

UGRO

WELL CONSTRUCTION

GLO4820

WELL NO. _____ LOGGED BY JFM + LBPROJECT NO. 79-290-45DATE (S) 7/5/83PROJECT NAME MX

JUN 26 - FEB 10, 1980

ELEVATION

GROUND LEVEL ± 4690'TOP OF CASING ± 4691'LOCATION OR COORDINATES T 35, R 64 E, S 12 C 2T 35, R 64 E, S 12 C 2

DRILLING SUMMARY

TOTAL DEPTH DRILLED 1010 FEET

ROTARY _____ CORE _____

DRILLING CONTRACTOR BEYLIKRIG (S) USED BULLET AUGER 0' TO 40'REVERSE ROTARY 40' TO TD.SIZE (S) AND TYPE (S) OF BITES 1 7/8" DRAG,3/4" TRICONS & CLUSTER BITS.DRILLING FLUID WATER + POLYMER(5 SACKS) + WATERSAMPLING METHOD GRAB FROM BACKHOEBUCKET AT DISCHARGE PIPE.SURFACE CASING 0' TO 40' 22" DIA

COMMENTS (PROBLEMS, SHUTDOWNS, ETC)

PACKERS ØCENTRALIZERS EVERY 100'SHOULDER GRAVEL PACK: 10' TO 400'WELL PACK: 400' TO 1010'CEMENT (MIX) ✓ DEPTH (S) 0' TO 10'

BENTONITE _____

PELLETS _____

SLURRY _____

DEVELOPMENT

TREMIE _____

DEPTH _____

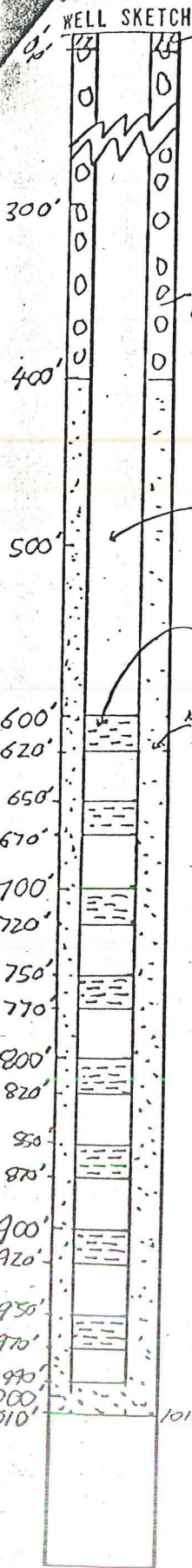
TIME _____

TIME LOG

	START	FINISH	ELAPSED TIME	% OF TOTAL
DRILLING	1-26-80 2:15	2-11-80	134 hrs	82%
LOGGING	<u>7/2</u>			
CASING	2/11/80	2/12/80	18 hrs	11%
GRAVEL PACKING	2/12/80	2/12/80	8 hrs	5%
CEMENTING	1/27/80	1/27/80	3 hrs	2%
BENTONITE PELLETS	2/12/80	2/12/80		
SLURRY				
DEVELOPMENT				

MISCELLANEOUS

10' BLANK CASING
INSTALLED ABOVE AND BELOW
EACH SCREENED INTERVAL.
A 22" DIAMETER STEEL CONDUIT CASING
WAS INSTALLED TO 40' BELOW THE
GROUND SURFACE.



DESIGN

BASIS DRILLER'S LOG ✓

GEOLOGIC LOG _____

GEOPHYSICAL LOG _____

COPIES ATTACHED YES NOSTEEL CASING WITH SCREENFROM 600 TO 620FROM 650 TO 670FROM 700 TO 720FROM 750 TO 770FROM 800 TO 820~~PIPE CASING~~FROM 850 TO 870FROM 900 TO 920FROM 950 TO 970

FROM _____ TO _____

FROM _____ TO _____

CASING STEEL ØDIMENSIONS 10" ID

SCREEN

DIMENSIONS 10" IDSLOT SIZE 60

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Bucket Auger 0'-40' Reverse Rotary
 COMPANY Beylik 40' - TD
 OPERATOR J. Clyde

