



## TECHNICAL MEMORANDUM

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**Date:** June 5, 2012  
**To:** Shawn Fillion, P.Eng. - PWGSC  
**Copies:** Harvey Walsh, P.Eng. - GENIVAR  
**From:** Steve Ash, P.Eng.  
**Project No.:** 111-26271-00  
**Subject:** Concrete Coring Results – Coboconk Dam – DRAFT No. 2

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GENIVAR Inc. (GENIVAR) was retained by Public Works and Government Services Canada to perform a concrete coring investigation of the Coboconk Dam, to assess the general quality of the concrete as input to a Dam Safety Review (DSR). The site location is shown on Figure 1, attached. The coring program was undertaken between March 6 and 8, 2012 and advanced eight (8) vertical core holes designated as CH-1 through CH-8 to depths of up to 6 m (22 ft) below the deck surface. Core hole locations are indicated on Figure 2.

Coring was completed using a 3-speed Hilti DD 200 Diamond Coring Tool, operated by G. Buteau Core Drilling, from Dowling, Ontario, under the supervision of a GENIVAR technician. The core holes were advanced using a 100 mm outside diameter (OD) diamond impregnated coring bit, and various lengths of AW (44 mm) diameter aluminum rods, with river water used for drilling lubrication. Sampling intervals were continuous from the deck surface of the dam to termination depth. Concrete core samples were logged in the field, core run recovery was measured, and core samples were placed into labelled boxes for transport, review and temporary storage. Samples will be stored at our facility for up to 6 months, after which they will be disposed.

Concrete slurry and spoils from the coring operation were contained and vacuumed up using an industrial vacuum. Drilling slurry was transferred into 45 gal barrels; once the barrels were full, the material was removed by Shepherd Environmental Services of Coboconk and transported to a registered waste facility.

Upon completion of drilling, the core holes were backfilled using non-shrink grout. A plug was used to seal off the bottom of the core holes to prevent wet grout from migrating into voids or fractures within the dam structure, and into the watercourse.

The concrete core samples were inspected, and selected core zones were submitted for laboratory tests, including: compressive strength, absorption, density and percent voids. Compressive strength tests were completed at GENIVAR's Peterborough laboratory; the other tests were completed at Golder Associates laboratory in Mississauga. Results are summarized below.

### **RESULTS**

Photographic logs of the core samples are appended, and a cross section is included as Figure 3. Laboratory test results are summarized in Table 1 as follows.

**Table 1: Concrete Core Test Results**

Core Hole No. (Figure 2) and Sample No.	Sample Depth (m)	Compressive Strength (MPa)	Density (kg/m <sup>3</sup> )	Absorption After Immersion (%)	Volume of Voids (%)
CH-1-1	0.22-0.42	30.3	2407	--	-
CH-2-1	0.00-0.22	34.4	2343	5.4	13.5
CH-2-2	0.92-1.12	35.6	2366	--	--
CH-2-3	3.00-3.25	29.0	2291	--	--
CH-3-1	0.30-0.51	29.4	2312	6.7	15.5
CH-3-2	1.83-2.04	36.6	2383	--	--
CH-4-1	0.00-0.22	28.7	2292	--	--
CH-5-1	0.08-0.28	33.1	2317	6.2	14.8
CH-7-1	0.92-1.12	45.4	2429	6.3	14.8
CH-7-2	5.18-5.39	35.4	2373	--	-
CH-8-1	0.00-0.23	43.8	2383	--	--

In summary, based on the inspections and tests, concrete within the dam appears to have good compressive strength, with an average of 34.0 MPa at the sampled locations. Occasional 19 mm diameter smooth rebar was observed in some of holes at various depths shown in the photos, and large cobble aggregate was observed in some of the deeper intervals (see CH-2 photo). Efflorescence was observed on the face of the dam and occasionally along fractures within the core samples. Overall, internal concrete degradation for this dam appears to be minor.

Core hole CH-7 encountered the pier/apron interface at 4.78 m depth, and limestone bedrock at a depth of 5.56 m. A small void was encountered between the concrete and the bedrock, which may be a result of erosion or possibly a construction gap. The bedrock was core sampled for a length of 0.46 m after which the borehole was terminated. The limestone was slightly weathered and sound.

Please call us if you have any questions about this information.

