EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants

ELSA TAILINGS TERRESTRIAL EFFECTS ASSESSMENT – PHASE 1.

PREPARED FOR:

ACCESS CONSULTING GROUP

3-151 INDUSTRIAL ROAD

WHITEHORSE, YT

YIA 2V3

PREPARED BY:

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EDI PROJECT NO.: 07-YC-0052

MARCH 2008

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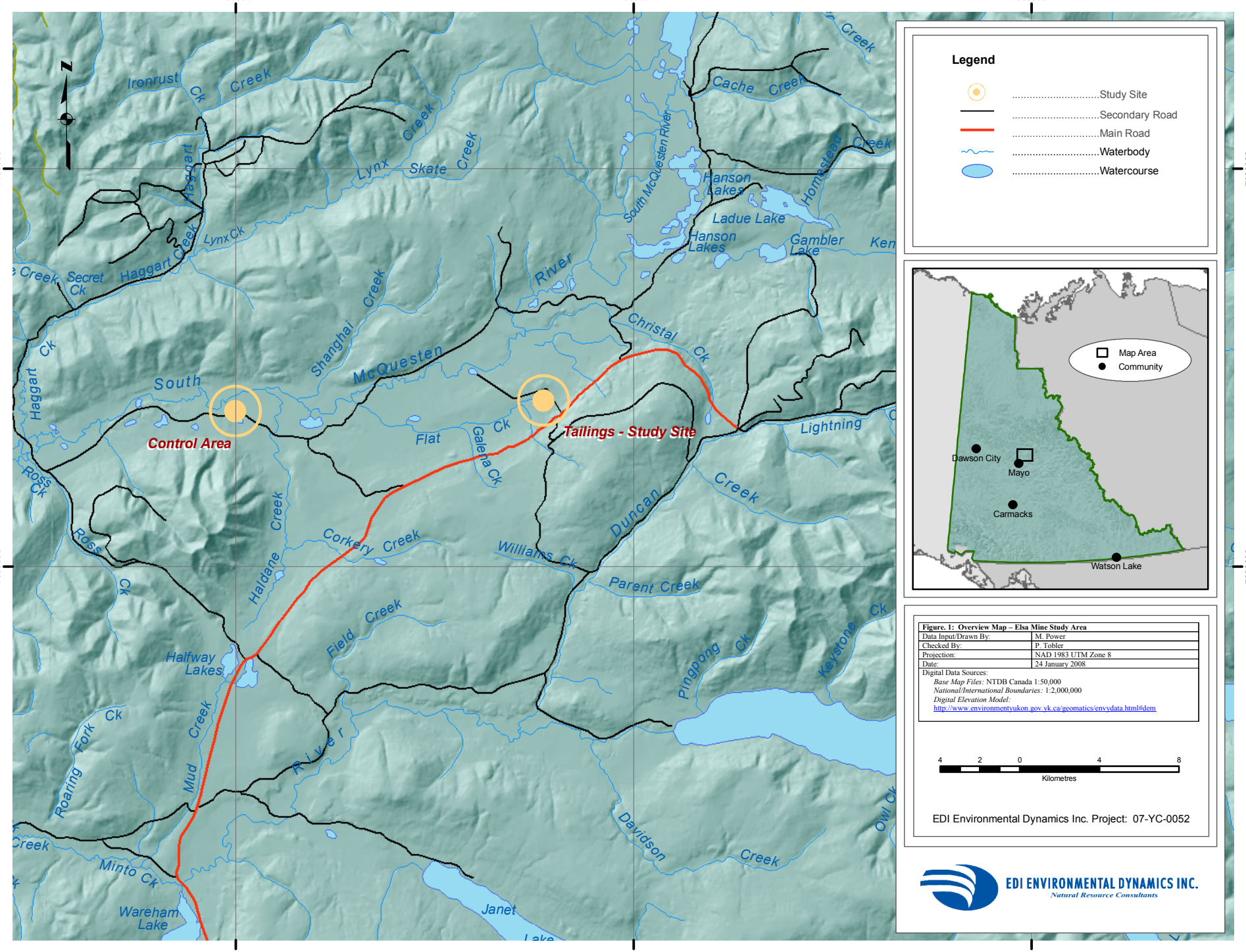
1 INTRODUCTION

The Keno Hill / Elsa property is located approximately 350 km north of Whitehorse, YT (Figure 1) within the Traditional Territory of the First Nation of the NaCho Nyak Dun. The property was mined for silver from 1914–1989 and care and maintenance has been on-going since that time.

In 2007, EDI Environmental Dynamics Inc. (EDI) was retained by the Access Consulting Group to complete phase 1 of a Terrestrial Effects Study in the vicinity of the Elsa tailings facilities. The objective of this phase of the study was to determine if aerial dispersion of metals has occurred and, if so, determine the extent of such dispersion into the natural terrestrial ecosystem surrounding the Elsa tailings facilities (Figure 1; Photo 1). While the terrestrial ecosystem includes plants, soils and animals, this study focused on lichens. As lichens receive most of their nutrients from air and rainfall, they are excellent indicators of airborne contamination and as such represent a logical first step in detecting the potential for terrestrial effects.

The tailings facilities cover an area of approximately 118 ha within the Flat Creek valley bottom. The tailings consist of three ponds in the northwest portion and a large area with 'dry' tailings mainly concentrated in the eastern half of the tailings. There are several patches of natural vegetation (mature conifer) located within the tailings area.

Photo 1. View of the Elsa tailings facilities, looking northwest.


460000
480000
500000
7100000
7080000
N
Ironrust Ck
Creek
Haggart Creek
Lynx Creek
Skate Creek
Lynx Ck
Secret Ck
Haggart Creek
Haggart Ck
South McQuesten River
Cache Creek
Homestead Creek
Hanson Lakes
Ladue Lake
Gambler Lake
Shanghai Creek
McQuesten River
Christal Ck
South
Control Area
Tailings - Study Site
Flat
Galena Ck
Lightning
Ross Ck
Haldane Creek
Corkery Creek
Williams Ck
Duncan Creek
Parent Creek
Field Creek
Halfway Lakes
Pingpong Ck
Keystone Ck
Roaring Fork Ck
Mud Creek
River
Davidson
Creek
Minto Ck
Wareham Lake
Janet Lake
Owl Ck
Legend
Study Site
Secondary Road
Main Road
Waterbody
Watercourse
Map Area
Community
Dawson City
Mayo
Carmacks
Watson Lake
Figure. 1: Overview Map – Elsa Mine Study Area
Data Input/Drawn By: M. Power
Checked By: P. Tobler
Projection: NAD 1983 UTM Zone 8
Date: 24 January 2008
Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
National/International Boundaries: 1:2,000,000
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem
4 2 0 4 8
Kilometres
EDI Environmental Dynamics Inc. Project: 07-YC-0052
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2 METHODS

2.1 FIELDWORK

Forty eight sample sites were established along eight transects (Figure 2). The transects radiated outwards in cardinal directions (N, NE, E, SE, S, SW, W, and NW) from a central location within the tailings area. The first plot (labeled 1) on each transect was located in natural vegetation adjacent (e.g., 5–10 m) to the tailings area. From there, additional plots were established at distances of 50, 150, 350, 750 and 1,250 meters from the first plot (labeled as plots 2-6, respectively), and their coordinates were recorded on a hand-held GPS. Some location adjustments were made where plots landed in disturbed areas that were unsuitable for lichen sampling. This pattern allowed for inspection of the contamination adjacent to the tailings area and for spatial analysis in many directions and distances from the tailings.

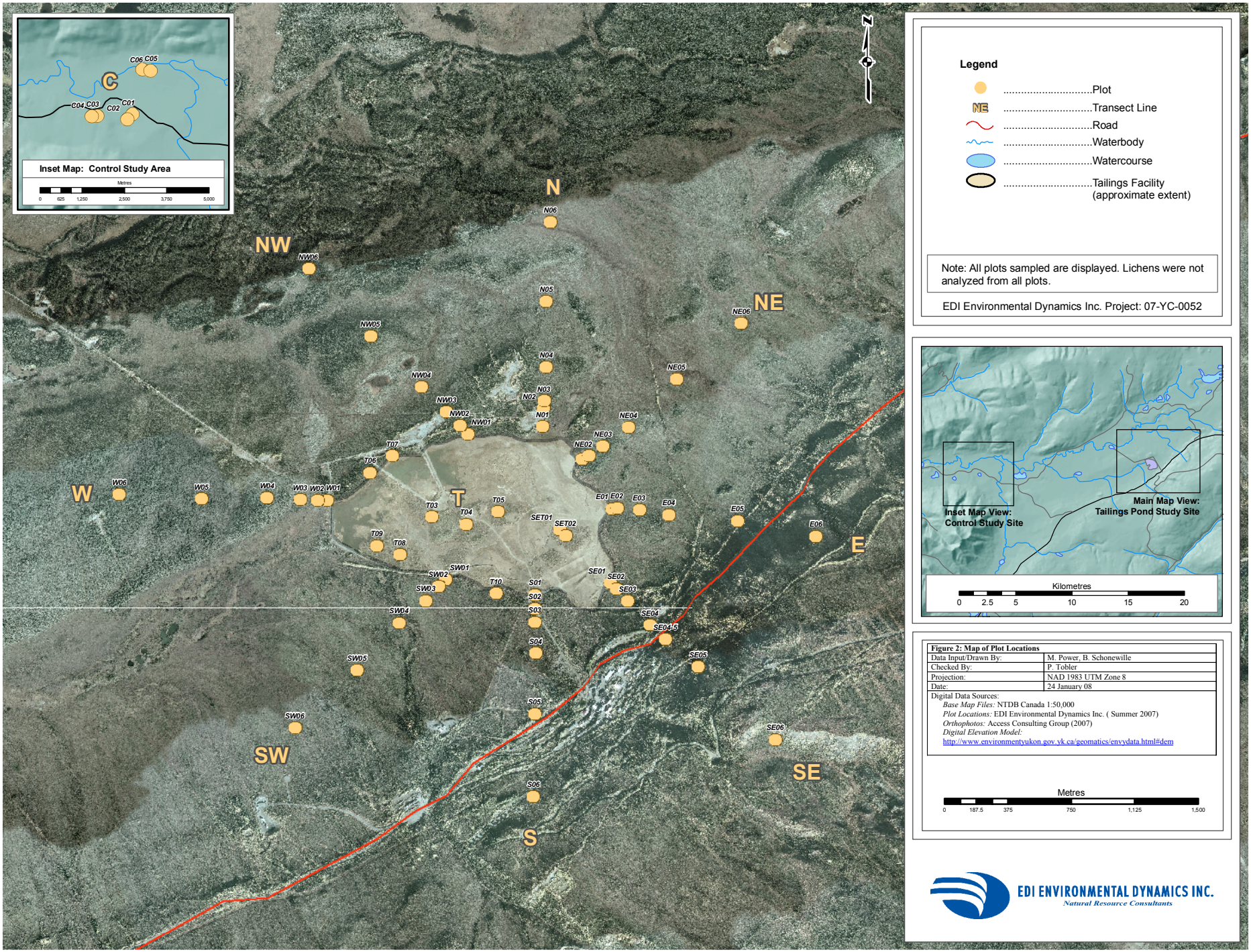
Six additional plots (labeled as T) were located in islands of natural vegetation within and/or in close proximity to the tailings pond where transect plots did not exist. Samples were also collected in a control area located 15 km to the west of the tailings facilities (Figure 2). All control plots were located at least 50 m away from any known disturbance (i.e. roads). In addition, the outermost plots on many transects were located a significant distance from disturbances thus providing some additional data for comparative purposes. However, some transects intercepted or were near other disturbances such as roads, buildings, and various exploration activity. All sampling was conducted within a 10 m radius of each plot site.

Lichen were collected from 25–27 September 2007. *Cladina mitis* (Caribou moss; labeled as CLMI*)* was collected from each upland sample site location where it occurred. This lichen species not only provides an indication of airborne contamination, it is known to be also used by First Nations for medicinal purposes. In the few plots where *Cladina mitis* did not occur, *Stereocaulon tomentosum* (labeled as STTO) was collected. To determine if these two lichens were comparable for determining metal contamination when one or the other species was not located in a plot, both lichens were collected when they occurred in the same plot and a sub-sample of plots with both species were analyzed to determine the differences among the lichens.

Lichens were collected using unpowdered nitrile gloves, which were replaced with new uncontaminated gloves for each sample collected. Several lichens (of the same species) at each location were combined into one sample for composite analysis. Non-lichen material was removed from the samples to ensure that only lichen material was analyzed. A few replicate samples were collected for quality assurance /quality control (QA/QC); two set of replicates (two field samples collected from the same site) were sent for analysis. All samples were collected (total of 71) in new zip-lock freezer bags, labeled, frozen and 62 samples were shipped to the lab (CANTEST) for analysis (ICP-MS).

2.2 DATA ANALYSIS

Results were analyzed to determine if metals levels were elevated (compared to Yukon background data and control site data) and if so, the magnitude and spatial extent of such elevation. Analysis of the results also included a review of the comparability of the two lichen species collected.



Legend

- Plot
- NE — Transect Line
- Road
- Waterbody
- Watercourse
- Tailings Facility (approximate extent)

Note: All plots sampled are displayed. Lichens were not analyzed from all plots.

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Figure 2: Map of Plot Locations	
Data Input/Drawn By:	M. Power, B. Schonewille
Checked By:	P. Tobler
Projection:	NAD 1983 UTM Zone 8
Date:	24 January 08

Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
Plot Locations: EDI Environmental Dynamics Inc. (Summer 2007)
Orthophotos: Access Consulting Group (2007)
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem

Metres
0 187.5 375 750 1,125 1,500

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3 RESULTS AND DISCUSSION

3.1 QUALITY CONTROL

As a test of the collection methods, replicate samples of *C. mitis* were analyzed from site T7 and E5. In general, most metal differences between replicate samples were within typical lab accepted levels for duplicate samples. Several metals for each site were in the range of 20–45.2 Relative Percent Difference (RPD) and chromium at E5 had a RPD of 150%, although low levels were found in both samples. The differences were not drastically different for replicate samples, and can be likely attributed to natural variability of lichens within each plot. Laboratory results including QA/QC are presented in Appendix A. Comparisons between the replicate samples collected at T7 and E5 are presented in Appendix B.

