

Water Quality Data for
Monitoring Well TVHP #4
Municipal Park

Addendum to the Report

Characterization of the Ground Water Flow in the
Lower Boise River Basin
(Petrich and Urban, 2004)

Summary of Water Chemistry Data for TVHP #4, Municipal Park Monitoring Well

	MP-1	MP-2	MP-3	MP-4	MP-5
<u>Well Data</u>					
Well depth (feet to bottom of screen)	55	210	320	470	730
Elevation (feet, top of PVC casing)	2710.32	2710.26	2710.19	2710.15	2710.12
<u>Laboratory Parameter</u>					
Alkalinity (mg/L; as CaCO ₃)	39	66	122	74	86
Ammonia (mg/L)	<0.005	0.073	0.084	0.1	0.124
Arsenic (mg/L)	<0.005	<0.005	<0.005	0.013	0.014
Calcium (mg/L)	10	13.4	31	7.4	12.4
Carbonate alkalinity (mg/L; as CaCO ₃)	<1	<1	3	3	<1
Chloride (mg/L)	<2.00	<2.00	3.14	6.16	7.49
Fluoride (mg/L)	1.61	3.71	1.59	9.98	8.52
Hardness (mg/L; as CaCO ₃)	32	28	78	22	32
Iron (mg/L)	0.08	<0.01	0.06	0.06	0.28
Magnesium (mg/L)	1.9	0.3	0.5	0.1	0.2
Manganese (mg/L)	0.003	0.026	0.033	0.009	0.027
pH (pH units)	7.16	8.05	8.23	8.23	8.31
Potassium (mg/L)	0.5	0.7	1	0.7	1.2
Silica (mg/L; as SiO ₂)	0.6	12	10	7	3
Sodium (mg/L)	4.5	25	40	65	72
Sulfate (mg/L)	2.83	17.2	40.1	52	72.1
Sulfide (mg/L)	0.03	<0.01	0.01	<0.01	0.02
TDS (mg/L)	13	84	170	200	180
Carbon 14 Age (years BP)	NA	NA	1,470+/- 50	NA	12,720 +/- 70
Tritium Units	NA	NA	4.4 +/- 2.1	NA	<2
<u>Field Parameters</u>					
Conductivity (mS/cm)	0.07	0.15	0.29	0.29	0.34
Dissolved Oxygen (mg/L)	12.5	10.4	9.6	8.1	8
Average Purge Rate (gpm)	2.1	2.2	2.3	1.3	1.4
Gallons Purged	40	50	210	80	100
Salinity (%)	0	0	0	0	0
pH (pH units)	6	8.1	8.3	8.9	8.5
Temperature (Celsius)	12	15	17	18	19
Turbidity (NTU)	20	0	30	10	20
Hydrogen Sulfide Odor?	no	no	yes	yes	yes

NA = Not Analyzed

Water Quality parameters analyzed by Idaho Department of Health and Welfare

Carbon 14 and Tritium data from Geochron Laboratories, Cambridge, Mass.

Samples collected 1/30/2003

Laboratory Data Sheets
for
Monitoring Well TVHP #4



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IDAHO DEPARTMENT OF
HEALTH & WELFARE
Department of Water Resources

DIRK KEMPTHORNE - Governor
KARL B. KURTZ - Director

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PHONE 208-334-2235
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Attention: Scott Urban
Idaho Dept. of Water Resources
1301 N ORCHARD ST.
BOISE, ID 83706-

Date Collected: 1/30/2003
Time Collected: 1:00 PM
Date/Time Received: 1/31/2003 4:28:27 PM

Lab Sample ID Number

03 01 416

(Please refer to this number when contacting the lab)

IDWR / 2002 Monitoring

Site: Municipal Park

Collected By: Scott Urban

Matrix: Drinking Water

Sample ID: ~~TXHP 4 Well~~ MP-1

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Alkalinity (as CaCO3)	SM 2320 B	39	mg/L	2/3/2003	ordeb
Ammonia as N	EPA 350.1	<0.005	mg/L	2/11/2003	rousselled
Arsenic	EPA 200.9	<0.005	mg/L	2/12/2003	stranskyj
Calcium	EPA 200.7	10.0	mg/L	2/13/2003	stranskyj
Carbonate alkalinity (as CaCO3)	EPA 310.1	<1	mg/L	2/3/2003	ordeb
Chloride	EPA 300.0	<2.00	mg/L	2/12/2003	ordeb
Fluoride	EPA 300.0	1.61	mg/L	2/6/2003	ordeb
Hardness (as CaCO3)	EPA 130.2	32	mg/L	2/10/2003	ordeb
Iron	EPA 200.7	0.08	mg/L	2/13/2003	stranskyj
Magnesium	EPA 200.7	1.9	mg/L	2/13/2003	stranskyj
Manganese	EPA 200.7	0.003	mg/L	2/13/2003	stranskyj
pH	EPA 150.1	7.16	pH Units	1/31/2003	bartlett
Potassium	SM 3111B	0.5	mg/L	2/5/2003	stranskyj
Silica (as SiO2)	EPA 370.1	0.6	mg/L	2/27/2003	ordeb
Sodium	SM 3111B	4.5	mg/L	2/5/2003	stranskyj

Reported: Wednesday, April 30, 2003

EPA Laboratory ID: ID00018

Laboratory Supervisor



IDAHO DEPARTMENT OF HEALTH & WELFARE

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IDWR / 2002 Monitoring

Site: Municipal Park


Collected By: Scott Urban

Matrix: Drinking Water

Sample ID: ~~TXHP 4 Well~~ MP-1

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Sulfate	EPA 300.0	2.83	mg/L	2/12/2003	ordeb
Sulfide	EPA 376.2	0.03	mg/L	2/6/2003	ordeb
Total Dissolved Solids	EPA 160.1	13	mg/L	2/4/2003	mathewss


