BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

KINROSS GOLD CORPORATION
LUPIN OPERATION

2005 GEOTECHNICAL INSPECTION
PERIMETER TAILINGS DAMS

LUPIN MINE
NUNAVUT

FINAL

PROJECT NO.: 0256-011-01
DATE: OCTOBER 7, 2005

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BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 - 7 Avenue SW
Calgary, Alberta T2P 3G2
Tel.: (403) 250-5185
Fax: (403) 250-5330

Project No. 0256-011-01
October 7, 2005

Mr. Mike Tansey, P.Eng. – Reclamation Manager
Kinross Gold Corporation
Lupin Operation
9818 International Airport
Edmonton, Alberta
T5J 2T2

Re: 2005 Report on Annual Geotechnical Inspection
Perimeter Tailings Dams, Lupin Mine, Nunavut

Dear Mike:

Please find attached our final report on the Annual Geotechnical Inspection of the Perimeter Tailings Dams at Lupin Mine, which was carried out on August 10 and 11, 2005. A site inspection memo was left with your site staff outlining items requiring maintenance following the inspection visit.

Thank you to you and your staff for the hospitality shown during the site visit. If there are any questions regarding this report, please contact the undersigned at your convenience.

Yours truly,
BGC ENGINEERING INC.
per:

James W. Cassie, M.Sc., P.Eng.
Specialist Geotechnical Engineer
(direct line 403/250-5185 ext. 103)

encl.: Final Report

JWC/sf

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LIMITATIONS OF REPORT

This report was prepared by BGC Engineering Inc. (BGC) for Kinross Gold Corporation. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of report preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be based on it are the responsibility of such Third Parties. BGC Engineering Inc. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

As a mutual protection to our client, the public, and ourselves, all reports and drawings are submitted for the confidential information of our client for a specific project and authorization for use and / or publication of data, statements, conclusions or abstracts from or regarding our reports and drawings is reserved pending our written approval.

1. INTRODUCTION

Lupin Mine, owned and operated by Kinross Gold Corporation, is located 285 km south-east of Kugluktuk and 400 km north-east of Yellowknife on Contwoyto Lake, as illustrated on Figure 1. Kinross's Nunavut Water Board License (NWB1LUP0008) requires that the tailings containment area (TCA) be inspected annually by a qualified Geotechnical Engineer. As such, Mr. Mike Tansey, P.Eng., Reclamation Manager for Lupin Mine, requested that BGC Engineering Inc. (BGC) conduct an inspection of the tailings facility perimeter embankments. A proposal to conduct this inspection, dated April 11, 2005, was submitted and Requisition No. L63512 was provided as authorization to proceed.

This inspection and the preparation of a report are required in partial satisfaction of the Lupin Mine Water License obligations. Conditions in the Water License that apply to the annual inspection are as follows:

- a freeboard limit of 1.0 m should be maintained at all times;
- seepage from the TCA be minimised;
- any seepage that occurs should be collected and returned immediately;
- any erosion of the facilities should be addressed immediately; and
- the annual inspection report should be forwarded to the Water Board within 60 days of the inspection date.

Based on the visual inspection and a review of monitoring data, the geotechnical performance of the perimeter dams is assessed. Any deficiencies and points of concern are brought to the attention of Kinross.

Previous design, as-built and annual inspection reports by Geocon Inc., Golder Associates Ltd. and BGC Engineering Inc. should be reviewed for information, observations and recommendations prior to 2005.

Geocon (1982) provides as-built information for Dams 1A, 1B, 1C, 2 and 4A (later a portion of the much larger Dam 4) that were all built up to elevation 485 m during the 1981 construction period. The dam embankments were constructed of silty sand till with a liner on the upstream side. The liner is keyed into the underlying permafrost.

Golder Associates (1992) provides dam design information for Dams 4, 5 and 6 and the End Lake Dam (which was never constructed). For these dams, a geosynthetic liner is installed within the upstream portion of the embankment and then anchored into the frozen foundation, except for Dam 4. On Dam 4, the liner extends 15 m upstream from the upstream toe. For each of these dams, the top of the liner was situated 0.5 m below the physical crest of the dams. Dam 4 has a rockfill toe drain to collect embankment seepage, should it occur.

Golder Associates (2004) provides a Dam Safety Review of the perimeter tailings dams. Within that work, a failure consequence classification for each perimeter dam was provided, as follows:

- Low consequence – Dams 1A, 2 and 4.
- Very low consequence – Dams 1B, 1C, 3, 5 and 6.

Slope stability analyses were also undertaken for Dams 1A, 2 and 4. Factors of safety for static conditions were greater than 1.6 and greater than 1.3 for conservative seismic loadings. As a result, Golder concluded that all three noted dams satisfy dam safety stability requirements. A brief Operations, Maintenance and Surveillance (OMS) Manual was also prepared as an appendix to their report.

2. TAILINGS CONTAINMENT AREA OPERATION DESCRIPTION

As illustrated on Figure 2, tailings storage at Lupin Mine utilises a number of low embankments which are arranged to provide five cells for solids accumulation, some supernatant water storage within these cells, supernatant runoff storage accumulation (Pond 1) and an adjacent area (Pond 2) for transport water conditioning and staged release. In that none of the tailings water is recycled to the mill, aged water is typically transferred from Pond 2 to the environment once every second year (usually beginning mid-July). Following this discharge, tailings water is transferred from Pond 1 to Pond 2 for subsequent ageing. During the transfer, water treatment chemicals are added, if required. In a typical year, compliant water within Pond 2 is discharged to the environment via the siphons over Dam 1A. When storage capacity is created in Pond 2, Pond 1 water is transferred in using the siphons over J-Dam.

Processing and tailings deposition was completed in February 2005 as Lupin Mine went into closure. Tailings deposition since last summer occurred within both Cells 3 and 5. Supernatant water from these two cells is pumped into Pond 1. In 2005, the following water transfers took place:

- Discharge from Pond 2 – 1,682,135 m^3 between July 15 and August 11, 2005.
- Discharge from Pond 1 – 858,776 m^3 between June 27 and August 27, 2005.

Table 1 summarises the resultant 2005 water level elevations within the TCA:

Table 1 Summary of Summer Water Levels within TCA
(Data Supplied by Kinross Gold Corp.)

Location	June 23, 2005 Water Elevation (m)	July 11, 2005 Water Elevation (m)	Aug. 2, 2005 Water Elevation (m)	August 9, 2005 Water Elevation (m)
Pond 1	484.97	483.93	485.05	485.09
Pond 2	481.97	483.19	482.03	481.57
Cell 4 (below L Dam)	486.58	487.07	486.49	486.64
Cell 5 (above M Dam)	487.34	487.89	486.67	485.64

Dams 1A and 2 retain Pond 2 and these dam are built to approximate elevation 486.3 m. Therefore, the high water mark on July 11th was still more than 4 m below the crest of the two noted retention dams.

