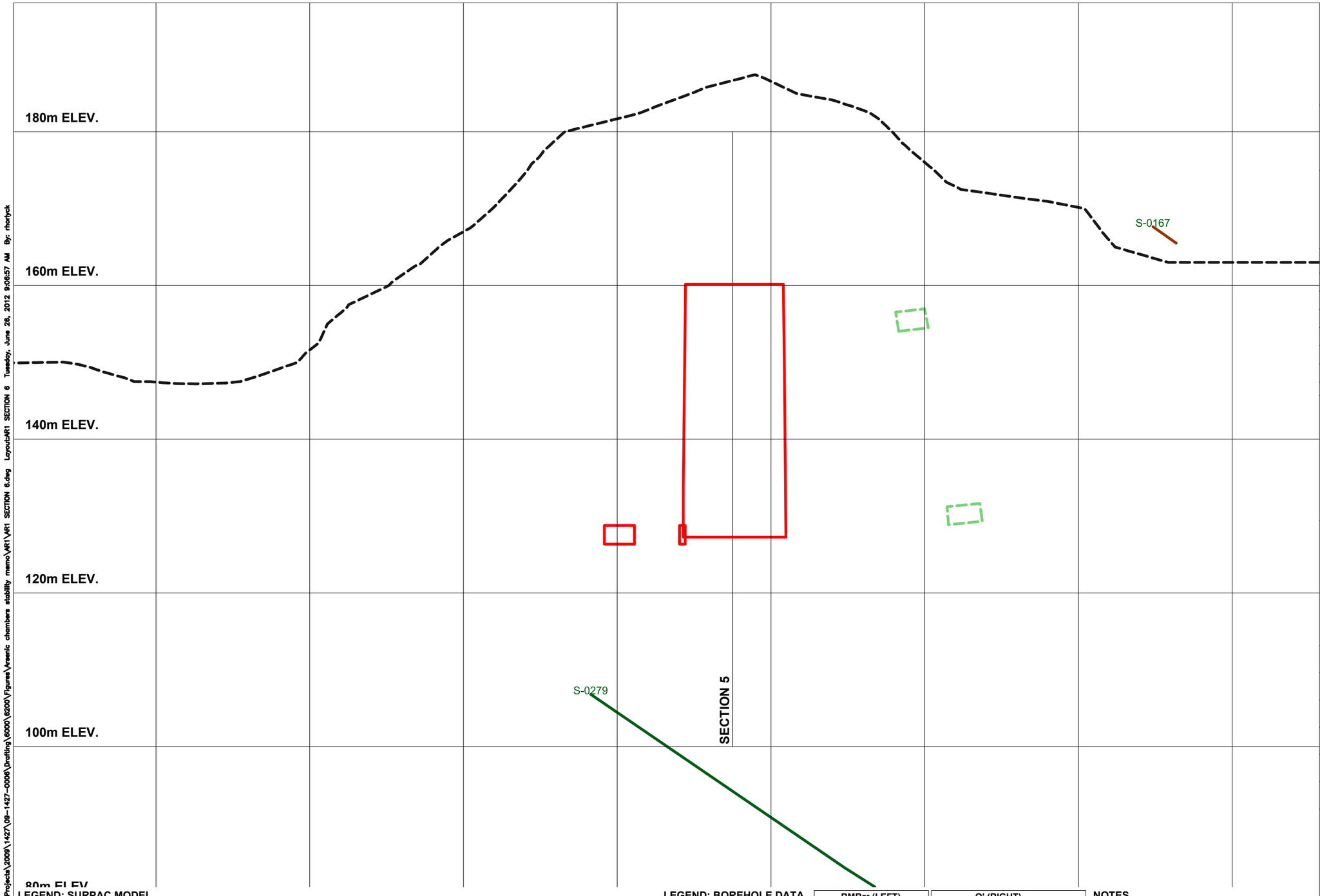
-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 298°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\8000\6200\Figures\Arsenic chambers stability memo\AR1\AR1 SECTION 5.dwg LayoutAR1 SECTION 5 Tuesday, June 26, 2012 9:11:22 AM By: rhorlyck

A0 - PWGSC - ANSI B-L1 - 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
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- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
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- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 28°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

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0	ISSUED WITH RPT-0004-REV3	2012-10-05
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A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

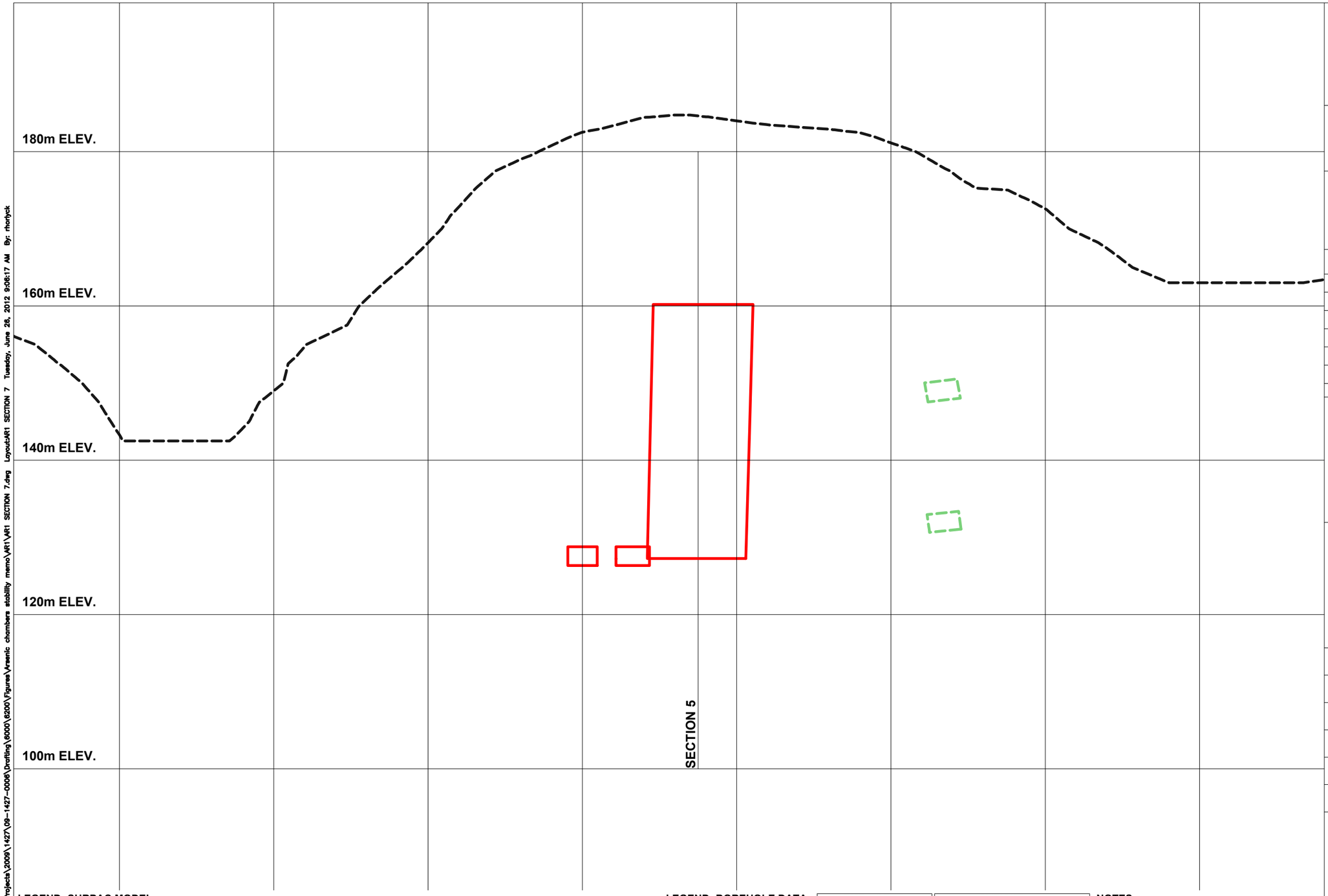
Client/client: **PWGSC**

Drawing title/Titre du dessin

ARSENIC CHAMBER B12

AR1 SECTION 6

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-6 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 28°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

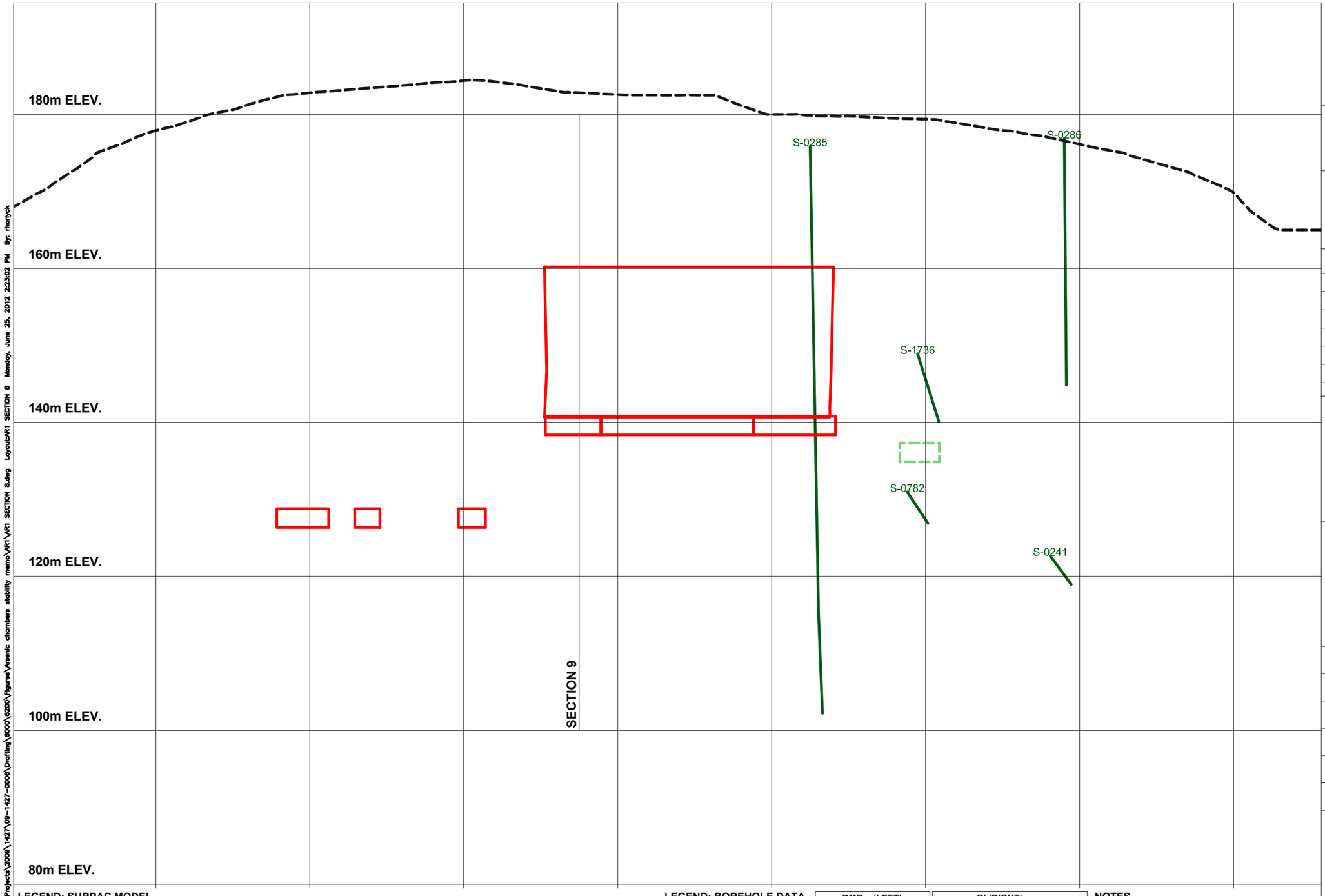
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B12

AR1 SECTION 7

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-7 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
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- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 328°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

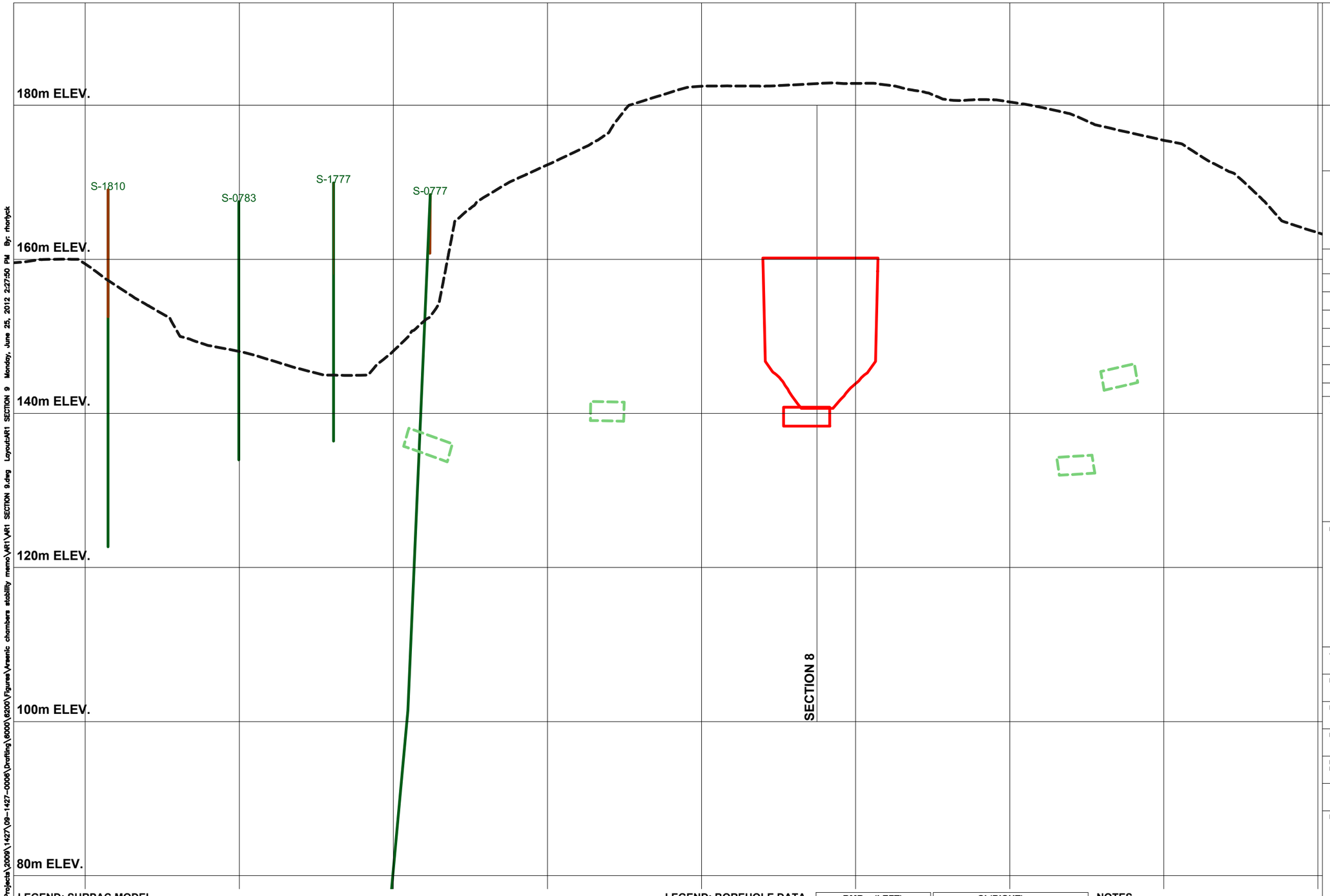
ARSENIC CHAMBER B11

AR1 SECTION 8

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-8 OF 90	0

Drawing File: N:\Bur-Graphics\Projects\2009\1427\09-1427-0006\Drafting\8000\8200\Figures\Arsenic chambers stability memo\AR1\AR1 SECTION 8.dwg LayoutAR1 SECTION 8 Monday, June 25, 2012 2:23:02 PM By: rhorlyck

A0 - PWGSC - ANSI B-L1 - 11X17



Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR1 SECTION 9.dwg Layout:AR1 SECTION 9 Monday, June 25, 2012 2:27:50 PM By: rhorlyck

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 58°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
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A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B11

AR1 SECTION 9

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-9 OF 90	0

Drawing File: N:\pur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR1\AR1 SECTION 10.dwg Layout:AR1 SECTION 10 Monday, June 25, 2012 2:30:45 PM By: rhoriyck

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 58°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

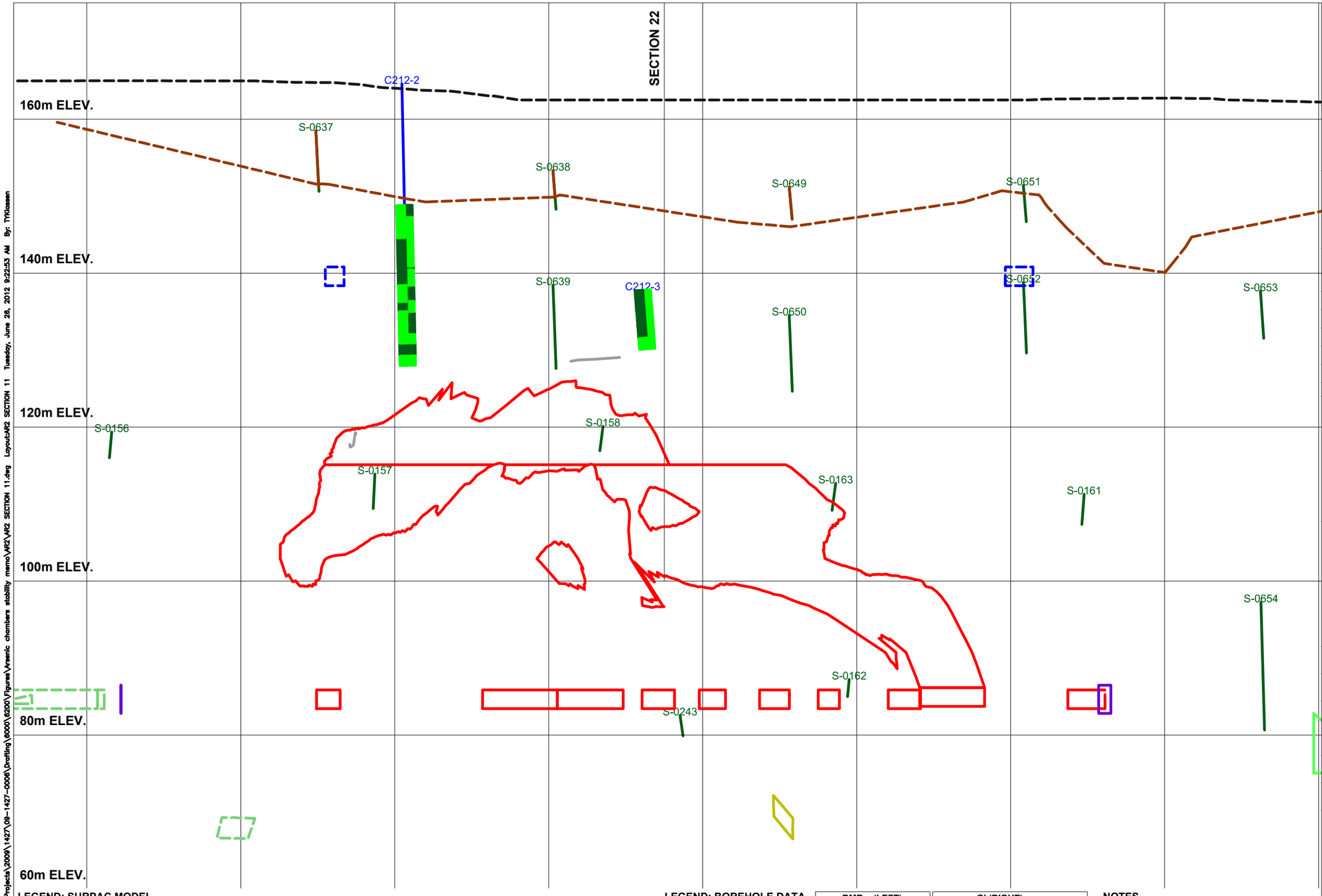
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B11

AR1 SECTION 10

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-10 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 295°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

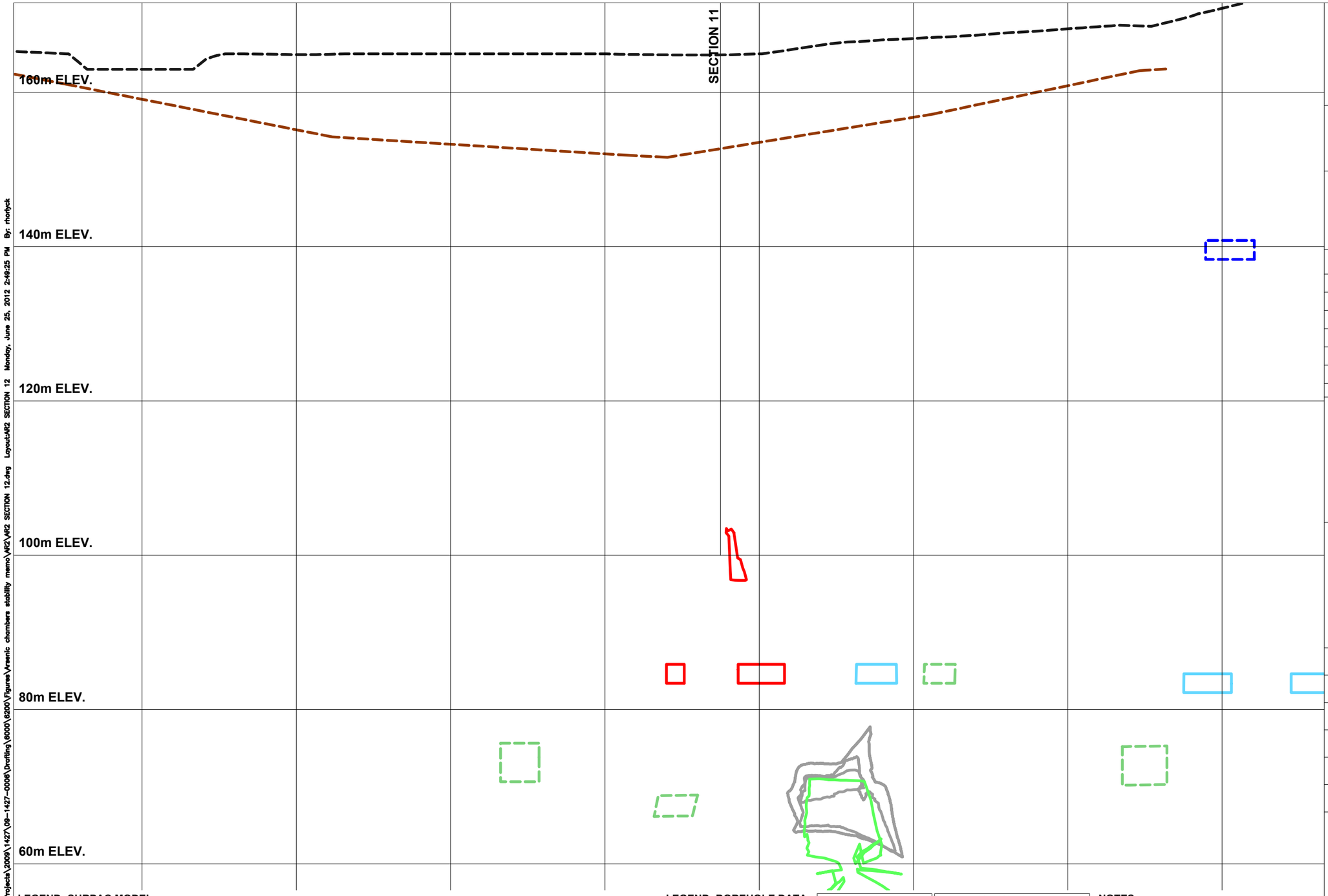
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 11

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-11 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC:

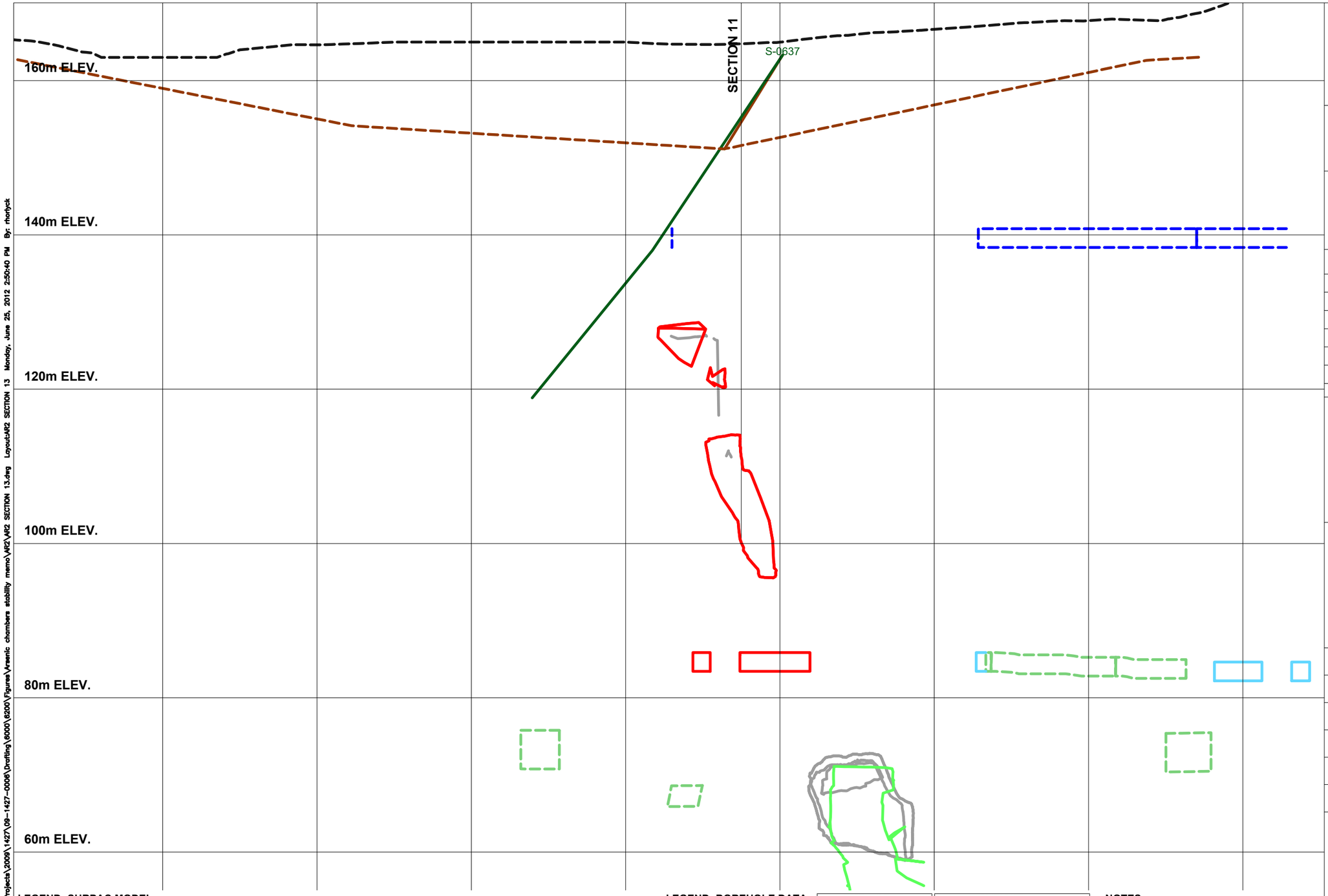
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 12

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-12 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 13

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
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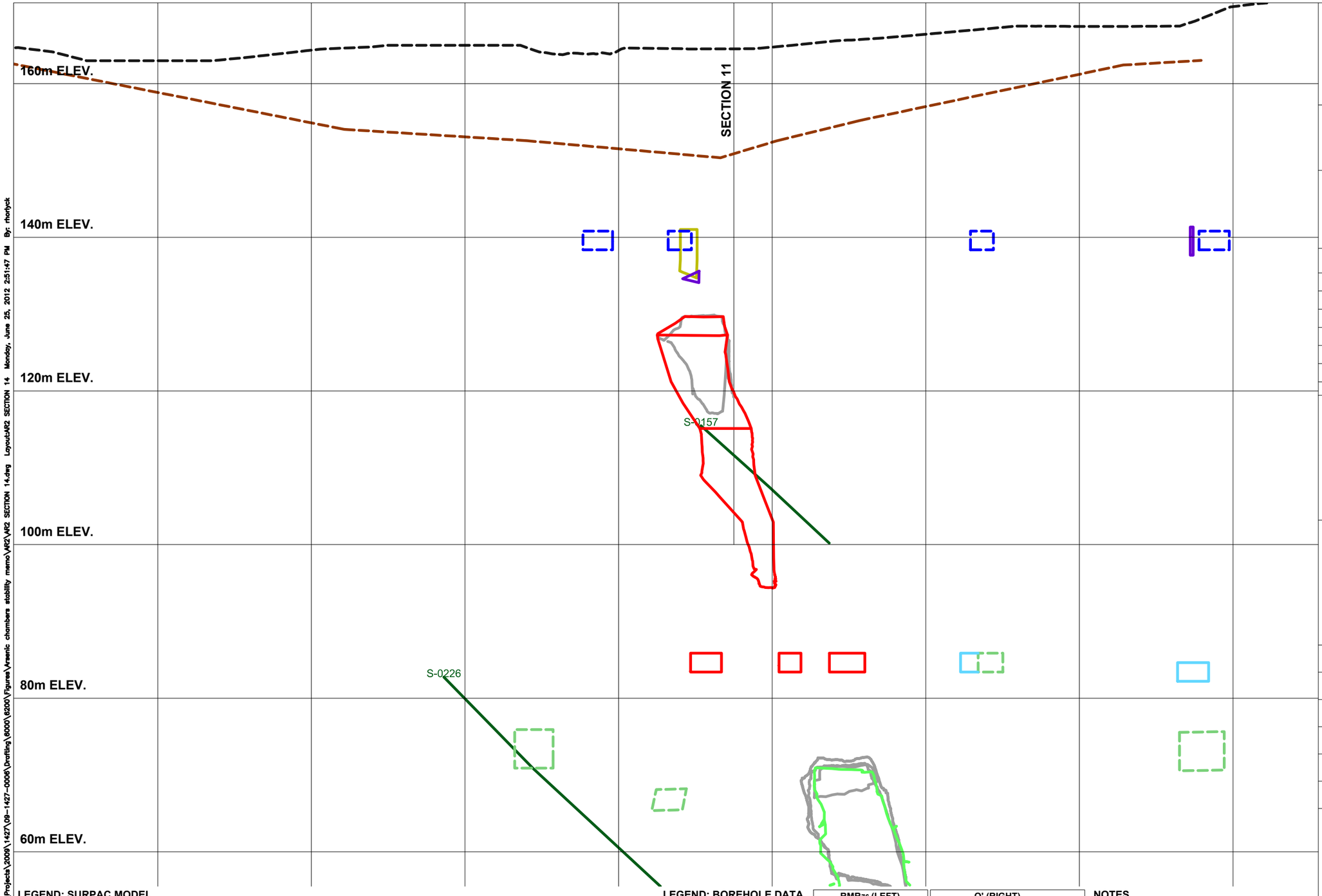

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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

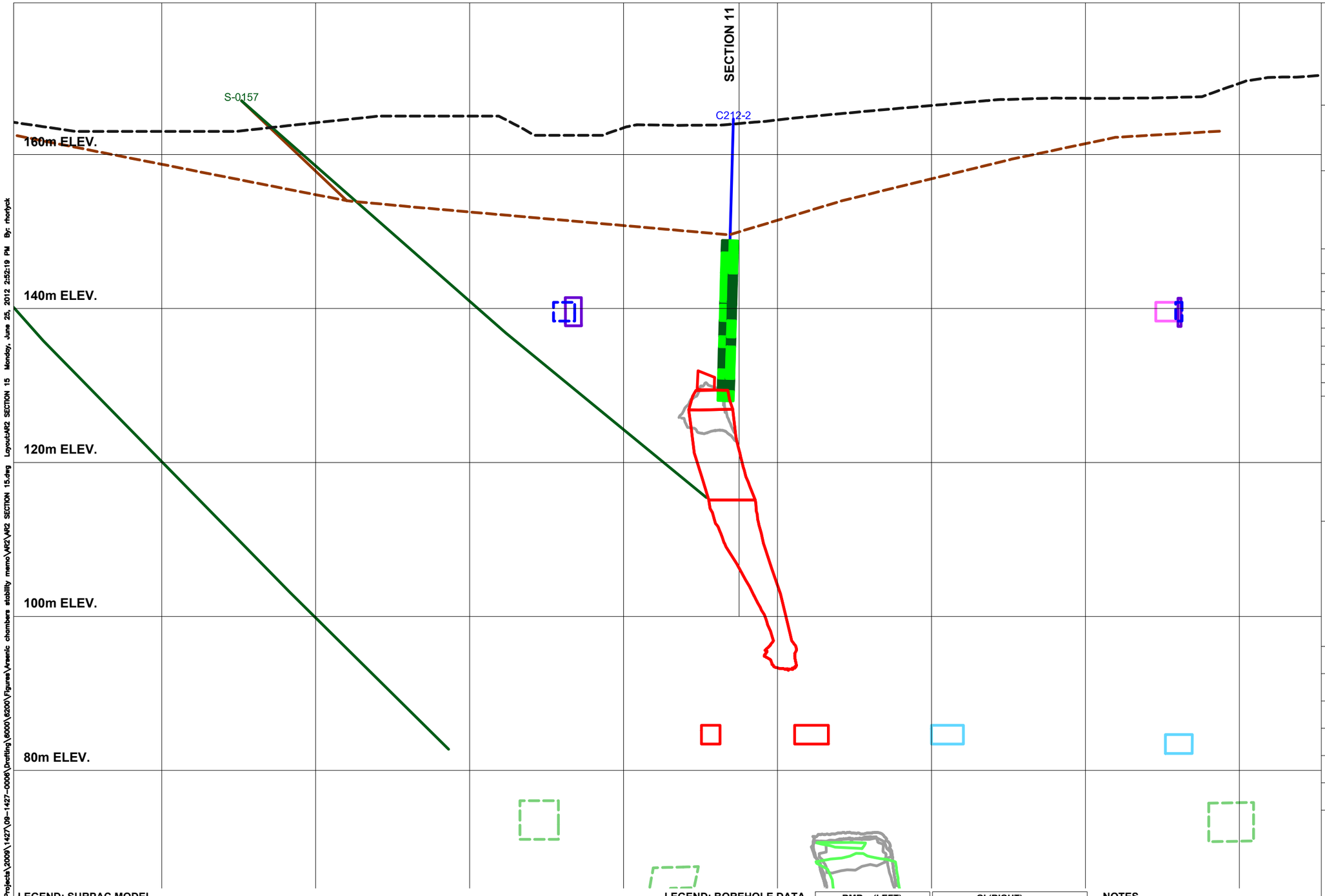
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 14

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-14 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

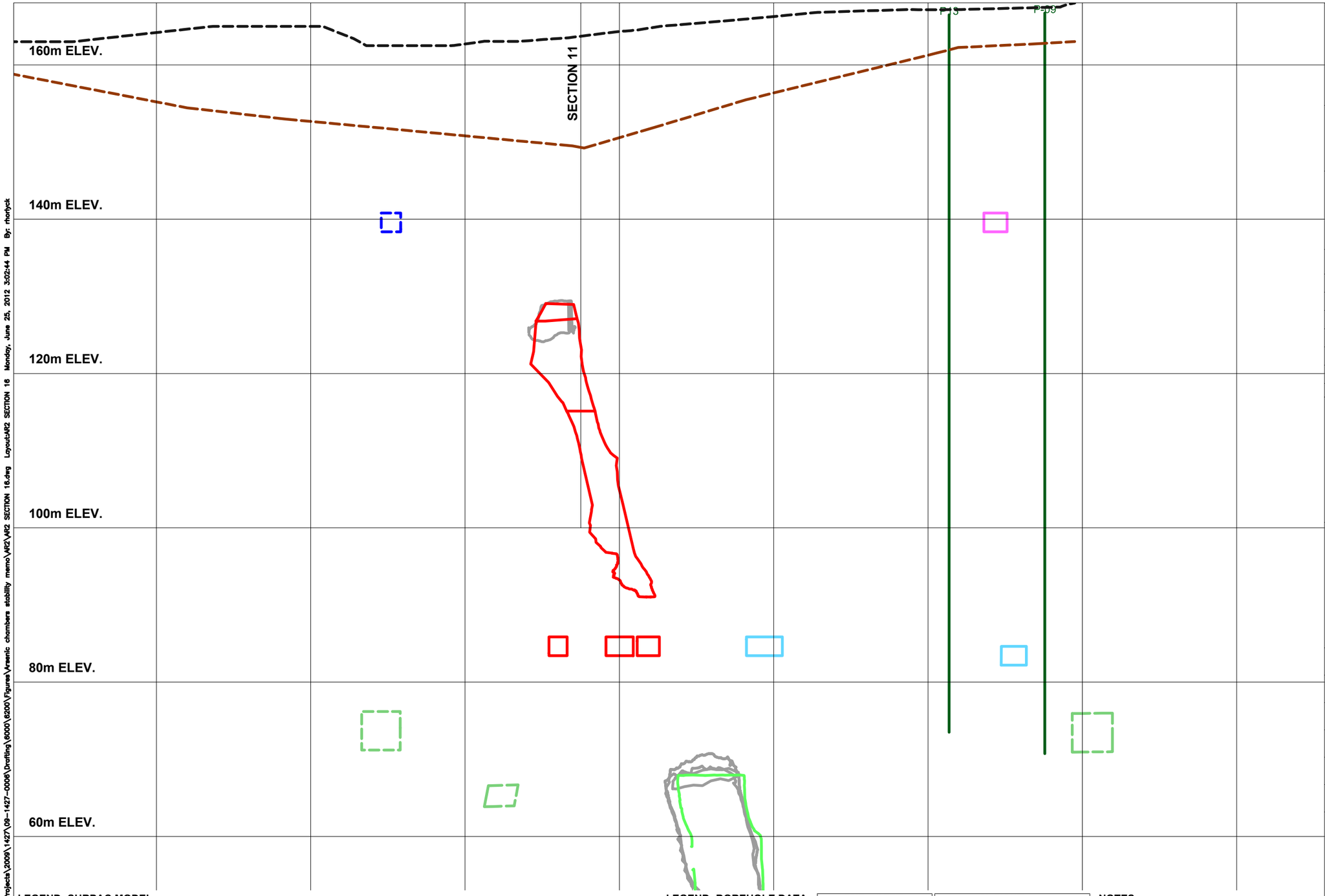
Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 15

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-15 OF 90	0

Drawing File: N:\ur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR2\AR2 SECTION 15.dwg LayoutAR2 SECTION 15 Monday, June 25, 2012 2:52:19 PM By: rhorlyck



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
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NOTES

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-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
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Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

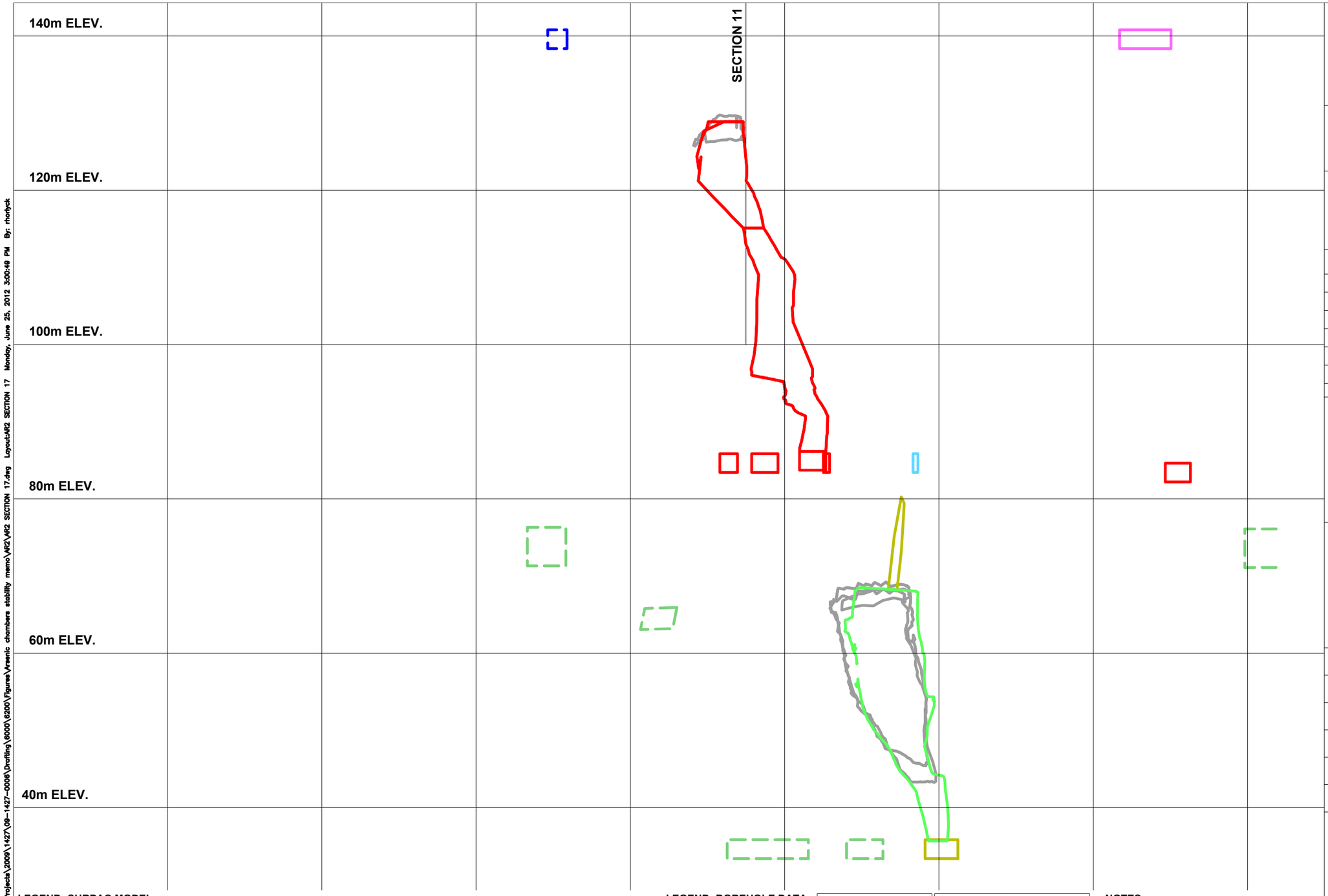
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 16

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-16 OF 90	0



Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

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0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

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PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 17

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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0 2.5 5 7.5 10 12.5
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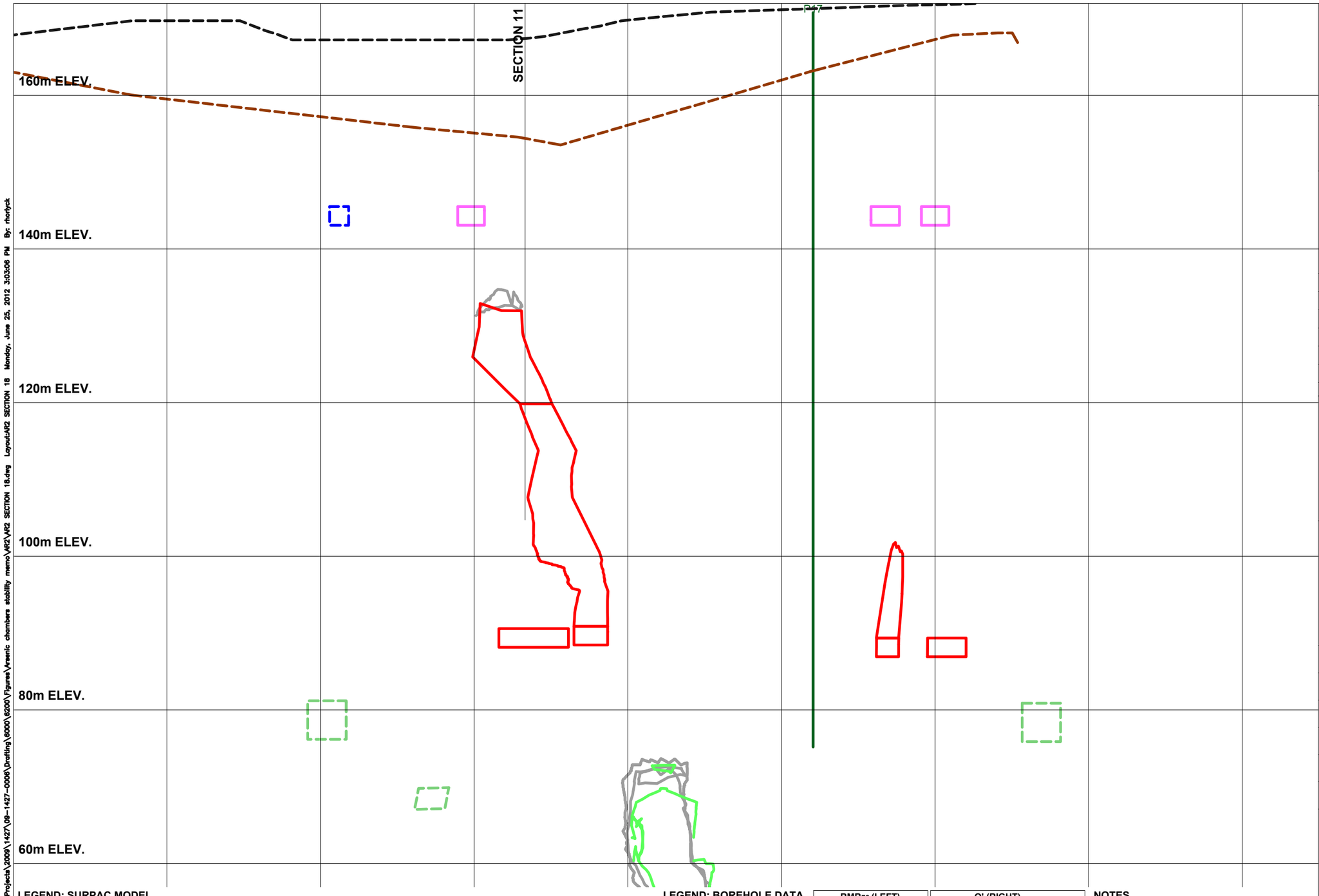
Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-17 OF 90	0

Drawing File: N:\our-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Vrsenic chambers stability memo\AR2\AR2 SECTION 17.dwg Layout:AR2 SECTION 17 Monday, June 25, 2012 3:00:49 PM By: rhorlyck

A0 - PWGSC - ANSI B-L1 - 11X17



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B10
AR2 SECTION 18

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-18 OF 90	0

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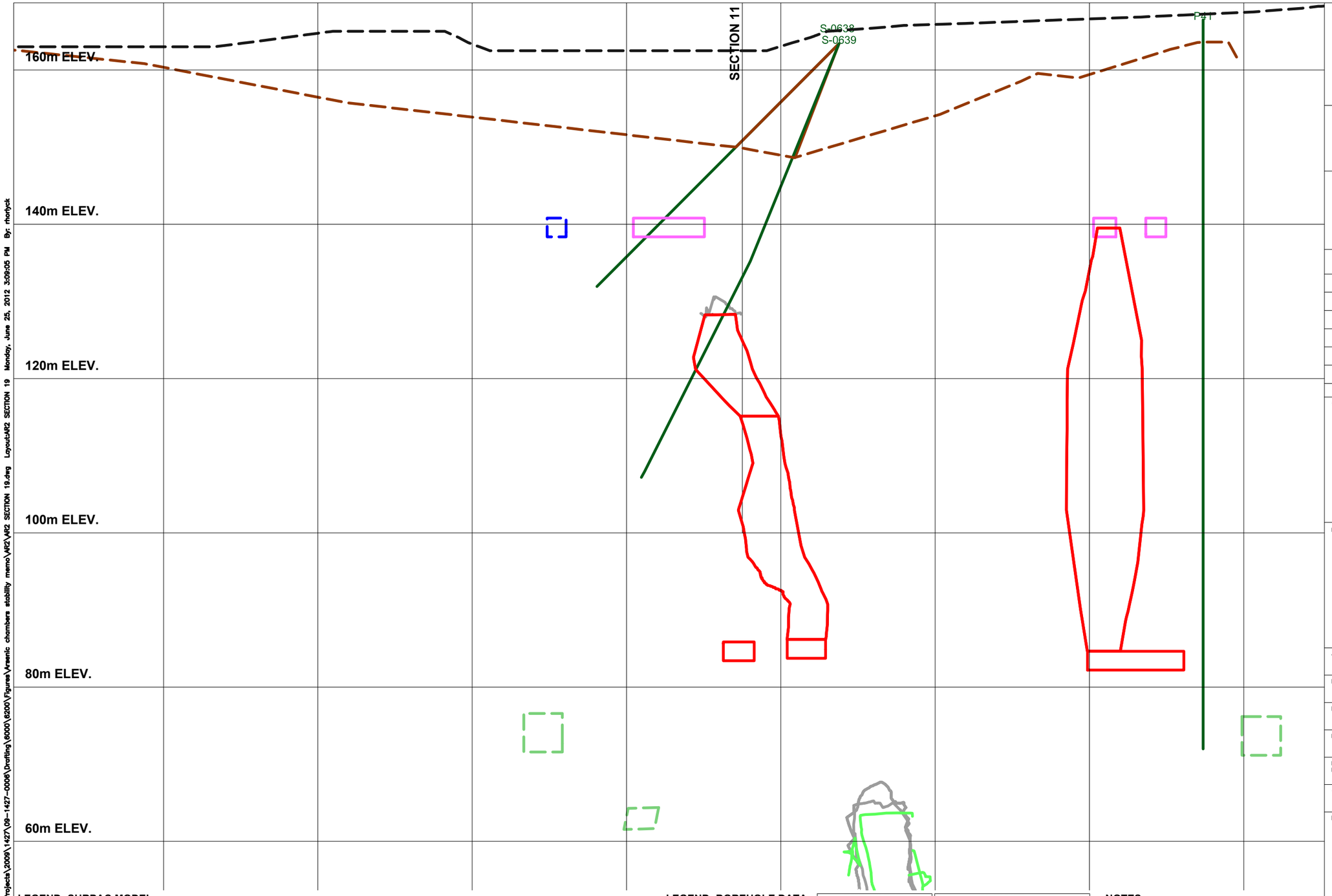

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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

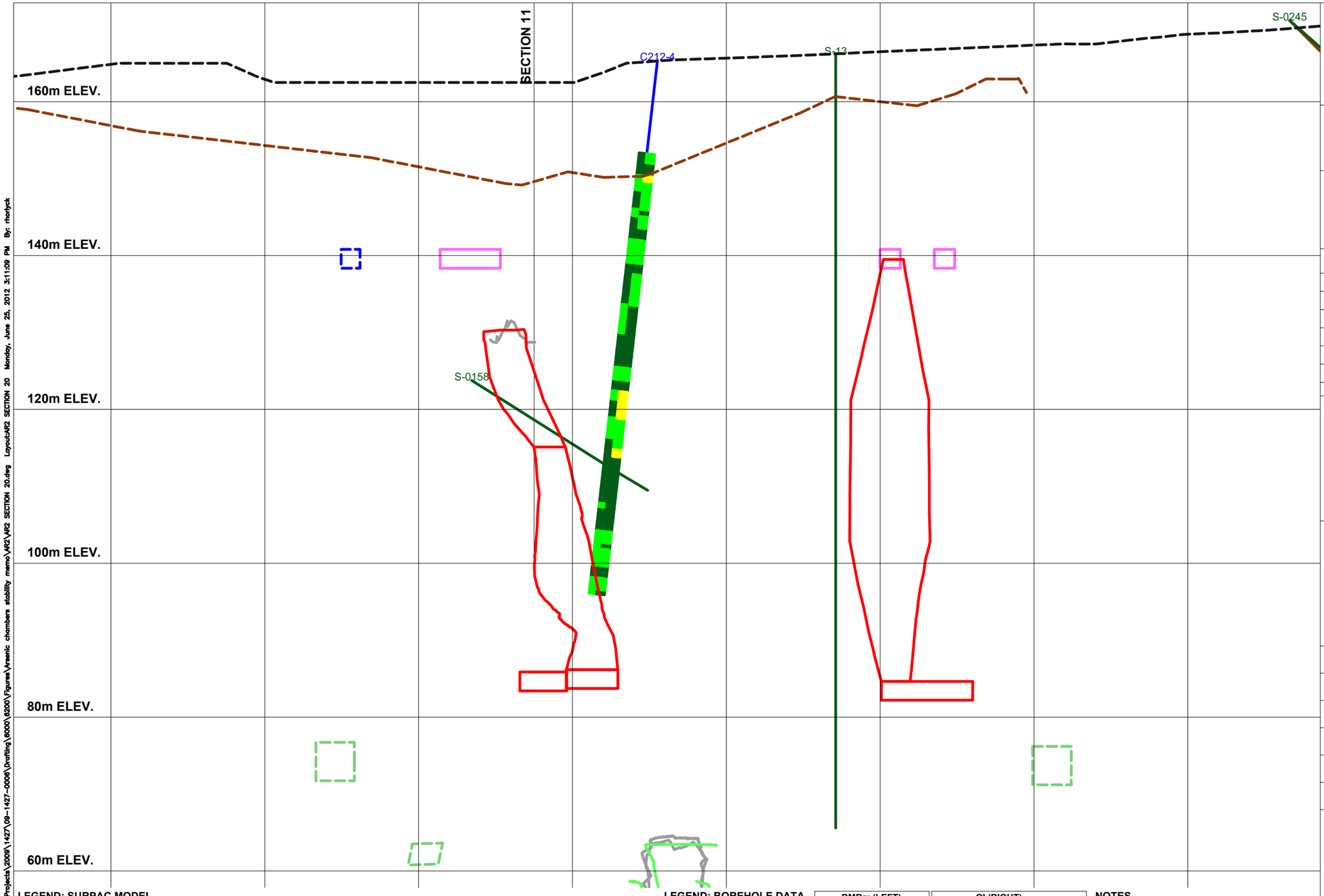
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B10
AR2 SECTION 19

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-19 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

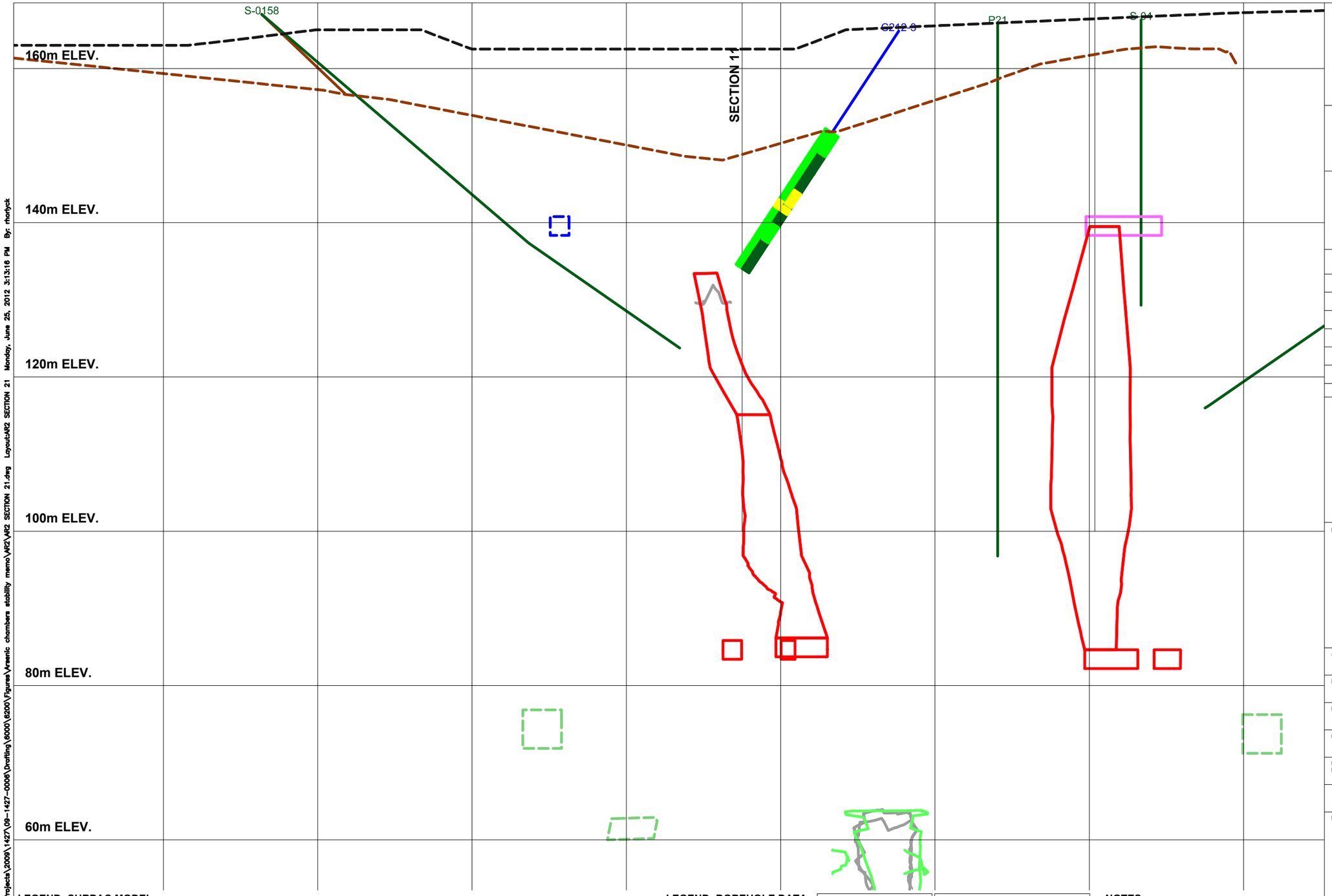
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B10 AR2 SECTION 20

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-20 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

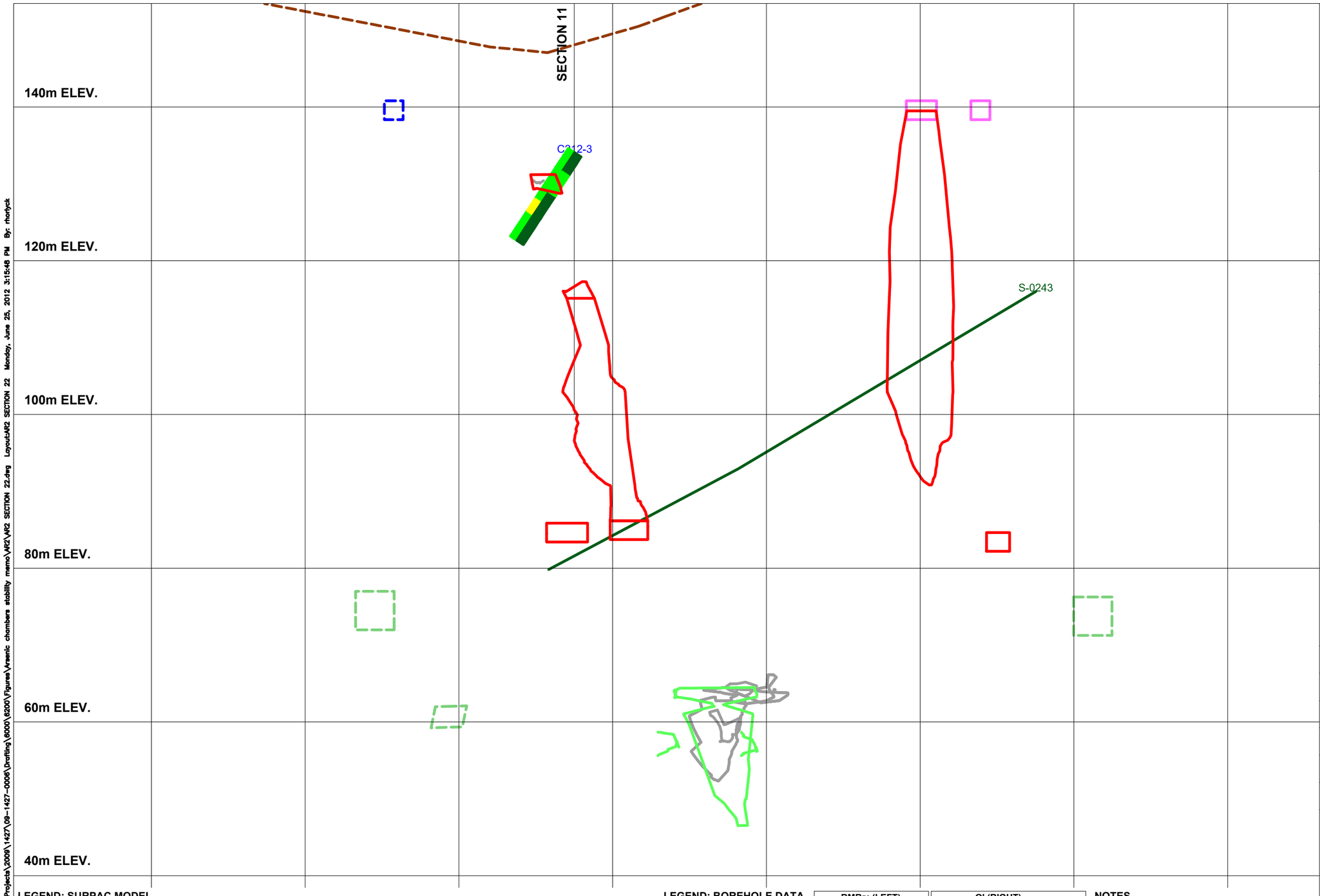
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B10 AR2 SECTION 21

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-21 OF 90	0



Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B10 AR2 SECTION 22

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-22 OF 90	0

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

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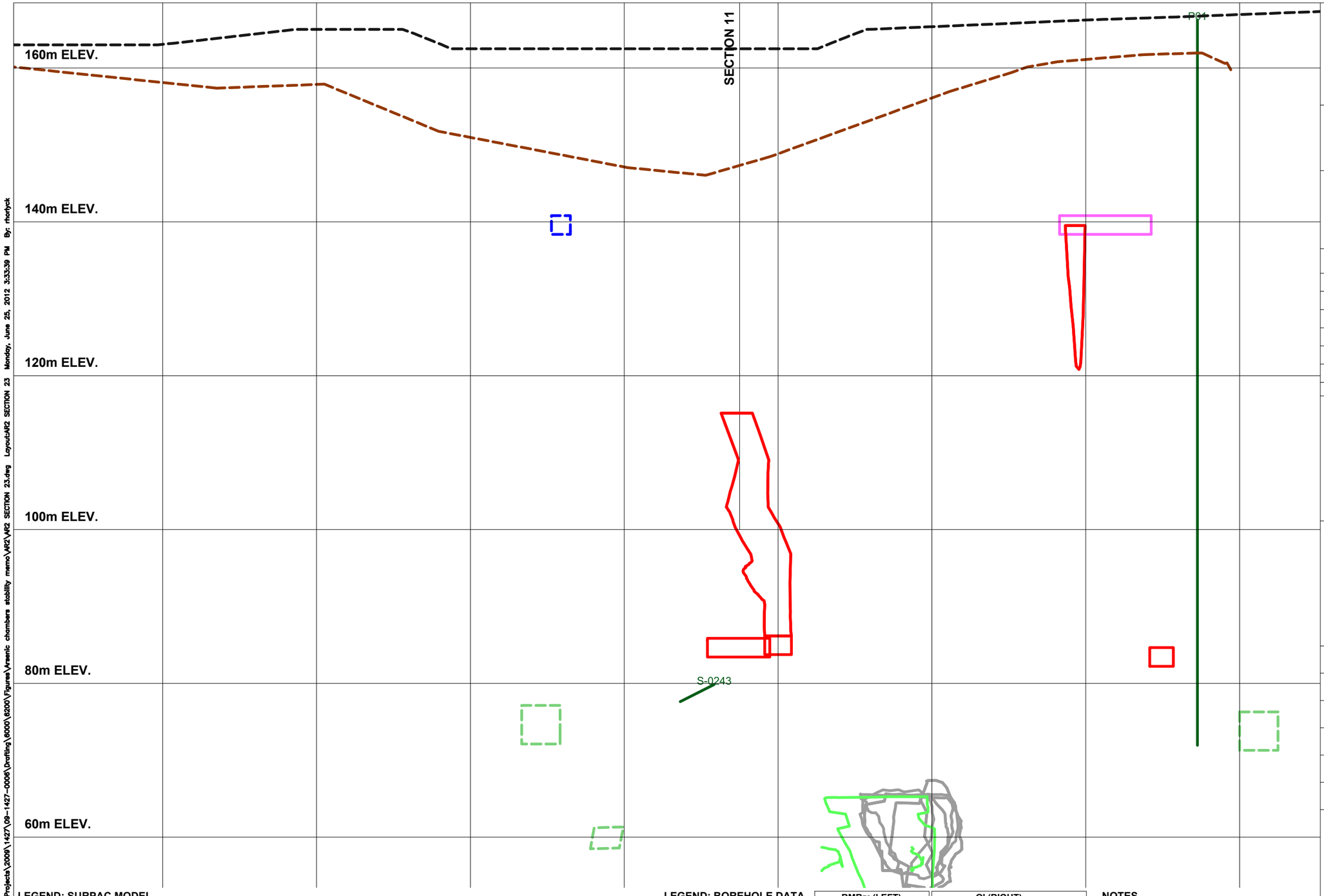

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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

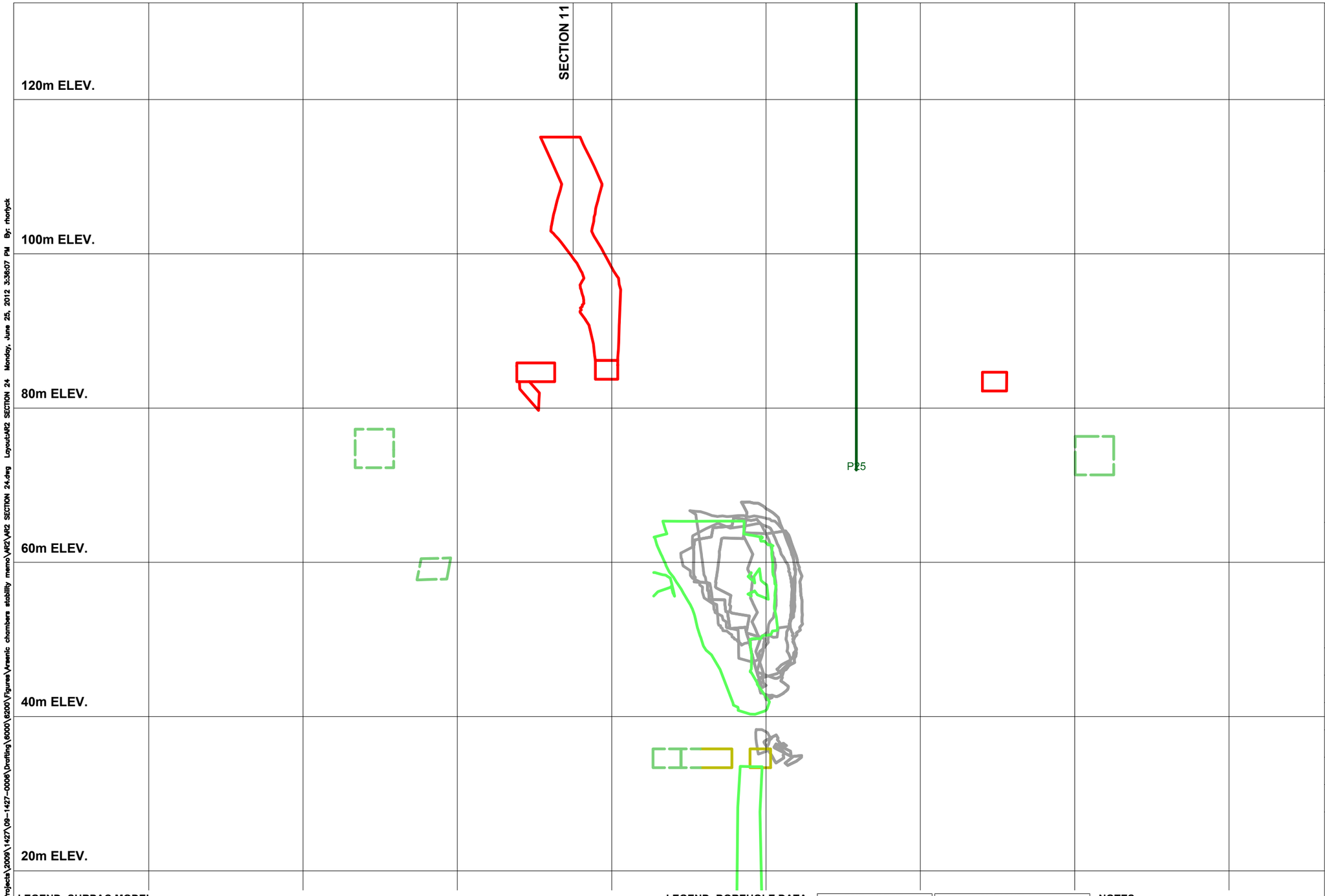
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B10
AR2 SECTION 22

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-23 OF 90	0

AO – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

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SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

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Golder Associates

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0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC:

