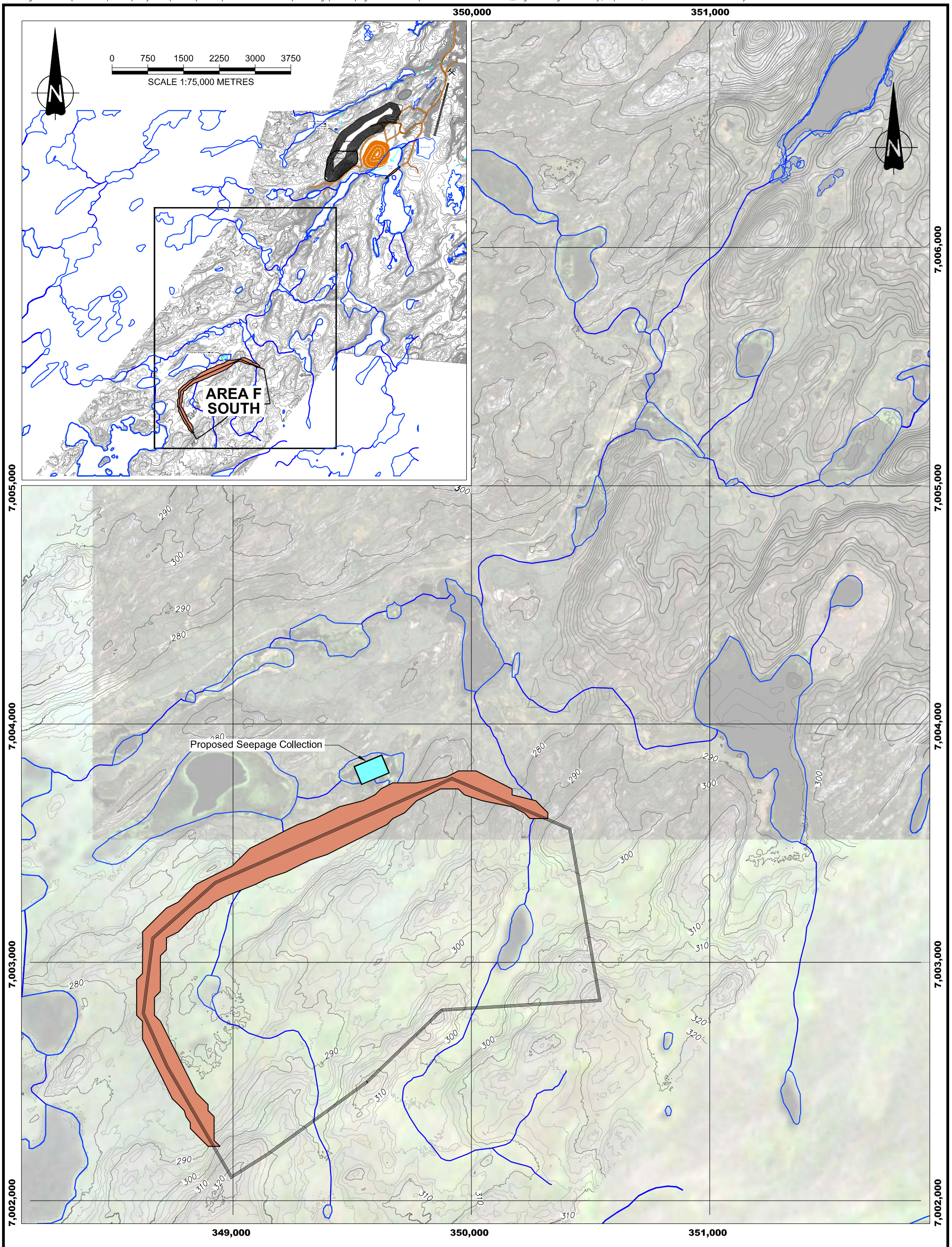
Drawing File: N:\Bur-Graphics\Projects\2009\1373\09-1373-1009\Drafting\3000\Figures Rev E\0913731009-3000-E_Fig.4.6.dwg Monday, April 11, 2011 11:03:12 AM By: NSmirnova




0 150 300 450 600 750
SCALE 1:15,000 METRES

## NOTES

1. BASE MAPPING FROM 2010 LIDAR SURVEY
   DRAWING FILE: CONTOURS_LIDAR.DWG
   AND WATTS, GRIFFIS AND MCOUAT
   DRAWING FILE: TDC_07_BASE_INFRASTRUCTURE.DWG
2. EXTRA WATER FEATURES EXTRACTED FROM IKONOS IMAGERY
3. COORDINATES SYSTEM BASED ON NAD 83, UTM ZONE 12

## REFERENCES

1. BASE PLAN PROVIDED BY "EBA ENGINEERING CONSULTANTS LTD".
   CAD FILE: V23201097.006_FIG 4.1-1_R1.dwg
   DATED: MARCH 14, 2011.