3. CLIMATIC CONDITIONS

Figures 3 and 4 provide a graphical representation of the 2004 and 2005 (to-date) monthly temperature and precipitation values versus the long-term mean values (which have been recorded since 1982). Figure 3 indicates that the 2004 temperature values were colder (MAAT of –13.1°C versus –11.0°C long term) than typical for the year, while values for 2005 (to July) were warmer until May and cooler thereafter. Figure 4 illustrates that precipitation in 2004 was near normal on an annual basis. However, July 2004 was significantly drier than normal while August was significantly wetter (almost double typical values). June 2005 was wetter than typical while July 2005 was drier.

4. INSPECTION CONDITIONS AND APPROACH

4.1 General

Mr. Jim Cassie, P. Eng., conducted the inspection on August 10 and 11, 2005. The temperature during the inspection was approximately 5° to 7°C under partly cloudy conditions, with some light rain. In the nine days before the inspection visit, approximately 38 mm of rain had fallen.

As noted, tailings placement was completed in February 2005. Reclamation activities were on-going in the TCA and a significant amount of the tailings in Cell 3, Cell 5 and behind N-Dam had been covered with esker sand and gravel. Water was being transferred over Dam 1A (Pond 2 water discharge to the environment) on August 10th, but the siphons were shut down on August 11th. No water transfer over J-Dam occurred during the inspection visit.

Each of the embankments was inspected on foot. A camera and Dictaphone were used to record pertinent observations concerning both the physical conditions and seepage. In general, the crest and upstream slope of a given embankment were inspected first, followed by inspection of the downstream slope by walking along the toe of the slope. The transcribed Dictaphone notes and photographs constitute the field record (the Field Memo which remains in the office of BGC) and provides the basis for this formal report. Before leaving the site, a summary memo regarding tailings area maintenance items was prepared and reviewed with Mr. Mike Tansey from Lupin Mine; this memo is attached in Appendix 1.

4.2 Instrumentation

Seacor Environmental Engineering Inc. installed four thermistor strings in Dam #4 in October 1995, along with several other cables in the reclaimed tailings area. In addition, BGC (2000) outlines the installation details of an additional four thermistor cables in Dams 1A and 2. Some thermistors were installed in Dam 6 in May 2003 as reported in BGC (2003). Lupin Mine staff also installed some thermistors in Dams 1A and 2 in May 2003. Most of these recently installed thermistors were destroyed by a bear shortly after installation. Long term plots of the instrumentation data still being monitored by site staff are provided in Appendix 2. An interpretation of this data is provided on the individual dam inspection sheets.

5. FINDINGS AND CONCLUSIONS

The inspection results for each of the structures are presented on the following pages in standardised format, complemented by a selection of site photographs. Refer to Figure 2 for the location of each structure. Specific maintenance requirements are documented on each of the individual sheets and again, in the summary memo provided in Appendix 1.

In general, the inspection confirms that the perimeter embankments are in satisfactory condition. Some minor erosional gullies resulted from the significant precipitation in June 2005 and these should be repaired.

Instrumentation installed in selected dams show subzero temperatures at depth. Temperatures at depth are cooling due to permafrost aggradation.

Clause D.6.f of the Water Licence notes that weekly inspections of tailings dams (and associated infrastructure) are to be undertaken by site staff and records kept on these inspections. As the water levels rise behind the various dams, inspections must be undertaken to assess potential seepage and dam performance.

Continued vigilance with regards to thermistor monitoring should be undertaken, especially when summer pond levels are high. Hence, all thermistors within tailings dams should be read according to the following frequency:

- November to April – monthly.
- May to June – weekly.
- July to October – bi-weekly.

The objective of collecting this data is to provide proactive assessment of potentially deteriorating performance of the dams. Instrumentation data from the various dams should be forwarded to BGC immediately after collection for review and interpretation.

In addition to thermistor readings, all pond levels should be recorded at least monthly and perhaps bi-weekly as water transfer events occur. Staff gauges or pore pressure transducers should be considered to record water levels.

DAM 1A

LOCATION: West side of Pond 2.

FUNCTION: Major perimeter closure for water retention; carries siphon pipes for water decant system.

LENGTH: 250 +/- m

MAX HEIGHT: 8 m +/- above d/s tundra.

AS-BUILT ELEVATION: 486.27 m

CREST WIDTH AND CONDITION: 7 to 8 m; surfaced with esker material, but not travelled because of the siphons. No significant cracking evident; condition is good.

RIPRAP: Run of Mine rockfill; broadly graded; good condition. Minor disturbed area (due to construction traffic possibly) in rip rap at the crest edge.

BACKSLOPE: Approx. 1.5H:1V; variably armoured with cobbles and boulders; no evidence of cracking.

TOE BERM: No significant cracking evident; condition is good.

SEEPAGE: No evidence of seepage.

INSTRUMENTATION: Thermistor D1A-00-1 is located in the crest, just south of the mid-point of the dam. All nodes below 5 m depth are subzero. Nodes below depth of 9 m (situated approximately below the embankment fill) are equal to or colder than $-4^{o}C$ with no signs of significant warming.

Thermistor D1A-00-02 is located in the crest towards the north end of the dam. All nodes below 5 m depth are subzero with no indications of warming at depth. Nodes below a depth of 10.3 m appear to be colder than $-4.0^{o}C$.

DAM 1A CONTINUED

MAINTENANCE RECOMMENDATIONS: No maintenance required.

CONCLUSIONS: The dam is in good condition with no evidence of seepage passing through or beneath the dam. Monitor instrumentation regularly and visually inspect downstream toe as Pond 2 level increases.

DAM 1B

LOCATION:	West side of Pond 2.
FUNCTION:	Minor perimeter closure for water retention; pond level is below dam base elevation thus currently functioning only as a road embankment.
LENGTH:	200 +/- m
MAX HEIGHT:	2.5 +/- m above d/s tundra.
AS-BUILT ELEVATION:	485.83 m
CREST WIDTH AND CONDITION:	5 to 6 m wide; surfaced with esker material so that this dam may also function as a roadway for access around the perimeter of the area. Crest condition is good.
RIPRAP:	Run of Mine rockfill; variable sizes; undulating; disturbed in areas but in good condition overall.
BACKSLOPE:	Approx. 1.5H:1V with minor runoff erosion rills and a toe-of-slope roadway berm. No cracking observed.
SEEPAGE:	No seepage observed. No water head being retained by the structure.
MAINTENANCE RECOMMENDATIONS:	None currently required.
CONCLUSIONS:	The structure is in good condition; it should be monitored for seepage if Pond 2 rises sufficiently to place a water head against the dam.

