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well contractor, customer, and county health department.



WATER MINERAL ENERGY

WELL INFORMATION - ROCK WELLS*Layne Christensen Company*

PROFESSIONAL SERVICES FOR WATER SYSTEMS

721 West Illinois Avenue • Aurora, Illinois 60506-2892 • Phone 630/897-6941
 229 West Indiana Avenue • Beecher, Illinois 60401 • Phone 708/946-2244

Name Of Job CITY OF WEBSTER CITY Date 4/4/13City WEBSTER CITY State IOWAWell No. 8 Drillers DEREK GOOD & GREG THOMAS. TOOLPUSHER - SCOTT BRANDENBURGWell Location 1510 ft. (W) and 1020 ft. (S) of the NE corner ofthe NE 1/4 of Section 33, Twp. 89 (N), Range 25 (W) HAMILTON CountyOtherwise located as 825 KENDALL YOUNG ROADGPS: 42° 28' 20" N., 93° 48' 21" W.Work Began: _____ Work Completed: 4/4/13

Casing Record: Amount	Dia.	Wt. or Thickness	Material					
<u>100'</u>	<u>26" O.D.</u>	<u>0.375"</u>	<u>API 5-L</u>	with	<u>weld</u>	joints from	<u>+9'</u>	to <u>91'</u>
<u>607'</u>	<u>22" O.D.</u>	<u>0.500"</u>	<u>API 5-L/A53B</u>	with	<u>weld</u>	joints from	<u>+2'</u>	to <u>605'</u>
<u>940'</u>	<u>16" O.D.</u>	<u>0.500"</u>	<u>A53B</u>	with	<u>weld</u>	joints from	<u>605'</u>	to <u>1540'</u>

22" O.D. x 16" O.D. x 0.500" concentric weld reducer joins 22" and 16" casings.

Hole Record:

<u>29</u>	inch from	<u>0</u>	to	<u>91'</u>
<u>25</u>	inch from	<u>91'</u>	to	<u>631'</u>
<u>20.0</u>	inch from	<u>631'</u>	to	<u>1545'</u>
<u>14-3/4</u>	inch from	<u>1545</u>	to	<u>1920 TD</u>

Cementing Record: 26" O.D. pressure grouted with 187 sx. neat cement.22" x 16" O.D. pressure grouted with 1820 sx. neat cement.Well Test Data: Static Level 210'; pumping level 280' after 24 hours pumping at 1882 g.p.m.Length of test 24 hrs. See Well Test Data Sheet Dated March 21-22, 2013Remarks Well tested 6 hours at 1,880 ft. top of Jordan: 218' SWL, 1594 gpm, 195' DD, Specific Capacity = 8.17.

Jordan drilled to 1920' TD: 210' SWL, 1808 gpm, 200' O.D., 9.5 hours 5:C=9.04. Next 3,200 gal. 20°B HCL injected at 1,600'
and Air Pressurized 8 hr. total.