Tyhee NWT Corp

PROJECT
TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
NORTHWEST TERRITORIES

TITLE
**AREA F SOUTH**

Golder Associates
Greater Vancouver Office, BC

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. 09-1373-1009 | | | PHASE No. | 3000 | |
| DESIGN | BW | 30MAR11 | SCALE AS SHOWN | REV. | 0 |
| CADD | SRR | 30MAR11 | | | |
| CHECK | BW | 11APR11 | | | |
| REVIEW | JAH | 11APR11 | | | |

**FIGURE 4.6**

# APPENDIX A

## Climate and Hydrology Data

Detailed summaries of site climate and hydrology data are presented.

## 1.0 CLIMATE DATA

Temperature norms for the YGP site and for the Yellowknife Airport climate station are presented in Tables I-1 and I-2.

**Table I-1: Summary of Yellowknife Gold Project Site Climate (Oct. 2004 – Dec. 2007)**

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Temperature (°C)** | | | | | | | | | | | | | |
| Average Daily Maximum | -20.3 | -17.9 | -10.3 | 1.5 | 9.1 | 18.3 | 20.5 | 17 | 8.7 | 0.2 | -11.8 | -17.1 | -0.2 |
| Average Daily Minimum | -28.3 | -26.5 | -21.1 | -9.4 | -1.2 | 8.1 | 11.6 | 8.7 | 2.8 | -4.9 | -18.4 | -24.2 | -8.6 |
| Daily Mean | -24.1 | -22.1 | -15.9 | -4 | 4 | 13.3 | 16 | 12.7 | 5.5 | -2.4 | -14.8 | -20.6 | -4.4 |
| Extreme Maximum | -3.2 | -3.9 | 4.8 | 13.4 | 25.4 | 30.1 | 29 | 26.9 | 21.6 | 10.8 | 1 | -2.7 | 30.1 |
| Extreme Minimum | -42.8 | -44.5 | -38.7 | -27.9 | -13 | -0.6 | 4.3 | 2.1 | -7.2 | -16.7 | -38.3 | -41 | -44.5 |

**Table I-2: Summary of Yellowknife Airport Climate (1942 – 2007)**

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Temperature (°C)** | | | | | | | | | | | | | |
| Average Daily Maximum | -23.1 | -19.6 | -12 | -0.7 | 9.7 | 17.7 | 20.9 | 18.1 | 10.3 | 1.3 | -10 | -19.2 | -0.6 |
| Average Daily Minimum | -31.4 | -29.1 | -23.7 | -12.1 | -0.4 | 8 | 12 | 10.1 | 3.7 | -1.5 | -17.7 | -27.2 | -9.1 |
| Daily Mean | -27.3 | -24.3 | -17.8 | -6.4 | 4.7 | 12.9 | 16.5 | 14.1 | 7 | -4.2 | -13.9 | -23.2 | -5.2 |
| Extreme Maximum | 3.4 | 6.2 | 9.3 | 20.3 | 26.1 | 30.3 | 32.5 | 30.9 | 26.1 | 19 | 7.8 | 2.8 | 32.5 |
| Extreme Minimum | -51.1 | -51.1 | -43.3 | -40.6 | -22.8 | -4.4 | 0.6 | -0.6 | -9.7 | -28.9 | -44.4 | -48.3 | -51.1 |

Source: Environment Canada Climate monthly data (July 1942 - December 2007)

Precipitation at YGP and the Yellowknife Airport climate station are presented in Tables I-3 to I-8.

**Table I-3: Summary of Yellowknife Gold Project Site Precipitation (Oct. 2004 – Dec. 2007)**

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Precipitation (mm) | 16.8 | 25 | 7.6 | 13.5 | 13.2 | 23.5 | 36.5 | 47.7 | 28.6 | 18.6 | 20.4 | 9.7 | 261.1 |
| Extreme Daily Precipitation (mm) | 11.2 | 18 | 2.8 | 10.4 | 4.8 | 29.5 | 21.1 | 17 | 21.6 | 5.3 | 17 | 6.6 | N/A |