DAM 1C

LOCATION:	West side of Pond 2.
FUNCTION:	Minor perimeter closure for water retention: currently retaining no water other than small puddles. Currently functioning only as a road embankment.
LENGTH:	230 +/- m
MAX HEIGHT:	2.0 +/- m above d/s tundra.
AS-BUILT ELEVATION:	485.88 m
CREST WIDTH AND CONDITION:	9 +/- m wide; surfaced with esker material, so that this dam may also function as a roadway, although the downstream toe roadway appears more commonly used. Crest condition is good.
RIPRAP:	Run of Mine rockfill; some minor disturbances noted; overall condition satisfactory.
BACKSLOPE:	Approx. 3H:1V, smooth slope. Access road berm appears in good condition.
SEEPAGE:	No seepage observed. No water currently being retained by the structure.
MAINTENANCE RECOMMENDATIONS:	None currently required.
CONCLUSIONS:	The structure is in good condition; it should be monitored for seepage if Pond 2 rises sufficiently to place a water head against the dam.

DAM 2

LOCATION: North end of Pond 2.

FUNCTION: Major perimeter closure for water retention; natural pond downstream of the dam.

LENGTH: 350 +/- m

MAX HEIGHT: 5.5 +/- m above d/s tundra.

AS-BUILT ELEVATION: 486.30 m

CREST WIDTH AND CONDITION: Approx. 6 m; surfaced with esker material and used as the primary traffic route. Crest condition is good; no cracking is evident.

RIPRAP: Run of Mine rock forms convex-upward, gently sloped upstream face; minor erosional scarps formed at previous higher water levels; good condition.

BACKSLOPE: Approx. 1.5H:1V; a thin (< 1 cm) layer of tailings has been deposited at the toe of this dam.

SEEPAGE: Seepage (likely resulting from active layer drainage rather than seepage through the dam) observed discharging at the toe of the northeast abutment where it is typically observed.

INSTRUMENTATION: Thermistor D2-00-02 is located at the north end of the crest. Temperatures at depth are subzero. Below 5 m depth (approximate bottom of embankment fill), temperatures are colder than $-2^{o}C$.

Thermistor D2-00-03 is situated near the mid-point of the dam. Temperatures below 5 m depth are all subzero. Temperatures below 15 m depth are colder than $-3.5^{o}C$.

MAINTENANCE RECOMMENDATIONS: The thin layer of tailings that has been deposited at the toe should be removed and placed within the containment pond.

CONCLUSIONS: The dam is in satisfactory condition. Continue with vigilant monitoring of instrumentation and visual condition assessment.

DAM 3

LOCATION: East end of now-covered tailings storage area, east of Cells 1 and 2.

FUNCTION: Minor perimeter closure for tailings retention; Boomerang Lake downstream of the dam. The dam retains tailings covered with an esker material cap, thickened in 1995 by one metre using esker material.

LENGTH: 600 +/- m

MAX HEIGHT: 2.5 +/- m above d/s tundra.

AS-BUILT ELEVATION: 488.4 m

CREST WIDTH AND CONDITION: Approx. 8 m; surfaced with esker material. Crest condition is good and no cracking is evident. Discharge swale on the east arm appears in satisfactory condition.

RIPRAP: Inside slope buried with tailings cover sand and gravel.

BACKSLOPE: Variable in inclination; locally meets the shoreline of Boomerang Lake. Minor toe cracking observed.

SEEPAGE: None observed near the toe of the east arm of the dam.

MAINTENANCE RECOMMENDATIONS: None required.

CONCLUSIONS: The dam is in satisfactory condition. Continue to conduct visual monitoring of small cracks at downstream toe.

DAM 4

LOCATION: South end of Cell 4 for K Dam sub-pond.

FUNCTION: Perimeter closure for water retention at present; natural pond downstream of the dam at its west end.

LENGTH: 900 +/- m

MAX HEIGHT: 6 +/- m above u/s native ground elevation.

AS-BUILT ELEVATION: 489.59 m

CREST WIDTH AND CONDITION: Approximately 12 m wide crest width in generally good condition.

RIPRAP: Run of Mine rockfill in generally good condition on upstream slope.

BACKSLOPE: Esker sand; slope steeper in upper portion and flattens in the lower portion, approximately 2H:1V. Several erosional gullies noted near the east end.

SEEPAGE: Water is seeping into the “cofferdam area” from the downstream lake, rather than from the upstream pond. This circumstance has been previously observed.

INSTRUMENTATION: Three of the original four thermistors are currently monitored in Dam 4. From east to west across the crest, the four cables are numbered TD4-1 to –4.

Thermistor TD4-1 has only subzero temperatures below 4 m depth. Below a depth of 6 m (approximately embankment fill thickness), the subsurface temperatures have all been colder than –2.9^{o}C with no signs of significant warming.

DAM 4 CONTINUED

INSTRUMENTATION:

Thermistor TD4-2 was destroyed in summer 2003.

Thermistor TD4-3 displayed only subzero temperatures below 4 m depth. Below a depth of 6 m (approximately embankment fill thickness), the temperatures have all been colder than –2.0^{o}C with no signs of significant warming.

Thermistor TD4-4 displayed only subzero temperatures below 4 m depth. Below a depth of 6 m (approximately embankment fill thickness), the subsurface temperatures have all been colder than –3.0^{o}C with no signs of significant warming.

MAINTENANCE RECOMMENDATIONS:

The erosional gullies on the downstream slope, near the east end, should be backfilled to prevent additional erosion.

CONCLUSIONS:

The dam is in good condition and is functioning without apparent seepage. If the “cofferdam area” is to be backfilled (as suggested by site staff), consideration should be given to the metals content in the sediments in the pond bottom. If tailings are located in these sediments, then the backfill thickness should be appropriate to ensure these sediments remain frozen.

DAM 5

LOCATION: Southeast corner of Cell 3, just northwest of Dam 4.

FUNCTION: Minor perimeter closure intended for future tails and water retention; currently functioning as a road embankment.

LENGTH: 250 +/- m

MAX HEIGHT: 1.5 +/- m above d/s tundra.

AS-BUILT ELEVATION: 491.54 m

CREST WIDTH AND CONDITION: Approximately 8 m wide and esker surfaced so that the dam may also function as roadway. Crest is in generally good condition.

RIPRAP: Angular rockfill, maximum particle size from 20 to 30 cm, has been placed on the upstream face. Approximate slope of 3H:1V and in good condition.

BACKSLOPE: About 1.5 to 2H:1V with till and esker sand. No cracking observed.

SEEPAGE: No seepage observed. No water head being retained by the structure.

MAINTENANCE RECOMMENDATIONS: None currently required.

CONCLUSIONS: The dam is in good condition and should be inspected for seepage when pond levels place a water head against it (unlikely occurrence).

DAM 6

LOCATION: West side of Cell 3 retaining tailings placed behind K-dam.

FUNCTION: Minor perimeter closure. Retaining some tailings beach and ponded water on the northern portion of the dam.

LENGTH: 300 +/- m

MAX HEIGHT: 2.5 +/- m above d/s tundra.

AS-BUILT ELEVATION: 490.25 m previously but some minor fill placement may have occurred.

CREST WIDTH AND CONDITION: Approximately 10 m wide and esker surfaced so that dam also function as a roadway (occasional tire rut near the downstream toe). Crest in good condition.