FIELD LOG OF WELL NUMBER TW-1
 VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY JM DATE 2-6-80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
0	<u>Silt:</u> Tan silt with occasional gravel up to 1½".
10	<u>Silt:</u> Tan silt.
20	<u>Silt:</u> Tan silt with less than 25% medium colored, fine- to coarse-grained, poorly sorted, subrounded to subangular sand with less than 10% gravel up to 1½".
30	<u>Gravel with Cobbles:</u> Medium to dark colored, subrounded to subangular, medium gravel with cobbles up to 4".
40	<u>Gravel:</u> Medium colored, moderately sorted, angular to subrounded, fine to coarse gravel up to 1½".
50	- - Gravel up to 1".
60	<u>Gravel:</u> Medium colored, moderately sorted, subangular to subrounded, fine to coarse gravel up to 1½" with less than 5% coarse-grained sand.
70	- - Gravel up to ¾".
80	
90	- - Gravel up to 1½".
100	

FIELD LOG OF WELL NUMBER TW-1

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY JFM DATE 2-6-80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
100	<u>Gravel</u> : Dark brown colored, well sorted, subangular to subrounded, gravel up to 1/2".
110	- - - Very well sorted gravel up to 1/4".
120	- - - Gravel up to 3/4".
130	<u>Gravel</u> : Light to dark colored, very well sorted, subangular to subrounded gravel up to 1/4".
140	<u>Gravel</u> : Light to dark colored, poorly sorted, subangular to subrounded gravel with occasional cobbles up to 2". Less than 20% medium- to coarse-grained sand.
150	<u>Gravel</u> : Light to dark colored, well sorted, subangular to subrounded, fine to medium gravel, occasionally up to 1", with less than 10% coarse-grained sand.
160	<u>Gravel with Cobbles</u> : Light to dark colored, poorly sorted, angular to subrounded, fine to coarse gravel, with cobbles up to 3" and less than 5% coarse-grained sand.
170	
180	<u>Gravel</u> : Light to dark colored, moderately sorted, subangular to subrounded, fine to coarse gravel, with occasional cobbles up to 1 1/2" and less than 5% coarse sand.
190	- - - Cobbles up to 2".
200	

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 EQUIPMENT USED Reverse Rotary
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 OPERATOR J. Clyde

VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY JFM DATE 2-06-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
200	<u>Gravel</u> : Light to dark colored, poorly sorted, angular to subangular, fine to coarse gravel with less than 20% cobbles up to 2½" and less than 5% coarse-grained sand.
210	<u>Gravel</u> : Light to dark colored, moderately sorted, angular to subangular, fine to coarse gravel, with occasional cobbles up to 4" and less than 5% medium- to coarse-grained sand.
220	<u>Gravel</u> : Light to dark colored, well sorted, subangular to subrounded, fine to coarse gravel up to 2½", with less than 10% medium- to coarse-grained sand.
230	<u>Gravel</u> : Light to dark colored, moderately sorted, subangular to subrounded, fine to coarse gravel up to 1", with less than 10% medium- to coarse-grained sand.
240	- - - Gravel up to 2".
250	
260	<u>Sand</u> : Medium colored, well sorted, fine-grained sand, with less than 25% medium-grained sand to coarse gravel up to 2".
270	<u>Gravel</u> : Medium to dark colored, medium sorted, subangular to subrounded, fine to coarse gravel up to 2½", with less than 10% coarse-grained sand.
280	<u>Gravel with Sand</u> : Medium to dark colored, poorly sorted, subrounded to angular, fine to coarse gravel up to 1½", and approximately 25% medium colored, fine- to coarse-grained sand.
290	<u>Gravel</u> : Medium to dark colored, moderately sorted, subrounded to subangular, fine to medium gravel up to ½", with approximately 10% fine- to coarse-grained sand.
300	

