

# **GEOLOGICAL ASSESEMENT OF BORROW AREA FOR ADI BADRI DAM PROJECT, DISTRICT YAMUNANAGAR, HARYANA**

Item No. M4EGG/C/NR/SU-PHP/2022/40647

Field Season: 2022 - 2023

By

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## **1. INTRODUCTION:**

The project envisages construction of 33.40m high (from the deepest foundation level) and 160m long concrete gravity dam across Somb River, district Yamunanagar, Haryana for revival of holy Sarasvati River. After construction of dam, the impounded water shall be carried through open channel/pipeline to the desilting reservoir to feed the water into Sarasvati River.

On request from Haryana Saraswati Heritage Development Board (HSHDB), an inspection visit to the Borrow area (quarry site) for Adi Badri Dam project was made on 6th September, 2022. Subsequently, detailed geological mapping was carried out in the month of February 2023 on 1:20 scale covering approximately 0.082 sq. km for the estimation/quantification of construction material available in the proposed borrow area. The work was carried out under the MOU with FSP No. M4EGG/C/NR/SU-PHP/2022/40647 of the approved Annual Programme of Geological Survey of India for the Field Season 2022-23.

### **1.1 LOCATION AND ACCESIBILITY:**

The study area falls in SOI toposheet No. 53F/07 and has the geo-coordinate 30°23'33"N 77°25'04"E located 1km south of Nagli village, Yamunanagar District, Haryana. Bilaspur is the nearest township located 24kms SW of the study area. The area is accessible with matelled road via Bilaspur-Nagli link road. The Borrow area for Adi Badri dam is chosen at Boli River near Jaitpur, approx. 18km d/s from the proposed Adi Badri Dam site.

### **1.2 GEOMORPHOLOGY OF THE AREA:**

There are number of ephemeral *nalas*/ streams draining the nearby hills in the northern part forming the main drainage system in the area. These streams have insignificant water discharge during the winters but during monsoons most of them get flooded, transporting huge amount of river bone sediments to the down streams.

### **1.3 REGIONAL GEOLOGY**

Geologically, the area forms a part of Outer Himalaya and is occupied by semi consolidated sedimentary sequences of Middle Siwalik (Lower Pliocene) and Quaternary sediments (Recent ages). To the north, the Siwalik belt is delimited by Main Boundary Fault (MBF) where Palaeogene shale and sandstone sequence of Sirmur Group thrust over Siwalik Group of rocks. To the south the Siwalik belt itself thrusts over the thick Indo-Gangetic alluvium. The proposed dam and barrage sites are occupied by semi consolidated sediments of Middle Siwalik comprising NW-SE striking thinly to thickly bedded, alternate sequence of sandstone and mudstone with or without conglomerate belonging to Mohargarh Formation. In general, the area is a part of recent alluvial plain and adjoining areas are covered to a large extent by Quaternary sediments of alluvial/aeolian origin.

### **1.4 PRESENT WORK:**

The authors have spent four days each and carried out geotechnical studies in the study area in which a detailed geological mapping on 1: 20 scale was carried out covering an area of 0.082 sq. km. A total 07 nos. of trenches were excavated upto a depth of 10 ft. to ascertain the thickness of sediments.

### **2. GEOLOGICAL ASSESSMENT OF BORROW AREA:**

The total requirements of quantity of coarse and fine aggregate for the construction of Adi Badri Dam project are approx. 82000 and 50000cum respectively. As per the discussion with project authorities, the required geo-mechanical testing was already done by CSMRS. The main aim of GSI is to estimate the quantity of the aggregate in the borrow area to fulfil requirement of aggregate material for the construction of the dam and its pertinent structure. The proposed borrow area was mapped on 1:20scale covering approx. 0.082 sq. km area. The River Borne Material (RBM) consists of boulder to pebbles size material of quartzite, feldspar, schist etc. with fine to coarse sandy material. Total 7 number of trench/pit was excavated in the proposed borrow area at different interval for the measurement of depth of aggregate material in the river bed. The aggregate wise reserve estimation could not be done, because the available aggregate material has mixture of pebbles with sand at ratio of 50:50 as observed in the excavated trenches (Plate- II). The proposed borrow area is present with dominantly pebbles and gravels of varying size deposited by Boli River. The studied area is divided by the polygons as per the surface features and observations recorded at different the pits/trenches (Plate-I). The pebbles are present with minor organic soil at the terrace side of Boli River (Plate-II).

Summary of the pit/trenches excavated in the borrow area

Sl. No.	Trench No.	Latitude	Longitude	Depth (ft.)
1	PIT-1	364703.6506	732439.1105	10
2	PIT-2	3364760.8338	732322.3840	10
3	PIT-3	3364790.7964	732336.7364	10
4	PIT-4	3364792.2025	732210.9926	10
5	PIT-5	3364792.3003	732122.2820	10
6	PIT-6	3364865.9484	732064.8408	10
7	PIT-7	3364889.4405	731981.9018	10

**3. CONCLUSSIONS AND SUGGESTIONS:**

- 1) Based on the geological mapping and excavated trench/pit, the average thickness of the aggregate is estimated at depth  $\pm 3\text{m}$ . The overall reserve estimation for the entire potential area is calculated approximately **2.46 lakh m<sup>3</sup> (82179x3m)** which is more than the present requirement.
- 2) The above values are based on the visible estimation only. However, it can be further suggested to confirm it with required geomechanical properties for its liability.
- 3) The alkali-aggregate reactivity test may be conducted for the strength or durability of the concrete.

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## FIELD PHOTOGRAPHS



**Fig.1** Trenching under progress



**Fig.2** Panoramic view of the proposed block



**Fig.3** The trench section showing poorly sorted River Borne Material (RBM)



**Fig.4** The trench section showing poorly sorted River Borne Material (RBM)



**Fig. 5** Detailed Mapping under progress



**Fig. 6** Section measurement under progress



**Fig. 7** River Borne Material exposed on the Boli river bed



**Fig.8** River Borne Material exposed along the Boli river section.