RIPRAP: Upstream side has been covered now that tailings cover layer of sand has been placed.

BACKSLOPE: About 2H:1V with till and esker sand; two minor longitudinal cracks were noted at the toe; four erosional gullies observed on the downstream toe.

SEEPAGE: No seepage observed.

INSTRUMENTATION: Three thermistors, BGC03-01, -02 and 03 were installed in May 2003 as part of the site investigation program. The first two thermistors on crest were destroyed in June 2003 and the third ceased to function in 2004.

MAINTENANCE RECOMMENDATIONS: The four erosional gullies located on the downstream toe should be backfilled and graded to prevent further erosion. A small pond has formed on the upstream side of this dam, at the south abutment, due to proximal cover placement trapping runoff against the natural topography. The placement of additional esker material over an area of 80 to 100 m^2 would prevent the formation of this pond, reducing the risk of overtopping.

CONCLUSIONS: The dam is in good condition but its performance should be monitored during spring freshet and significant rainfall events.

6. CLOSURE

We trust the enclosed meets your present requirements and we thank Kinross Gold Corporation, Echo Bay Division, for the opportunity to be of service at Lupin Mine. If you have any questions or require additional information, please contact the undersigned.

Respectfully submitted,
BGC ENGINEERING INC.

per:	Reviewed by:
James W. Cassie, M.Sc., P.Eng.	Holger Hartmaier, M.Eng., P.Eng.
Specialist Geotechnical Engineer	Senior Geotechnical Engineer.

REFERENCES

BGC Engineering Inc. 2000. Thermistor Installation Program, Dam 1A, Dam 2, M Dam, Cell 1 and Esker, Lupin Mine, Nunavut. Report submitted to Echo Bay Mines Ltd., Project No. 0256-002-01, December 11, 2000, 7 pages plus figures and appendices.

BGC Engineering Inc. 2003. Dam 6 Site Investigation and Raise Design, Lupin Mine, Nunavut. Report submitted to Kinross Gold Corporation, Project No. 0256-006, July 25, 2003, 31 pages plus figures and appendices.

Geocon Inc. 1982. As-Built Tailings Containment Area, Lupin Project. Report submitted to Echo Bay Mines Ltd., Project No. A1207 / 01186-3, December 15, 1982, 26 pages plus figures and appendices.

Golder Associates Ltd. 1992. 1992 Perimeter Dam Construction Drawings. Issued for tender to Echo Bay Mines Ltd., February 1992, 4 sheets.

Golder Associates Ltd. 2004. 2004 Dam Safety Review, Perimeter Tailings Dams, Lupin Mine, Nunavut. Report submitted to Kinross Gold Corporation, Project No. 04-1321-022, December 2004, 36 pages plus figures and appendix.

FIGURES

APPENDIX 1 - SITE INSPECTION MEMO

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
#1605 - 840 7th Avenue S.W., Calgary, Alberta, Canada. T2P 3G2
Phone (403) 250-5185 Fax (403) 250-5330

PROJECT MEMORANDUM

To:	Kinross Gold Corp., Lupin Operation	Fax No.:	provided at site
Attention:	Mr. Mike Tansey, P.Eng.	CC:	-
From:	Mr. Jim Cassie, P.Eng.	Date:	August 11, 2005
Subject:	2005 Annual Inspection of Perimeter Tailings Dams Lupin Mine, NU		
No. of Pages (including this page): 2 Pages		Project No:	0256-011-01

The following memo provides some comments on the current conditions and recommended maintenance following the inspection of the perimeter tailings dams on August 10 and 11, 2005.

Dam 1A

- No concerns noted or maintenance required.

Dam 1B

- No concerns noted or maintenance required.

Dam 1C

- No concerns noted or maintenance required.

Dam 2

- A thin (< 1 cm) layer of tailings has been deposited at the toe of this dam. This windblown material could be removed and placed within the containment pond.
- The small seepage discharge was observed at the toe of the north abutment.
- No other concerns noted or maintenance required.

Dam 3

- Minor toe cracking noted at the downstream toe.
- No other concerns noted or maintenance required.

Dam 4

- Numerous erosional gullies on the downstream slope, near the east end, should be backfilled to prevent additional erosion.
- Water is seeping into the "cofferdam area" from the downstream lake, rather than from the upstream pond.

- If the "cofferdam area" is to be backfilled (as suggested by site staff), consideration should be given to the metals content in the sediments in the pond bottom. If tailings are located in these sediments, then the backfill thickness should be appropriate to ensure these sediments remain frozen.
- No other concerns noted or maintenance required.

Dam 5

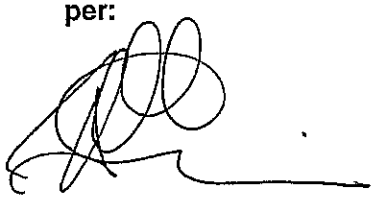
- No concerns noted or maintenance required.

Dam 6

- Four erosional gullies located on the downstream toe should be backfilled and graded to prevent further erosion.
- Two minor longitudinal cracks were noted at the toe.
- A small pond has been formed on the upstream side of this dam, at the south abutment, due to proximal cover placement trapping runoff against the natural topography. The placement of additional esker material over an area of 80 to 100 m^2 would prevent the formation of this pond, reducing the risk of overtopping or seepage.
- No other concerns noted or maintenance required.

All of the noted work is relatively minor but should be undertaken in the near future to prevent potential further damage from occurring next Spring. Please contact the undersigned should you have any concerns or questions with this inspection report.