3.2 COMPARISONS OF LICHEN SPECIES COLLECTED

The objective in the field was to collect the same lichen species at all sample plots. However, *C. mitis* was not found at all sample plots Therefore, where *C. mitis* was not available, the most abundant lichen species found in a plot was plot – in most cases *Sterecaulon tomentosum*. To determine if *C. mitis* and *S. tomentosum* from the same plot had similar metal levels retention levels, paired samples were collected and analyzed from three plots where both species were found, including one control plot (Appendix C). Interestingly, metal concentrations within species for the paired samples were notably different, especially from ones around the tailing area (Plots SE1 and S3). The RPD between the samples from the control site samples ranged up to ± 66.8 %. From the two plots near the tailings the RPD was up to 127.5 % and metals levels were consistently higher in *S. tomentosum* (with the exception of magnesium and phosphorus at Plot SE01). This may indicate that *S. tomentosum* may actually retain greater metals in areas were aerial contamination is occurring. More research is required to confirm this; however, some caution should be used when analyzing the data from plots where only *S. tomentosum* was collected (E1, S1 and S2)[1].

3.3 GENERAL ANALYSIS

The lichen *C. mitis* was present and thus collected from almost all transect sites and all control plots. Comparing the *C. mitis* data from the transect sites to known Yukon background levels (Gamberg 2006) and control sites (from this study) suggests that there are several metal levels that may be elevated in *C. mitis* (Table 1). Arsenic, lead, silver and antimony were present in some samples of *C. mitis* collected near the

[1] At plots where both lichen species were collected only the results from *C. mitis* were considered.

tailings at levels that were much higher than the highest control sites and background levels recorded in the Yukon (Gamberg 2006; this 'control' data does not include data from other disturbed sites in the Yukon). Cadmium, copper, manganese, mercury, thallium, uranium, zinc appeared to be somewhat elevated in some samples of *C. mitis* tissue collected near the tailing facilities.

Table 1. Metals in *Cladina mitis* tissue that were notably higher near the Elsa tailings than control and Yukon background data.

Metal	Known Yukon range (*u*g/g)	Elsa control site range (*u*g/g)	Elsa tailings area range (*u*g/g)	Comments
Arsenic (As)	0.0818–2.5539	0.1	<0.1 to 37.4	High levels near tailings compared to control data.
Antimony (Sb)	0.02–0.0109 (n=6)	<0.1	<0.1 to 11.9	High levels near tailings compared to control, outer transect sites and Yukon data.
Lead (Pb)	0.398–6.839	0.4 to 0.7	0.6 to 447	Very high levels near tailings compared to control and outer transect sites.
Silver (Ag)	0.0275–0.1781	0.02 – 0.04	0.05 – 6.67	High levels near tailings compared to control data.
Cadmium (Cd)	0.03–0.343	0.04 to 0.9	0.04 to 4.2	High levels near tailings compared to control data.
Copper (Cu)	0.71–7.17	0.7 to 1.0	0.8 to 26.5	High levels near tailings compared to control data.
Manganese (Mn)	19–382.5	36.2 - 86.7	32.8 to 724	Highest level at T1.
Mercury (Hg)	n/a	<0.03	<0.03-0.032	Three plots (T1, NE01 & 02) above detection limit, all near tailings.
Thallium (Tl)	n/a	<0.02	<0.02 to 0.08	Five plots (T1, SE01, S3, NE01 & 02) above detection limit, all near tailings.
Uranium (U)	0.0039–0.0109	< 0.04	< 0.04 to 0.05	Three plots (T1, NE02) above detection limit, all near tailings.
Zinc (Zn)	8.6– 94	10.7 to 17.3	11.4 to 238	Levels somewhat high near tailings compared to background Yukon data.

Metal levels in *S. tomentosum* collected near the tailings were generally high compared to the levels collected at the control plot. The limited amount of data for this species limits interpretation; however, Table 2 provides a comparison of metal levels found in *S. tomentosum*. The complete laboratory results from the lichen analysis are presented in Appendix A.

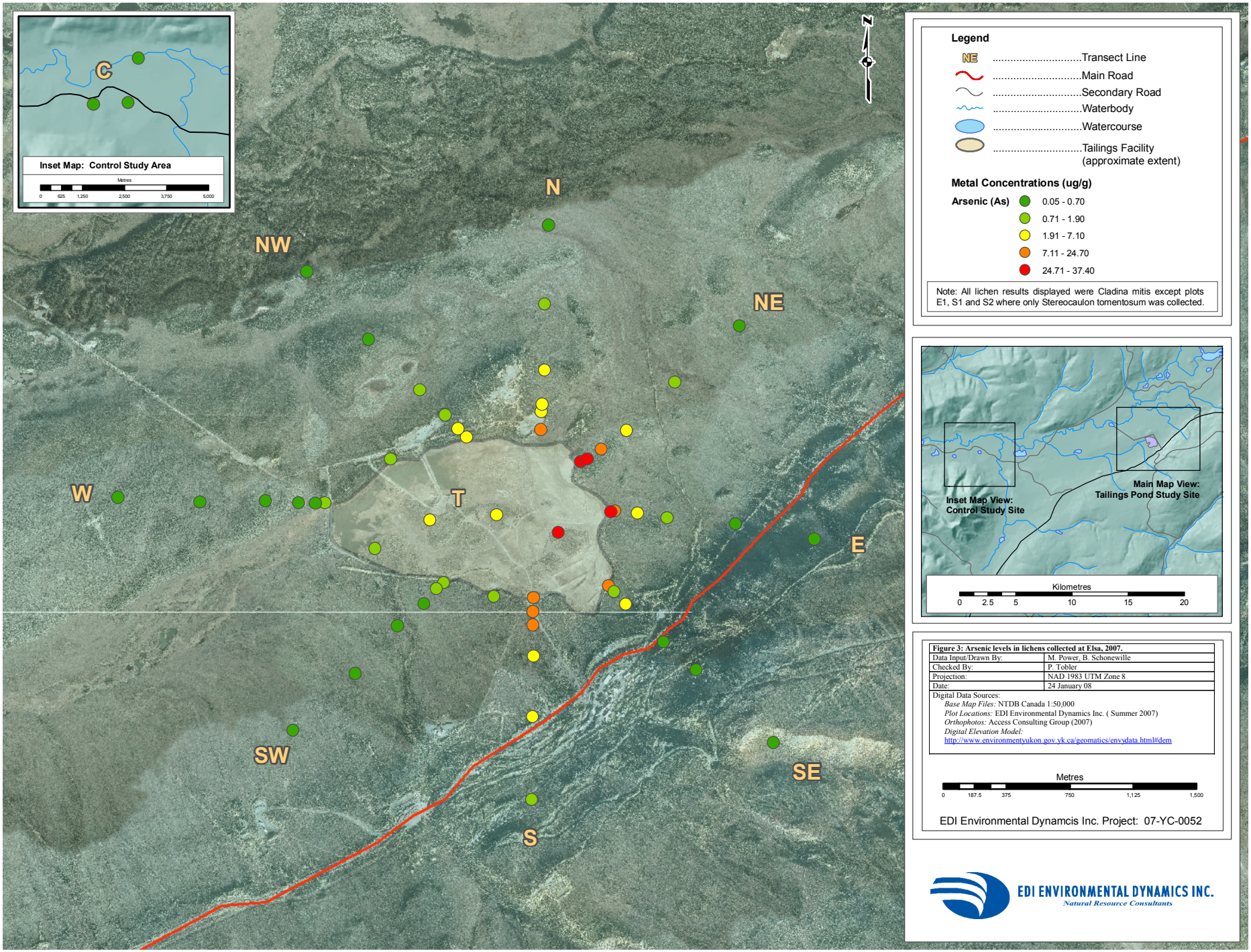
Table 2. Metals in *Stereocaulon tomentosum* tissue that were notably higher near the Elsa tailings than control and Yukon background data.

Metal	Elsa Control Site Level (*u*g/g; n=1)	Elsa Tailings Area Range (*u*g/g; n=5)
Arsenic (As)	0.2	14.1 to 47.5
Antimony (Sb)	<0.1	3.5 to 12.2
Lead (Pb)	0.5	135 to 529
Silver (Ag)	0.05	3.07 to 10.3
Cadmium (Cd)	0.03	2.28 to 5.85
Copper (Cu)	1.4	6.6 to 25.3
Manganese (Mn)	55.8	274 to 583
Mercury (Hg)	<0.03	<0.03 to 0.045
Thallium (Tl)	<0.02	0.04 to 0.16
Uranium (U)	<0.04	<0.04 to 0.08
Zinc (Zn)	15.8	135-324
Calcium (Ca)	268	2,230 to 5,510
Copper (Cu)	1.4	6.6 to 25.3
Iron (Fe)	114	1,410 to 3,390
Silicon (Si)	91	194-371
Strontium (Sr)	1.64	6.55 to 8.62
Tin (Sn)	<0.1	0.4 to 3

3.4 SPATIAL ANALYSIS

Elevated metal levels were generally found around the eastern 'dry' portion of the tailings. The highest metal levels were generally found at plots located within island of vegetation in the tailings (labeled as T) and the first two or three plots on transect lines extending north, northeast, east, southeast and south. As such, the most notable aerial dispersion of metals appears limited to within 200 m from the tailings facilities. Beyond this area, moderate levels of metals were generally found from 200–350 m on the above mentioned transects and other plots within and around the edges of the tailings in other directions. Figures 3 to 10 display metal levels at plots for selected metal levels.

There were also some moderate levels of some metals near the Elsa mine/town site. Specifically lead, silver, zinc, copper and cadmium had moderate to high levels in all plots on the transect line extending south from the tailings facility. This line crosses many disturbances including several roads and is near several buildings and miscellaneous developments. It is likely that dust generated from activities in those areas are responsible for these moderate metal levels in lichens from the outer two plots (S4 and S5).