Layne Job No. 20007B Well Permit No.: _____

LW-96

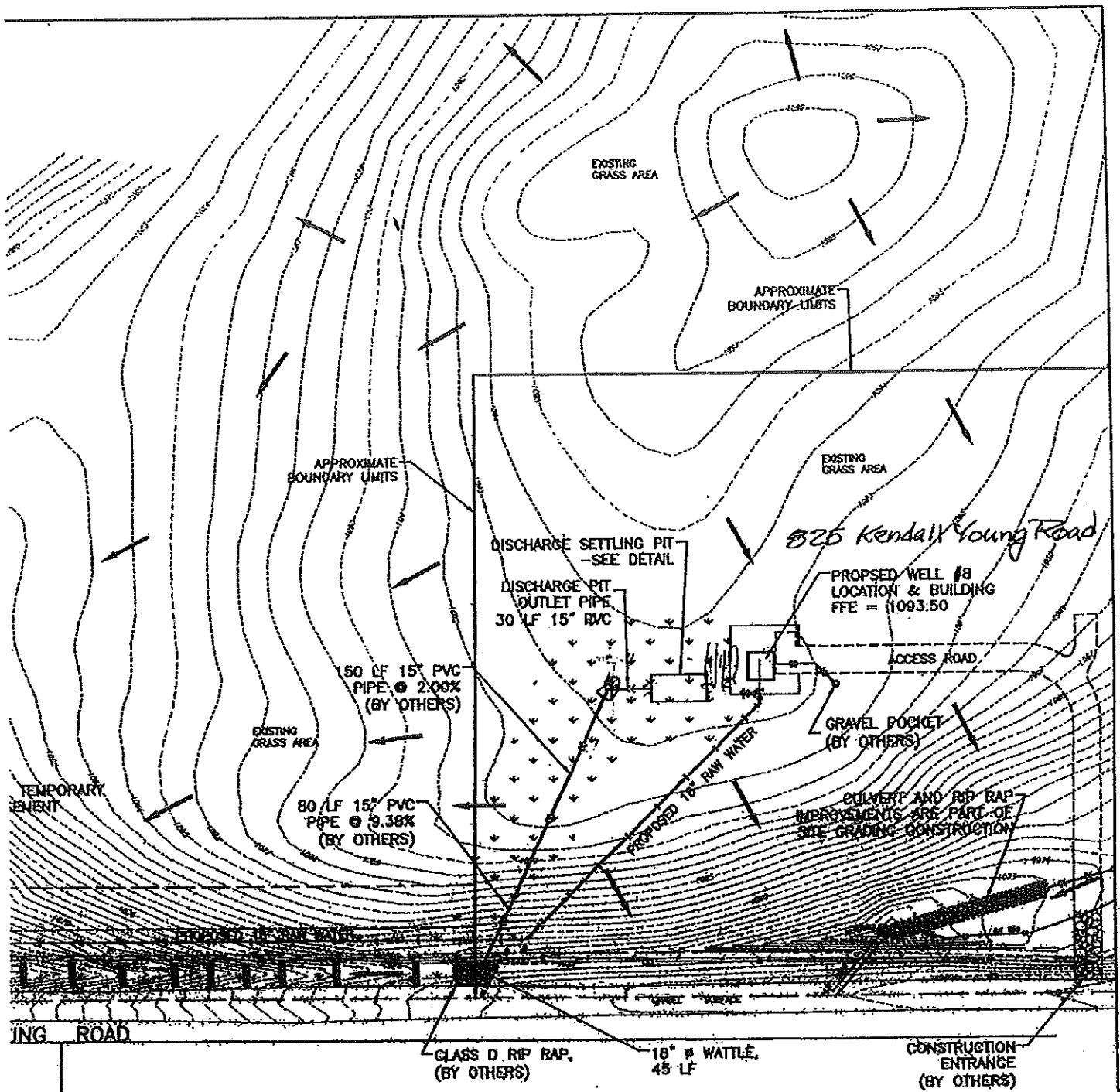
040413 City of Webster City IA Well 8.DOC

WELL LOG

Feet		Feet	Description
0	to	40	DRIFT / CLAY
40	to	70	CLAY AND GRAVEL, VERY ROUGH DRILLING, BROKEN ROCK
70	to	90	LIME - SANDSTONE - GRAVEL
90	to	190	GRAY LIME
190	to	220	GRAY LIME SANDY
220	to	285	WHITE LIME - DOLOMITE
285	to	310	BROWN AND WHITE LIME - DOLOMITE
310	to	410	DARK GRAY LIME
410	to	470	LIGHT GRAY LIME - WHITE LIME
470	to	510	GRAY LIME
510	to	545	DARK GRAY AND TAN LIME
545	to	575	DARK GRAY LIME AND SHALE
575	to	665	GRAY LIME
665	to	725	TAN AND GRAY LIME - DOLOMITE
725	to	780	GRAY LIME TO BROWN LIME, ALTERNATING LAYERS
780	to	840	TAN AND GRAY LIME AND GUMMY SHALE
840	to	870	DARK BROWN LIME - SHALE - ANHYDRITE
870	to	970	GRAY AND DARK BROWN LIME - SHALE - GYPSUM
970	to	1005	GRAY LIME - DOLOMITE
1005	to	1030	BROWN LIME - DOLOMITE
1030	to	1110	LIME CHIPS AND VERY GUMMY SHALE
1110	to	1170	DARK GRAY LIME - DOLOMITE
1170	to	1210	GUMMY SHALE AND LIME
1210	to	1255	GRAY LIME - DOLOMITE
1255	to	1310	GRAY LIME - BROWN SANDSTONE
1310	to	1390	GRAY LIME (WITH SHALE 1350' - 1365')
1390	to	1465	GRAY LIME - GUMMY SHALE
1465	to	1485	SANDSTONE, BLUE SHALE, SAND
1485	to	1510	SANDSTONE
1510	to	1540	GRAY LIME SANDSTONE - DOLOMITE

WELL LOG

[illegible]



EROSION CONTROL NOTES (CONT):