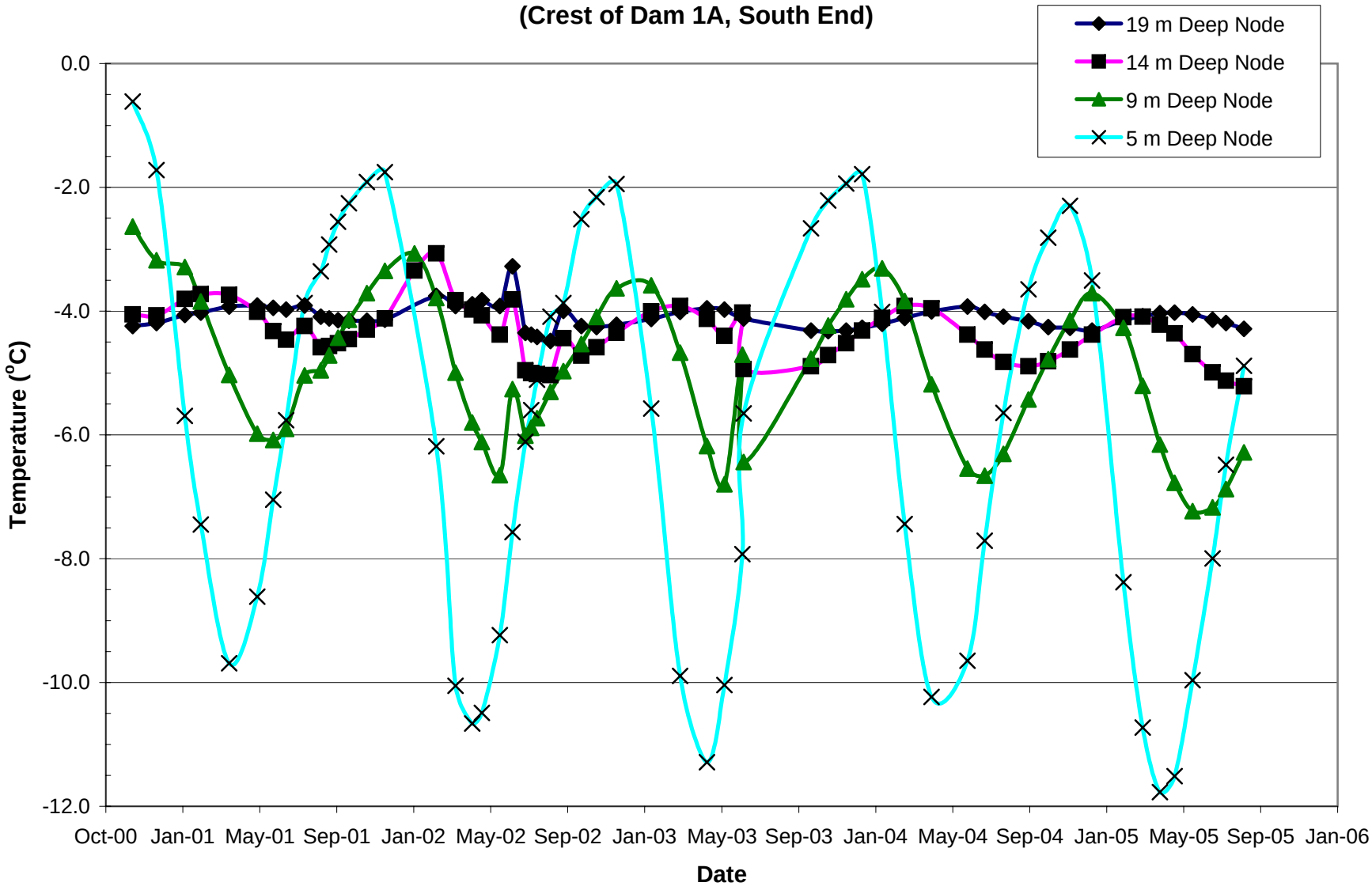
Respectfully submitted,
BGC Engineering Inc.
per:

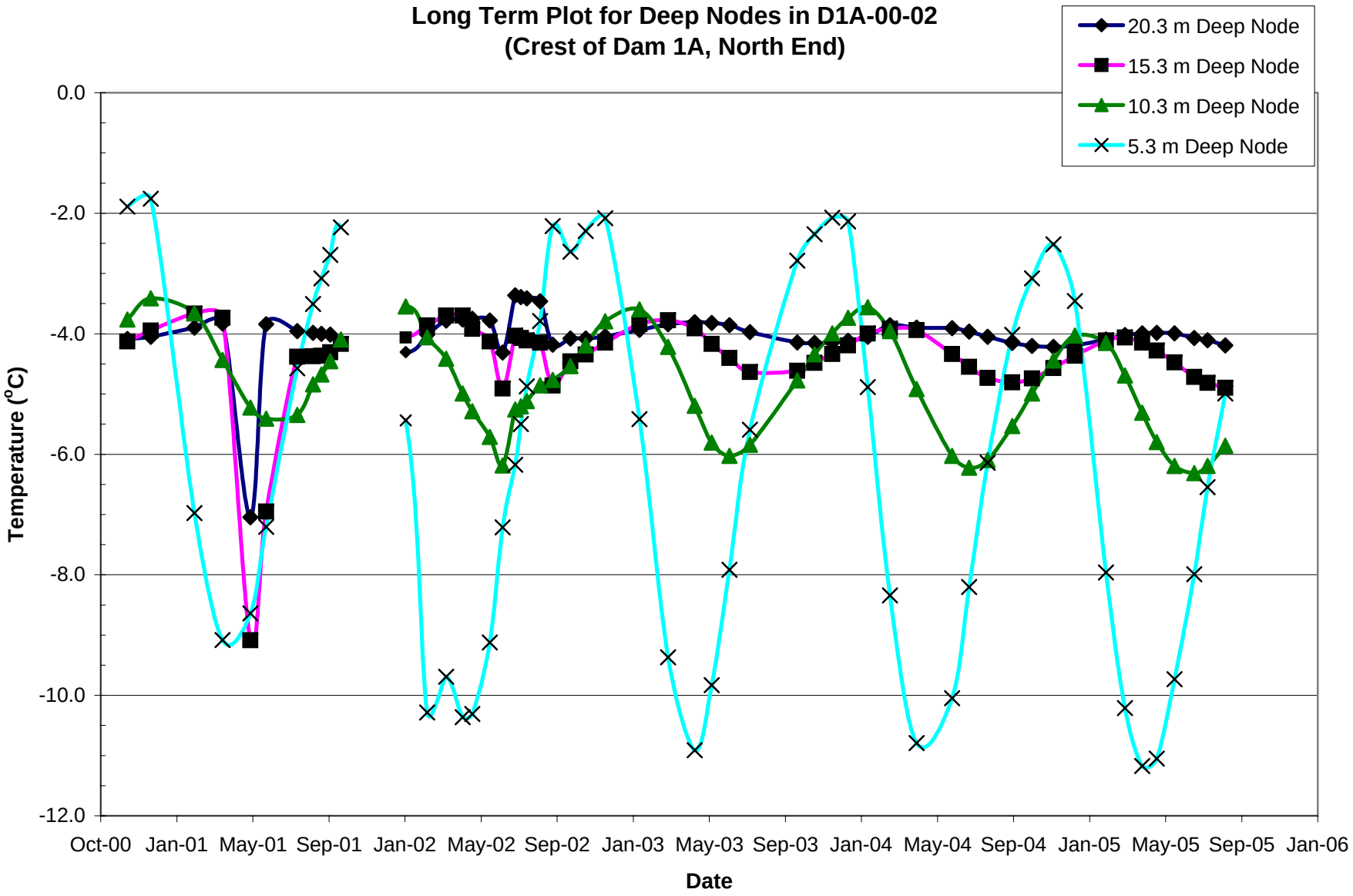


James W. Cassie, M.Sc., P.Eng.
Specialist Geotechnical Engineer
(jcassie@bgcengineering.ca)