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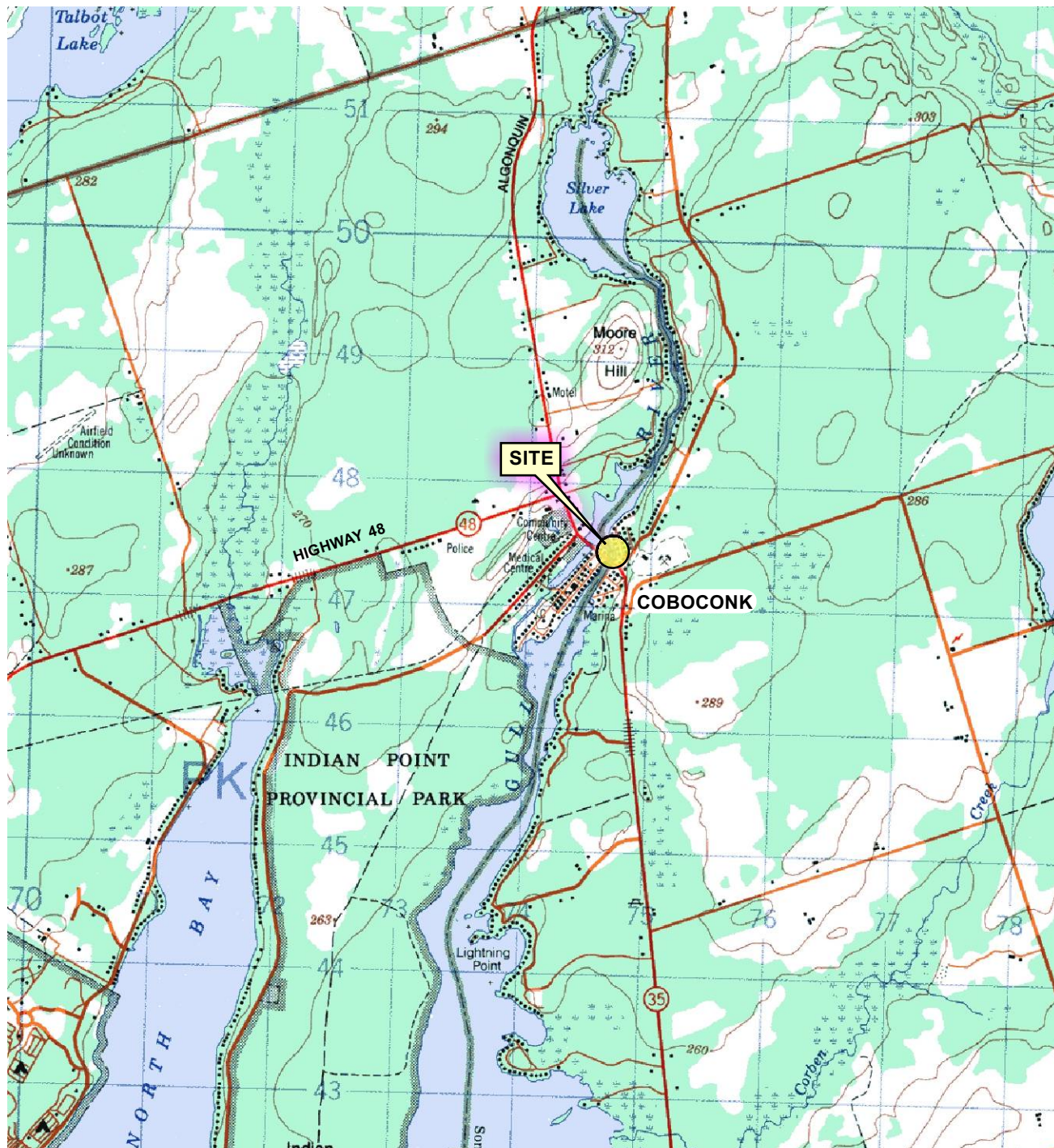
## Figures

Figure 1 – Location Map

Figure 2 – Core Hole Locations

Figure 3 – Cross Section

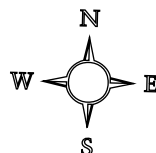
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#### LEGEND



LOCATION OF STUDY AREA



MAP SOURCE:  
NTS 1:50000 SHEET 31D/10, FENELON FALLS.