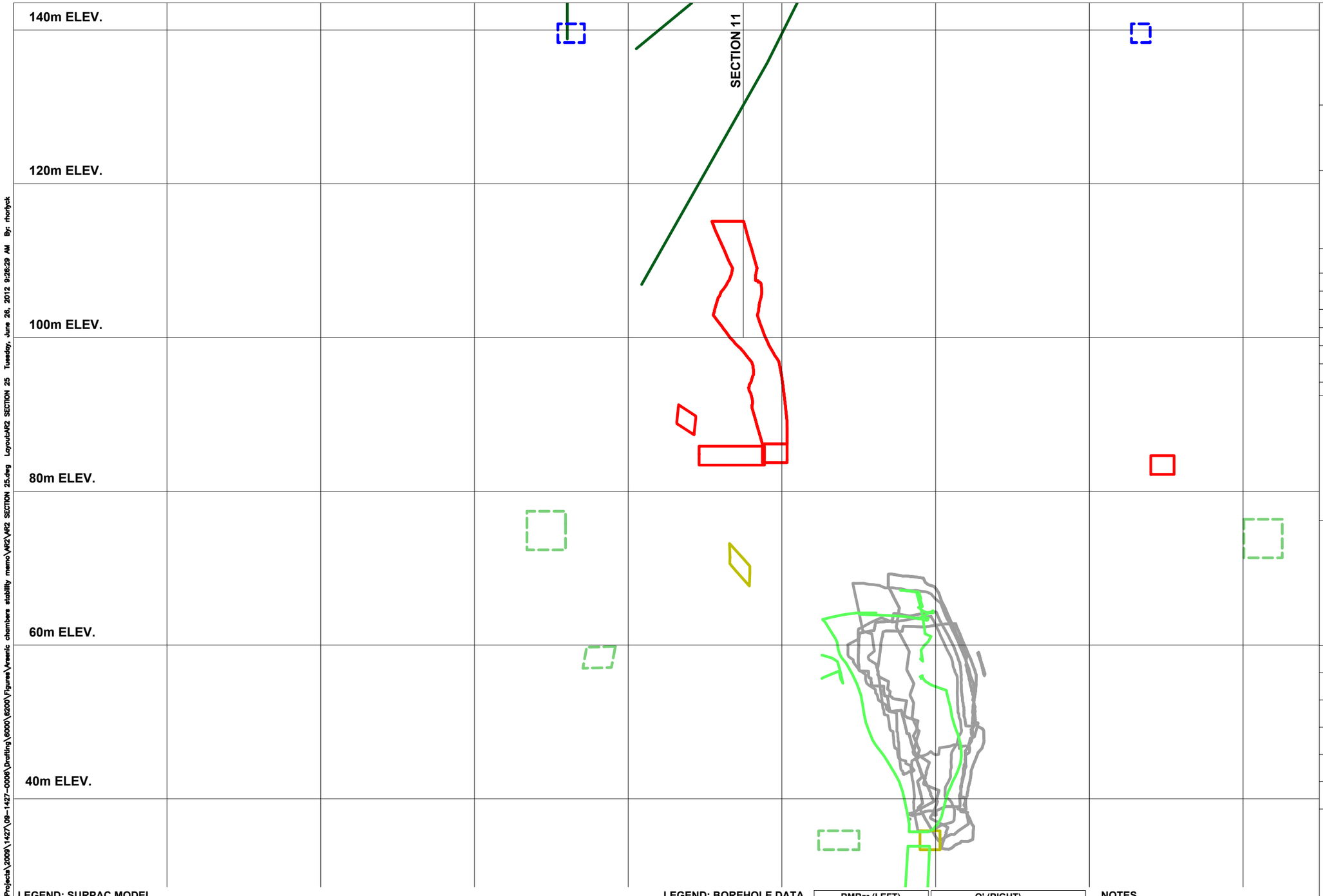
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 24

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-24 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

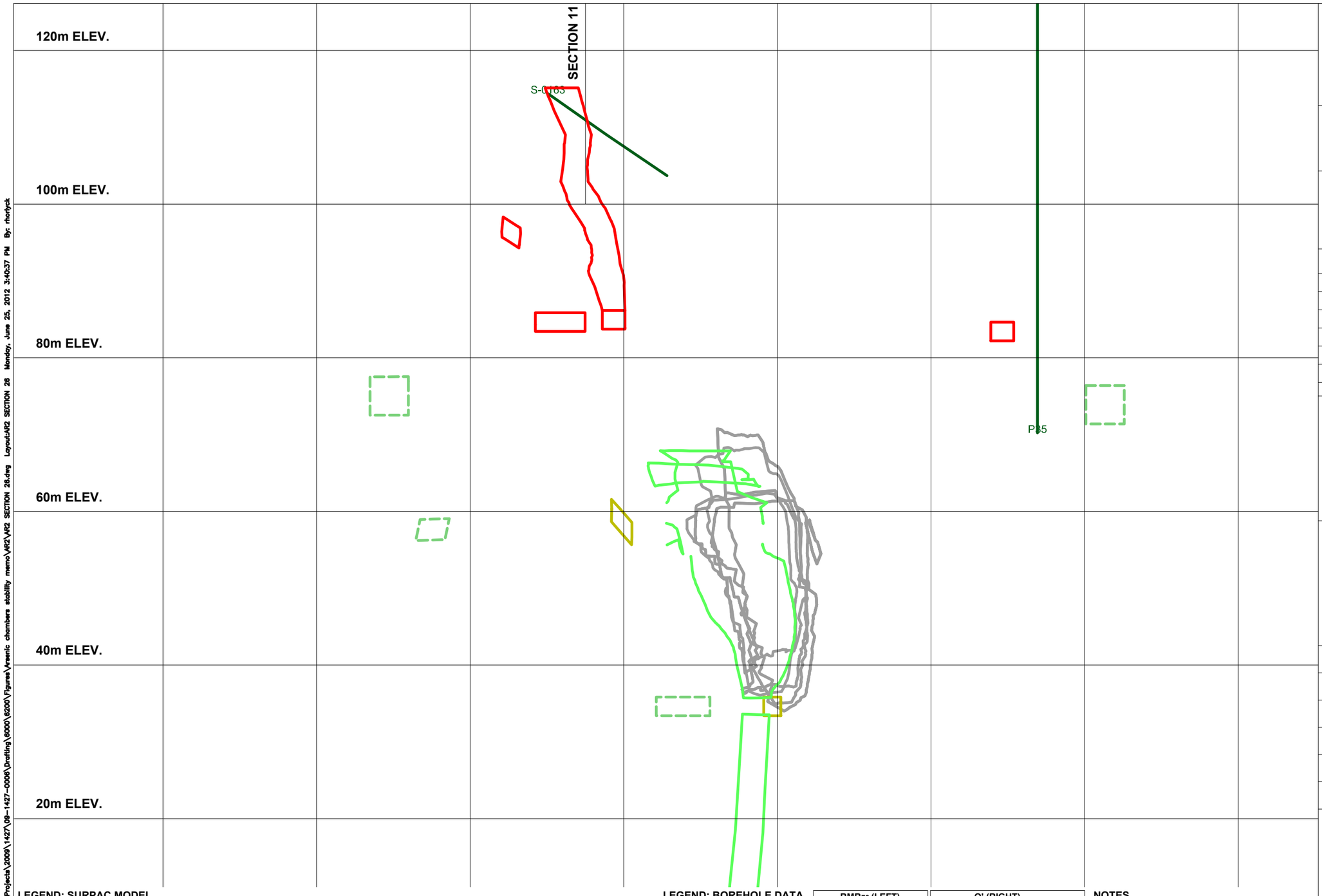
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 25

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-25 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-06

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

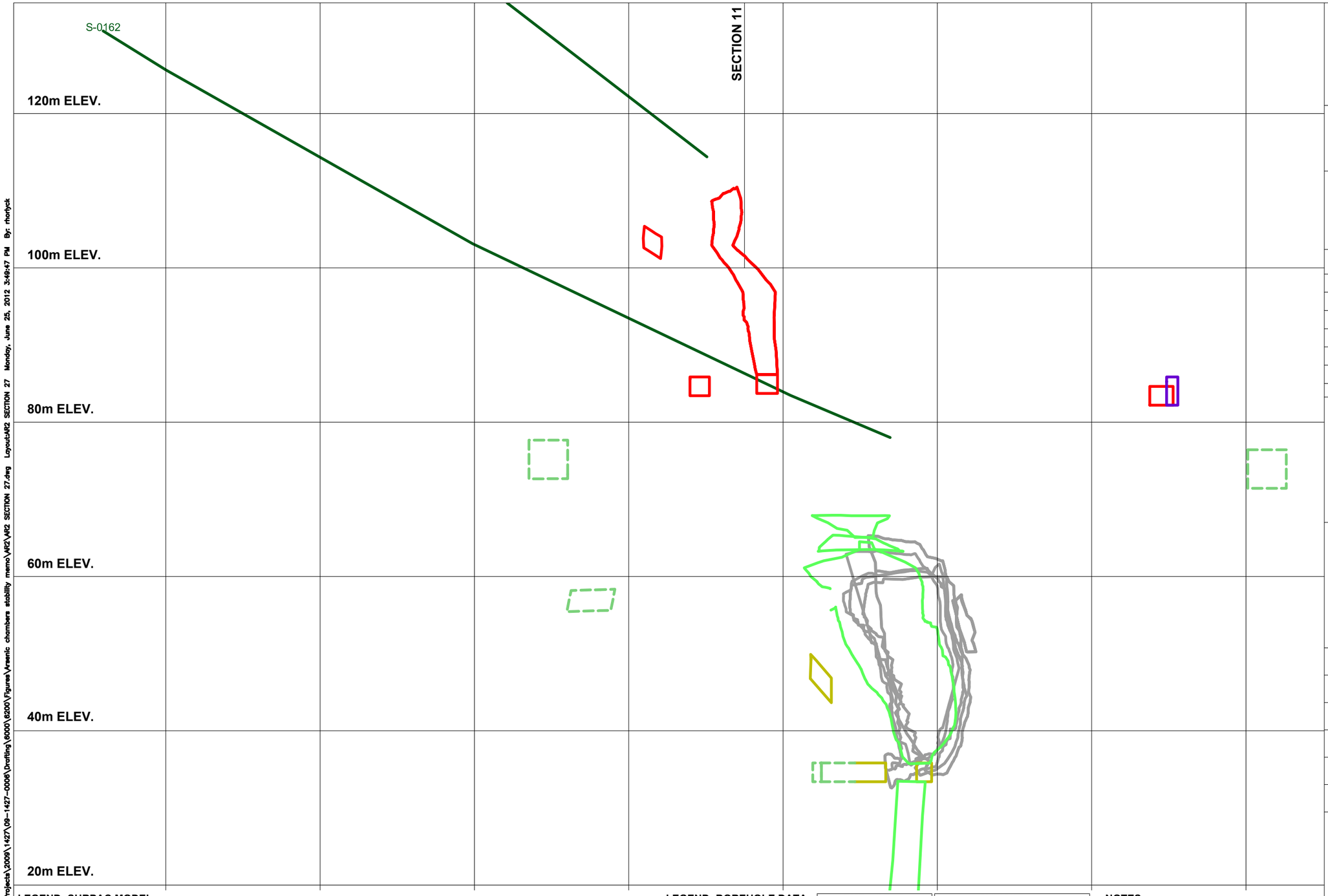
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 26

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-26 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: **PWGSC**

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 27

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
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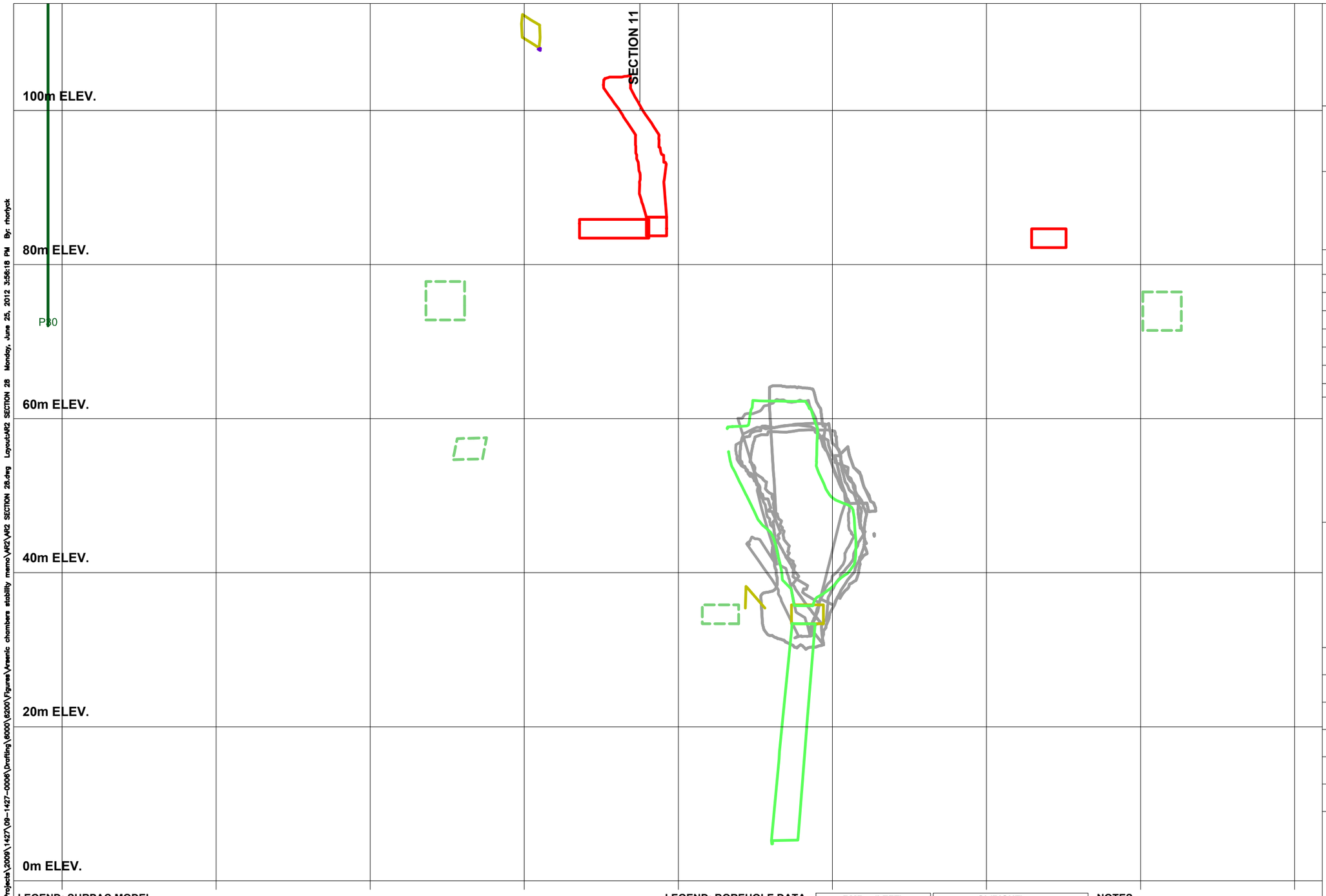

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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

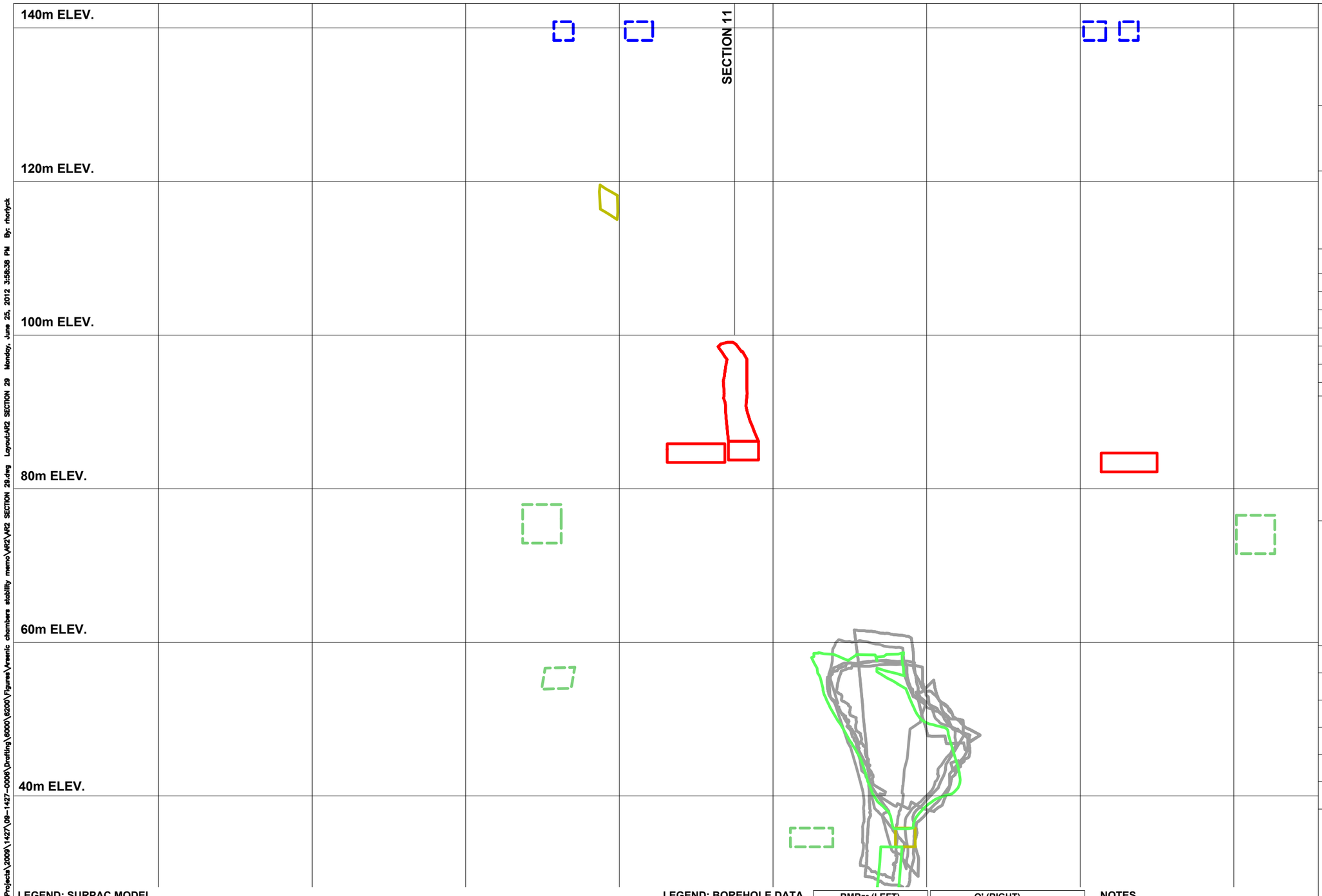
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 28

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-28 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 29

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-29 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17

Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR2 SECTION 30.dwg Layout:AR2 SECTION 30 Monday, June 25, 2012 4:00:14 PM By: rhorlyck

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

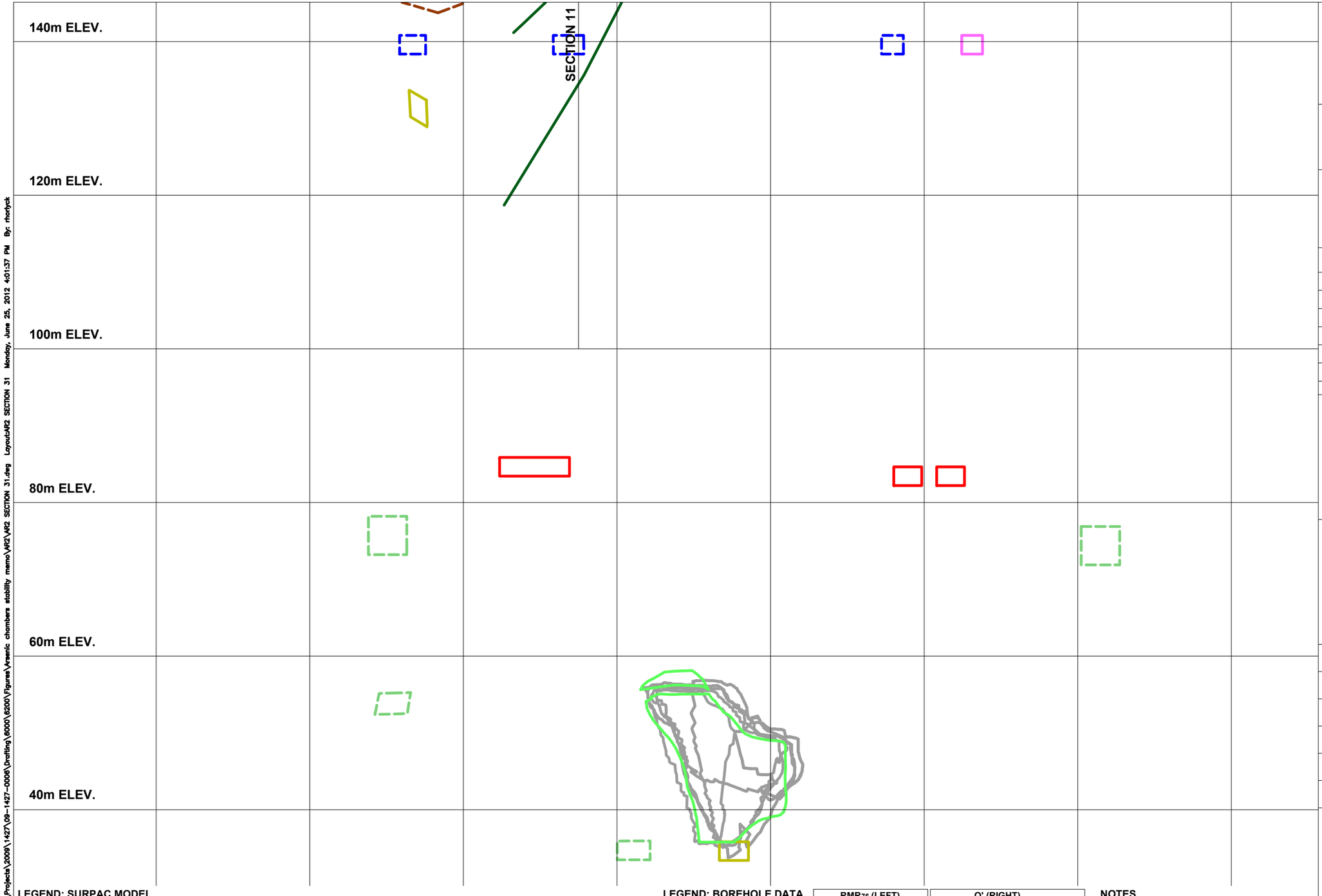
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 30

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-30 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
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- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
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RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

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Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

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Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

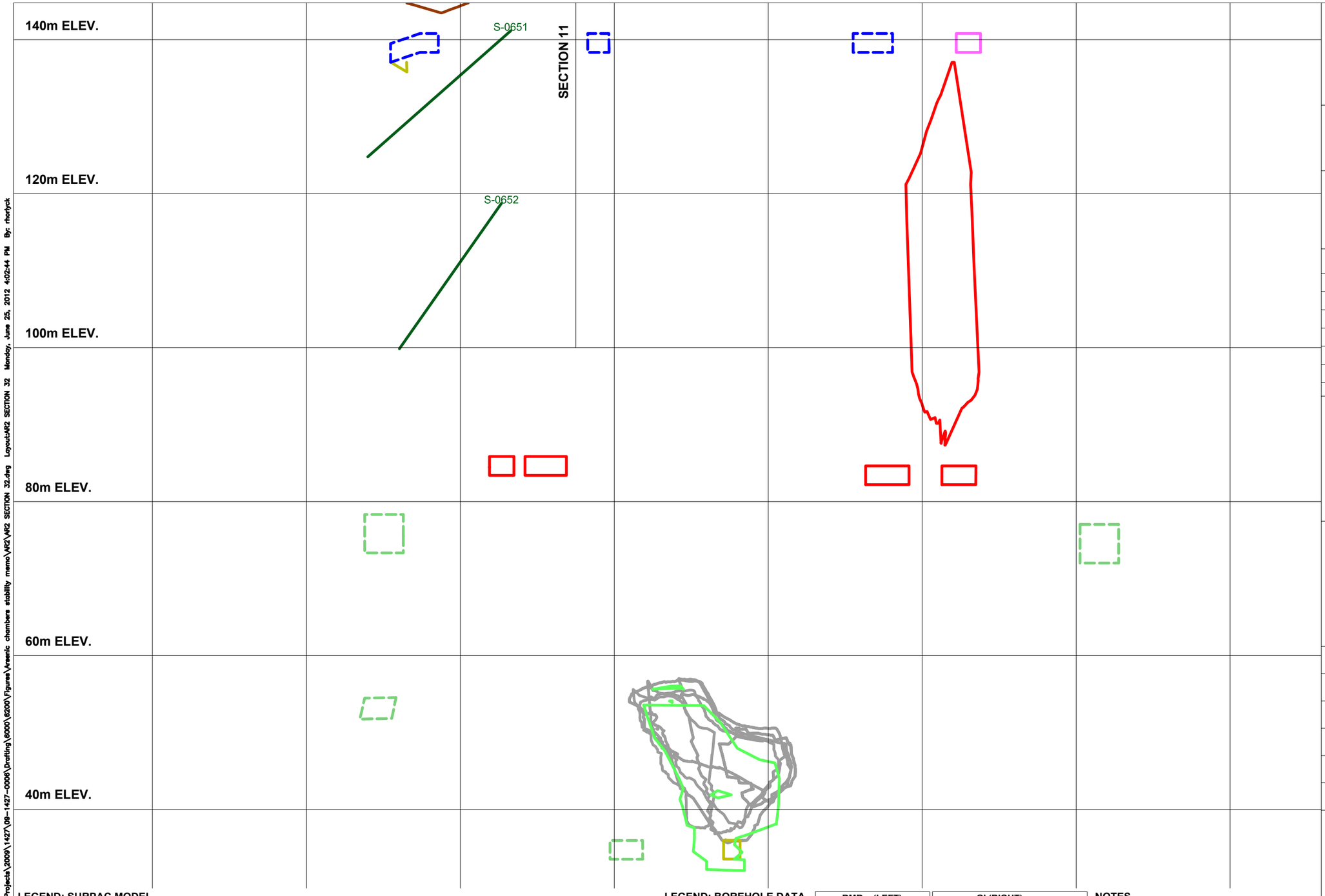
Client/client: **PWGSC**

Drawing title/Titre du dessin

ARSENIC STOPE C212

AR2 SECTION 31

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-31 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 25°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

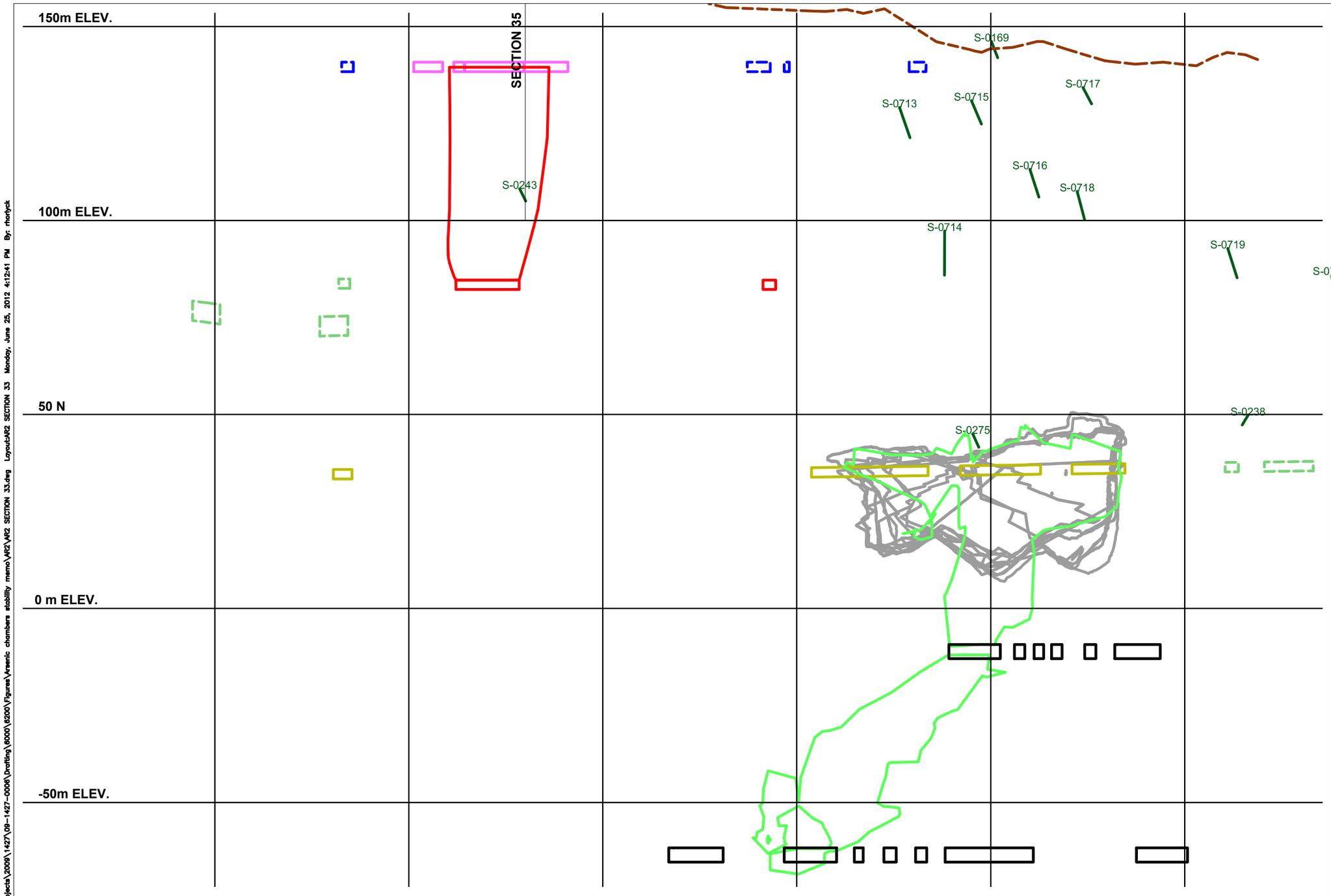
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B9 AR2 SECTION 32

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-32 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 5 m OF SECTION

-SECTION FACES 282°

0 5 10 15 20 25
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05
Revision/ Revision	Description/Description	Date/Date

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B10

AR2 SECTION 33

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-33 OF 90	0

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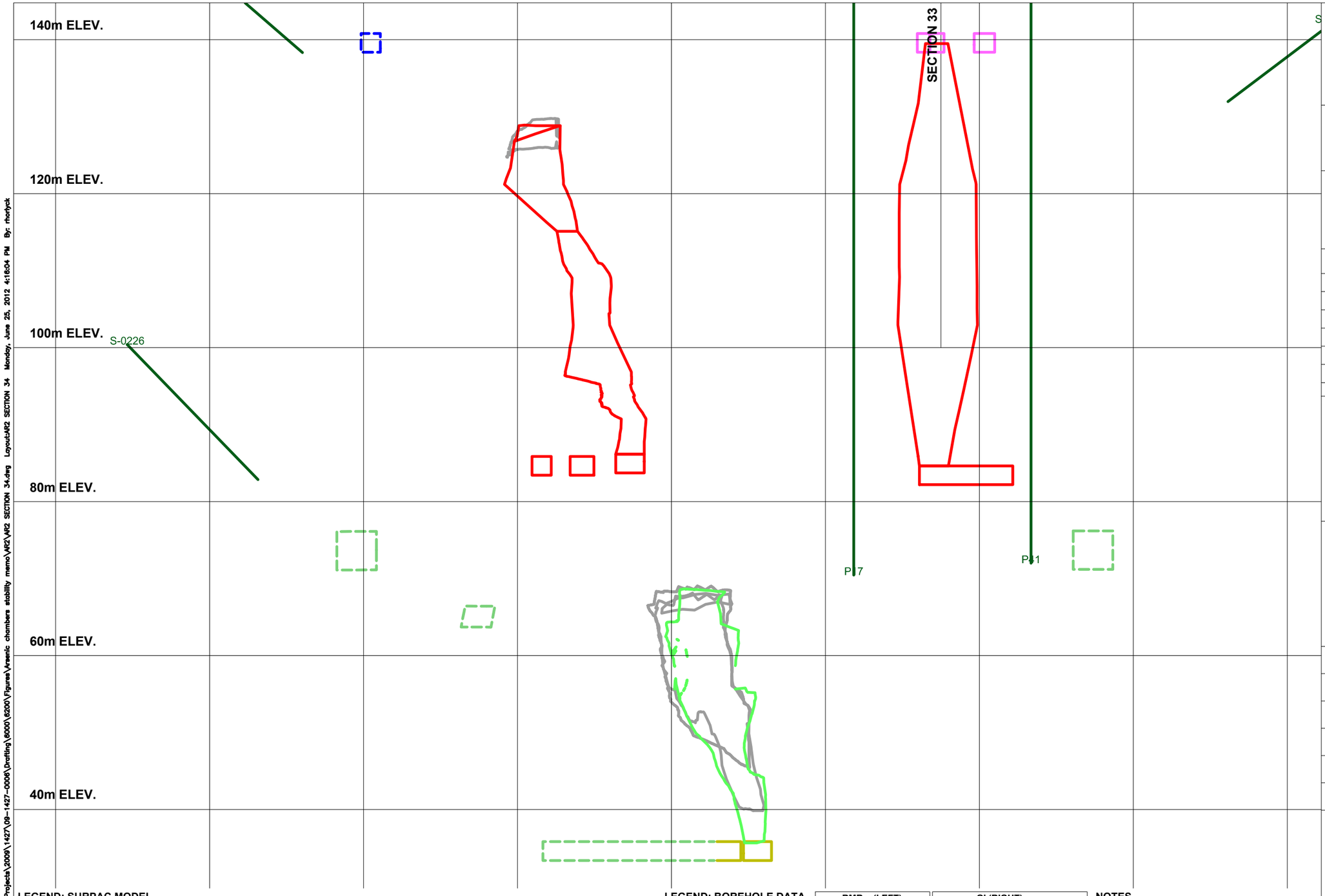
A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 12°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

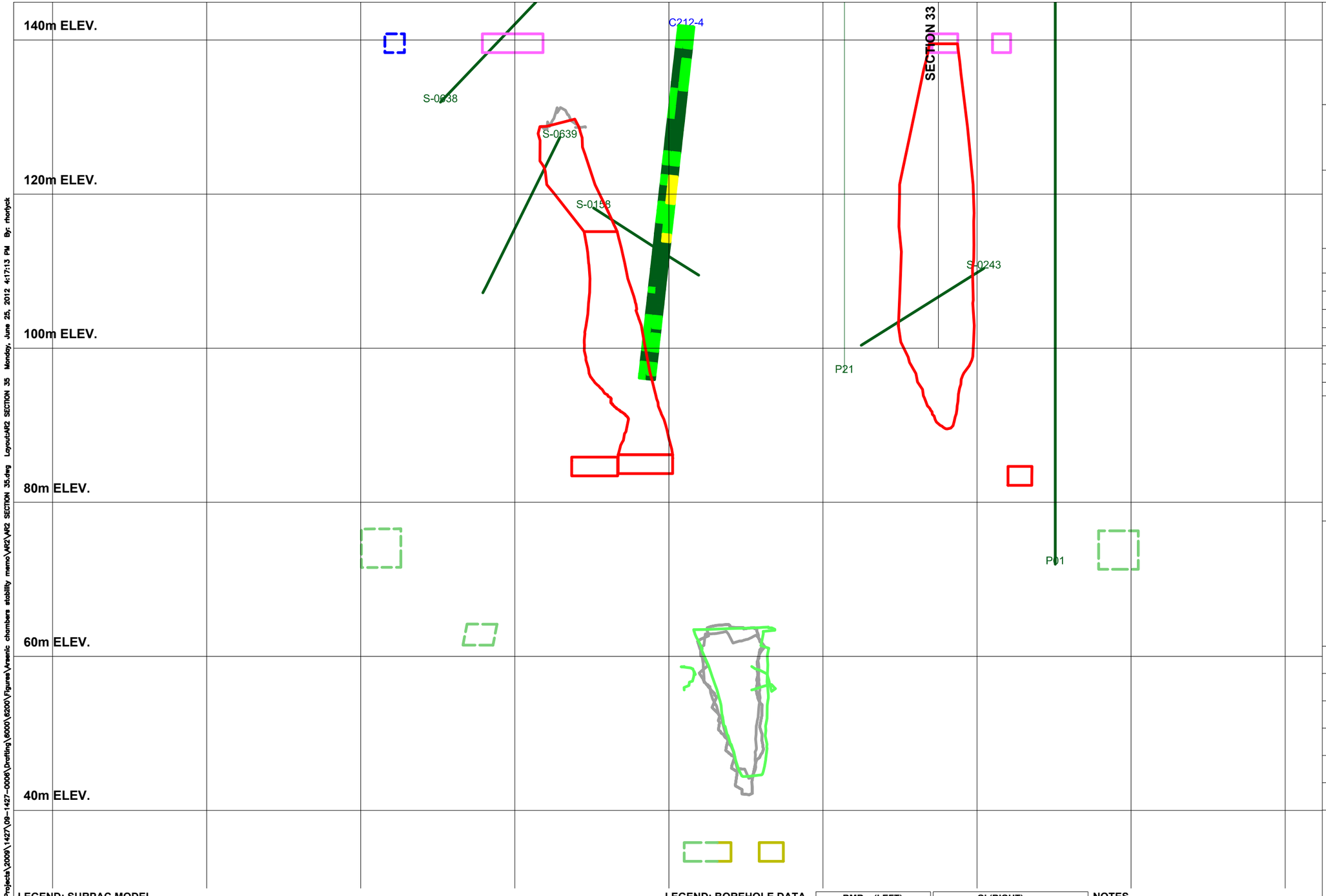
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B10
AR2 SECTION 34

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-34 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES NORTH

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Drawing File: N:\our-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\8200\Figures\Arsenic chambers stability memo\AR2\AR2 SECTION 35.dwg LayoutAR2 SECTION 35 Monday, June 25, 2012 4:17:13 PM By: rhorlyck

A0 - PWGSC - ANSI B-L1 - 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

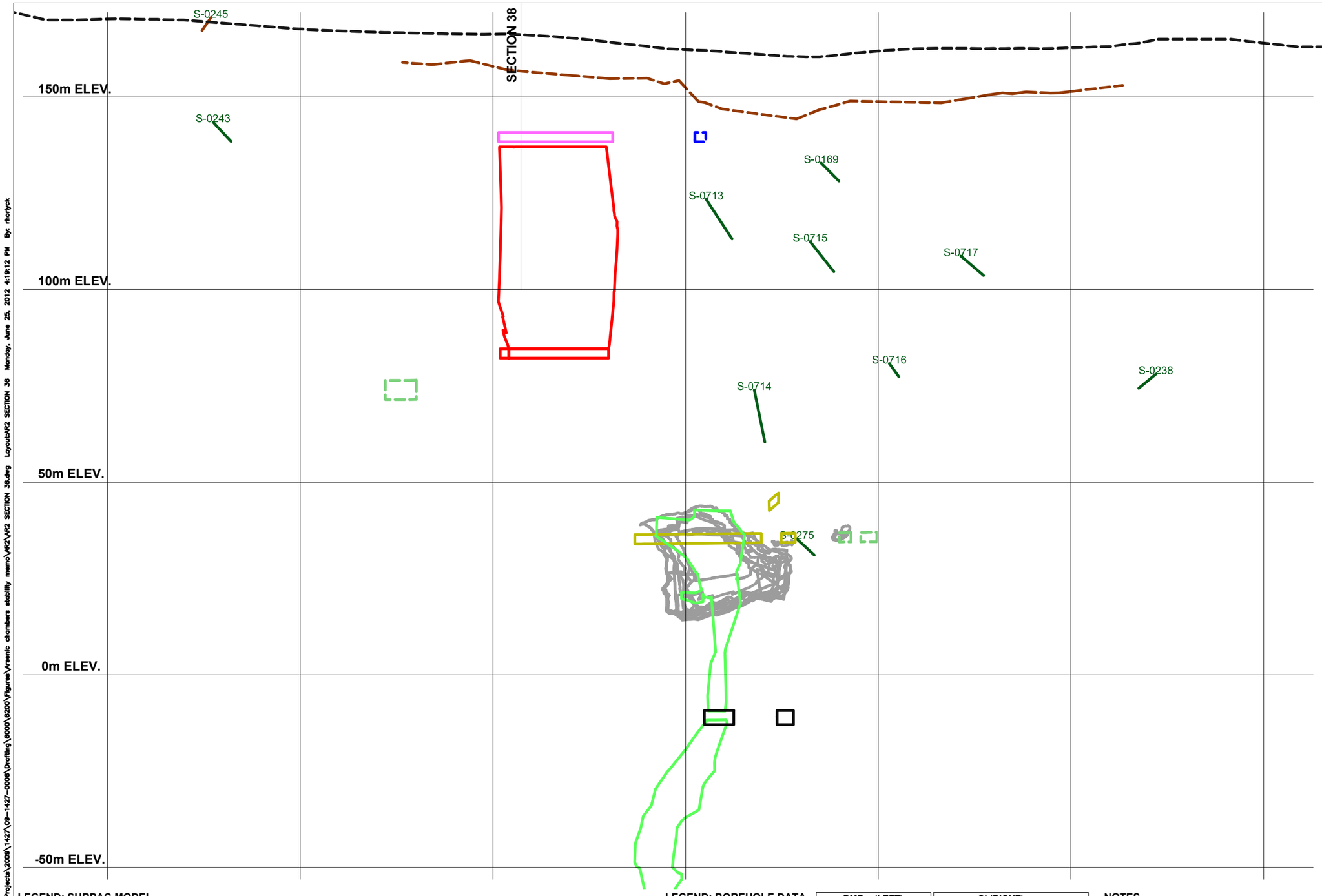
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B10
AR2 SECTION 35

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-35 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 5 m OF SECTION

-SECTION FACES 257°

0 5 10 15 20 25
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05
Revision/ Revision	Description/Description	Date/Date

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

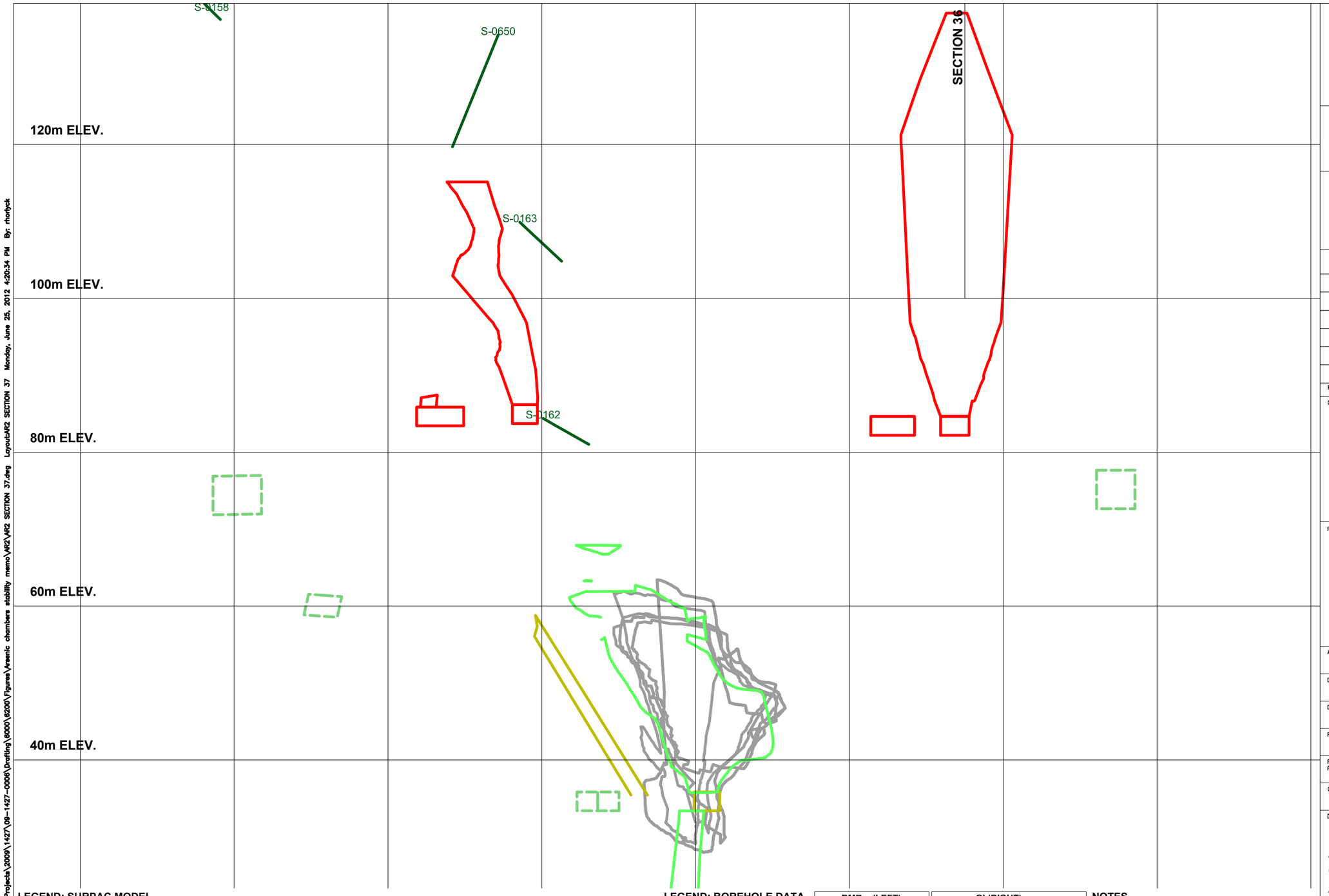
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B9

AR2 SECTION 36

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-36 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 347°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

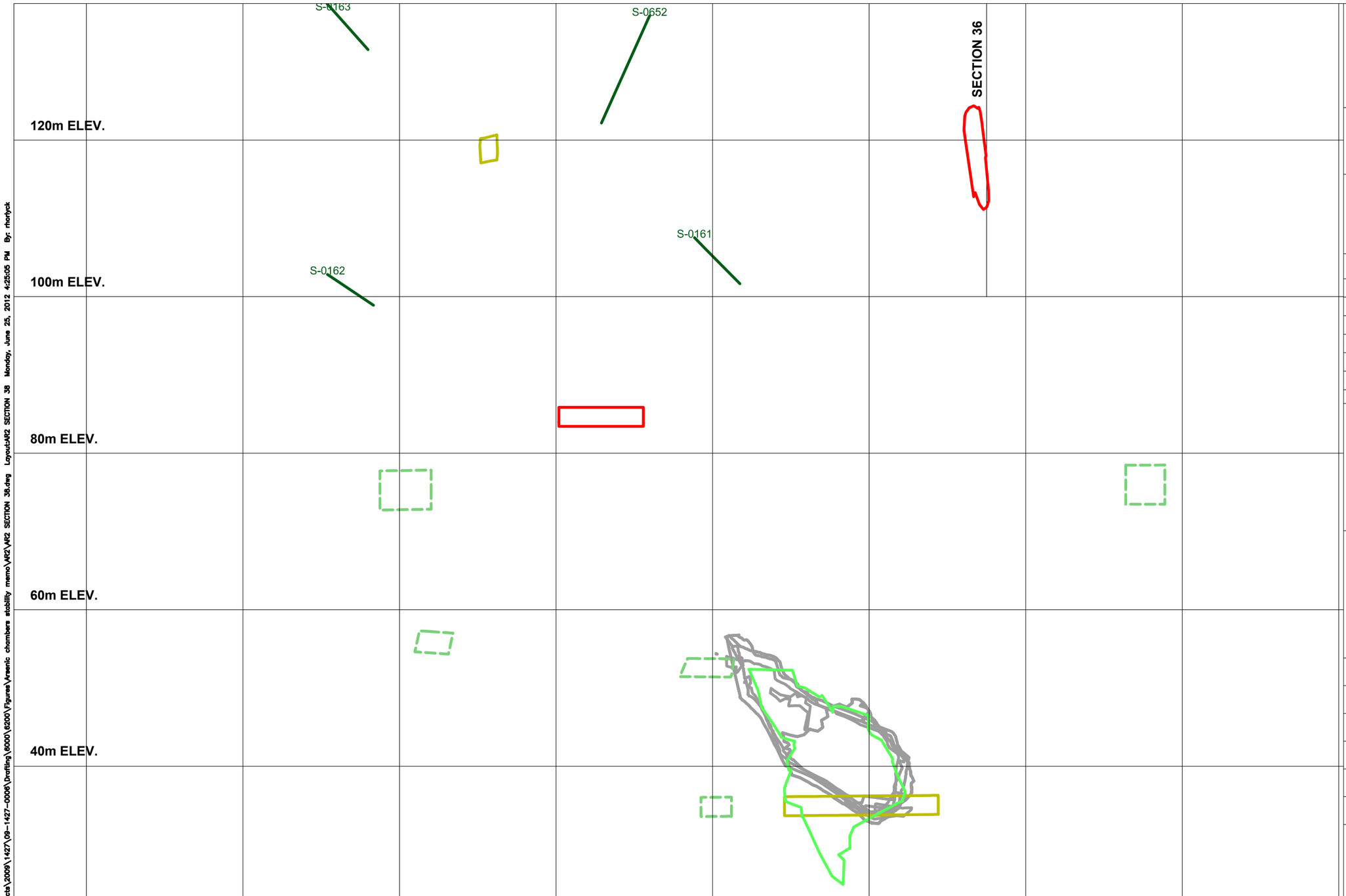
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE C212 AND CHAMBER B9 AR2 SECTION 37

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-37 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

C212-3 SRK 2005 DRILLHOLE

S-0650 HISTORICAL DRILLHOLE

- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 347°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

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A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2101-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

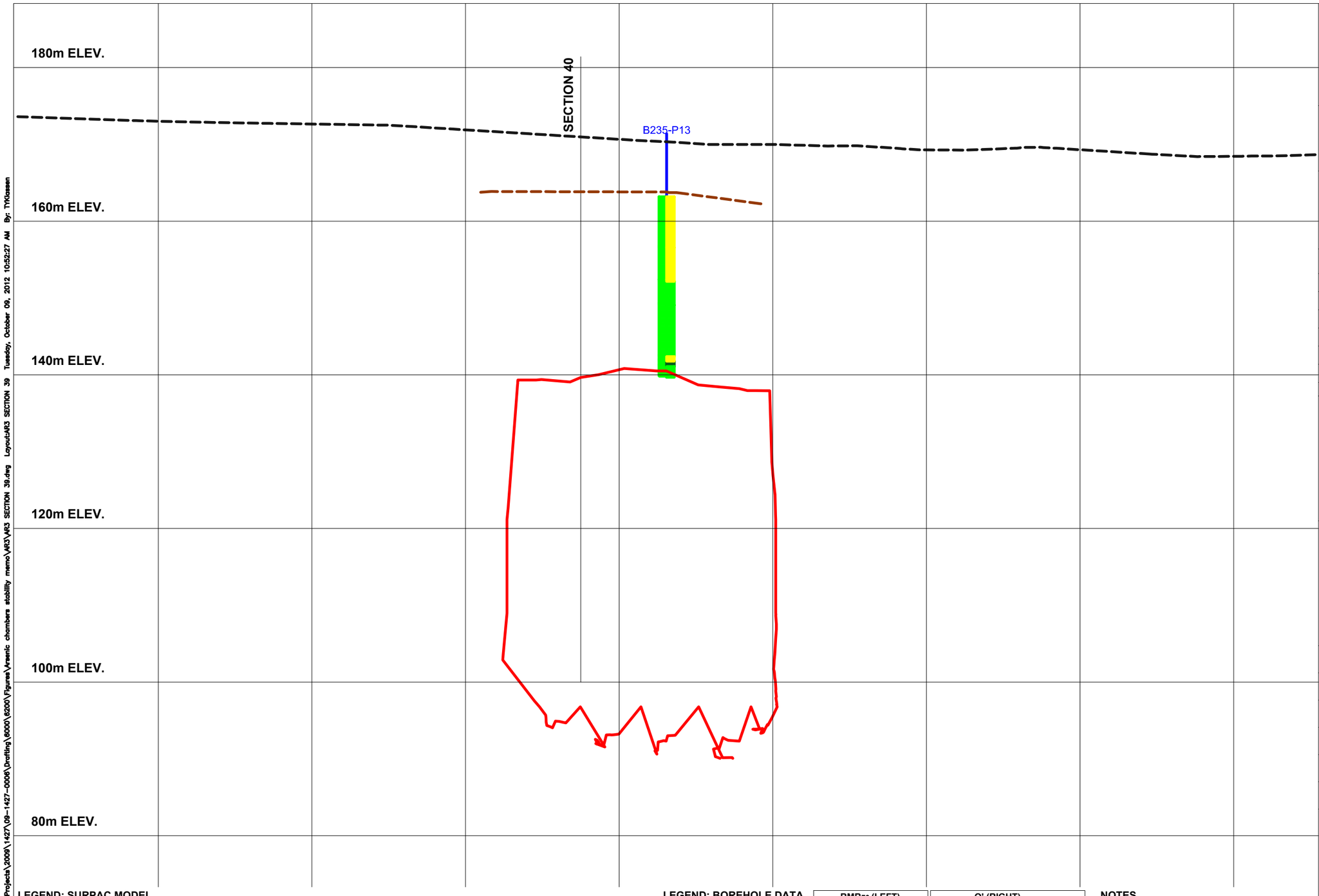
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B9

AR2 SECTION 38

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-38 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 5 m OF SECTION

-SECTION FACES 283°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client
PWGSC

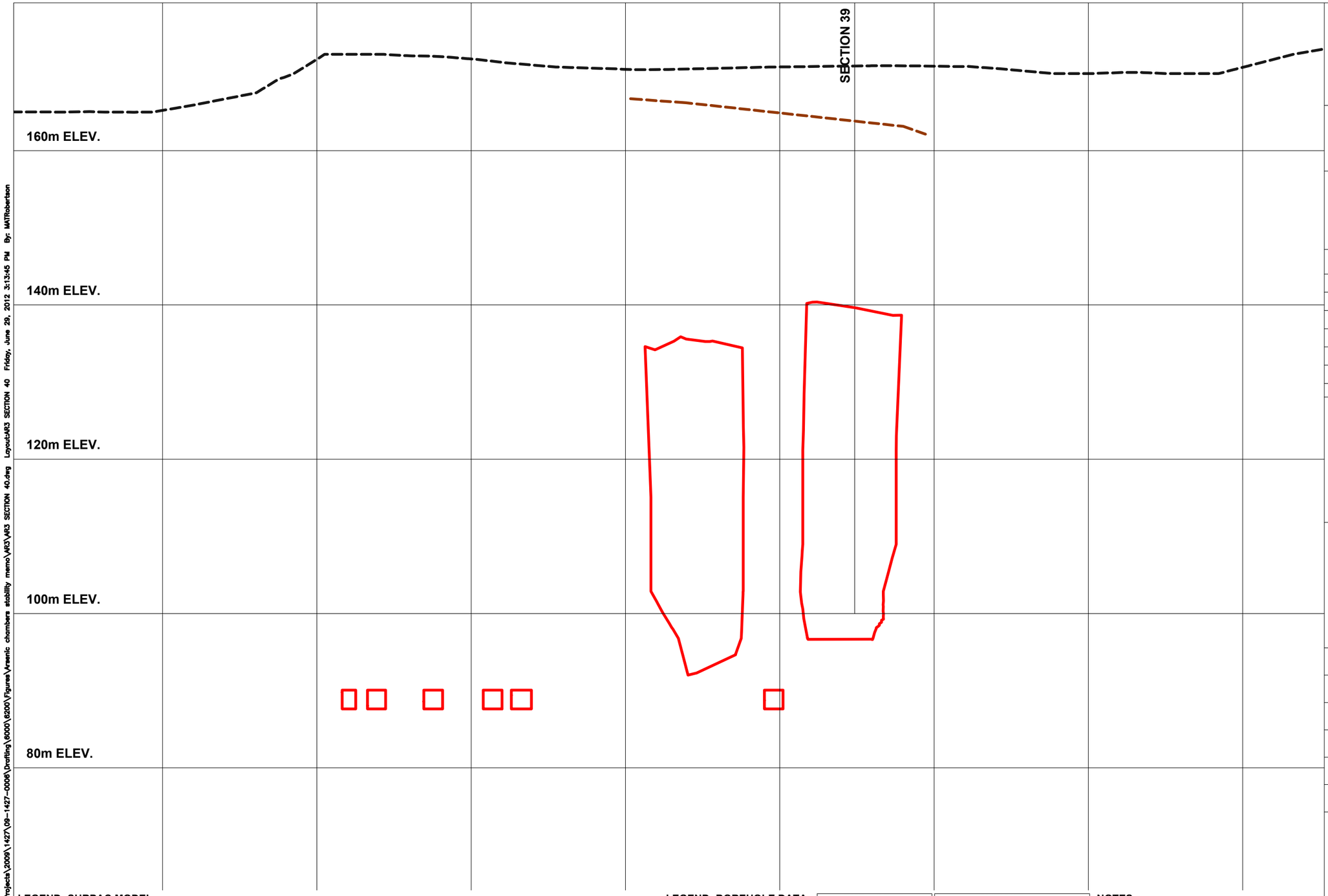
Drawing title/Titre du dessin

ARSENIC CHAMBER B235

AR3 SECTION 39

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-39 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 13°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

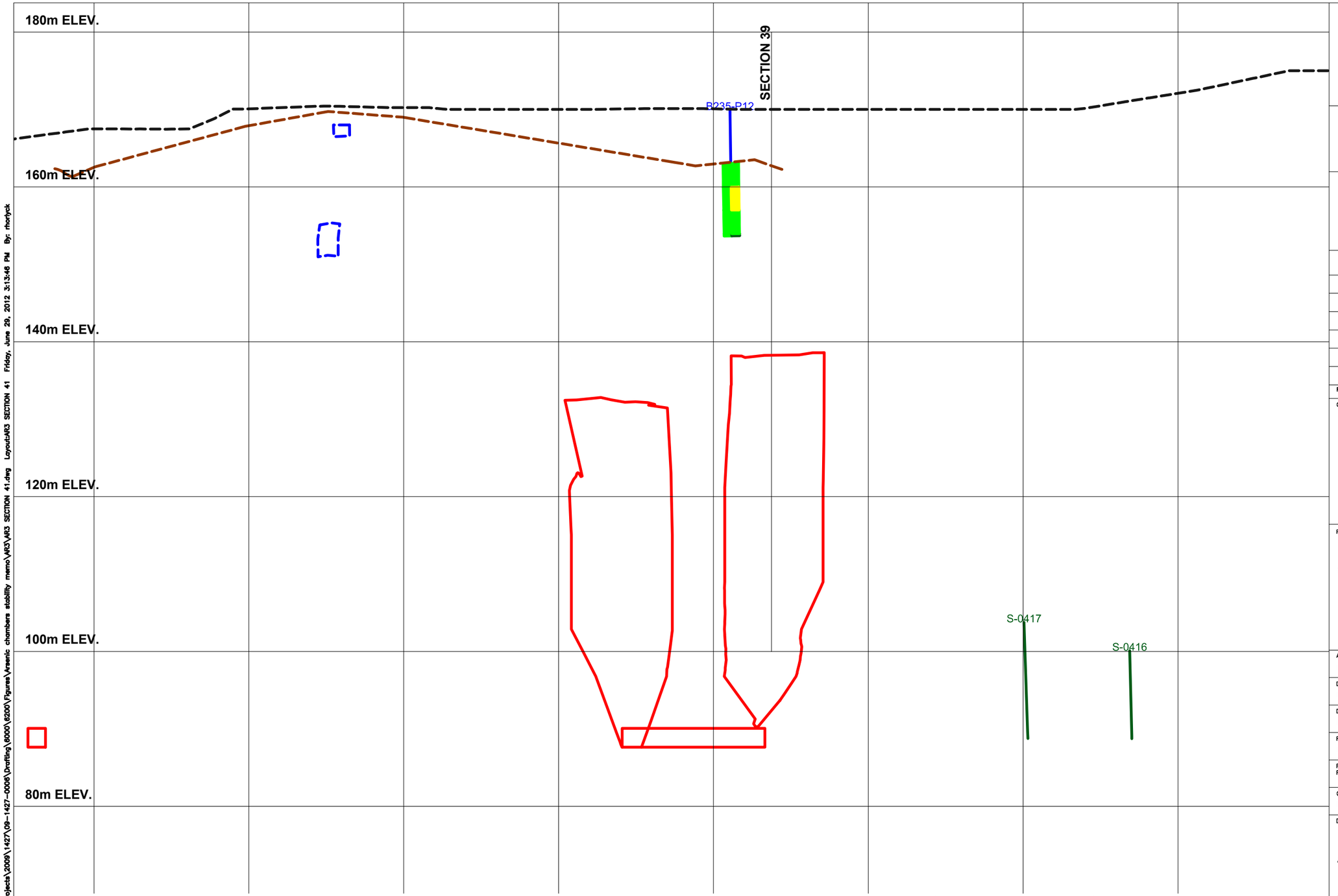
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B35 AND B236

AR3 SECTION 40

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-40 OF 90	0



Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B235 AND B236

AR3 SECTION 41

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

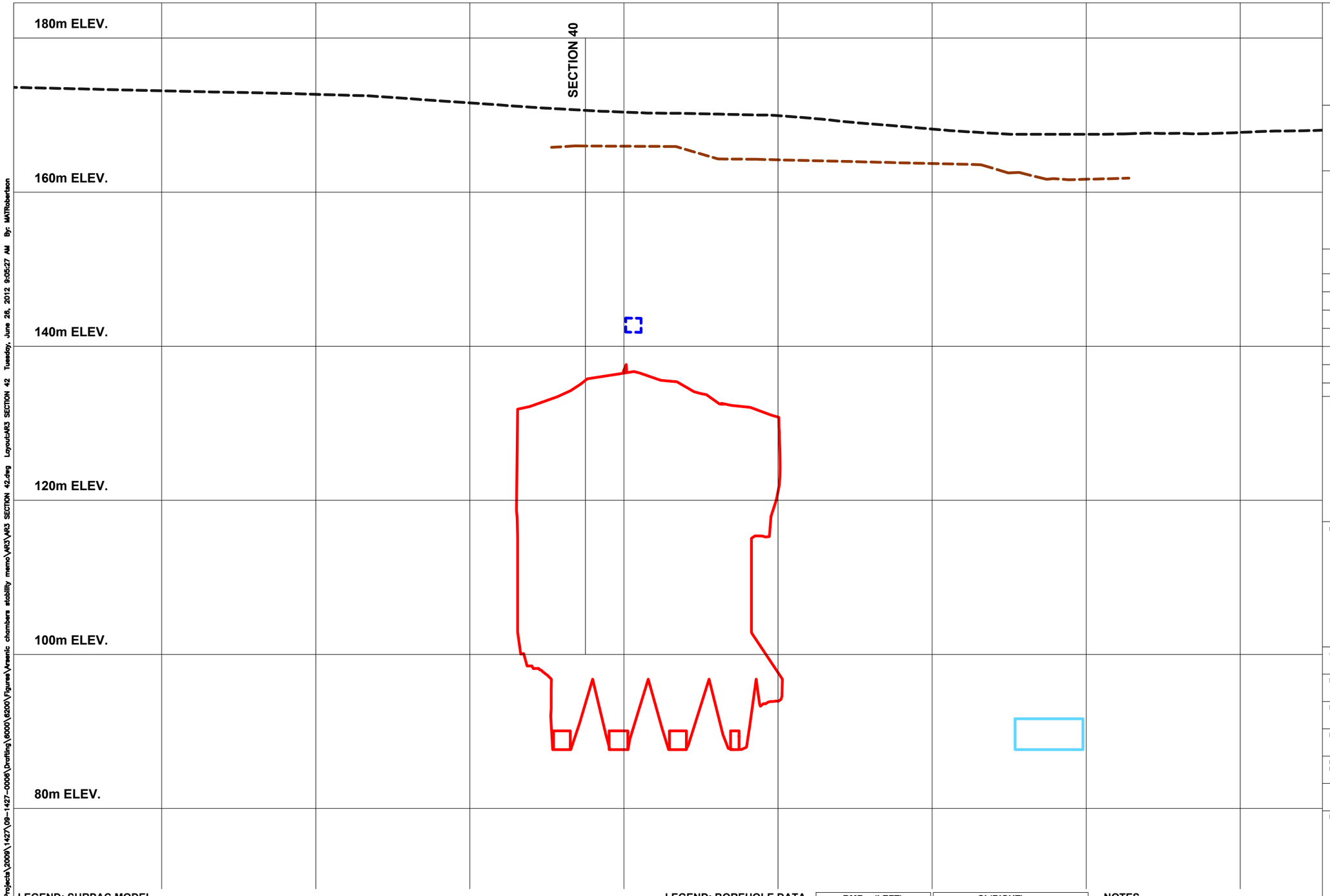
-SECTION FACES 13°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-41 OF 90	0

Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR3\AR3 SECTION 41.dwg Layout:AR3 SECTION 41 Friday, June 29, 2012 3:13:46 PM By: rhortyck

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 5 m OF SECTION

-SECTION FACES 284°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client
PWGSC

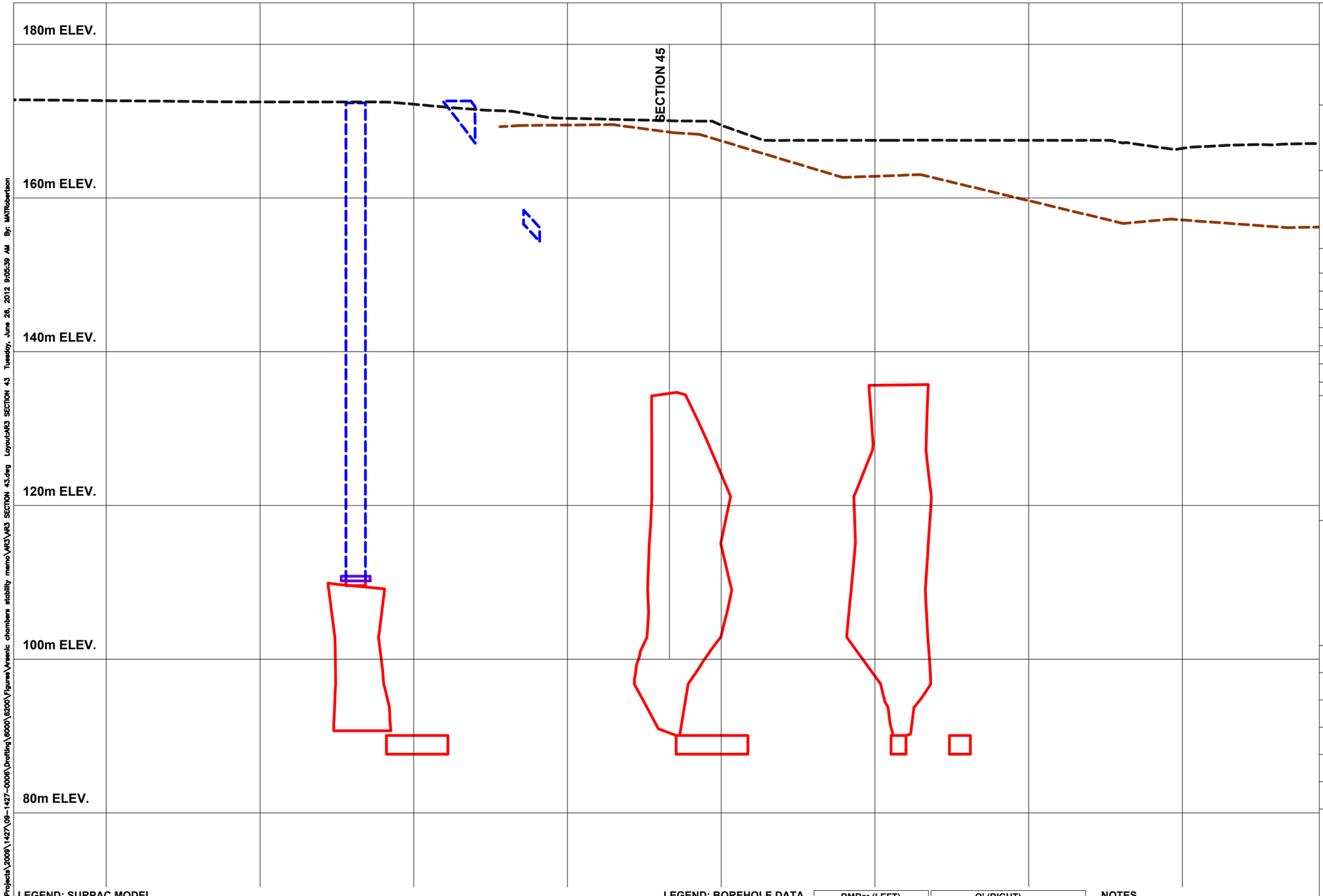
Drawing title/Titre du dessin

ARSENIC CHAMBER B236

AR3 SECTION 42

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-42 OF 90	0

AR3 SECTION 42



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 5 m OF SECTION

-SECTION FACES 282°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B230, B233, B234