1. REFERENCE

WA DOT

RS DURING
LL GRADINGS
SHOWN AS

XPILED

6. DISCHARGE SETTLING PITS SHALL BE CLEARED OF DEPOSITED MATERIAL AND BACKFILLED TO 95% OF STANDARD PROCTOR DENSITY WITH RAISE MATERIAL. REMOVED SEDIMENT SHALL BE HAULED TO A SITE SELECTED BY THE OWNER WITHIN TWO MILES OF WELL CONSTRUCTION SITE.
7. WATTLES SHALL BE REMOVED AFTER CONSTRUCTION OF THE WELLS IS COMPLETE, UNLESS THEY ARE BEING UTILIZED AS PART OF THE SLOPE FOR ANOTHER PORTION OF THE PROJECT.
8. ROCK CHECK DAMS SHALL BE REMOVED AFTER CONSTRUCTION OF THE WELLS IS COMPLETE, UNLESS THEY ARE BEING UTILIZED AS PART OF THE SLOPE FOR ANOTHER PORTION OF THE PROJECT.
9. EROSION STONE MATERIAL FROM THE ROCK CHECK DAMS SHALL BE SALVAGED AND STOCKPILED AT A SITE SELECTED BY THE OWNER, IF DIRECTED, OTHERWISE CONTRACTOR'S RESPONSIBILITY TO REMOVE AND REPOSE OF PROPERLY.
10. TEMPORARY SEEDING OF AREAS DISTURBED BY THE WELL CONSTRUCTION OR BMP PLACEMENT SHALL BE COMPLETED ONCE WELL CONSTRUCTION IS COMPLETED.

ESTIMATED EROSION CONTROL QUANTITIES:

1. DISCHARGE SETTLING PIT	EA	1
2. WATTLES, 18" #	LF	100
3. ROCK CHECK DAM	TON	175
4. TEMPORARY SEEDING	AC	1.5
5. DISCHARGE PIT RECLAMATION	EA	1
6. REMOVE WATTLE	LF	100
7. REMOVE CHECK DAM	TON	175

CONTRACT NO. 1

	BOLTON & MENK, INC.			CITY OF WESTER CITY, IOWA		SHEET 7.3
	Consulting Engineers & Surveyors			JORDAN WELL PROJECT - CONSTRUCTION OF WELL NO. 8		
	MINNAPOLIS, MN; FARMINGTON, MN; SLEEPER, MN; BURLINGTON, MN; MILWAUKEE, WI; CHICAGO, IL; RAISSEY, MN; ENFIELDWOOD, MN; BRIDGEMO, MN; AMER, IA			WELL WATER POLLUTION PREVENTION PLAN SEDIMENT AND EROSION CONTROL PLAN		



State Hygienic Laboratory

AMENDED REPORT

GREG BUFFINGTON
LAYNE CHRISTENSEN COMPANY
721 W ILLINOIS AVE
AUROA, IL 60506-

Accession Number	87583	Revision 5
Date Sample Finalized	2013-04-10 12:29	
Date Received	2013-03-22 11:59	
Date Collected	2013-03-22 07:30	
Sample Source	Drinking Water	
Collector	sopiwnik roscoe	
PWS ID	JA4063094	
PWS Name	WEBSTER CITY WATER SUPPLY	
Facility ID	WL05	
Sample Type	SP - Special	
Sample Category	Chemical	
Sampling Point ID	NEW	
Collection Site	wellhead tap well 8	
Client Reference	webster city well 8	

Note: Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

Results of Analyses

Units	mg/L
Date Analyzed	2013-04-08 09:47
Analyst	MP
Analysis Prep	Ammonia distillation, SM 4500