## LOCATION MAP

GEOTECHNICAL INVESTIGATION  
GULL RIVER BUNDLE DAM SAFETY REVIEW  
COBOCONK DAM  
For Public Works & Government Services Canada

DATE: MARCH 2012

SCALE: 1:50000

PROJECT: 111-26271-00

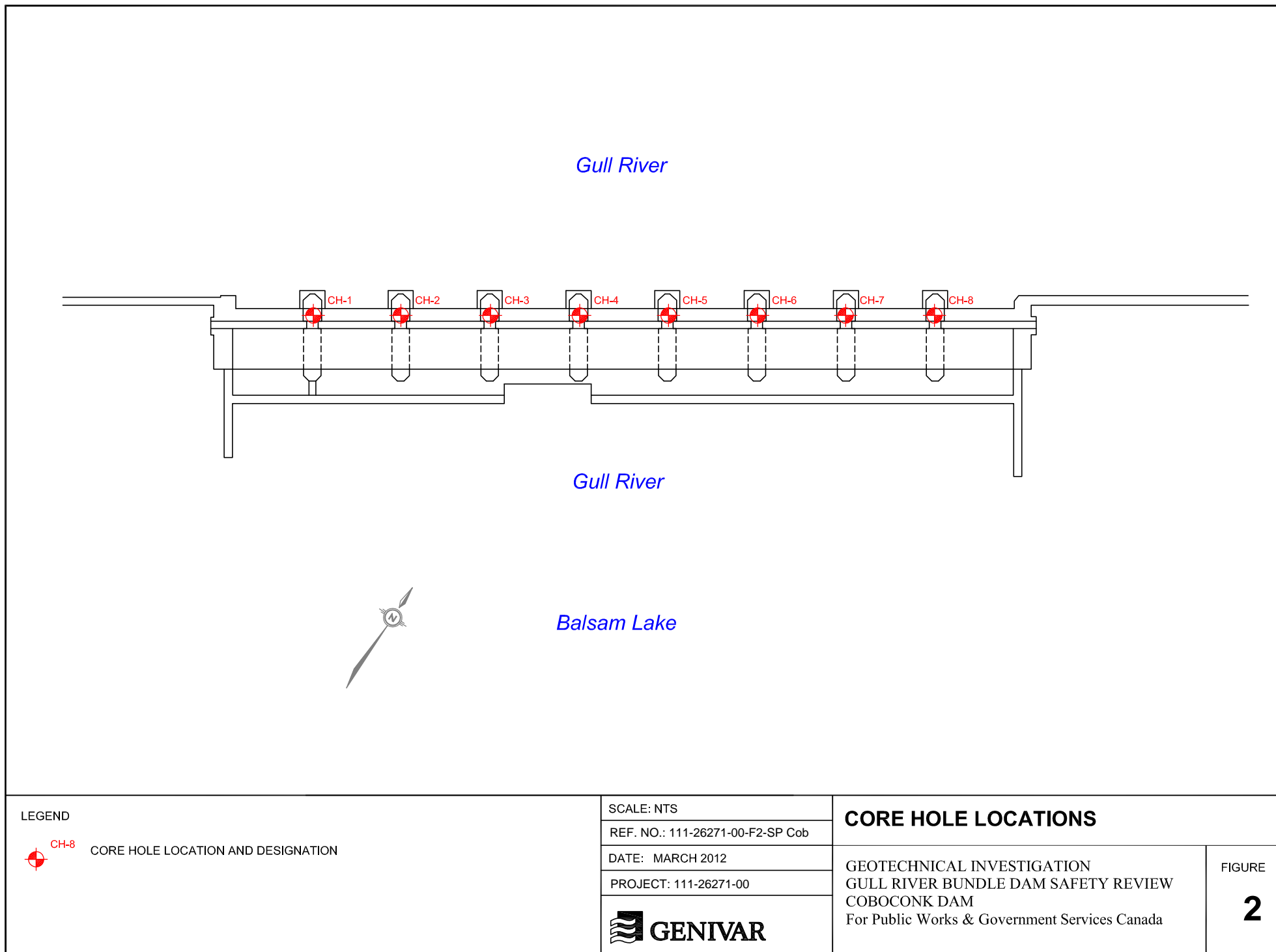
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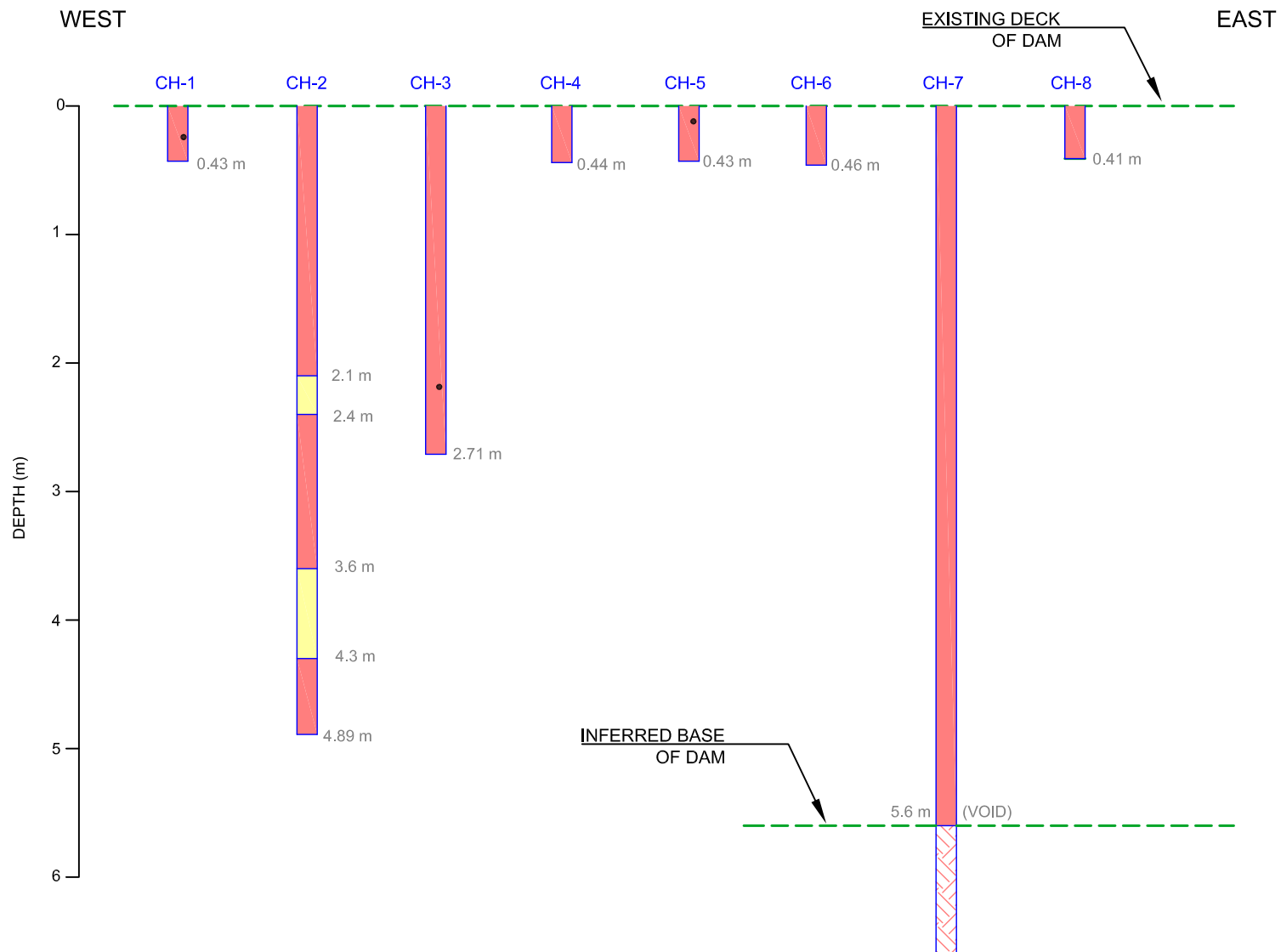