AR3 SECTION 43

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
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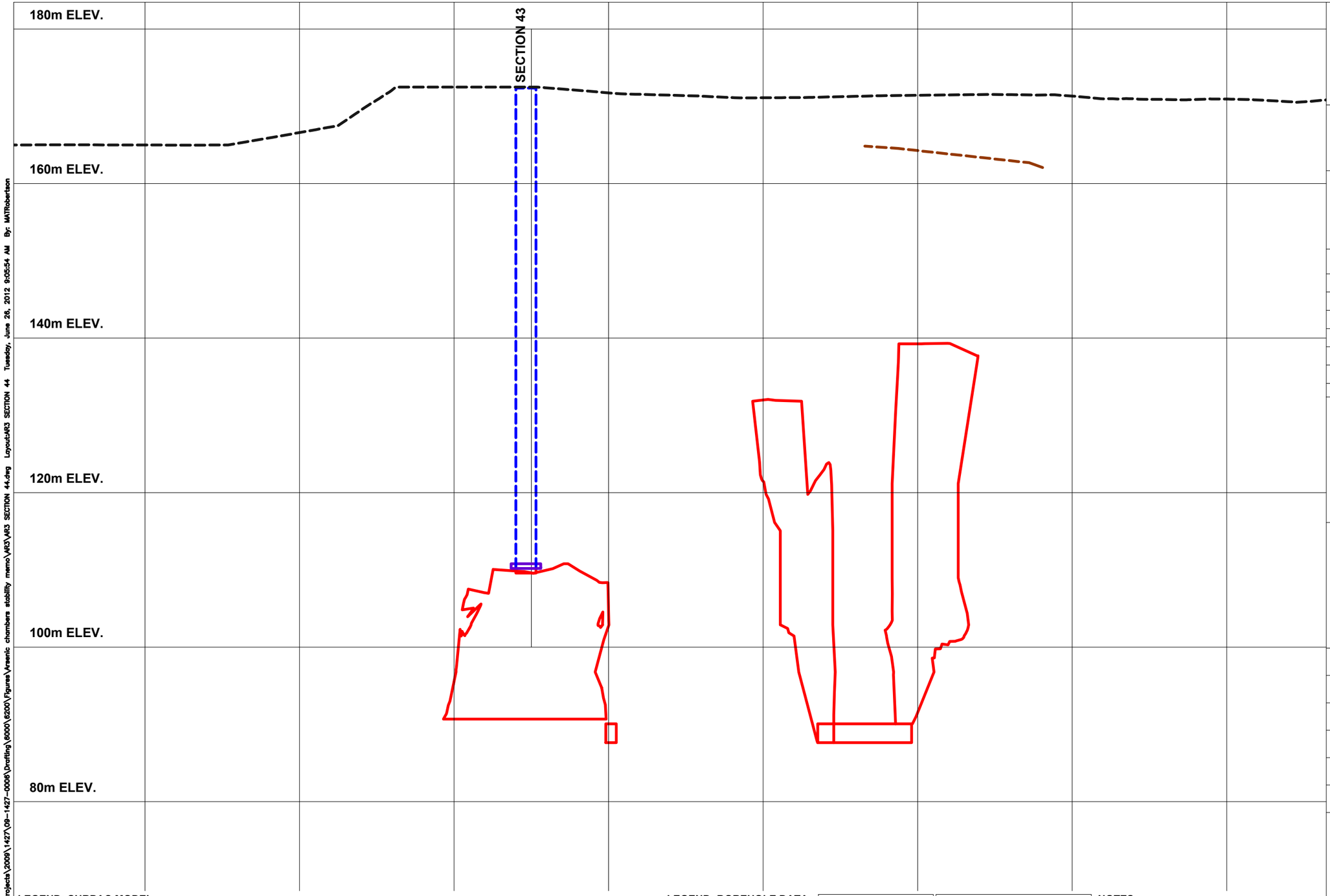


Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B230, B235, B236

AR3 SECTION 44

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-44 OF 90	0

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

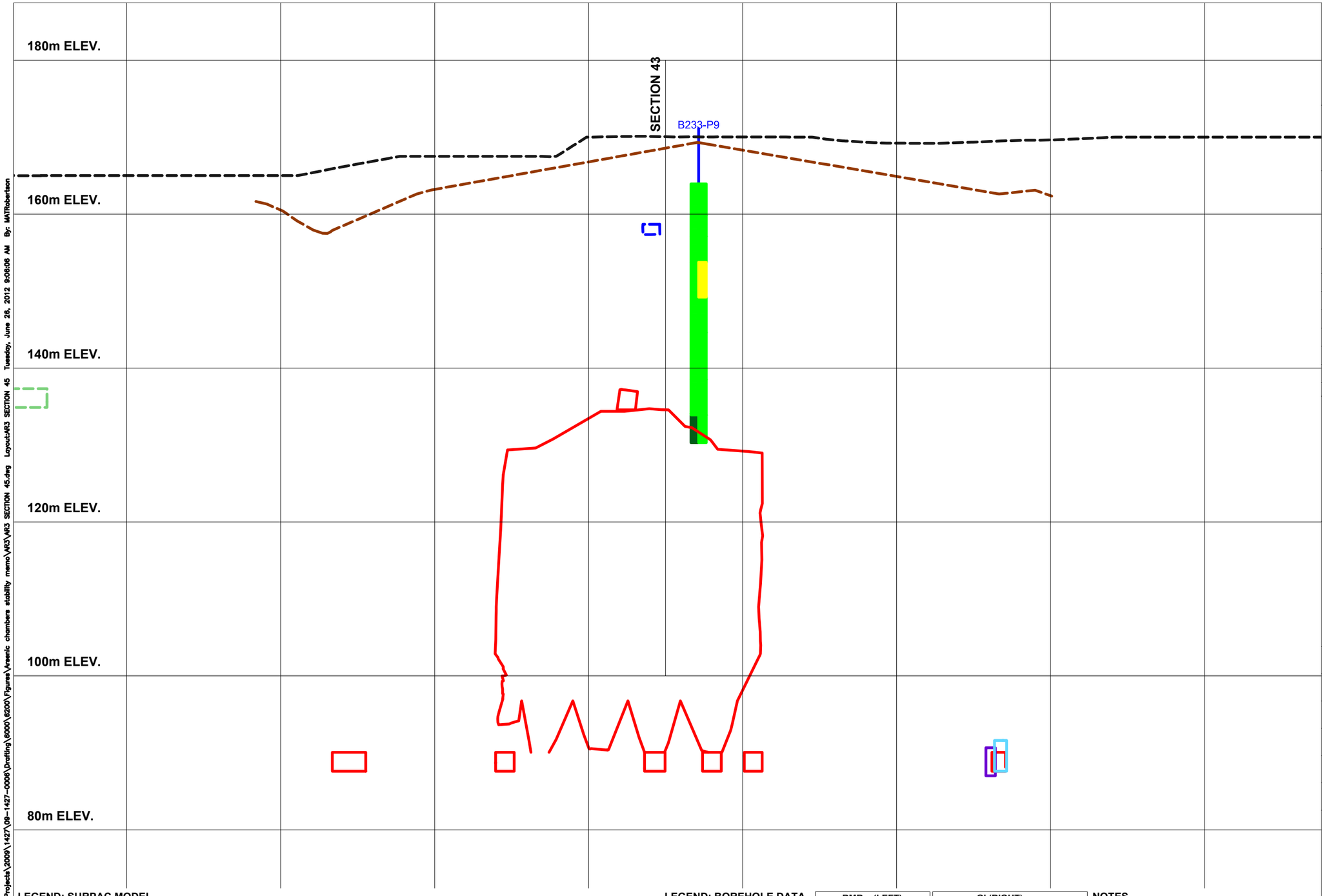
-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 12°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Drawing File: N:\ur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\8200\Figures\Arsenic chambers stability memo\AR3\AR3 SECTION 44.dwg Layout:AR3 SECTION 44 Tuesday, June 26, 2012 9:05:54 AM By: MATRobertson

A0 – PWGSC – ANSI B–L1 – 11X17



Drawing File: N:\ur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR3\AR3 SECTION 45.dwg Layout:AR3 SECTION 45 Tuesday, June 26, 2012 9:06:06 AM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 12°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

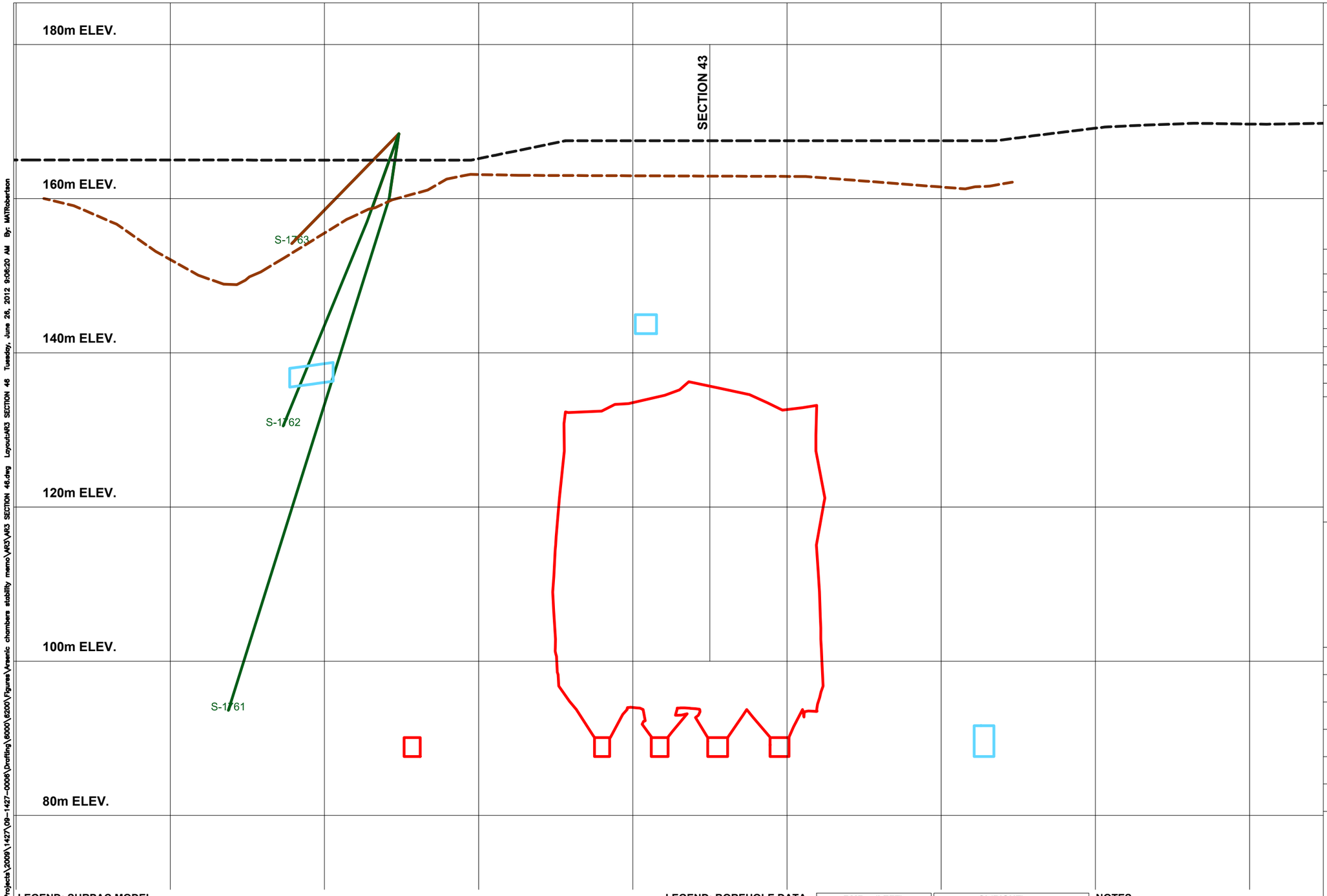
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC CHAMBER B233

AR3 SECTION 45

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-45 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 12°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

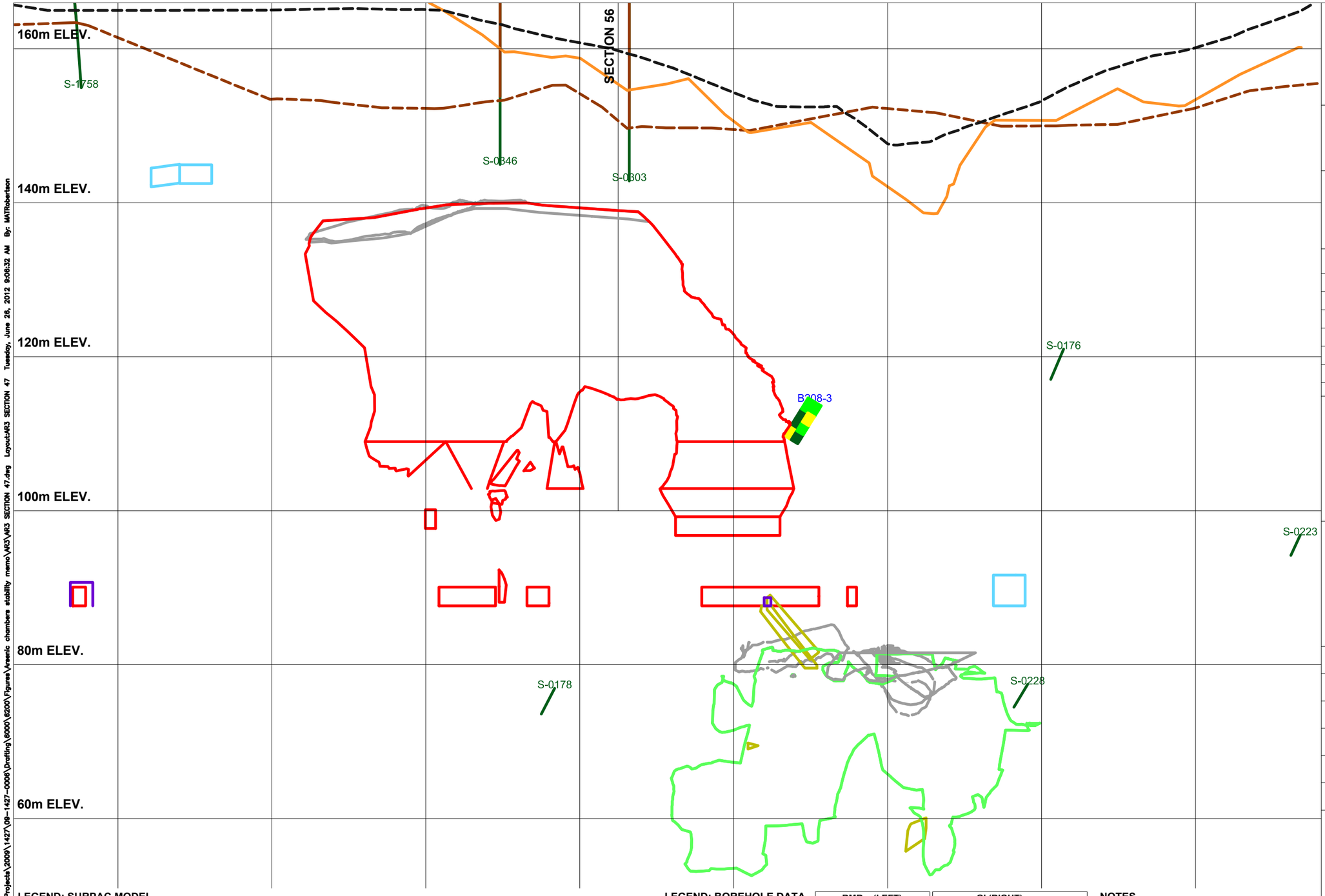
Drawing title/Titre du dessin

ARSENIC CHAMBER B234

AR3 SECTION 46

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-46 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 5 m OF SECTION

-SECTION FACES 280°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 47

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-47 OF 90	0

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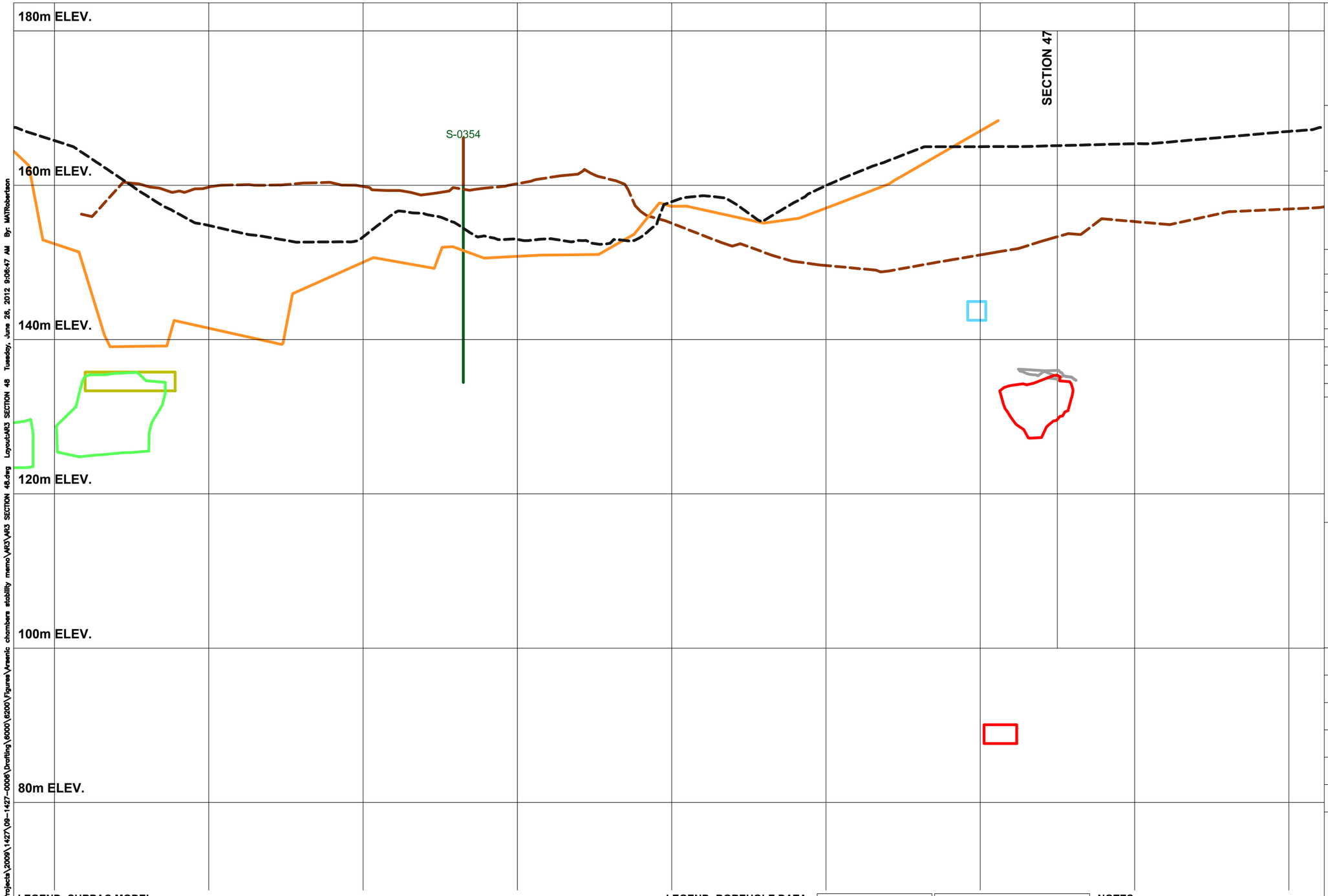
A0 – PWGSC – ANSI B–L1 – 11X17



Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR3\AR3 SECTION 48.dwg Layout:AR3 SECTION 48 Tuesday, June 26, 2012 9:06:47 AM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

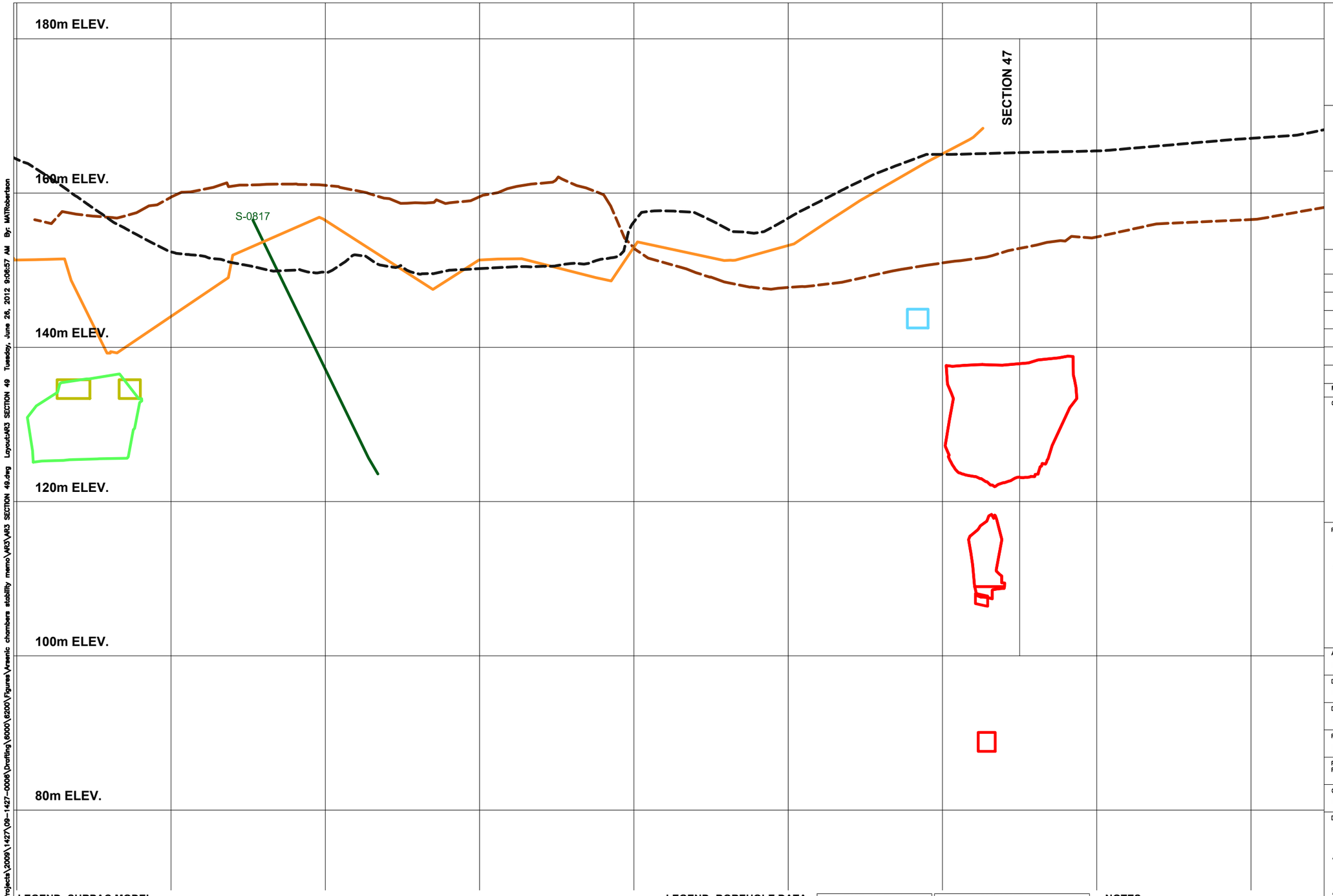
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 48

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-48 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05
Revision/ Revision	Description/Description	Date/Date

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

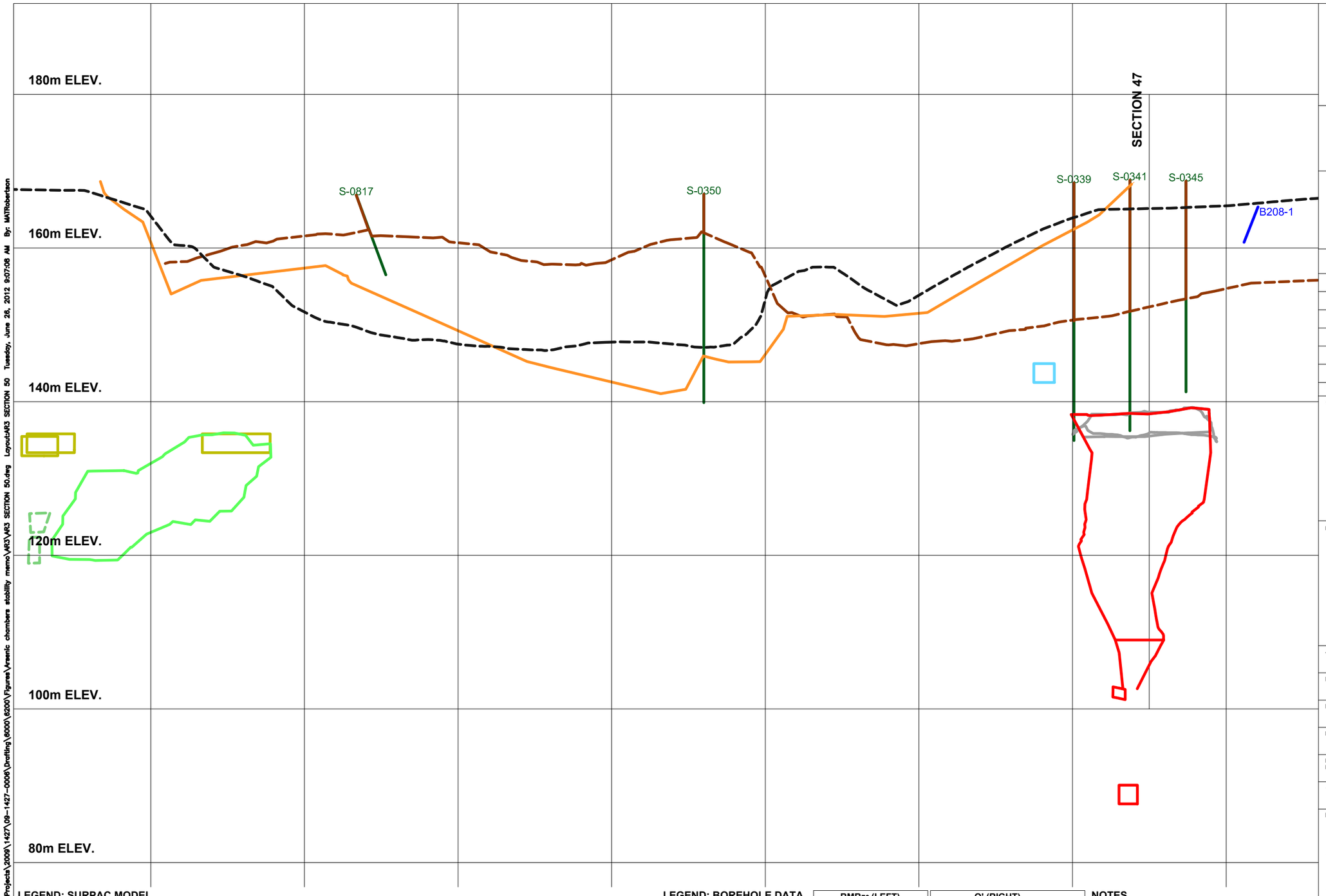
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 49

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-49 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

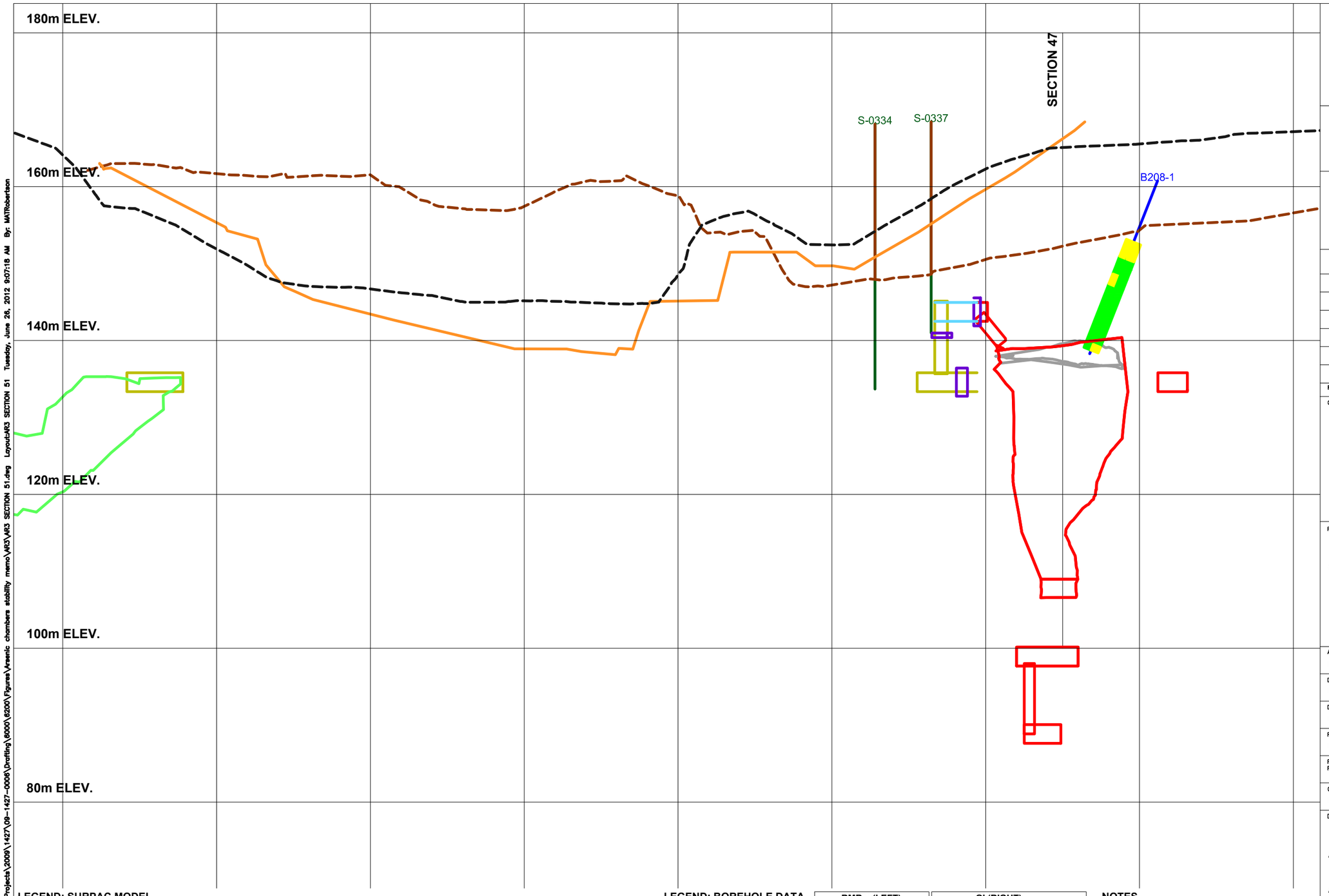
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 50

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-50 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

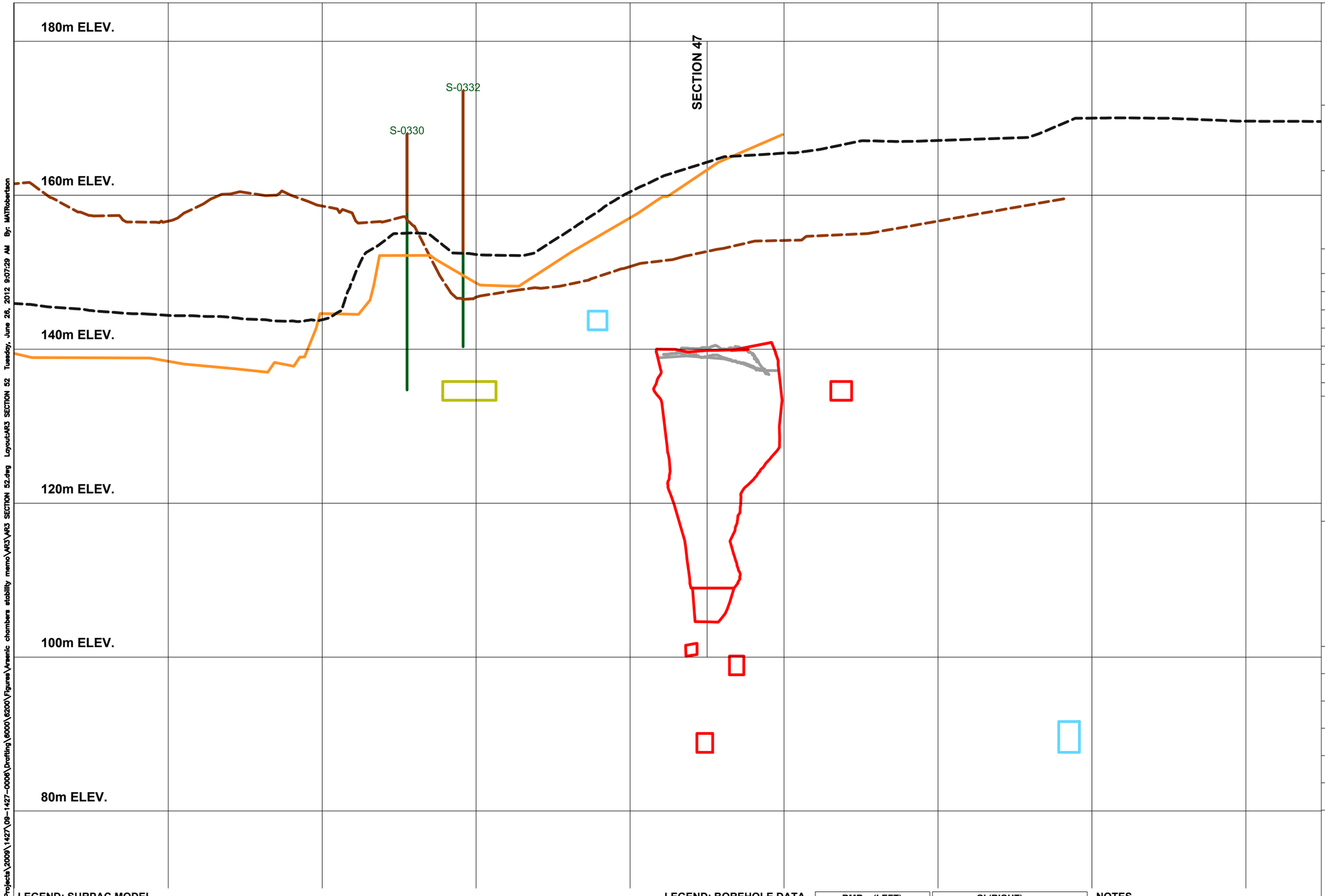
Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 51

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-51 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



Drawing File: N:\ur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR3\AR3 SECTION 52.dwg LayoutAR3 SECTION 52 Tuesday, June 26, 2012 9:07:29 AM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

SCALE 1:500 (METRIC)

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

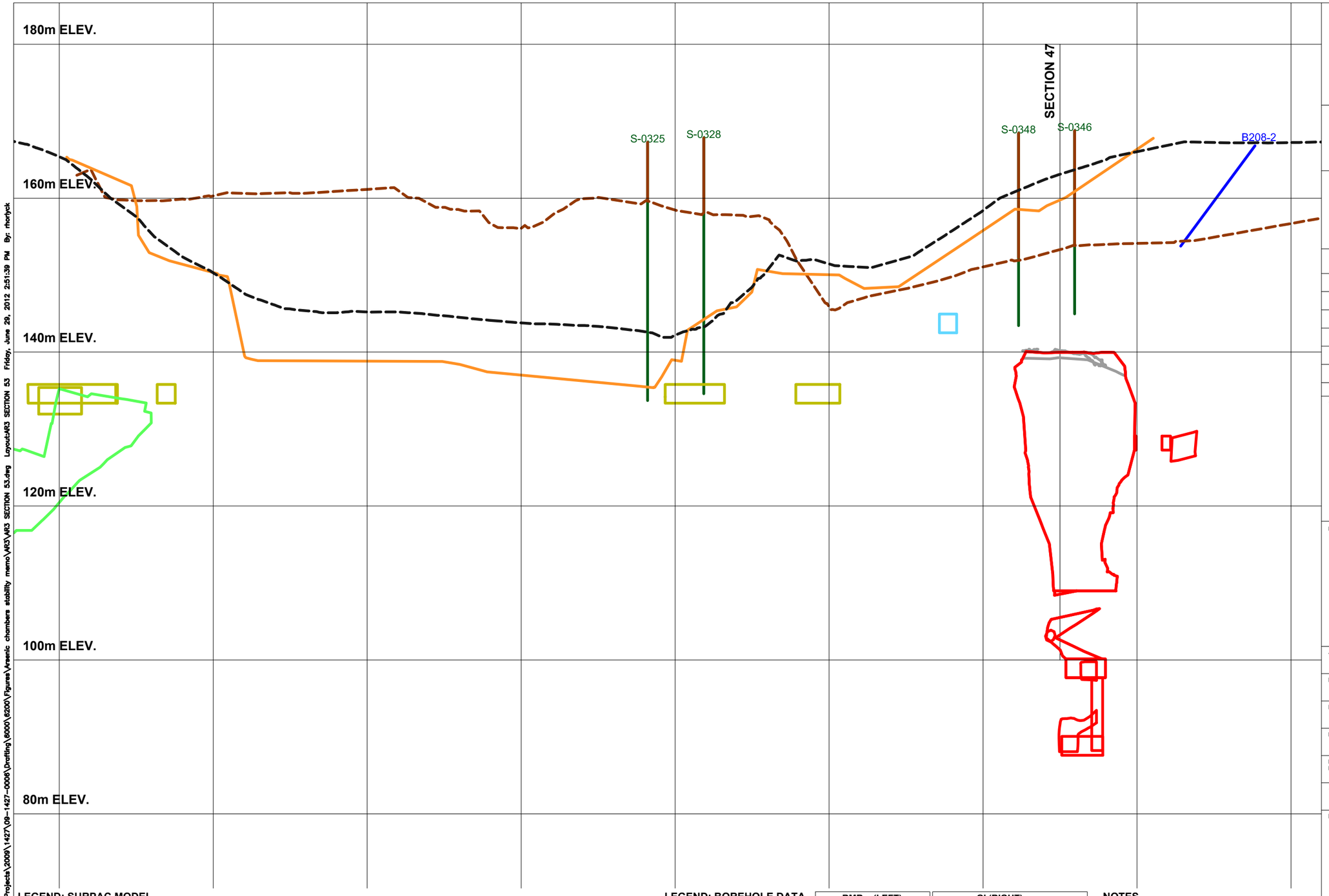
Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 52

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-52 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

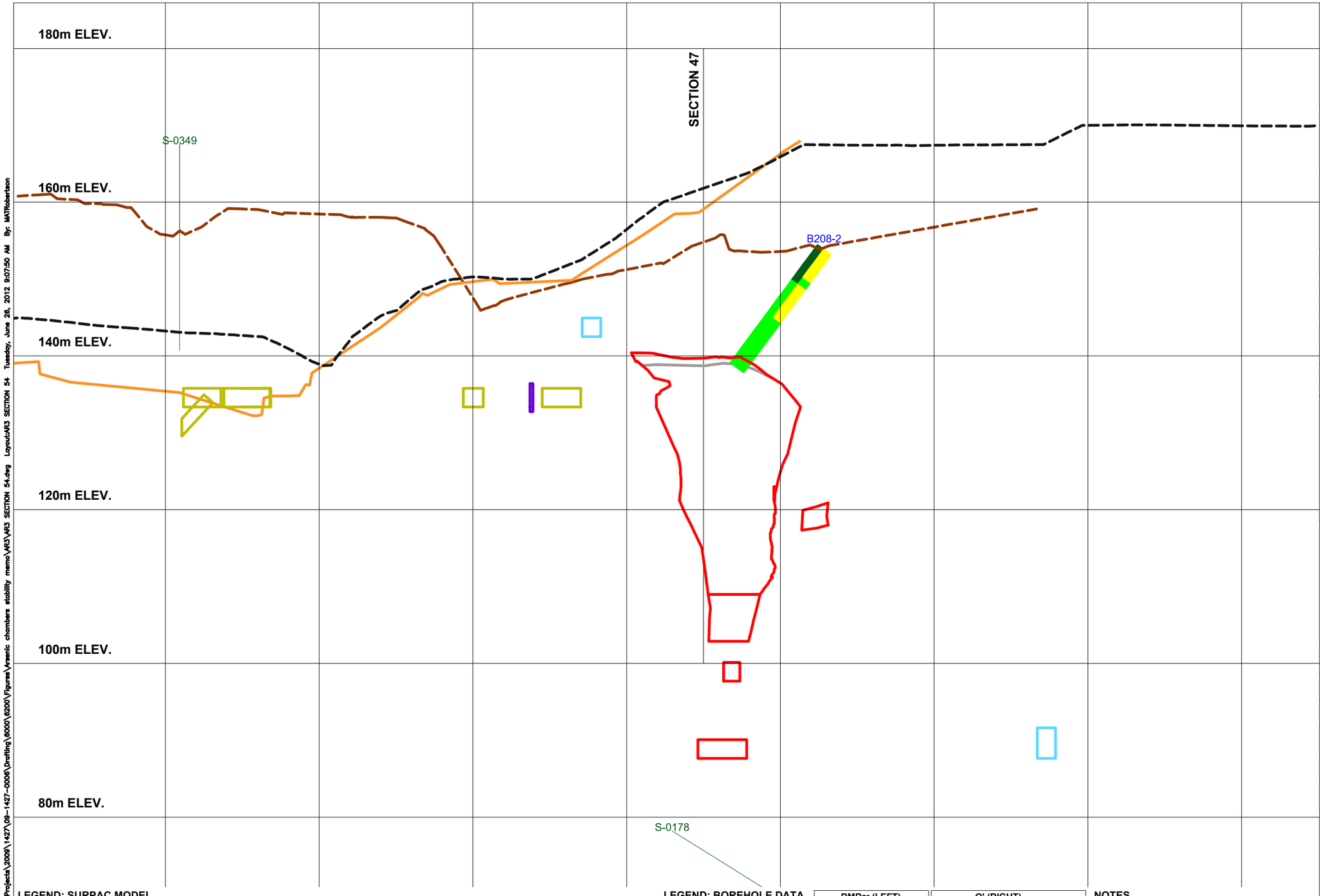
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 53

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-53 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

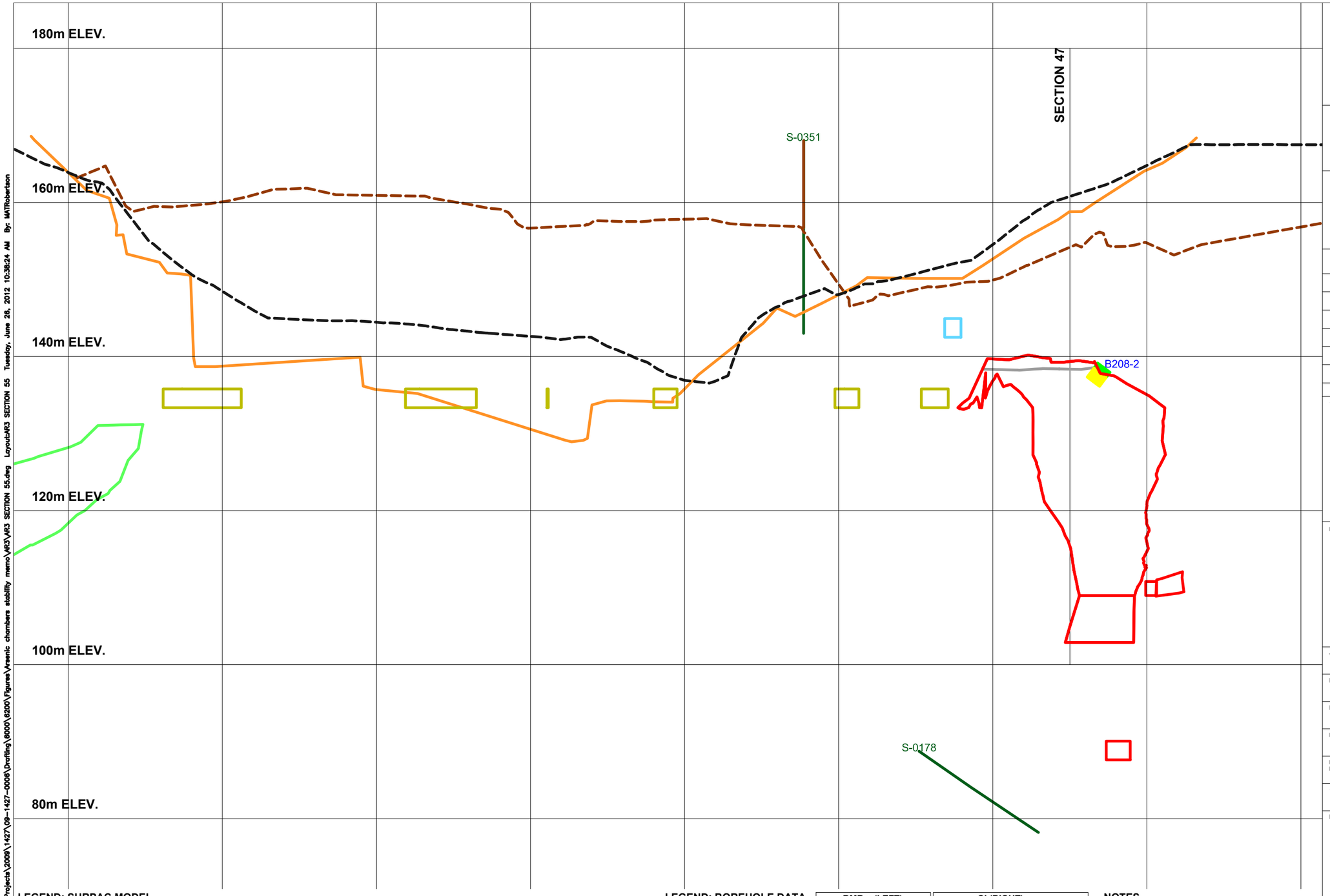
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 54

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-54 OF 90	0



Drawing File: N:\our-graphics\Projects\2009\1427\09-1427-0006\Drafting\8000\6200\Figures\Arsenic chambers stability memo\AR3\AR3 SECTION 55.dwg Layout:AR3 SECTION 55 Tuesday, June 26, 2012 10:38:24 AM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05
Revision/ Revision	Description/Description	Date/Date

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

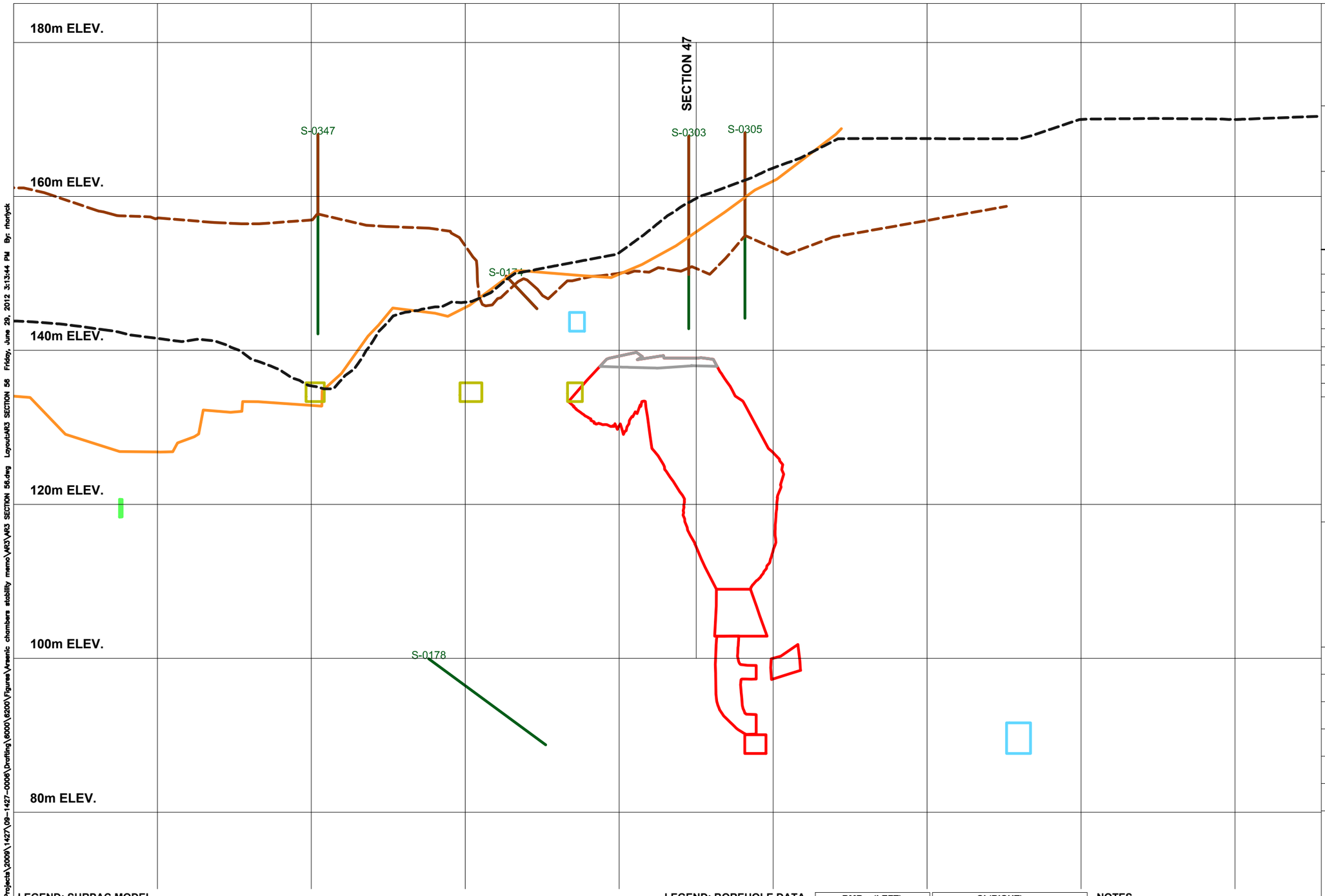
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 55

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-55 OF 90	0



Drawing File: N:\our-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR3\AR3 SECTION 56.dwg Layout:AR3 SECTION 56 Friday, June 29, 2012 3:13:44 PM By: rhorlyck

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

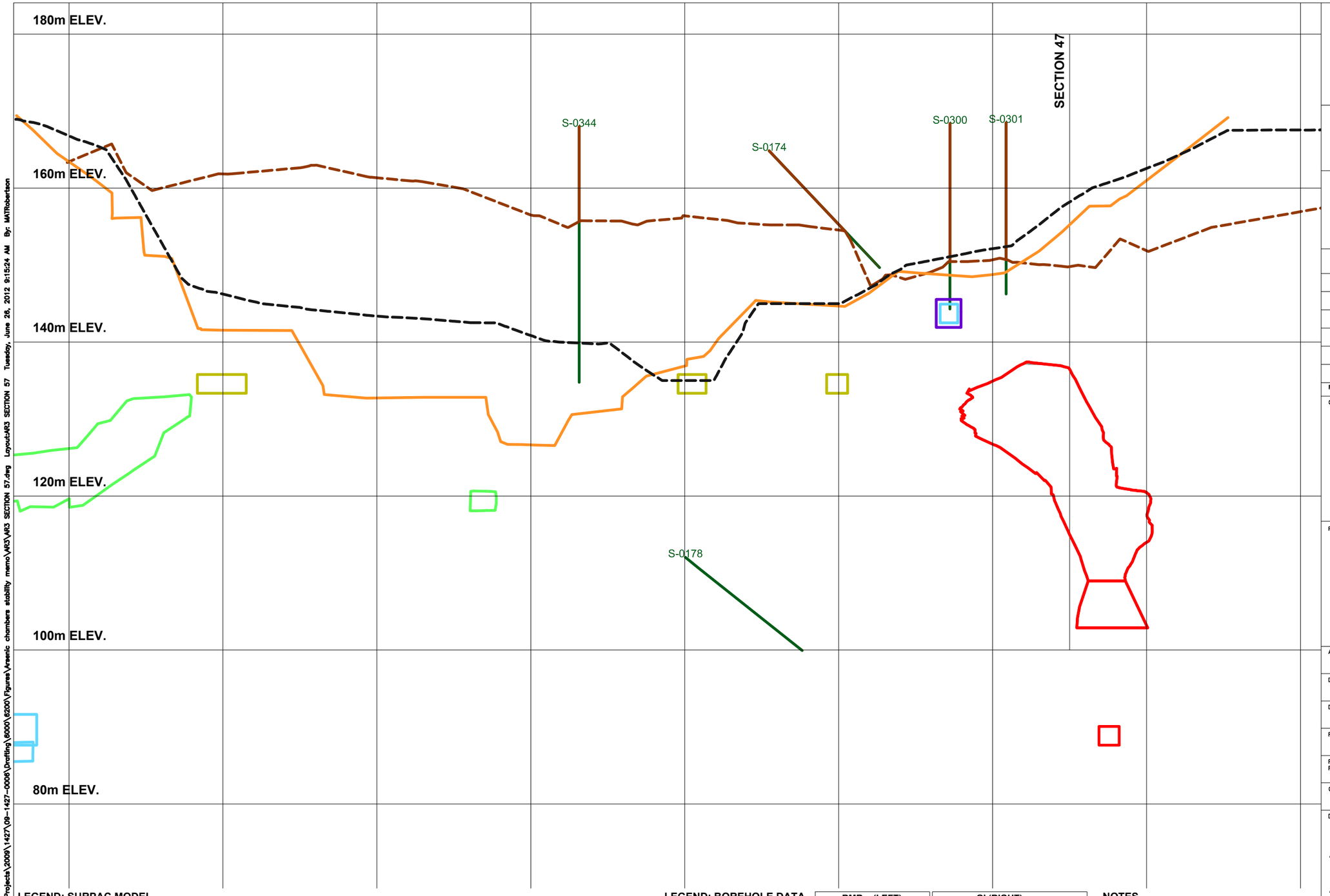
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 56

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-56 OF 90	0



Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\8000\8200\Figures\Arsenic chambers stability memo\AR3\AR3 SECTION 57.dwg Layout:AR3 SECTION 57 Tuesday, June 26, 2012 9:15:24 AM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

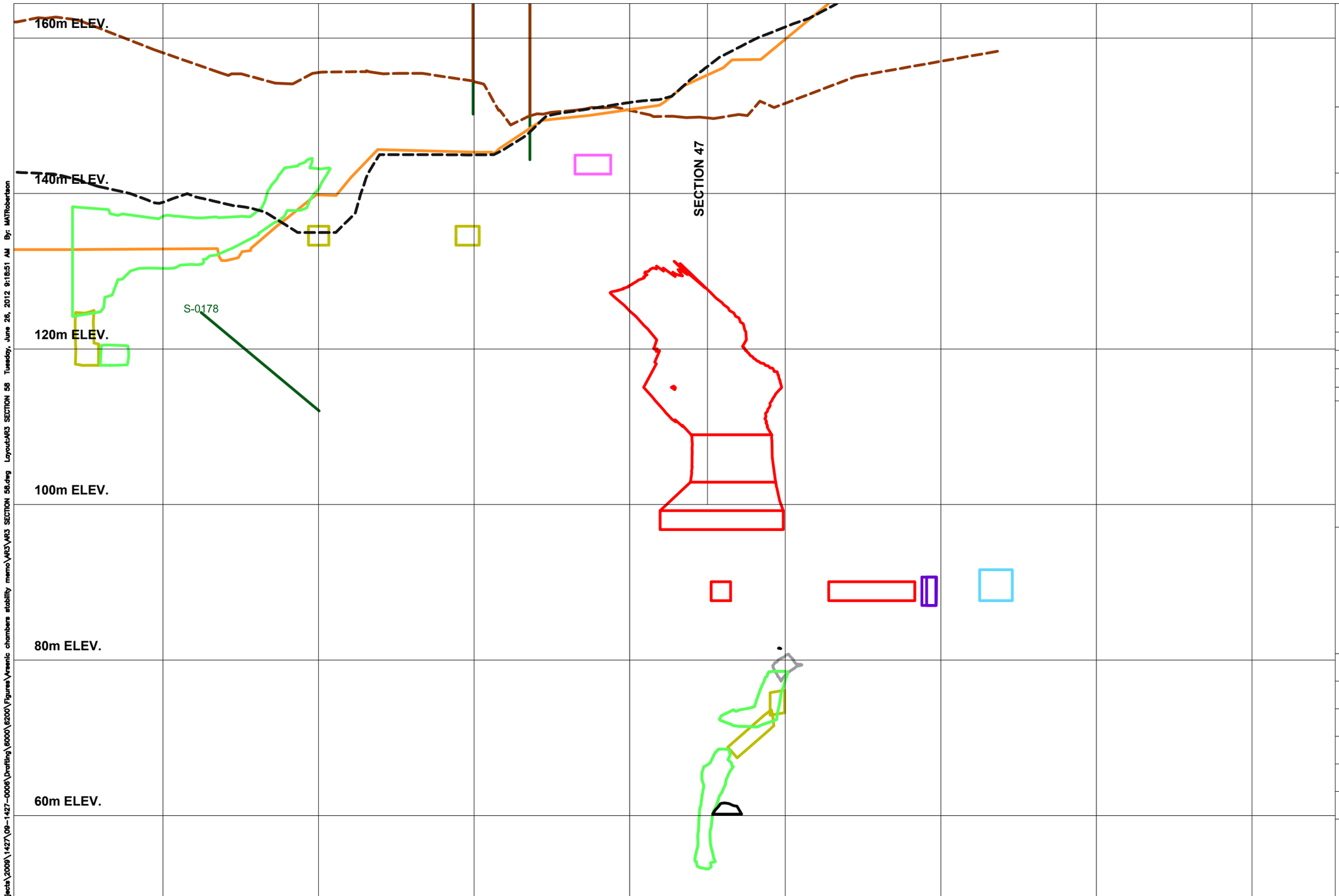
Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 57

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-57 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
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80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

SCALE 1:500 (METRIC)

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

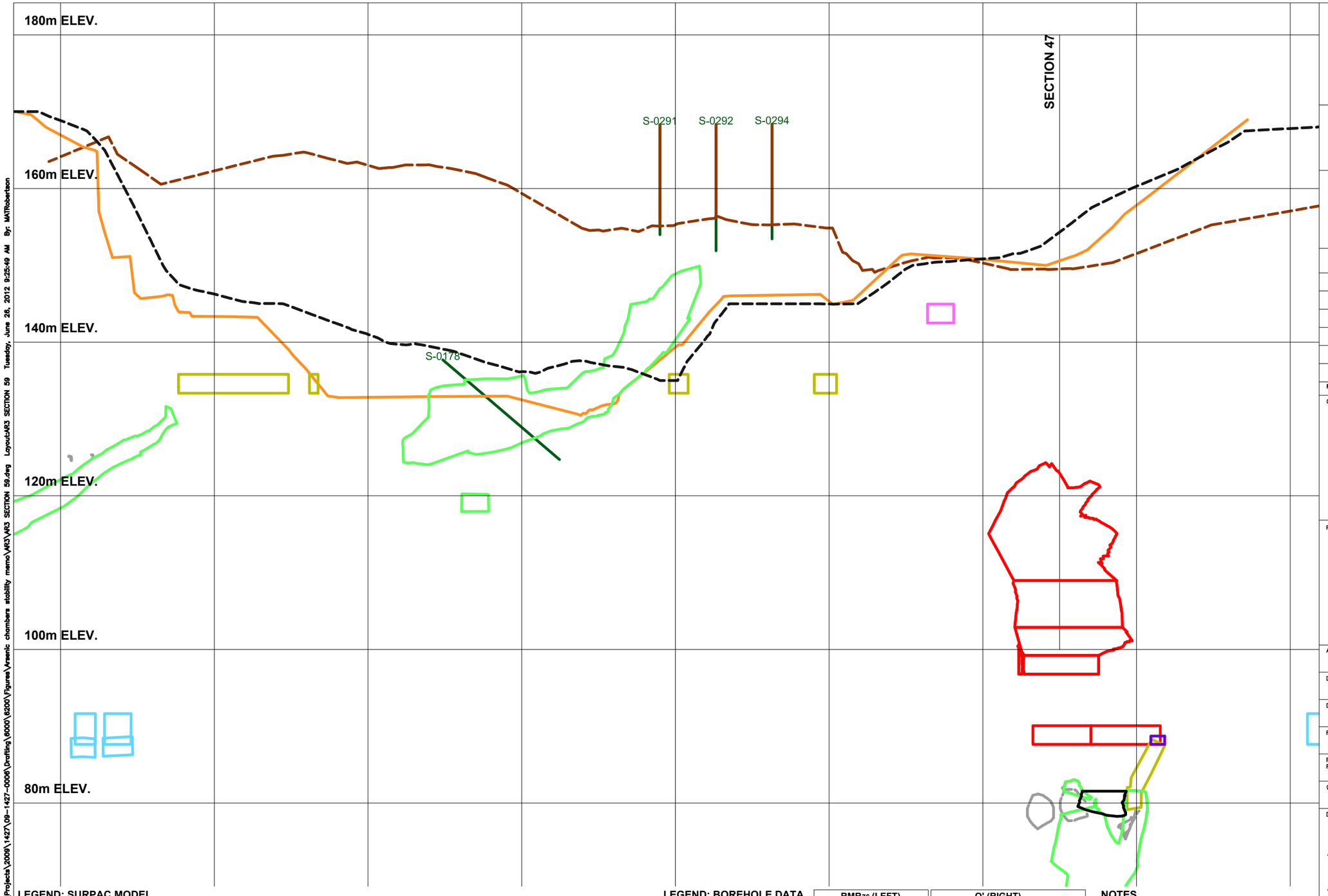
Client/client: **PWGSC**

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR2 SECTION 58

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-58 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

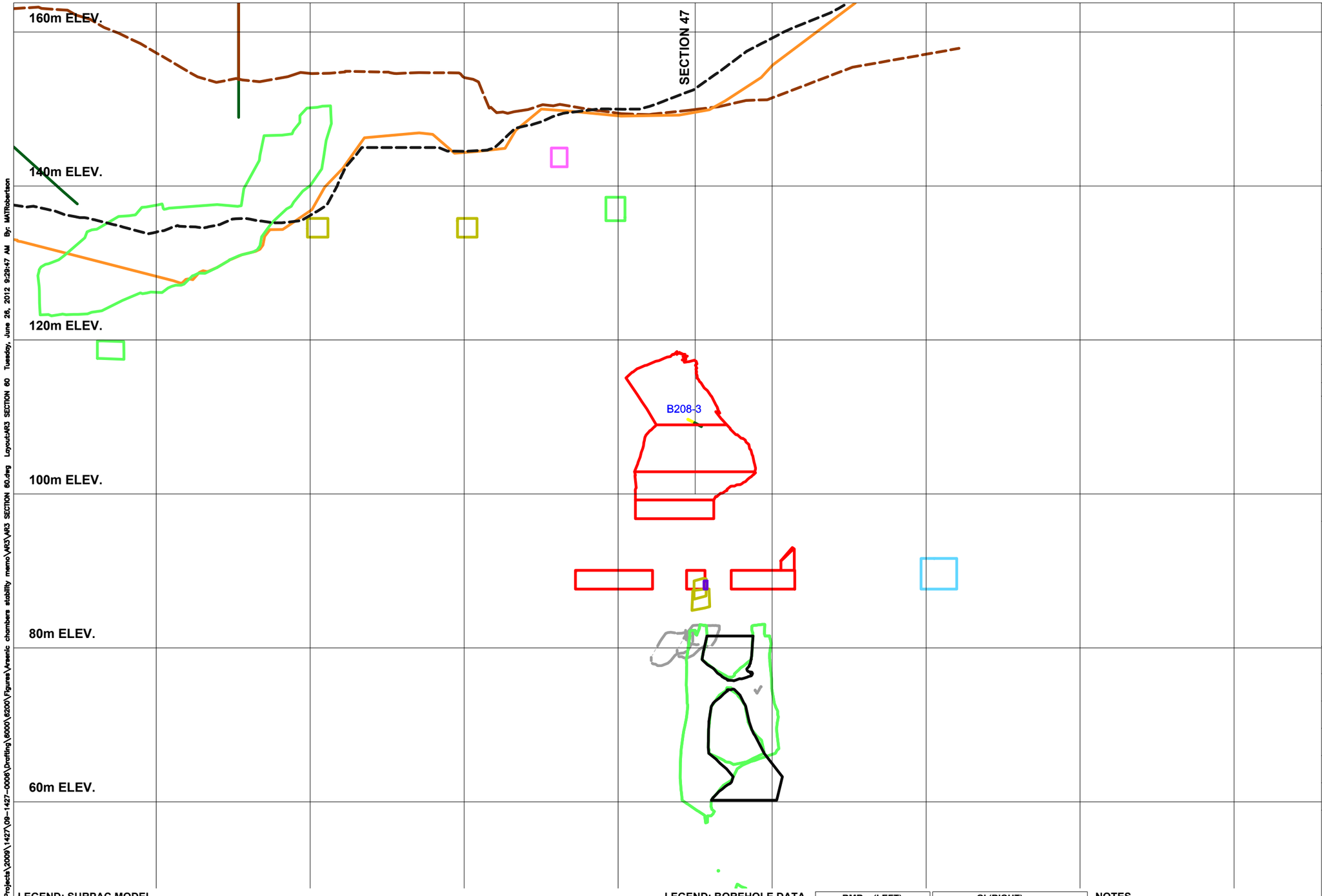
Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 59

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-59 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

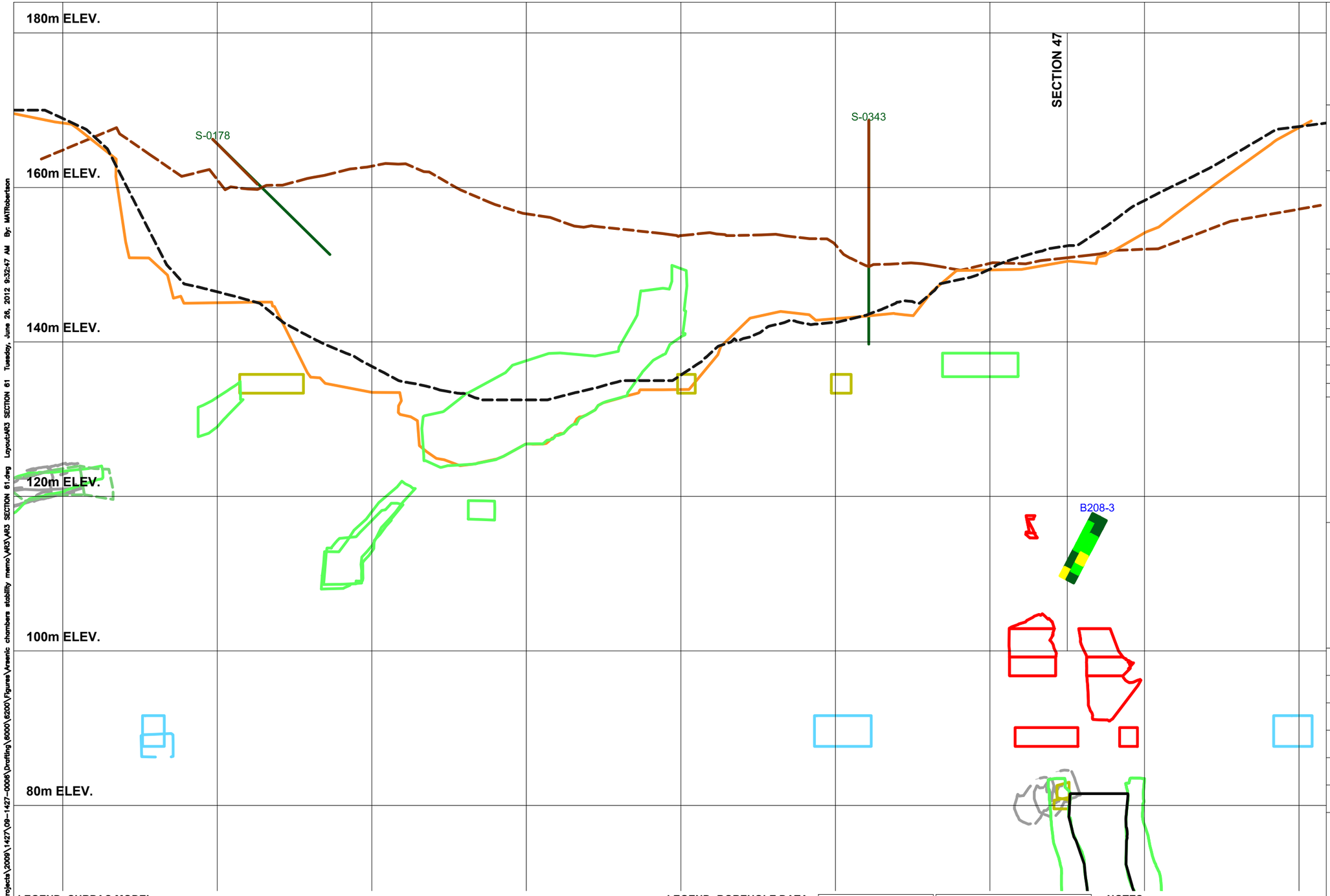
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 60

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-60 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