C
Inset Map: Control Study Area
Metres
0 625 1,250 2,500 3,750 5,000
N
NW
NE
W
T
E
SW
SE
S
Legend
NE .....Transect Line
.....Main Road
.....Secondary Road
.....Waterbody
.....Watercourse
.....Tailings Facility (approximate extent)
Metal Concentrations (ug/g)
Arsenic (As)
0.05 - 0.70
0.71 - 1.90
1.91 - 7.10
7.11 - 24.70
24.71 - 37.40
Note: All lichen results displayed were Cladina mitis except plots E1, S1 and S2 where only Stereocaulon tomentosum was collected.
Inset Map View: Control Study Site
Main Map View: Tailings Pond Study Site
Kilometres
0 2.5 5 10 15 20
Figure 3: Arsenic levels in lichens collected at Elsa, 2007.
Data Input/Drawn By: M. Power, B. Schonewille
Checked By: P. Tobler
Projection: NAD 1983 UTM Zone 8
Date: 24 January 08
Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
Plot Locations: EDI Environmental Dynamics Inc. (Summer 2007)
Orthophotos: Access Consulting Group (2007)
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem
Metres
0 187.5 375 750 1,125 1,500
EDI Environmental Dynamcis Inc. Project: 07-YC-0052
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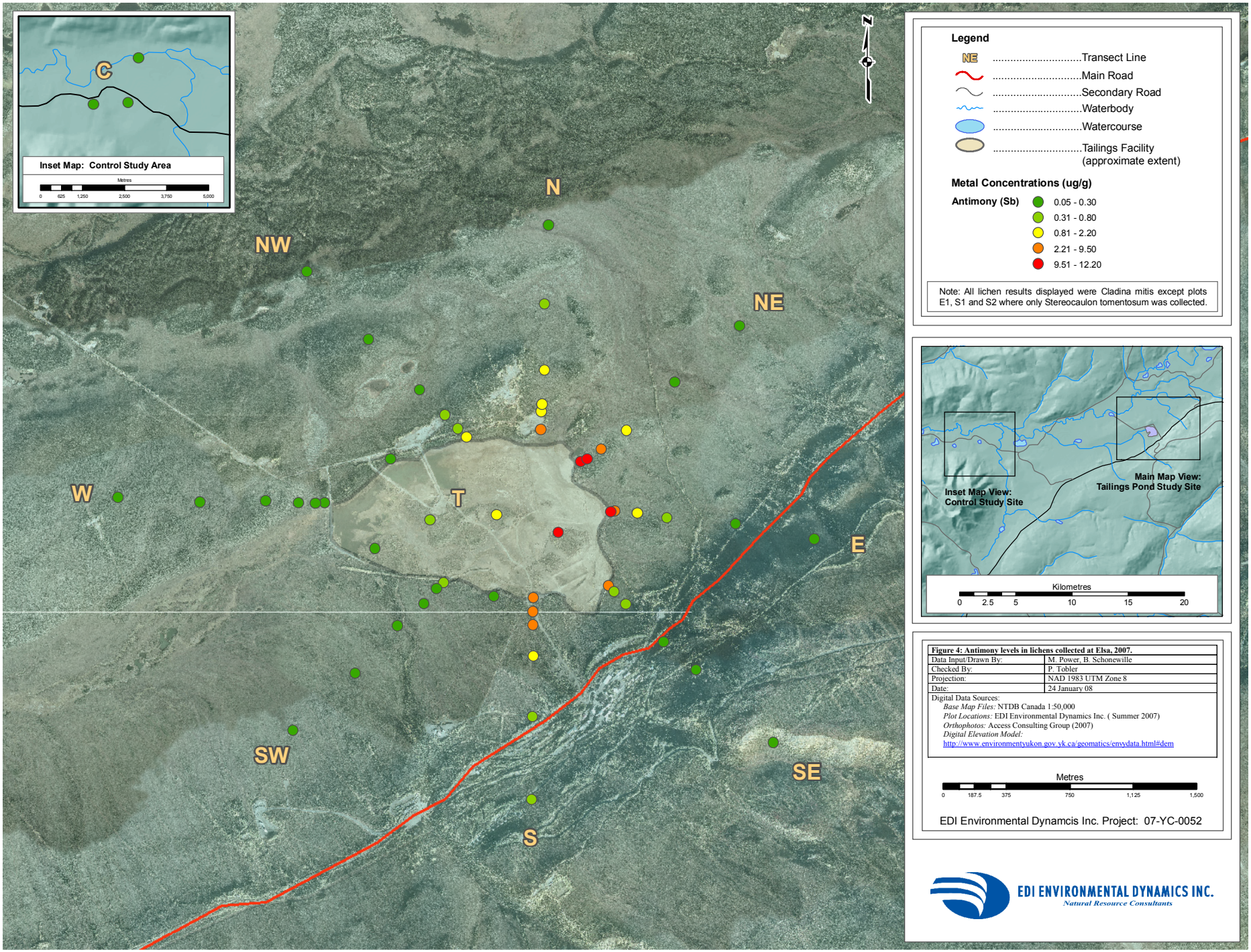
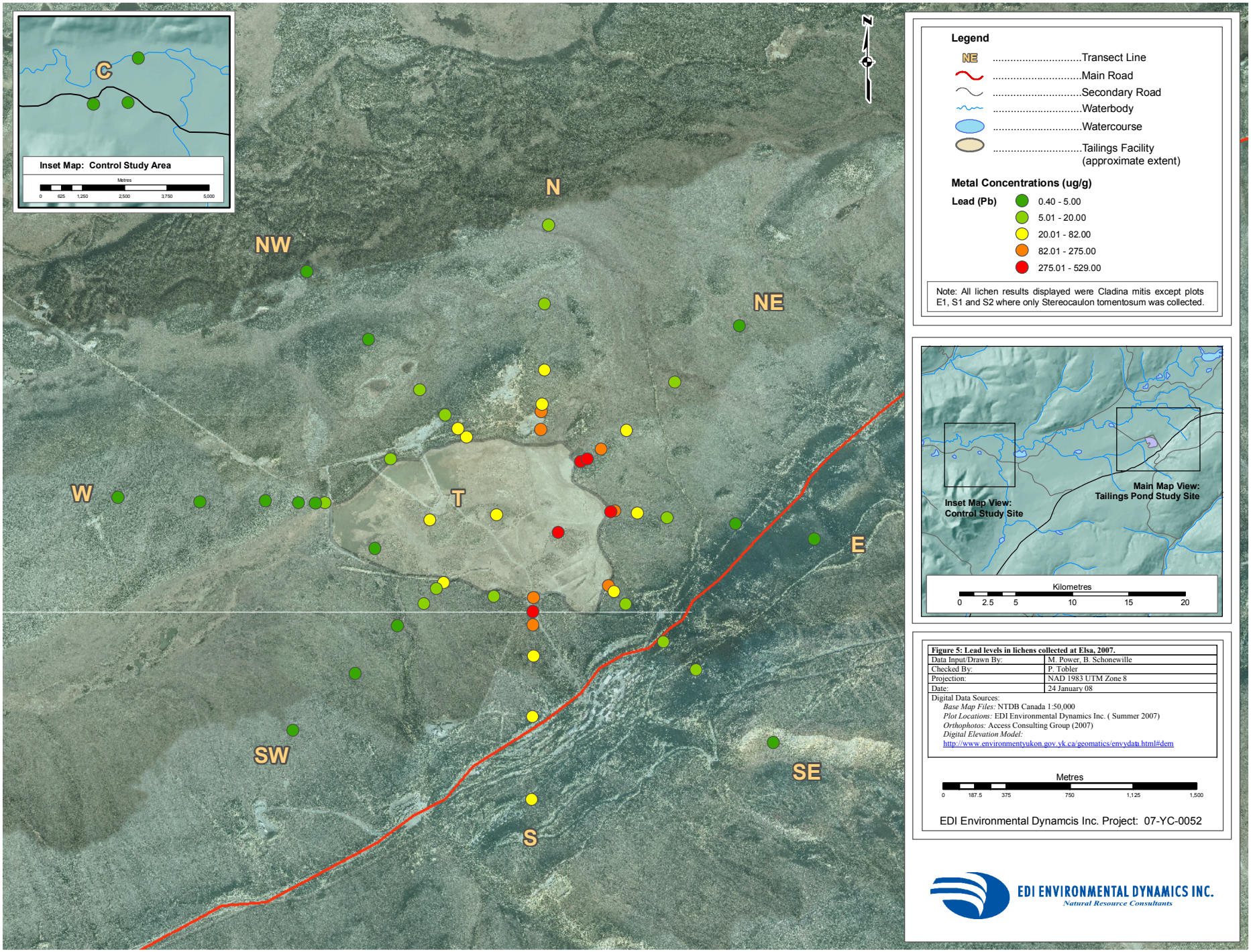
Natural Resource Consultants


C
Inset Map: Control Study Area
Metres
0 625 1,250 2,500 3,750 5,000
N
NW
NE
W
T
E
SW
SE
S
Legend
NE .....Transect Line
.....Main Road
.....Secondary Road
.....Waterbody
.....Watercourse
.....Tailings Facility (approximate extent)
Metal Concentrations (ug/g)
Antimony (Sb)
0.05 - 0.30
0.31 - 0.80
0.81 - 2.20
2.21 - 9.50
9.51 - 12.20
Note: All lichen results displayed were Cladina mitis except plots E1, S1 and S2 where only Stereocaulon tomentosum was collected.
Inset Map View: Control Study Site
Main Map View: Tailings Pond Study Site
Kilometres
0 2.5 5 10 15 20
Figure 4: Antimony levels in lichens collected at Elsa, 2007.
Data Input/Drawn By: M. Power, B. Schonewille
Checked By: P. Tobler
Projection: NAD 1983 UTM Zone 8
Date: 24 January 08
Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
Plot Locations: EDI Environmental Dynamics Inc. (Summer 2007)
Orthophotos: Access Consulting Group (2007)
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem
Metres
0 187.5 375 750 1,125 1,500
EDI Environmental Dynamcis Inc. Project: 07-YC-0052
EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants


C
Inset Map: Control Study Area
Metres
0 625 1,250 2,500 3,750 5,000
N
NW
NE
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T
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SW
SE
S
Legend
NE .....Transect Line
.....Main Road
.....Secondary Road
.....Waterbody
.....Watercourse
.....Tailings Facility (approximate extent)
Metal Concentrations (ug/g)
Lead (Pb)
0.40 - 5.00
5.01 - 20.00
20.01 - 82.00
82.01 - 275.00
275.01 - 529.00
Note: All lichen results displayed were Cladina mitis except plots E1, S1 and S2 where only Stereocaulon tomentosum was collected.
Inset Map View: Control Study Site
Main Map View: Tailings Pond Study Site
Kilometres
0 2.5 5 10 15 20
Figure 5: Lead levels in lichens collected at Elsa, 2007.
Data Input/Drawn By: M. Power, B. Schonewille
Checked By: P. Tobler
Projection: NAD 1983 UTM Zone 8
Date: 24 January 08
Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
Plot Locations: EDI Environmental Dynamics Inc. (Summer 2007)
Orthophotos: Access Consulting Group (2007)
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem
Metres
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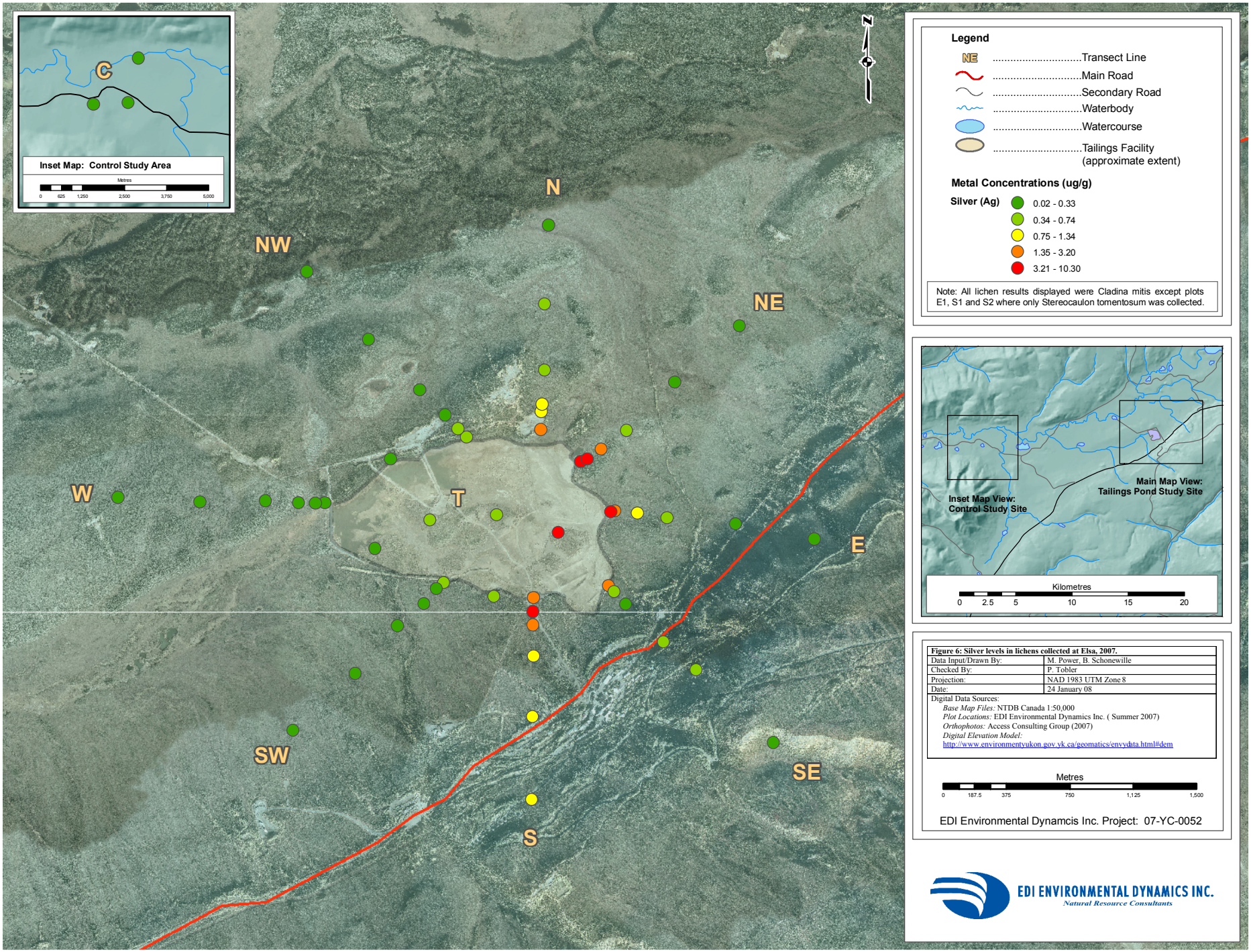
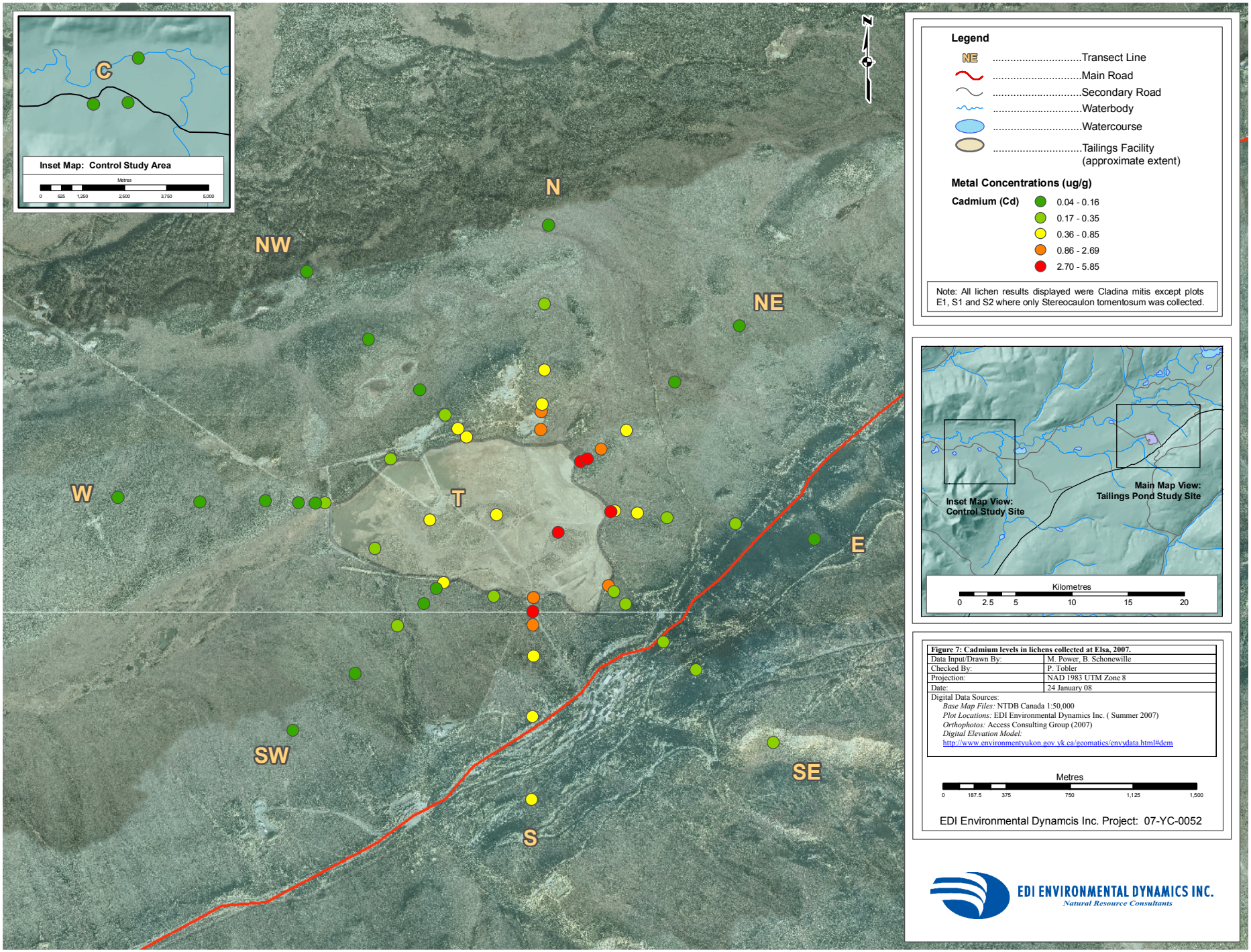
EDI Environmental Dynamcis Inc. Project: 07-YC-0052
EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants


C
Inset Map: Control Study Area
Metres
0 625 1,250 2,500 3,750 5,000
N
NW
NE
W
T
E
SW
SE
S
Legend
NE .....Transect Line
.....Main Road
.....Secondary Road
.....Waterbody
.....Watercourse
.....Tailings Facility (approximate extent)
Metal Concentrations (ug/g)
Silver (Ag)
0.02 - 0.33
0.34 - 0.74
0.75 - 1.34
1.35 - 3.20
3.21 - 10.30
Note: All lichen results displayed were Cladina mitis except plots E1, S1 and S2 where only Stereocaulon tomentosum was collected.
Inset Map View: Control Study Site
Main Map View: Tailings Pond Study Site
Kilometres
0 2.5 5 10 15 20
Figure 6: Silver levels in lichens collected at Elsa, 2007.
Data Input/Drawn By: M. Power, B. Schonewille
Checked By: P. Tobler
Projection: NAD 1983 UTM Zone 8
Date: 24 January 08
Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
Plot Locations: EDI Environmental Dynamics Inc. (Summer 2007)
Orthophotos: Access Consulting Group (2007)
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem
Metres
0 187.5 375 750 1,125 1,500
EDI Environmental Dynamcis Inc. Project: 07-YC-0052
EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants


C
Inset Map: Control Study Area
Metres
0 625 1,250 2,500 3,750 5,000
N
NW
NE
W
T
E
SW
SE
S
Legend
NE .....Transect Line
.....Main Road
.....Secondary Road
.....Waterbody
.....Watercourse
.....Tailings Facility (approximate extent)
Metal Concentrations (ug/g)
Cadmium (Cd)
0.04 - 0.16
0.17 - 0.35
0.36 - 0.85
0.86 - 2.69
2.70 - 5.85
Note: All lichen results displayed were Cladina mitis except plots E1, S1 and S2 where only Stereocaulon tomentosum was collected.
Inset Map View: Control Study Site
Main Map View: Tailings Pond Study Site
Kilometres
0 2.5 5 10 15 20
Figure 7: Cadmium levels in lichens collected at Elsa, 2007.
Data Input/Drawn By: M. Power, B. Schonewille
Checked By: P. Tobler
Projection: NAD 1983 UTM Zone 8
Date: 24 January 08
Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
Plot Locations: EDI Environmental Dynamics Inc. (Summer 2007)
Orthophotos: Access Consulting Group (2007)
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem
Metres
0 187.5 375 750 1,125 1,500
EDI Environmental Dynamcis Inc. Project: 07-YC-0052
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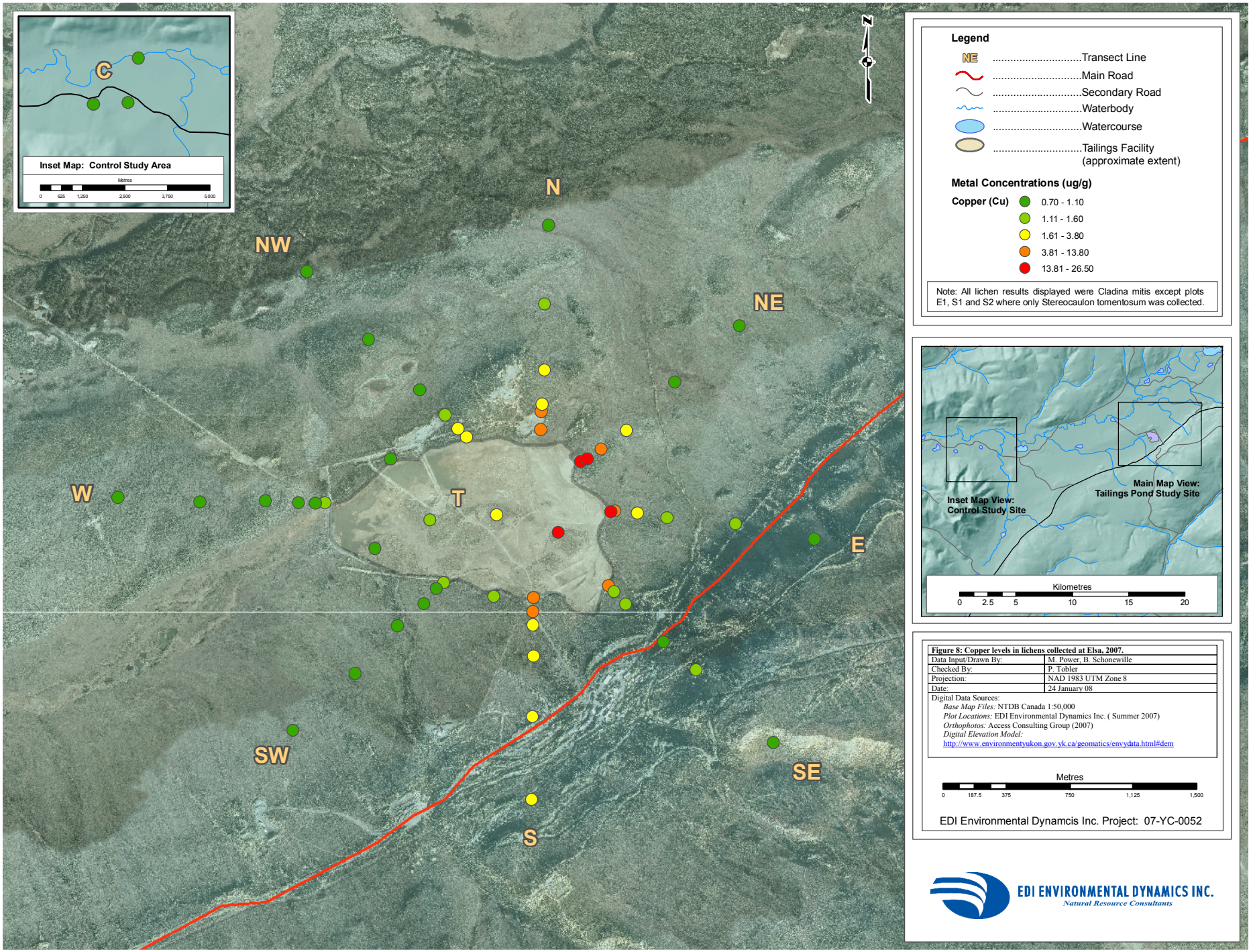
C
Inset Map: Control Study Area
Metres
0 625 1,250 2,500 3,750 5,000
N
NW
NE
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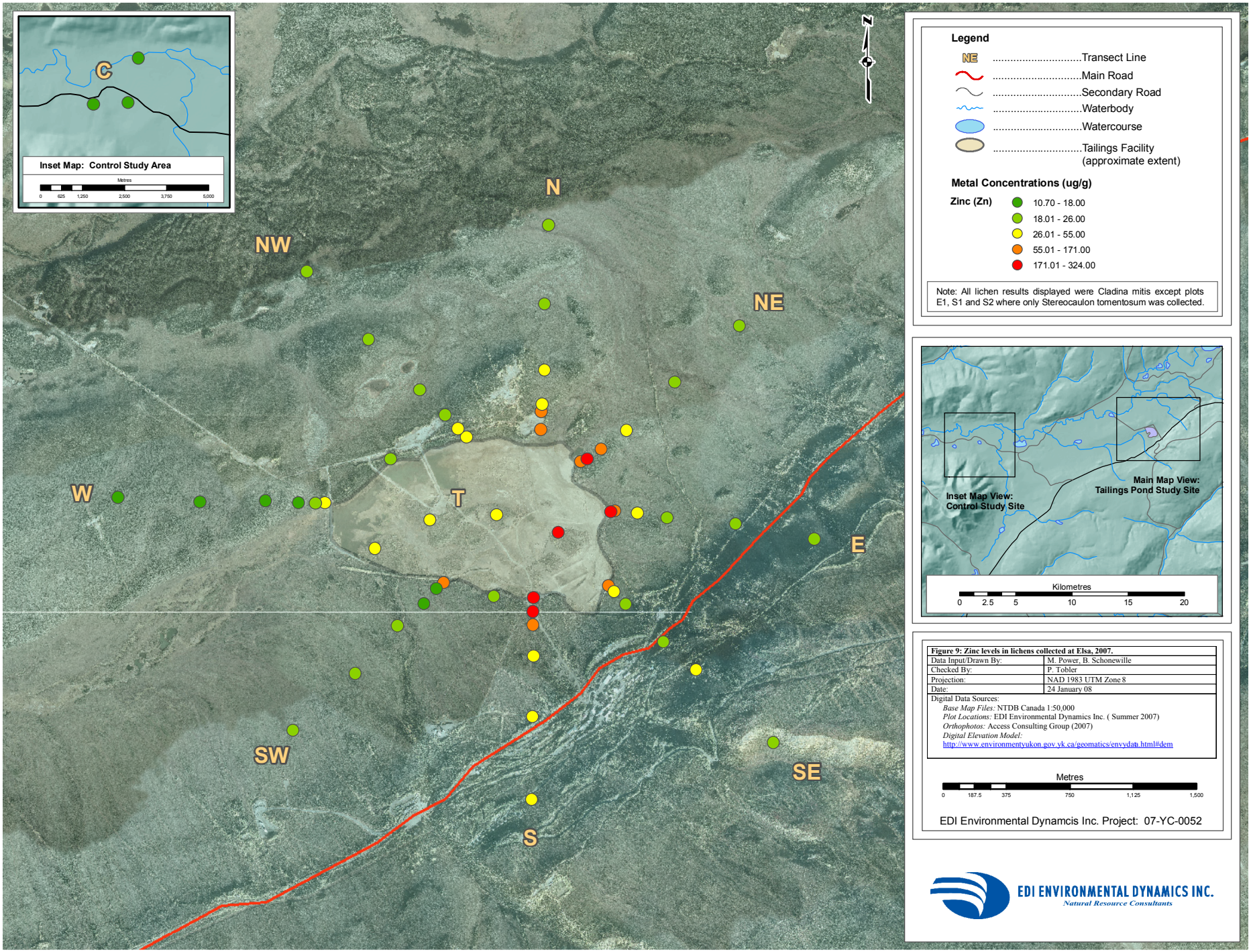
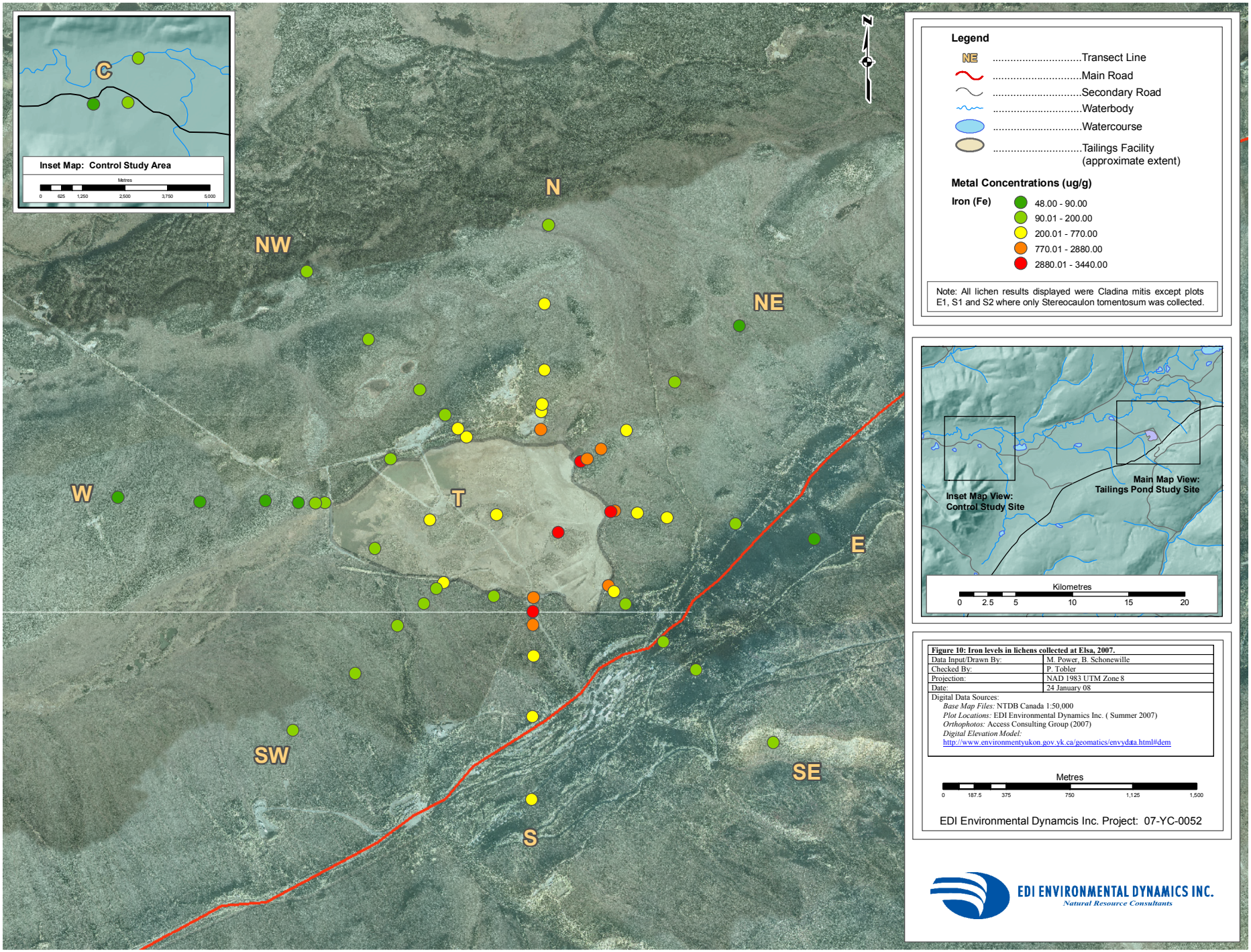
T
E
SW
SE
S
Legend
NE .....Transect Line
.....Main Road
.....Secondary Road
.....Waterbody
.....Watercourse
.....Tailings Facility (approximate extent)
Metal Concentrations (ug/g)
Copper (Cu)
0.70 - 1.10
1.11 - 1.60
1.61 - 3.80
3.81 - 13.80
13.81 - 26.50
Note: All lichen results displayed were Cladina mitis except plots E1, S1 and S2 where only Stereocaulon tomentosum was collected.
Inset Map View: Control Study Site
Main Map View: Tailings Pond Study Site
Kilometres
0 2.5 5 10 15 20
Figure 8: Copper levels in lichens collected at Elsa, 2007.
Data Input/Drawn By: M. Power, B. Schonewille
Checked By: P. Tobler
Projection: NAD 1983 UTM Zone 8
Date: 24 January 08
Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
Plot Locations: EDI Environmental Dynamics Inc. (Summer 2007)
Orthophotos: Access Consulting Group (2007)
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem
Metres
0 187.5 375 750 1,125 1,500
EDI Environmental Dynamcis Inc. Project: 07-YC-0052
EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants


C
Inset Map: Control Study Area
Metres
0 625 1,250 2,500 3,750 5,000
N
NW
NE
W
T
E
SW
SE
S
Legend
NE .....Transect Line
.....Main Road
.....Secondary Road
.....Waterbody
.....Watercourse
.....Tailings Facility (approximate extent)
Metal Concentrations (ug/g)
Zinc (Zn)
10.70 - 18.00
18.01 - 26.00
26.01 - 55.00
55.01 - 171.00
171.01 - 324.00
Note: All lichen results displayed were Cladina mitis except plots E1, S1 and S2 where only Stereocaulon tomentosum was collected.
Inset Map View: Control Study Site
Main Map View: Tailings Pond Study Site
Kilometres
0 2.5 5 10 15 20
Figure 9: Zinc levels in lichens collected at Elsa, 2007.
Data Input/Drawn By: M. Power, B. Schonewille
Checked By: P. Tobler
Projection: NAD 1983 UTM Zone 8
Date: 24 January 08
Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
Plot Locations: EDI Environmental Dynamics Inc. (Summer 2007)
Orthophotos: Access Consulting Group (2007)
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem
Metres
0 187.5 375 750 1,125 1,500
EDI Environmental Dynamcis Inc. Project: 07-YC-0052
EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants


C
Inset Map: Control Study Area
Metres
0 625 1,250 2,500 3,750 5,000
N
NW
NE
W
T
E
SW
SE
S
Legend
NE .....Transect Line
.....Main Road
.....Secondary Road
.....Waterbody
.....Watercourse
.....Tailings Facility (approximate extent)
Metal Concentrations (ug/g)
Iron (Fe)
48.00 - 90.00
90.01 - 200.00
200.01 - 770.00
770.01 - 2880.00
2880.01 - 3440.00
Note: All lichen results displayed were Cladina mitis except plots E1, S1 and S2 where only Stereocaulon tomentosum was collected.
Inset Map View: Control Study Site
Main Map View: Tailings Pond Study Site
Kilometres
0 2.5 5 10 15 20
Figure 10: Iron levels in lichens collected at Elsa, 2007.
Data Input/Drawn By: M. Power, B. Schonewille
Checked By: P. Tobler
Projection: NAD 1983 UTM Zone 8
Date: 24 January 08
Digital Data Sources:
Base Map Files: NTDB Canada 1:50,000
Plot Locations: EDI Environmental Dynamics Inc. (Summer 2007)
Orthophotos: Access Consulting Group (2007)
Digital Elevation Model:
http://www.environmentyukon.gov.yk.ca/geomatics/envydata.html#dem
Metres
0 187.5 375 750 1,125 1,500
EDI Environmental Dynamcis Inc. Project: 07-YC-0052
EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants

4 CONCLUSIONS / RECOMMENDATIONS

There is indication of aerial contamination of metals around the eastern 'dry' portion of the tailings facility. While the spatial extent is limited (compared to other Yukon sites; i.e Faro), there were notably high levels of some metals. For example, lead in some samples in this study were up to 60% of the highest levels found at Faro (747.7 *u*g/g; inferred from Gartner Lee 2006). This was surprising considering the small size of the Elsa tailings and disturbances compared to those of the Faro mine.

A concern with the Elsa tailings is that they have the potential to continue to contribute metals to the surrounding terrestrial environment. When the tailings are dry and significant wind events occur, dust from the tailings likely can be easily transported to the surrounding ecosystem. To confirm if aerial contamination is on-going and to what extent, deployment of moss bags is recommended. Moss bags are a standard low-technology method for assessing both dry and wet (i.e., airborne and precipitation-based) deposition of airborne contaminants (Temple *et al.*, 1981).

There may be a need to assess other components of the terrestrial ecosystem to determine if metal levels are accumulating in the ecosystem. This is especially important if local individuals (i.e. First Nations) collect plant material or small animals (with small home ranges) for consumption from the immediate vicinity of the tailings.

5 REFERENCES

Gamberg, M. 2006. Unpublished data regarding metal levels in plants throughout the Yukon. Data provided by email, December, 2005. Gamberg Consulting, Whitehorse, YT.

Gartner Lee Limited. 2006. *Anvil Range Mining Complex – Terrestrial Effects Study: Investigation into Metal Concentrations in Vegetation, Wildlife and Soils*. Prepared for Deloitte & Touche Inc. on behalf of the Faro Mine Closure Office.

Temple, P., D. McLaughlin, S. Linzon and R. Wills 1981. *Moss Bags as Monitors of Atmospheric Deposition.* Journal of the Air Pollution Control Association, Vol. 31, No. 6.

6 ACKNOWLEDGEMENTS

The field study team for this project included Mike Setterington and Pat Tobler from EDI and Anne Reyner and Josee Lemieux-Tremblay representing the First Nation of the NaCho Nyak Dun. Crystal Stevens organized the First Nation's involvement in the project.

Dan Cornett, from Access Consulting Group and Frank Patch from Yukon Abandoned Mines Branch provided background information and direction for the project.

Appendix A. Complete metal concentrations (ug/g) laboratory results from CANTEST.

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Conventional Parameters in Tissue

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	Moisture
STTO-SE01	Sep 26/07	710040238	71.0
CLMI-SE01	Sep 26/07	710040242	65.9
CLMI-SE02	Sep 26/07	710040243	64.5
CLMI-SE03	Sep 26/07	710040244	66.6
CLMI-SE04.5	Sep 26/07	710040245	68.0
CLMI-SE05	Sep 26/07	710040246	67.6
CLMI-SE06	Sep 26/07	710040248	56.4
CLMI-SW1	Sep 27/07	710040250	50.1
CLMI-SW2	Sep 27/07	710040251	58.8
CLMI-SW3	Sep 27/07	710040253	51.2
CLMI-SW4	Sep 27/07	710040256	52.6
CLMI-SW5	Sep 27/07	710040257	45.8
CLMI-SW6	Sep 27/07	710040258	60.1
CLMI-NE01	Sep 27/07	710040260	65.1
CLMI-NE02	Sep 26/07	710040261	59.9
CLMI-NE03	Sep 26/07	710040262	61.7
CLMI-NE04	Sep 26/07	710040263	62.5
CLMI-NE05	Sep 26/07	710040264	62.1
CLMI-NE06-1	Sep 26/07	710040266	68.9
CLMI-W1	Sep 27/07	710040269	55.2
CLMI-W2	Sep 27/07	710040270	53.7
CLMI-W3	Sep 27/07	710040271	49.8
CLMI-W4	Sep 27/07	710040272	60.0
CLMI-W5	Sep 27/07	710040273	53.1
CLMI-W6	Sep 27/07	710040274	58.5
STTO-S1	Sep 26/07	710040275	74.3
STTO-S2	Sep 26/07	710040276	69.5
STTO-S3	Sep 26/07	710040277	78.1
CLMI-S3	Sep 26/07	710040278	66.0
CLMI-S4	Sep 26/07	710040279	65.8
CLMI-S5	Sep 26/07	710040280	67.2
CLMI-S6	Sep 26/07	710040281	67.3
CLMI-C01	Sep 27/07	710040283	52.9
CLMI-C03	Sep 27/07	710040287	58.1
CLMI-C05	Sep 27/07	710040288	62.2
STTO-C05	Sep 27/07	710040289	71.6
STTO-E1	Sep 25/07	710040290	67.2
CLMI-E2	Sep 25/07	710040291	55.7

(Continued on next page)

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Conventional Parameters in Tissue

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	Moisture
CLMI-E3	Sep 25/07	710040292	57.3
CLMI-E4	Sep 25/07	710040294	53.3
CLMI-E5-1	Sep 25/07	710040296	60.5
CLMI-E6-1	Sep 25/07	710040298	61.2
CLMI-NW01	Sep 27/07	710040299	51.6
CLMI-NW02	Sep 27/07	710040301	51.8
CLMI-NW03	Sep 27/07	710040303	59.5
CLMI-NW04	Sep 27/07	710040304	54.6
CLMI-NW05	Sep 27/07	710040306	58.9
CLMI-NW06	Sep 27/07	710040308	56.6
CLMI-N1	Sep 26/07	710040311	61.7
CLMI-N2	Sep 26/07	710040312	54.2
CLMI-N3	Sep 26/07	710040315	66.2
CLMI-N4	Sep 26/07	710040318	69.5
CLMI-N5	Sep 26/07	710040319	66.6
CLMI-N6	Sep 26/07	710040320	65.6
CLMI-T1	Sep 26/07	710040321	69.5
CLMI-T03	Sep 26/07	710040324	48.9
CLMI-T5	Sep 26/07	710040326	54.5
CLMI-T07-1	Sep 27/07	710040327	41.4
CLMI-T09	Sep 27/07	710040328	28.2
CLMI-T10	Sep 27/07	710040330	51.6
CLMI-T7-2	Sep 27/07	710040333	46.2
CLMI-E5-2	Sep 25/07	710040334	57.3
DETECTION LIMIT			0.1
UNITS			%