**GENIVAR**

FIGURE

**1**





#### LEGEND

CH-1	CORE HOLE DESIGNATION
•	REBAR
	CONCRETE
	COBBLE AND AGGREGATE
	BEDROCK (LIMESTONE)

SCALES: AS SHOWN

REF. NO.: 111-26271-00-F3-CR

DATE: JUNE 2012

PROJECT: 111-26271-00



#### CROSS SECTION

CONCRETE CORING RESULTS  
GULL RIVER BUNDLE DAM SAFETY REVIEW  
COBOCONK DAM  
For Public Works & Government Services Canada

FIGURE

3

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# Appendix A

## Core Photographs

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CH-1

0.2

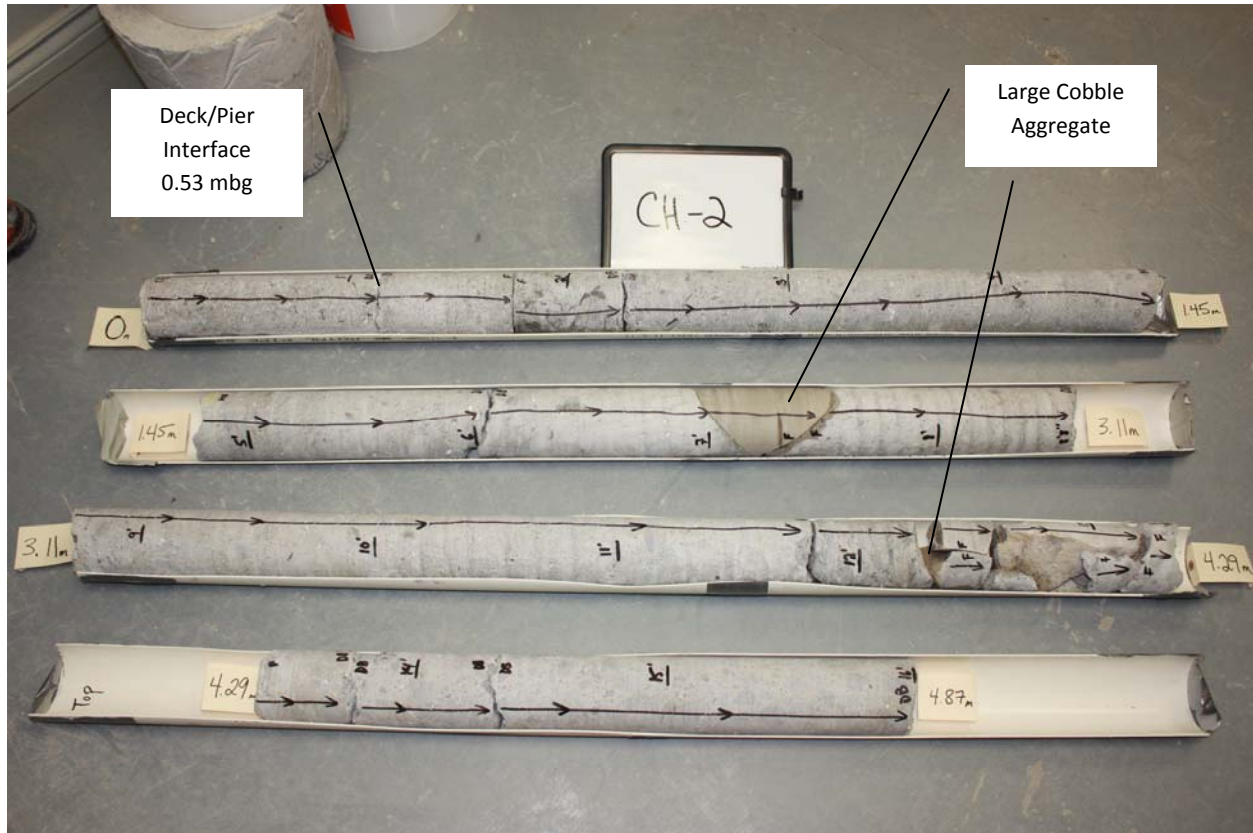
CH-1  
0-1

0.43m

19 mm re-bar