Analyzed In	Ankeny
Date Verified	2013-04-08 13:59
Verifier	DLS

Analyte	Result	Quant Limit
Ammonia nitrogen as N	1.0	0.05

Units	mg/L
Date Analyzed	2013-03-22 11:38
Analyst	BER, PMR

Analyzed In	Ankeny
Date Verified	2013-03-26 08:02
Verifier	DLS

Analyte	Result	Quant Limit
Chloride	92	1

Units	mg/L
Date Analyzed	2013-03-22 11:38
Analyst	BER, PMR

Analyzed In	Ankeny
Date Verified	2013-03-26 08:02
Verifier	DLS

Analyte	Result	Quant Limit
Sulfate	370	1



State Hygienic Laboratory

AMENDED REPORT

Accession Number 87583

Revision 5

Units mg/L
Date Analyzed 2013-03-22 11:38
Analyst BBR, PMR

Analyzed In Ankeny
Date Verified 2013-03-26 08:06
Verifier DLS

Analyte	Result	Quant Limit	MCL
Nitrate nitrogen as N	<1.0	1	10

Note: The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

Units mg/L
Date Analyzed 2013-03-22 11:38
Analyst BBR, PMR

Analyzed In Ankeny
Date Verified 2013-03-26 08:11
Verifier DLS

Analyte	Result	Quant Limit	MCL
Nitrite nitrogen as N	<0.1	0.1	1.0

Note: The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

Units mg/L
Date Analyzed 2013-03-27 09:22
Analyst AJB

Analyzed In Ankeny
Date Verified 2013-03-29 09:05
Verifier BRW

Analyte	Result	Quant Limit
Total Organic Carbon	1.2	0.5

Units mg/L
Date Analyzed 2013-04-03 15:49
Analyst AJB

Analyzed In Ankeny
Date Verified 2013-04-08 13:24
Verifier BRW

Analyte	Result	Quant Limit
Total Alkalinity	300	1.0

Units
Date Analyzed 2013-03-22 14:15
Analyst BBR, RWR

Analyzed In Ankeny
Date Verified 2013-03-25 13:02
Verifier JAE

Analyte	Result	Unit
Dominant Wavelength	None	Nanometers
Purity	<2	Percent



State Hygienic Laboratory

AMENDED REF.

The results are as follows:

Accession Number | 87583

Revision 5

Analyte	Result	Unit
Luminance	99.9	Percent

Analyte	Result
Hue	Colorless

Units | mg/L
Date Analyzed | 2013-03-25 13:30
Analyst | LD

Analyzed In | Ankeny
Date Verified | 2013-03-26 08:53
Verifier | DLS

Analyte	Result	Quant Limit	MCL
Fluoride	1.4	0.1	4.0

Note: The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

Units | mg/L
Date Analyzed | 2013-03-25 00:00
Analyst | MRC

Analyzed In | Ankeny
Date Verified | 2013-03-26 11:03
Verifier | DLS

Analyte	Result	Quant Limit
Total Hardness	510	5

Units |
Date Analyzed | 2013-04-03 15:49
Analyst | AJB

Analyzed In | Ankeny
Date Verified | 2013-04-04 10:19
Verifier | DLS

Analyte	Result
Langlier Index	0.35

Units | pH
Date Analyzed | 2013-04-03 15:49
Analyst | AJB

Analyzed In | Ankeny
Date Verified | 2013-04-04 10:18
Verifier | DLS

Analyte	Result
Laboratory pH	7.3



State Hygienic Laboratory

AMENDED REPORT

Accession Number 87583

Revision 5

Units | mg/L
Date Analyzed | 2013-03-26 00:00
Analyst | RWR

Analyzed In | Ankeny
Date Verified | 2013-03-27 15:11
Verifier | LAF

Analyte	Result	Quant Limit
Total Dissolved Solids	980	1

Units | mg/L
Date Analyzed | 2013-03-26 15:18
Analyst | MRC
Analysis Prep | Turbidity screen for drinking water metals, SM 2130

Analyzed In | Ankeny
Date Verified | 2013-03-27 09:35
Verifier | DLS

Analyte	Result	Quant Limit
Boron	0.85	0.05

Units | mg/L
Date Analyzed | 2013-03-28 11:14
Analyst | SGB
Analysis Prep | Mercury Digestion, EPA 245.2

Analyzed In | Ankeny
Date Verified | 2013-03-29 08:29
Verifier | DLS

Analyte	Result	Quant Limit	MCL
Mercury	<0.0002	0.0002	0.002

Note: The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

Units | mg/L
Date Analyzed | 2013-03-26 17:43
Analyst | SGB
Analysis Prep | Turbidity screen for drinking water metals, SM 2130

Analyzed In | Ankeny
Date Verified | 2013-03-28 09:57
Verifier | DLS

Analyte	Result	Quant Limit	MCL
Antimony	<0.005	0.005	0.006
Arsenic	<0.001	0.001	0.010
Barium	<0.05	0.05	2
Cadmium	<0.001	0.001	0.005
Chromium	<0.01	0.01	0.1
Selenium	<0.01	0.01	0.05
Thallium	<0.001	0.001	0.002

