

**RECONNAISSANCE GEOLOGICAL REPORT OF PROPOSED SITE OF**  
**SHRI LAKHDU S/O SHRI KANATU FOR THE CONSTRUCTION OF**  
**OWNER DRIVEN CONSTRUCTION FOR HOUSING (ODCH)**  
**VILLAGE-SETWARI, TEHSIL- BARKOT, DIST.- UTTARKASHI**  
**KHASARA NO – 1146 & AREA – 0.011 ha**

**Date of Inspection: 24-12-2013**

In a 'World Bank' funded programme, Government of Uttarakhand has provided teams of Consultant Geologists and Consultant Associate Geologists to Director, Geology and Mining Unit, Uttarakhand for geological studies in proposed sites for Owner Driven Construction For Housing (ODCH) in disaster affected districts of Uttarakhand. Director, Geology and Mining Unit, Directorate of Industries, Uttarakhand has issued an Office Order No.1612 Aa. Pra./Bhu.Ni./Bhu.Khani.E./2013-14 dated 10<sup>th</sup> December 2013 regarding geological studies in disaster affected five districts of Uttarakhand. District Uttarkashi is one of them where the undersigned took traverses and collected field geological observations under the management of cosignatory departmental 'Assistant Geologist'.

In the above mentioned questioned area, the reconnaissance geological investigation was carried out in the presence and co-operation of Shri Upendra Singh Rana, Revenue Sub-Inspector, Setwari. The site is 65km approximately from Tehsil Barkot, District Uttarkashi, Uttarakhand, 42km by NH-123 (Delhi-Yamunotri National Highway) till Damta, then 23km via Diyadi-Setwari Motor Marg and 25-30m downhill on bridle path from road. It falls on coordinates – N 30°36.546' E 78°02.736' and elevation 1347m. There is no plot boundary and the site is highly populated.

The proposed site is situated on left bank of River Yamuna and on a hill slope. The overburden thickness in the proposed site is about 10-15m approximately and is colluvial in nature. There are fragments of phyllite in the overburden material of approximately 5-10cm in size and some boulders of phyllite of 20-30cm size. The uphill slope above the road is 65°-70° in NNW direction while the downhill slope of the site is approximately 15°-20° towards NNW direction from the proposed site. There are two perennial Nalas, one 'Selya Khad' Nala 70m in West direction and another 'Deyari Khad' Nala 80m in East side of the site. The proposed site is less vegetated.

Along the road about 50-55m uphill of the site, phyllite outcrop of approximately 5x20m size is found. The foliation plane is dipping 80° toward South direction with E-W strike. The foliation spacing is 2-5cm, continuity is >3m and opening is 2-5mm. The joint plane J1 is dipping 65° towards N160° with strike N110° and the joint spacing is 20-30cm and continuity is 2-3m with 2-5mm openings. J2 plane is dipping 60° towards N70° with strike N160° and spacing of approximately 50cm, continuity <1m with 1-2mm openings. It is grey colored, thinly foliated with minor folding. The rocks are moderately strong and slightly weathered. The site is consolidated and appears stable.



**Phyllite outcrop along the roadside in Setwari Village.**

The proposed site is on a hill slope in Setwari Village with few remains of the previously damaged house on the site which must be removed before starting of the new construction. There are mostly houses on the downhill side of the site. The general slope of the site is 20°-25° towards NW direction. The soil is yellow color with silty clay material and phyllite fragments.

**Proposed site for construction**



**A far view from West direction of the proposed site.**

**Remains of old damaged house**



**A side view from NW direction of the proposed site.**

## **RECOMMENDATIONS:**


Based on above surface geological observations of the proposed area the following remedial measures for construction of a geologically suitable house are recommended:

1. The depth of foundation of the house should be as per the compactness of the overburden material.


2. An inclined retaining wall of 3-4m on NNW side and another retaining wall of 4-4.5m on SSE side of the proposed site must be constructed with proper weep holes at specific distance for enhanced stability of the plot.
3. The weep-holes passage should be clear to discharge subsurface water to maintain stability of foundation of the house.
4. There must be a minimum gap of 2-3ft between the uphill retaining and the backside wall of the house to avoid seepage into the house.
5. The back, sides and premises of the houses must be made cemented to prevent subsurface seepage and a proper drainage system with drain discharge towards West direction needs to be developed.
6. As the area falls in Lesser Himalayan earthquake zone IV, light weight and slanting roof, framed structure, deep column and single or double storied house construction is preferable.


### **CONCLUSION:**

Prima-facie, the proposed site of Shri Lakhdu S/o Shri Kanatu, is geologically feasible for the proposed construction, with the strict implementation of the above mentioned recommendations, otherwise, in their contravention; geological suitability will be deemed voided.

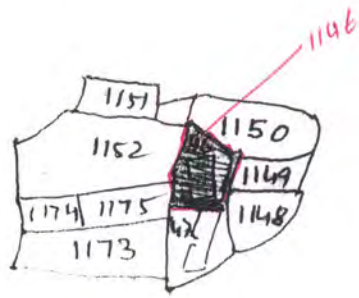
  
(Anupriya Shah)  
Consultant Associate Geologist

**Date:** 5<sup>th</sup> Jan, 2014  
**Place:** Camp Uttarkashi

  
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कच्चा मौजा सेतवाडी मध्ये श्री लखणूदासाय यांनी २५० हेतवाडी  
वाढी के लिए प्री फ्रेंडशिप भवन निर्माण हेतु भूमि प्रस्तावित  
की गयी है, रा० उ० नि० - समय तहसील - बडवाड जिला का  
पैमाना ६५" = १ मील



चौहद्दी

- ① पूर्व में - वाफिया आदि का क्षेत्र
- ② पश्चिम में - सरदारसिंह का क्षेत्र
- ③ उत्तर में - वाफिया आदि का क्षेत्र
- ④ दक्षिण में - हफात आदि का क्षेत्र

- संकेत
- आवादी
- नापरवेत
- प्रस्तावित भूमि

सत्यापित  
रा० उ० नि०  
बनीगाड

06/07/13  
रा० उ० नि०  
डामप

सत्यापित  
06/07/13  
R.S. 104

सेतवाड़ी मध्ये श्री लखणू उ० काठाडू के लिए प्रीफेक्टिड भयन निर्माण  
 प्राकृतिक भूमि का रा० उ० नि० क्षेत्र - डामय तहसील - बंडोरा (जिला) उ० काठाडू

प्रस्तावित संख्या	खाला खतोबरी सं०	खातेदार का नाम पिता/पति का नाम खबं। मैवा. स्थान	विवरण
0011	3	कृपालू वार्धिया, जगतू बवलू गोगनू दुम मकर, चमनलाल दुम लाल, जमलाल उ० हरदेव व दिग्ग देवी फनी हरदेव लखणू मुन्नाल उ० नरेणू विजमाडो उ० नरेणू साठ सेतवाड़ी .x.	महोदय, प्रस्तावित भूमि श्री लखणू उ० काठाडू उ० काठाडू के खोले वंश्या में होनी वतायी गयी है।

सत्यापित  
 रा० नि० वनेगाड

08/07/2013  
 M.S.1 accounts

08/07/2013  
 रा० उ० नि०  
 डामय