## Coboconk Dam Coring Investigation



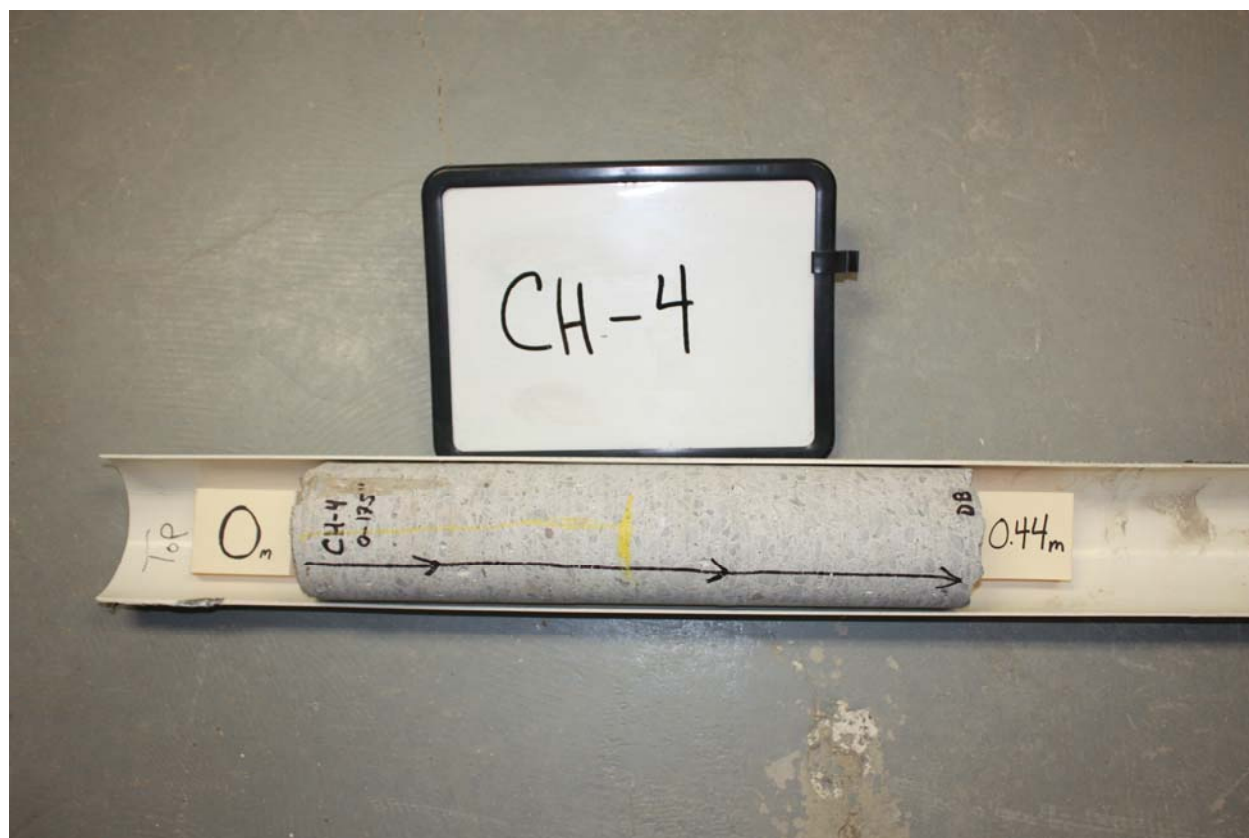
Photograph 2: Core Sample CH-2

## Coboconk Dam Coring Investigation



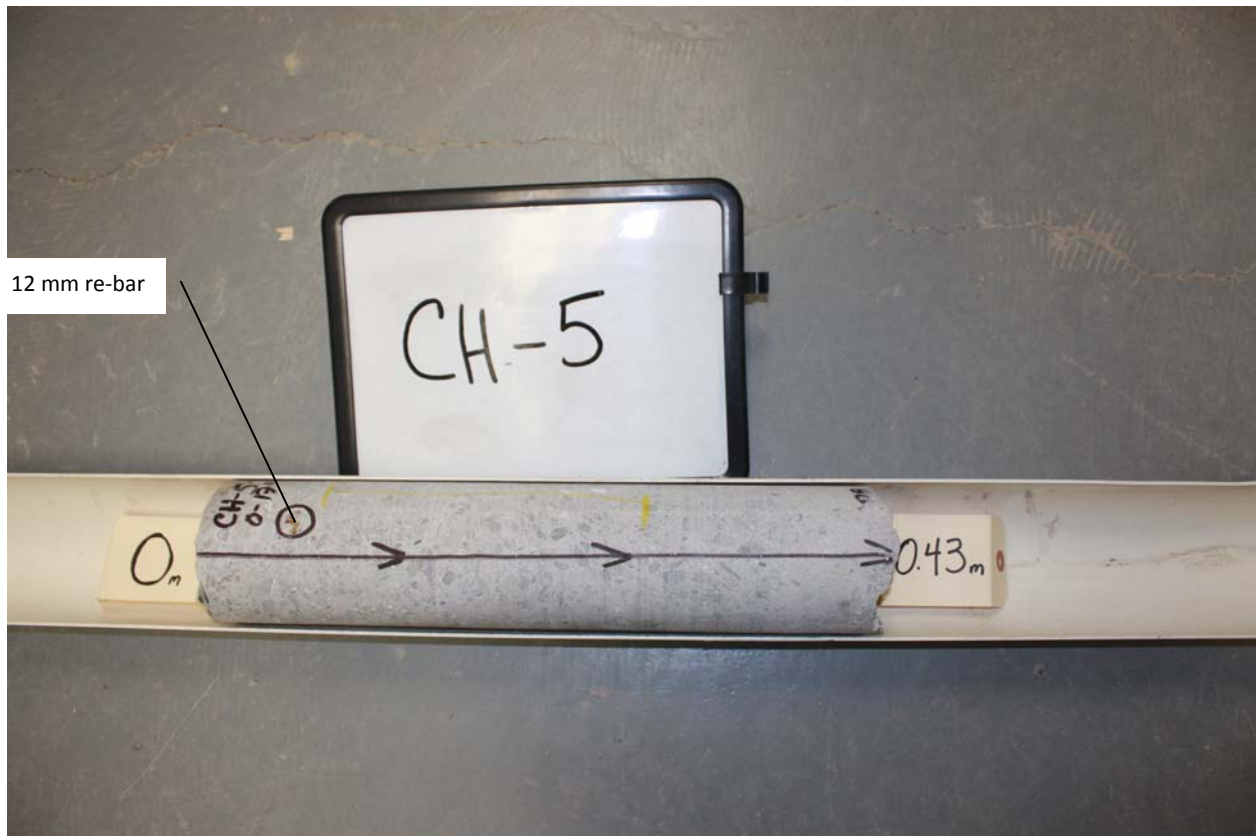
Figure 3: Coboconk Dam CH-3

# Coboconk Dam Coring Investigation



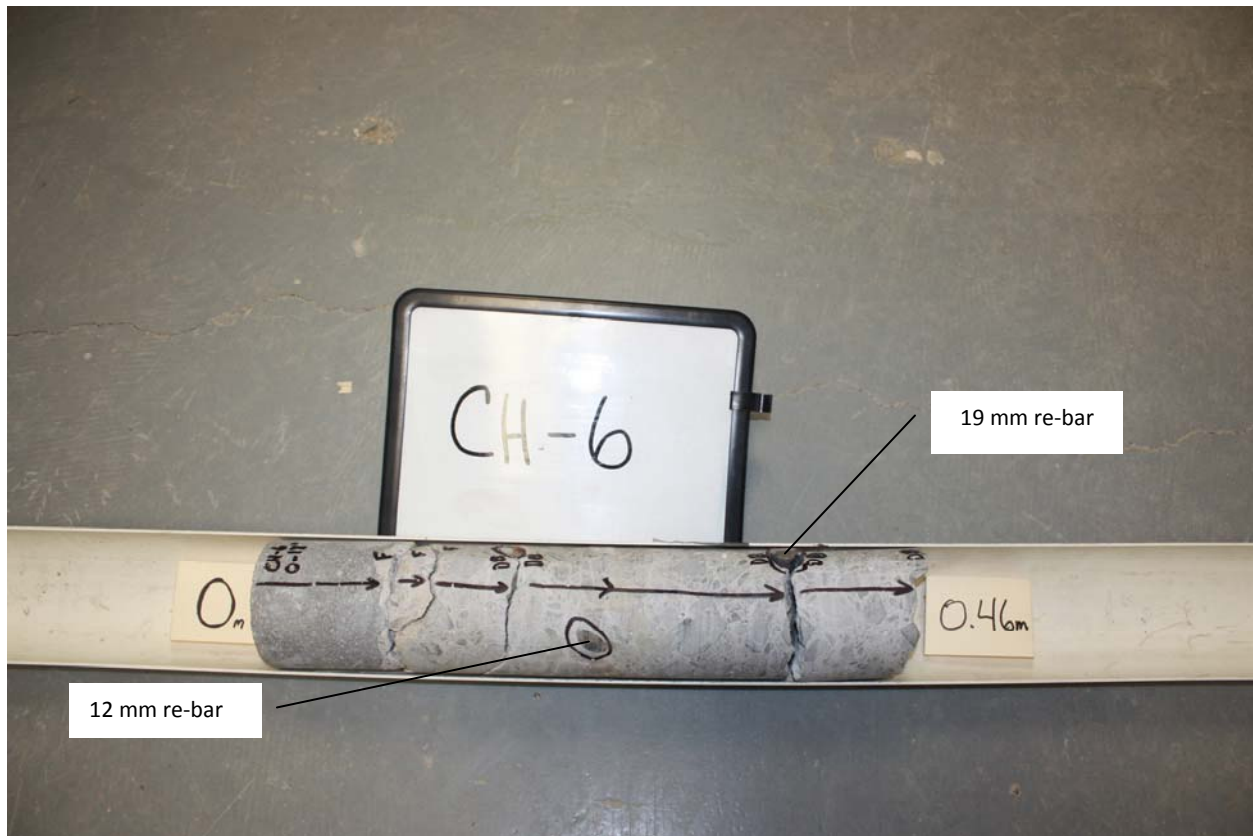
Photograph 4: Core Sample CH-4