% = percent

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		STTO-SE01	CLMI-SE01	CLMI-SE02	CLMI-SE03	
DATE SAMPLED:		Sep 26/07	Sep 26/07	Sep 26/07	Sep 26/07	DETECTION LIMIT
CANTEST ID:		710040238	710040242	710040243	710040244	
Aluminum	Al	147	88.4	58.2	44.2	0.5
Antimony	Sb	9.8	4.7	0.5	0.4	0.1
Arsenic	As	47.5	21.2	1.9	2.2	0.1
Barium	Ba	14.6	6.9	5.8	4.2	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	3	<	<	<	2
Cadmium	Cd	4.07	2.04	0.35	0.20	0.02
Calcium	Ca	5130	2060	1010	1220	1
Chromium	Cr	0.9	0.6	0.2	0.2	0.1
Cobalt	Co	0.2	0.1	<	<	0.1
Copper	Cu	19.4	8.6	1.4	1.3	0.1
Iron	Fe	3290	1450	210	172	5
Lead	Pb	395	165	22.4	12.8	0.1
Magnesium	Mg	571	769	326	335	0.5
Manganese	Mn	444	238	83.2	44.4	0.1
Mercury	Hg	0.045	<	<	<	0.03
Molybdenum	Mo	0.1	<	<	<	0.1
Nickel	Ni	1.2	0.5	0.2	0.2	0.1
Phosphorus	P	589	591	344	309	0.5
Potassium	K	2510	1540	1100	1100	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	371	165	121	108	10
Silver	Ag	6.22	3.20	0.50	0.32	0.01
Sodium	Na	26	10	9	13	1
Strontium	Sr	8.62	3.91	2.05	2.19	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	0.06	0.03	<	<	0.02
Tin	Sn	3.0	1.6	0.2	0.3	0.1
Titanium	Ti	4.1	3.1	2.9	2.2	0.3
Uranium	U	0.05	<	<	<	0.04
Vanadium	V	0.6	<	<	<	0.5
Zinc	Zn	217	122	27.1	21.2	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-SE04.5	CLMI-SE05	CLMI-SE06	CLMI-SW1	
DATE SAMPLED:		Sep 26/07	Sep 26/07	Sep 26/07	Sep 27/07	DETECTION LIMIT
CANTEST ID:		710040245	710040246	710040248	710040250	
Aluminum	Al	66.8	45.7	50.5	67.1	0.5
Antimony	Sb	0.2	0.2	<	0.5	0.1
Arsenic	As	0.7	0.5	0.3	1.9	0.1
Barium	Ba	5.8	8.6	12.5	4.9	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.22	0.20	0.21	0.54	0.02
Calcium	Ca	884	1030	1040	1070	1
Chromium	Cr	0.3	0.3	0.2	0.2	0.1
Cobalt	Co	<	<	<	<	0.1
Copper	Cu	1.1	1.2	1.0	1.4	0.1
Iron	Fe	159	108	101	219	5
Lead	Pb	9.6	5.9	2.9	21.2	0.1
Magnesium	Mg	353	383	344	326	0.5
Manganese	Mn	173	115	113	174	0.1
Mercury	Hg	<	<	<	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.3	0.4	0.2	0.3	0.1
Phosphorus	P	376	474	626	489	0.5
Potassium	K	1130	1390	1660	1370	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	107	128	89	117	10
Silver	Ag	0.38	0.43	0.15	0.61	0.01
Sodium	Na	11	9	8	9	1
Strontium	Sr	1.53	2.39	2.35	2.71	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	<	<	0.02
Tin	Sn	<	<	<	<	0.1
Titanium	Ti	3.4	2.4	3.2	3.4	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	24.8	26.9	23.3	59.9	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-SW2	CLMI-SW3	CLMI-SW4	CLMI-SW5	
DATE SAMPLED:		Sep 27/07	Sep 27/07	Sep 27/07	Sep 27/07	DETECTION LIMIT
CANTEST ID:		710040251	710040253	710040256	710040257	
Aluminum	Al	42.1	46.5	50.5	52.5	0.5
Antimony	Sb	0.2	0.1	0.1	<	0.1
Arsenic	As	0.9	0.7	0.7	0.4	0.1
Barium	Ba	3.9	3.6	6.3	10.1	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.14	0.10	0.29	0.10	0.02
Calcium	Ca	1520	1310	957	1160	1
Chromium	Cr	0.2	0.2	0.2	0.1	0.1
Cobalt	Co	<	<	<	<	0.1
Copper	Cu	1.0	0.9	1.0	0.9	0.1
Iron	Fe	109	120	112	105	5
Lead	Pb	7.0	5.9	4.5	3.4	0.1
Magnesium	Mg	261	276	285	307	0.5
Manganese	Mn	55.0	47.8	64.9	54.6	0.1
Mercury	Hg	<	<	<	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.2	0.2	0.2	0.2	0.1
Phosphorus	P	434	429	356	422	0.5
Potassium	K	1160	1120	1230	1290	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	150	173	116	145	10
Silver	Ag	0.24	0.21	0.18	0.13	0.01
Sodium	Na	13	18	10	7	1
Strontium	Sr	3.11	3.04	2.77	3.78	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	<	<	0.02
Tin	Sn	<	<	0.2	<	0.1
Titanium	Ti	2.4	2.6	2.7	3.0	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	16.0	14.9	19.3	22.5	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-SW6	CLMI-NE01	CLMI-NE02	CLMI-NE03	
DATE SAMPLED:		Sep 27/07	Sep 27/07	Sep 26/07	Sep 26/07	DETECTION LIMIT
CANTEST ID:		710040258	710040260	710040261	710040262	
Aluminum	Al	56.7	136	147	73.0	0.5
Antimony	Sb	<	11.7	11.9	3.5	0.1
Arsenic	As	0.2	32.9	32.4	9.8	0.1
Barium	Ba	6.5	10.4	20.1	14.1	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.07	2.83	2.91	1.15	0.02
Calcium	Ca	909	1570	2240	1250	1
Chromium	Cr	0.2	1.2	1.2	0.4	0.1
Cobalt	Co	<	0.2	0.2	<	0.1
Copper	Cu	0.8	26.5	17.6	5.7	0.1
Iron	Fe	98	2980	2880	919	5
Lead	Pb	1.8	447	433	135	0.1
Magnesium	Mg	327	626	554	380	0.5
Manganese	Mn	110	496	535	224	0.1
Mercury	Hg	<	0.032	0.030	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.3	0.9	1.0	0.4	0.1
Phosphorus	P	296	501	501	412	0.5
Potassium	K	1040	1510	1610	1320	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	113	181	186	143	10
Silver	Ag	0.08	6.67	6.61	1.91	0.01
Sodium	Na	9	16	15	10	1
Strontium	Sr	1.94	3.80	5.71	2.99	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	0.03	0.03	<	0.02
Tin	Sn	<	2.9	2.9	0.9	0.1
Titanium	Ti	3.1	3.9	4.4	3.1	0.3
Uranium	U	<	<	0.04	<	0.04
Vanadium	V	<	0.6	0.6	<	0.5
Zinc	Zn	19.9	171	190	77.5	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-NE04	CLMI-NE05	CLMI-NE06-1	CLMI-W1	
DATE SAMPLED:		Sep 26/07	Sep 26/07	Sep 26/07	Sep 27/07	DETECTION LIMIT
CANTEST ID:		710040263	710040264	710040266	710040269	
Aluminum	Al	52.3	56.8	43.4	63.1	0.5
Antimony	Sb	1.1	0.2	<	0.2	0.1
Arsenic	As	2.8	0.8	0.3	1.1	0.1
Barium	Ba	7.9	5.8	5.7	11.1	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.44	0.14	0.12	0.28	0.02
Calcium	Ca	1060	1550	703	1010	1
Chromium	Cr	0.3	0.2	0.8	0.3	0.1
Cobalt	Co	<	<	<	<	0.1
Copper	Cu	2.1	1.1	1.0	1.2	0.1
Iron	Fe	283	144	90	168	5
Lead	Pb	33.3	7.9	3.3	6.5	0.1
Magnesium	Mg	319	430	254	532	0.5
Manganese	Mn	83.3	53.6	192	99.9	0.1
Mercury	Hg	<	<	<	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.3	0.2	1.1	0.4	0.1
Phosphorus	P	389	443	459	503	0.5
Potassium	K	1230	1260	1420	1500	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	117	195	128	115	10
Silver	Ag	0.63	0.23	0.15	0.30	0.01
Sodium	Na	10	9	11	9	1
Strontium	Sr	2.41	3.81	1.38	2.68	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	<	<	0.02
Tin	Sn	0.4	0.1	<	<	0.1
Titanium	Ti	2.8	3.2	2.6	3.1	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	34.3	18.9	21.3	29.2	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-W2	CLMI-W3	CLMI-W4	CLMI-W5	
DATE SAMPLED:		Sep 27/07	Sep 27/07	Sep 27/07	Sep 27/07	DETECTION LIMIT
CANTEST ID:		710040270	710040271	710040272	710040273	
Aluminum	Al	51.7	44.0	34.9	53.8	0.5
Antimony	Sb	<	<	<	<	0.1
Arsenic	As	0.4	0.2	0.1	0.1	0.1
Barium	Ba	12.9	7.5	10.1	5.7	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.12	0.05	0.09	0.04	0.02
Calcium	Ca	960	1060	1060	739	1
Chromium	Cr	0.2	0.1	0.1	0.2	0.1
Cobalt	Co	<	<	<	<	0.1
Copper	Cu	0.8	0.8	0.8	0.8	0.1
Iron	Fe	105	82	62	86	5
Lead	Pb	2.6	1.5	0.8	0.7	0.1
Magnesium	Mg	309	403	354	287	0.5
Manganese	Mn	68.2	84.3	32.8	41.8	0.1
Mercury	Hg	<	< 0.3	<	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.2	0.2	0.2	0.2	0.1
Phosphorus	P	411	363	462	325	0.5
Potassium	K	1370	1080	1460	1210	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	106	131	89	118	10
Silver	Ag	0.15	0.07	0.06	0.05	0.01
Sodium	Na	8	8	8	7	1
Strontium	Sr	2.60	2.30	2.28	1.98	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	<	<	0.02
Tin	Sn	<	<	0.2	<	0.1
Titanium	Ti	2.8	2.5	1.9	3.0	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	20.4	16.0	13.6	14.2	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-W6	STTO-S1	STTO-S2	STTO-S3	
DATE SAMPLED:		Sep 27/07	Sep 26/07	Sep 26/07	Sep 26/07	DETECTION LIMIT
CANTEST ID:		710040274	710040275	710040276	710040277	
Aluminum	Al	28.7	148	522	261	0.5
Antimony	Sb	<	3.5	9.5	6.5	0.1
Arsenic	As	<	14.1	24.7	16.2	0.1
Barium	Ba	11.2	8.2	23.3	12.5	0.1
Beryllium	Be	<	<	0.02	<	0.02
Boron	B	<	<	<	2	2
Cadmium	Cd	0.04	2.28	2.99	2.69	0.02
Calcium	Ca	846	3760	2230	5510	1
Chromium	Cr	0.2	0.6	1.6	0.9	0.1
Cobalt	Co	<	0.2	0.5	0.2	0.1
Copper	Cu	0.9	6.6	13.8	9.6	0.1
Iron	Fe	48	1410	3140	2020	5
Lead	Pb	0.6	135	438	275	0.1
Magnesium	Mg	268	745	702	715	0.5
Manganese	Mn	69.4	454	583	274	0.1
Mercury	Hg	<	<	0.047	<	0.03
Molybdenum	Mo	<	0.1	0.2	0.1	0.1
Nickel	Ni	0.2	1.6	2.4	1.4	0.1
Phosphorus	P	477	797	696	664	0.5
Potassium	K	1620	3410	2830	2910	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	125	194	293	239	10
Silver	Ag	0.05	3.07	10.2	6.49	0.01
Sodium	Na	8	15	21	18	1
Strontium	Sr	2.00	6.72	6.71	6.55	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	0.04	0.09	0.06	0.02
Tin	Sn	0.1	0.4	0.6	0.6	0.1
Titanium	Ti	1.7	4.4	13.5	9.2	0.3
Uranium	U	<	<	0.08	0.04	0.04
Vanadium	V	<	0.6	1.7	1.1	0.5
Zinc	Zn	11.4	174	209	135	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-S3	CLMI-S4	CLMI-S5	CLMI-S6	
DATE SAMPLED:		Sep 26/07	Sep 26/07	Sep 26/07	Sep 26/07	DETECTION LIMIT
CANTEST ID:		710040278	710040279	710040280	710040281	
Aluminum	Al	126	56.4	111	77.9	0.5
Antimony	Sb	2.8	1.0	0.8	0.6	0.1
Arsenic	As	7.2	2.9	2.0	1.9	0.1
Barium	Ba	6.0	4.7	5.9	7.3	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	1.45	0.45	0.40	0.43	0.02
Calcium	Ca	1220	1220	1230	1010	1
Chromium	Cr	0.5	0.2	0.5	0.4	0.1
Cobalt	Co	0.1	<	0.1	0.1	0.1
Copper	Cu	3.8	1.8	1.9	1.9	0.1
Iron	Fe	772	316	379	326	5
Lead	Pb	110	39.5	33.7	26.9	0.1
Magnesium	Mg	493	352	374	436	0.5
Manganese	Mn	237	134	77.6	92.8	0.1
Mercury	Hg	<	<	<	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.6	0.3	0.5	0.4	0.1
Phosphorus	P	491	413	432	327	0.5
Potassium	K	1400	1140	1270	1170	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	109	101	122	113	10
Silver	Ag	2.49	0.99	1.04	1.23	0.01
Sodium	Na	13	9	13	12	1
Strontium	Sr	2.41	2.30	2.70	2.37	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	0.03	<	<	<	0.02
Tin	Sn	0.3	0.2	0.2	0.2	0.1
Titanium	Ti	4.3	2.5	4.9	4.0	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	90.2	40.7	31.4	37.9	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
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REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-C01	CLMI-C03	CLMI-C05	STTO-C05	
DATE SAMPLED:		Sep 27/07	Sep 27/07	Sep 27/07	Sep 27/07	DETECTION LIMIT
CANTEST ID:		710040283	710040287	710040288	710040289	
Aluminum	Al	59.0	48.5	69.7	80.1	0.5
Antimony	Sb	<	<	<	<	0.1
Arsenic	As	0.1	0.1	0.1	0.2	0.1
Barium	Ba	8.0	7.5	13.3	14.0	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.04	0.09	0.07	0.03	0.02
Calcium	Ca	1220	1170	537	268	1
Chromium	Cr	0.2	0.2	0.2	0.2	0.1
Cobalt	Co	<	<	<	0.1	0.1
Copper	Cu	1.0	0.8	0.7	1.4	0.1
Iron	Fe	101	84	98	114	5
Lead	Pb	0.4	0.6	0.7	0.5	0.1
Magnesium	Mg	400	421	171	160	0.5
Manganese	Mn	36.2	65.1	86.7	55.8	0.1
Mercury	Hg	<	<	<	<	0.03
Molybdenum	Mo	<	<	<	0.1	0.1
Nickel	Ni	0.4	0.3	0.3	0.5	0.1
Phosphorus	P	419	524	361	500	0.5
Potassium	K	1080	1650	1070	1680	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	110	73	83	91	10
Silver	Ag	0.02	0.02	0.04	0.05	0.01
Sodium	Na	10	8	12	17	1
Strontium	Sr	2.52	2.20	2.21	1.64	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	<	<	0.02
Tin	Sn	<	<	<	<	0.1
Titanium	Ti	3.3	2.9	3.5	3.9	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	17.3	13.0	10.7	15.8	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		STTO-E1	CLMI-E2	CLMI-E3	CLMI-E4	
DATE SAMPLED:		Sep 25/07	Sep 25/07	Sep 25/07	Sep 25/07	DETECTION LIMIT
CANTEST ID:		710040290	710040291	710040292	710040294	
Aluminum	Al	159	76.4	57.6	58.9	0.5
Antimony	Sb	12.2	3.1	1.4	0.5	0.1
Arsenic	As	36.8	9.5	3.9	1.5	0.1
Barium	Ba	22.3	5.8	5.6	4.8	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	5.85	0.85	0.44	0.23	0.02
Calcium	Ca	4520	1000	1040	1070	1
Chromium	Cr	0.9	0.4	0.3	0.2	0.1
Cobalt	Co	0.2	<	<	<	0.1
Copper	Cu	25.3	5.0	2.5	1.3	0.1
Iron	Fe	3390	792	376	203	5
Lead	Pb	529	116	42.9	15.5	0.1
Magnesium	Mg	546	399	427	292	0.5
Manganese	Mn	420	206	104	65.4	0.1
Mercury	Hg	0.034	<	<	<	0.03
Molybdenum	Mo	0.1	<	<	<	0.1
Nickel	Ni	1.9	0.4	0.3	0.2	0.1
Phosphorus	P	469	413	371	328	0.5
Potassium	K	1910	1250	1140	929	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	317	109	93	73	10
Silver	Ag	10.3	2.05	0.89	0.37	0.01
Sodium	Na	34	10	9	10	1
Strontium	Sr	7.55	2.29	2.25	3.51	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	0.16	<	<	<	0.02
Tin	Sn	2.5	0.9	0.4	0.2	0.1
Titanium	Ti	4.0	3.5	2.8	3.0	0.3
Uranium	U	0.06	<	<	<	0.04
Vanadium	V	0.6	<	<	<	0.5
Zinc	Zn	324	61.3	34.0	20.9	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
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REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-E5-1	CLMI-E6-1	CLMI-NW01	CLMI-NW02	
DATE SAMPLED:		Sep 25/07	Sep 25/07	Sep 27/07	Sep 27/07	DETECTION LIMIT
CANTEST ID:		710040296	710040298	710040299	710040301	
Aluminum	Al	38.0	39.8	51.0	45.7	0.5
Antimony	Sb	<	0.1	0.9	0.8	0.1
Arsenic	As	0.4	0.3	2.8	2.7	0.1
Barium	Ba	6.6	6.1	9.2	11.2	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.17	0.09	0.47	0.41	0.02
Calcium	Ca	1270	1000	960	1210	1
Chromium	Cr	0.7	0.1	0.2	0.2	0.1
Cobalt	Co	<	<	<	<	0.1
Copper	Cu	1.4	0.8	2.0	1.9	0.1
Iron	Fe	92	83	267	249	5
Lead	Pb	3.6	2.3	30.7	26.2	0.1
Magnesium	Mg	407	387	420	512	0.5
Manganese	Mn	194	92.4	114	82.1	0.1
Mercury	Hg	<	<	<	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.4	0.2	0.2	0.2	0.1
Phosphorus	P	512	379	441	521	0.5
Potassium	K	2340	1310	1320	1620	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	92	82	100	74	10
Silver	Ag	0.23	0.11	0.63	0.57	0.01
Sodium	Na	9	12	8	9	1
Strontium	Sr	2.02	1.97	2.48	3.12	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	<	<	0.02
Tin	Sn	0.1	<	0.3	1.1	0.1
Titanium	Ti	2.1	2.3	2.5	2.2	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	23.0	21.3	32.0	30.3	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-NW03	CLMI-NW04	CLMI-NW05	CLMI-NW06	
DATE SAMPLED:		Sep 27/07	Sep 27/07	Sep 27/07	Sep 27/07	DETECTION LIMIT
CANTEST ID:		710040303	710040304	710040306	710040308	
Aluminum	Al	41.6	47.4	48.0	46.1	0.5
Antimony	Sb	0.5	0.3	0.1	0.1	0.1
Arsenic	As	1.3	0.9	0.5	0.5	0.1
Barium	Ba	16.1	6.3	12.6	21.7	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.24	0.16	0.11	0.09	0.02
Calcium	Ca	1130	993	643	1040	1
Chromium	Cr	0.3	0.2	0.2	0.2	0.1
Cobalt	Co	<	<	<	<	0.1
Copper	Cu	1.3	1.1	0.9	1.0	0.1
Iron	Fe	151	130	100	100	5
Lead	Pb	12.7	8.2	4.4	3.7	0.1
Magnesium	Mg	364	408	216	252	0.5
Manganese	Mn	109	77.5	147	181	0.1
Mercury	Hg	<	<	<	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.3	0.2	0.3	0.3	0.1
Phosphorus	P	524	375	375	461	0.5
Potassium	K	1590	1280	1320	1450	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	95	111	87	95	10
Silver	Ag	0.33	0.24	0.16	0.15	0.01
Sodium	Na	10	10	10	13	1
Strontium	Sr	2.69	2.64	1.98	3.22	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	<	<	0.02
Tin	Sn	0.2	0.1	<	<	0.1
Titanium	Ti	2.2	2.9	2.5	2.4	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	21.4	18.9	18.5	21.5	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-N1	CLMI-N2	CLMI-N3	CLMI-N4	
DATE SAMPLED:		Sep 26/07	Sep 26/07	Sep 26/07	Sep 26/07	DETECTION LIMIT
CANTEST ID:		710040311	710040312	710040315	710040318	
Aluminum	Al	71.8	47.2	50.9	44.0	0.5
Antimony	Sb	4.3	2.2	1.2	0.9	0.1
Arsenic	As	13.0	7.1	3.3	2.6	0.1
Barium	Ba	7.6	9.6	8.5	7.0	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	1.50	0.93	0.48	0.37	0.02
Calcium	Ca	1340	1370	1470	1020	1
Chromium	Cr	0.5	0.3	0.2	0.1	0.1
Cobalt	Co	<	<	<	<	0.1
Copper	Cu	6.5	4.9	2.3	2.1	0.1
Iron	Fe	997	557	341	270	5
Lead	Pb	153	82.5	44.3	34.0	0.1
Magnesium	Mg	645	823	448	376	0.5
Manganese	Mn	248	161	101	110	0.1
Mercury	Hg	<	<	<	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.5	0.4	0.3	0.4	0.1
Phosphorus	P	683	704	440	381	0.5
Potassium	K	2050	2100	1560	1210	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	129	78	121	111	10
Silver	Ag	2.66	1.34	0.82	0.61	0.01
Sodium	Na	11	11	11	12	1
Strontium	Sr	2.70	3.04	3.03	1.93	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	<	<	0.02
Tin	Sn	1.0	0.6	0.3	0.2	0.1
Titanium	Ti	2.6	2.2	2.6	2.2	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	83.5	55.7	34.6	28.4	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-N5	CLMI-N6	CLMI-T1	CLMI-T03	
DATE SAMPLED:		Sep 26/07	Sep 26/07	Sep 26/07	Sep 26/07	DETECTION LIMIT
CANTEST ID:		710040319	710040320	710040321	710040324	
Aluminum	Al	61.5	69.7	136	55.8	0.5
Antimony	Sb	0.5	0.2	11.9	0.4	0.1
Arsenic	As	1.5	0.7	37.4	3.1	0.1
Barium	Ba	9.4	4.7	12.8	6.0	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.17	0.11	4.20	0.52	0.02
Calcium	Ca	1030	1530	1450	796	1
Chromium	Cr	0.2	0.3	5.1	0.2	0.1
Cobalt	Co	<	<	0.2	<	0.1
Copper	Cu	1.4	1.1	18.5	1.2	0.1
Iron	Fe	217	180	3440	234	5
Lead	Pb	18.0	7.4	418	20.8	0.1
Magnesium	Mg	365	317	636	321	0.5
Manganese	Mn	51.0	55.4	724	112	0.1
Mercury	Hg	<	<	0.032	<	0.03
Molybdenum	Mo	<	<	0.3	<	0.1
Nickel	Ni	0.3	0.3	1.7	0.4	0.1
Phosphorus	P	275	344	604	367	0.5
Potassium	K	983	983	1660	1170	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	145	202	171	73	10
Silver	Ag	0.36	0.19	6.33	0.59	0.01
Sodium	Na	11	17	12	10	1
Strontium	Sr	3.33	3.47	3.10	1.90	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	0.08	<	0.02
Tin	Sn	0.2	0.2	2.8	<	0.1
Titanium	Ti	3.3	3.8	4.3	2.8	0.3
Uranium	U	<	<	0.05	<	0.04
Vanadium	V	<	<	0.6	<	0.5
Zinc	Zn	24.2	23.0	238	33.5	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-T5	CLMI-T07-1	CLMI-T09	CLMI-T10	
DATE SAMPLED:		Sep 26/07	Sep 27/07	Sep 27/07	Sep 27/07	DETECTION LIMIT
CANTEST ID:		710040326	710040327	710040328	710040330	
Aluminum	Al	68.2	47.6	41.8	43.1	0.5
Antimony	Sb	0.9	0.3	0.1	0.3	0.1
Arsenic	As	4.7	1.3	0.8	1.3	0.1
Barium	Ba	10.9	9.5	9.2	3.4	0.1
Beryllium	Be	<	<	<	<	0.02
Boron	B	<	<	<	<	2
Cadmium	Cd	0.60	0.20	0.18	0.29	0.02
Calcium	Ca	853	1390	1290	1590	1
Chromium	Cr	0.3	0.2	0.1	0.2	0.1
Cobalt	Co	<	<	<	<	0.1
Copper	Cu	1.7	1.1	0.9	1.3	0.1
Iron	Fe	367	152	93	154	5
Lead	Pb	30.3	9.1	4.3	15.1	0.1
Magnesium	Mg	268	561	372	492	0.5
Manganese	Mn	192	59.2	84.8	52.8	0.1
Mercury	Hg	<	<	<	<	0.03
Molybdenum	Mo	<	<	<	<	0.1
Nickel	Ni	0.4	0.2	0.2	0.2	0.1
Phosphorus	P	322	485	500	395	0.5
Potassium	K	966	1530	1530	1260	1
Selenium	Se	<	<	<	<	0.2
Silicon	Si	114	77	70	98	10
Silver	Ag	0.74	0.32	0.17	0.42	0.01
Sodium	Na	8	7	9	7	1
Strontium	Sr	1.84	3.13	4.95	3.03	0.05
Tellurium	Te	<	<	<	<	0.1
Thallium	Tl	<	<	<	<	0.02
Tin	Sn	0.2	<	<	<	0.1
Titanium	Ti	3.3	2.4	2.2	2.3	0.3
Uranium	U	<	<	<	<	0.04
Vanadium	V	<	<	<	<	0.5
Zinc	Zn	48.8	23.3	28.0	23.8	0.5
Zirconium	Zr	<	<	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Metals Analysis in Tissue