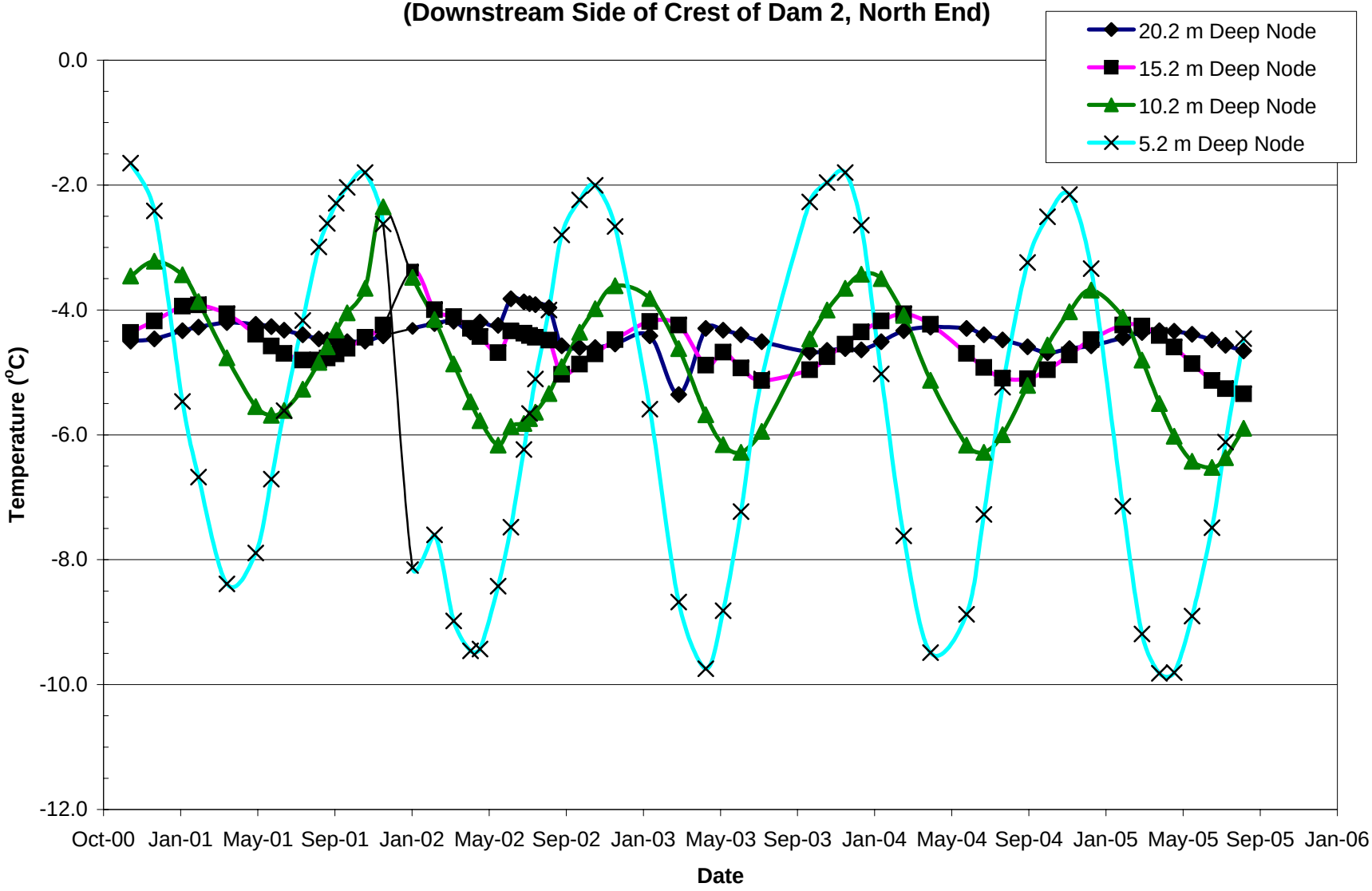
APPENDIX 2 - THERMISTOR PLOTS FOR VARIOUS DAMS

Long Term Plot for Deep Nodes in D1A-00-01 (Crest of Dam 1A, South End)

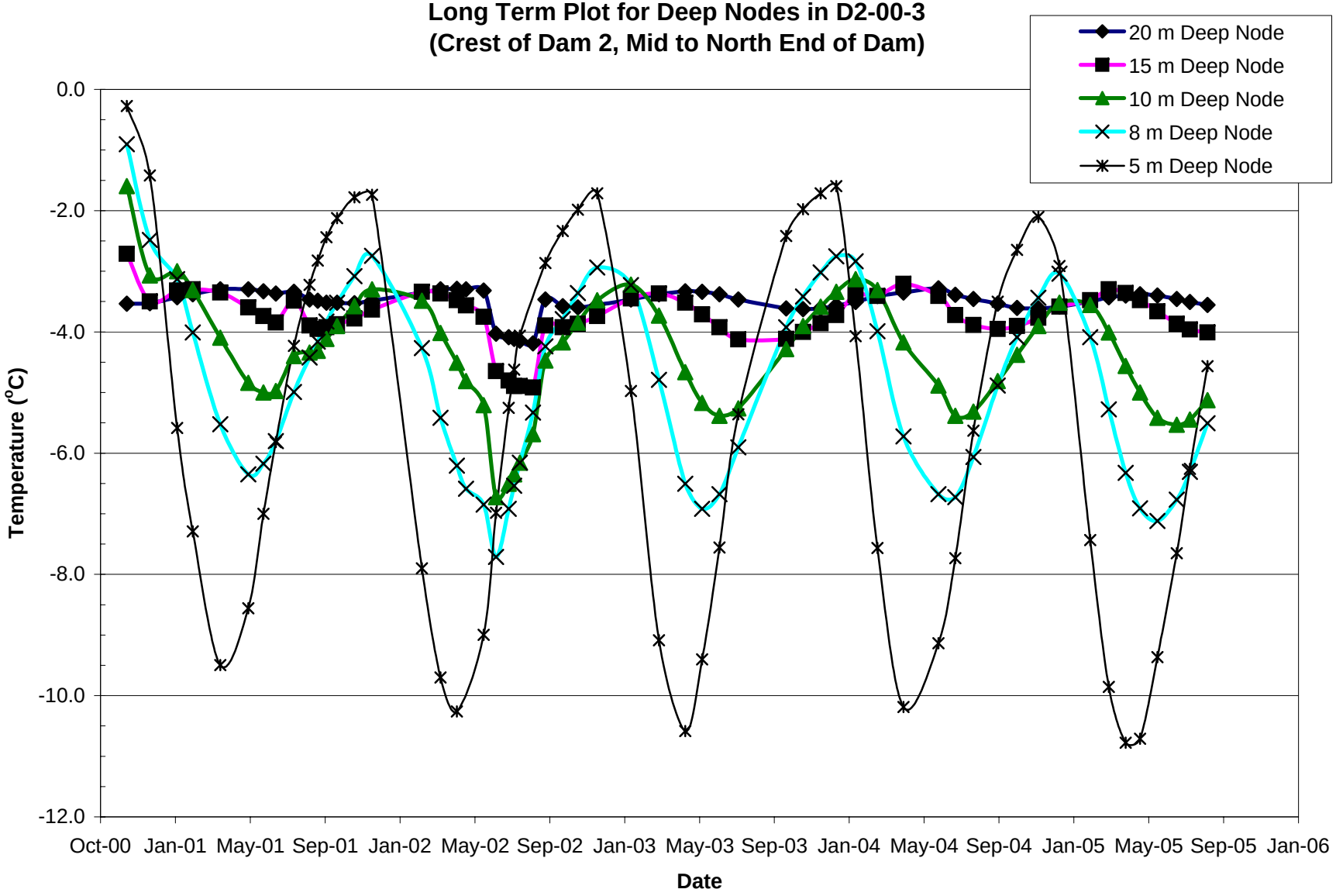



Long Term Plot for Deep Nodes in D1A-00-02
(Crest of Dam 1A, North End)
20.3 m Deep Node
15.3 m Deep Node
10.3 m Deep Node
5.3 m Deep Node
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
-12.0
Temperature (°C)
Oct-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
Sep-05
Jan-06
Date