# Coboconk Dam Coring Investigation



Photograph 5: Core Sample CH-5

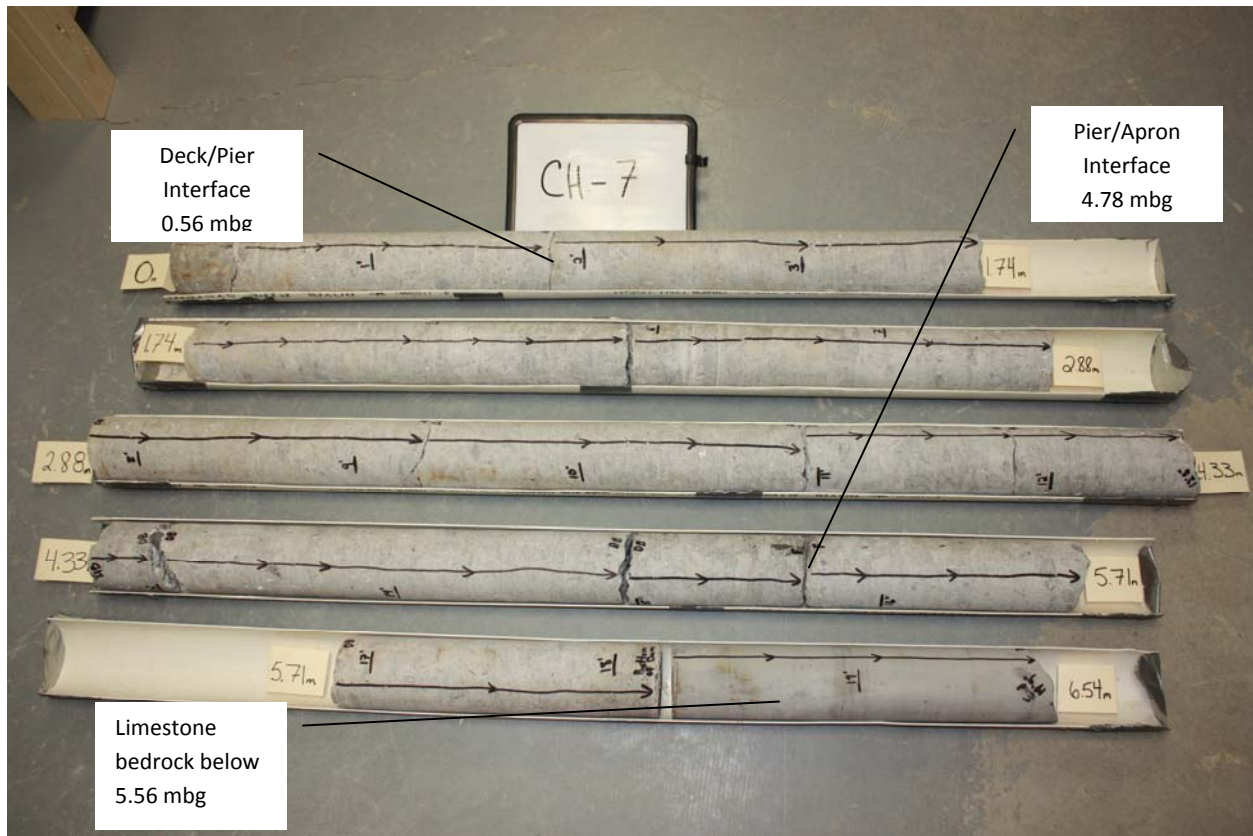
## Coboconk Dam Coring Investigation



Photograph 6: Coboconk Dam CH-6



## Coboconk Dam Coring Investigation



Photograph 7: Core Sample CH-7

# Coboconk Dam Coring Investigation



Photograph 8: Core Sample CH-8