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 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY LB DATE 2-07-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
300	<u>Gravel</u> : Medium to dark colored, moderately sorted, subrounded to angular, fine to medium gravel up to 1/3", with approximately 10% fine- to coarse-grained sand.
310	<u>Gravel</u> : Medium to dark colored, poorly sorted, subangular to angular, fine to 2 1/2" gravel.
320	<u>Gravel</u> : Dark colored, poorly sorted, subrounded to angular, fine to 2" gravel (less than 10% sand).
330	<u>Gravel</u> : Dark colored, poorly sorted, subrounded to angular, fine to 2 1/2" gravel (less than 5% sand).
340	<u>Gravel with Sand</u> : Dark colored, poorly sorted, subangular to angular, fine to 2" gravel, with less than 20% medium colored, medium-to coarse-grained sand.
350	<u>Gravel</u> : Dark colored, poorly sorted, subangular to angular, fine to 3/4" gravel with less than 10% sand.
360	<u>Gravel</u> : Dark colored, moderately sorted, subangular to angular, fine to 1/2" gravel.
370	<u>Gravel</u> : Dark colored, poorly sorted, subangular to angular (predominantly angular), fine to 1" gravel.
380	<u>Gravel</u> : Dark colored, poorly sorted, subangular, fine to 1/2" gravel (with less than 10% sand).
390	<u>Gravel</u> : Medium to dark colored, poorly sorted, subangular to angular, 1/3"-diameter gravel with less than 15% sand.
400	

LOGS INTERNATIONAL, INC.
DRILL CUTTINGS LOG

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 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY LB, JM DATE 2-07-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
400	<u>Gravel</u> : Light to dark color, medium sorted, subangular to subrounded gravel up to ¼" with less than 15% medium- to coarse-grained sand.
410	<u>Gravel with Sand & Clay</u> : Medium colored, poorly sorted, subangular to subrounded gravel up to 3/8", with less than 50% fine- to coarse-grained sand and clay.
420	
430	<u>Gravel</u> : Medium to dark colored, well sorted, subangular to subrounded gravel up to ½", with less than 20% coarse-grained sand.
440	- - - Gravel up to 1".
450	- - - Less than 10% coarse sand.
460	<u>Gravel with Sand</u> : Light to dark colored, poorly sorted, subangular to subrounded, fine to coarse gravel up to 1", with less than 30% fine to coarse-grained sand.
470	<u>Gravel with Sand</u> : Medium to dark colored, poorly sorted, subrounded to subangular, fine to 1" gravel with less than 25% medium- to coarse-grained sand.
480	
490	- - - Gravel up to 3/4".
500	

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 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY LB, JFM DATE 2/08/80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
500	<u>Gravel with Sandy Silt</u> : Medium to dark colored, poorly sorted, subrounded to angular, fine to 1" gravel with less than 30% tan colored, coarse-grained sand to silt.
510	<u>Gravel</u> : Medium to dark colored, moderately sorted, angular, fine to 1½" gravel.
520	- - - 5% fine- to coarse-grained sand.
530	
540	<u>Gravel</u> : Light to dark colored, poorly sorted, angular to subangular, fine to 2¼" gravel with less than 10% sand.
550	<u>Gravel</u> : Medium to dark colored, poorly sorted, angular to subangular, fine to 1" gravel with less than 25% medium colored, fine- to coarse-grained sand.
560	<u>Gravel and Sand</u> : Medium to dark colored, poorly sorted, angular to subangular, fine to ½" gravel with less than 40% medium to dark colored sand.
570	<u>Gravel</u> : Medium to dark colored, poorly sorted, angular to subangular, fine to 1" gravel with less than 20% fine- to coarse-grained sand.
580	<u>Gravel</u> : Dark colored, moderately sorted, subrounded to subangular gravel with less than 10% sand.
590	- - - Sand content up to about 25%.
600	

