

# 1 INTRODUCTION

The MIU Project (Phase I) has been conducted at the Shobasama site since 1996. However, due to difficulties in obtaining authorisation to proceed with Phase II-Excavation at this site, Mizunami City offered JNC the option to lease the city-owned land at Togari/Yamanouchi district for the excavation of the MIU. JNC decided to accept the offer despite some technical disadvantages at the new site. The contract to lease the land was made in January of 2002, and the investigations from the surface have begun in accordance with the 2002 Master Plan of the geoscientific research programme for the MIU Project [1].

Phase I is planned to be completed by March 2005, and the excavation of the main shaft is planned to start in January 2005. The Shallow Borehole Investigations were one of the earliest programmes performed at the MIU Construction Site, together with a reflection seismic survey and investigations using an existing borehole, DH-2, drilled for the Regional Hydrogeological Study (RHS). The MIU Shallow Borehole Investigations targeted the shallow part of the site, from the sedimentary cover rocks to the upper part of the granite. The results will provide information on the near-surface geology and hydrogeology, for interpretation of the other investigations, and for planning and support of later programmes; borehole geophysics, cross-hole interference tests, and borehole investigations in MIZ-1 and DH-15 (an RHS borehole).

The Shallow Borehole Investigations were launched in April 2002. The main aims are as follows:

- To understand initial state of groundwater flow in the sedimentary rocks and the weathered granite.
- To understand groundwater chemistry in the sedimentary rocks and the weathered granite.
- To monitor hydraulic head continuously over a long time period.
- To understand relevant structural discontinuities in the site.

Location and layout of the four MIU shallow boreholes (MSB) were determined taking the prioritised aims, restrictions and requirements into account [2]. An earlier naming convention for the boreholes has been retained for consistency with planning documents. The prioritisation for drilling is as follows:

- MSB-2: a vertical hole to understand and monitor hydrogeological and geochemical conditions on the downstream side of both the regional groundwater flow and the palaeo-channel.
- MSB-4: a vertical hole to understand and monitor hydrogeological and geochemical conditions on the upstream side of the regional groundwater flow field.
- MSB-3: an inclined hole, 20 degrees from vertical to characterise the NNW fault within the sedimentary rocks; also to monitor hydraulic conditions.
- MSB-1: a vertical hole to understand and monitor hydrogeological conditions on the upstream side of the palaeo-channel; also to understand geochemical conditions around the redox front.

The planned field work in the sedimentary rocks and the granite section has been carried out

according to the Working Programme for Shallow Borehole Investigations [2]. This technical report presents an overview of the Shallow Borehole investigations carried out from April to October 2002, with all results obtained. This will be of help not only for the future field-based investigations in sedimentary rocks (*e.g.* MIZ-1 borehole investigations) but also for the development of conceptual geological models.