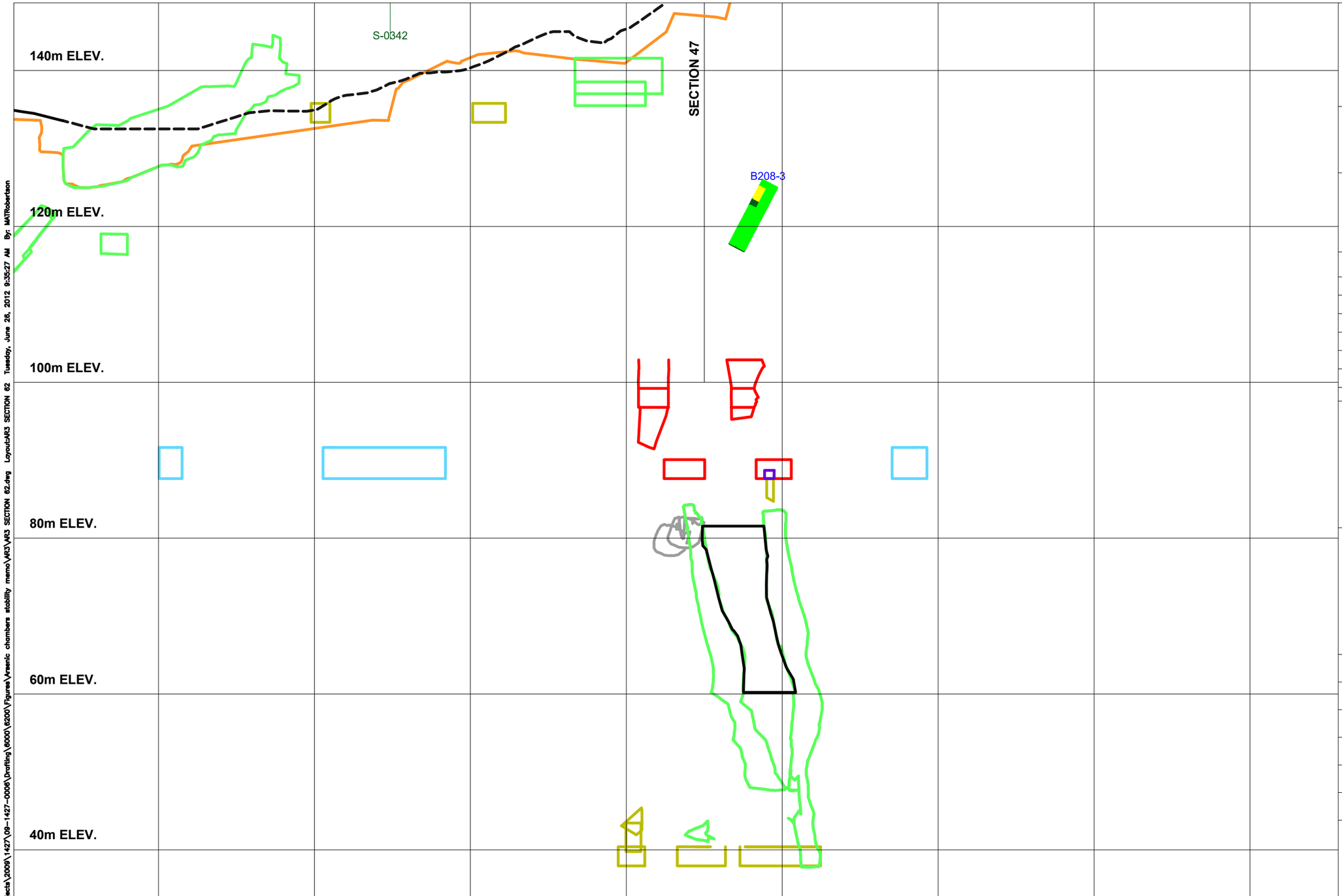
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 61

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-61 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

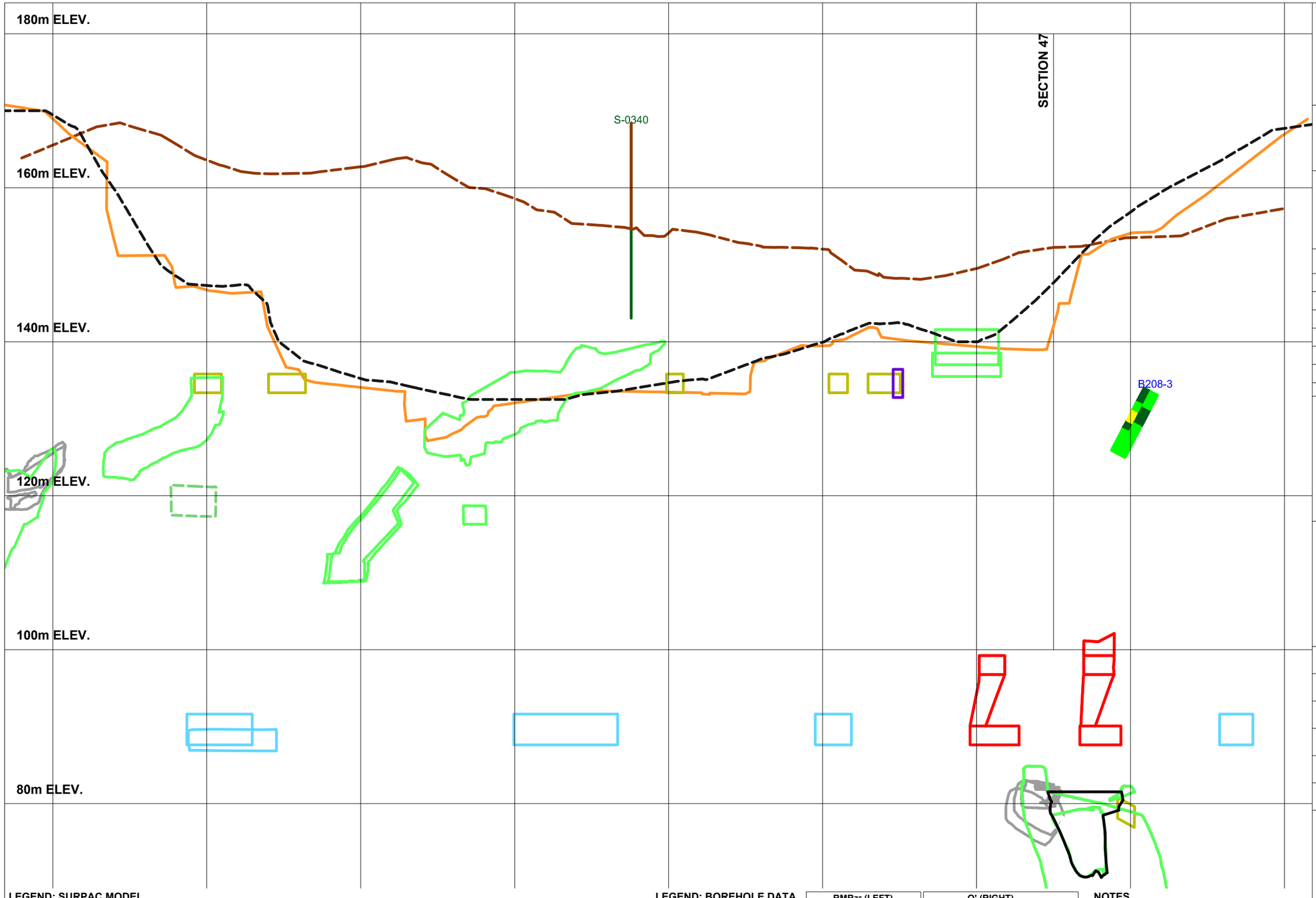
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 62

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-62 OF 90	0



Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND TASK NO. 13

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 63

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK
20 - 40 : POOR ROCK
40 - 60 : FAIR ROCK
60 - 80 : GOOD ROCK
80 - 100 : VERY GOOD ROCK

Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
1 - 4 : POOR ROCK
4 - 10 : FAIR ROCK
10 - 40 : GOOD ROCK
40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

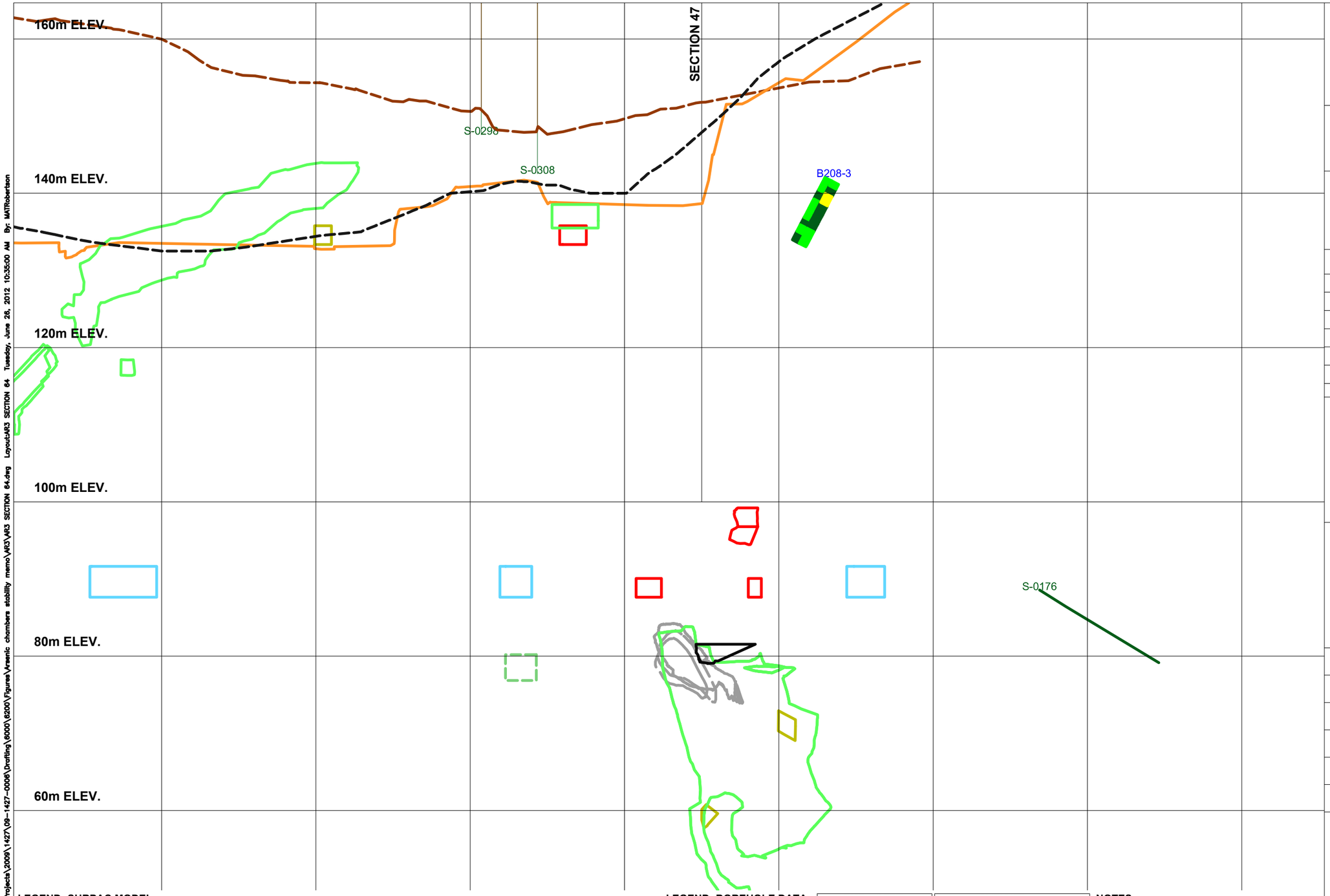
-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-63 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

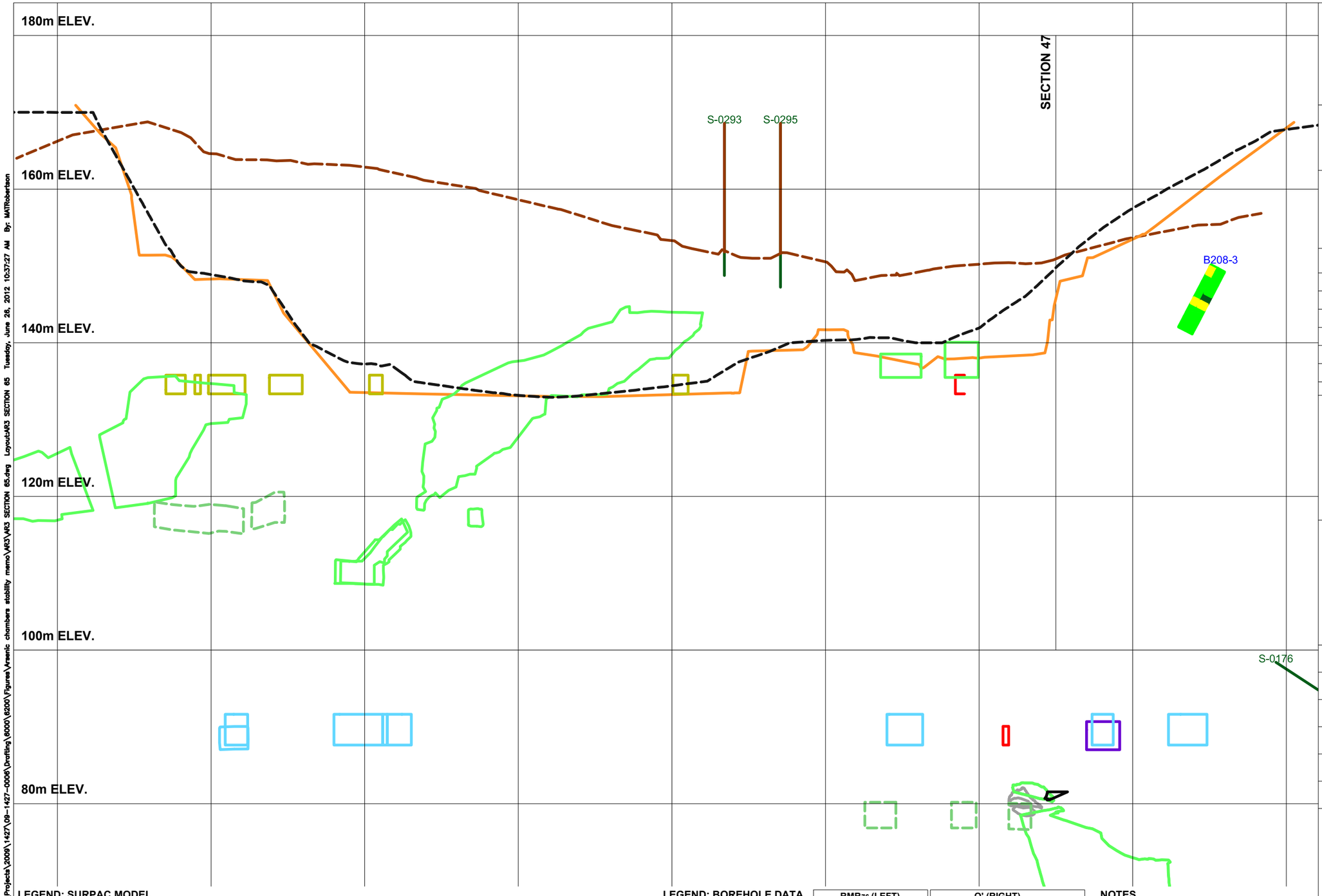
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 64

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-64 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 10°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

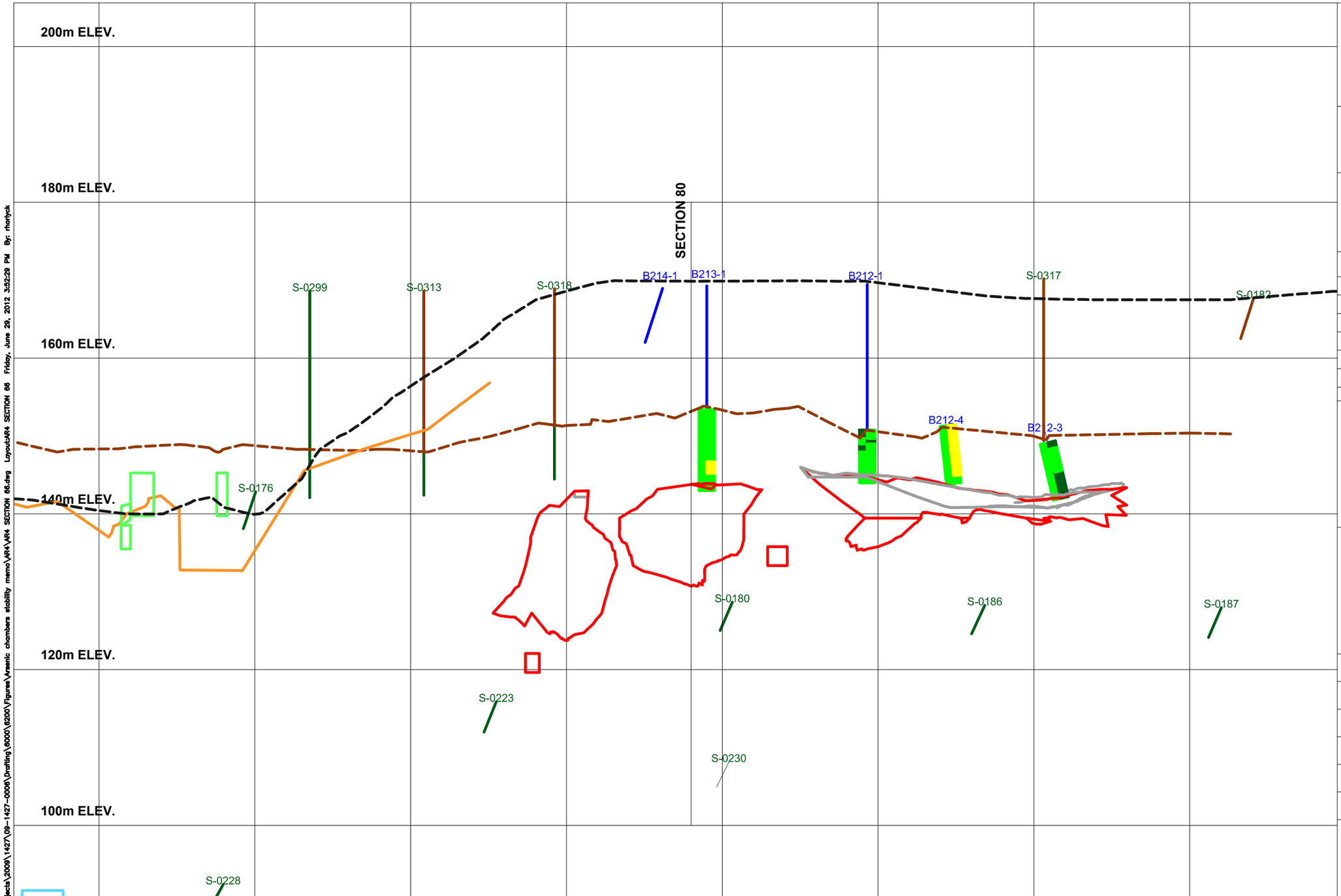
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B208

AR3 SECTION 65

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-65 OF 90	0



Drawing File: H:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 66.dwg LayoutAR4 SECTION 66 Friday, June 29, 2012 3:52:29 PM By: rhortyck

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
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RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 281°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

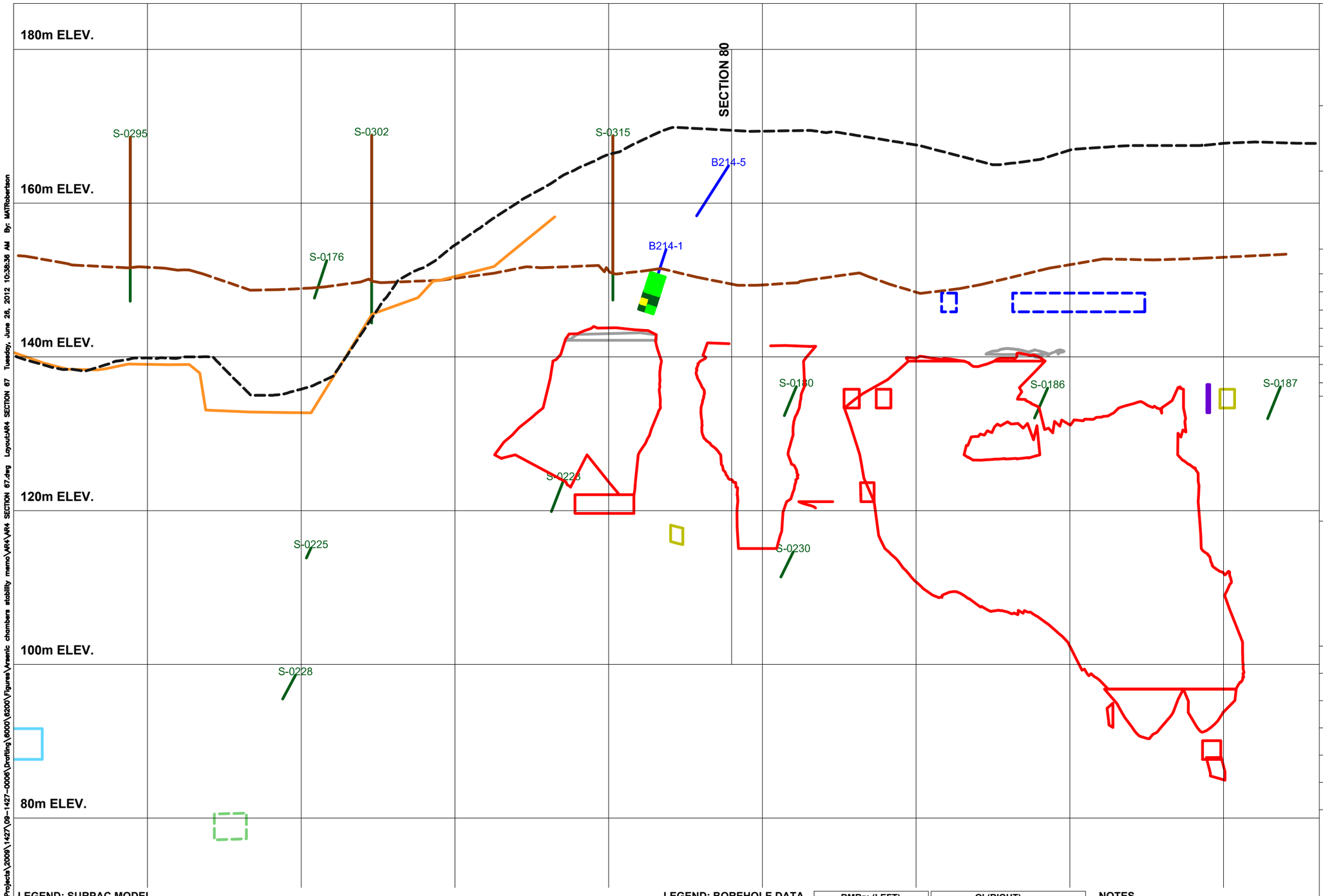
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 66

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-66 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 281°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

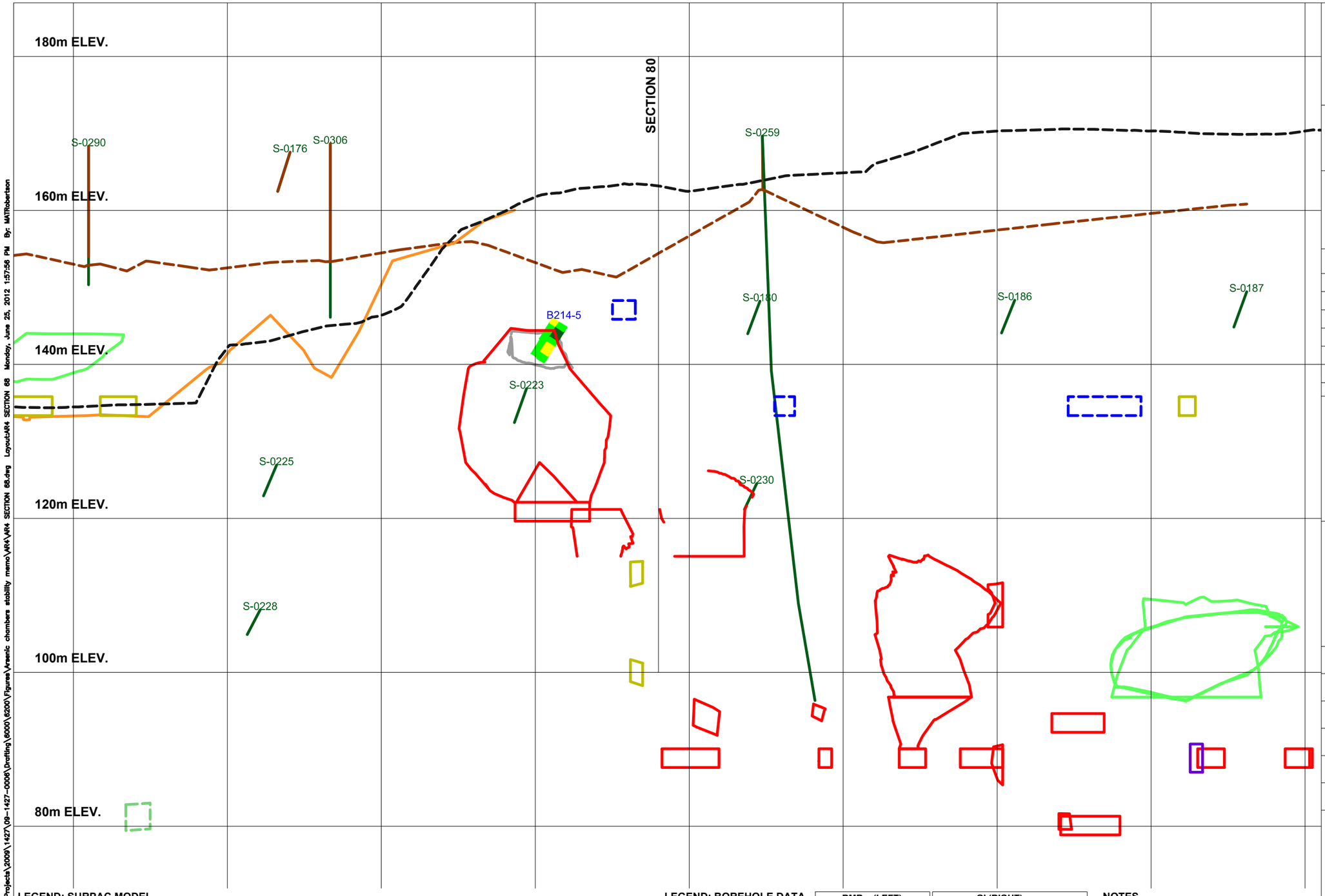
ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 67

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-67 OF 90	0

Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\8200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 67.dwg LayoutAR4 SECTION 67 Tuesday, June 26, 2012 10:38:36 AM By: MATRobertson

AO – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 281°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

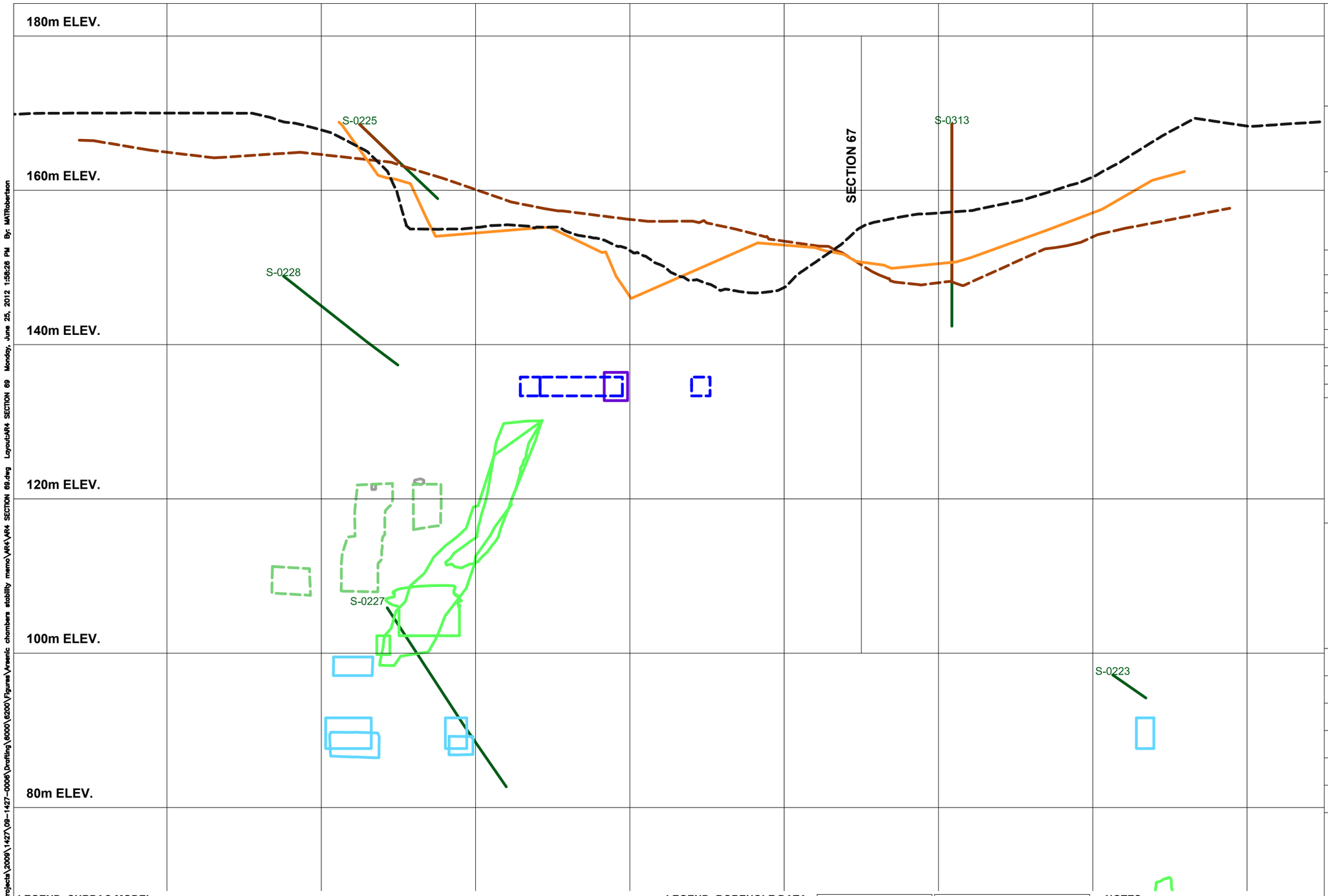
Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 68

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-68 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
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- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

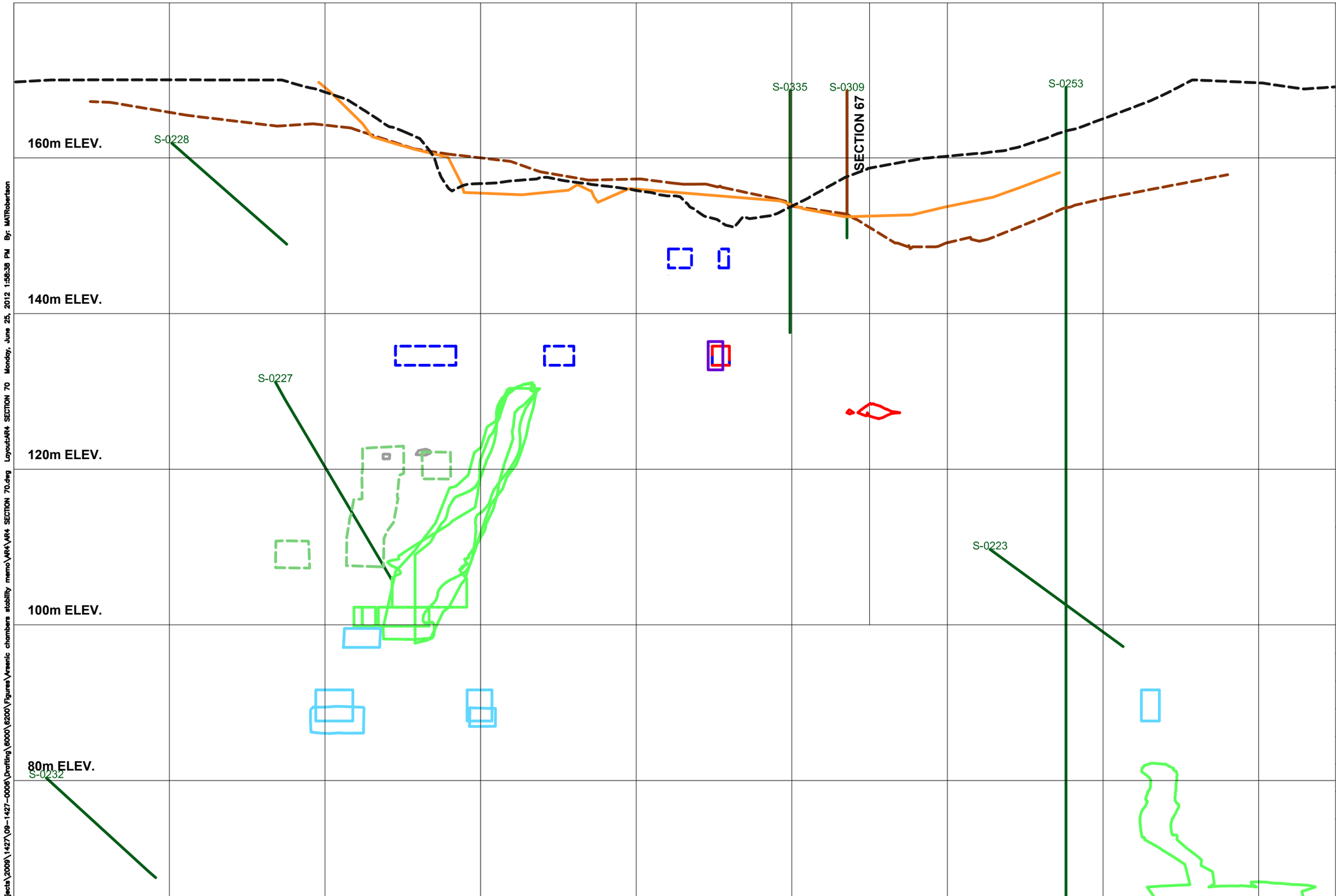
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 69

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-69 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 70

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-70 OF 90	0

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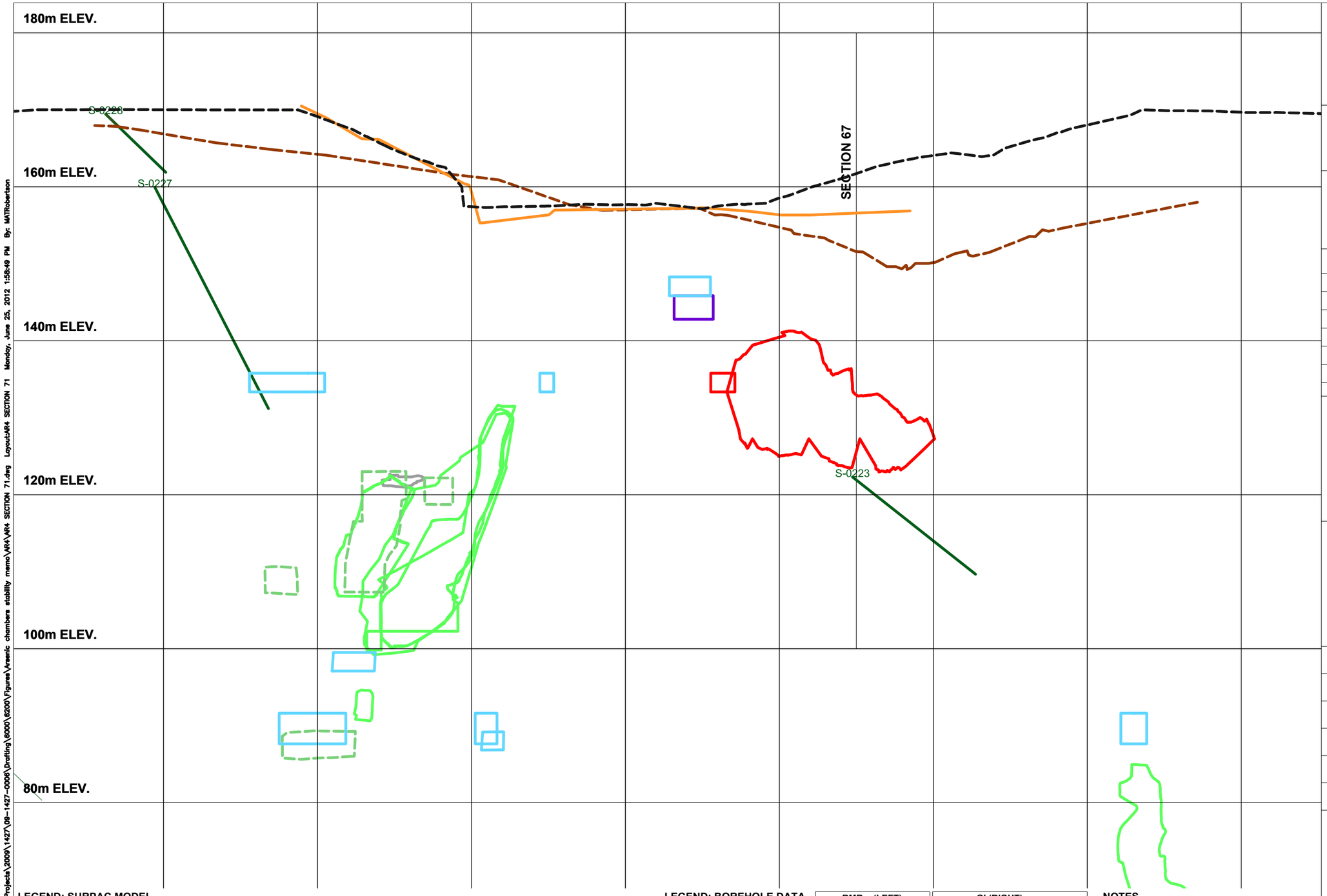
A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

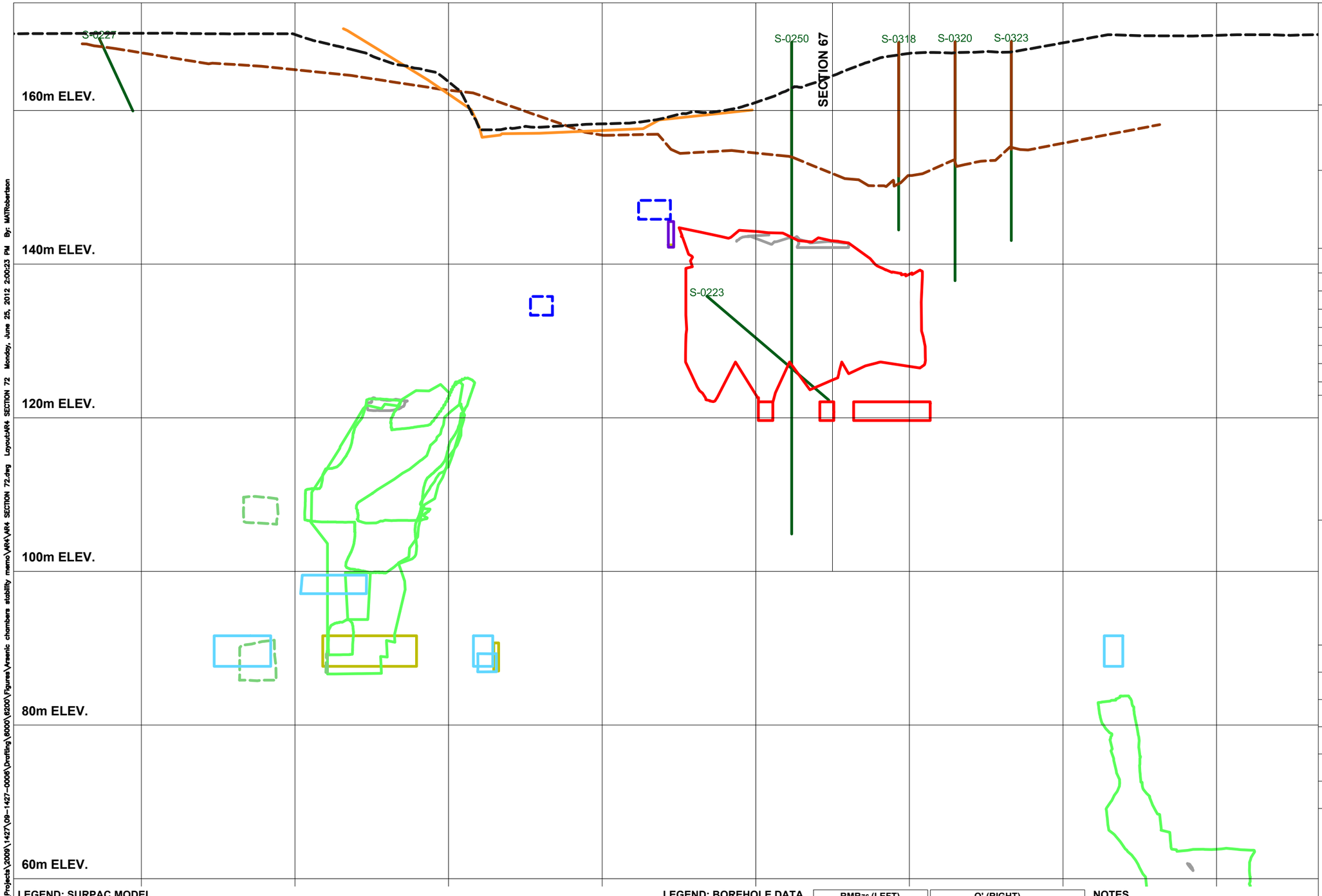
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 71

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-71 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

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-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

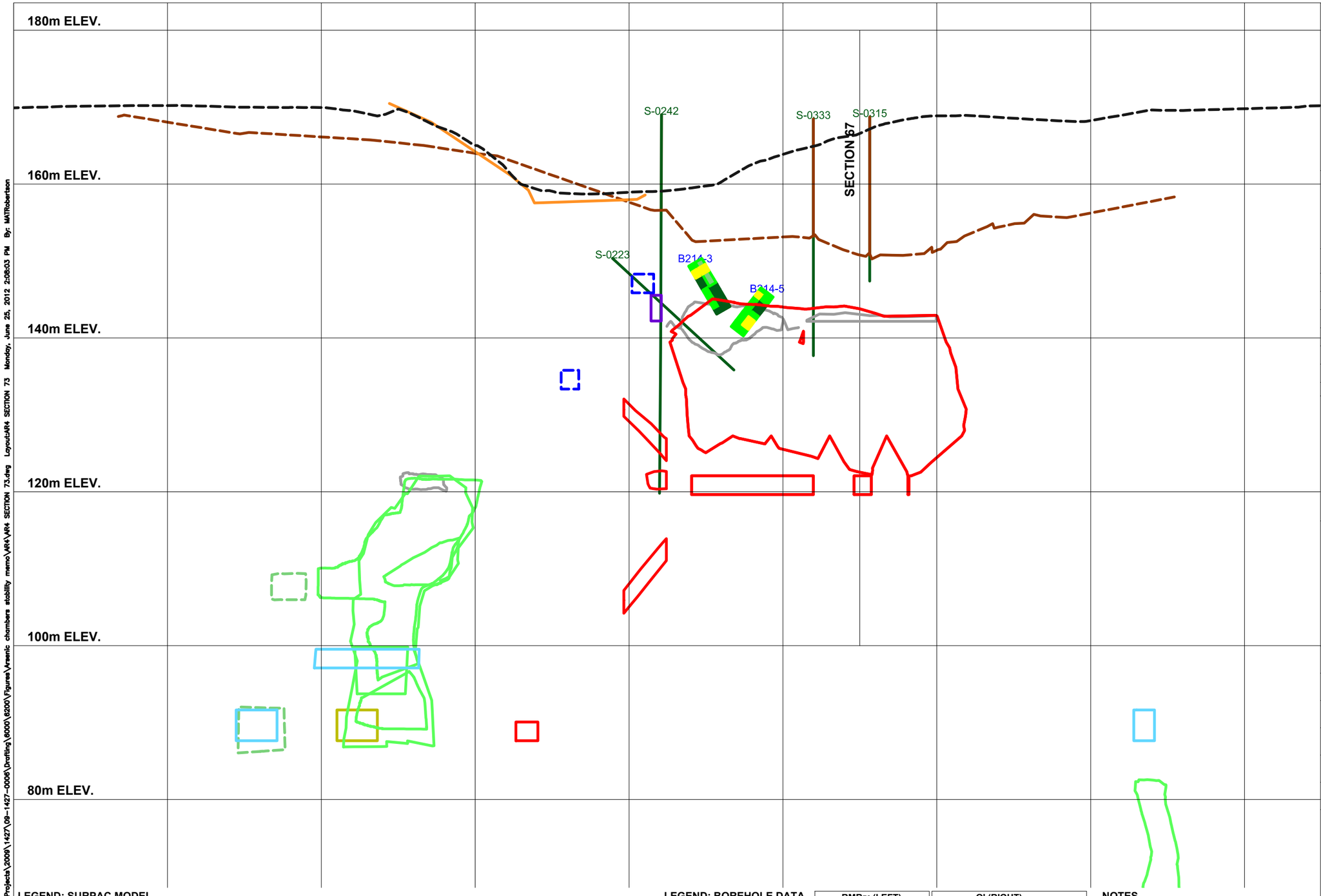
AR4 SECTION 72

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-72 OF 90	0

Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Vrsenic chambers stability memo\AR4\AR4 SECTION 72.dwg Layout:AR4 SECTION 72 Monday, June 25, 2012 2:00:23 PM By: MATRobertson

A0 - PWGSC - ANSI B-L1 - 11X17

AR4 SECTION 72



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
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RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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-SECTION FACES 11°

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SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

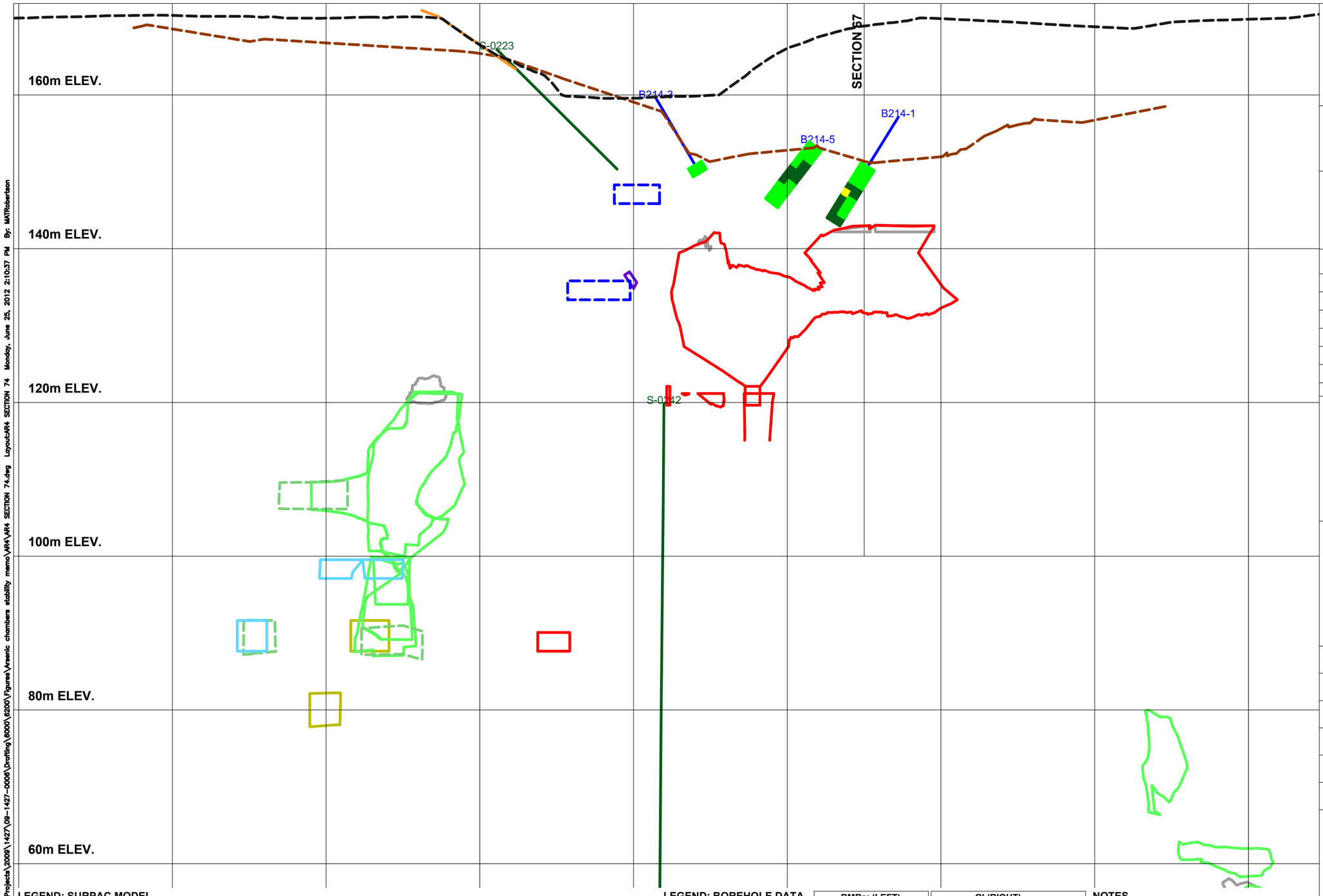
Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 73

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-73 OF 90	0

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

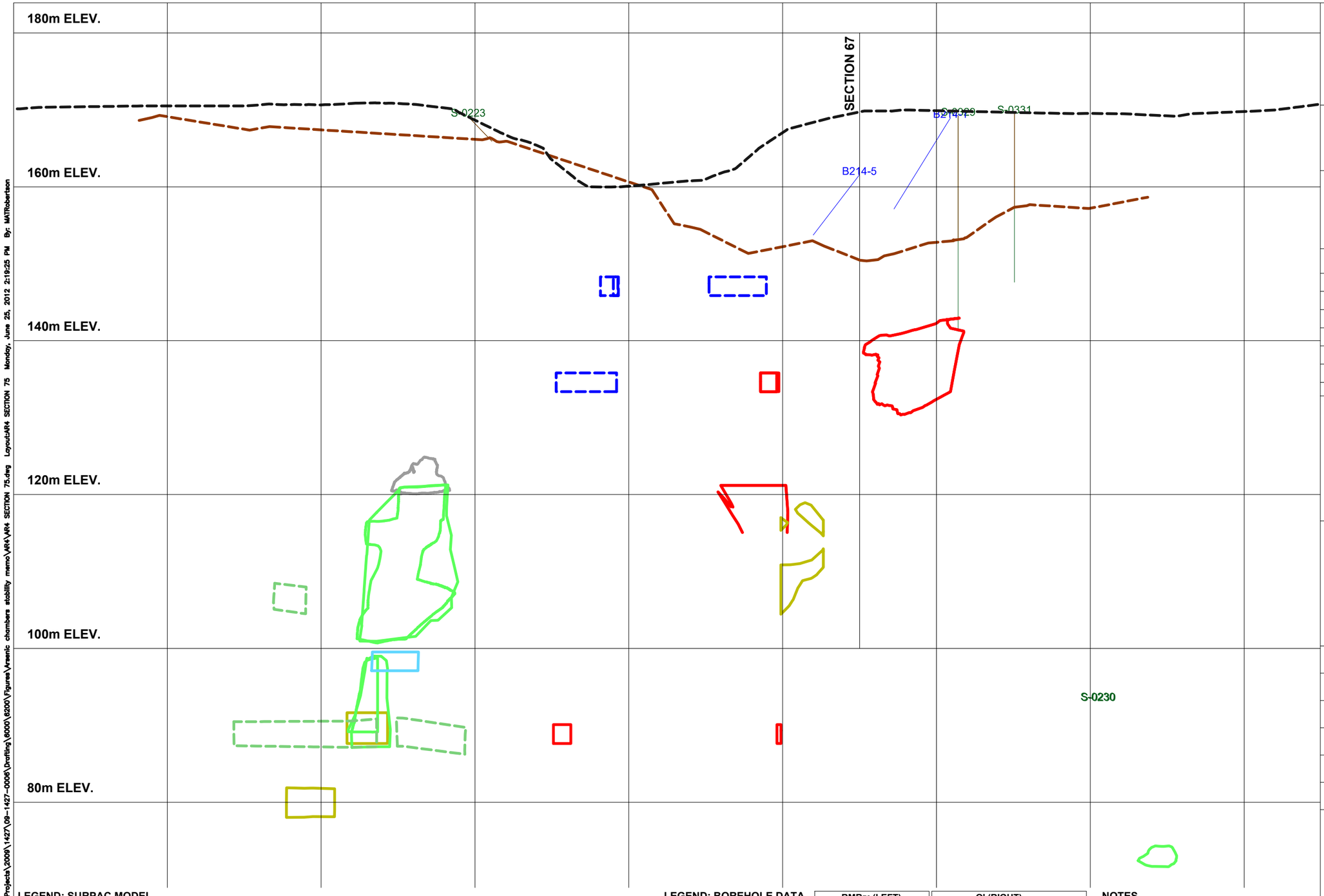
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 74

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-74 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

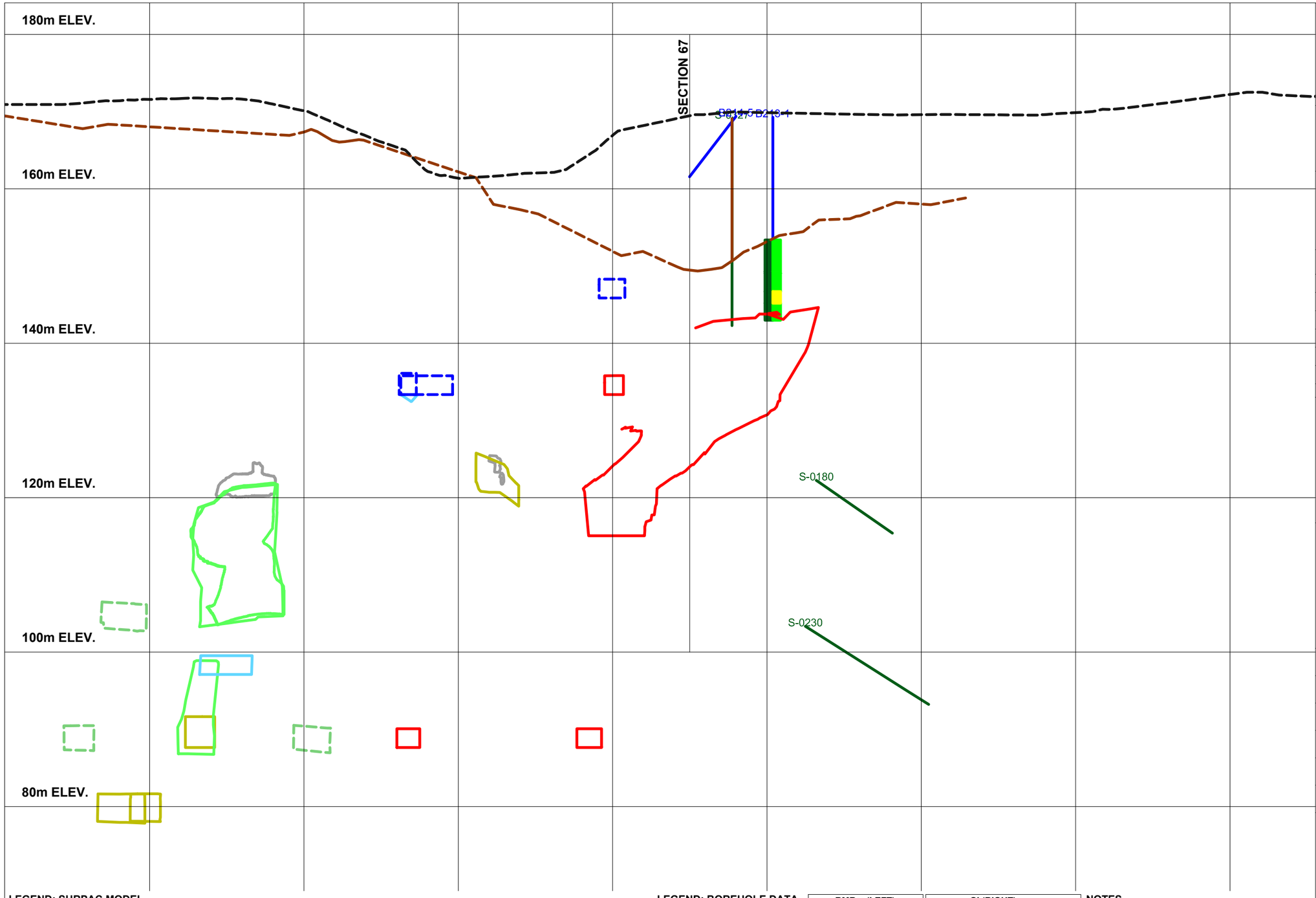
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 75

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-75 OF 90	0



Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK
Designed by/Concept par: MP
Drawn by/Dessine par: MP
PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC:
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 76

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

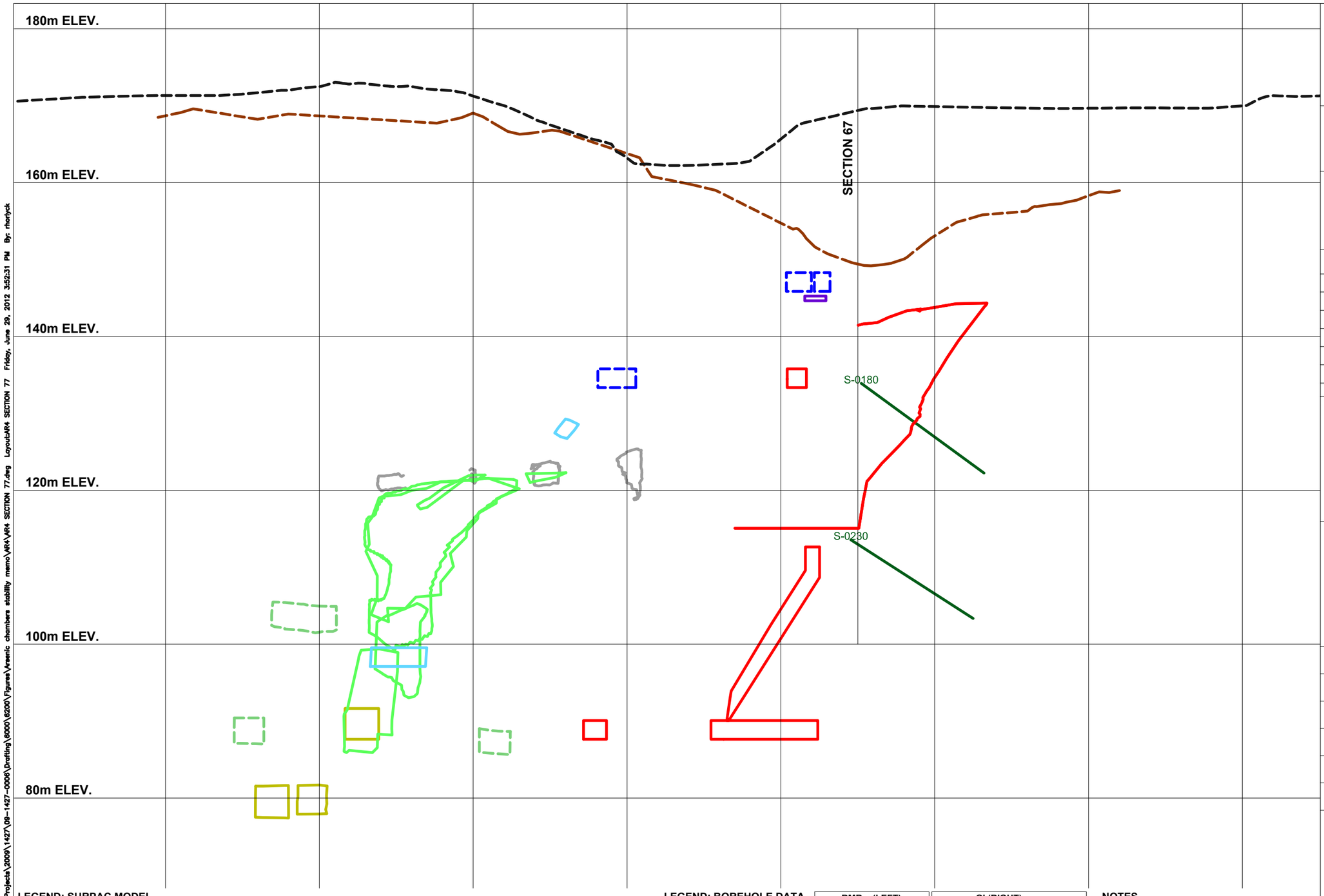
-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-76 OF 90	0

AO – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
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- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

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-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

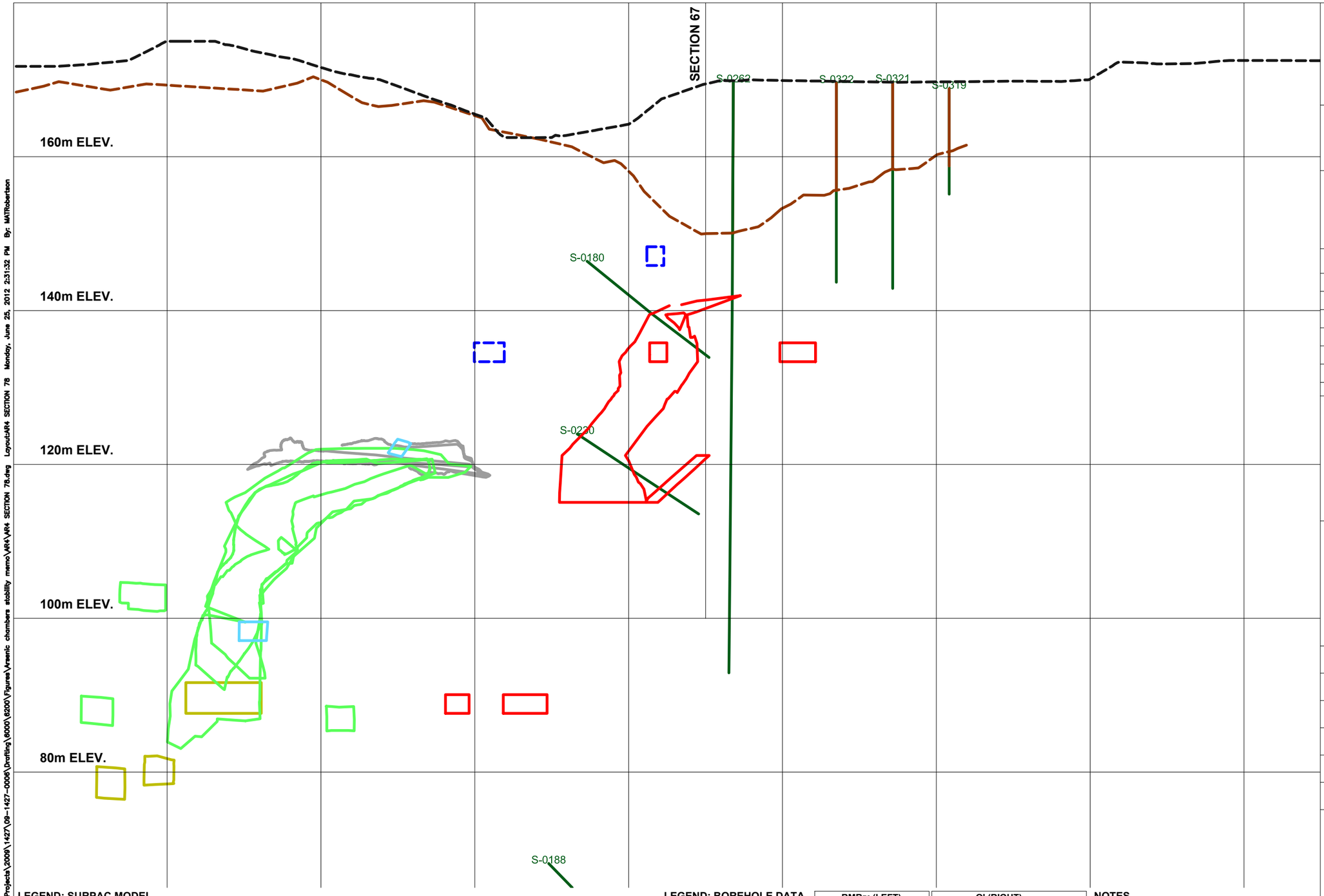
Client/client: **PWGSC**

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 77

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-77 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

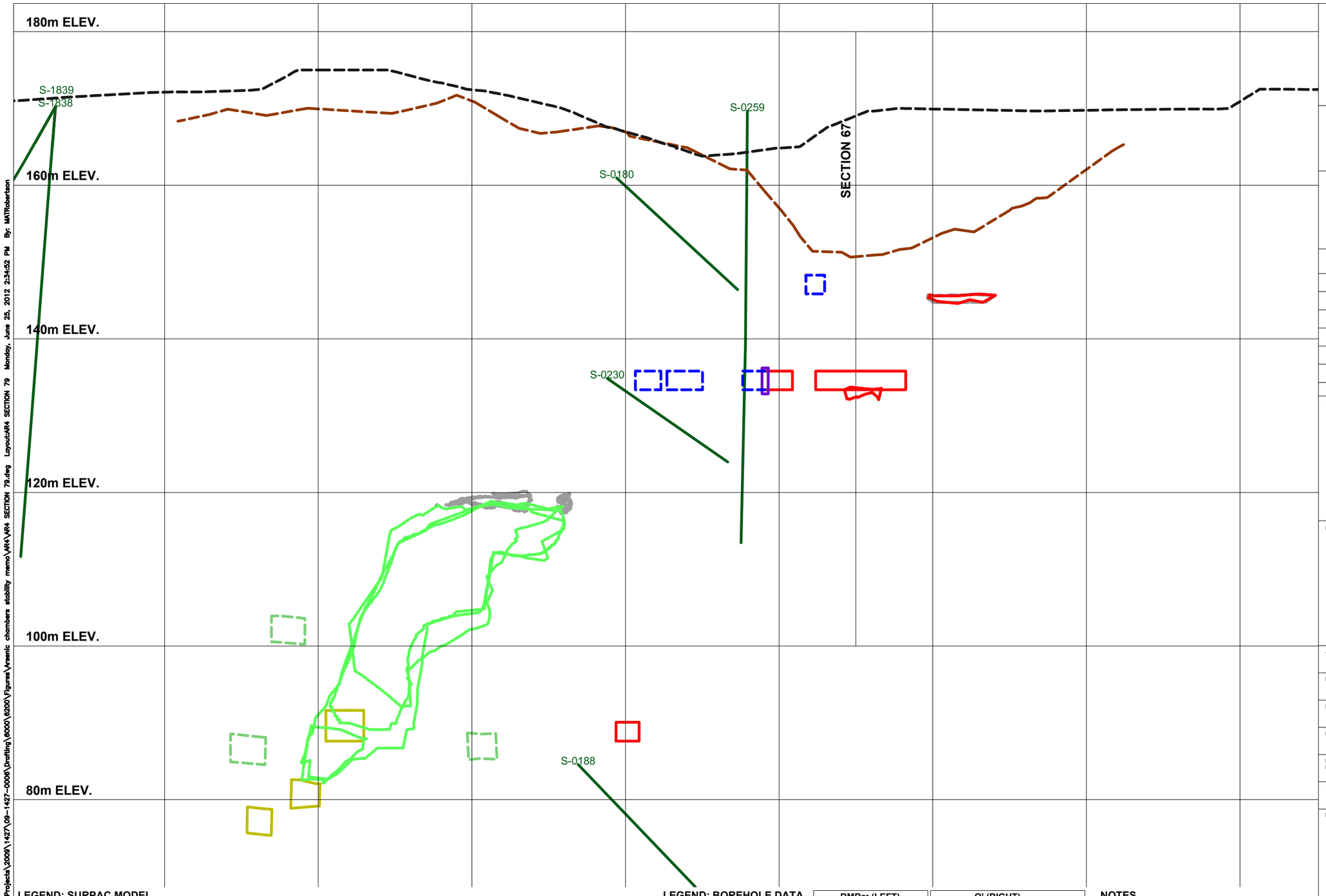
ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 78

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-78 OF 90	0

Drawing File: N:\ur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 78.dwg LayoutAR4 SECTION 78 Monday, June 25, 2012 2:31:32 PM By: MATRobertson

A0 - PWGSC - ANSI B-L1 - 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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NOTES

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-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