FIELD LOG OF WELL NUMBER TW-1

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 OPERATOR J. Clyde

VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY LB DATE 2-08-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
600	<u>Sand and Gravel with Silt</u> : Dark colored, moderately sorted, fine-grained to 1/2" sand and gravel with less than 50% tan silt.
610	<u>Gravel</u> : Dark colored, moderately sorted, subangular to angular, fine to 1" gravel.
620	<u>Gravel</u> : Dark colored, moderately sorted, subrounded to subangular, fine to 2" gravel with less than 10% sand.
630	<u>Gravel</u> : Dark colored, moderately sorted, subangular to angular, fine to 1" gravel with less than 5% coarse-grained sand.
640	<u>Gravel</u> : Dark colored, poorly sorted, subangular to angular (predominantly angular), fine to 2" gravel.
650	<u>Gravel</u> : Medium to dark colored, well sorted, subangular to angular, fine to 1/3" gravel.
660	<u>Gravel</u> : Medium to dark colored, poorly sorted, subangular to angular (predominantly angular), fine to 1 1/2" gravel, with less than 10% sand.
670	<u>Gravel</u> : Medium to dark colored, moderately sorted, subangular to angular, fine to 1/3" gravel.
680	- - - Increasing fine-grained gravel.
690	<u>Gravel</u> : Medium to dark colored, well sorted, subrounded to angular, fine to 1/2" gravel.
700	

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VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY LB, JFM DATE 2/09/80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
700	
710	<u>Gravel</u> : Dark colored, well sorted, subangular to angular, fine to 1½" gravel.
720	<u>Gravel</u> : Dark colored, well sorted, subangular to angular (predominantly angular), fine to 1" gravel.
730	<u>Gravel</u> : Dark colored, poorly sorted, subangular, fine to medium gravel up to ½" with less than 25% fine- to coarse-grained sand.
740	<u>Gravel</u> : Dark colored, poorly sorted, angular to subangular, fine to medium gravel up to 1" with less than 10% fine- to coarse-grained sand.
750	<u>Gravel</u> : Medium to dark colored, poorly sorted, angular to subangular, fine to medium gravel, occasionally up to 1½", with less than 10% fine- to coarse-grained sand.
760	<u>Gravel</u> : Medium to dark colored, moderately sorted, angular to subangular, fine to medium gravel up to ¾" (predominantly fine gravel), with less than 10% medium- to coarse-grained sand.
770	<u>Gravel with Sand</u> : Medium to dark colored, poorly sorted, angular to subangular, fine to medium gravel up to ¾" with less than 35% fine- to coarse-grained sand.
780	<u>Gravel</u> : Medium to dark colored, moderately sorted, angular to subangular, fine to medium gravel up to ½" with less than 10% medium- to coarse-grained sand.
790	<u>Gravel</u> : Medium to dark colored, moderately sorted, angular to subangular, fine to medium gravel up to 1" (predominantly 1/8" to 1/4").
800	

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VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY JFM DATE 2-10-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
800	<u>Gravel</u> : Light to dark colored, moderately sorted, angular to subangular, fine to medium gravel up to 1".
810	<u>Gravel</u> : Medium to dark color, poorly sorted, angular to subangular, fine to medium gravel (predominantly less than 1/4" and up to 3/4"), with less than 10% coarse-grained sand.
820	<u>Gravel</u> : Medium to dark color, well sorted, angular to subangular, fine to medium gravel (predominantly fine, occasionally up to 1/2"), with less than 10% coarse-grained sand.
830	<u>Gravel</u> : Dark colored, moderately sorted, angular to subangular, fine to medium with occasional coarse gravel up to 2-3/4", with less than 5% coarse-grained sand.
840	<u>Gravel</u> : Medium to dark colored, poorly sorted, angular to subangular, fine to medium, occasionally up to 1".
850	
860	- - - Gravel up to 1 1/2", with less than 5% coarse sand.
870	<u>Gravel</u> : Medium to dark colored, moderately sorted, angular to subangular, fine to medium gravel up to 1" with less than 5% coarse-grained sand.
880	<u>Gravel</u> : Medium to dark colored, moderately sorted, angular, fine to medium gravel up to 1 1/2".
890	<u>Gravel</u> : Medium to dark colored, moderately to well sorted, angular to subangular, fine to medium gravel up to 3/4".
900	