CLIENT SAMPLE IDENTIFICATION:		CLMI-T7-2	CLMI-E5-2	
DATE SAMPLED:		Sep 27/07	Sep 25/07	DETECTION LIMIT
CANTEST ID:		710040333	710040334	
Aluminum	Al	41.7	40.4	0.5
Antimony	Sb	0.2	0.1	0.1
Arsenic	As	1.0	0.5	0.1
Barium	Ba	8.1	5.5	0.1
Beryllium	Be	<	<	0.02
Boron	B	<	<	2
Cadmium	Cd	0.18	0.12	0.02
Calcium	Ca	928	869	1
Chromium	Cr	0.1	0.1	0.1
Cobalt	Co	<	<	0.1
Copper	Cu	1.2	1.6	0.1
Iron	Fe	124	95	5
Lead	Pb	6.8	3.4	0.1
Magnesium	Mg	354	326	0.5
Manganese	Mn	42.4	125	0.1
Mercury	Hg	<	<	0.03
Molybdenum	Mo	<	<	0.1
Nickel	Ni	0.2	0.3	0.1
Phosphorus	P	434	491	0.5
Potassium	K	1460	1810	1
Selenium	Se	<	<	0.2
Silicon	Si	75	63	10
Silver	Ag	0.31	0.16	0.01
Sodium	Na	8	9	1
Strontium	Sr	2.06	1.66	0.05
Tellurium	Te	<	<	0.1
Thallium	Tl	<	<	0.02
Tin	Sn	<	<	0.1
Titanium	Ti	2.0	2.0	0.3
Uranium	U	<	<	0.04
Vanadium	V	<	<	0.5
Zinc	Zn	18.7	22.5	0.5
Zirconium	Zr	<	<	3

Results expressed as micrograms per gram, dry basis (µg/g)
< = Less than detection limit

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

Batch Quality Control for Dissolved Metals Analysis in Tissue (QC# 100051)

Parameter		Blank (ug/g)	Blank Limits	Duplicate (R.P.D.) 710040238	Duplicate Limits	Duplicate (R.P.D.) 710040256	Duplicate Limits
Aluminum	Al	< 0.5	0.2	10.9	20	4	20
Antimony	Sb	< 0.1	0.001	6.1	20	PASS	20
Arsenic	As	< 0.1	0.002	1.9	20	13.3	20
Barium	Ba	< 0.1	0.001	1.4	20	7.9	20
Beryllium	Be	< 0.02	0.001	NC	20	NC	20
Boron	B	< 2	0.02	PASS	20	NC	20
Cadmium	Cd	< 0.02	0.0004	3.4	20	6.9	20
Calcium	Ca	< 1	0.3	3.1	20	6.3	20
Chromium	Cr	< 0.1	0.001	10.5	20	PASS	20
Cobalt	Co	< 0.1	0.001	PASS	20	NC	20
Copper	Cu	< 0.1	0.001	9.8	20	10.5	20
Iron	Fe	< 5	0.05	1.5	20	3.6	20
Lead	Pb	< 0.1	0.002	2.5	20	8.9	20
Magnesium	Mg	< 0.5	0.2	1.1	20	2.1	20
Manganese	Mn	< 0.1	0.01	5.4	20	2.5	20
Mercury	Hg	-	-	0	20	NC	20
Molybdenum	Mo	< 0.1	0.002	PASS	20	NC	20
Nickel	Ni	< 0.1	0.003	0	20	PASS	20
Phosphorus	P	< 0.5	0.1	4.2	20	1.7	20
Potassium	K	< 1	0.3	2.4	20	4.1	20
Selenium	Se	< 0.2	0.004	NC	20	NC	20
Silver	Ag	< 0.01	0.001	13.7	20	5.4	20
Sodium	Na	< 1	0.5	0	20	10.5	20
Strontium	Sr	< 0.05	0.002	5.7	20	6.5	20
Tellurium	Te	< 0.1	0.002	NC	20	NC	20
Thallium	Tl	< 0.02	0.002	PASS	20	NC	20
Tin	Sn	< 0.1	0.01	9.8	20	PASS	20
Titanium	Ti	< 0.3	0.01	5.3	20	3.8	20
Uranium	U	< 0.04	0.002	PASS	20	NC	20
Vanadium	V	< 0.5	0.002	PASS	20	NC	20
Zinc	Zn	< 0.5	0.04	2.3	20	6.2	20
Zirconium	Zr	< 3	0.04	NC	20	NC	20

ug/g = micrograms per gram, dry basis
R.P.D. = Relative Percent Difference
PASS = Duplicate sample results were in the range of one to five times the detection limit. R.P.D. calculation is not applicable in this range. Acceptance criteria is a maximum difference between the duplicates equivalent to the value of the detection limit.
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculatio is not defined for analyte levels of less than detection limit.