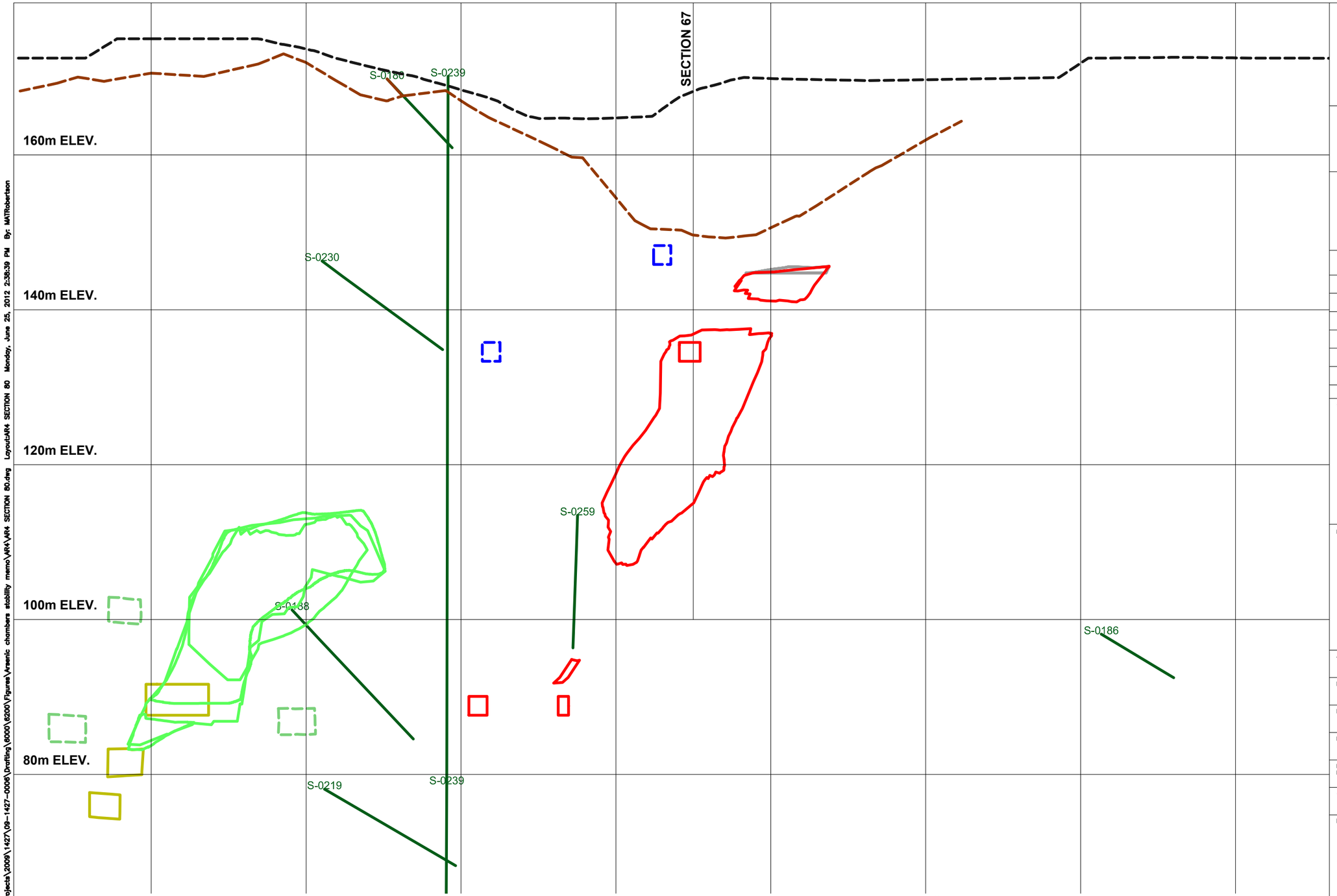
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 79

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-79 OF 90	0



Drawing File: N:\our-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 80.dwg Layout:AR4 SECTION 80 Monday, June 25, 2012 2:35:39 PM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC:

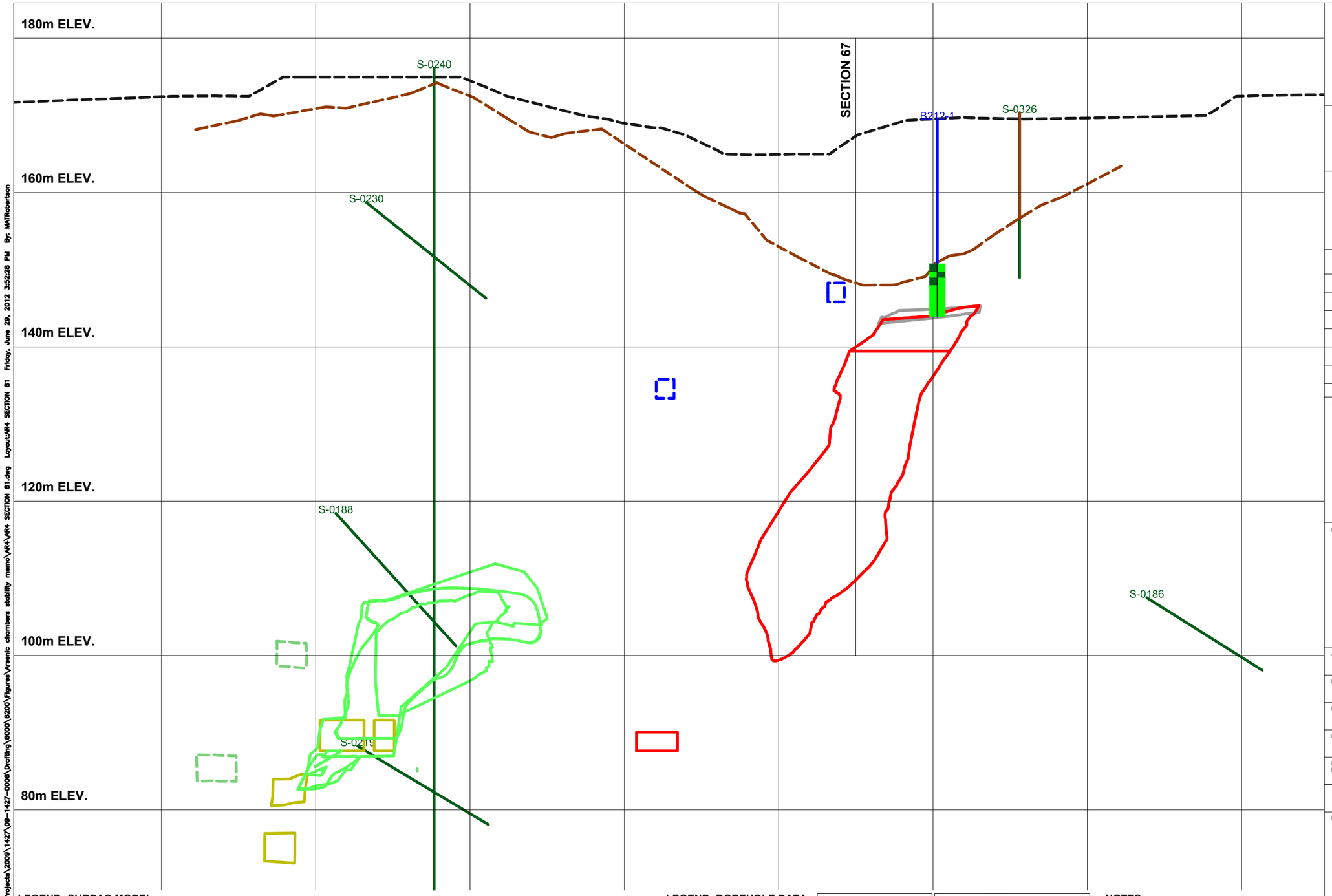
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 80

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-80 OF 90	0



Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 81.dwg LayoutAR4 SECTION 81 Friday, June 29, 2012 3:52:28 PM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

C212-3 SRK 2005 DRILLHOLE
S-0650 HISTORICAL DRILLHOLE
BOREHOLE - OVERBURDEN
BOREHOLE - OVERBURDEN
BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

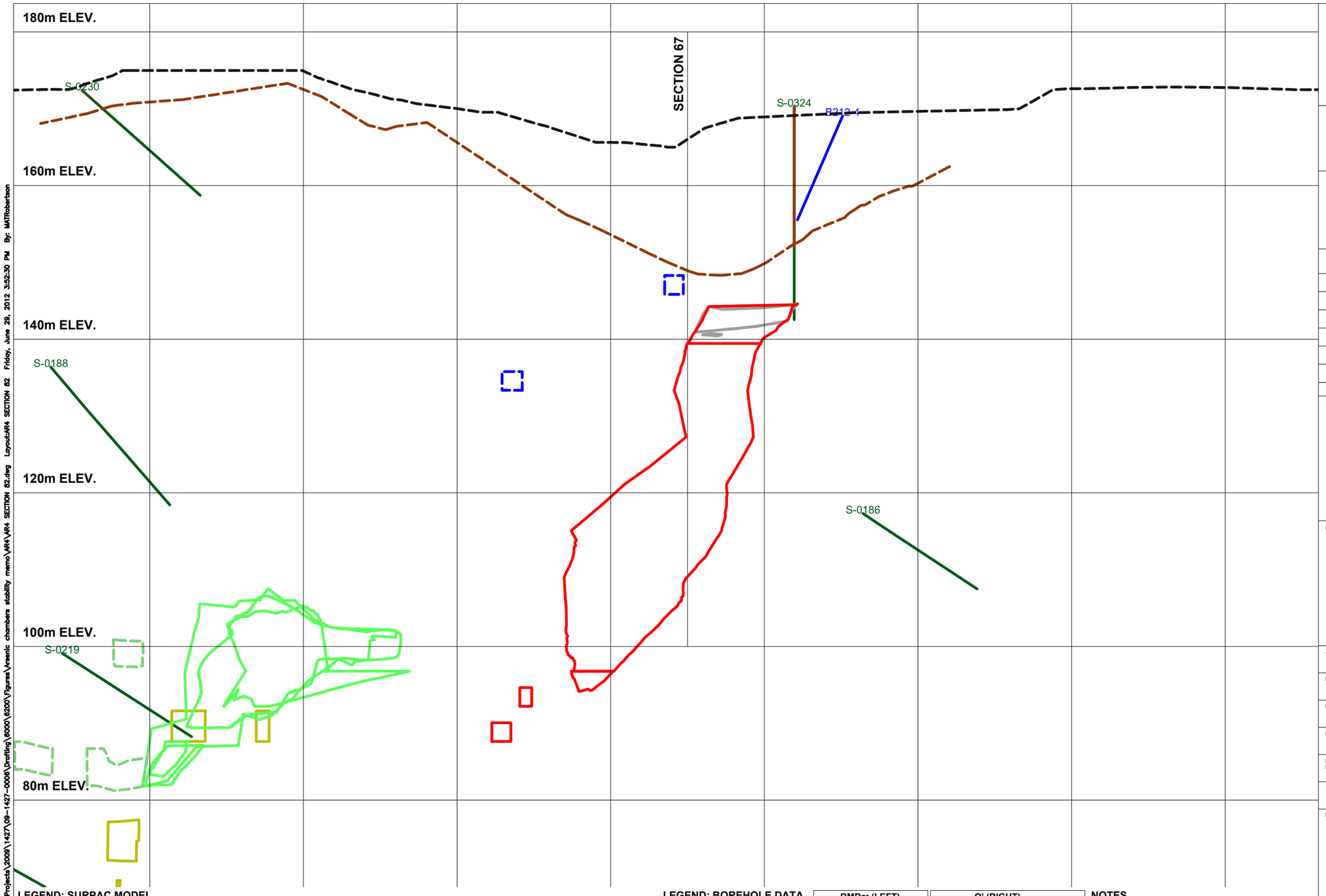
Client/client: **PWGSC**

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 81

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-81 OF 90	0



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 82.dwg Layout:AR4 SECTION 82 Friday, June 29, 2012 3:52:30 PM By: MATRobertson

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: **PWGSC**

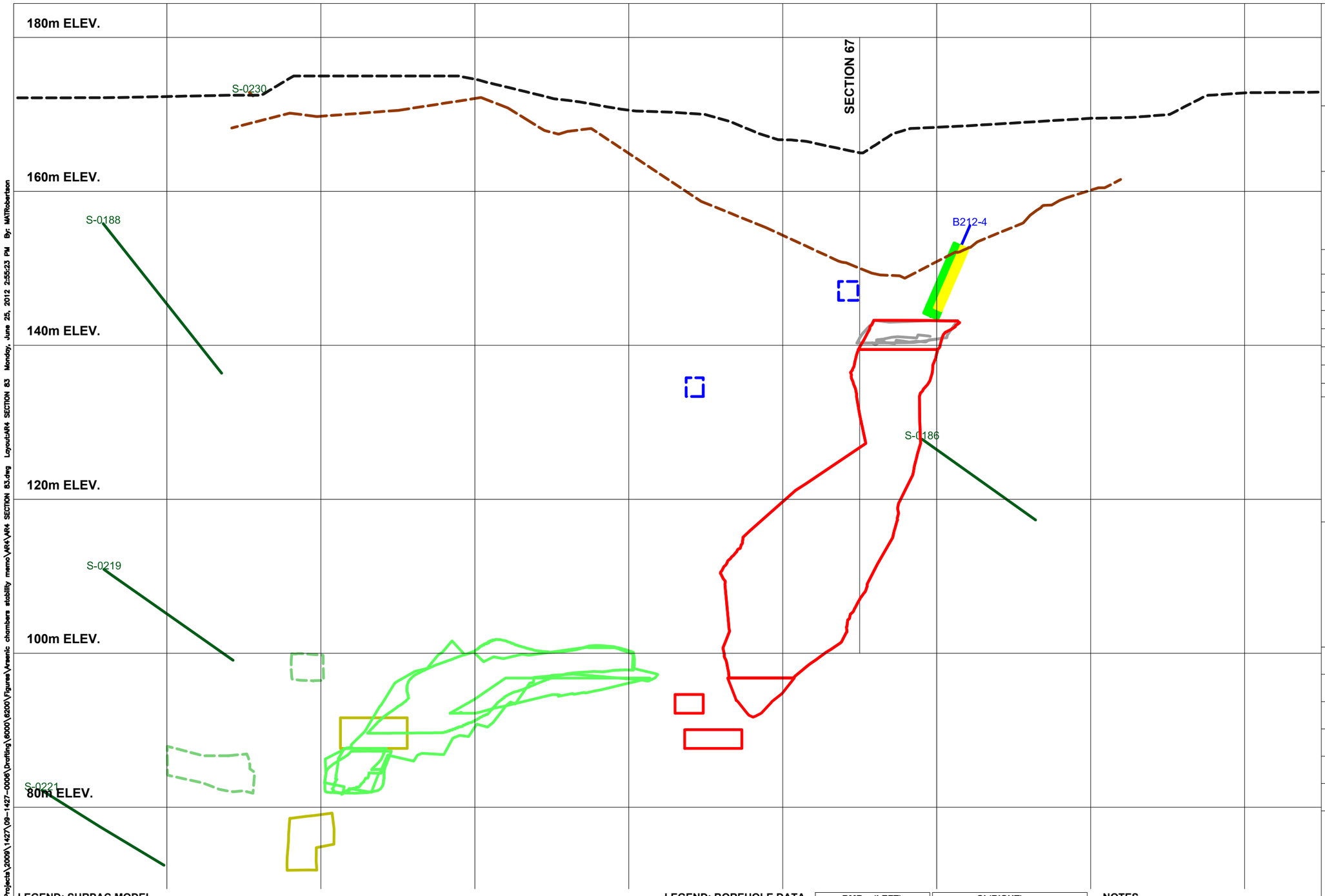
Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 82

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-82 OF 90	0

AR4 SECTION 82



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0 - 20 : VERY POOR ROCK
- 20 - 40 : POOR ROCK
- 40 - 60 : FAIR ROCK
- 60 - 80 : GOOD ROCK
- 80 - 100 : VERY GOOD ROCK

Q' (RIGHT)
(CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)

- 0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
- 1 - 4 : POOR ROCK
- 4 - 10 : FAIR ROCK
- 10 - 40 : GOOD ROCK
- 40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

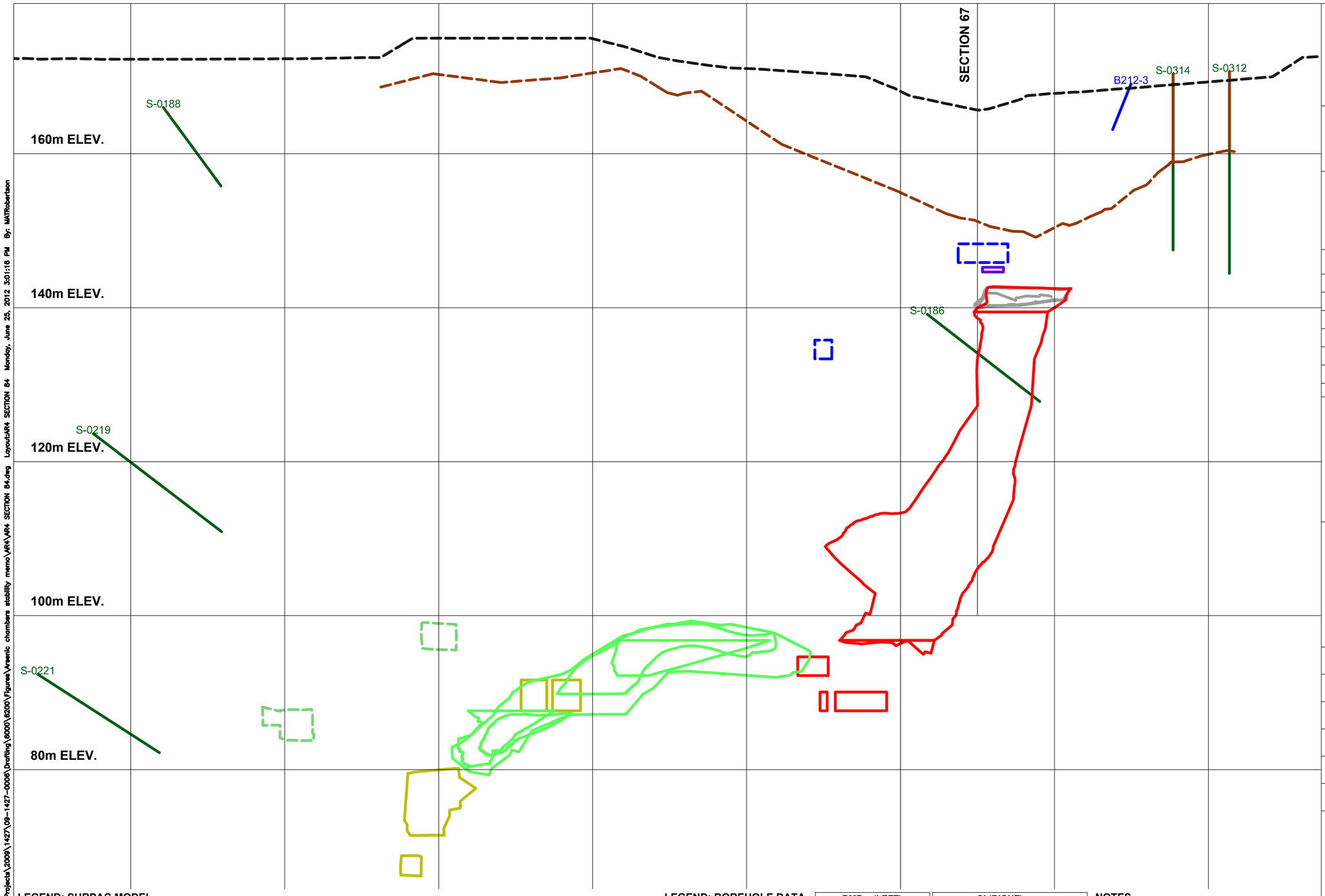
ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 83

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-83 OF 90	0

Drawing File: N:\our-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 83.dwg LayoutAR4 SECTION 83 Monday, June 25, 2012 2:55:23 PM By: MATRobertson

AO – PWGSC – ANSI B–L1 – 11X17



LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
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- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

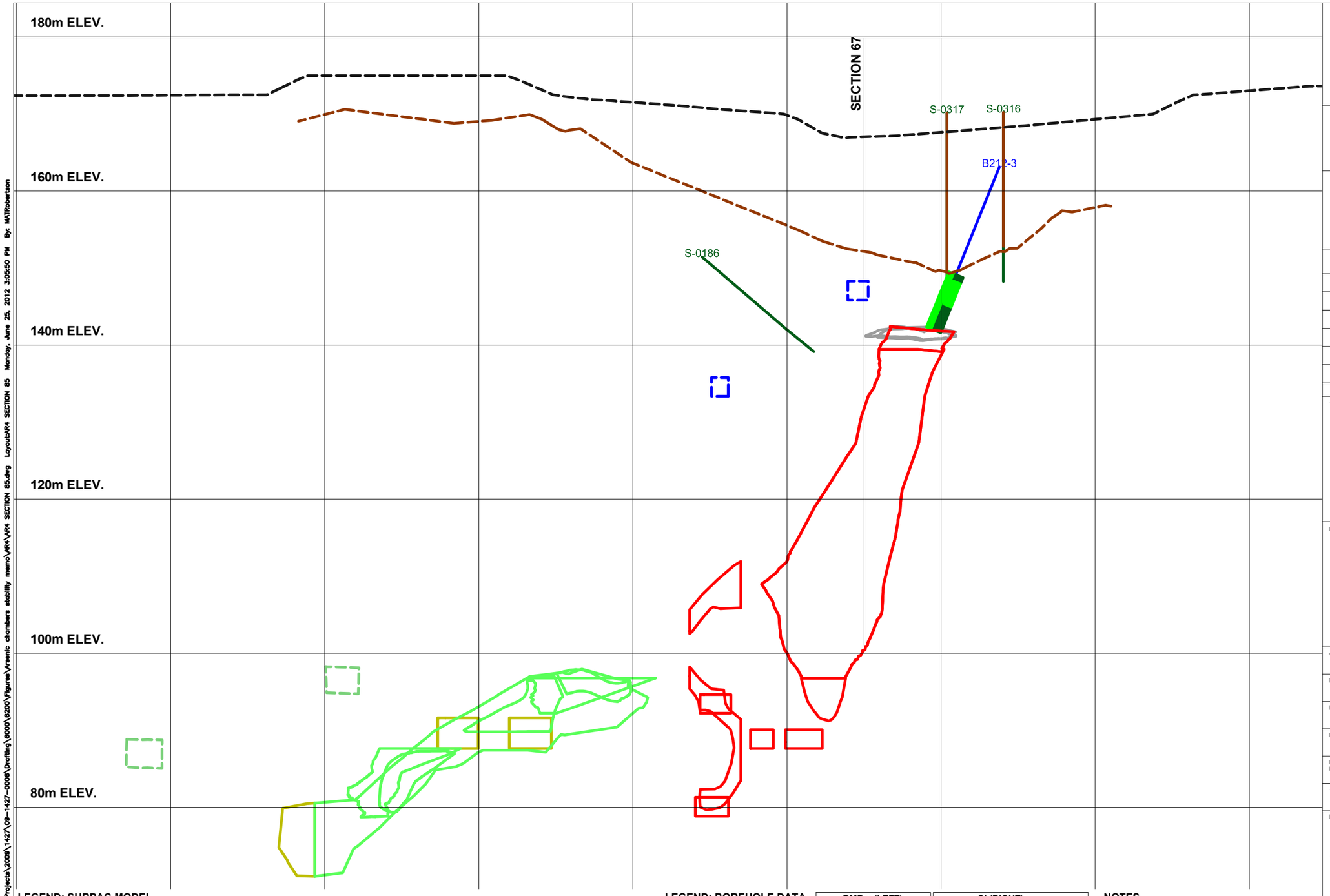
AR2 SECTION 66

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-84 OF 90	0

Drawing File: N:\our-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 84.dwg LayoutAR4 SECTION 84 Monday, June 25, 2012 3:01:16 PM By: MATRobertson

A0 – PWGSC – ANSI B–L1 – 11X17

AR4 SECTION 84



Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 85.dwg LayoutAR4 SECTION 85 Monday, June 25, 2012 3:05:50 PM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

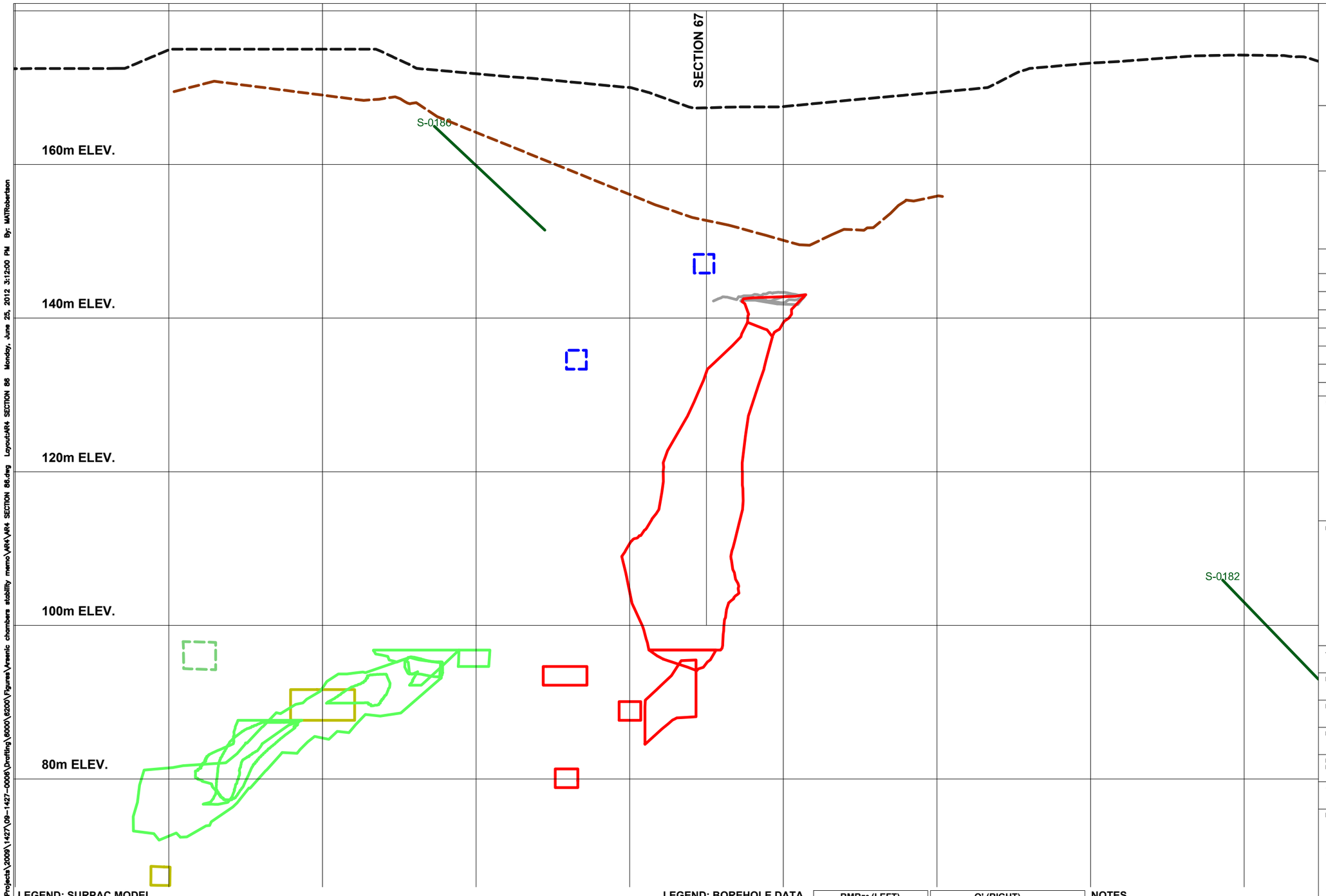
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 85

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-85 OF 90	0



Drawing File: N:\bur--graphics\Projects\2009\1427\09--1427--0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 86.dwg Layout:AR4 SECTION 86 Monday, June 25, 2012 3:12:00 PM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
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- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
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40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

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-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
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A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: **DTK**

Designed by/Concept par: **MP**

Drawn by/Dessine par: **MP**

PWGSC Project Manager/Administrateur de Projets TPSGC: **PWGSC**

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

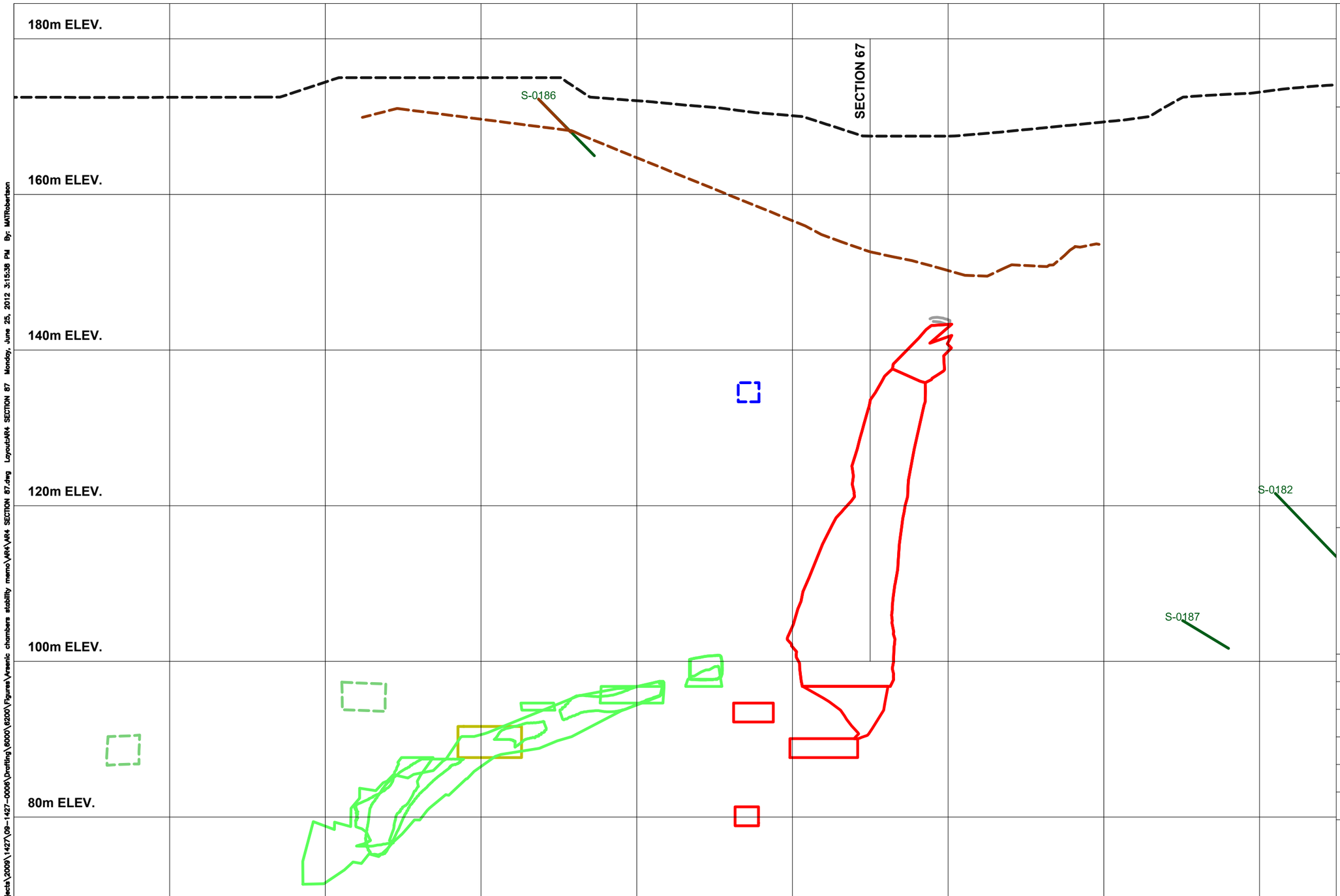
Client/client: **PWGSC**

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 86

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-86 OF 90	0



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
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NOTES

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-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

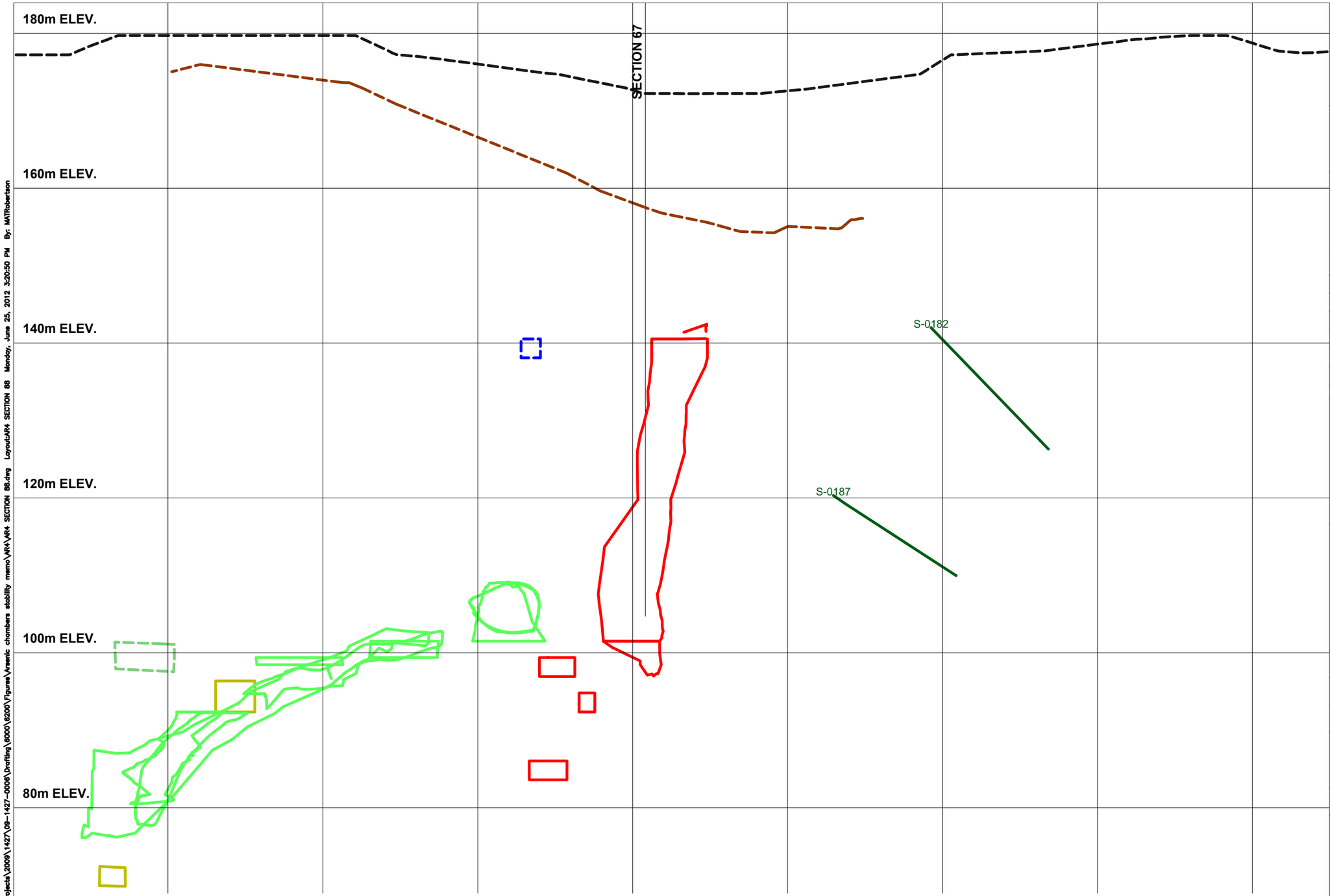
Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 87

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-87 OF 90	0



Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 88.dwg Layout:AR4 SECTION 88 Monday, June 25, 2012 3:20:50 PM By: MATRobertson

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
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- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

C212-3 SRK 2005 DRILLHOLE
S-0650 HISTORICAL DRILLHOLE
BOREHOLE - OVERBURDEN
BOREHOLE - OVERBURDEN
BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

A0 – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par
DTK

Designed by/Concept par
MP

Drawn by/Dessine par
MP

PWGSC Project Manager/Administrateur de Projets TPSGC
PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

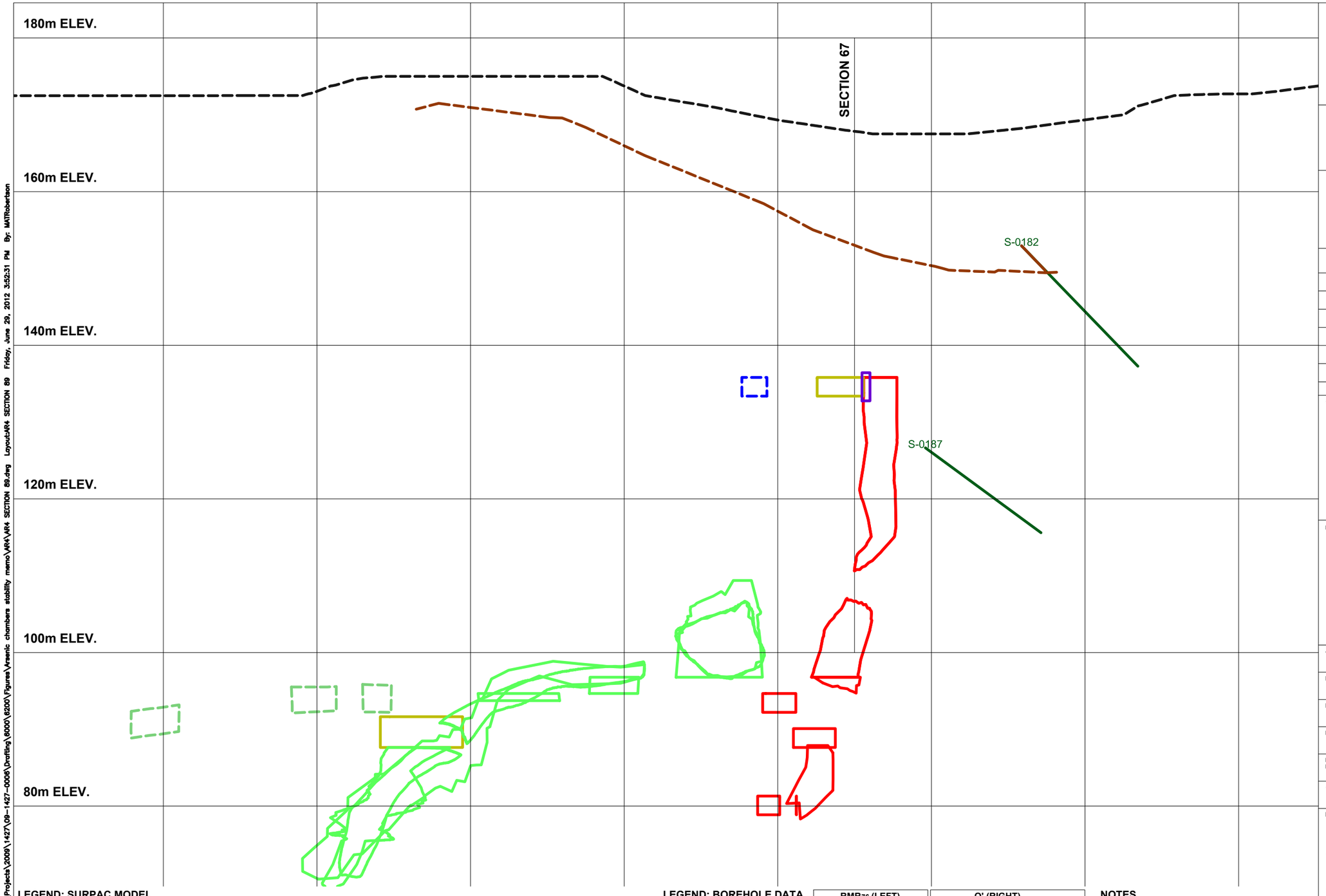
Client/client
PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 88

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-88 OF 90	0



Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

PRELIMINARY
NOT FOR CONSTRUCTION

Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 89

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-89 OF 90	0

LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

RMR76 (LEFT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)	Q' (RIGHT) (CALCULATED FROM SRK 2005 ARSENIC CHAMBER DRILLING DATA)
0 - 20 : VERY POOR ROCK	0.01 - 1 : EXTREMELY POOR TO VERY POOR ROCK
20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

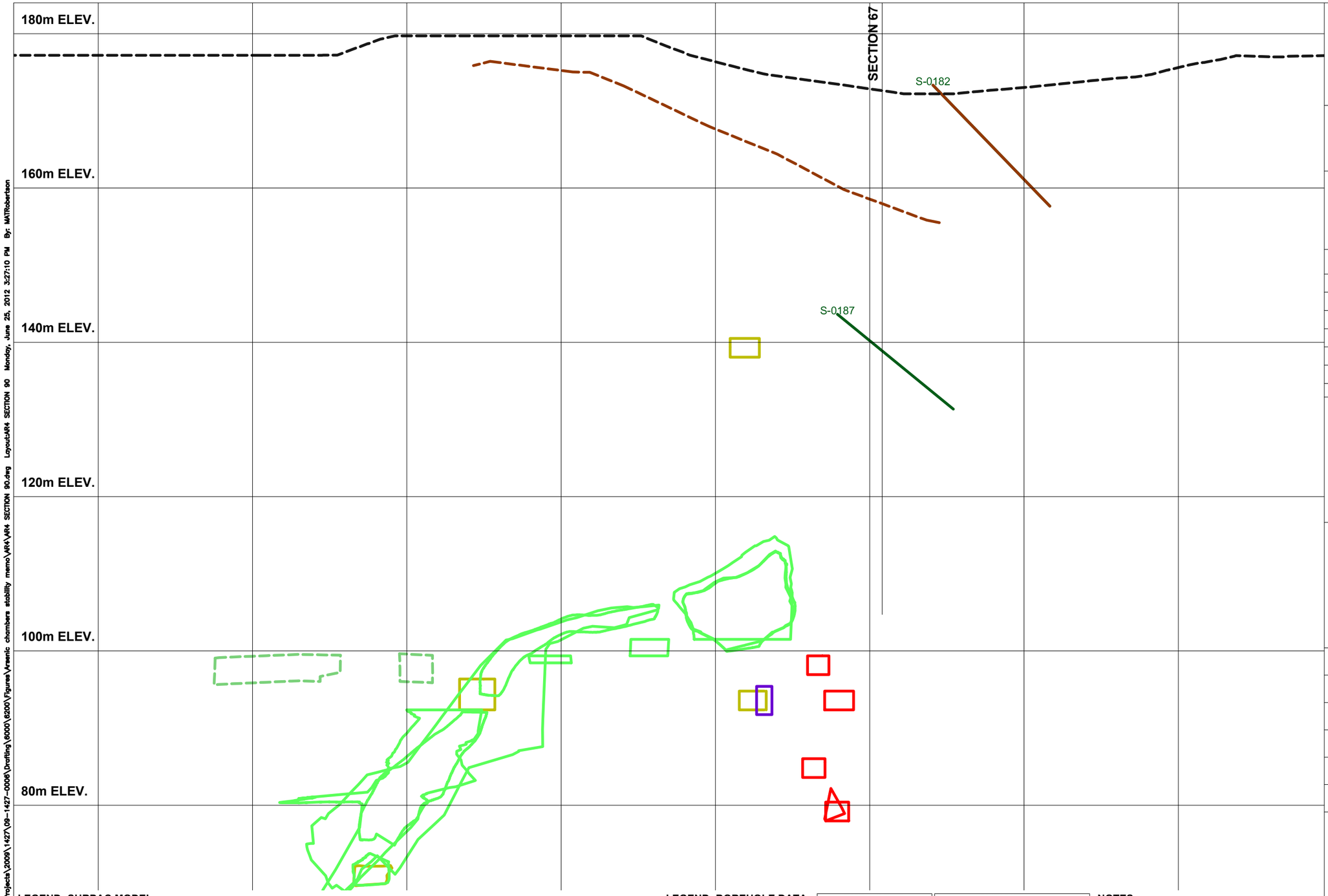
-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

Drawing File: N:\bur-graphics\Projects\2009\1427\09-1427-0006\Drafting\6000\6200\Figures\Arsenic chambers stability memo\AR4\AR4 SECTION 89.dwg Layout:AR4 SECTION 89 Friday, June 29, 2012 3:52:31 PM By: MATRobertson

A0 – PWGSC – ANSI B–L1 – 11X17



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LEGEND: SURPAC MODEL

- DEVELOPMENT: UNKNOWN ACCESSIBILITY STATUS
- DEVELOPMENT: TRACKED/FOOT ACCESS ON LEVEL
- DEVELOPMENT: CONNECTED TO ARSENIC CHAMBERS
- DEVELOPMENT: INACCESSIBLE/CUT-OFF BY PITS OR STOPES
- DEVELOPMENT: MECHANISED ACCESS
- DEVELOPMENT: ACCESSIBLE BY LADDER ONLY
- ARSENIC CHAMBERS/ARSENIC CONTAMINATED NON-ACCESSIBLE DEVELOPMENT
- NON-ARSENIC STOPES
- EXISTING BULKHEAD
- CAVITY MONITORING SURVEY (CMS)
- PIT SURFACE
- TOPOGRAPHY SURFACE
- OVERBURDEN/BEDROCK CONTACT SURFACE

LEGEND: BOREHOLE DATA

- C212-3 SRK 2005 DRILLHOLE
- S-0650 HISTORICAL DRILLHOLE
- BOREHOLE - OVERBURDEN
- BOREHOLE - OVERBURDEN
- BOREHOLE - BEDROCK

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20 - 40 : POOR ROCK	1 - 4 : POOR ROCK
40 - 60 : FAIR ROCK	4 - 10 : FAIR ROCK
60 - 80 : GOOD ROCK	10 - 40 : GOOD ROCK
80 - 100 : VERY GOOD ROCK	40 - 1000 : VERY GOOD TO EXCEPTIONALLY GOOD ROCK

NOTES

-DRILLHOLES DISPLAYED ARE +/- 2.5 m OF SECTION

-SECTION FACES 11°

0 2.5 5 7.5 10 12.5
SCALE IN METRES

AO – PWGSC – ANSI B–L1 – 11X17

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
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PRELIMINARY
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Golder Associates

Revision/ Revision	Description/Description	Date/Date
0	ISSUED WITH RPT-0004-REV3	2012-10-05
A	ISSUED WITH RPT-0004-REV2	2011-09-07
A	ISSUED WITH RPT-0004-REV1	2011-08-08
A	ISSUED WITH RPT-0004-REV0	2011-08-05

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

GIANT MINE REMEDIATION PROJECT
GIANT MINE REMEDIATION PROJECT, NWT

UNDERGROUND

Approved by/Approuve par: DTK

Designed by/Concept par: MP

Drawn by/Dessine par: MP

PWGSC Project Manager/Administrateur de Projets TPSGC: PWGSC

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC

Client/client: PWGSC

Drawing title/Titre du dessin

ARSENIC STOPE B212, B213 AND B214

AR4 SECTION 90

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.014204.313	B-90 OF 90	0

APPENDIX C

Preliminary Open Stope Stability Assessment for Arsenic Stopes and Chambers – Mathew's Method

October 5, 2012
Project No. 09-1427-0006/6000/6100
Doc No. 090

STOPE INPUT DATA

Orientation

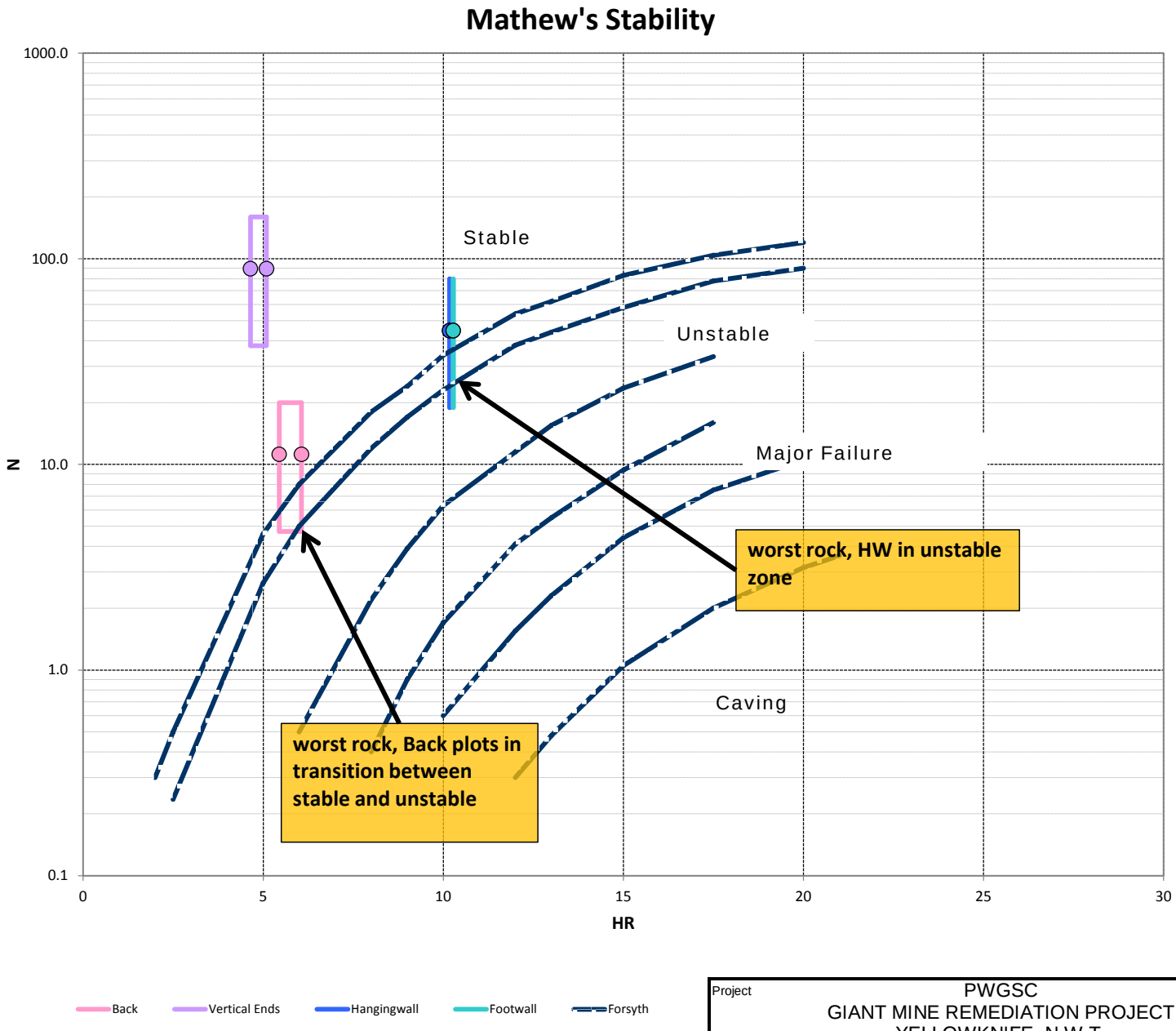
DIMENSIONS	min	max		STRESSES		
VERT HT(m)	30.8	30.8	*m*	VERTICAL (V)	1.3	*MPa*
DIP HT(m)	30.8	30.8	*m*	HOR.-Strike (H1)	1.9	*MPa*
SPAN (S)	13.3	15.2	*m*	HOR.-Dip (H2)	1.9	*MPa*
LENGTH* (L)	60.0	60.0	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	5.9	14	25	1.00	1.00	0.8	1	5.4	6.1	4.7	11.2	20.0
Vertical End	5.9	14	25	1.00	1.00	0.8	8	4.6	5.1	37.8	89.6	160.0
Hangingwall	5.9	14	25	1.00	1.00	0.4	8	10.2	10.2	18.9	44.8	80.0
Footwall	5.9	14	25	1.00	1.00	0.4	8	10.2	10.2	18.9	44.8	80.0

Comments:



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR1 - B15

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-1
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

Golder Associates

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	21.6	21.6	*m*	VERTICAL (V)	1.1	*MPa*
DIP HT(m)	21.6	21.6	*m*	HOR.-Strike (H1)	1.6	*MPa*
SPAN (S)	10.6	13.1	*m*	HOR.-Dip (H2)	1.6	*MPa*
LENGTH* (L)	54.0	54.0	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

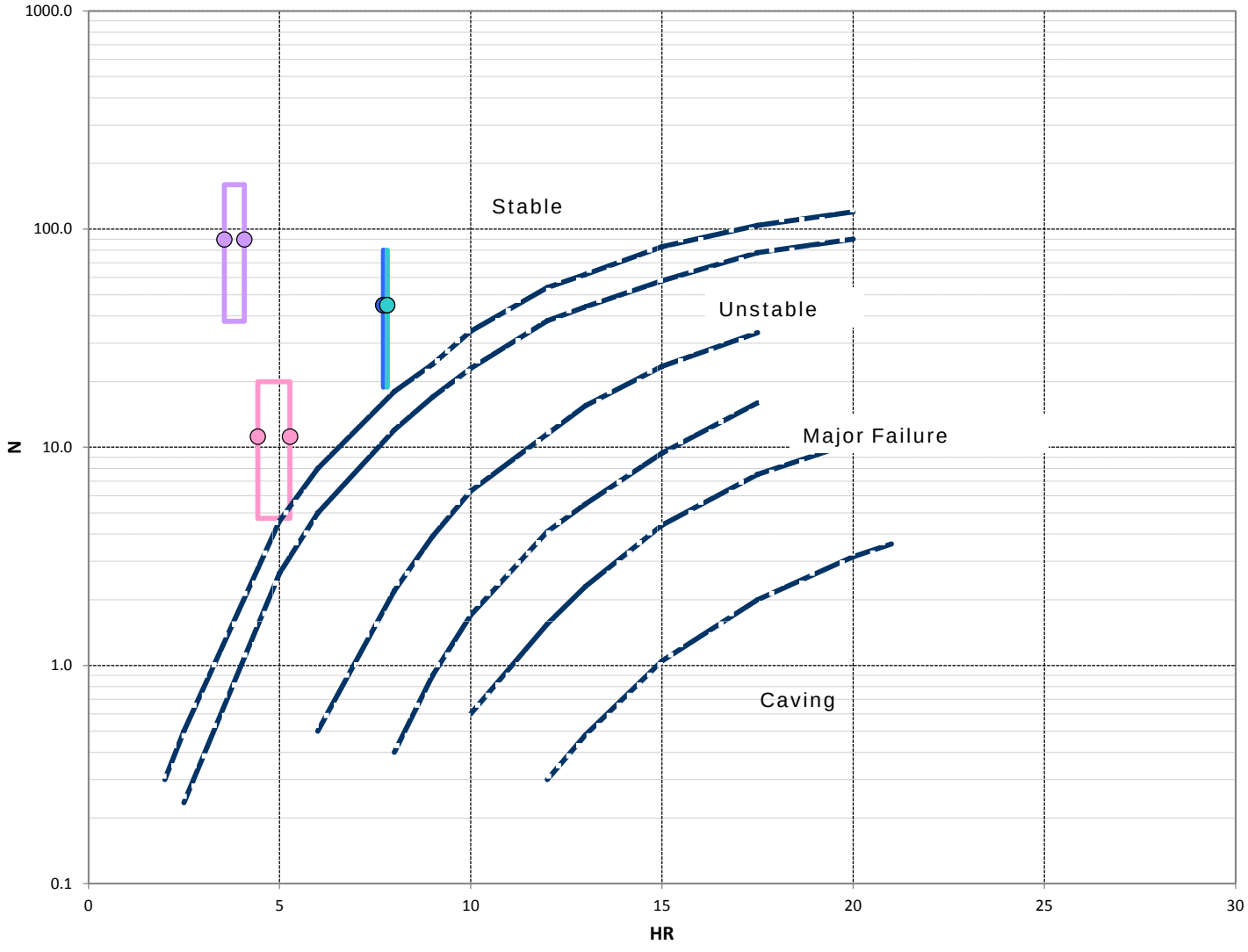
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	5.9	14	25	1.00	1.00	0.8	1	4.4	5.3	4.7	11.2	20.0
Vertical End	5.9	14	25	1.00	1.00	0.8	8	3.6	4.1	37.8	89.6	160.0
Hangingwall	5.9	14	25	1.00	1.00	0.4	8	7.7	7.7	18.9	44.8	80.0
Footwall	5.9	14	25	1.00	1.00	0.4	8	7.7	7.7	18.9	44.8	80.0

Comments:

Mathew's Stability



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR1 - B14

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-2

STOPE INPUT DATA

Orientation

	DIMENSIONS min	max		STRESSES		
VERT HT(m)	32.9	32.9	*m*	VERTICAL (V)	1.2	*MPa*
DIP HT(m)	32.9	32.9	*m*	HOR.-Strike (H1)	1.8	*MPa*
SPAN (S)	12.5	13.7	*m*	HOR.-Dip (H2)	1.8	*MPa*
LENGTH* (L)	61.6	61.6	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

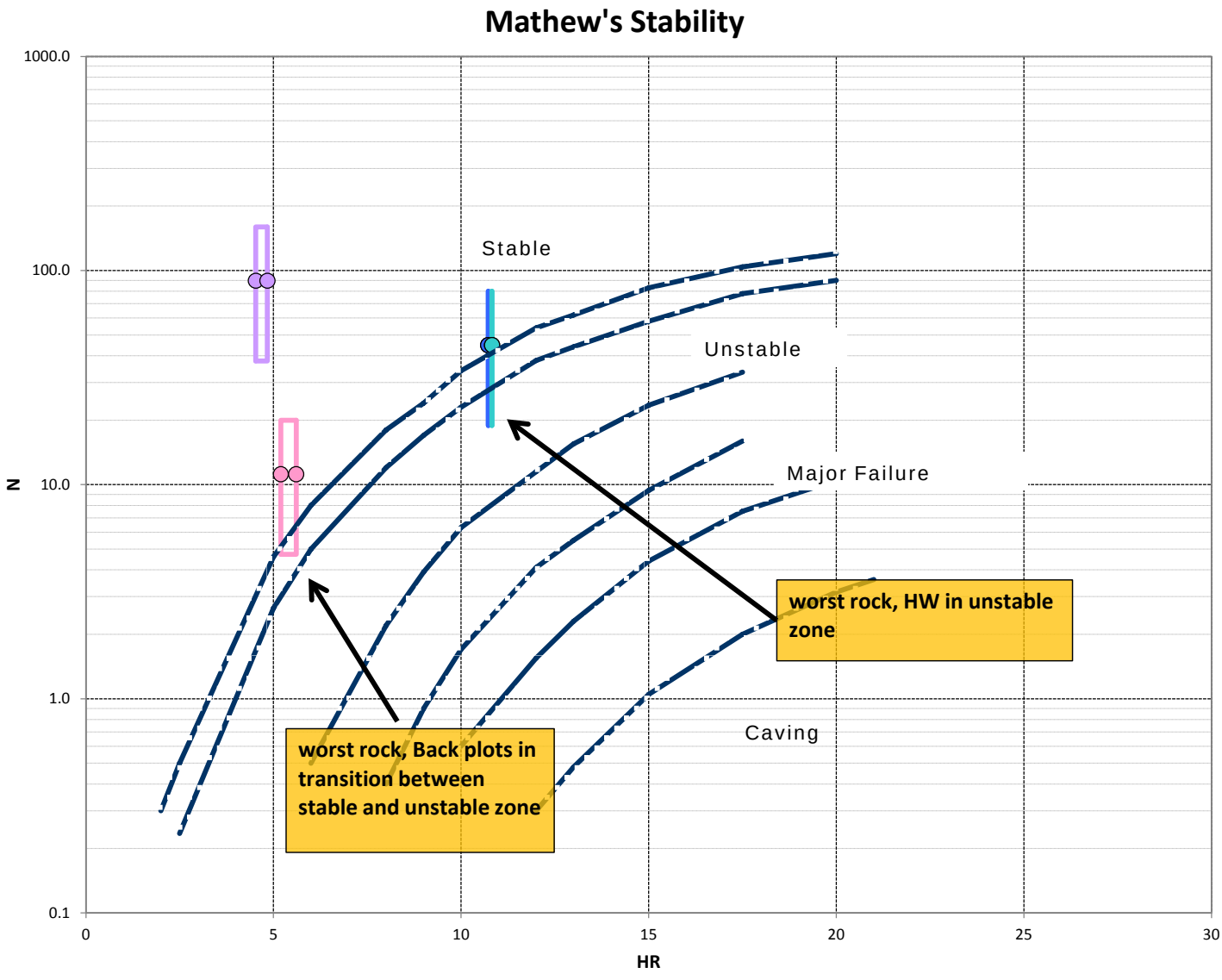
* - along strike

Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	5.9	14	25	1.00	1.00	0.8	1	5.2	5.6	4.7	11.2	20.0
Vertical End	5.9	14	25	1.00	1.00	0.8	8	4.5	4.8	37.8	89.6	160.0
Hangingwall	5.9	14	25	1.00	1.00	0.4	8	10.7	10.7	18.9	44.8	80.0
Footwall	5.9	14	25	1.00	1.00	0.4	8	10.7	10.7	18.9	44.8	80.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR1 - B12

Golder Associates

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-3

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	19.5	19.5	*m*	VERTICAL (V)	0.9	*MPa*
DIP HT(m)	19.5	19.5	*m*	HOR.-Strike (H1)	1.4	*MPa*
SPAN (S)	12.9	13.2	*m*	HOR.-Dip (H2)	1.4	*MPa*
LENGTH* (L)	37.5	37.5	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

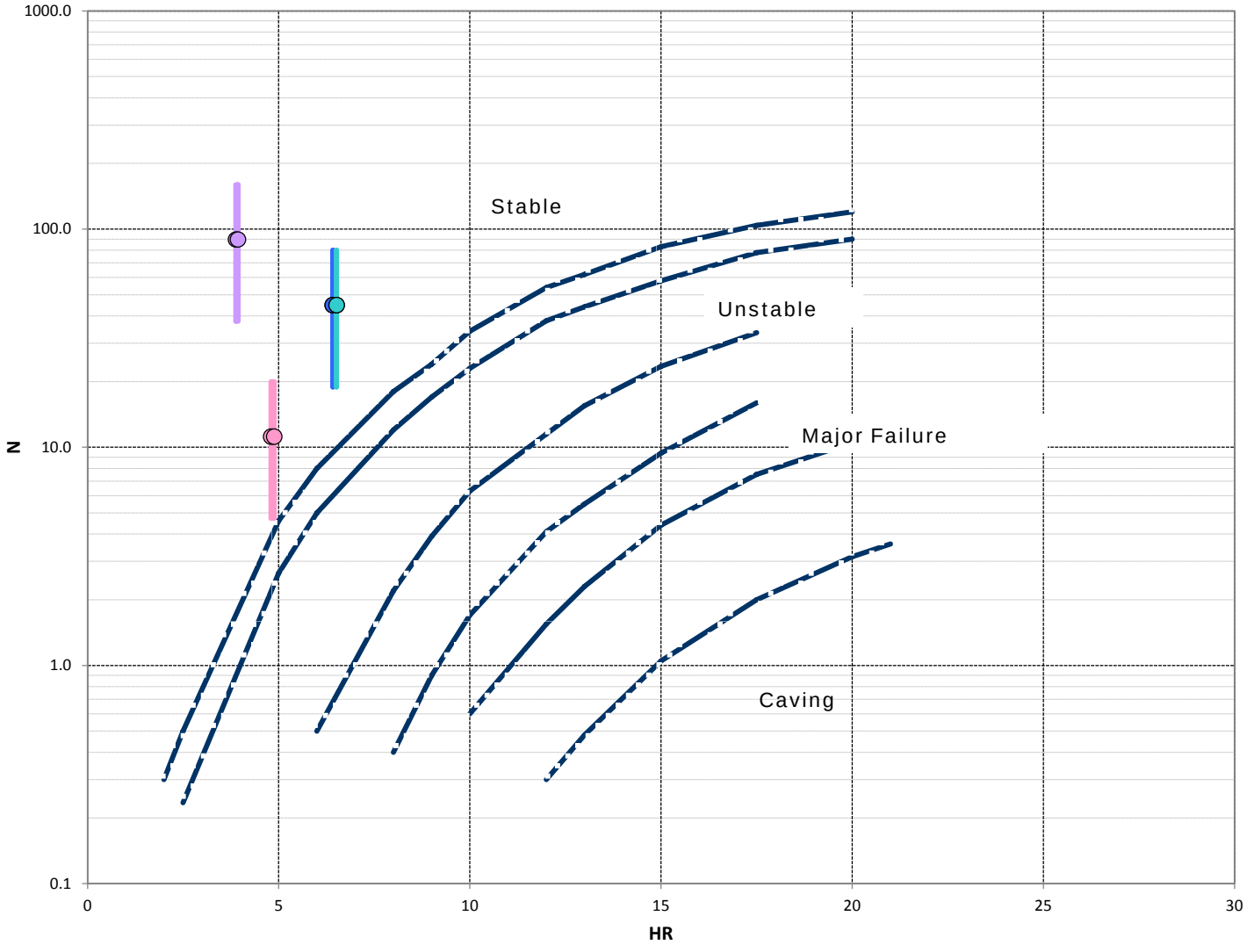
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	5.9	14	25	1.00	1.00	0.8	1	4.8	4.9	4.7	11.2	20.0
Vertical End	5.9	14	25	1.00	1.00	0.8	8	3.9	3.9	37.8	89.6	160.0
Hangingwall	5.9	14	25	1.00	1.00	0.4	8	6.4	6.4	18.9	44.8	80.0
Footwall	5.9	14	25	1.00	1.00	0.4	8	6.4	6.4	18.9	44.8	80.0

Comments:

Mathew's Stability



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR1 - B11

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-4

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	120.0	120.0	*m*	VERTICAL (V)	2.9	*MPa*
DIP HT(m)	124.8	124.8	*m*	HOR.-Strike (H1)	4.3	*MPa*
SPAN (S)	**8.0**	**11.0**	*m*	HOR.-Dip (H2)	4.3	*MPa*
LENGTH* (L)	120	120	*m*			
DIP (D)	74		*deg.*	U.C.S.	75	*MPa*

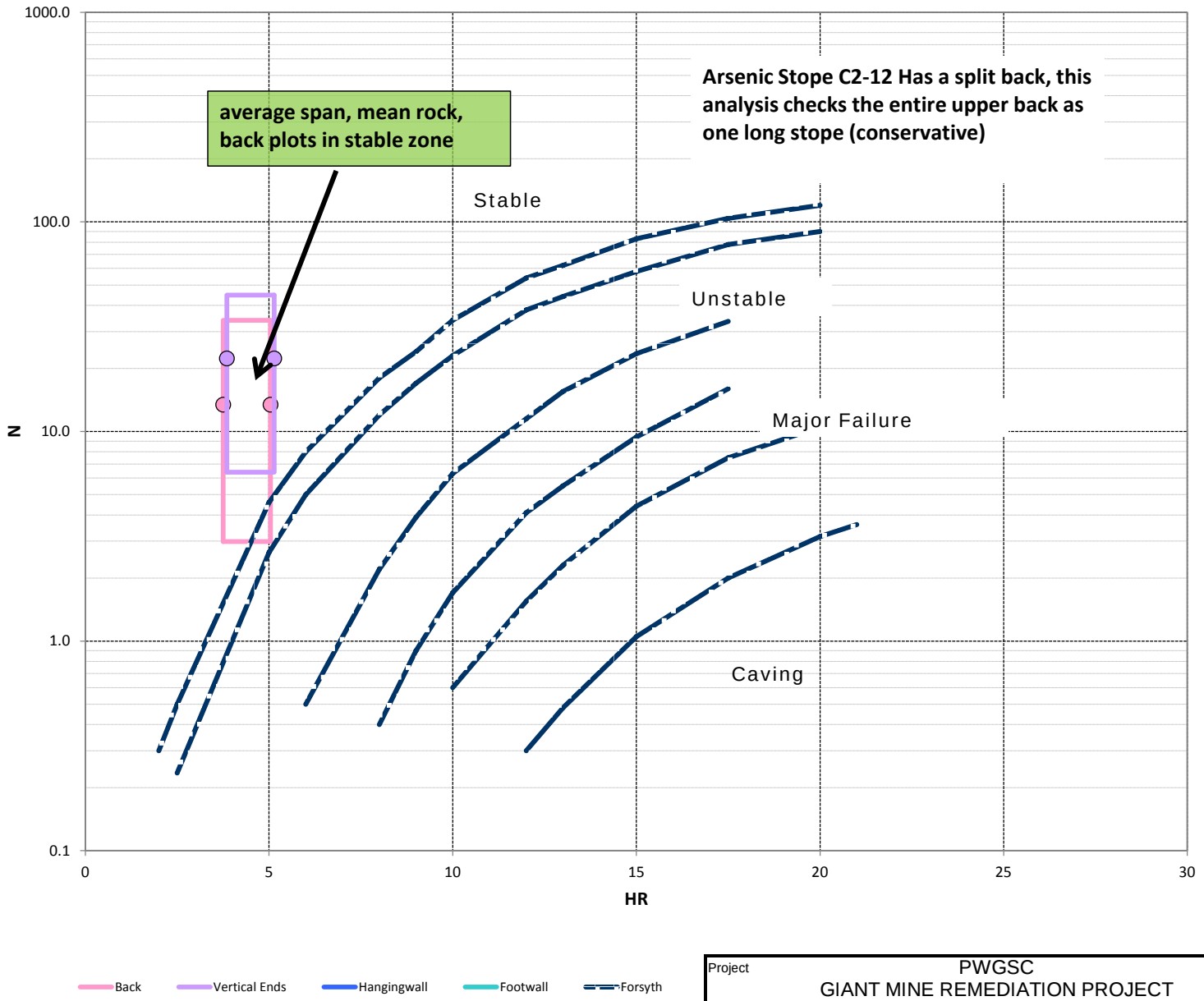
* - along strike

Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
South Back	8	30	65	0.47	0.65	0.8	1	3.8	5.0	3.0	13.4	33.9
End Wall	8	30	65	1.00	0.86	0.8	1	3.8	5.0	6.4	22.3	44.7

Comments:

Mathew's Stability



Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR2 C2-12 Back (All)

PROJECT No. 09-1427-0006			Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-5
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

Golder Associates

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix C\Table 7.1 and Appendix C.xls

STOPE INPUT DATA

Orientation

	DIMENSIONS avg.	max.		STRESSES		
VERT HT(m)	30.0	50.0	*m*	VERTICAL (V)	1.8	*MPa*
DIP HT(m)	31.1	51.8	*m*	HOR.-Strike (H1)	2.7	*MPa*
SPAN (S)	8.0	11.0	*m*	HOR.-Dip (H2)	2.7	*MPa*
LENGTH* (L)	48.1	92.0	*m*			
DIP (D)	75		*deg.*	U.C.S.	75.0	*MPa*