FIELD LOG OF WELL NUMBER TW-1

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Dry Lake (DL)
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY JFM, LB DATE 2/10/80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
900	<u>Gravel:</u> Medium to dark colored, well sorted, angular to subangular, fine gravel up to 1/4", with less than 5% coarse-grained sand.
910	<u>Gravel:</u> Medium to dark colored, well sorted, angular to subangular, fine to medium gravel, occasionally up to 1", with less than 5% coarse-grained sand.
920	<u>Gravel:</u> Medium to dark colored, moderately well sorted, angular to subangular, fine to medium gravel up to 3/8", with less than 5% coarse-grained sand.
930	
940	<u>Gravel and Sand:</u> Dark colored, well sorted, subangular to angular, fine gravel and coarse-grained sand.
950	<u>Gravel:</u> Dark colored, poorly sorted, subangular to angular, fine to 2" gravel, with less than 10% medium- to coarse-grained sand.
960	
970	<u>Gravel:</u> Dark colored, well sorted, subrounded to subangular, fine to 1/3" gravel, with less than 20% fine- to coarse-grained sand.
980	<u>Gravel:</u> Dark colored, poorly sorted, subrounded to angular, fine to 3" gravel, with less than 10% sand.
990	<u>Gravel:</u> Dark colored, moderately well sorted, subangular to angular, fine to 1 1/4" gravel, with less than 5% sand.
1000	

TECUMSEH NATIONAL, INC.
DRILL CUTTINGS LOG

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

FIELD LOG OF WELL NUMBER TW-1
 VALLEY NAME Dry Lake
 LOCATION NUMBER T6S, R63E, Sec. 12d
 LOGGED BY JFM, LB DATE 2-10-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1010 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
<p>1000</p> <p>1010</p> <p>20</p> <p>30</p> <p>40</p> <p>50</p> <p>60</p> <p>70</p> <p>80</p> <p>90</p> <p>00</p>	<p>Gravel and Cobbles: Medium to dark colored, poorly sorted, subangular to angular gravel to 3". Broken cobbles to 6".</p> <hr/> <p>T.D.: 1010'</p>

Client: Fugro

Lab Number 399281.

Job Number 437.0000

Description: Dry Lake Valley TW-1
 Sample volume = 4.00 Liters
 Sample Taken on 4/ 2/87 by Client
 Sample Received: 4/ 4/87
 Completed on 4/ 8/87 by MB, CL, JD

T35/R64E-12ca
 WD-5

*
 * STANDARD MINERALS *
 *

* CATIONS *	* MG/L *	* MEQ/L *	* ANIONS *	* MG/L *	* MEQ/L *
* SODIUM *	* 76.9 *	* 3.31 *	* BICARBONATE *	* 217.5 *	* 3.57 *
* POTASSIUM *	* 5.2 *	* 0.13 *	* CARBONATE *	* 1.0 *	* 0.03 *
* CALCIUM *	* 20.2 *	* 1.01 *	* HYDROXIDE *	* 0.0 *	* 0.00 *
* MAGNESIUM *	* 10.3 *	* 0.85 *	* CHLORIDE *	* 21.2 *	* 0.60 *
* AMMONIUM *	* 0. *	* 0. *	* SULFATE *	* 44.8 *	* 0.93 *
* *	* *	* *	* NITRATE *	* 6.7 *	* 0.11 *
* *	* *	* *	* *	* *	* *

TOT CATIONS * 5.29 *TOTAL ANIONS* * 5.24 *

*
 * SPECIAL ANALYSES *
 *

* PARAMETERS *	* VALUE *	* UNITS *
* Silica *	* 1.440 *	* MG/L *
* arsenic *	* 0.018 *	* MG/L *
* Chromium, Tot. *	* 0.013 *	* MG/L *
* Tot. hardness *	* 92.8 *	* MG/L as CaCO3 *
* Fluoride *	* < 0.010 *	* MG/L *
* Total Iron *	* 0.191 *	* MG/L *
* CO2 *	* 4.2 *	* MG/L *
* pH *	* 7.900 *	* *
* Spec. Cond. *	* 480.0 *	* Micro-mhos/cm *
* TDS by fld *	* 292.4 *	* MG/L *
* Alkalinity *	* 120.0 *	* MG/L as CaCO3 *
* *	* *	* *
* LANG. INDEX *	* 0.01 *	* *

Grace Livingston