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

Batch Quality Control for Dissolved Metals Analysis in Tissue (QC# 100051)

Parameter		Duplicate (R.P.D.) 710040270	Duplicate Limits	Duplicate (R.P.D.) 710040280	Duplicate Limits	Duplicate (R.P.D.) 710040296	Duplicate Limits
Aluminum	Al	2.5	20	3.6	20	14	20
Antimony	Sb	NC	20	13.3	20	NC	20
Arsenic	As	PASS	20	10	20	PASS	20
Barium	Ba	1.6	20	10.2	20	9.1	20
Beryllium	Be	NC	20	NC	20	NC	20
Boron	B	NC	20	NC	20	NC	20
Cadmium	Cd	8.7	20	5	20	5.7	20
Calcium	Ca	4	20	3.3	20	13.4	20
Chromium	Cr	PASS	20	PASS	20	PASS	20
Cobalt	Co	NC	20	PASS	20	NC	20
Copper	Cu	11.8	20	0	20	14.3	20
Iron	Fe	0	20	2.1	20	17.4	20
Lead	Pb	3.8	20	4.2	20	8.2	20
Magnesium	Mg	4.5	20	2.7	20	10.8	20
Manganese	Mn	2.2	20	2.7	20	10.3	20
Mercury	Hg	NC	20	NC	20	NC	20
Molybdenum	Mo	NC	20	NC	20	NC	20
Nickel	Ni	PASS	20	PASS	20	PASS	20
Phosphorus	P	2.2	20	2.5	20	7.6	20
Potassium	K	0.7	20	3.1	20	5.5	20
Selenium	Se	NC	20	NC	20	NC	20
Silver	Ag	0	20	7.7	20	(*)	20
Sodium	Na	0	20	8	20	0	20
Strontium	Sr	3.5	20	5.2	20	9.9	20
Tellurium	Te	NC	20	NC	20	NC	20
Thallium	Tl	NC	20	NC	20	NC	20
Tin	Sn	NC	20	PASS	20	PASS	20
Titanium	Ti	0	20	6.1	20	14.6	20
Uranium	U	NC	20	NC	20	NC	20
Vanadium	V	NC	20	NC	20	NC	20
Zinc	Zn	2	20	1.6	20	8.7	20
Zirconium	Zr	NC	20	NC	20	NC	20

ug/g = micrograms per gram, dry basis
R.P.D. = Relative Percent Difference
PASS = Duplicate sample results were in the range of one to five times the detection limit. R.P.D. calculation is not applicable in this range. Acceptance criteria is a maximum difference between the duplicates equivalent to the value of the detection limit.
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculation is not defined for analyte levels of less than detection limit.
(*) = Quality Control results exceeded internally set limits; after review by Quality Assurance Unit, non-conformance overridden and batch sample analysis results released for reporting

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

Batch Quality Control for Dissolved Metals Analysis in Tissue (QC# 100051)

Parameter		Duplicate (R.P.D.) 710040315	Duplicate Limits	NIST1570a Spinach Leaves (% Recovery)	NIST1570a Spinach Leaves Limits	NIST1573a Tomato Leaves (% Recovery)	NIST1573a Tomato Leaves Limits
Aluminum	Al	9.4	20	32	17 - 93	30	7 - 91
Antimony	Sb	8.7	20	-	-	-	-
Arsenic	As	9	20	-	-	179	80 - 283
Barium	Ba	4.7	20	-	-	-	-
Beryllium	Be	NC	20	-	-	-	-
Boron	B	NC	20	96	63 - 143	90	62 - 142
Cadmium	Cd	8.3	20	76	39 - 114	82	30 - 124
Calcium	Ca	4.1	20	87	60 - 120	91	60 - 120
Chromium	Cr	PASS	20	-	-	55	28 - 97
Cobalt	Co	NC	20	77	50 - 150	88	50 - 150
Copper	Cu	8.7	20	85	62 - 124	83	59 - 125
Iron	Fe	15.2	20	-	-	124	52 - 167
Lead	Pb	9.5	20	-	-	-	-
Magnesium	Mg	3.6	20	-	-	-	-
Manganese	Mn	7.3	20	93	53 - 134	93	62 - 131
Mercury	Hg	NC	20	87	59 - 119	85	66 - 110
Molybdenum	Mo	NC	20	-	-	-	-
Nickel	Ni	PASS	20	79	58 - 126	75	28 - 143
Phosphorus	P	4.3	20	92	60 - 120	94	60 - 120
Potassium	K	3.2	20	90	60 - 120	86	60 - 120
Selenium	Se	NC	20	-	-	-	-
Silver	Ag	0	20	-	-	-	-
Sodium	Na	8.7	20	97	60 - 120	76	60 - 120
Strontium	Sr	4.3	20	84	60 - 120	-	-
Tellurium	Te	NC	20	-	-	-	-
Thallium	Tl	NC	20	-	-	-	-
Tin	Sn	PASS	20	-	-	-	-
Titanium	Ti	15.4	20	-	-	-	-
Uranium	U	NC	20	-	-	-	-
Vanadium	V	NC	20	88	50 - 150	60	50 - 150
Zinc	Zn	3.8	20	74	48 - 110	72	49 - 109
Zirconium	Zr	NC	20	-	-	-	-

ug/g = micrograms per gram, dry basis
R.P.D. = Relative Percent Difference
PASS = Duplicate sample results were in the range of one to five times the detection limit. R.P.D. calculation is not applicable in this range. Acceptance criteria is a maximum difference between the duplicates equivalent to the value of the detection limit.
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculatio is not defined for analyte levels of less than detection limit.

REPORTED TO: Environmental Dynamics

REPORT DATE: October 24, 2007

GROUP NUMBER: 81004040

CANTEST

Instrument Quality Control for the Mercury Monitor (QC# 195771)

QC Type: Calibration Verification

Parameter		% Recovery	Limits
Mercury	Hg	107	90 - 110

CANTEST

Batch Quality Control Frequency Summary

Metals Plant Tissue Digestion (Batch# 100051)

QC Type	No. Samples
NIST1570a Spinach Leaves	1
NIST1573a Tomato Leaves	1
Blank	3
Duplicate	6
Batch Size	62

Analysis Report

CANTEST LTD.

Professional
Analytical
Services

4606 Canada Way
Burnaby, B.C.
V5G 1K5

FAX: 604 731 2386

TEL: 604 734 7276

1 800 665 8566

REPORT ON: **Analysis of Tissue Samples**

REPORTED TO: **Environmental Dynamics**
402 Hawkings St
Whitehorse, YK
Y1A 1X8

Att'n: Pat Tobler

CHAIN OF CUSTODY: **62185, 38328, 38325, 38326**
PROJECT NAME: **ELSA 07-YL-0052**
P.O. NUMBER: **00010508**

NUMBER OF SAMPLES: 62

REPORT DATE: October 24, 2007

DATE SUBMITTED: October 3, 2007

GROUP NUMBER: 81004040

SAMPLE TYPE: Tissue

NOTE: Results contained in this report refer only to the testing of samples as submitted. Other information is available on request.

TEST METHODS:

Moisture Content of Plant Tissue - analysis was performed gravimetrically by heating a pre-weighed portion of sample at 105C and measuring the weight loss.

Mercury in Tissue - samples were digested using a nitric acid-hydrogen peroxide digestion procedure based on EPA Method 200.3. Analysis was performed using Cold Vapour Atomic Absorption Spectrophotometry or Cold Vapour Atomic Fluorescence Spectrophotometry.

Metals in Tissue - samples were digested using a nitric acid-hydrogen peroxide digestion procedure based on EPA Method 200.3. Analysis was performed using Inductively Coupled Argon Plasma Spectroscopy (ICP), or ICP Mass Spectrometry (ICP/MS).

TEST RESULTS:

(See following pages)

CANTEST LTD.

Anna Becalska, PhD
Coordinator, Trace Metals

Appendix B.

Comparisons of metal concentrations (ug/g) from replicate samples of *Cladina mitis* (CLMI) from two plots, Elsa tailings terrestrial effects assessment.

Appendix B. Comparisons of metal concentrations (ug/g) from replicate samples of *Cladina mitis* (CLMI)from two plots, Elsa tailings terrestrial effects assessment.

Metal	Plot E05			Plot T07		
	CLMI-E05-1	CLMI-E05-2	RPD	CLMI-T07-1	CLMI-T07-2	RPD
Aluminum Al	38	40.4	6.1	47.6	41.7	-13.2
Antimony Sb	< 0.1	0.1	NC	0.3	0.2	Pass
Arsenic As	0.4	0.5	Pass	1.3	1	-26.1
Barium Ba	6.6	5.5	-18.2	9.5	8.1	-15.9
Beryllium Be	< 0.02	< 0.02	NC	< 0.02	< 0.02	NC
Boron B	< 2	< 2	NC	< 2	< 2	NC
Cadmium Cd	0.17	0.12	-34.5	0.2	0.18	-10.5
Calcium Ca	1270	869	-37.5	1390	928	-39.9
Chromium Cr	0.7	0.1	-150	0.2	0.1	Pass
Cobalt Co	< 0.1	< 0.1	NC	< 0.1	< 0.1	NC
Copper Cu	1.4	1.6	13.3	1.1	1.2	8.7
Iron Fe	92	95	3.2	152	124	-20.3
Lead Pb	3.6	3.4	-5.7	9.1	6.8	-28.9
Magnesium Mg	407	326	-22.1	561	354	-45.2
Manganese Mn	194	125	-43.3	59.2	42.4	-33.1
Mercury Hg	< 0.03	< 0.03	NC	< 0.03	< 0.03	NC
Molybdenum Mo	< 0.1	< 0.1	NC	< 0.1	< 0.1	NC
Nickel Ni	0.4	0.3	NC	0.2	0.2	0.0
Phosphorus P	512	491	-4.2	485	434	-11.1
Potassium K	2340	1810	-25.5	1530	1460	-4.7
Selenium Se	< 0.2	< 0.2	NC	< 0.2	< 0.2	NC
Silicon Si	92	63	-37.4	77	75	-2.6
Silver Ag	0.23	0.16	-35.9	0.32	0.31	-3.2
Sodium Na	9	9	0.0	7	8	13.3
Strontium Sr	2.02	1.66	-19.6	3.13	2.06	-41.2
Tellurium Te	< 0.1	< 0.1	NC	< 0.1	< 0.1	NC
Thallium Tl	< 0.02	< 0.02	NC	< 0.02	< 0.02	NC
Tin Sn	0.1	< 0.1	NC	< 0.1	< 0.1	NC
Titanium Ti	2.1	2	-4.9	2.4	2	-18.2
Uranium U	< 0.04	< 0.04	NC	< 0.04	< 0.04	NC
Vanadium V	< 0.5	< 0.5	NC	< 0.5	< 0.5	NC
Zinc Zn	23	22.5	-2.2	23.3	18.7	-21.9
Zirconium Zr	< 3	< 3	NC	< 3	< 3	NC

R.P.D.: Relative Percent Difference.

PASS: Replicate sample results were in the range of 1 to 5 times the detection limit. Acceptance criteria is a maximum difference between the replicates equivalent to the detection limit.

NC: Not calculated. Replicate sample results were less than detection limit.

Appendix C.

Comparison of metals (ug/g) in *Cladina mitis* (CLMI)and *Stereocaulon tomentosum* (STTO) samples collected from the same plot during the Elsa tailings assessment.

Appendix C. Comparison of metals (ug/g) in *Cladina mitis* (CLMI)and *Stereocaulon tomentosum* (STTO) samples collected from the same plot during the Elsa tailings assessment.

Metal	Plot Control 05			Plot S3			Plot SE01		
	CLMI-C05	STTO-C05	RPD	CLMI-S3	STTO-S3	RPD	CLMI-SE01	STTO-SE01	RPD
Aluminum Al	69.7	80.1	13.9	126	261	69.8	88.4	147	49.8
Antimony Sb	< 0.1	< 0.1	nc	2.8	6.5	79.6	4.7	9.8	70.3
Arsenic As	0.1	0.2	nc	7.2	16.2	76.9	21.2	47.5	76.6
Barium Ba	13.3	14	5.13	6	12.5	70.3	6.9	14.6	71.6
Beryllium Be	< 0.02	< 0.02	nc	< 0.02	< 0.02	nc	< 0.02	< 0.02	nc
Boron B	< 2	< 2	nc	< 2	2	nc	< 2	3	nc
Cadmium Cd	0.07	0.03	-80	1.45	2.69	59.9	2.04	4.07	66.4
Calcium Ca	537	268	-66.8	1220	5510	127.5	2060	5130	85.4
Chromium Cr	0.2	0.2	0	0.5	0.9	57.1	0.6	0.9	40.0
Cobalt Co	< 0.1	0.1	nc	0.1	0.2	66.7	0.1	0.2	66.7
Copper Cu	0.7	1.4	66.7	3.8	9.6	86.6	8.6	19.4	77.1
Iron Fe	98	114	15.1	772	2020	89.4	1450	3290	77.6
Lead Pb	0.7	0.5	-33.3	110	275	85.7	165	395	82.1
Magnesium Mg	171	160	-6.6	493	715	36.8	769	571	-29.6
Manganese Mn	86.7	55.8	-43.4	237	274	14.5	238	444	60.4
Mercury Hg	< 0.03	< 0.03	nc	< 0.03	< 0.03	nc	< 0.03	0.045	nc
Molybdenum Mo	< 0.1	0.1	nc	< 0.1	0.1	nc	< 0.1	0.1	nc
Nickel Ni	0.3	0.5	50	0.6	1.4	80.0	0.5	1.2	82.4
Phosphorus P	361	500	32.3	491	664	30.0	591	589	-0.3
Potassium K	1070	1680	44.4	1400	2910	70.1	1540	2510	47.9
Selenium Se	< 0.2	< 0.2	nc	< 0.2	< 0.2	nc	< 0.2	< 0.2	nc
Silicon Si	83	91	9.2	109	239	74.7	165	371	76.9
Silver Ag	0.04	0.05	22.2	2.49	6.49	89.1	3.2	6.22	64.1
Sodium Na	12	17	34.5	13	18	32.3	10	26	88.9
Strontium Sr	2.21	1.64	-29.6	2.41	6.55	92.4	3.91	8.62	75.2
Tellurium Te	< 0.1	< 0.1	nc	< 0.1	< 0.1	nc	< 0.1	< 0.1	nc
Thallium Tl	< 0.02	< 0.02	nc	0.03	0.06	66.7	0.03	0.06	66.7
Tin Sn	< 0.1	< 0.1	nc	0.3	0.6	66.7	1.6	3	60.9
Titanium Ti	3.5	3.9	10.8	4.3	9.2	72.6	3.1	4.1	27.8
Uranium U	< 0.04	< 0.04	nc	< 0.04	0.04	nc	< 0.04	0.05	nc
Vanadium V	< 0.5	< 0.5	nc	< 0.5	1.1	nc	< 0.5	0.6	nc
Zinc Zn	10.7	15.8	38.5	90.2	135	39.8	122	217	56.0
Zirconium Zr	< 3	< 3	nc	< 3	< 3	nc	< 3	< 3	nc

R.P.D.: Relative Percent Difference (differences of over 20% highlighted)

NC: Not calculated. Replicate sample results were less than detection limit.