* - along strike

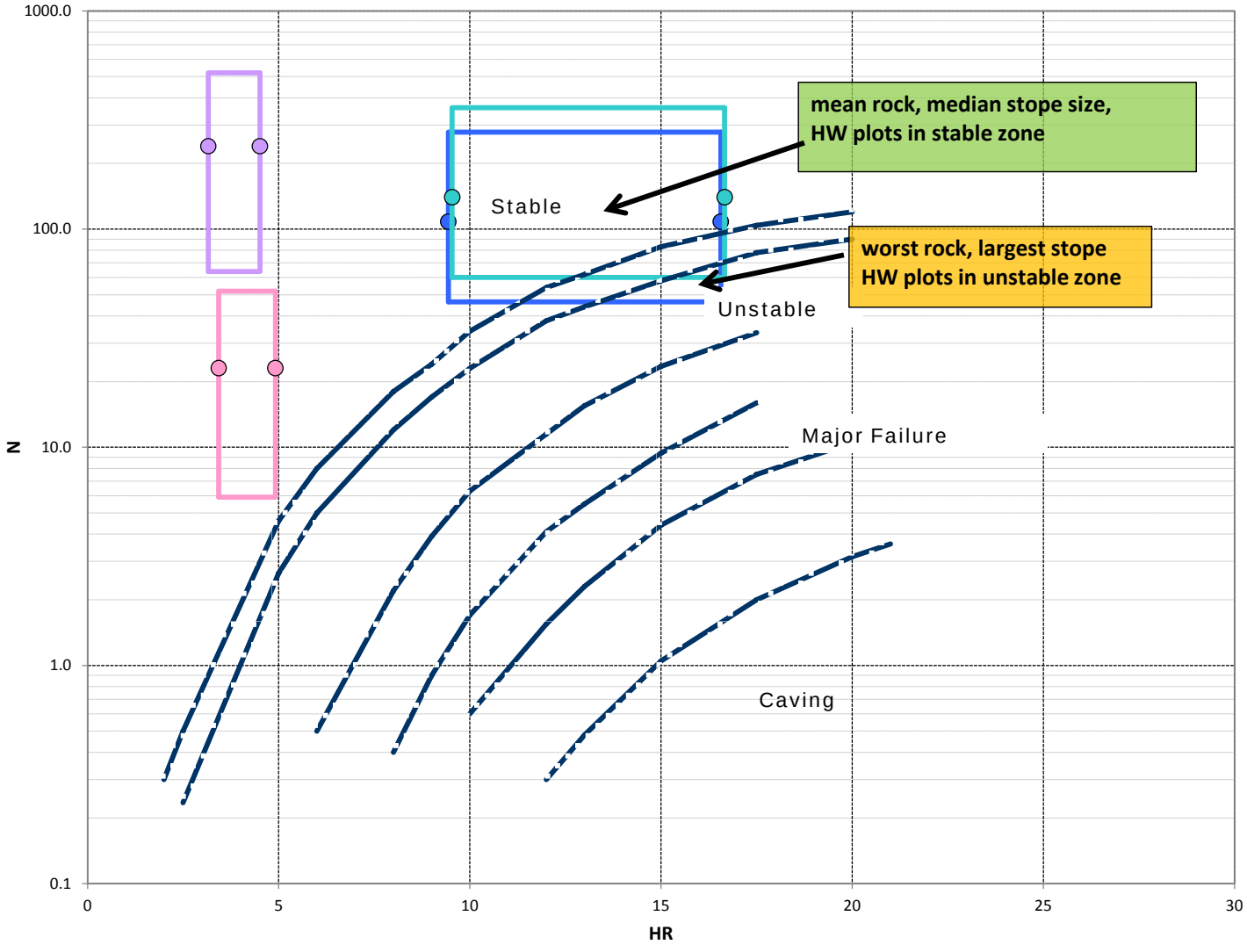
Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	8	30	65	0.92	1.00	0.8	1	3.4	4.9	5.9	23.1	52.0
Vertical End	8	30	65	1.00	1.00	1	8	3.2	4.5	64.0	240.0	520.0
Hangingwall	15	35	90	1.00	1.00	0.5	6.2	9.4	16.6	46.4	108.3	278.5
Footwall	15	35	90	1.00	1.00	0.5	8	9.4	16.6	60.0	140.0	360.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement

Mathew's Stability



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR2 C2-12

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-6

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	35.0	50.0	*m*	VERTICAL (V)	0.8	*MPa*
DIP HT(m)	37.2	53.2	*m*	HOR.-Strike (H1)	1.1	*MPa*
SPAN (S)	11.0	20.0	*m*	HOR.-Dip (H2)	1.1	*MPa*
LENGTH* (L)	140.0	140.0	*m*			
DIP (D)	70		*deg.*	U.C.S.	75.0	*MPa*

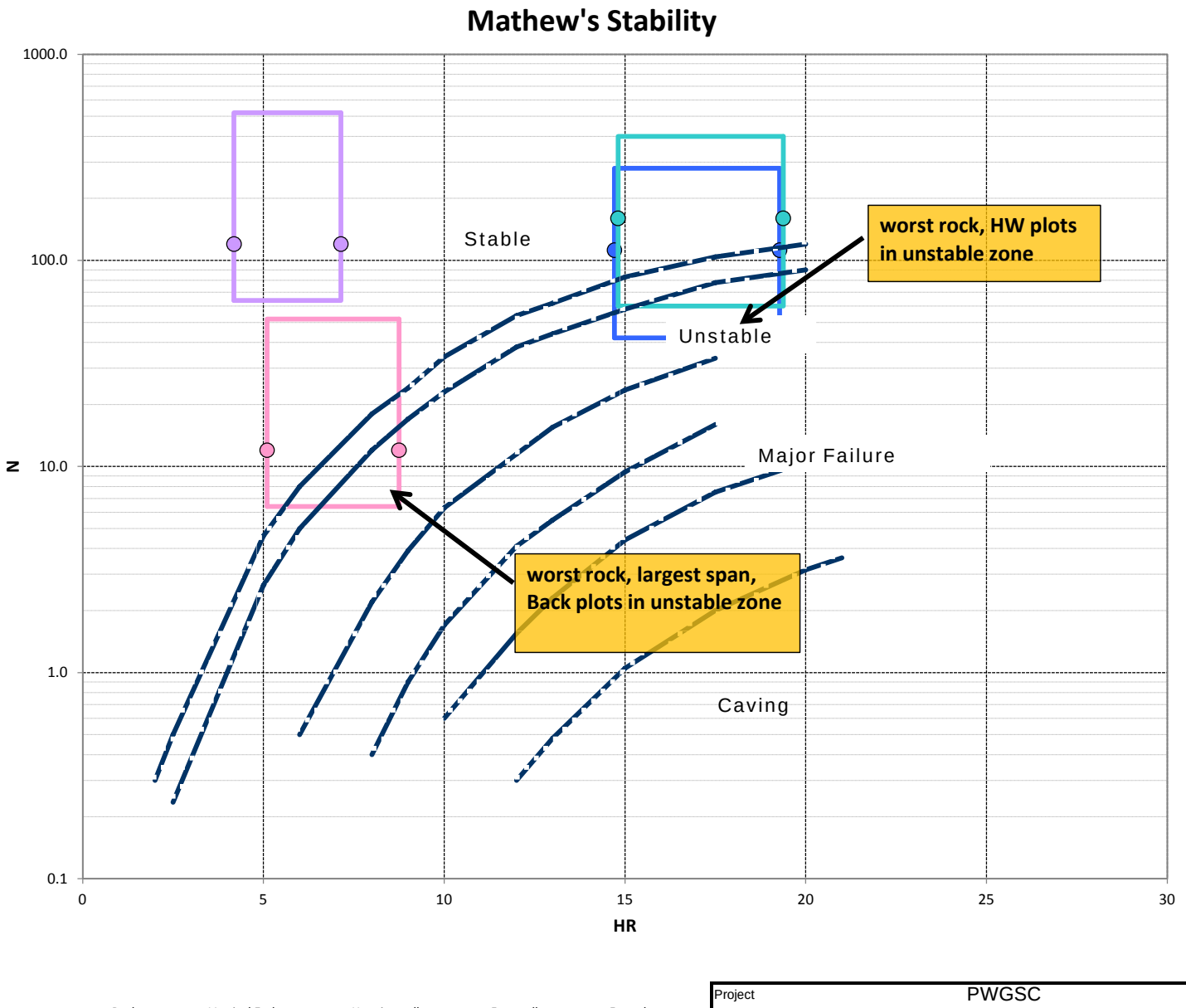
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	8	15	65	1.00	1.00	0.8	1	5.1	8.8	6.4	12.0	52.0
Vertical End	8	15	65	1.00	1.00	1	8	4.2	7.1	64.0	120.0	520.0
Hangingwall	15	40	100	1.00	1.00	0.5	5.6	14.7	19.3	42.0	112.1	280.3
Footwall	15	40	100	1.00	1.00	0.5	8	14.7	19.3	60.0	160.0	400.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR2 C3-12

Golder Associates

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-7
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	35.0	120.0	*m*	VERTICAL (V)	5.5	*MPa*
DIP HT(m)	37.2	127.7	*m*	HOR.-Strike (H1)	8.2	*MPa*
SPAN (S)	15.0	20.0	*m*	HOR.-Dip (H2)	8.2	*MPa*
LENGTH* (L)	120.0	160.0	*m*			
DIP (D)	70		*deg.*	U.C.S.	75.0	*MPa*

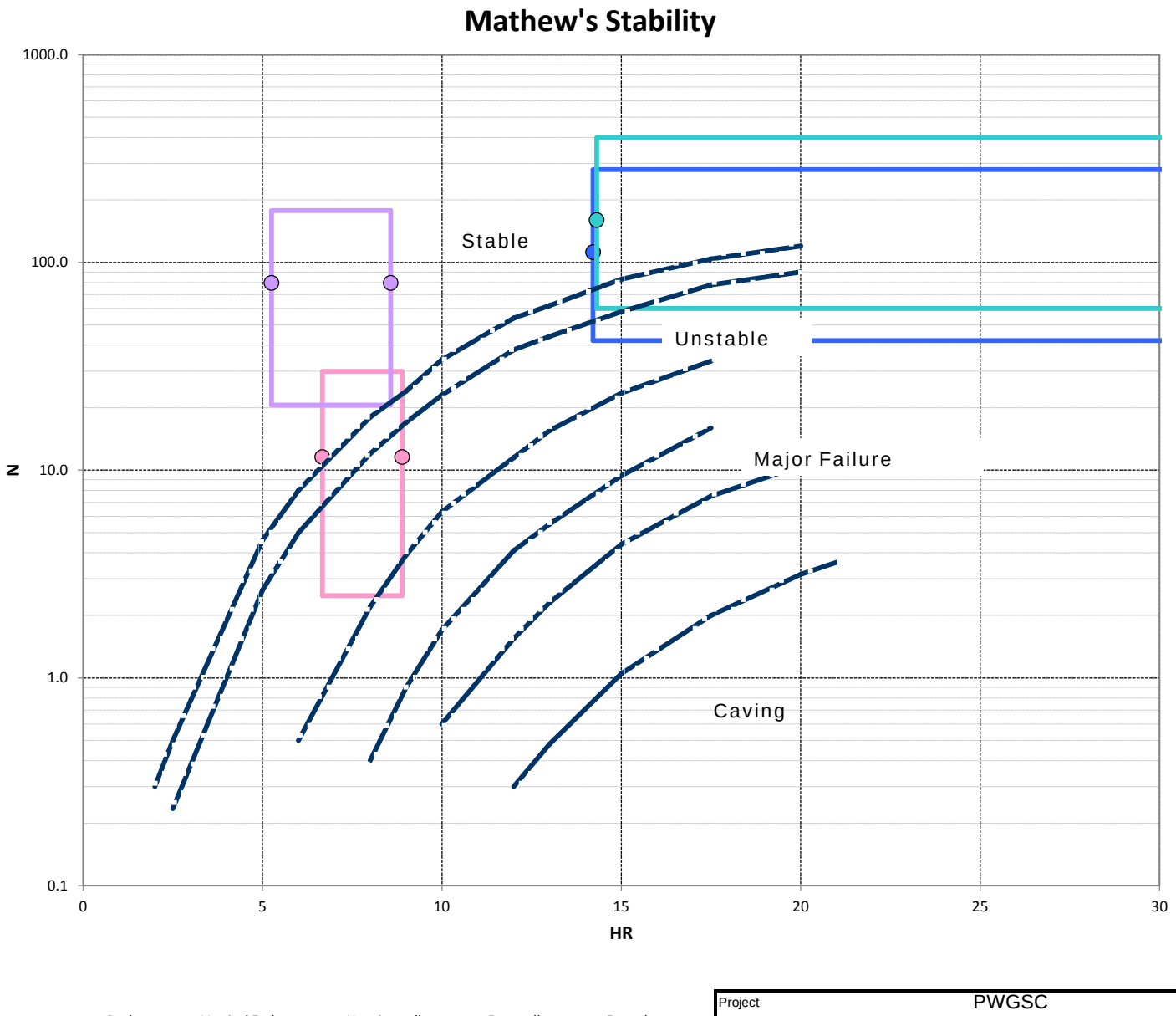
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	8	30	65	0.39	0.58	0.8	1	6.7	8.9	2.5	11.6	29.9
Vertical End	8	30	65	0.32	0.34	1	8	5.3	8.6	20.6	79.7	177.9
Hangingwall	15	40	100	1.00	1.00	0.5	5.6	14.2	35.5	42.0	112.1	280.3
Footwall	15	40	100	1.00	1.00	0.5	8	14.2	35.5	60.0	160.0	400.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR2 C5-09

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-8
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

Golder Associates

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	46.6	52.4	*m*	VERTICAL (V)	1.8	*MPa*
DIP HT(m)	46.6	52.4	*m*	HOR.-Strike (H1)	2.7	*MPa*
SPAN (S)	9.3	11.4	*m*	HOR.-Dip (H2)	2.7	*MPa*
LENGTH* (L)	29.9	29.9	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

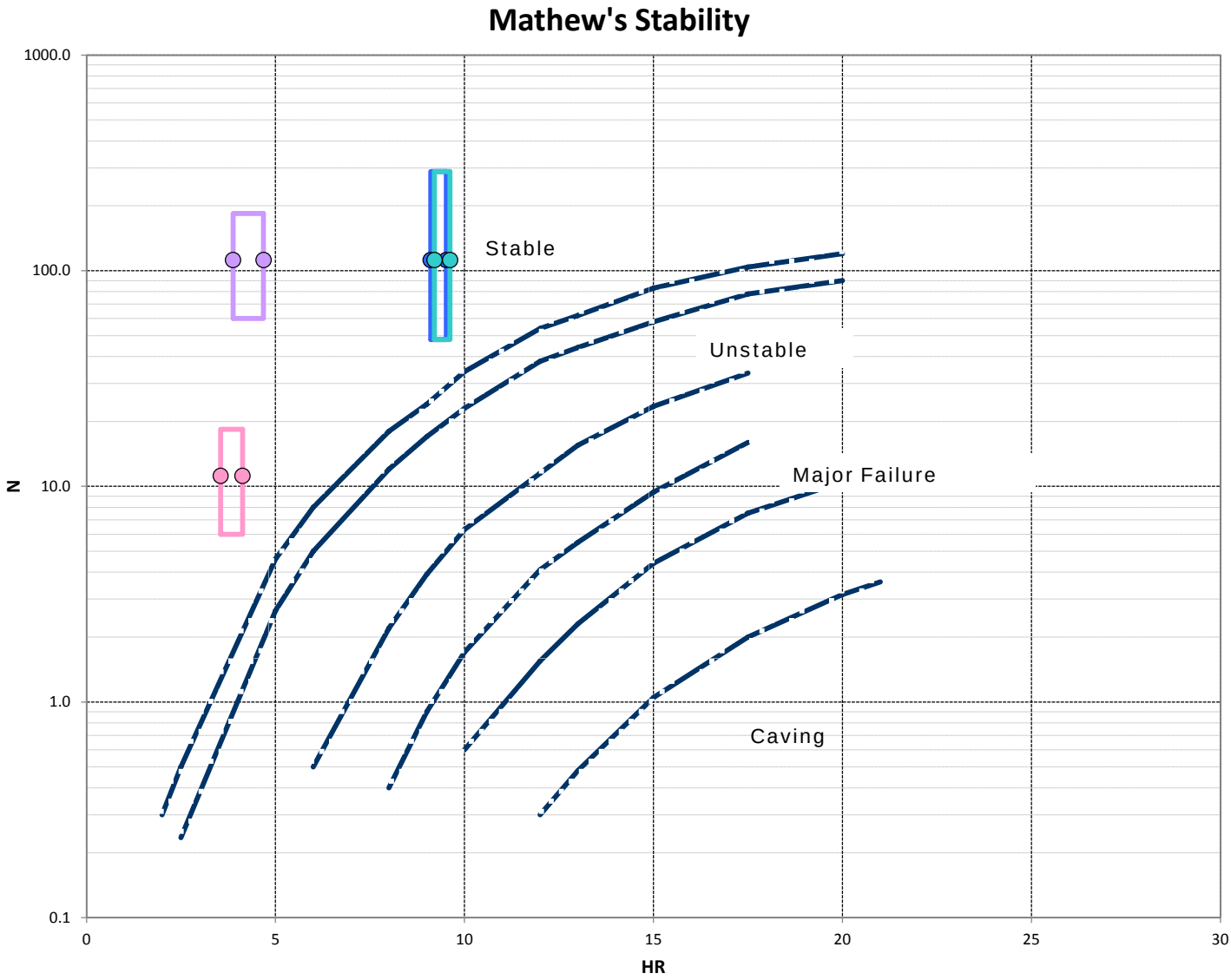
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	7.5	14	23	1.00	1.00	0.8	1	3.5	4.1	6.0	11.2	18.4
Vertical End	7.5	14	23	1.00	1.00	1	8	3.9	4.7	60.0	112.0	184.0
Hangingwall	15	35	90	1.00	1.00	0.4	8.0	9.1	9.5	48.0	112.0	288.0
Footwall	15	35	90	1.00	1.00	0.4	8	9.1	9.5	48.0	112.0	288.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR2 B9

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-9

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix C\Table 7.1 and Appendix C.xls

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	38.8	54.9	*m*	VERTICAL (V)	1.9	*MPa*
DIP HT(m)	38.8	54.9	*m*	HOR.-Strike (H1)	2.8	*MPa*
SPAN (S)	3.4	8.3	*m*	HOR.-Dip (H2)	2.8	*MPa*
LENGTH* (L)	25.5	25.5	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

* - along strike

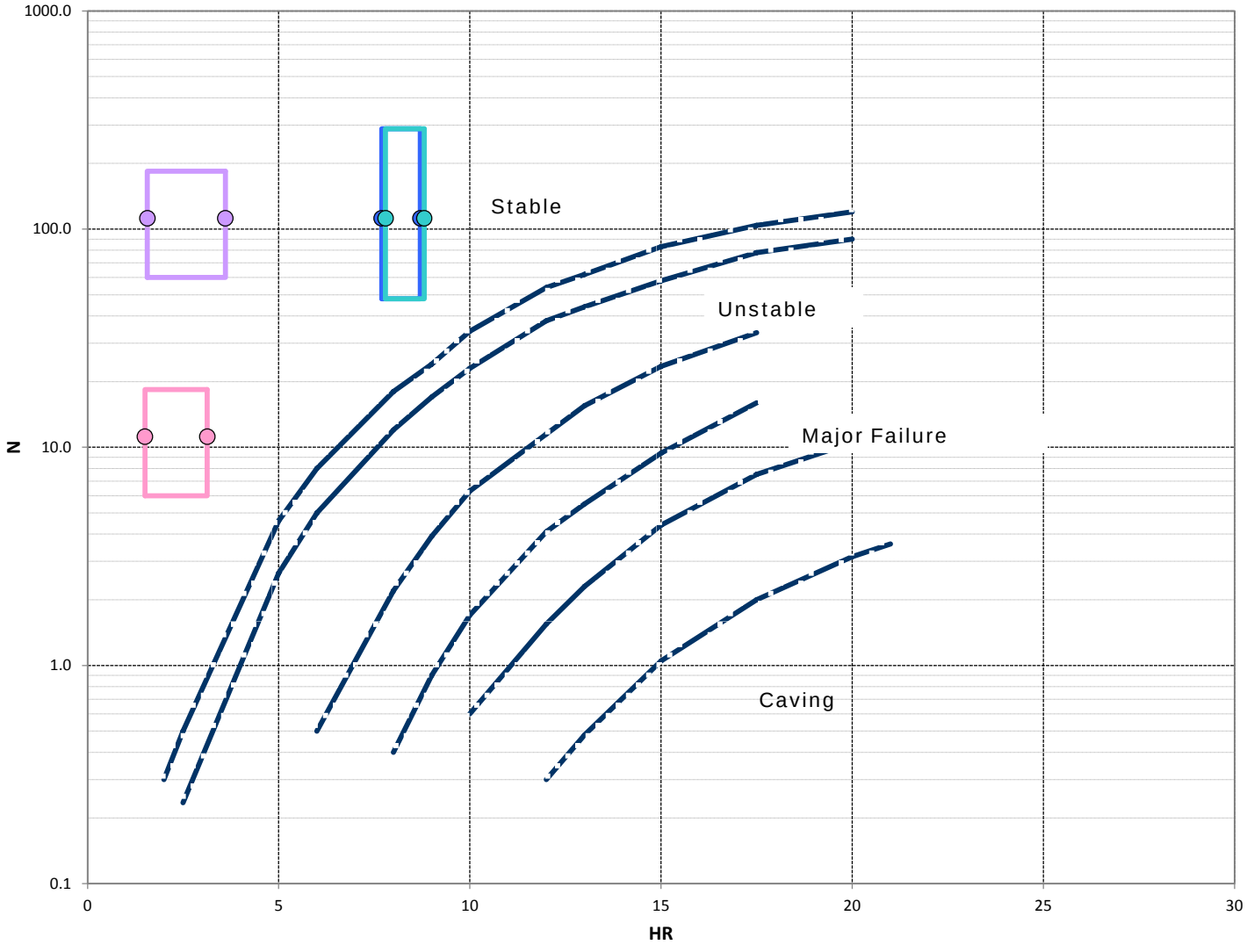
Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	7.5	14	23	1.00	1.00	0.8	1	1.5	3.1	6.0	11.2	18.4
Vertical End	7.5	14	23	1.00	1.00	1	8	1.6	3.6	60.0	112.0	184.0
Hangingwall	15	35	90	1.00	1.00	0.4	8.0	7.7	8.7	48.0	112.0	288.0
Footwall	15	35	90	1.00	1.00	0.4	8	7.7	8.7	48.0	112.0	288.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement

Mathew's Stability



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR2 B10

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-10
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

Golder Associates

STOPE INPUT DATA

Orientation

		DIMENSIONS avg.	max		STRESSES		
VERT HT(m)	40.0	40.0	*m*	VERTICAL (V)	1.2	*MPa*
DIP HT(m)	40.6	40.6	*m*	HOR.-Strike (H1)	1.7	*MPa*
SPAN (S)	14.0	18.0	*m*	HOR.-Dip (H2)	1.7	*MPa*
LENGTH* (L)	45.0	45.0	*m*			
DIP (D)	80		*deg.*	U.C.S.	37.5	*MPa*

* - along strike

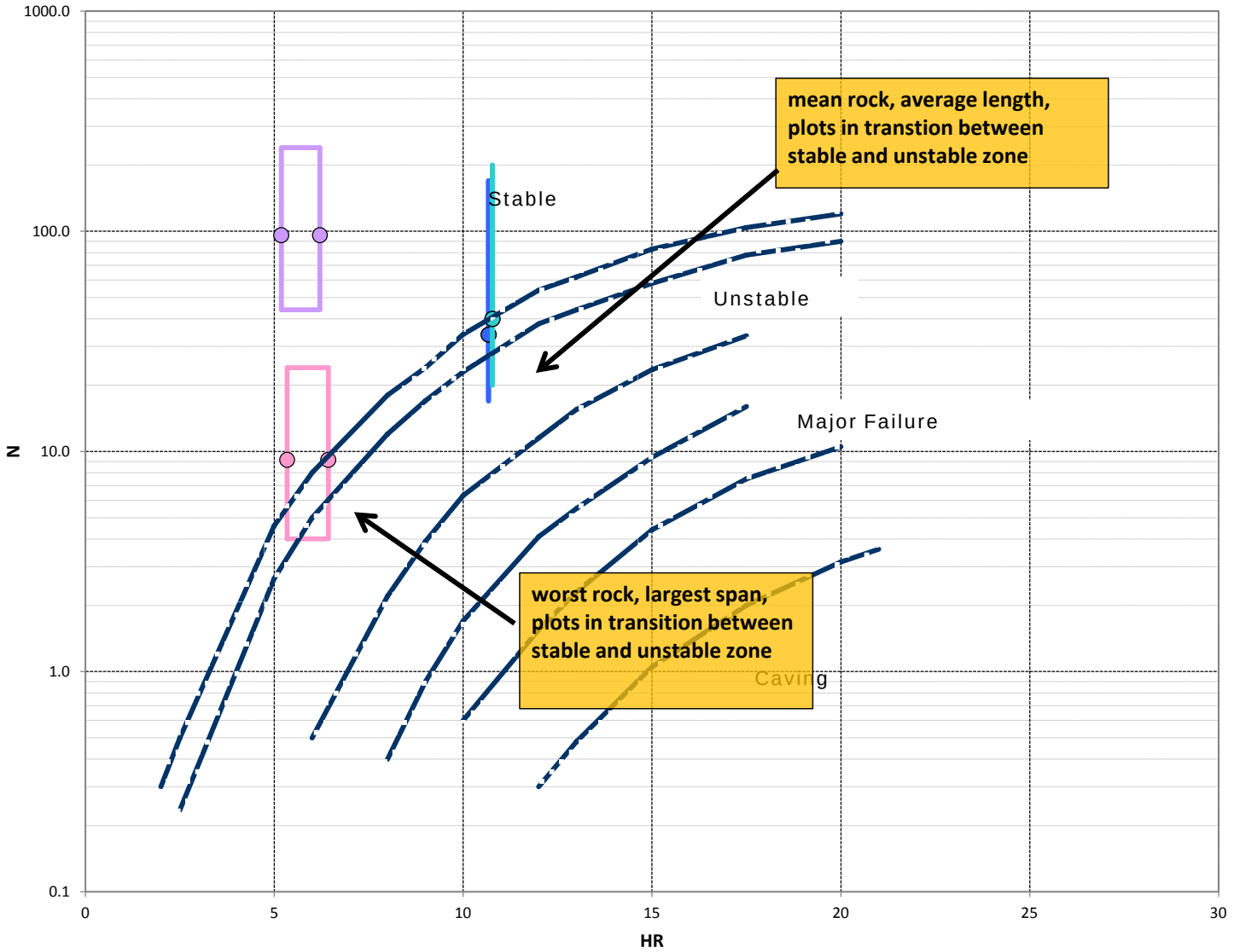
Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	5.5	12	30	0.91	1.00	0.8	1	5.3	6.4	4.0	9.2	24.0
Vertical End	5.5	12	30	1.00	1.00	1	8	5.2	6.2	44.0	96.0	240.0
Hangingwall	5	10	50	1.00	1.00	0.5	6.8	10.7	10.7	17.0	33.9	169.6
Footwall	5	10	50	1.00	1.00	0.5	8	10.7	10.7	20.0	40.0	200.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement

Mathew's Stability



Conditions in shallower portions of walls would be worse

Back Vertical Ends Hangingwall Footwall Forsyth

Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR3 - B2-08

Golder Associates

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-11

STOPE INPUT DATA

Orientation

	DIMENSIONS min	max		STRESSES		
VERT HT(m)	40.0	40.0	*m*	VERTICAL (V)	1.2	*MPa*
DIP HT(m)	40.6	40.6	*m*	HOR.-Strike (H1)	1.7	*MPa*
SPAN (S)	18.0	18.0	*m*	HOR.-Dip (H2)	1.7	*MPa*
LENGTH* (L)	24.0	24.0	*m*			
DIP (D)	80		*deg.*	U.C.S.	37.5	*MPa*

* - along strike

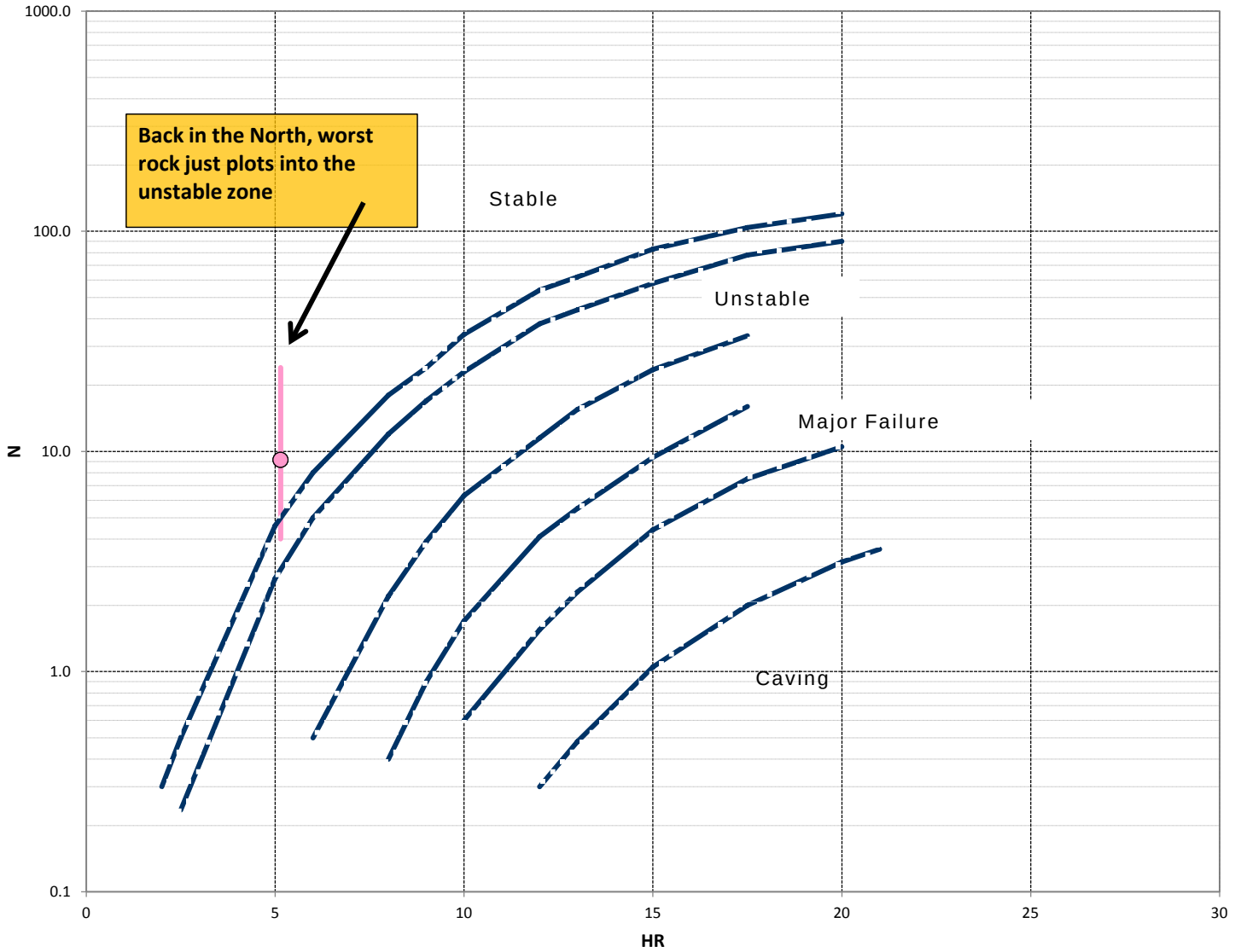
Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	5.5	12	30	0.91	1.00	0.8	1	5.1	5.1	4.0	9.2	24.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement

Mathew's Stability



Conditions in shallower portions of walls would be worse

Back · Vertical Ends · Hangingwall · Footwall · Forsyth

Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR3 - B2-08 North Back

Golder Associates

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-12
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

STOPE INPUT DATA

Orientation

		DIMENSIONS avg.	max		STRESSES		
VERT HT(m)	40.0	40.0	*m*	VERTICAL (V)	1.2	*MPa*
DIP HT(m)	40.6	40.6	*m*	HOR.-Strike (H1)	1.7	*MPa*
SPAN (S)	14.0	18.0	*m*	HOR.-Dip (H2)	1.7	*MPa*
LENGTH* (L)	45.0	45.0	*m*			
DIP (D)	80		*deg.*	U.C.S.	37.5	*MPa*

* - along strike

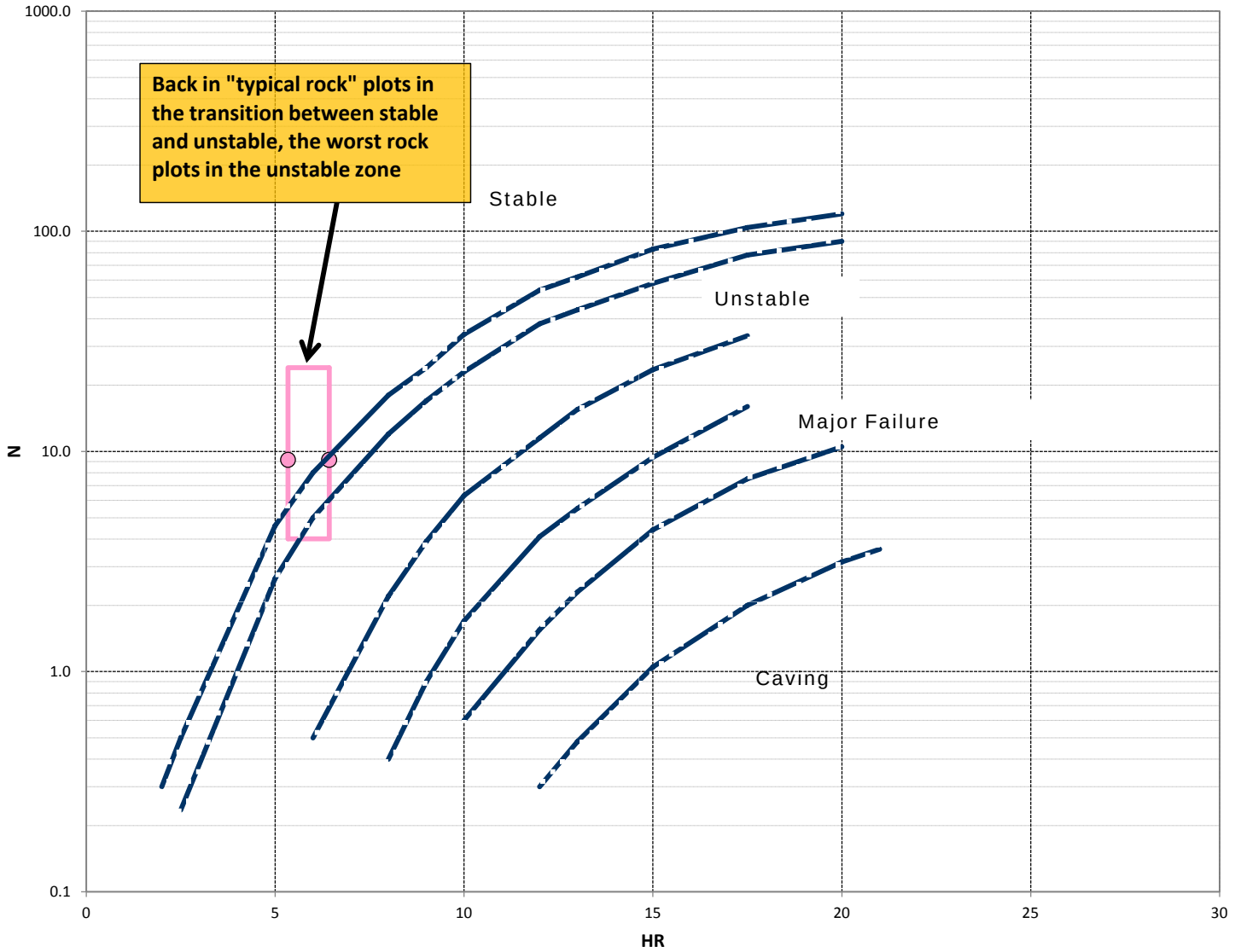
Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	5.5	12	30	0.91	1.00	0.8	1	5.3	6.4	4.0	9.2	24.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement

Mathew's Stability



Conditions in shallower portions of walls would be worse

Back Vertical Ends Hangingwall Footwall Forsyth

Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR3 - B2-08 South Back

Golder Associates

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-13

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	43.0	43.0	*m*	VERTICAL (V)	1.2	*MPa*
DIP HT(m)	45.8	45.8	*m*	HOR.-Strike (H1)	1.8	*MPa*
SPAN (S)	15.0	15.0	*m*	HOR.-Dip (H2)	1.8	*MPa*
LENGTH* (L)	45.0	45.0	*m*			
DIP (D)	70		*deg.*	U.C.S.	120.0	*MPa*

* - along strike

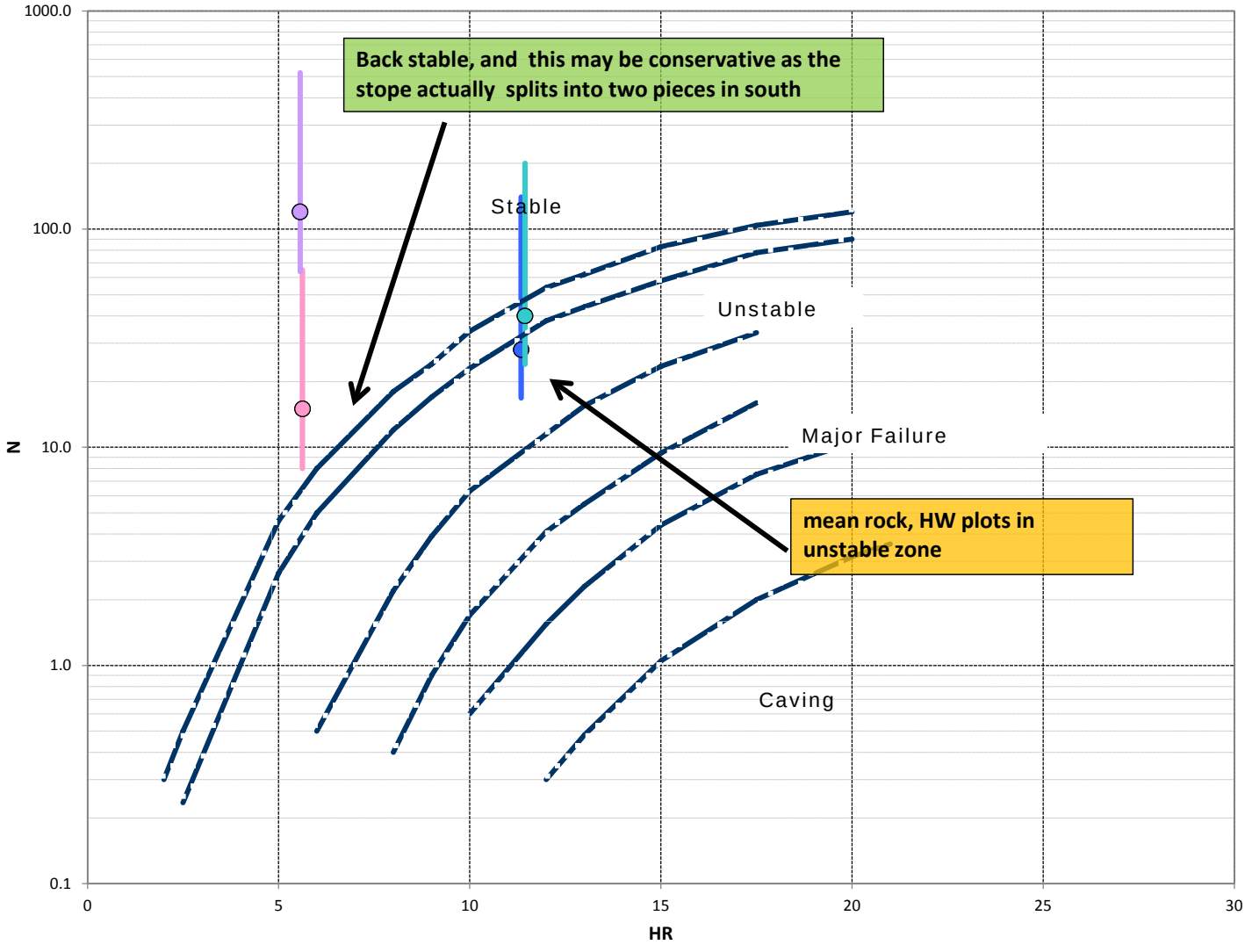
Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	8	15	65	1.00	1.00	1	1	5.6	5.6	8.0	15.0	65.0
Vertical End	8	15	65	1.00	1.00	1	8	5.6	5.6	64.0	120.0	520.0
Hangingwall	6	10	50	1.00	1.00	0.5	5.6	11.3	11.3	16.8	28.0	140.1
Footwall	6	10	50	1.00	1.00	0.5	8	11.3	11.3	24.0	40.0	200.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement

Mathew's Stability



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR3 - B3-06

Golder Associates

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-14
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix C\Table 7.1 and Appendix C.xls

STOPE INPUT DATA

Orientation

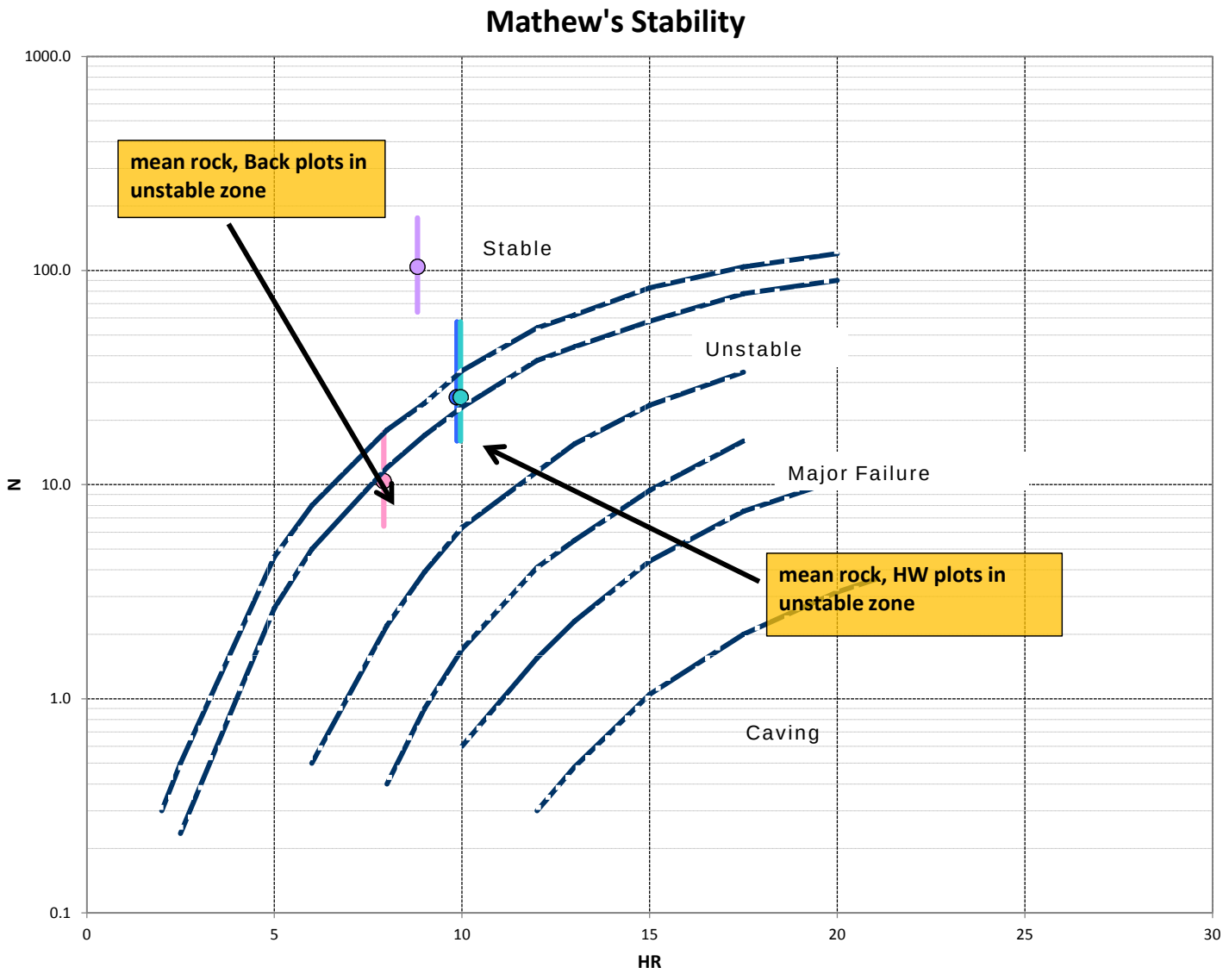
	DIMENSIONS min	max		STRESSES		
VERT HT(m)	45.2	45.2	*m*	VERTICAL (V)	1.7	*MPa*
DIP HT(m)	45.2	45.2	*m*	HOR.-Strike (H1)	2.6	*MPa*
SPAN (S)	28.9	28.9	*m*	HOR.-Dip (H2)	2.6	*MPa*
LENGTH* (L)	35.0	35.0	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

* - along strike

Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	8	13	22	1.00	1.00	0.8	1	7.9	7.9	6.4	10.4	17.6
Vertical End	8	13	22	1.00	1.00	1	8	8.8	8.8	64.0	104.0	176.0
Hangingwall	5	8	18	1.00	1.00	0.4	8.0	9.9	9.9	16.0	25.6	57.6
Footwall	5	8	18	1.00	1.00	0.4	8	9.9	9.9	16.0	25.6	57.6

Comments:



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR3 - B2-35, B2-36 Combined

Golder Associates

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-15

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	42.2	48.2	*m*	VERTICAL (V)	1.3	*MPa*
DIP HT(m)	42.2	48.2	*m*	HOR.-Strike (H1)	1.9	*MPa*
SPAN (S)	9.7	11.5	*m*	HOR.-Dip (H2)	1.9	*MPa*
LENGTH* (L)	35.0	35.0	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

* - along strike

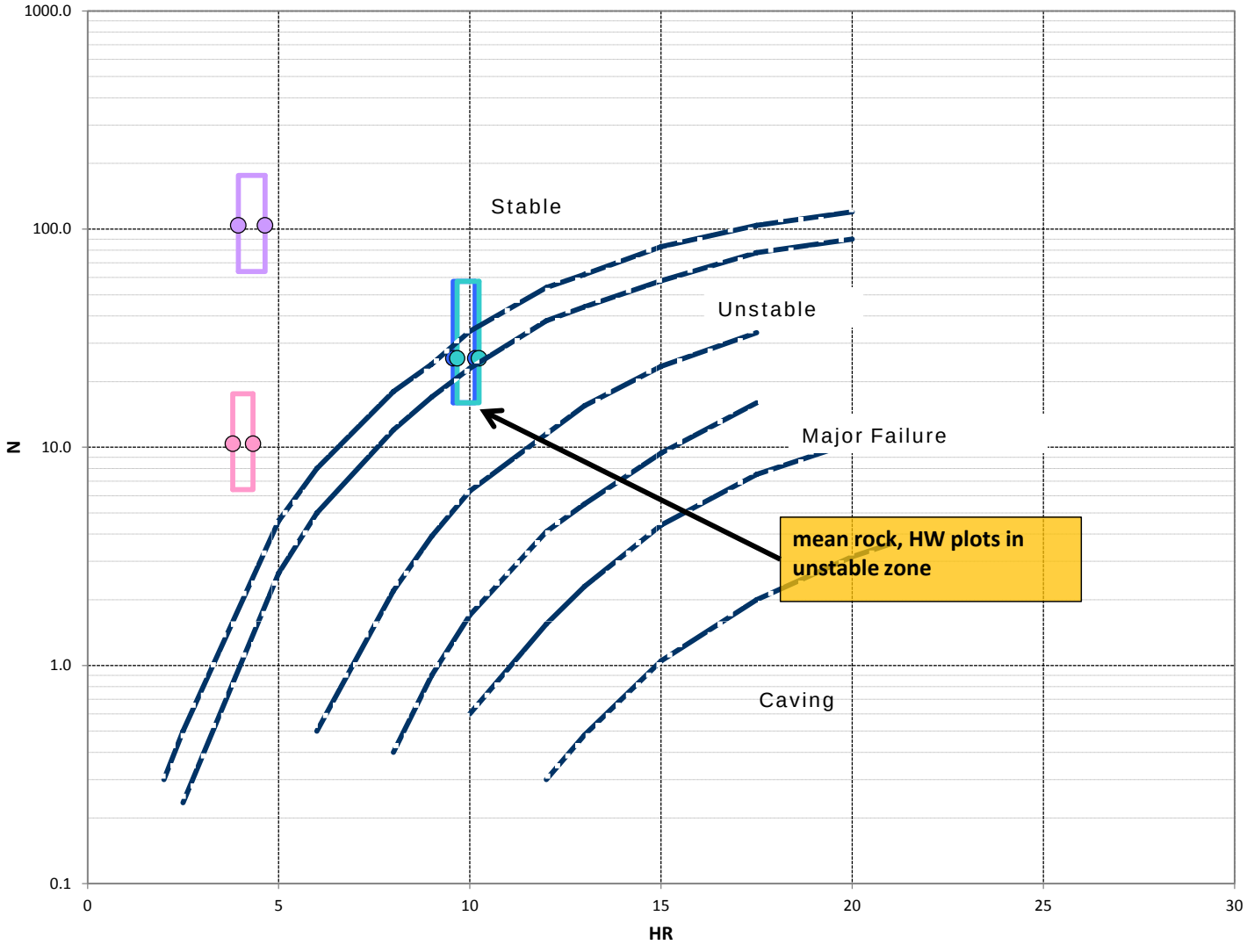
Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	8	13	22	1.00	1.00	0.8	1	3.8	4.3	6.4	10.4	17.6
Vertical End	8	13	22	1.00	1.00	1	8	3.9	4.6	64.0	104.0	176.0
Hangingwall	5	8	18	1.00	1.00	0.4	8.0	9.6	10.1	16.0	25.6	57.6
Footwall	5	8	18	1.00	1.00	0.4	8	9.6	10.1	16.0	25.6	57.6

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement

Mathew's Stability



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR3 - B2-35

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-16
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

Golder Associates

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	41.7	48.2	*m*	VERTICAL (V)	1.3	*MPa*
DIP HT(m)	41.7	48.2	*m*	HOR.-Strike (H1)	1.9	*MPa*
SPAN (S)	7.4	11.6	*m*	HOR.-Dip (H2)	1.9	*MPa*
LENGTH* (L)	35.0	35.0	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

* - along strike

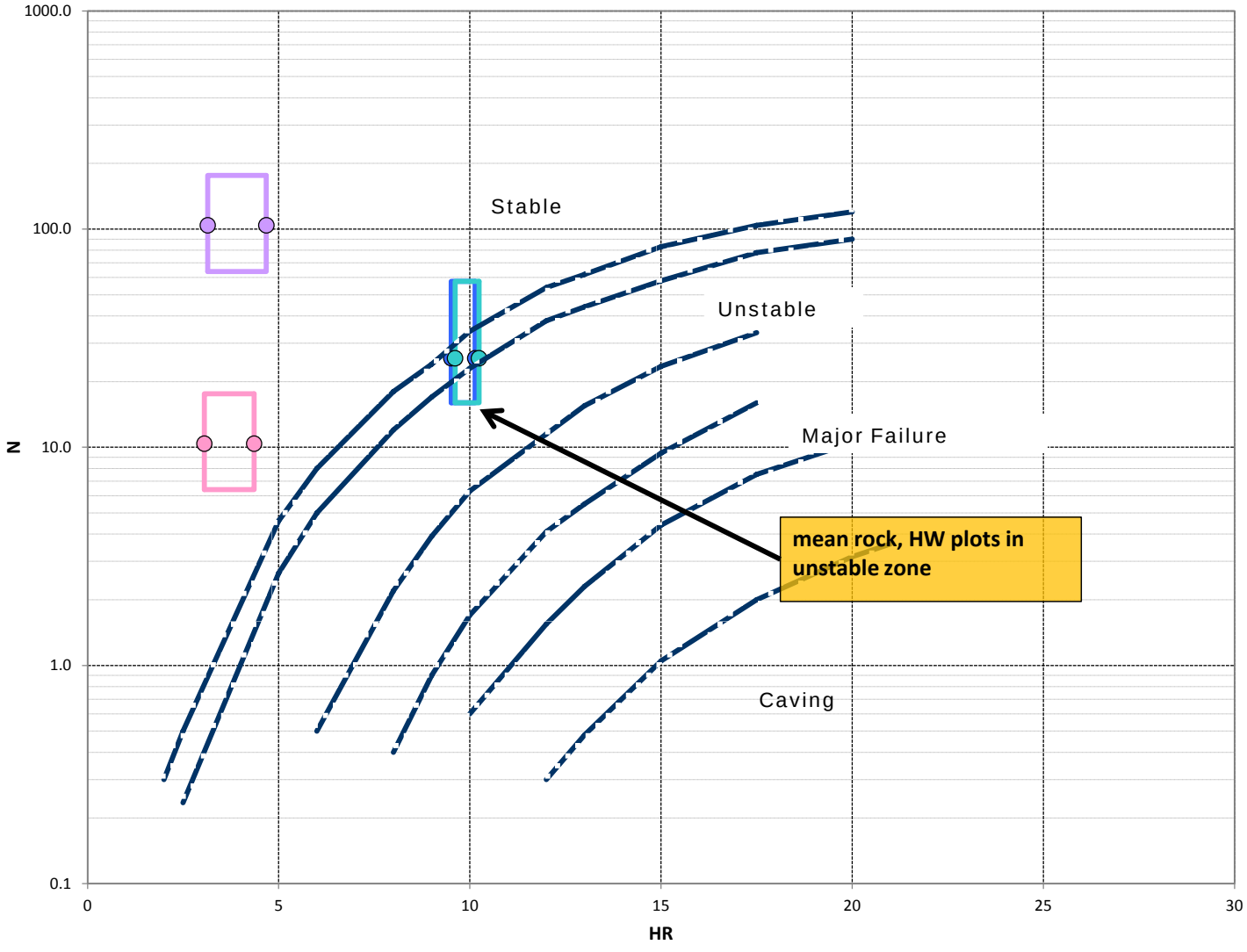
Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	8	13	22	1.00	1.00	0.8	1	3.1	4.4	6.4	10.4	17.6
Vertical End	8	13	22	1.00	1.00	1	8	3.1	4.7	64.0	104.0	176.0
Hangingwall	5	8	18	1.00	1.00	0.4	8.0	9.5	10.1	16.0	25.6	57.6
Footwall	5	8	18	1.00	1.00	0.4	8	9.5	10.1	16.0	25.6	57.6

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement

Mathew's Stability



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR3 - B2-36

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-17
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

Golder Associates

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	33.5	43.7	*m*	VERTICAL (V)	1.8	*MPa*
DIP HT(m)	33.5	43.7	*m*	HOR.-Strike (H1)	2.7	*MPa*
SPAN (S)	5.7	8.4	*m*	HOR.-Dip (H2)	2.7	*MPa*
LENGTH* (L)	35.0	35.0	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

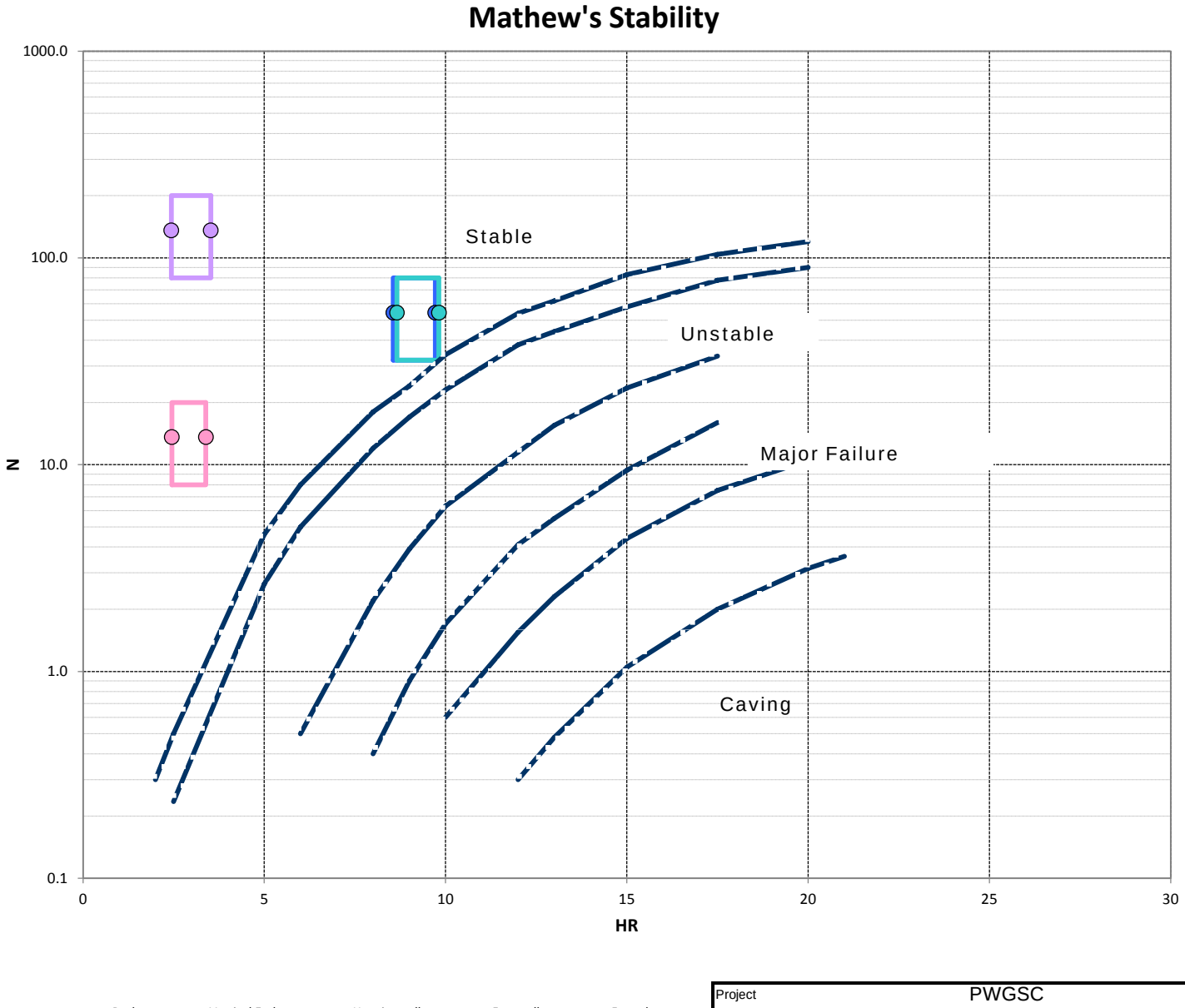
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	10	17	25	1.00	1.00	0.8	1	2.5	3.4	8.0	13.6	20.0
Vertical End	10	17	25	1.00	1.00	1	8	2.4	3.5	80.0	136.0	200.0
Hangingwall	10	17	25	1.00	1.00	0.4	8.0	8.6	9.7	32.0	54.4	80.0
Footwall	10	17	25	1.00	1.00	0.4	8	8.6	9.7	32.0	54.4	80.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Max
Average
Min

Range of stabilty number

Project: PWGSC
GIANT MINE REMEDIATION PROJECT
YELLOWKNIFE, N.W.T.

Title: AR3 - B2-33

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-18

STOPE INPUT DATA

Orientation

		DIMENSIONS min	max		STRESSES		
VERT HT(m)	31.4	44.2	*m*	VERTICAL (V)	1.7	*MPa*
DIP HT(m)	31.4	44.2	*m*	HOR.-Strike (H1)	2.5	*MPa*
SPAN (S)	6.9	9.6	*m*	HOR.-Dip (H2)	2.5	*MPa*
LENGTH* (L)	34.4	34.4	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

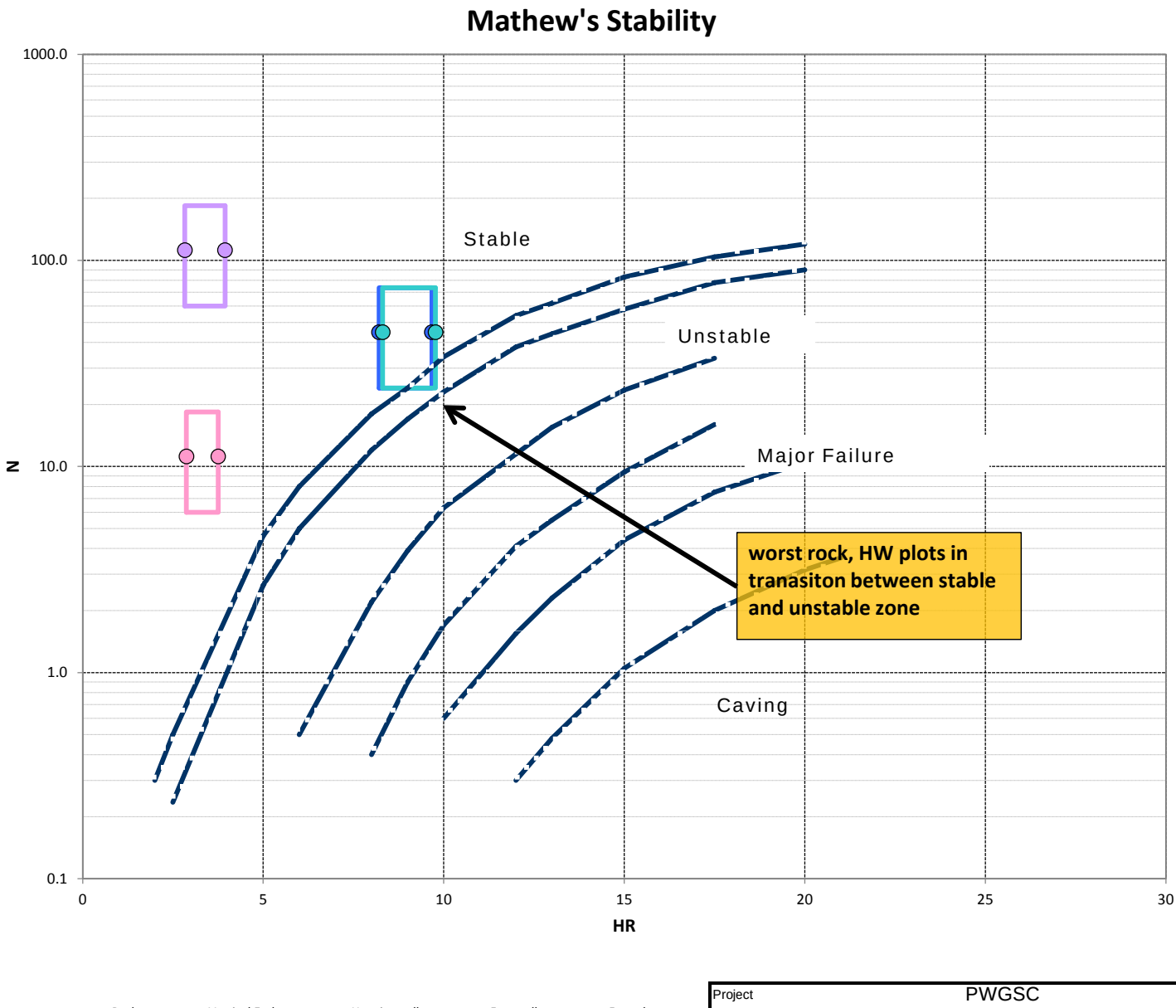
* - along strike

Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	7.5	14	23	1.00	1.00	0.8	1	2.9	3.8	6.0	11.2	18.4
Vertical End	7.5	14	23	1.00	1.00	1	8	2.8	3.9	60.0	112.0	184.0
Hangingwall	7.5	14	23	1.00	1.00	0.4	8.0	8.2	9.7	24.0	44.8	73.6
Footwall	7.5	14	23	1.00	1.00	0.4	8	8.2	9.7	24.0	44.8	73.6

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR3 - B2-34

Golder Associates

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-19
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	16.3	19.8	*m*	VERTICAL (V)	2.2	*MPa*
DIP HT(m)	16.3	19.8	*m*	HOR.-Strike (H1)	3.4	*MPa*
SPAN (S)	2.7	6.6	*m*	HOR.-Dip (H2)	3.4	*MPa*
LENGTH* (L)	22.1	22.1	*m*			
DIP (D)	90		*deg.*	U.C.S.	100.0	*MPa*

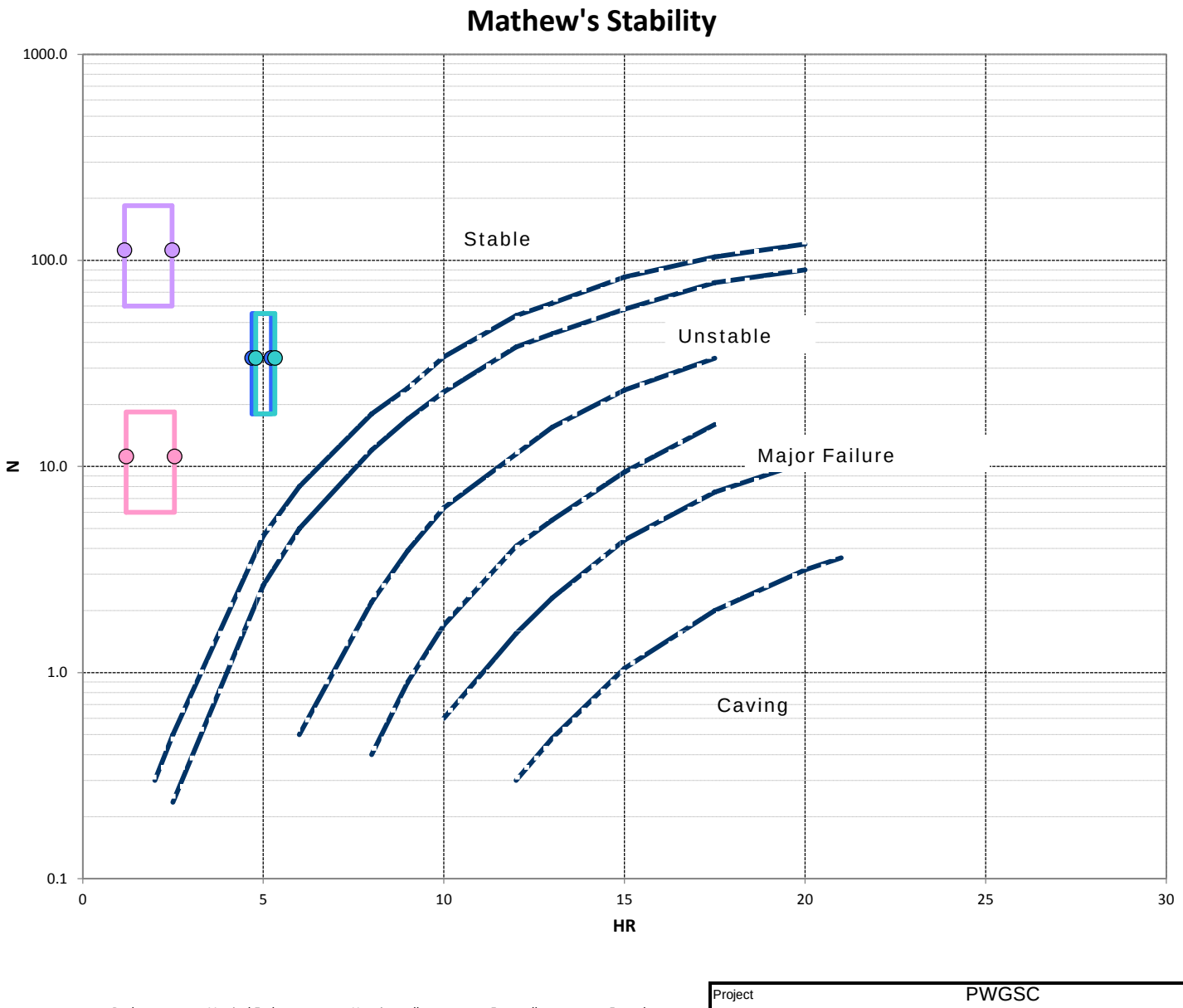
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	7.5	14	23	1.00	1.00	0.8	1	1.2	2.5	6.0	11.2	18.4
Vertical End	7.5	14	23	1.00	1.00	1	8	1.2	2.5	60.0	112.0	184.0
Hangingwall	7.5	14	23	1.00	1.00	0.3	8.0	4.7	5.2	18.0	33.6	55.2
Footwall	7.5	14	23	1.00	1.00	0.3	8	4.7	5.2	18.0	33.6	55.2

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Max
Average
Min

Range of stabilty number

Project: PWGSC
GIANT MINE REMEDIATION PROJECT
YELLOWKNIFE, N.W.T.

