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MEMO TO: Mr. Ken Brouwer, P.Eng.
Knight Piésold Limited
Via Fax (604) 685-0147

FROM: Fred Matich

COPIES TO: Mr. Brian Kynoch, P.Eng.
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Mr. George Headley, P.Eng.
Fax (604) 952-0481

RE: **Geotechnical Review, Drainage Aspects,
Tailings Retention Structures,
Mt. Polley Project, B.C.**

DATE: March 3, 1997

Further to our discussions of today's date, this will confirm arrangements for a meeting in the morning of March 10, 1997. Mr. George Headley has indicated that he would be able to attend. It is understood that the Final Design Report is presently being finalized. It would be appreciated if a Draft copy plus additional documentation, as discussed below, (to the extent that they may be then available), could be left for me at the desk of the Vancouver Renaissance Hotel by the end of this week.

The Reference documentation previously available to this writer is listed in the attachments hereto (pages 19 and 20 excerpted from my Draft Report). The handout provided for discussion purposes during the meeting on February 28, 1997, identifies various additional programs with geotechnical components which have been carried out (with, in some cases, reports prepared) in the interval since the August, 1996 site visit. These include the following:

- (i) Test Pit Excavations for a variety of objectives, particularly to delineate the extent of the basin liners.
- (ii) Borehole investigations in borrow areas and also in conjunction with installation of instrumentation in the Main Embankment foundation soils.
- (iii) Cone Penetration Test (CPT) investigations of the foundation soils at the Main Embankment. Results covered (presumably) in a Report by Knight Piésold, as well as in a "Cone Tec Field Report".

- (iv) Additional groundwater monitoring wells installed in November, 1996. Knight Piésold Limited Report "1996 Groundwater Monitoring Well Installation Program", (Ref. No. 1628/4, February 1997).
- (v) 1996 Pressure Relief Wells and Pressure Relief Trenches. These appear to have been installed after the CPT investigations. In any event, they were hydraulically connected to the foundation drains. The locations in plan are available and other specific details are requested along with the rationale for inclusion of this system.
- (vi) The R.E. Graham Engineering Ltd. Report on the geotechnical investigation performed at the time of installation of the vibrating wire piezometers at the Main Embankment.
- (vii) Permeability testing carried out during construction, particularly the Basin Liner.

It would be appreciated also, if the following items could be discussed further at the planned meeting on March 10, 1997.

1. The detailed results of the geotechnical investigation included in the additional references as identified above. Particular emphasis in this respect on the geotechnical properties and pattern of occurrence of the "glaciofluvial/glaciolacustrine" formation in the environs of the Main Embankment, and review of the requirements for additional measures in the downstream toe area for pressure relief and/or additional protection against possible piping.
2. "As-builts" for the Main Embankment and Basin Liner. It is understood that these are under development from data included in Construction Reports.
3. Measures carried out to date, such as excavation and backfilling of former exploration Test Pits, Trenches, and exposures in the base of the Reclaim Barge Channel. Also, details of the fill placed over the Basin Liner at its juncture with the upstream toe of the Main Embankment.
4. Zones within the Main Embankment constructed at below-freezing temperatures, or exposed to the latter.
5. Ponding which has been experienced to date both upstream and downstream of the Main Embankment.
6. Monitoring measures, particularly special requirements in this respect to cover the period between initial impoundment of water to about el. 925m and significant blanketing of the base of the Tailings Area by tailings in storage.
7. Strategy for initial spigotting of tailings upstream of the Main Embankment, plus an approximate initial stage-storage relationship.

8. The current plan for overall water management particularly as it relates to pond levels at the Main Embankment.
9. Revisions to the original Design Report such as (i) analyses of seepage through the Embankment and Basin Liner and underseepage through the foundation formations, for the natural ground and "as-built" details and revised operating plans, and (ii) stability analyses similarly updated.
10. Assessment of potential problems and risks, e.g. from seepage and stability standpoints, particularly when the Stage 1b Embankment will be impounding primarily water.

Contingency plans and measures, and plans for management of risks generally.

11. Operations Manual, particularly aspects covering the start-up phase when primarily water impoundment will be involved.
12. Proposed plans for ongoing engineering inspections, surveillance and monitoring, particularly during the start-up phase as mentioned earlier.


M.A.J. Matich, P.Eng. (Ont.)

Re. 7960

9.0**REFERENCES**

- 9.1 Knight Piésold Ltd. Imperial metals Corp., Mt. Polley Project. Tailings Storage Facility, Design Report. Volume I - Main Report. May 26, 1995.
- 9.2 Knight Piésold Ltd. Imperial Metals Corp., Mt. Polley Project. Tailings Storage Facility, Design Report (Ref. No. 1625/1). Volume II. Appendices. May 26, 1995.
- 9.3 Knight Piésold Ltd. Imperial Metals Corporation. Mt. Polley Project. Response to Review Comments on Tailings Embankment Design. January 25, 1996.
- 9.4 Knight Piésold Ltd. Imperial Metals Corporation. Mt. Polley Project. Groundwater Monitoring Program. (Ref. No. 1624/2). June 3, 1996.
- 9.5 Knight Piésold. Site Memorandum from Ken Embree to Dennis Romanchuk, North American. Re: Revisions to Foundation Drain System. August 7, 1996.
- 9.6 Knight Piésold. Interoffice Correspondence. Memo from D. Harper to Ken Embree. Re: MPC 4-Foundation Drains. August 14, 1996.
- 9.7 Knight Piésold Ltd. Memo from Ken Brouwner to Ken Embree. Re: Embankment Chimney Drain. August 29, 1996.
- 9.8 Knight Piésold Ltd. Nine work sheets as follows:
 - (a) Part Plan showing basin liner details and exploratory trenches/test pits near South end of Dam. August 21, 1996.
 - (b) Part Plan showing similar detail to (a) but with Reclaim Barge Channel added. (Undated)
 - (c) Part Plan showing similar detail to (a) and (b) but including North end of Dam and borrow area.
 - (d) Work Sheet showing Section 7/1625.201, Ch. 24 + 80 and Section 8/1625.201, Ch. 25 + 90.
 - (e) Work Sheet showing Section 5/1625.201, 0 + 400m upstream of Dam Centreline, and Section 6/1625.201, 0 + 200m upstream.
 - (f) Work Sheet showing Section 4/1625.201.
 - (g) Work Sheet showing Section 3/1625.201, July 24, 1996. (Section at 050° through main embankment centreline).

9.0 REFERENCES

9.8 Continued

- (h) Work Sheet showing Section 2/1625.201, July 24, 25, 1996 (Section at 190° looking East through Swamp.)
- (j) Work Sheet showing Section 1/1625.201. (Section at about 110°, located through swamp and main embankment.)

9.9 Knight Piésold Ltd. Memo from Mr. Ken Brouwer re Mt. Polley Tailings Facility. January 18, 1997.