Analyte	Result	Quant Limit
Aluminum	<0.1	0.1



State Hygienic Laboratory

AMENDED REPORT

Accession Number | 87583

Revision 5

Analyte	Result	Quant Limit
Beryllium	<0.002	0.002
Copper	<0.01	0.01
Lead	<0.001	0.001
Manganese	0.04	0.02
Nickel	<0.05	0.05
Zinc	0.03	0.02

Note: The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

Units	mg/L	Analyzed In	Ankeny
Date Analyzed	2013-03-29 13:41	Date Verified	2013-04-02 14:24
Analyst	SGB	Verifier	BRW
Analysis Prep	Total Recoverable Metals Digestion, EPA 200.2		

Analyte	Result	Quant Limit
Silver	<0.010	0.01

Units	mg/L	Analyzed In	Ankeny
Date Analyzed	2013-03-25 00:00	Date Verified	2013-03-26 11:01
Analyst	MRC	Verifier	DLS
Analysis Prep	Turbidity screen for drinking water metals, SM 2130		

Analyte	Result	Quant Limit
Calcium	130	1
Iron	0.35	0.02
Magnesium	46	0.5
Manganese	0.04	0.02
Potassium	19	1
Sodium	120	0.5
Zinc	0.03	0.02

Note: The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

Units	[NTU]	Analyzed In	Ankeny
Date Analyzed	2013-03-22 15:00	Date Verified	2013-03-28 10:05
Analyst	KMJ, DH	Verifier	DLS

Analyte	Result	Quant Limit
Turbidity	1.0	1.0



State Hygienic Laboratory **AMENDED REPORT**

The University of Iowa

Accession Number | 87583

Revision 5

[NTU] = Nephelometric Turbidity Units

mg/L = Milligrams per Liter

pH = pH Units

The result(s) of this report relate only to the items analyzed. This report shall not be reproduced except in full without the written approval of the laboratory.

Iowa Environmental Laboratory IDs are: Ankeny #397, Iowa City/Coralville #027, Lakeside #393.

If you have any questions, please call Client Services at 800/421-IOWA (4692) or 319/335-4500. Thank you.



State Hygienic Laboratory

AMENDED REPORT

GREG BUFFINGTON
LAYNE CHRISTENSEN COMPANY
721 W ILLINOIS AVE
AUROA, IL 60506

Accession Number	87602	Revision	2
Date Sample Finalized	2013-04-10 12:22		
Date Received	2013-03-22 14:51		
Date Collected	2013-03-22 07:30		
Sample Source	Drinking Water		
Collector	sopiwnik roscoc		
PWS ID	IA4063094		
PWS Name	WEBSTER CITY WATER SUPPLY		
Facility ID	WL05		
Sample Type	SP - Special		
Sample Category	Chemical		
Sampling Point ID	NEW		
Collection Site	wellhead tap well 8		
Client Reference	webster city well 8		

Note: Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

Results of Analyses

Units	[MPN]/100mL	Analyzed In	Iowa City
Date Analyzed	2013-03-22 16:15	Date Verified	2013-03-23 10:34
Analyst	CSR	Verifier	CSR

Analyte	Result
Total Coliform Bacteria	<1
E.coli	<1

Note: If the total coliform bacteria and E.coli test results are "Absent" or "<1", these results are satisfactory and the water is bacterially safe for drinking purposes. If the total coliform bacteria test is "Present" or number is greater than or equal to 1 (e.g. 1, 20.7, 50.4 >200.5, etc), this result is UNSATISFACTORY and indicates the water is bacterially UNSAFE and should NOT be used for drinking unless properly disinfected before use (e.g. boiling for one minute). In addition, if the E.coli bacteria test result is also "Present" or number is greater than or equal to 1, this result indicates the water may be contaminated by human or animal sewage. E.coli presence indicates that the water may be contaminated with microorganisms that CAN cause disease and thus, represents a serious health concern. Contact your local county health department or SHL's web site (<http://www.shl.uiowa.edu>; click on Well Water in the left hand menu) for information and guidance to help correct your water quality problem.