Title: AR3 - B2-30

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-20

STOPE INPUT DATA

Orientation

	DIMENSIONS avg.	max		STRESSES		
VERT HT(m)	58.0	58.0	*m*	VERTICAL (V)	2.4	*MPa*
DIP HT(m)	65.7	65.7	*m*	HOR.-Strike (H1)	3.6	*MPa*
SPAN (S)	12.0	14.0	*m*	HOR.-Dip (H2)	3.6	*MPa*
LENGTH* (L)	55.0	55.0	*m*			
DIP (D)	62		*deg.*	U.C.S.	75	*MPa*

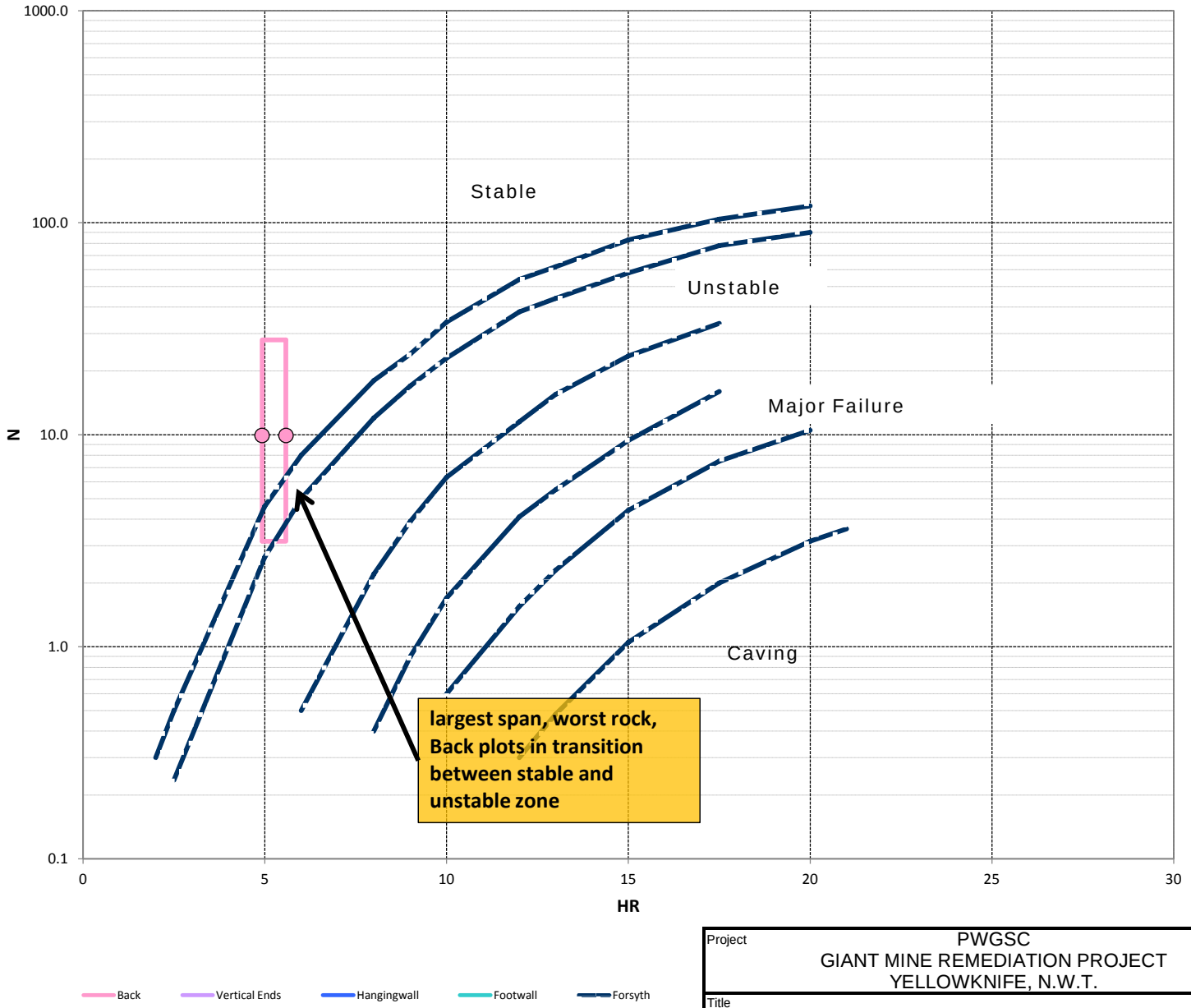
* - along strike

Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	6	15	35	0.66	1.00	0.8	1	4.9	5.6	3.1	9.9	28.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR4 - B2-12-13 Back

Golder Associates

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-21

STOPE INPUT DATA

Orientation

	DIMENSIONS avg.	max		STRESSES		
VERT HT(m)	24.0	25.0	*m*	VERTICAL (V)	1.9	*MPa*
DIP HT(m)	26.1	27.2	*m*	HOR.-Strike (H1)	2.9	*MPa*
SPAN (S)	19.0	21.0	*m*	HOR.-Dip (H2)	2.9	*MPa*
LENGTH* (L)	40.0	40.0	*m*			
DIP (D)	67		*deg.*	U.C.S.	75	*MPa*

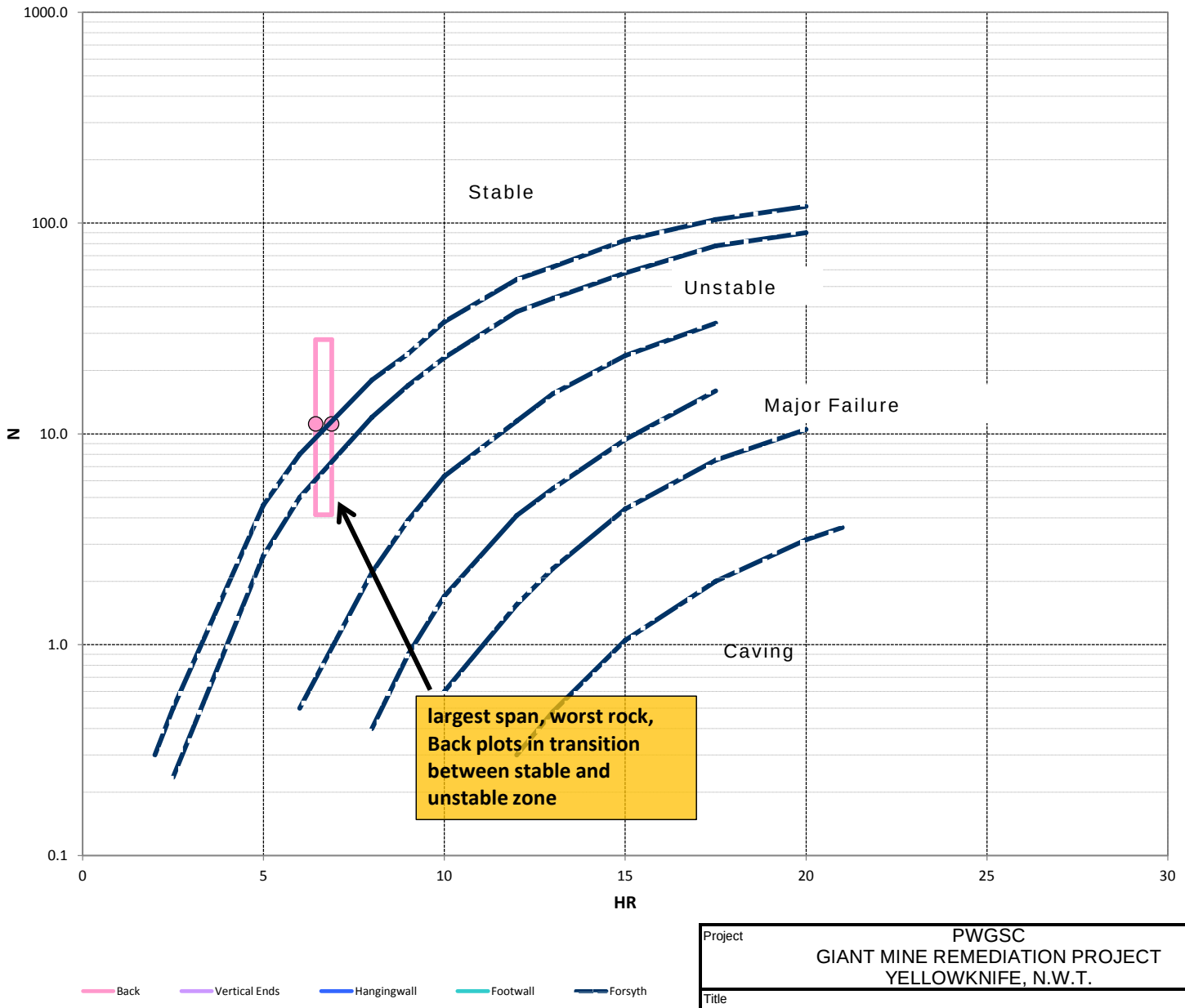
* - along strike

Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	6	15	35	0.86	1.00	0.8	1	6.4	6.9	4.1	11.2	28.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Project: PWGSC
GIANT MINE REMEDIATION PROJECT
YELLOWKNIFE, N.W.T.

Title: AR4 - B2-13-14 Back

Golder Associates

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-22

STOPE INPUT DATA

Orientation

DIMENSIONS	avg.	max		STRESSES		
VERT HT(m)	24.0	25.0	*m*	VERTICAL (V)	1.9	*MPa*
DIP HT(m)	24.1	25.1	*m*	HOR.-Strike (H1)	2.9	*MPa*
SPAN (S)	7.0	13.0	*m*	HOR.-Dip (H2)	2.9	*MPa*
LENGTH* (L)	37.0	37.0	*m*			
DIP (D)	85		*deg.*	U.C.S.	75	*MPa*

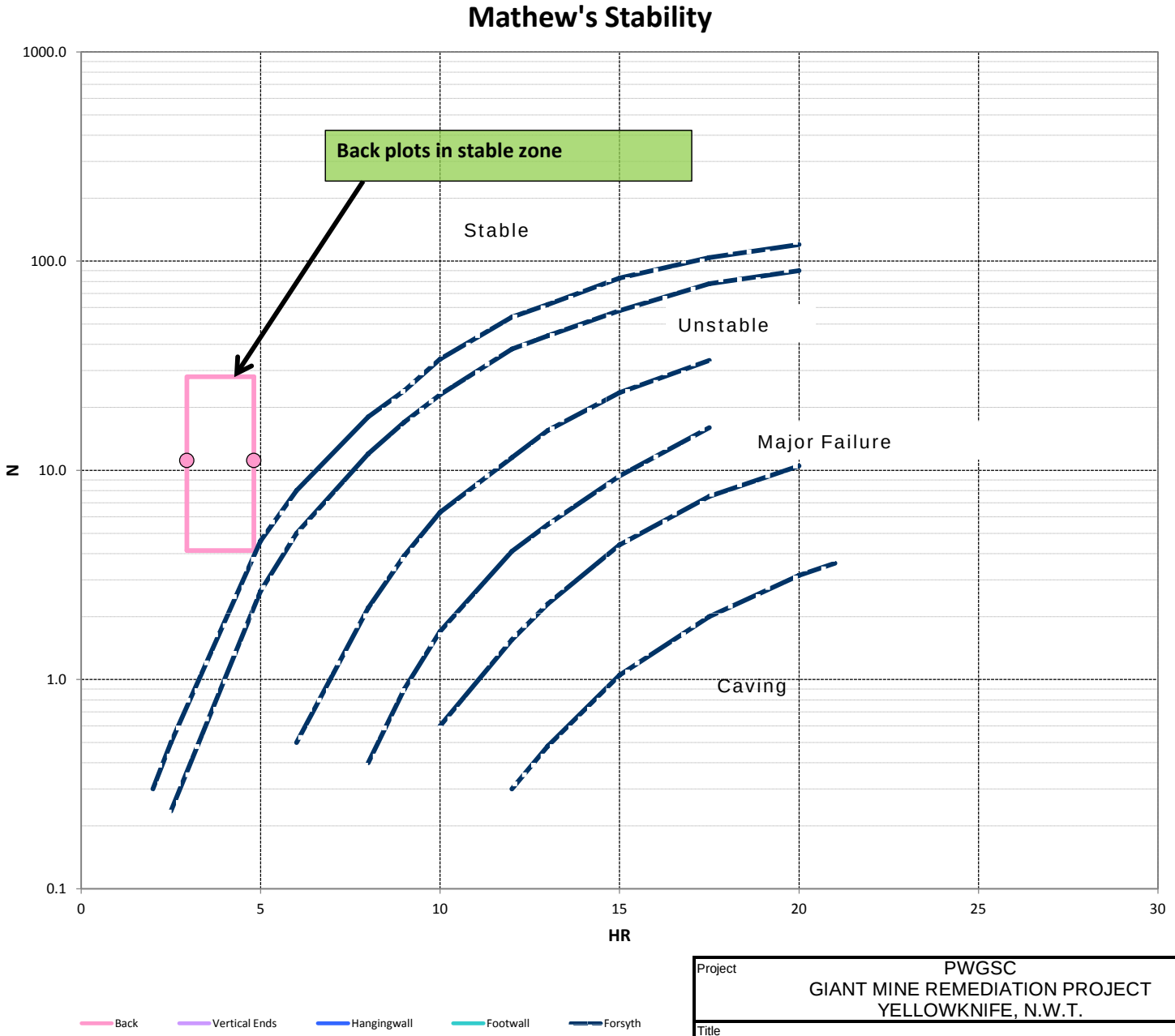
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	6	15	35	0.86	1.00	0.8	1	2.9	4.8	4.1	11.2	28.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.	
Title	AR4 - B2-14 Back	
Golder Associates	PROJECT No. 09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12
Figure C-23		

STOPE INPUT DATA

Orientation

	DIMENSIONS min	max		STRESSES		
VERT HT(m)	58.0	58.0	*m*	VERTICAL (V)	2.4	*MPa*
DIP HT(m)	61.7	61.7	*m*	HOR.-Strike (H1)	3.6	*MPa*
SPAN (S)	11.5	14.0	*m*	HOR.-Dip (H2)	3.6	*MPa*
LENGTH* (L)	55.0	55.0	*m*			
DIP (D)	70		*deg.*	U.C.S.	75	*MPa*

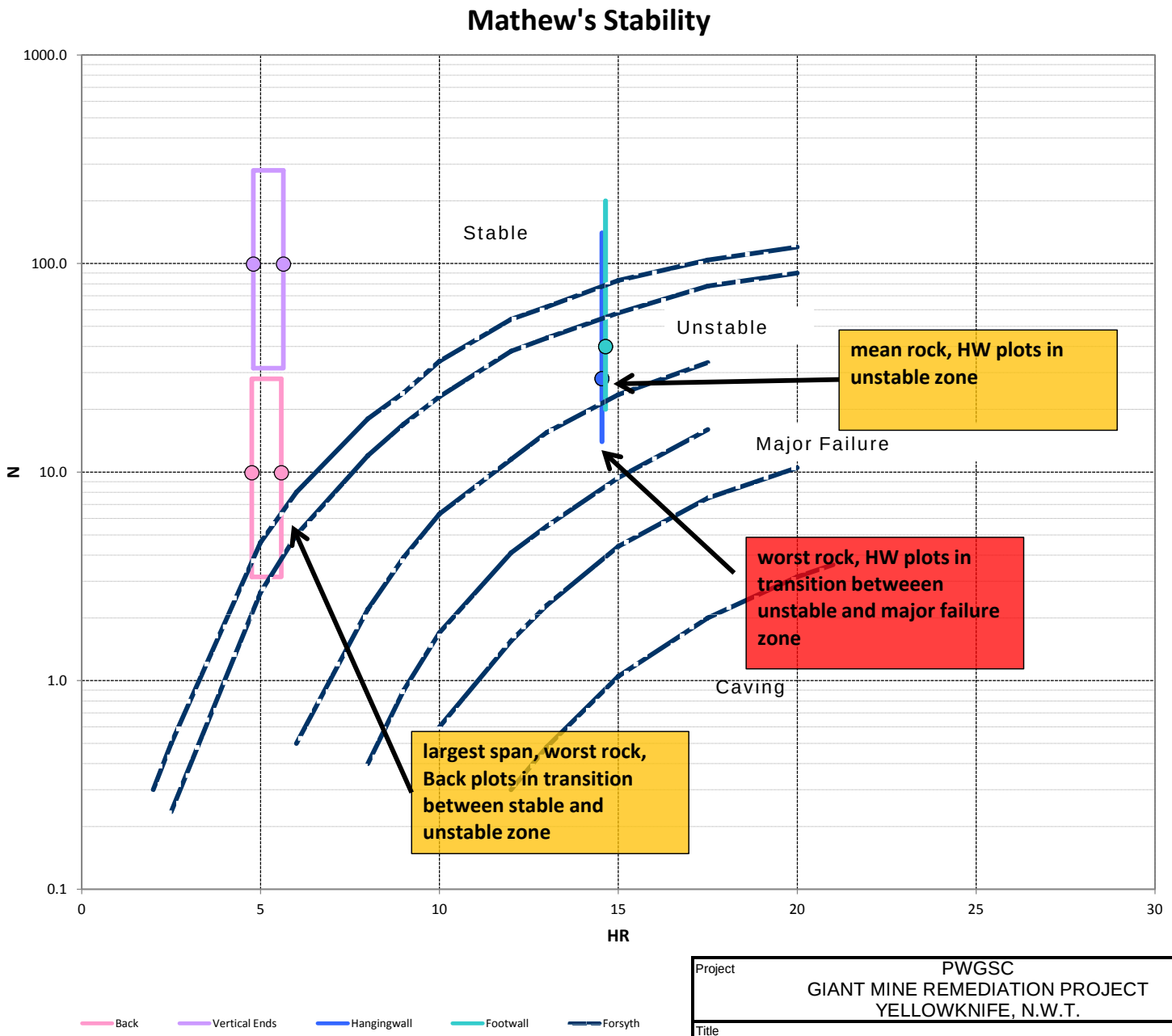
* - along strike

Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	6	15	35	0.66	1.00	0.8	1	4.8	5.6	3.1	9.9	28.0
Vertical End	6	15	35	0.66	1.00	1	8	4.8	5.6	31.5	99.3	280.0
Hangingwall	5	10	50	1.00	1.00	0.5	5.6	14.5	14.5	14.0	28.0	140.1
Footwall	5	10	50	1.00	1.00	0.5	8	14.5	14.5	20.0	40.0	200.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR4 - B2-12

Golder Associates

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-24

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	24.3	35.0	*m*	VERTICAL (V)	2.1	*MPa*
DIP HT(m)	27.8	40.0	*m*	HOR.-Strike (H1)	3.1	*MPa*
SPAN (S)	17.8	22.1	*m*	HOR.-Dip (H2)	3.1	*MPa*
LENGTH* (L)	23.0	23.0	*m*			
DIP (D)	61		*deg.*	U.C.S.	75	*MPa*

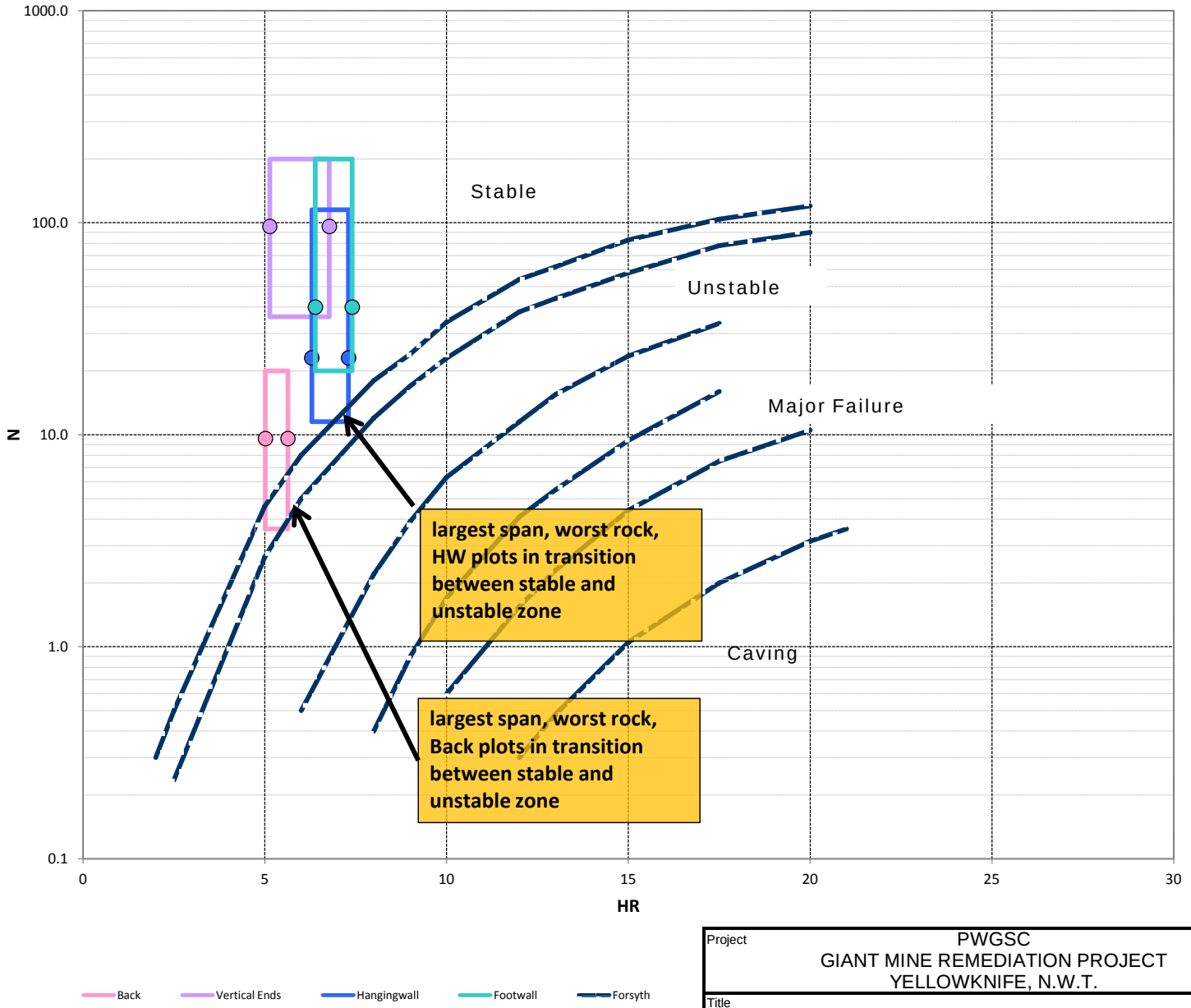
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	4.5	12	25	1.00	1.00	0.8	1	5.0	5.6	3.6	9.6	20.0
Vertical End	4.5	12	25	1.00	1.00	1	8	5.1	6.8	36.0	96.0	200.0
Hangingwall	5	10	50	1.00	1.00	0.5	4.6	6.3	7.3	11.5	23.0	115.2
Footwall	5	10	50	1.00	1.00	0.5	8	6.3	7.3	20.0	40.0	200.0

Comments:

Mathew's Stability



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.	
Title	AR4 - B2-13	
Golder Associates	PROJECT No. 09-1427-0006	Phase/Task No. 6000-6200
	RUN NSO 18-Mar-11	Figure C-25
	CHECK DTK 18-Mar-11	
	REVIEW DTK 21-Jun-12	

STOPE INPUT DATA

Orientation

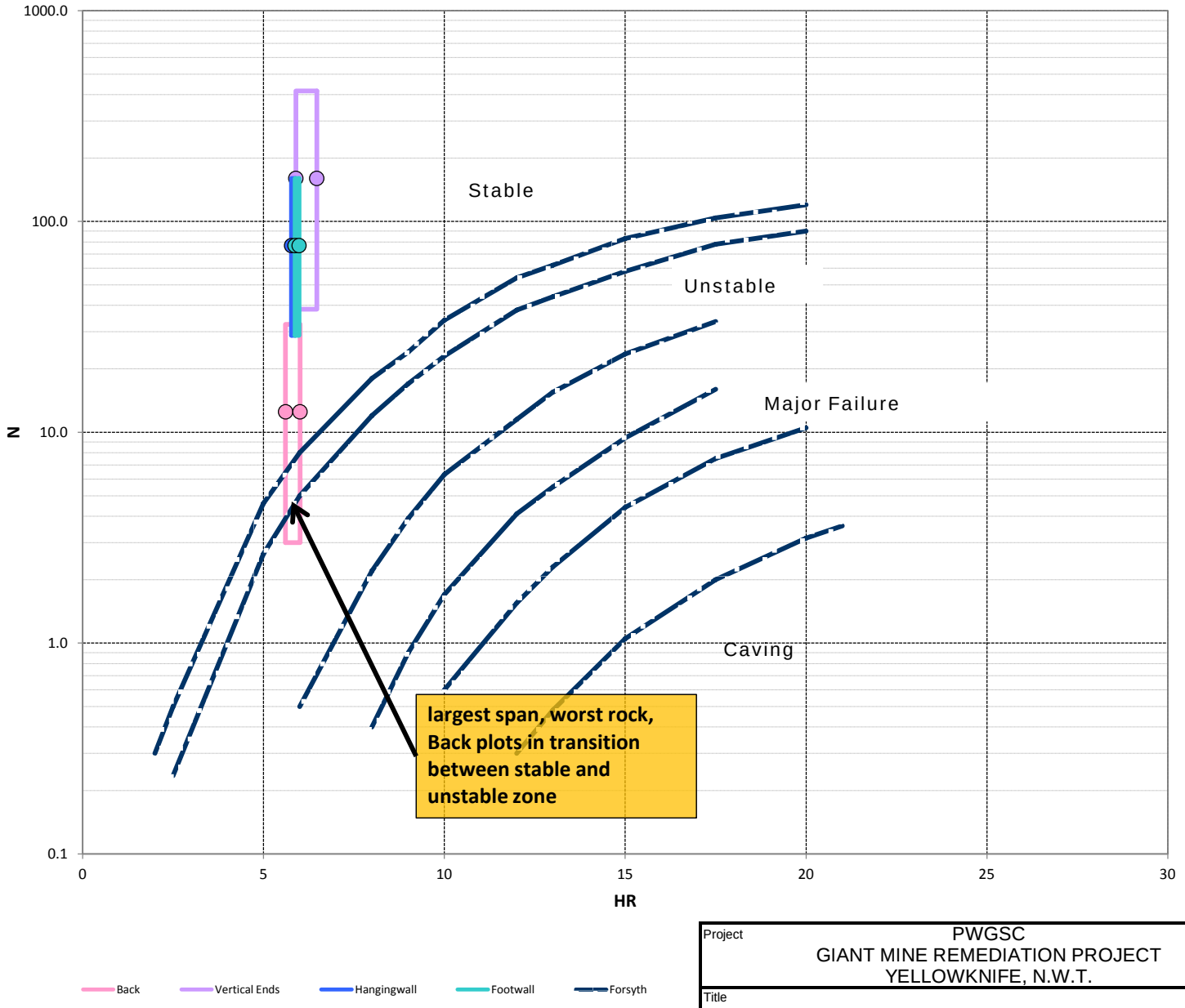
	DIMENSIONS min	max		STRESSES		
VERT HT(m)	24.3	25.3	*m*	VERTICAL (V)	1.9	*MPa*
DIP HT(m)	24.3	25.3	*m*	HOR.-Strike (H1)	2.9	*MPa*
SPAN (S)	22.9	26.5	*m*	HOR.-Dip (H2)	2.9	*MPa*
LENGTH* (L)	22.0	22.0	*m*			
DIP (D)	90		*deg.*	U.C.S.	75	*MPa*

* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	6	25	65	1.00	1.00	0.5	1	5.6	6.0	3.0	12.5	32.5
Vertical End	6	25	65	1.00	1.00	0.8	8	5.9	6.5	38.4	160.0	416.0
Hangingwall	4.5	12	25	1.00	1.00	0.8	8.0	5.8	5.9	28.8	76.8	160.0
Footwall	4.5	12	25	1.00	1.00	0.8	8	5.8	5.9	28.8	76.8	160.0

Comments:



Max
Average
Min

Range of stabilty number

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR4 - B2-14

Golder Associates

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-26

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	23.0	23.0	*m*	VERTICAL (V)	0.9	*MPa*
DIP HT(m)	23.4	23.4	*m*	HOR.-Strike (H1)	1.4	*MPa*
SPAN (S)	17.8	26.5	*m*	HOR.-Dip (H2)	1.4	*MPa*
LENGTH* (L)	45.0	45.0	*m*			
DIP (D)	80		*deg.*	U.C.S.	37.5	*MPa*

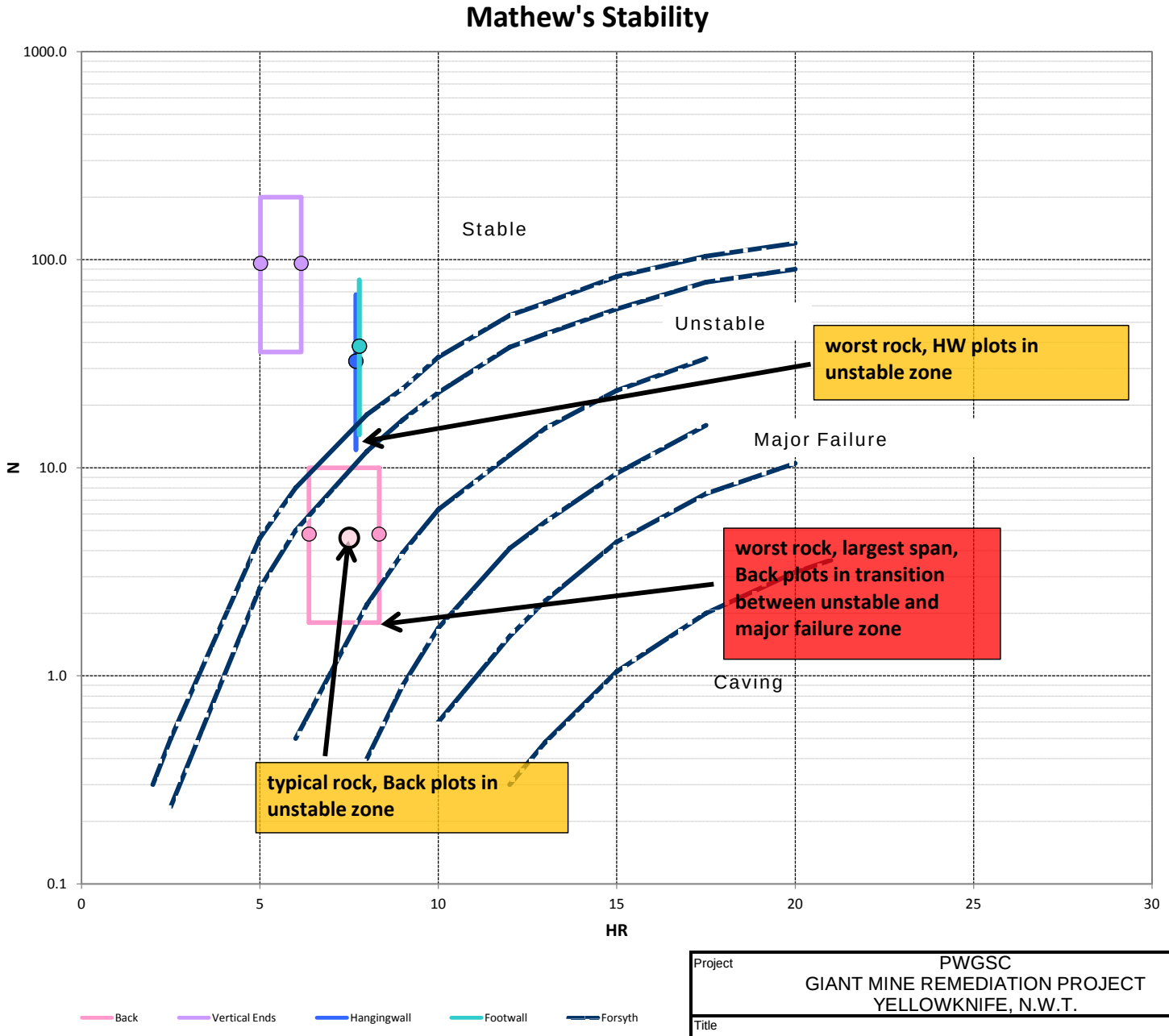
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Back	4.5	12	25	1.00	1.00	0.4	1	6.4	8.3	1.8	4.8	10.0
Vertical End	4.5	12	25	1.00	1.00	1	8	5.0	6.2	36.0	96.0	200.0
Hangingwall	4.5	12	25	1.00	1.00	0.4	6.8	7.7	7.7	12.2	32.6	67.8
Footwall	4.5	12	25	1.00	1.00	0.4	8	7.7	7.7	14.4	38.4	80.0

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement



Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR4 - B2-13 and B2-14

Golder Associates

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure C-27
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

STOPE INPUT DATA

Orientation

DIMENSIONS	min	max		STRESSES		
VERT HT(m)	40.0	40.0	*m*	VERTICAL (V)	1.2	*MPa*
DIP HT(m)	40.0	40.0	*m*	HOR.-Strike (H1)	1.8	*MPa*
SPAN (S)	**14.5**	**38.5**	*m*	HOR.-Dip (H2)	1.8	*MPa*
LENGTH* (L)	85	85	*m*			
DIP (D)	90		*deg.*	U.C.S.	75	*MPa*

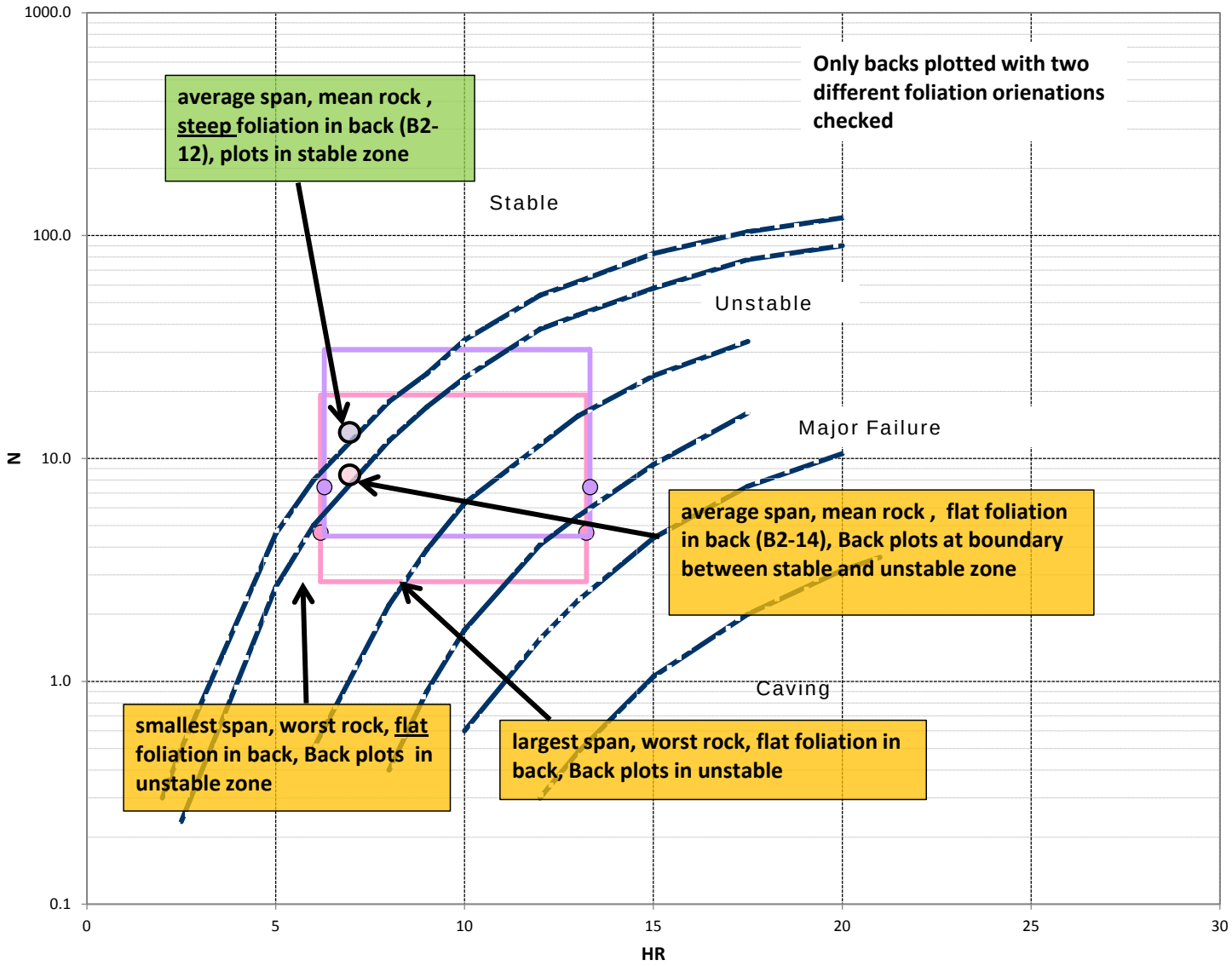
* - along strike

Stability Numbers

	Q'			Amin	Amax	B	C	HR		N		
	20%	50%	80%					Low	High	Low	Avg	High
Flat FOL	5.6	9.3	38.5	1.00	1.00	0.5	1	6.2	13.2	2.8	4.7	19.3
Steep FOL	5.6	9.3	38.5	1.00	1.00	0.8	1	6.2	13.2	4.5	7.4	30.8

Comments:

Mathew's Stability



Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE, N.W.T.
Title	AR4 - B212, B213 AND B214 Combined Back

Golder Associates	PROJECT No.	09-1427-0006	Phase/Task No.	6000-6200
	RUN	NSO	18-Mar-11	Figure C-28
	CHECK	DTK	18-Mar-11	
	REVIEW	DTK	21-Jun-12	

STOPE INPUT DATA

Orientation

	DIMENSIONS min	max		STRESSES		
VERT HT(m)	40.0	40.0	*m*	VERTICAL (V)	1.2	*MPa*
DIP HT(m)	40.0	40.0	*m*	HOR.-Strike (H1)	1.7	*MPa*
SPAN (S)	14.5	38.5	*m*	HOR.-Dip (H2)	1.7	*MPa*
LENGTH* (L)	45.0	45.0	*m*			
DIP (D)	90		*deg.*	U.C.S.	75.0	*MPa*

* - along strike

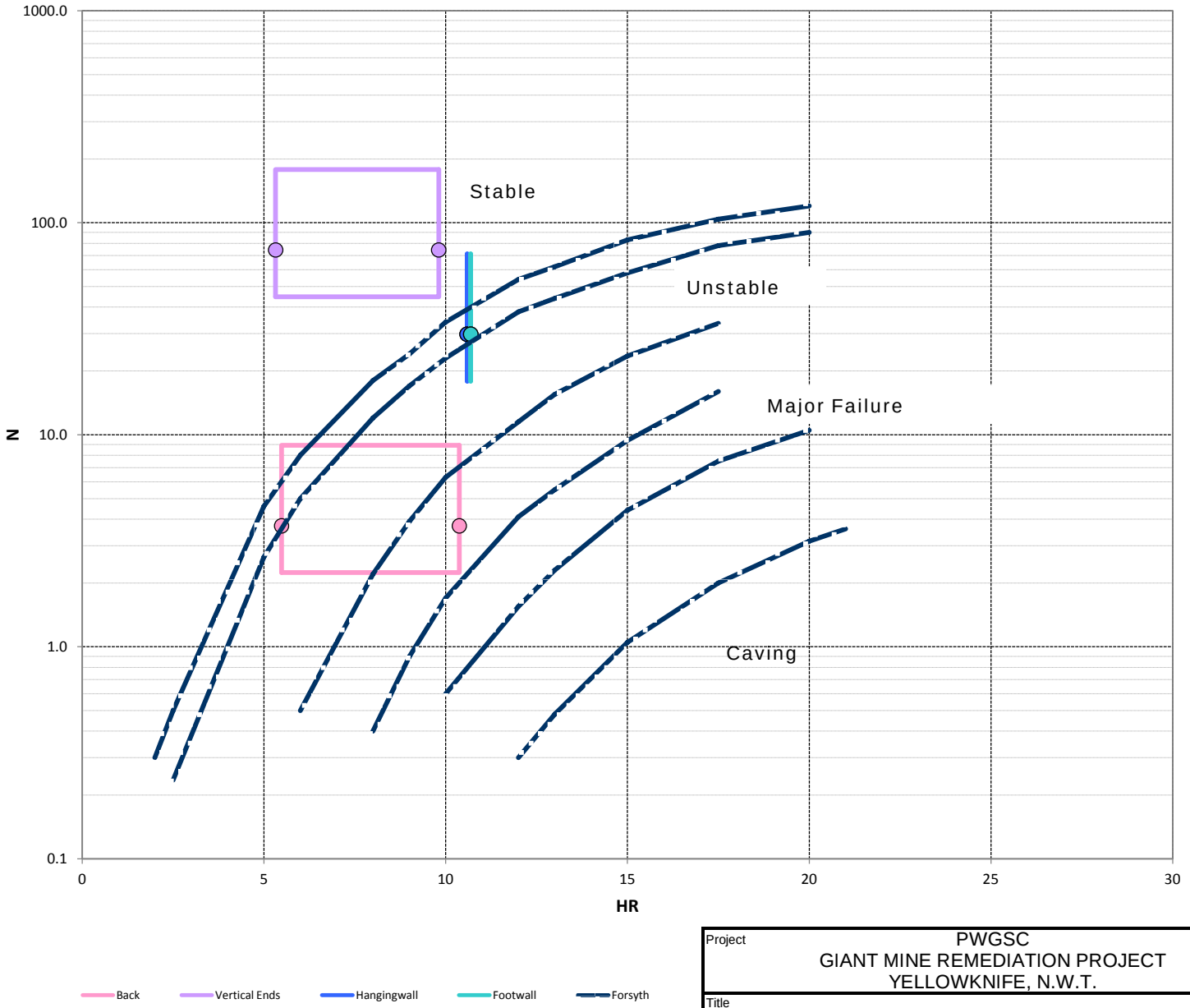
Stability Numbers

	Q' 20%	Q' 50%	Q' 80%	Amin	Amax	B	C	HR Low	HR High	N Low	N Avg	N High
Back	5.6	9.3	22.3	1.00	1.00	0.4	1	5.5	10.4	2.2	3.7	8.9
Vertical End	5.6	9.3	22.3	1.00	1.00	1	8	5.3	9.8	44.8	74.4	178.4
Hangingwall	5.6	9.3	22.3	1.00	1.00	0.4	8.0	10.6	10.6	17.9	29.8	71.4
Footwall	5.6	9.3	22.3	1.00	1.00	0.4	8	10.6	10.6	17.9	29.8	71.4

Comments:

Potential failure due to lack of confinement
Potential failure due to lack of confinement

Mathew's Stability



Max
Average
Min

Range of stabilty number

Project: PWGSC
GIANT MINE REMEDIATION PROJECT
YELLOWKNIFE, N.W.T.

Title: 2-02, 2-18 non-arsenic sterop adjacent to B2-12

Golder Associates

PROJECT No. 09-1427-0006		Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure C-29

APPENDIX D

Preliminary Crown Pillar Stability Assessment for Arsenic Stopes and Chambers – Charter Analysis

October 5, 2012
Project No. 09-1427-0006/6000/6100
Doc No. 090

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B11	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	13.2	18.2	37.5	5.0	0.0	3.1	2.1	2.5			
Average	90.0	13.0	20.3	37.5	5.0	0.0	3.1	2.1	2.5			

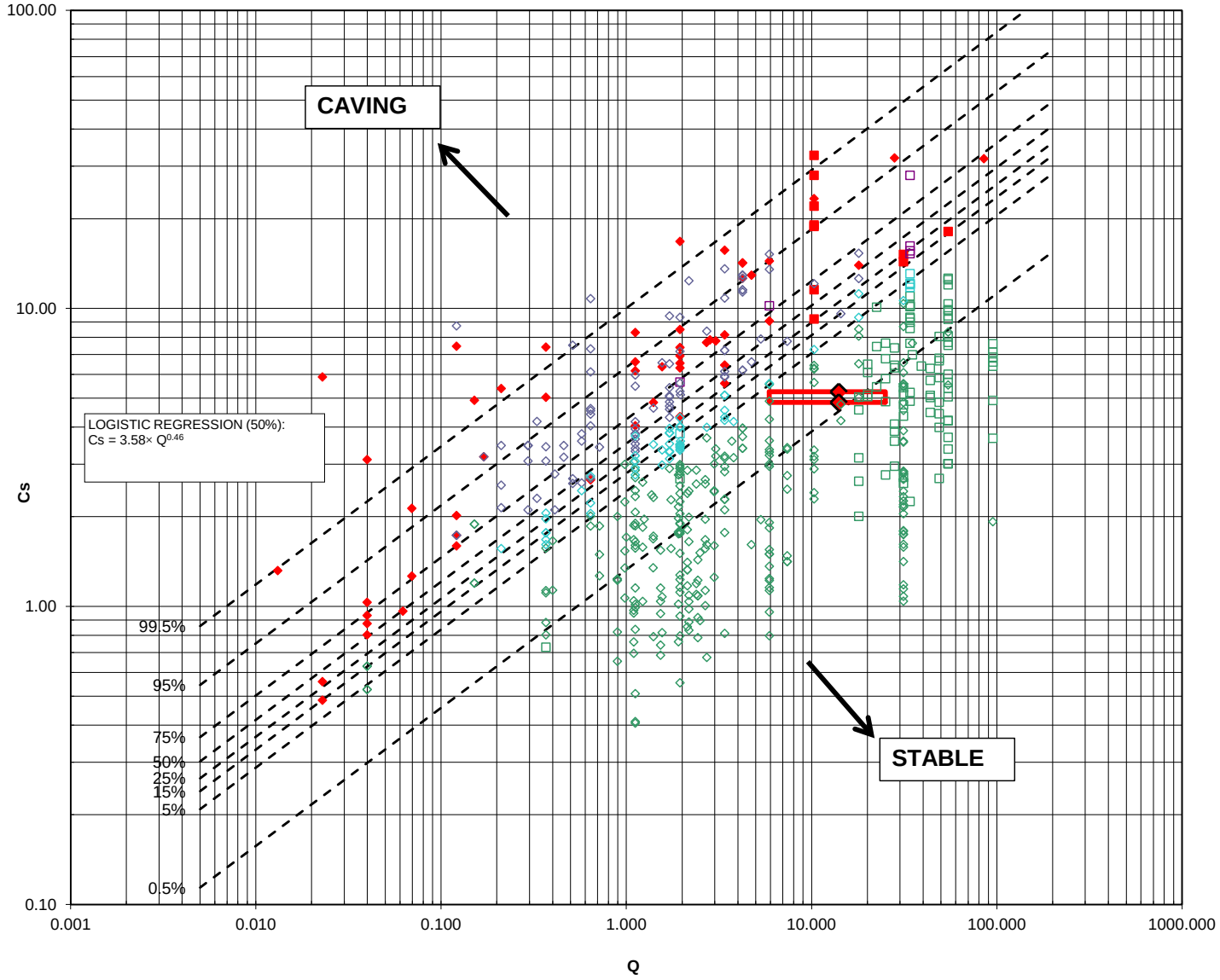
Rock Crown Thickness

13.2	m
15.3	m

Factor of Safety | **Probability of Failure**

B11	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	5.9	14.0	25.0	5.3	7.1	10.5	13.7	1.4	2.0	2.6	12%	4%	2%
Average	5.9	14.0	25.0	4.8	7.1	10.5	13.7	1.5	2.2	2.8	9%	3%	2%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B11

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR1 B11

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-1

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B12	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	13.7	22.8	61.6	0.0	0.0	3.1	2.1	2.5			
Average	90.0	13.2	23.5	61.6	0.0	0.0	3.1	2.1	2.5			

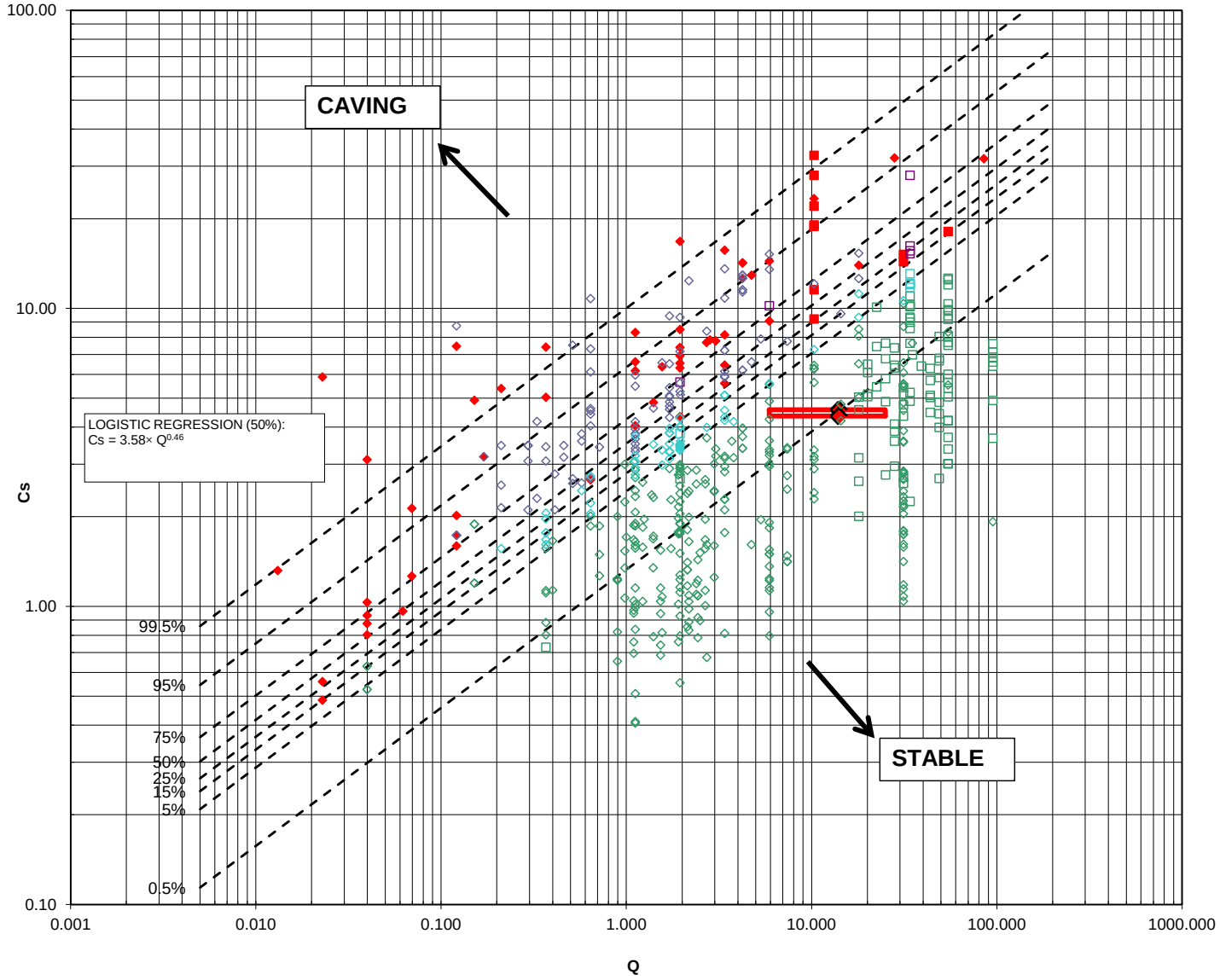
Rock Crown Thickness

22.8	m
23.5	m

Factor of Safety | **Probability of Failure**

B12	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	5.9	14.0	25.0	4.6	7.1	10.5	13.7	1.6	2.3	3.0	7.4%	2.5%	1.5%
Average	5.9	14.0	25.0	4.4	7.1	10.5	13.7	1.6	2.4	3.1	6.3%	2.2%	1.3%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B12

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR1 B12

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-2

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B14	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	13.1	21.4	54.0	0.0	0.0	3.1	2.1	2.5			
Average	90.0	12.6	24.4	54.0	0.0	0.0	3.1	2.1	2.5			

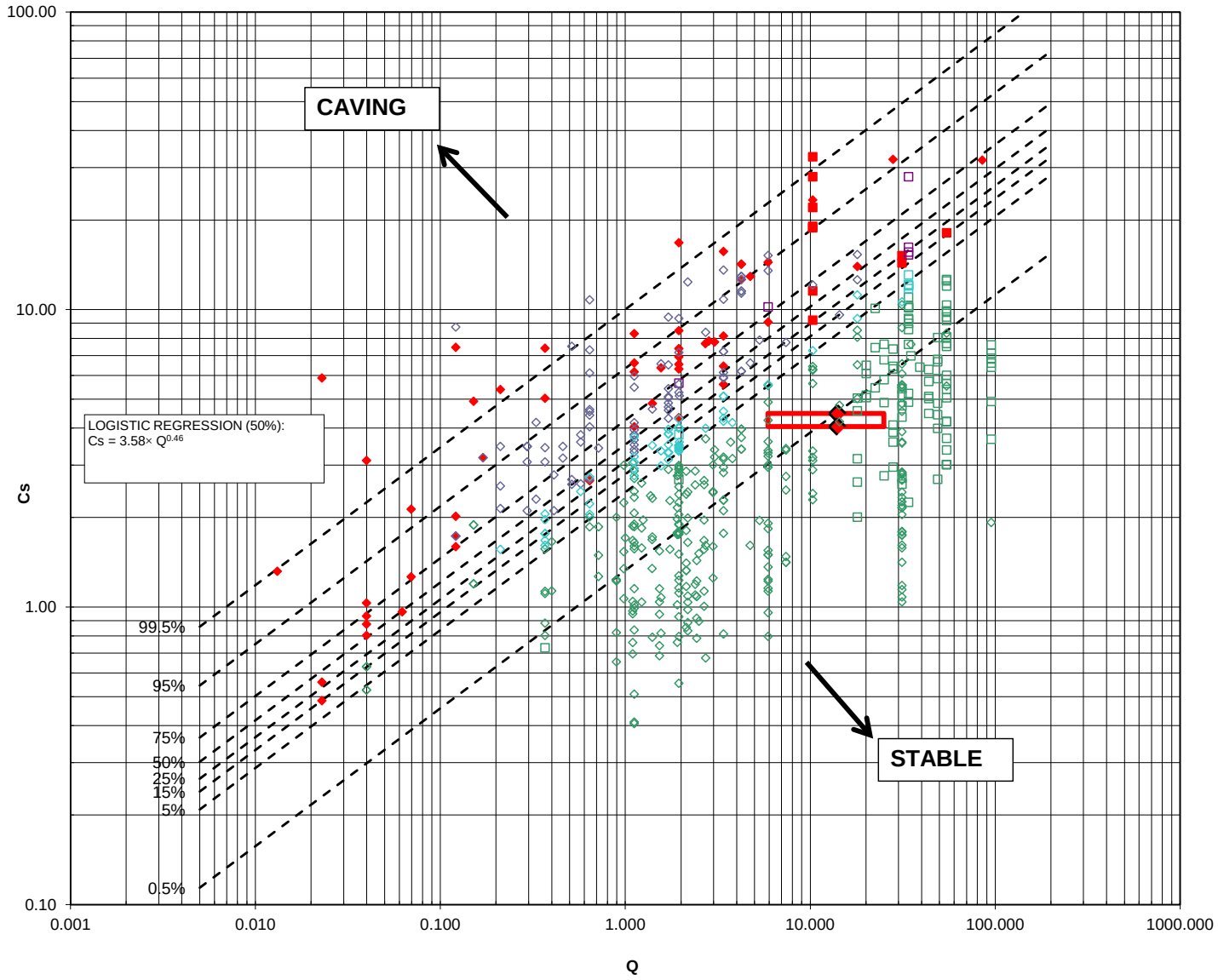
Rock Crown Thickness

21.4	m
24.4	m

Factor of Safety | **Probability of Failure**

B14	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	5.9	14.0	25.0	4.5	7.1	10.5	13.7	1.6	2.3	3.1	6.9%	2.4%	1.4%
Average	5.9	14.0	25.0	4.0	7.1	10.5	13.7	1.8	2.6	3.4	5.0%	1.9%	1.2%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B14

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR1 B14

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-3

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B15	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	15.2	22.3	60.0	0.0	0.0	3.1	2.1	2.5			
Average	90.0	14.1	25.1	60.0	0.0	0.0	3.1	2.1	2.5			

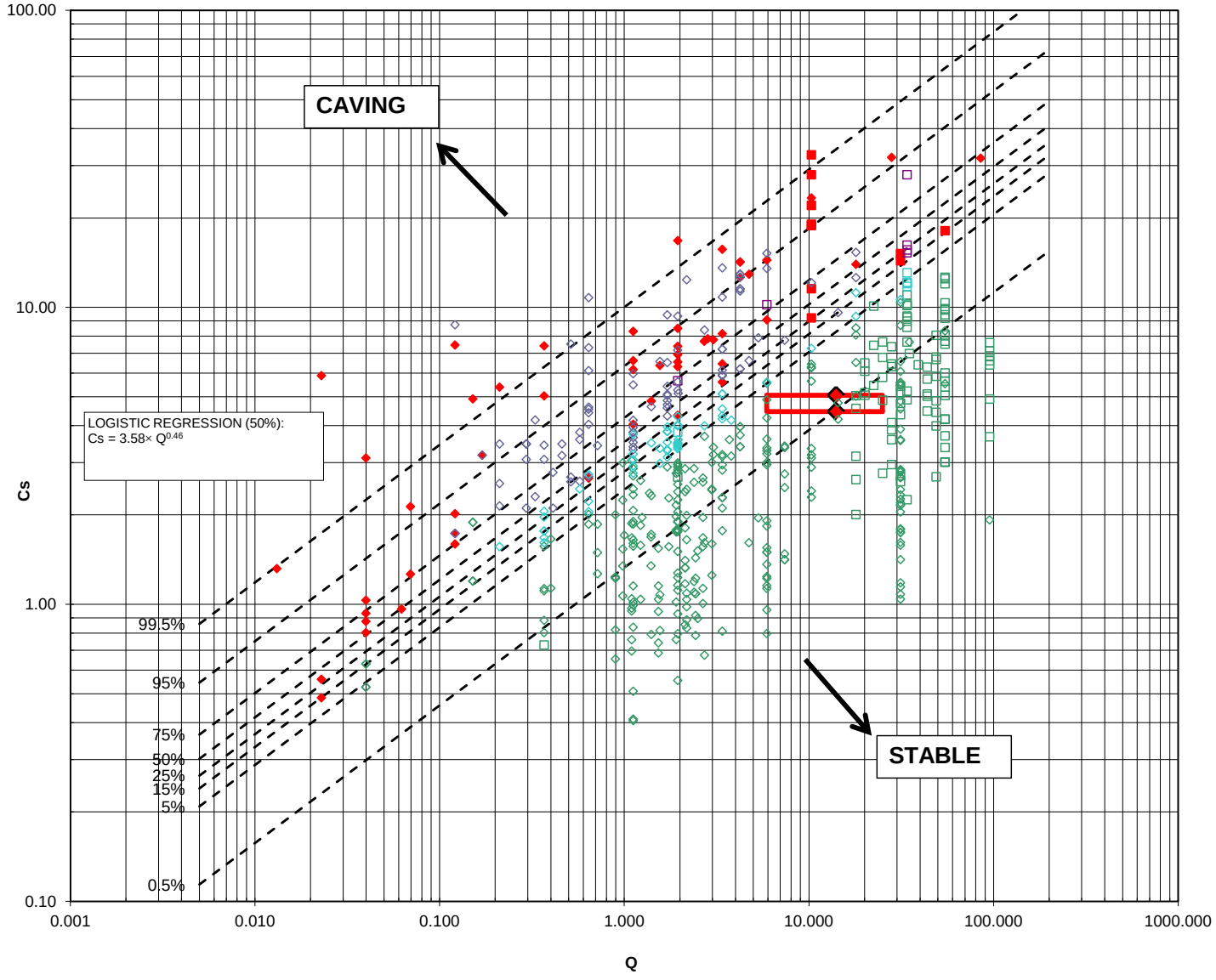
Rock Crown Thickness

22.3	m
25.1	m

Factor of Safety | **Probability of Failure**

B15	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	5.9	14.0	25.0	5.1	7.1	10.5	13.7	1.4	2.1	2.7	10.5%	3.2%	1.8%
Average	5.9	14.0	25.0	4.5	7.1	10.5	13.7	1.6	2.4	3.1	6.8%	2.4%	1.4%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B15

Max
Average
Min

Range of rock mass quality (Q)

Project: PWGSC
GIANT MINE REMEDIATION PROJECT
YELLOWKNIFE N.W.T.

