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AMENDMENT February 14, 1985

To: Pigage, L.C. 1984 GRUM Data Base - T & R Data

INTRODUCTION

During the course of processing structural S2 measurements for underground (FAGU) drill holes of constant orientation, it was noted that the drill hole azimuth orientation was systematically $+1.6^{\circ}$ different from the original azimuth direction (for example $+45.6^{\circ}$ instead of 44°). An investigation of source programs in DDHDB (Diamond Drill Hole Data Base) system was undertaken to clarify the reasons for this difference. This amendment/appendix reports the results of that study.

GRID NORTH (UTM NORTH) vs TRUE NORTH

All downhole displacement calculations, cross-section calculations, projection calculations and structural calculations in DDHDB use the UTM coordinate system as the reference grid system. All azimuth (i.e. angular orientation) directions are reported as angles (degrees) relative to Grid North = UTM North.

The R-data subfile in the GRUM data base contains all downhole survey measurements for the drill holes in the data base. Azimuth readings for the surveys are all referenced to True North. True North differs from Grid North by 1.57° with True North being rotated in a counter-clockwise sense from Grid North.

The Property Master in DDHDB contains the variable UTMTRN which is reserved for the angular difference between True North and Grid North. For the GRUM data base this constant was set to the value $+1.57^{\circ}$ to correct for the angular difference between the two reference systems.

Inspection of the DDHDB source programs indicates that UTMTRN is utilized only during the downhole spline calculation. Immediately before the spline calculation is done, all azimuth readings are corrected to a Grid North reference by adding UTMTRN to the azimuth reading in the data base. With all subsequent calculations and reports, azimuth orientations are with reference to Grid North.

GRUM DATA BASE

Because of the actual correction procedure used by DDHDB, the variable UTMTRN for the GRUM data base should have been -1.57° instead of $+1.57^{\circ}$. The result of this inadvertant error is that all drill hole deviations for each drill hole have been rotated 3.14° in a clockwise sense around a vertical axis through the drill hole collar.

The effect of this angular rotation was ascertained by comparing downhole displacements for the drill holes collared on cross sections 52W using correct and incorrect UTMTRN values. For FA81AX1 (303 metres deep) the two displacements differ by about 1.5 metres in both the UTM-North and UTM-East coordinates at the bottom of the hole. For FAGA050

(200 metres deep) the difference between old and new UTM-North and UTM-East coordinates at the bottom of the hole was about 0.5 metres.

Therefore it is considered that the 3° angular rotation has a negligible effect on cross and long section projections and calculations in most instances. Certainly these differences are well within the error cone for drill hole deviation caused by errors in measuring and reading the downhole surveys.

The incorrect value of $+1.57^{\circ}$ (UTMTRN) has not been changed in the GRUM data base. It was considered most appropriate to maintain a totally internally consistent data set. Because the cross-section plots have already been completed. UTMTRN should not be changed. Results from Section 52W indicate that the accuracy of the plots is not significantly affected.

RECOMMENDATIONS

Corrections between True North and Grid North (UTM North) coordinate systems will continue to create confusion and problems in the Anvil District as long as both systems remain in use. All CAMC survey information, orthophotos and topographic base maps have now been referenced to the Grid North coordinates. Therefore, it is recommended that all future field work should be reported using only the Grid North system. Geologists would set their compasses for a magnetic declination of 31.5° (instead of 33°). All downhole surveys should use the same (31.5°) magnetic declination. UTMTRN in data bases on the Vangorda Plateau should be set to 0.0 and downhole survey azimuths edited to a Grid North reference.

Copies to: Dick Hogan
Robin Tolbert
Ron Buckley
Gregg Jilson
Lee Pigage