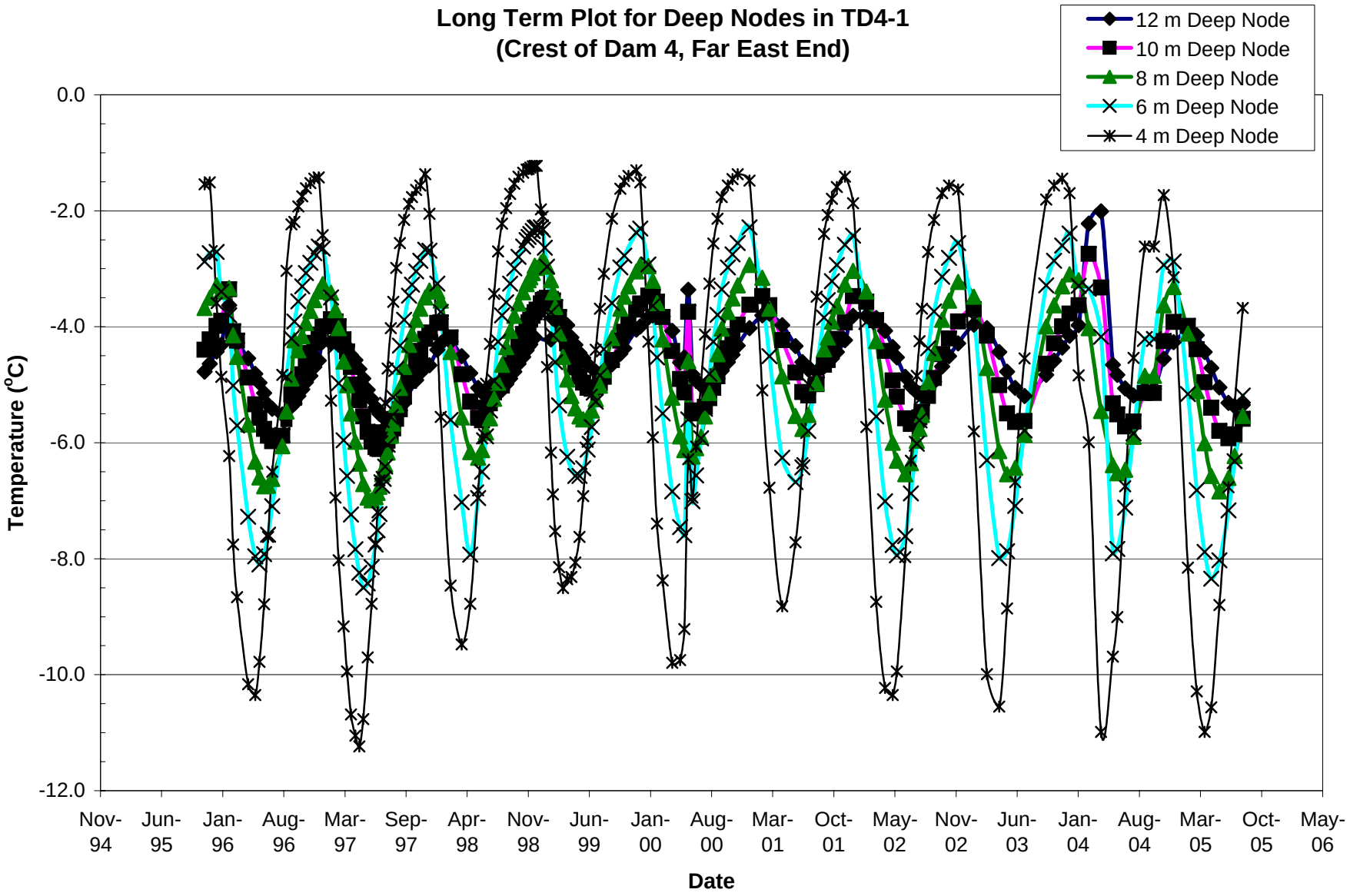
Long Term Plot for Deep Nodes in D2-00-2
(Downstream Side of Crest of Dam 2, North End)