Title: AR1 B15

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-4

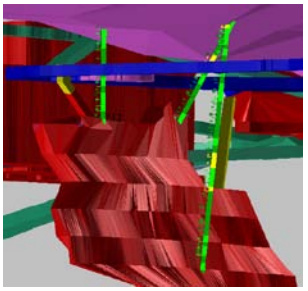
Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

C2-12	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	75.0	11.0	30.7	50.0	14.3	0.0	3.1	2.1	2.5			
Average	75.0	8.0	30.8	50.0	10.8	0.0	3.1	2.1	2.5			

Rock Crown Thickness

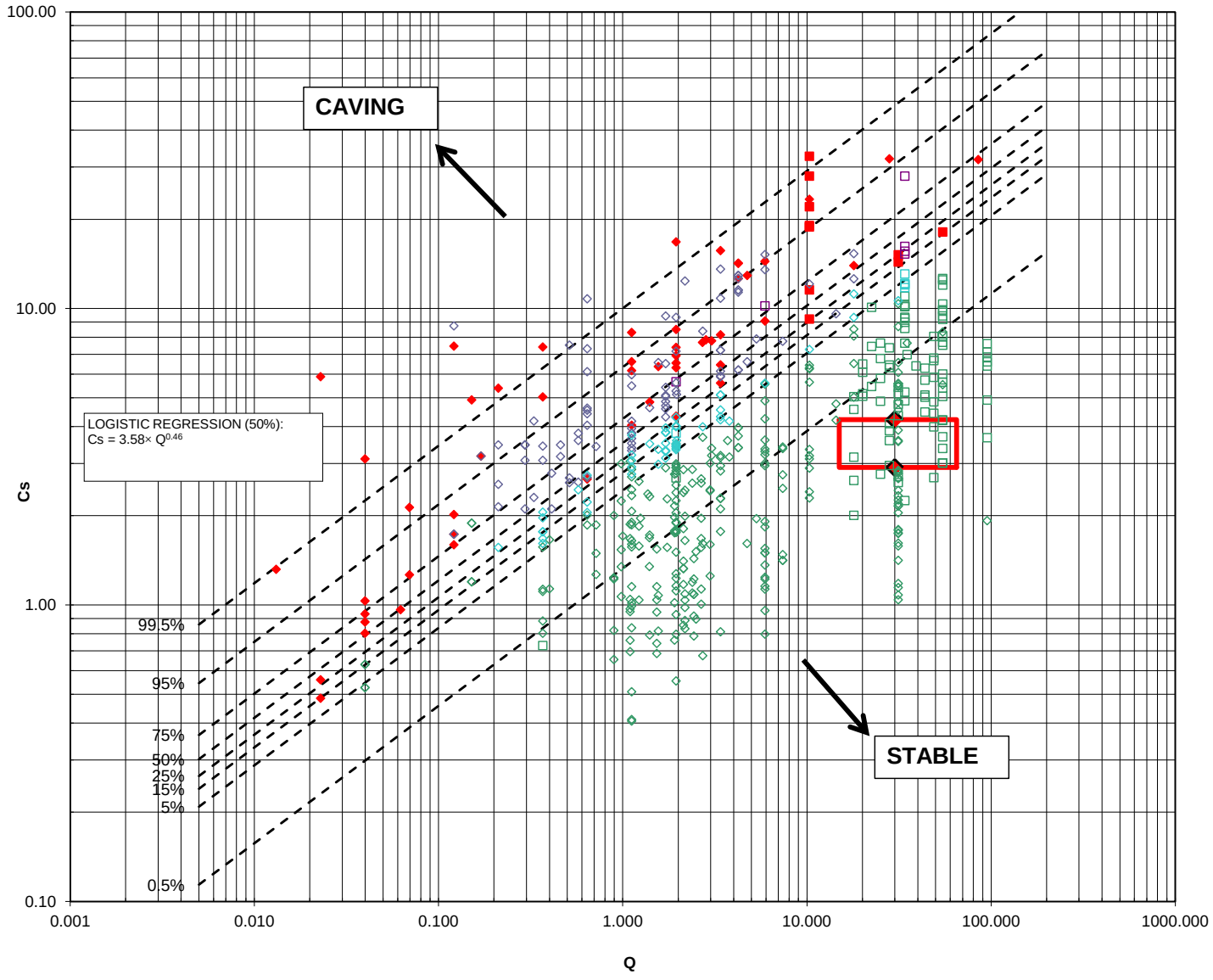
16.4	m
20.0	m



Factor of Safety | **Probability of Failure**

C2-12	Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	15.0	30.0	65.0	4.2	10.8	14.9	22.0	2.6	3.5	5.2	2.0%	1.1%	0.7%
Average	15.0	30.0	65.0	2.9	10.8	14.9	22.0	3.7	5.1	7.6	1.0%	0.7%	0.5%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | C2-12

Max / Average / Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR2 C2-12

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

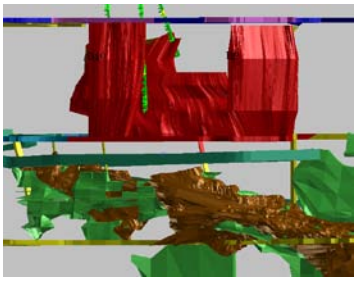
Figure D-5

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

C5-09	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
South	70.0	11.0	11.0	135.0	0.0	0.0	3.1	2.1	2.5			
North	70.0	16.0	18.0	135.0	0.0	0.0	3.1	2.1	2.5			

Rock Crown Thickness

11.0	m
18.0	m

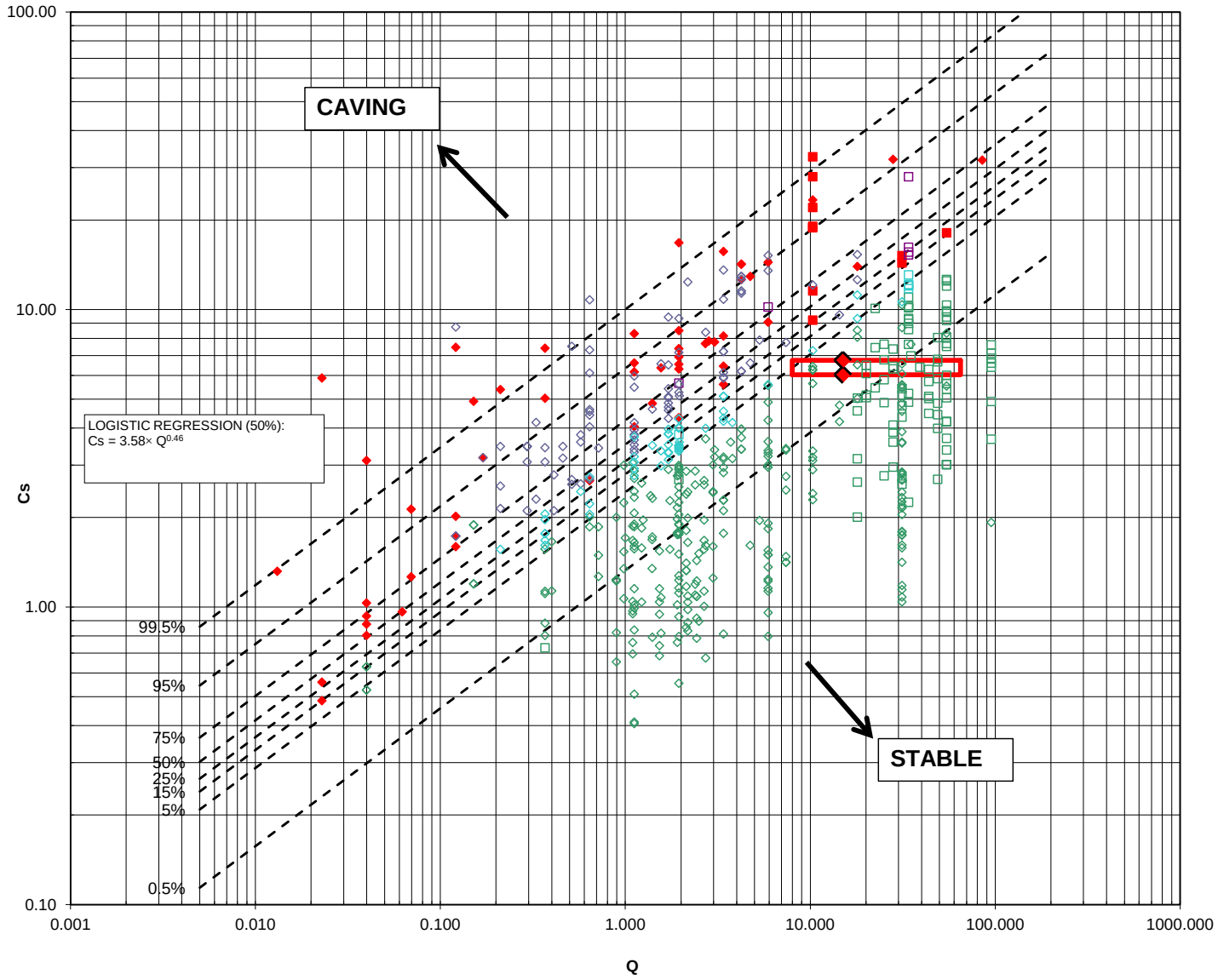


Factor of Safety | **Probability of Failure**

C5-09	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%*	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
South	8.0	15.0	65.0	6.0	8.2	10.8	22.0	1.4	1.8	3.6	12.2%	4.9%	1.2%
North	8.0	15.0	65.0	6.8	8.2	10.8	22.0	1.2	1.6	3.3	18.4%	6.9%	1.4%

* Slightly reduced 50% Q' used due to lack of drilling

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | C5-09

Max / Average / Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR2 - C2-12 / C5-09 Sill Pillar

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-6

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B9	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	11.4	34.0	29.9	17.2	0.0	3.1	2.1	2.5			
Average	90.0	10.6	30.0	29.9	8.3	0.0	3.1	2.1	2.5			

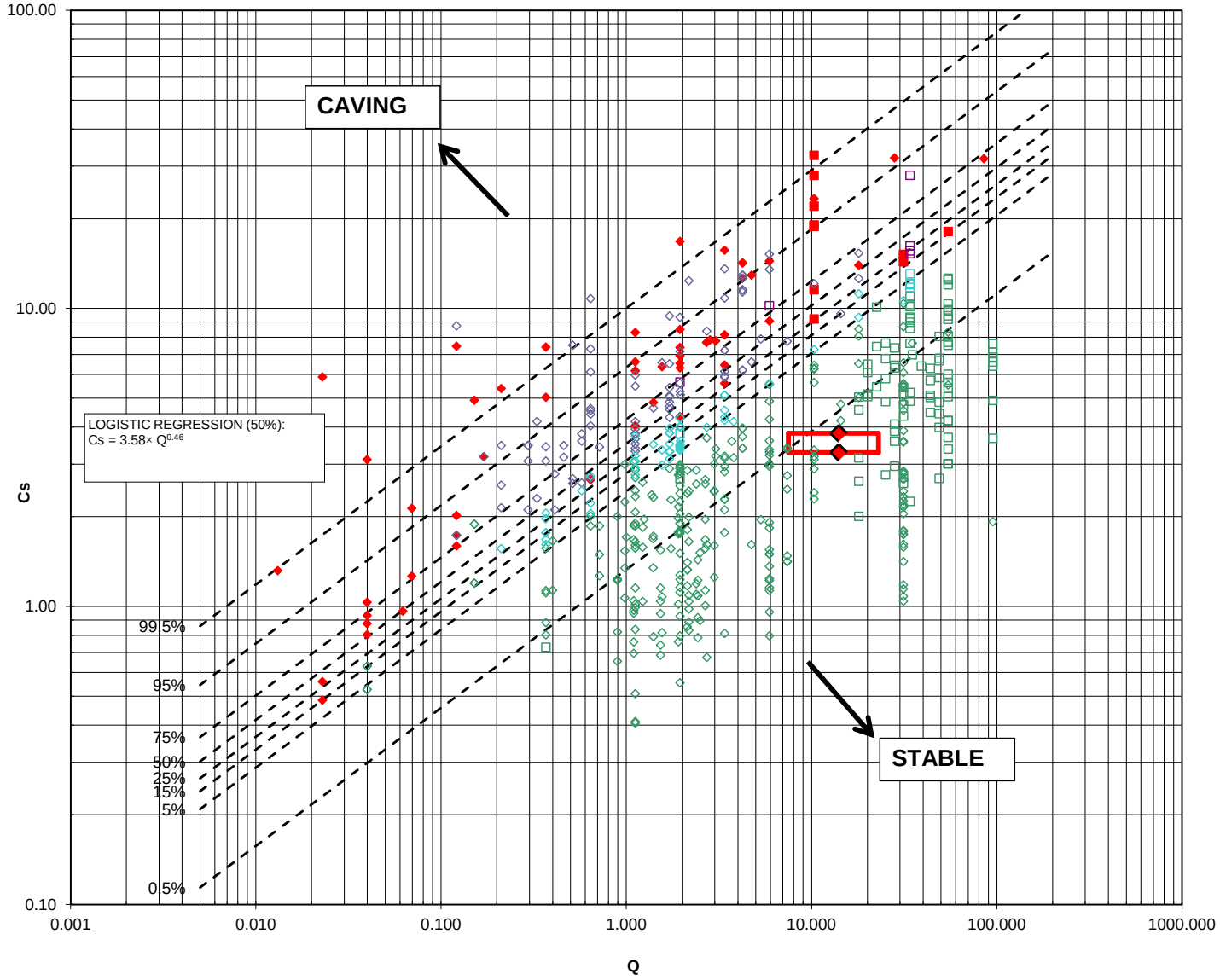
Rock Crown Thickness

16.8	m
21.7	m

Factor of Safety | **Probability of Failure**

B9	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	7.5	14.0	23.0	3.8	7.9	10.5	13.2	2.1	2.8	3.5	3.2%	1.7%	1.1%
Average	7.5	14.0	23.0	3.3	7.9	10.5	13.2	2.4	3.2	4.0	2.2%	1.3%	0.9%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B9

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR2 B9

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-7

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B10	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	8.3	26.8	25.5	7.8	0.0	3.1	2.1	2.5			
Average	90.0	6.3	27.0	25.5	5.2	0.0	3.1	2.1	2.5			

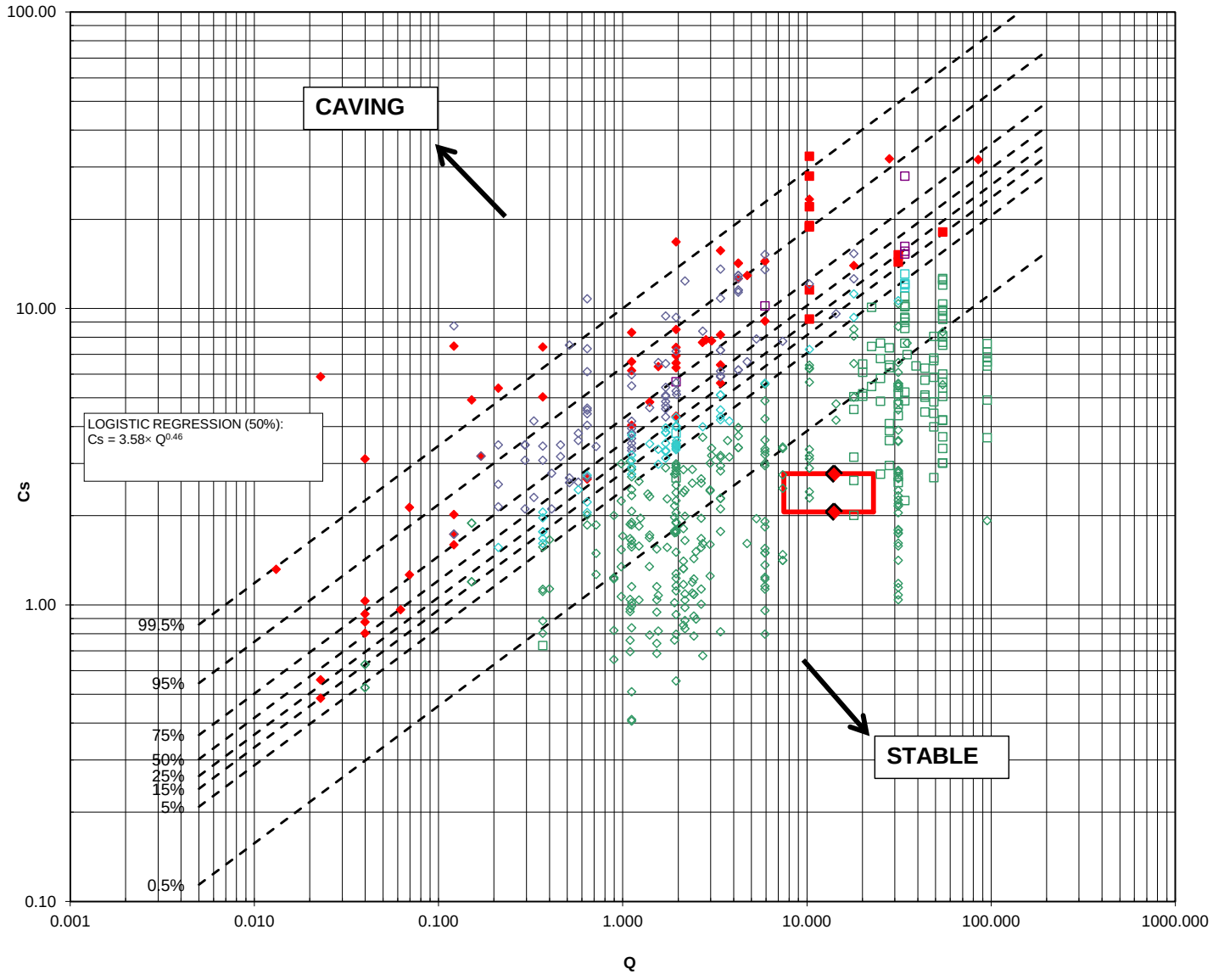
Rock Crown Thickness

19.0	m
21.8	m

Factor of Safety | **Probability of Failure**

B10	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	7.5	14.0	23.0	2.8	7.9	10.5	13.2	2.9	3.8	4.8	1.6%	1.0%	0.7%
Average	7.5	14.0	23.0	2.1	7.9	10.5	13.2	3.9	5.1	6.4	1.0%	0.7%	0.5%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B10

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR2 B10

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-8

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-08	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest*	75.0	23.0	11.0	45.0	3.0	0.0	3.1	2.1	2.5			
Average	90.0	15.0	18.0	45.0	8.0	0.0	3.1	2.1	2.5			

* This span only present over a very localised area in north of stope, not likley representative of overall stope stability

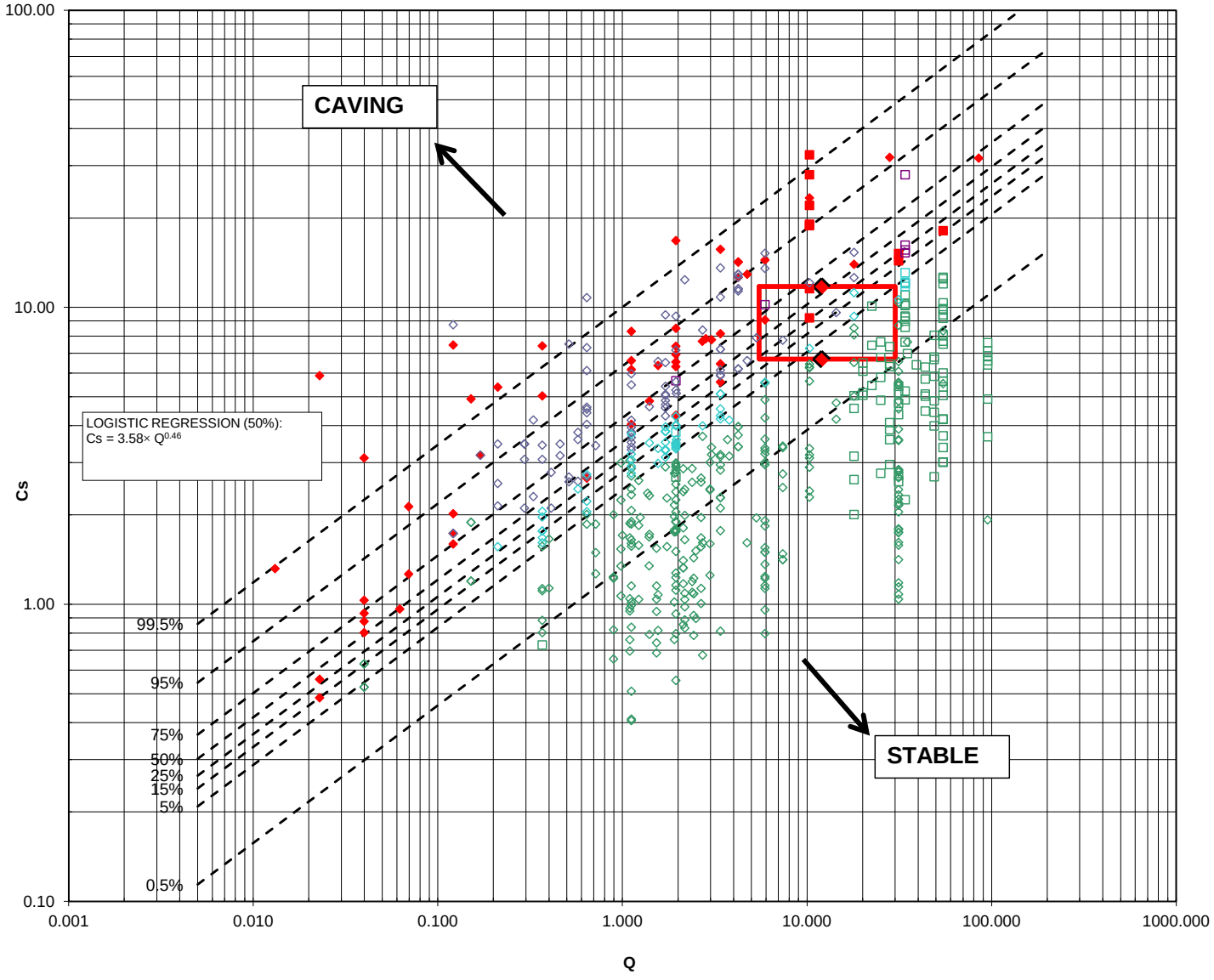
Rock Crown Thickness

8.0	m
10.0	m

Factor of Safety | **Probability of Failure**

B2-08	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest*	5.5	12.0	30.0	11.7	6.9	9.8	14.9	0.6	0.8	1.3	96.6%	64.6%	16.6%
Average	5.5	12.0	30.0	6.7	6.9	9.8	14.9	1.0	1.5	2.2	32.9%	9.3%	2.8%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B2-08

Max / Average / Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR3 B2-08

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-9

Stope Geometry Data

B2-08 S	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w
Largest	75.0	18.0	11.0	45.0	0.5	0.0	3.1	2.1	2.5
Average	80.0	16.0	15.0	45.0	2.5	0.0	3.1	2.1	2.5

Specific Gravity

ADDITIONAL INPUT DATA FOR STOPES <50°

m_{value}	σc	H

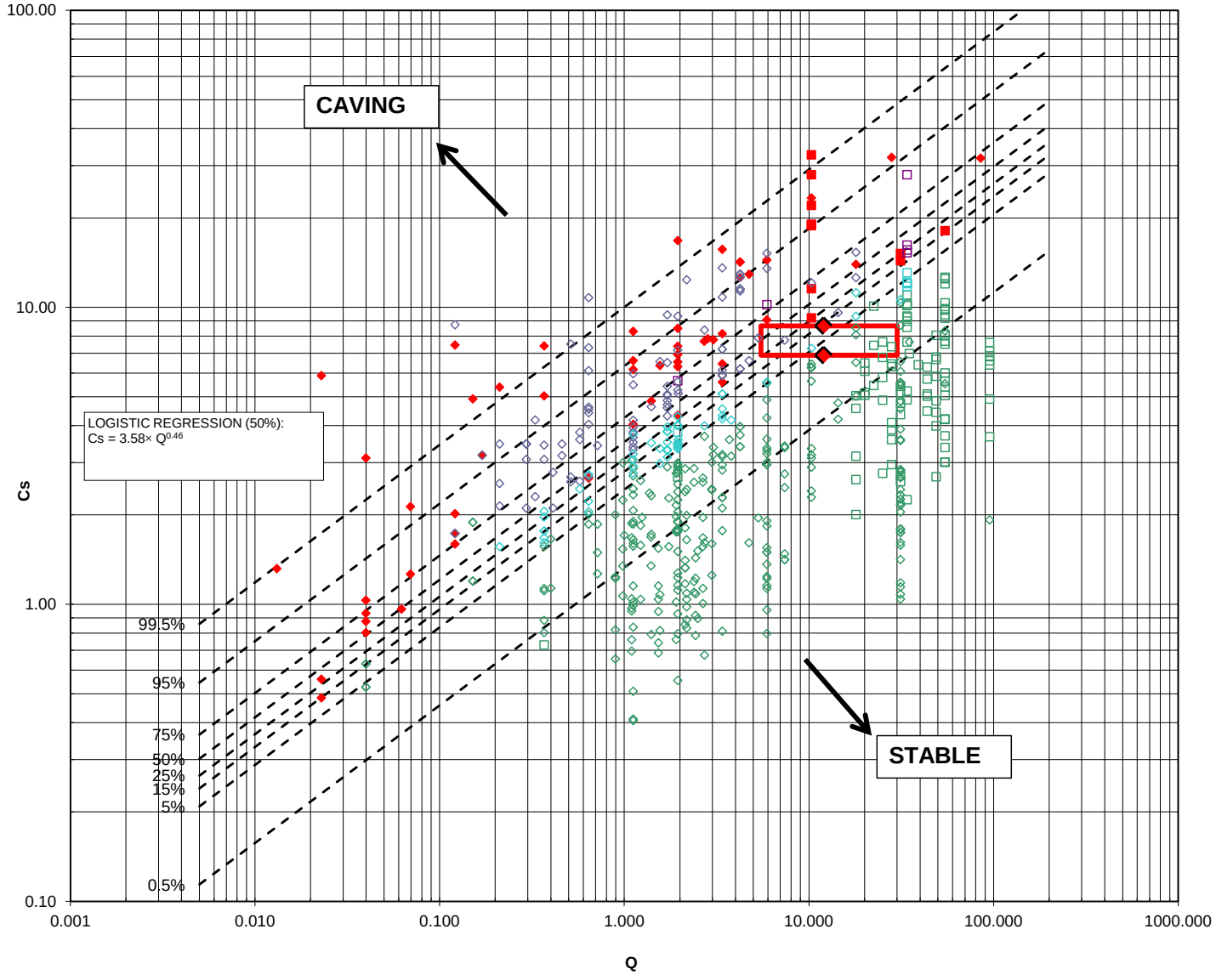
Rock Crown Thickness

10.5	m
12.5	m

Factor of Safety **Probability of Failure**

B2-08 S	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	5.5	12.0	30.0	8.7	6.9	9.8	14.9	0.8	1.1	1.7	70.5%	24.0%	5.8%
Average	5.5	12.0	30.0	6.9	6.9	9.8	14.9	1.0	1.4	2.2	36.6%	10.4%	3.0%

Crown Stability Graph



Stable-HW/FW Stable-Ore Failed - HW/FW Failed - Ore

Predict to Fail - HW/FW Predict to Fail - Ore Marginal - HW/FW Marginal - Ore

Carter2008 B2-08 S

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR3 B2-08 South

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-10

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-08 N	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	70.0	18.0	10.5	24.0	0.0	0.0	3.1	2.1	2.5			
Average	70.0	17.0	15.0	24.0	3.0	0.0	3.1	2.1	2.5			

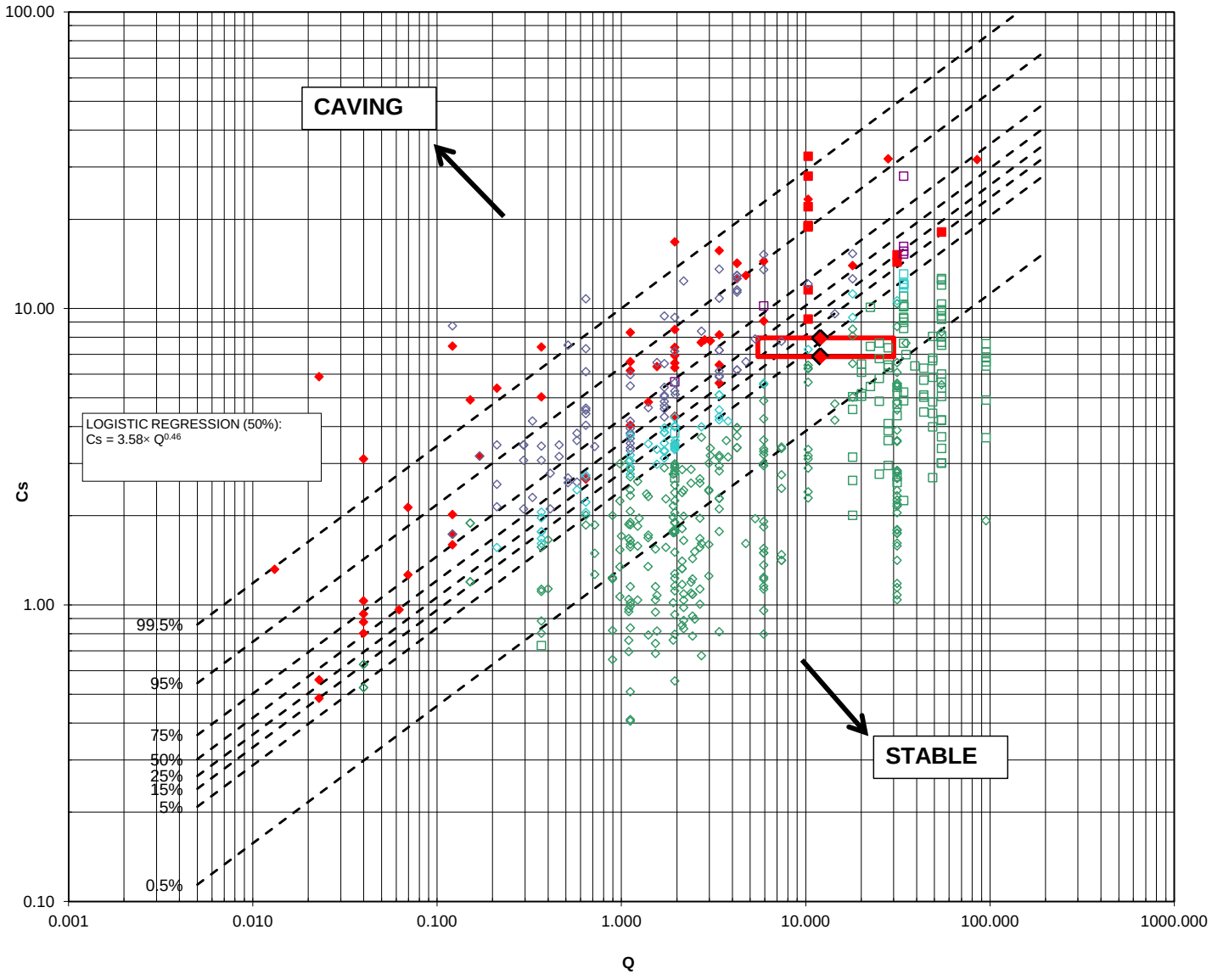
Rock Crown Thickness

10.5	m
12.0	m

Factor of Safety | **Probability of Failure**

B2-08 N	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	5.5	12.0	30.0	8.0	6.9	9.8	14.9	0.9	1.2	1.9	57.5%	17.4%	4.5%
Average	5.5	12.0	30.0	6.9	6.9	9.8	14.9	1.0	1.4	2.2	36.3%	10.3%	3.0%

Crown Stability Graph



Range of rock mass quality (Q)

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR3 B2-08 North

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-11

Stope Geometry Data

B3-06 S	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w
South *	80.0	15.0	5.0	40.0	0.0	0.0	3.1	2.1	2.5
North	85.0	15.0	4.0	20.0	0.0	0.0	3.1	2.1	2.5

Specific Gravity

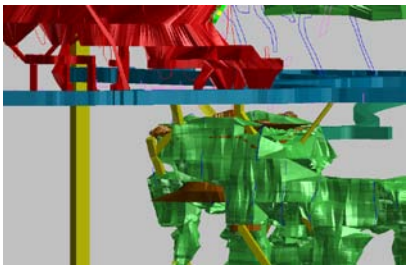
ADDITIONAL INPUT DATA FOR STOPES <50°

m_{value}	σc	H

Rock Crown Thickness

5.0	m
4.0	m

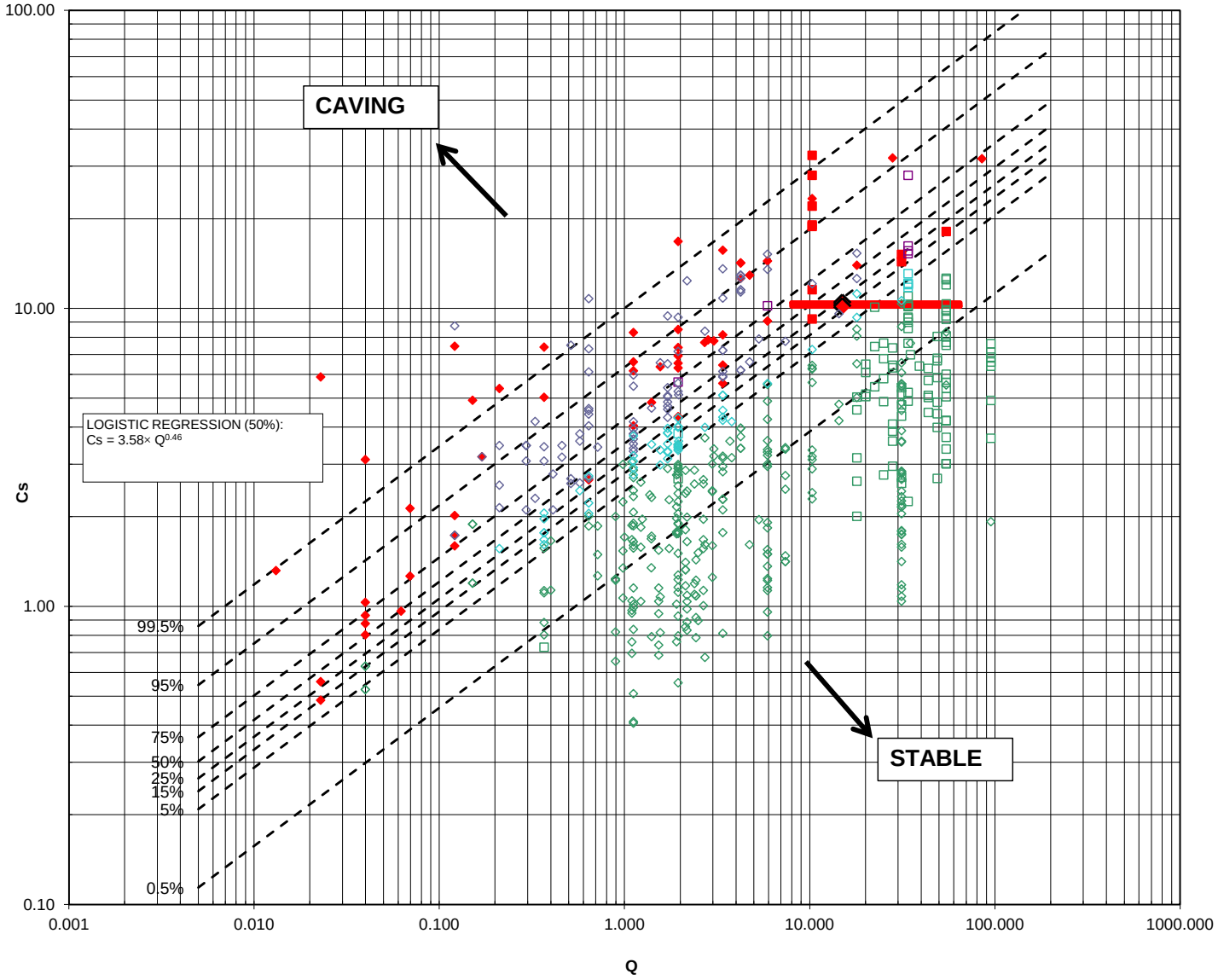
* Assumes that pillar between two "arms" in the south is ineffective



Factor of Safety **Probability of Failure**

B3-06 S	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
South *	8.0	15.0	65.0	10.4	8.2	10.8	22.0	0.8	1.0	2.1	73.5%	33.2%	3.7%
North	8.0	15.0	65.0	10.2	8.2	10.8	22.0	0.8	1.1	2.2	69.6%	30.1%	3.4%

Crown Stability Graph



Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR3 B2-08 / B3-06 Sill Pillar

Golder Associates

PROJECT No.		09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11	Figure D-12
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-30	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	6.6	61.0	22.1	6.1	0.0	3.1	2.1	2.5			
Average	90.0	5.5	63.6	22.1	6.1	0.0	3.1	2.1	2.5			

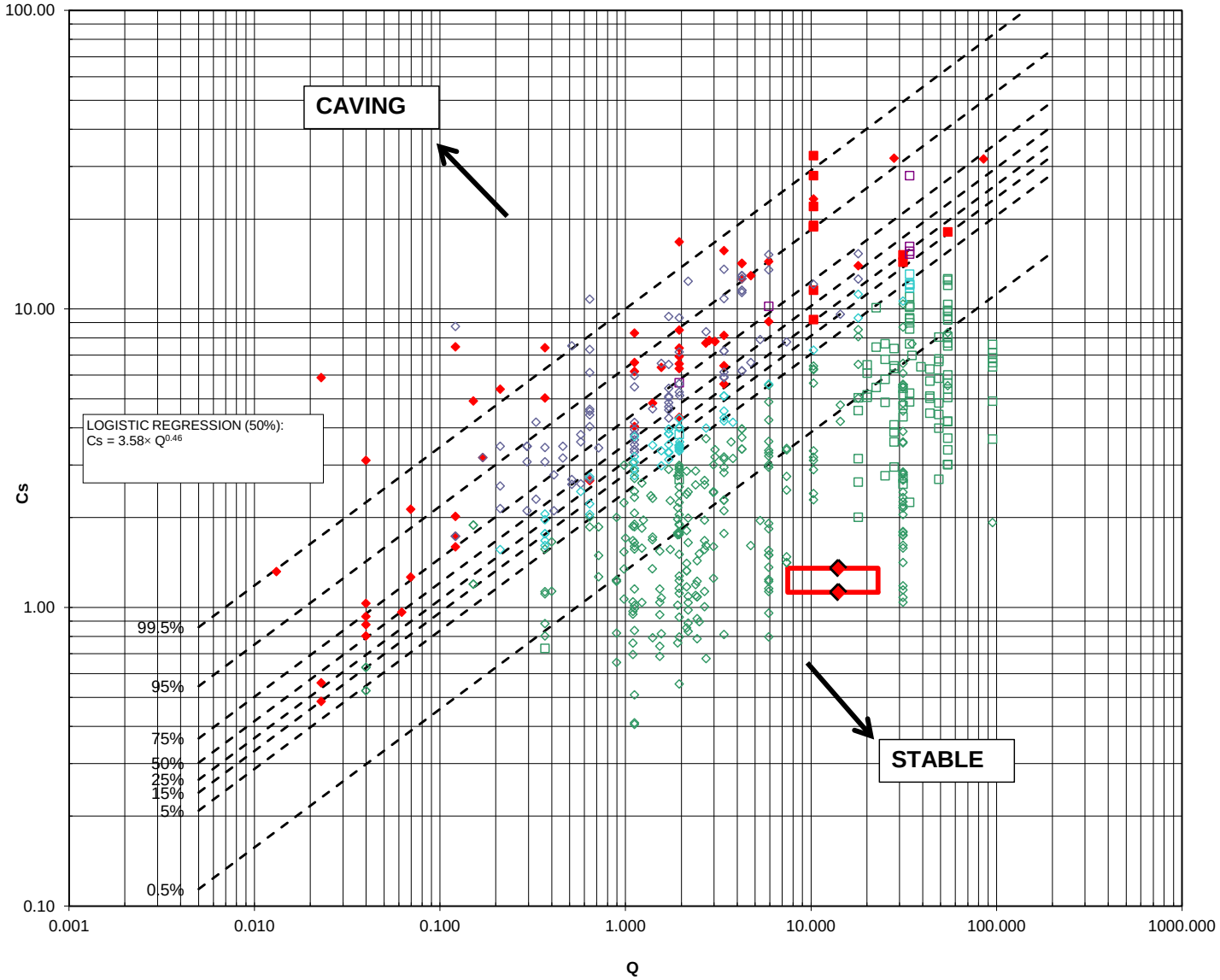
Rock Crown Thickness

54.9	m
57.5	m

Factor of Safety | **Probability of Failure**

B2-30	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	7.5	14.0	23.0	1.4	7.9	10.5	13.2	5.9	7.7	9.7	0.6%	0.5%	0.4%
Average	7.5	14.0	23.0	1.1	7.9	10.5	13.2	7.1	9.3	11.7	0.5%	0.4%	0.4%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B2-30

Max
Average
Min

Range of rock mass quality (Q)

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR3 B2-30

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No.	6000-6200
RUN	NSO	18-Mar-11	Figure D-13
CHECK	DTK	18-Mar-11	
REVIEW	DTK	21-Jun-12	

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-33	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	8.4	33.1	34.3	0.0	0.0	3.1	2.1	2.5			
Average	90.0	7.6	33.1	34.3	0.0	0.0	3.1	2.1	2.5			

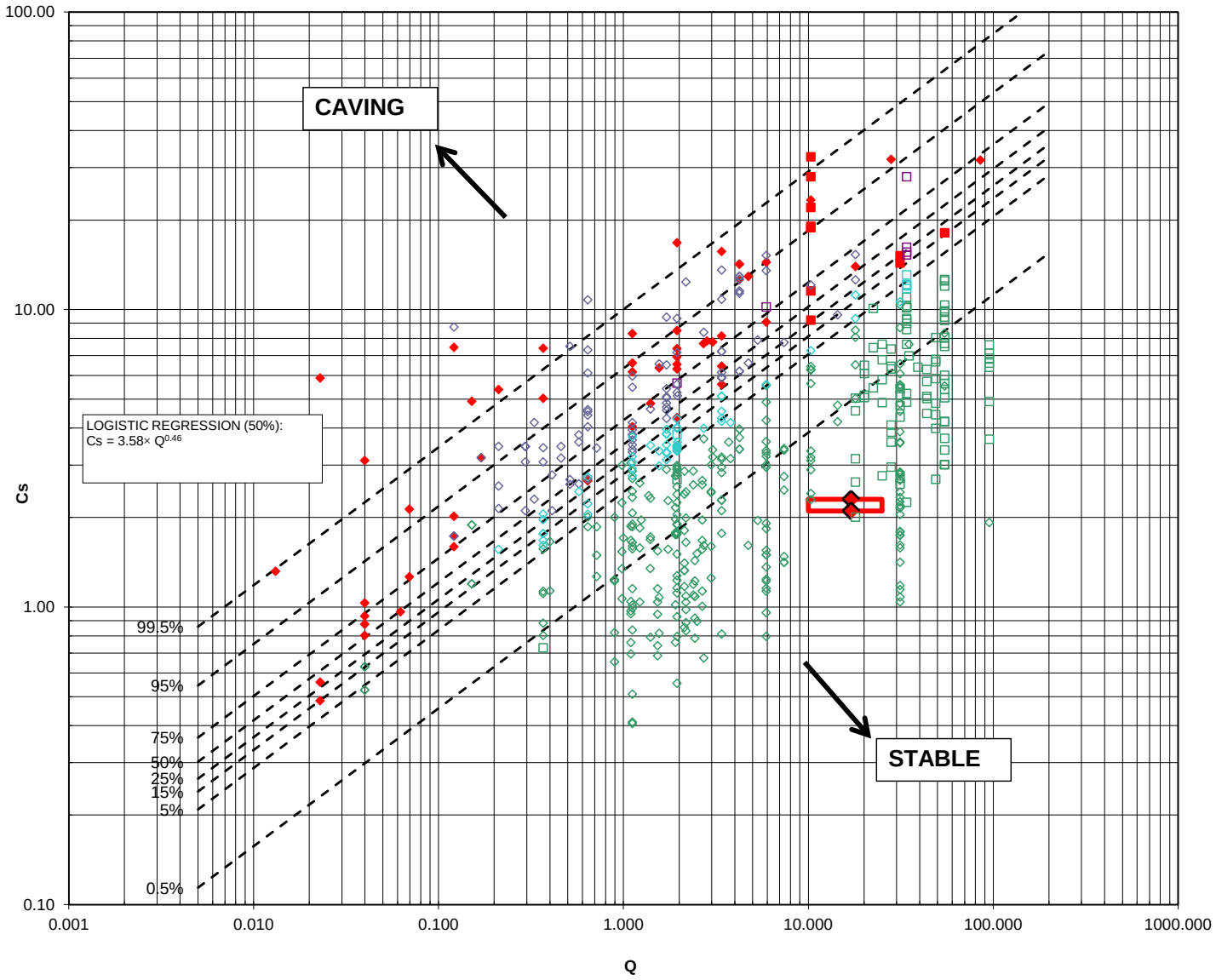
Rock Crown Thickness

33.1	m
33.1	m

Factor of Safety | **Probability of Failure**

B2-33	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	10.0	17.0	25.0	2.3	9.0	11.5	13.7	3.9	5.0	5.9	0.9%	0.7%	0.6%
Average	10.0	17.0	25.0	2.1	9.0	11.5	13.7	4.3	5.4	6.5	0.8%	0.6%	0.5%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B2-33

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR3 B2-33

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-14

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-34	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	9.6	31.4	34.4	9.2	0.0	3.1	2.1	2.5			
Average	90.0	8.3	32.0	34.4	9.2	0.0	3.1	2.1	2.5			

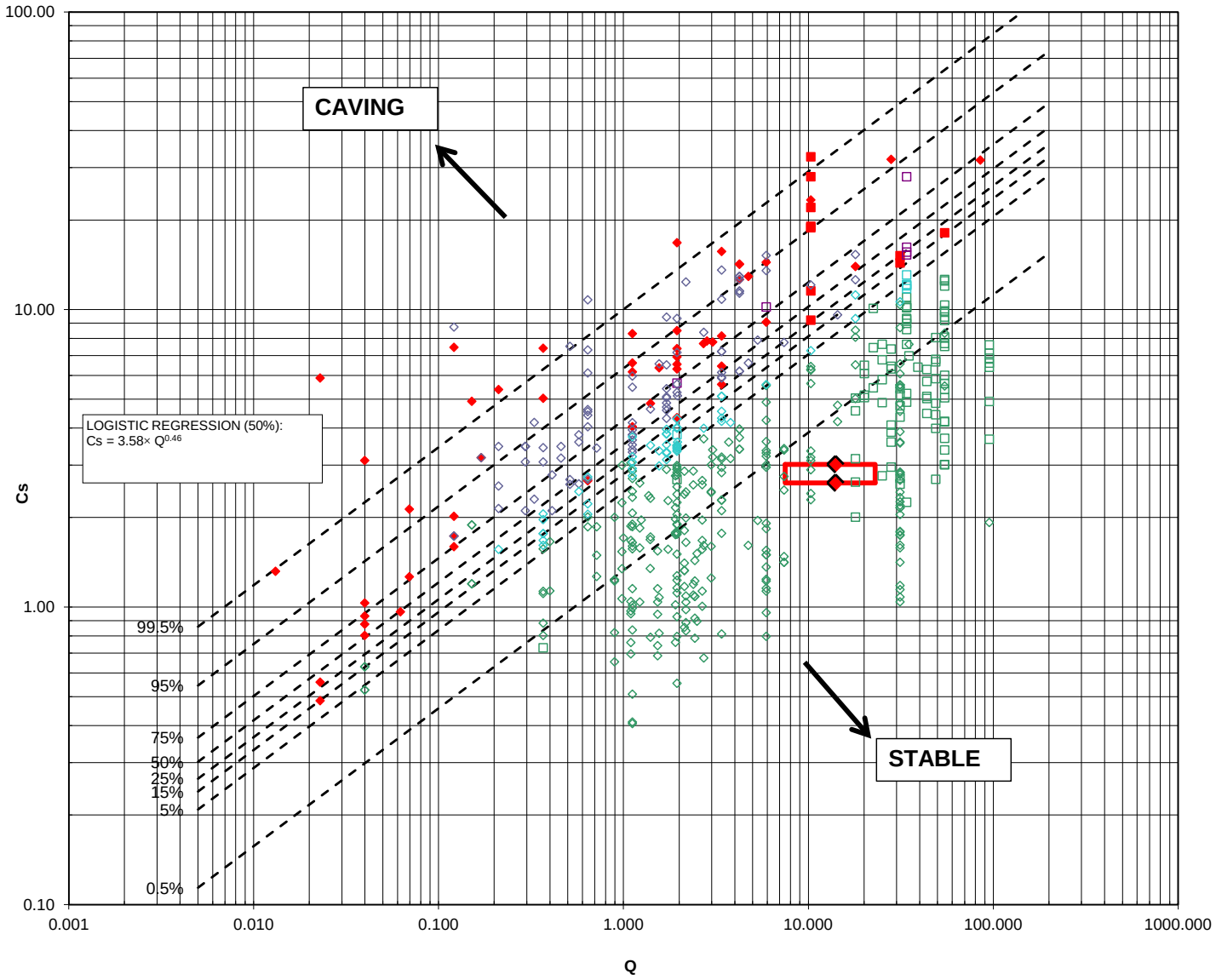
Rock Crown Thickness

22.2	m
22.8	m

Factor of Safety | **Probability of Failure**

B2-34	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	7.5	14.0	23.0	3.0	7.9	10.5	13.2	2.6	3.5	4.4	1.8%	1.1%	0.8%
Average	7.5	14.0	23.0	2.6	7.9	10.5	13.2	3.0	4.0	5.0	1.4%	0.9%	0.7%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B2-34

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR3 B2-34

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-15

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-35	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	11.5	28.5	35.0	6.4		3.1	2.1	2.5			
Average	90.0	11.1	30.1	35.0	7.0	0.0	3.1	2.1	2.5			

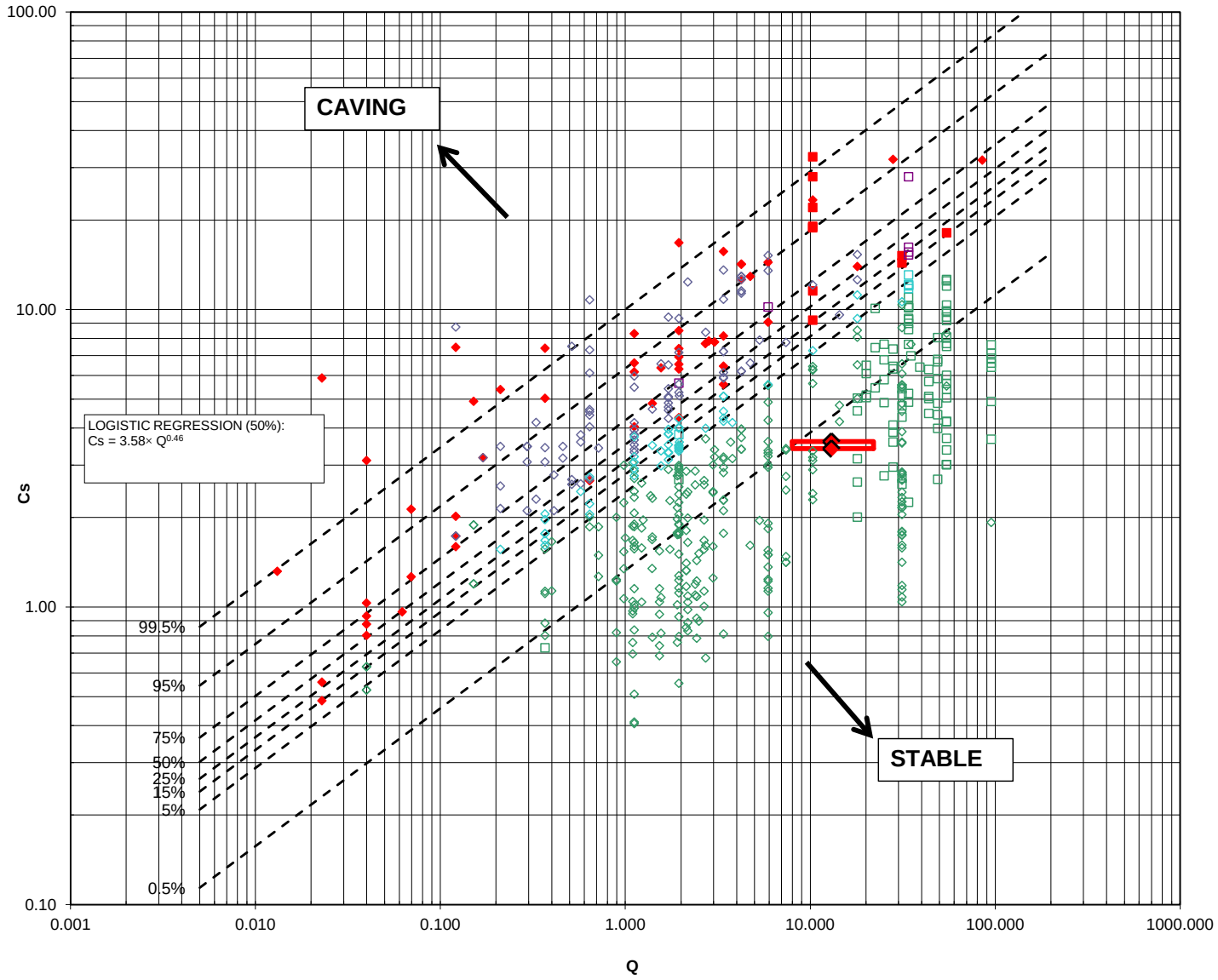
Rock Crown Thickness

22.1	m
23.1	m

Factor of Safety | **Probability of Failure**

B2-35	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	8.0	13.0	22.0	3.6	8.2	10.1	12.9	2.3	2.8	3.6	2.6%	1.6%	1.1%
Average	8.0	13.0	22.0	3.4	8.2	10.1	12.9	2.4	3.0	3.8	2.3%	1.5%	1.0%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B2-35

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR3 B2-35

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-16

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Stope Geometry Data

B2-36	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w
Largest	90.0	11.6	33.7	35.0	7.5	0.0	3.1	2.1	2.5
Average	90.0	10.3	36.2	35.0	7.1	0.0	3.1	2.1	2.5

Specific Gravity

ADDITIONAL INPUT DATA FOR STOPES <50°

m_{value}	σc	H

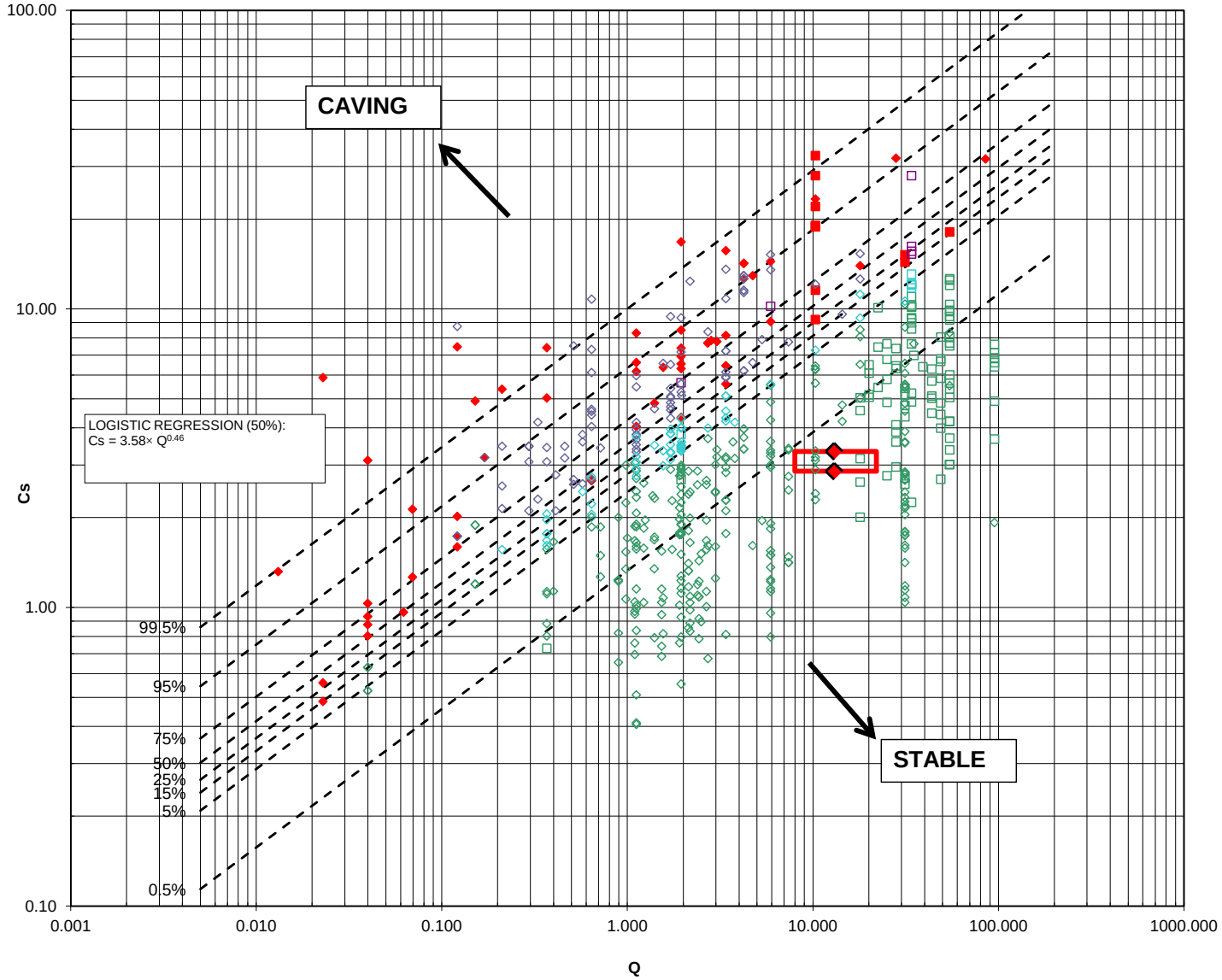
Rock Crown Thickness

26.2	m
29.1	m

Factor of Safety **Probability of Failure**

B2-36	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	8.0	13.0	22.0	3.3	8.2	10.1	12.9	2.5	3.0	3.9	2.1%	1.4%	1.0%
Average	8.0	13.0	22.0	2.9	8.2	10.1	12.9	2.9	3.5	4.5	1.6%	1.1%	0.8%

Crown Stability Graph



Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR3 B2-36

Golder Associates

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-17

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-35/36	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	90.0	32.0	30.0	33.0	7.0	0.0	3.1	2.1	2.5			
Average	90.0	32.0	35.0	33.0	8.0	0.0	3.1	2.1	2.5			

Rock Crown Thickness

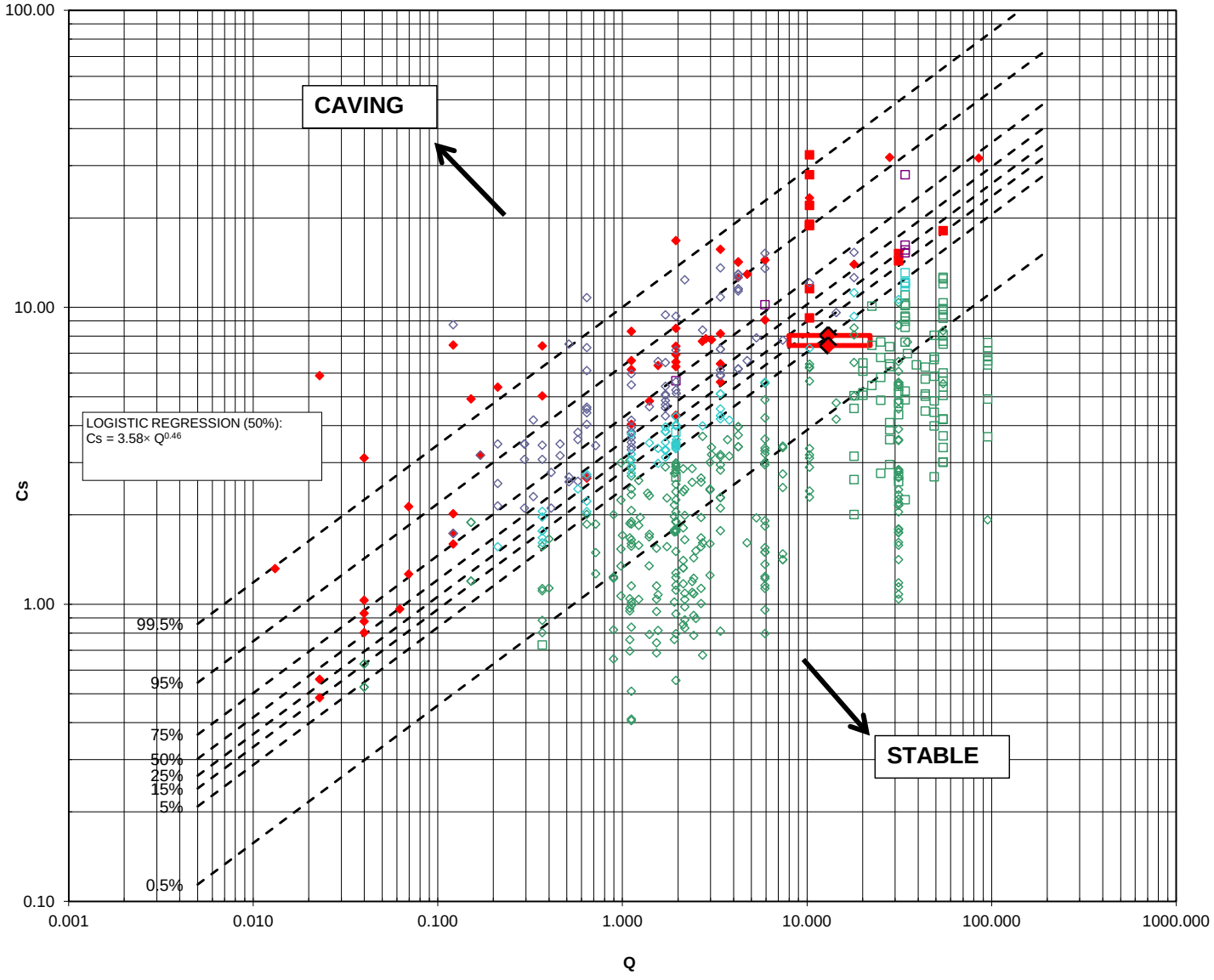
23.0	m
27.0	m

* These spans only possible if rib pillar between stopes fails

Factor of Safety | **Probability of Failure**

B2-35/36	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	8.0	13.0	22.0	8.0	8.2	10.1	12.9	1.0	1.3	1.6	35.3%	15.9%	7.1%
Average	8.0	13.0	22.0	7.4	8.2	10.1	12.9	1.1	1.4	1.7	26.4%	11.9%	5.5%

Crown Stability Graph



Range of rock mass quality (Q)

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	Combined AR3 B2-35 / B2-36

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PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-18

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-12-13	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	62.0	14.0	25.0	55.0	21.0	0.0	3.1	2.1	2.5			
Average	65.0	12.0	25.0	55.0	18.5	0.0	3.1	2.1	2.5			

Rock Crown Thickness

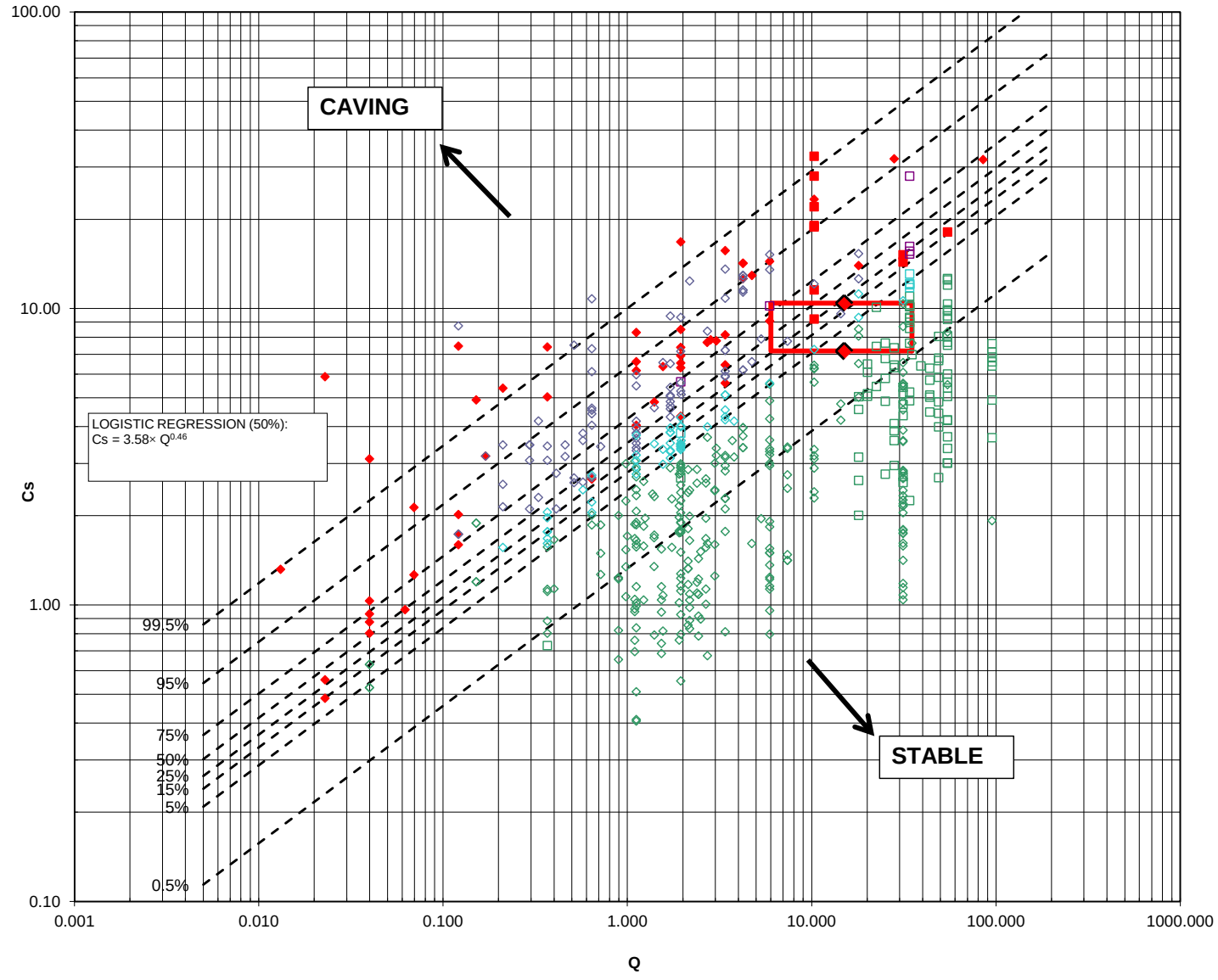
4.0	m
6.5	m

These values derived from specific zones of crown pillar

Factor of Safety | **Probability of Failure**

B2-12-13	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	6.0	15.0	35.0	10.4	7.2	10.8	16.1	0.7	1.0	1.5	87.7%	33.1%	8.5%
Average	6.0	15.0	35.0	7.2	7.2	10.8	16.1	1.0	1.5	2.2	36.9%	8.5%	2.8%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B2-12-13

Max
Average
Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR4 B2-12-13

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-19

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-13-14	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	67.0	21.0	27.0	40.0	20.5	0.0	3.1	2.1	2.5			
Average	70.0	18.5	27.0	40.0	18.5	0.0	3.1	2.1	2.5			

Rock Crown Thickness

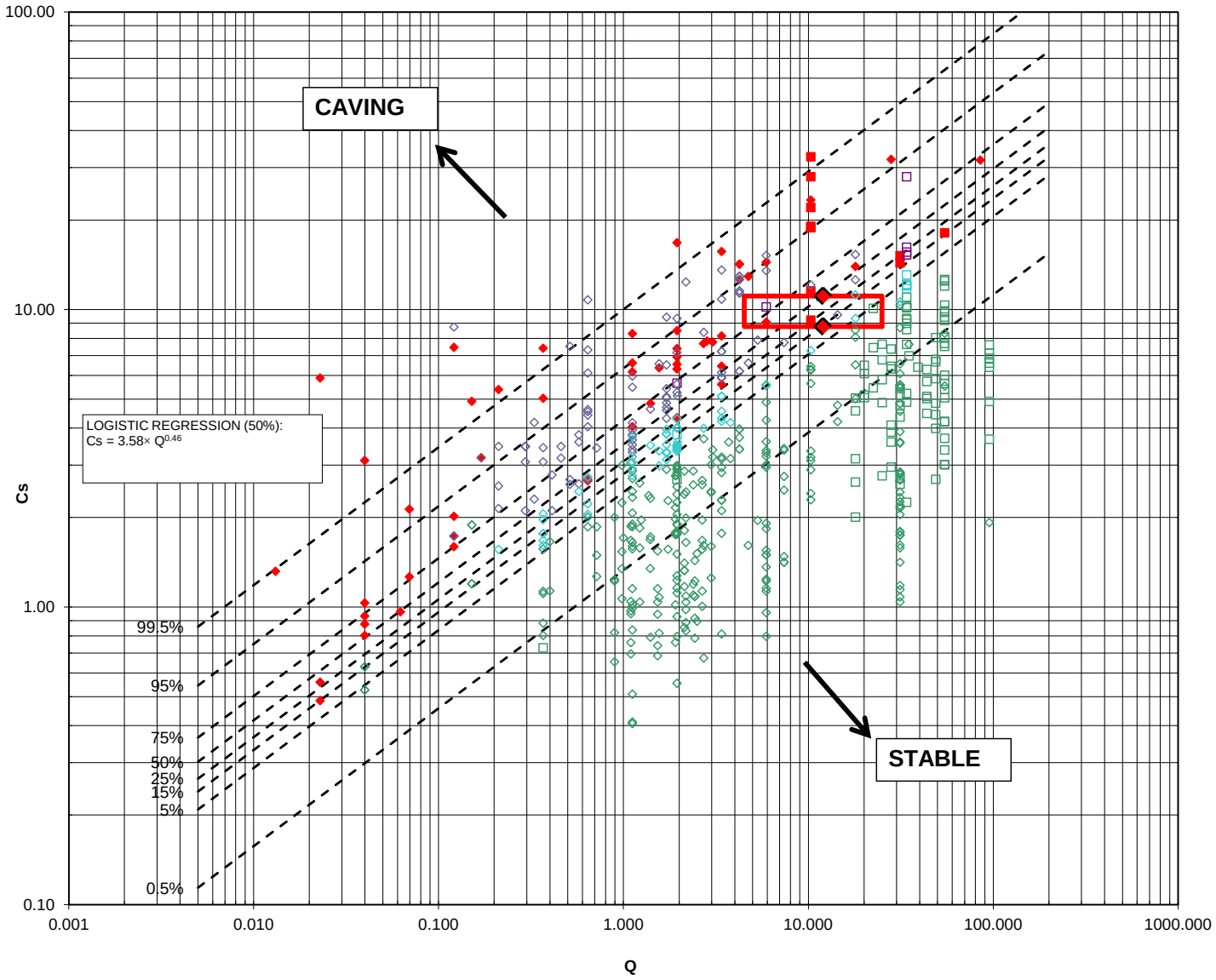
6.5	m
8.5	m

These values derived from specific zones of crown pillar

Factor of Safety | **Probability of Failure**

B2-13-14	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	4.5	12.0	25.0	11.1	6.3	9.8	13.7	0.6	0.9	1.2	97.5%	56.0%	18.1%
Average	4.5	12.0	25.0	8.8	6.3	9.8	13.7	0.7	1.1	1.6	83.3%	25.2%	7.8%

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B2-13-14

Max / Average / Min

Range of rock mass quality (Q)

Project	PWGSC GIANT MINE REMEDIATION PROJECT YELLOWKNIFE N.W.T.
Title	AR4 B2-13-14

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-20

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

Stope Geometry Data | **Specific Gravity** | **ADDITIONAL INPUT DATA FOR STOPES <50°**

B2-14	Dip	S	T	L	t_o	t_w	γ_r	γ_o	γ_w	m_{value}	σc	H
Largest	80.0	13.0	20.0	40.0	13.0	0.0	3.1	2.1	2.5			
Average	90.0	7.0	20.0	40.0	12.0	0.0	3.1	2.1	2.5			

Rock Crown Thickness

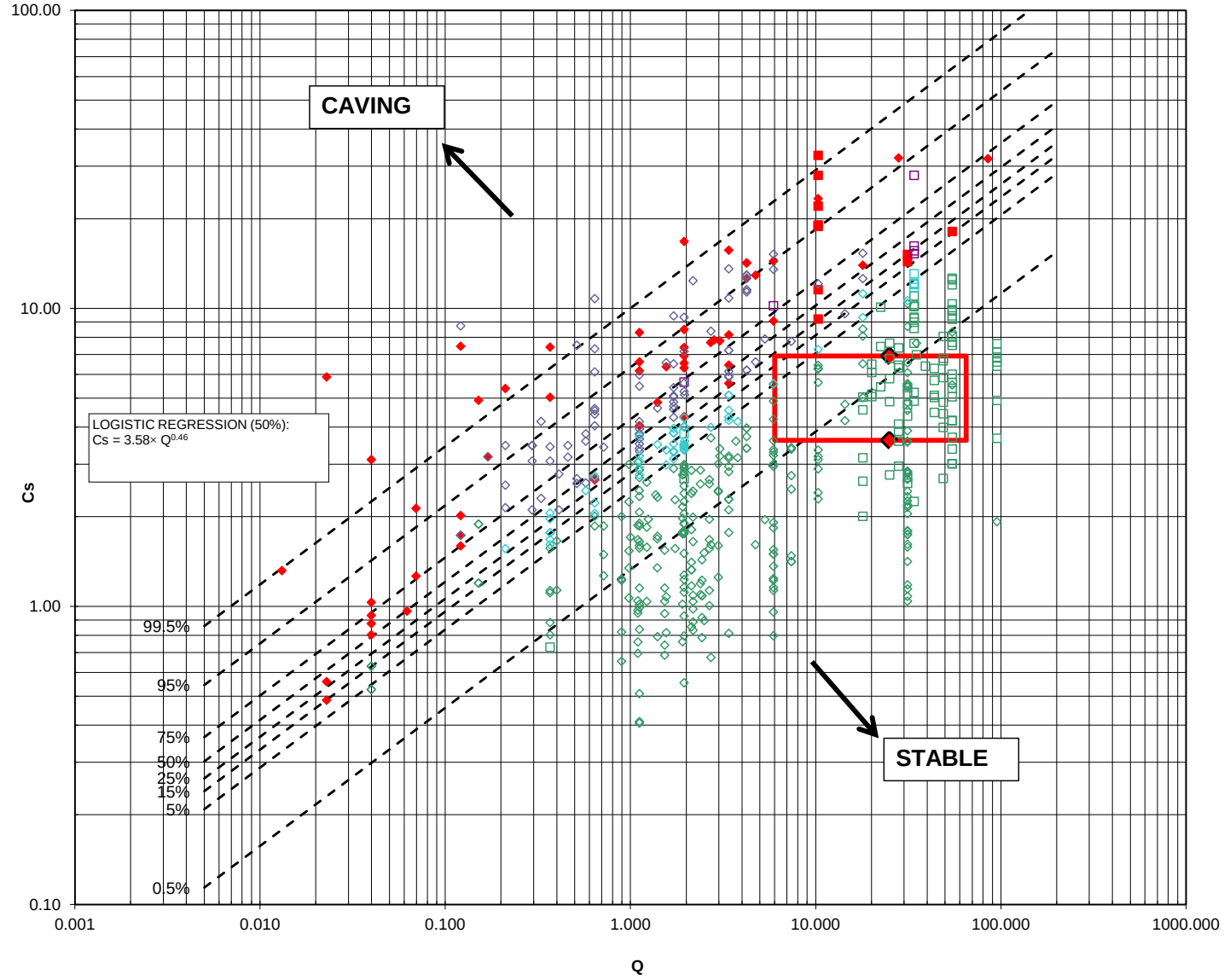
7.0	m
8.0	m

These values derived from specific zones of crown pillar

B2-14	Range of Q			Cs	Sc			Fc			Pfnew		
	20%	50%	80%		LOW	AVG	HIGH	LOW	AVG	HIGH	HIGH	AVG	LOW
Largest	6.0	25.0	65.0	6.9	7.2	13.7	22.0	1.0	2.0	3.2	32.4%	3.8%	1.5%
Average	6.0	25.0	65.0	3.6	7.2	13.7	22.0	2.0	3.8	6.1	3.6%	1.0%	0.6%

Factor of Safety | **Probability of Failure**

Crown Stability Graph



Stable-HW/FW | Stable-Ore | Failed - HW/FW | Failed - Ore

Predict to Fail - HW/FW | Predict to Fail - Ore | Marginal - HW/FW | Marginal - Ore

Carter2008 | B2-14

Max
Average
Min

Range of rock mass quality (Q)

Project: PWGSC
GIANT MINE REMEDIATION PROJECT
YELLOWKNIFE N.W.T.

Title: AR4 B2-14

PROJECT No.	09-1427-0006	Phase/Task No. 6000-6200
RUN	NSO	18-Mar-11
CHECK	DTK	18-Mar-11
REVIEW	DTK	21-Jun-12

Figure D-21

Project no. 09-1427-0006 Run: NSO Review: DTK Date: 18-Mar-11 Filename: O:\Active_2009\1427\09-1427-0006 Giant AECOM - PWGSC\Phase 2000\Project Management\Correspondence\Correspondence-Deliverables\Doc 090 REP 0802_11\Doc 090 Rev 3 Final June 2012\Appendix D\GIANT rp stability aug 02 2011.xls

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Africa	+ 27 11 254 4800
Asia	+ 852 2562 3658
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Ltd.
500 - 4260 Still Creek Drive
Burnaby, British Columbia, V5C 6C6
Canada
T: +1 (604) 296 4200

Golder Associates