Units	[CFU]/mL	Analyzed In	Iowa City
Date Analyzed	2013-03-23 10:06	Date Verified	2013-03-25 09:59
Analyst	CSR, MCC	Verifier	CSR

Analyte	Result	Quant Limit
Heterotrophic Plate Count	<1	1

Units	mg/L	Analyzed In	Iowa City
Date Analyzed	2012-09-25 12:28	Date Verified	2013-03-26 17:16
Analyst	LJL	Verifier	JM



State Hygienic Laboratory

AMENDED REPORT

For Laboratory Use Only

Accession Number | 87602

Revision 2

Analyte	Result	Quant Limit	MCL
Vinyl chloride	<0.0005	0.0005	0.002
1,1-Dichloroethane	<0.0005	0.0005	0.007
Methylene chloride	<0.0010	0.0010	0.005
trans-1,2-Dichloroethylene	<0.0005	0.0005	0.1
cis-1,2-Dichloroethylene	<0.0005	0.0005	0.07
1,2-Dichloroethane	<0.0005	0.0005	0.005
1,1,1-Trichloroethane	<0.0005	0.0005	0.2
Carbon tetrachloride	<0.0005	0.0005	0.005
Benzene	<0.0005	0.0005	0.005
1,2-Dichloropropane	<0.0005	0.0005	0.005
Trichloroethene	<0.0005	0.0005	0.005
1,1,2-Trichloroethane	<0.0005	0.0005	0.005
Toluene	<0.0005	0.0005	1
Tetrachloroethylene	0.0015	0.0005	0.005
Chlorobenzene	<0.0005	0.0005	0.1
Ethylbenzene	<0.0005	0.0005	0.7
Styrene	<0.0005	0.0005	0.1
Total Xylenes	<0.0005	0.0005	10
p-Dichlorobenzene	<0.0005	0.0005	0.075
o-Dichlorobenzene	<0.0005	0.0005	0.6
1,2,4-Trichlorobenzene	<0.0005	0.0005	0.07

Note: The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

[CFU]/mL = Colony Forming Units per Milliliter
 [MPN]/100mL = Most Probable Number per 100 Milliliters
 mg/L = Milligrams per Liter

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Iowa Environmental Laboratory IDs are: Ankeny #397, Iowa City/Coralville #027, Lakeside #393.

If you have any questions, please call Client Services at 800/421-IOWA (4692) or 319/335-4500. Thank you.



State Hygienic Laboratory

AMENDED REPORT

Environmental Health of Iowa

Accession Number | 87602

Revision 2

Analyte	Result	Quant Limit	MCL
Vinyl chloride	<0.0005	0.0005	0.002
1,1-Dichloroethene	<0.0005	0.0005	0.007
Methylene chloride	<0.0010	0.0010	0.005
trans-1,2-Dichloroethylene	<0.0005	0.0005	0.1
cis-1,2-Dichloroethylene	<0.0005	0.0005	0.07
1,2-Dichloroethane	<0.0005	0.0005	0.005
1,1,1-Trichloroethane	<0.0005	0.0005	0.2
Carbon tetrachloride	<0.0005	0.0005	0.005
Benzene	<0.0005	0.0005	0.005
1,2-Dichloropropane	<0.0005	0.0005	0.005
Trichloroethene	<0.0005	0.0005	0.005
1,1,2-Trichloroethane	<0.0005	0.0005	0.005
Toluene	<0.0005	0.0005	1
Tetrachloroethylene	0.0015	0.0005	0.005
Chlorobenzene	<0.0005	0.0005	0.1
Ethylbenzene	<0.0005	0.0005	0.7
Styrene	<0.0005	0.0005	0.1
Total Xylenes	<0.0005	0.0005	10
p-Dichlorobenzene	<0.0005	0.0005	0.075
o-Dichlorobenzene	<0.0005	0.0005	0.6
1,2,4-Trichlorobenzene	<0.0005	0.0005	0.07

Note: The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

[CFU]/mL = Colony Forming Units per Milliliter
 [MPN]/100mL = Most Probable Number per 100 Milliliters
 mg/L = Milligrams per Liter

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ANALYTICAL REPORT

March 12, 2013

Work Order: IC30393

Page 1 of 6

Report To

Herman Dharmarajah
Bolton & Menk Engineers - MN
1960 Premier Drive
Mankato, MN 56001

Work Order Information

Date Received: 03/08/2013 9:25AM
Collector: Strand, David - LBG
Phone: (507) 625-4171
PO Number:

Project : Well Analysis

Project Number: Webster City

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
IC30393-01	Well #8/ Webster City , IA			Matrix:Drink Wtr		Collected: 03/06/13 16:15	
Alkalinity, as CaCO ₃	258 mg/L	10	1WC0231	2320B	JDK	03/08/13 15:07	
Chloride	64.3 mg/L	10.0	1WC0271	300.0	GGD	03/08/13 17:32	
Sulfate	399 mg/L	10.0	1WC0271	300.0	GGD	03/08/13 17:32	
Hardness, Total as CaCO ₃	477 mg/L	1	1WC0258	2340B	DRB	03/11/13 16:51	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.