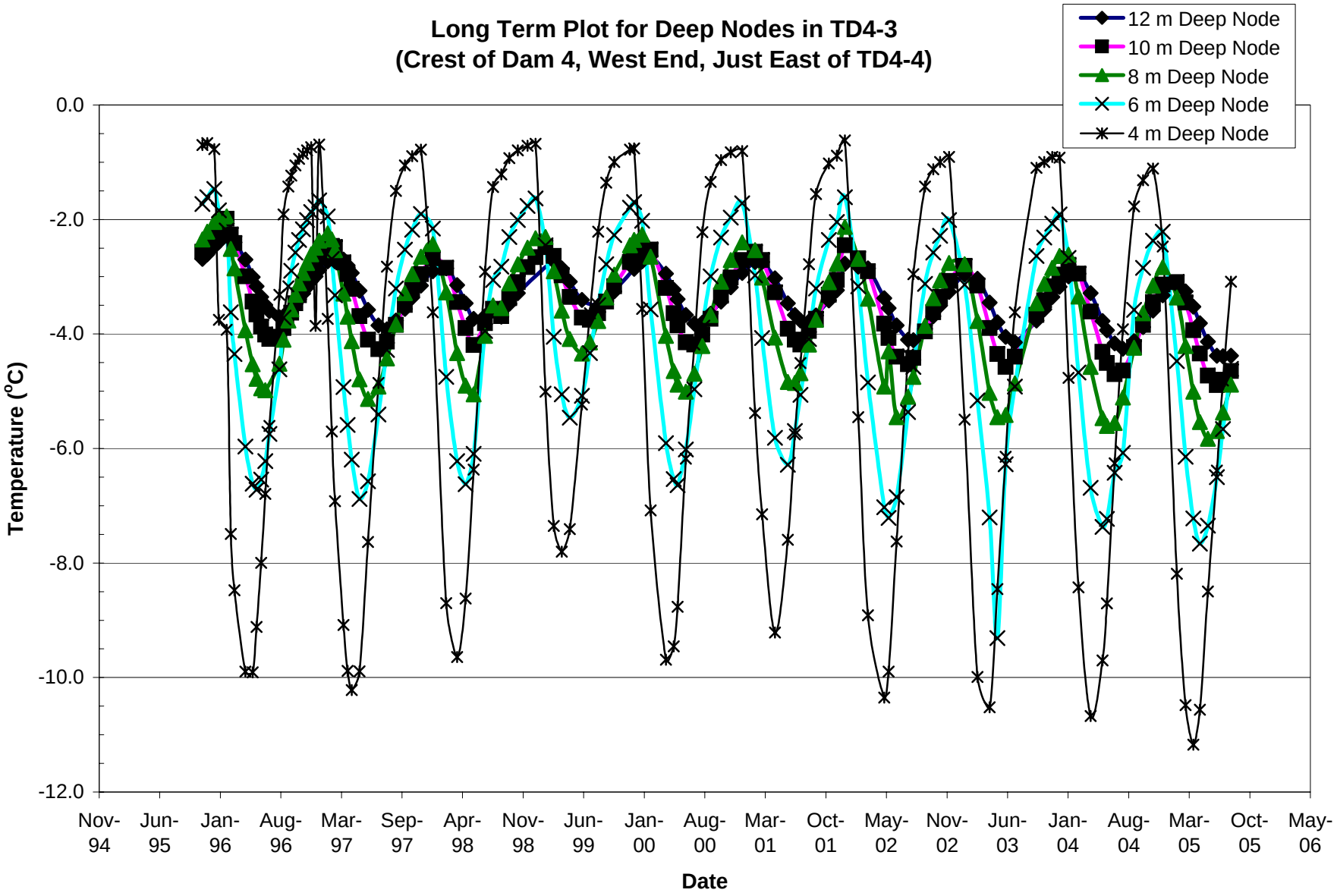


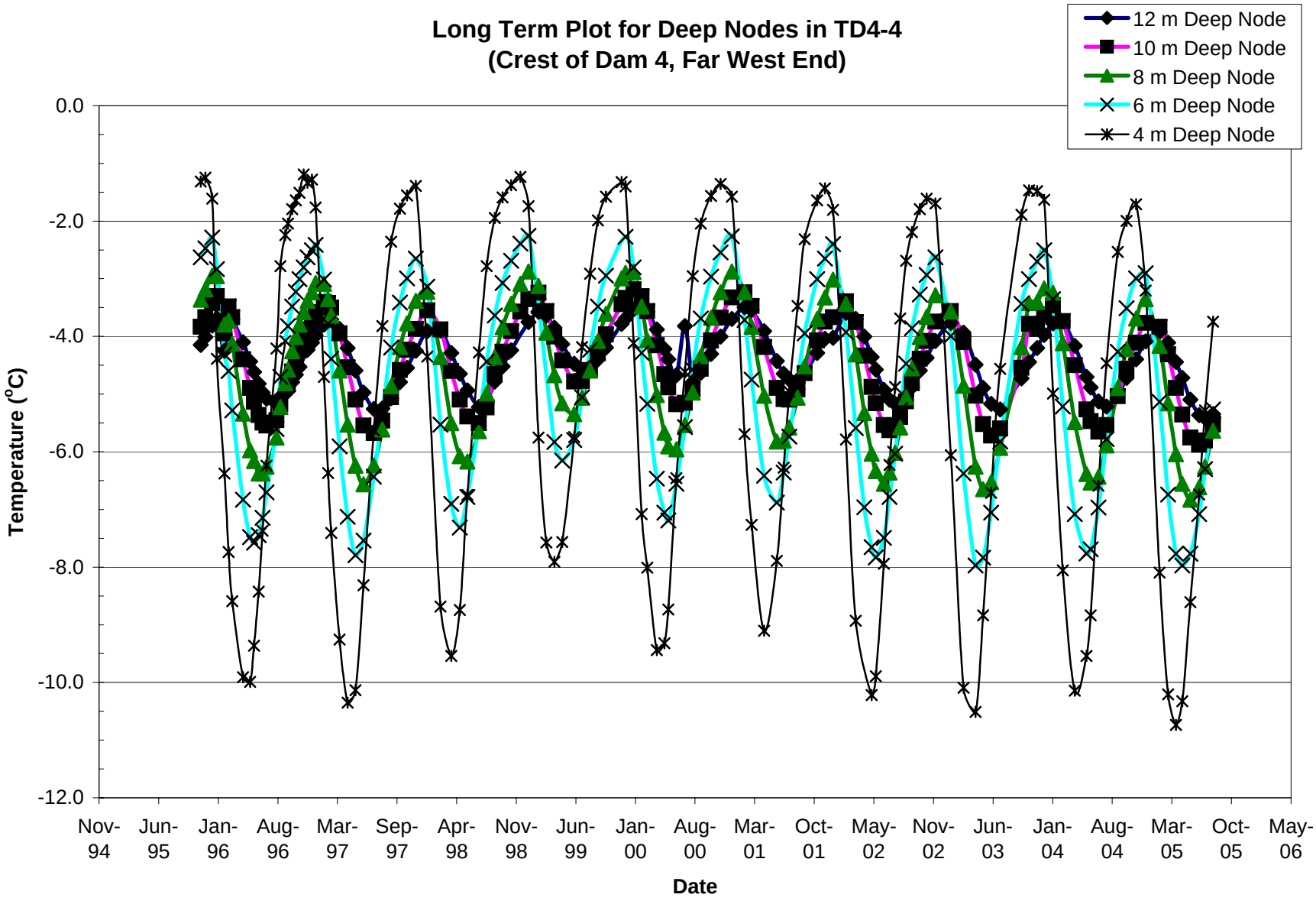
Long Term Plot for Deep Nodes in D2-00-3
(Crest of Dam 2, Mid to North End of Dam)



Long Term Plot for Deep Nodes in TD4-1
(Crest of Dam 4, Far East End)




Long Term Plot for Deep Nodes in TD4-3
(Crest of Dam 4, West End, Just East of TD4-4)
12 m Deep Node
10 m Deep Node
8 m Deep Node
6 m Deep Node
4 m Deep Node
Temperature (°C)
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
-12.0
Nov-94
Jun-95
Jan-96
Aug-96
Mar-97
Sep-97
Apr-98
Nov-98
Jun-99
Jan-00
Aug-00
Mar-01
Oct-01
May-02
Nov-02
Jun-03
Jan-04
Aug-04
Mar-05
Oct-05
May-06
Date


Long Term Plot for Deep Nodes in TD4-4
(Crest of Dam 4, Far West End)
12 m Deep Node
10 m Deep Node
8 m Deep Node
6 m Deep Node
4 m Deep Node
Temperature (°C)
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
-12.0
Nov-94
Jun-95
Jan-96
Aug-96
Mar-97
Sep-97
Apr-98
Nov-98
Jun-99
Jan-00
Aug-00
Mar-01
Oct-01
May-02
Nov-02
Jun-03
Jan-04
Aug-04
Mar-05
Oct-05
May-06
Date