**Table I-4: Summary of Yellowknife Airport Precipitation (1942 - 2007)**

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rainfall (mm) | 0.1 | 0.02 | 0.08 | 2.1 | 13.4 | 21.8 | 36.1 | 39.6 | 28.5 | 12.6 | 0.5 | 0.1 | 154.9 |
| Snowfall (cm) | 17.2 | 15.9 | 15.6 | 9.6 | 3.8 | 0.1 | - | 0.02 | 3.1 | 20.4 | 30.9 | 22 | 138.6 |
| Precipitation (mm) | 14 | 12.7 | 12.7 | 10.6 | 17.2 | 22 | 36.1 | 39.6 | 31.8 | 31.4 | 23.7 | 17.3 | 269.1 |

**Table I-5: Summary of Yellowknife Airport Extreme Daily Precipitation (1942 - 2007)**

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Extreme Daily Rainfall (mm) | 2.8 | 0.8 | 3 | 14.4 | 34 | 33.6 | 66 | 82.8 | 29.7 | 35.6 | 7.1 | 2.2 | 82.8 |
| Extreme Daily Snowfall (cm) | 16.4 | 23.7 | 16.2 | 13 | 11.2 | 3 | - | 1 | 15.2 | 16 | 15 | 20.2 | 23.7 |
| Extreme Daily Precipitation (cm) | 14.2 | 17.5 | 12.4 | 14.4 | 34 | 33.6 | 33.6 | 82.8 | 29.7 | 35.6 | 12.2 | 11.4 | 82.8 |
| Mean Month-End Snow Cover (cm) | 46 | 51 | 47 | 6 | - | - | - | - | 10 | 15 | 31 | 37 | N/A |

Source: Environment Canada Climate daily data (July 1942 - December 2007)

**Table I-6: Monthly Distribution of Precipitation, Rainfall, and Snowfall - Yellowknife Gold Project Site**

| Month | Precipitation (%) | Rainfall (%) | Snowfall (%) |
|---|---|---|---|
| January | 7 | 0 | 12 |
| February | 9 | 0 | 12 |
| March | 3 | 0 | 11 |
| April | 5 | 1 | 7 |
| May | 5 | 9 | 3 |
| June | 8 | 14 | 0 |
| July | 15 | 23 | 0 |
| August | 19 | 26 | 0 |
| September | 10 | 18 | 2 |
| October | 7 | 8 | 14 |
| November | 8 | 0 | 22 |
| December | 4 | 0 | 16 |
| Annual | 100% | 100% | 100% |

**Table I-7: Comparison of Annual Mean Precipitation**

| | Yellowknife Gold Project Site Annual Precipitation (mm) | Yellowknife Airport Annual Precipitation (mm) |
|---|---|---|
| 2005 | 316 | 389 |
| 2006 | 281 | 304 |
| 2007 | 169 | 310 |
| 3 - Year Mean | 255 | 334 |
| Correlation Ratio (%) | Project Site/Yellowknife Airport = 76 | |

**Table I-8: Mean and Extreme Annual Precipitation**

| Yellowknife Airport Precipitation (mm) | | Correlation Ratio (%) | Yellowknife Gold Project Site Precipitation (mm) | |
|---|---|---|---|---|
| Mean Annual | 293 | 76 | Mean Annual | 222 |
| 10-Year Wet | 379 | 76 | 10-Year Wet | 288 |
| 10-Year Dry | 210 | 76 | 10-Year Dry | 160 |

Evaporation data for the site is summarized in Tables I-9 to I-11.

**Table I-9: Annual Evaporation Totals - Yellowknife Gold Project Site**

| | Period of Record | | | Total Annual Evaporation | |
|---|---|---|---|---|---|
| | Start | Finish | # of Days | Total Pan (mm) | Total Lake (mm) |
| 2005 | May 26, 11:13 | Sep. 13, 19:30 | 110.3 | 377 | 264 |
| 2006 | June 9, 17.55 | Sep. 21, 7:50 | 103.6 | 445 | 312 |
| 2007 | June 2, 7:30 | Sep. 15, 6.55 | 105 | 431 | 302 |
| Average | - | - | 106.3 | 419 | 293 |

**Table I-10: Lake Evaporation and Monthly Distribution - Yellowknife Gold Project (2005 - 2007)**

| | Lake Evaporation (mm) | | | | | |
|---|---|---|---|---|---|---|
| | May | June | July | August | September | Annual |
| 2005 | 24 | 96 | 64 | 67 | 13 | 264 |
| 2006 | 0 | 97 | 110 | 79 | 30 | 316 |
| 2007 | 0 | 110 | 113 | 63 | 16 | 302 |
| Mean | 8 | 1001 | 95 | 70 | 20 | 294 |
| Distribution (%) | 3 | 34 | 32 | 24 | 7 | 100 |

**Table I-11: Average Daily Evaporation Rates - Yellowknife Gold Project**

| | 2005 | | | | | 2006 | | | | 2007 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *May | Jun. | Jul. | Aug. | *Sep. | Jun. | Jul. | Aug. | *Sep. | Jun. | Jul. | Aug. | *Sep. |
| Pan Evaporation Rate (mm/day) | 7 | 4.5 | 3.5 | 3.6 | 1.6 | 7.3 | 5.1 | 3.6 | 2.1 | 6 | 5.2 | 2.7 | 1.7 |
| Lake Evaporation Rate (mm/day) | 4.9 | 3.2 | 2.5 | 2.5 | 1.1 | 5.1 | 3.5 | 2.5 | 1.5 | 4.2 | 3.6 | 1.9 | 1.2 |

Note: A factor of 0.7 has been used to convert pan evaporation to lake evaporation

* May 2005 data based on a period of record of 5 days

* Sep. 2005 data based on a period of record of 13 days

* Sep. 2006 data based on a period of record of 21 days

* Sep. 2007 data based on a period of record of 15 days

## 2.0 HYDROLOGY TABLES

Basin characteristics and flow data are presented in Tables I-12 to I-15.

**Table I-12: Summary of Hydrometric Station General Basin Characteristics**

| Gauging Station Site ID | Basin Name | *Length (m) | *Width (m) | *Drainage Area ($m^2$) | Approx. Lake Elevation (m) | Maximum Basin Elevation (m) |
|---|---|---|---|---|---|---|
| Combined Basins | | | | | | |
| Site 3+4 | Winter - Round Basin | 4600 | 1700 | 5,500,000 | N/A | 330 |
| Site 1+3+4 | Narrow - Winter - Round Basin | 4600 | 3400 | 9,300,000 | N/A | 350 |
| Individual Basins | | | | | | |
| Site 1 | Narrow Basin | 3900 | 1500 | 3,800,000 | 282 | 350 |
| Site 3 | Winter Basin | 4300 | 1400 | 4,300,000 | 285 | 330 |
| Site 4 | Round Basin | 1800 | 800 | 1,200,000 | 288 | 330 |
| Site 6 | Nicholas Basin | 6000 | 2000 | 6,280,000 | 235 | 370 |

* Note basin areas, lengths and widths are determined only up to the location of the gauging station

**Table I-13: Round Lake Outlet Hydrometric Station Annual Discharge and Runoff Values**

| Site 4 - Round Lake Outlet (Round Lake Basins) | | | | | |
|---|---|---|---|---|---|
| Year | Period of Record | | Total Station Volume ($m^3$) | Period Total Runoff (mm) | Average Station Flow (L/s) |
| | Start | Finish | | | |
| 2005 | Jul 18, 09:32 | Sep 12, 09:32 | 17,768 | 14.8 | 3.7 |
| 2006 | Jun 09, 16:59 | Sep 19, 09:15 | 47,431 | 39.5 | 4.7 |
| 2007 | May 21, 09:30 | Sep 28, 09:15 | 24,449 | 20.4 | 2.3 |

**Table I-14: Winter Lake Outlet Hydrometric Station Annual Discharge and Runoff Values**

| Site 3 - Winter Lake Outlet (Winter + Narrow Lake Basins) | | | | | |
|---|---|---|---|---|---|
| Year | Period of Record | | Total Station Volume ($m^3$) | Period Total Runoff (mm) | Average Station Flow (L/s) |
| | Start | Finish | | | |
| 2005 | Jul 14, 14:26 | Sep 12, 10:26 | 82,937 | 15.1 | 16.0 |
| 2006 | Jun 09, 11:10 | Sep 19, 13:40 | 140,052 | 25.5 | 15.9 |
| 2007 | May 21, 09:30 | Sep 28, 09:15 | 155,047 | 28.2 | 14.5 |

**Table I-15: Narrow Lake Outlet Hydrometric Station Annual Discharge and Runoff Values**

| Site 1 - Narrow Lake Outlet (Round + Winter + Narrow Lake Basins) | | | | | |
|---|---|---|---|---|---|
| Year | Period of Record | | Total Station Volume ($m^3$) | Period Total Runoff (mm) | Average Station Flow (L/s) |
| | Start | Finish | | | |
| 2005 | May 22, 11:11 | Sep 12, 14:59 | 754014 | 81.1 | 77.1 |
| 2006 | Jun 09, 09:27 | Sep 19, 14:12 | 328611 | 35.3 | 37.2 |
| 2007 | May 21, 09:30 | Sep 28, 09:15 | 302184 | 38.7 | 26.8 |

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.


| | |
|---|---|
| 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