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IDWR / 2002 Monitoring

Site: Municipal Park

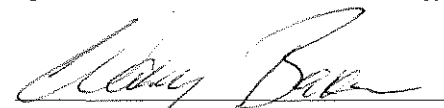
Collected By: Scott Urban

Matrix: Drinking Water

Sample ID: IDWR-MP-2

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Alkalinity (as CaCO ₃)	SM 2320 B	66	mg/L	2/3/2003	ordeb
Ammonia as N	EPA 350.1	0.073	mg/L	2/11/2003	rousselled
Arsenic	EPA 200.9	<0.005	mg/L	2/12/2003	stranskyj
Calcium	EPA 200.7	13.4	mg/L	2/13/2003	stranskyj
Carbonate alkalinity (as CaCO ₃)	EPA 310.1	<1	mg/L	2/3/2003	ordeb
Chloride	EPA 300.0	<2.00	mg/L	2/12/2003	ordeb
Fluoride	EPA 300.0	3.71	mg/L	2/6/2003	ordeb
Hardness (as CaCO ₃)	EPA 130.2	28	mg/L	2/10/2003	ordeb
Iron	EPA 200.7	<0.01	mg/L	2/13/2003	stranskyj
Magnesium	EPA 200.7	0.3	mg/L	2/13/2003	stranskyj
Manganese	EPA 200.7	0.026	mg/L	2/13/2003	stranskyj
pH	EPA 150.1	8.05	pH Units	1/31/2003	bartlettl
Potassium	SM 3111B	0.7	mg/L	2/5/2003	stranskyj
Silica (as SiO ₂)	EPA 370.1	12	mg/L	2/27/2003	ordeb
Sodium	SM 3111B	25	mg/L	2/5/2003	stranskyj


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IDWR / 2002 Monitoring

Site: Municipal Park

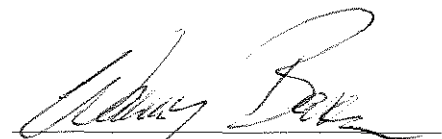
Collected By: Scott Urban

Matrix: Drinking Water

Sample ID: IDWR-MP-2

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Sulfate	EPA 300.0	17.2	mg/L	2/12/2003	ordeb
Sulfide	EPA 376.2	<0.01	mg/L	2/6/2003	ordeb
Total Dissolved Solids	EPA 160.1	84	mg/L	2/4/2003	mathewss


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Date Collected: 1/30/2003
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Date/Time Received: 1/31/2003 4:28:27 PM

Lab Sample ID Number

03 01 418

(Please refer to this number when contacting the lab)

IDWR / 2002 Monitoring

Site: Municipal Park

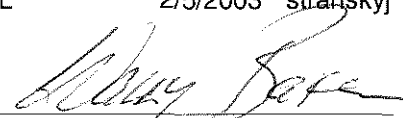
Collected By: Scott Urban

Matrix: Drinking Water

Sample ID: IDWR-MP-3

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Alkalinity (as CaCO3)	SM 2320 B	122	mg/L	2/4/2003	ordeb
Ammonia as N	EPA 350.1	0.084	mg/L	2/11/2003	rousselled
Arsenic	EPA 200.9	<0.005	mg/L	2/12/2003	stranskyj
Calcium	EPA 200.7	31.0	mg/L	2/13/2003	stranskyj
Carbonate alkalinity (as CaCO3)	EPA 310.1	3	mg/L	2/4/2003	ordeb
Chloride	EPA 300.0	3.14	mg/L	2/12/2003	ordeb
Fluoride	EPA 300.0	1.59	mg/L	2/6/2003	ordeb
Hardness (as CaCO3)	EPA 130.2	78	mg/L	2/10/2003	ordeb
Iron	EPA 200.7	0.06	mg/L	2/13/2003	stranskyj
Magnesium	EPA 200.7	0.5	mg/L	2/13/2003	stranskyj
Manganese	EPA 200.7	0.033	mg/L	2/13/2003	stranskyj
pH	EPA 150.1	8.23	pH Units	1/31/2003	bartlettl
Potassium	SM 3111B	1.0	mg/L	2/5/2003	stranskyj
Silica (as SiO2)	EPA 370.1	10	mg/L	2/27/2003	ordeb
Sodium	SM 3111B	40	mg/L	2/5/2003	stranskyj


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Lab Sample ID Number

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(Please refer to this number when contacting the lab)

IDWR / 2002 Monitoring

Site: Municipal Park

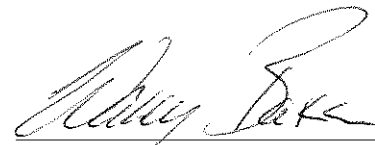
Collected By: Scott Urban

Matrix: Drinking Water

Sample ID: IDWR-MP-3

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Sulfate	EPA 300.0	40.1	mg/L	2/12/2003	ordeb
Sulfide	EPA 376.2	0.01	mg/L	2/6/2003	ordeb
Total Dissolved Solids	EPA 160.1	170	mg/L	2/4/2003	mathewss


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Date Collected: 1/30/2003
Time Collected: 9:20 AM
Date/Time Received: 1/31/2003 4:28:27 PM

Lab Sample ID Number

03 01 419

(Please refer to this number when contacting the lab)

IDWR / 2002 Monitoring

Site: Municipal Park

Collected By: Scott Urban

Matrix: Drinking Water

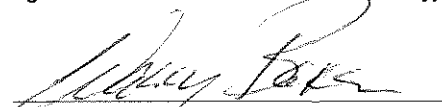
Sample ID: IDWR-MP-4

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Alkalinity (as CaCO3)	SM 2320 B	74	mg/L	2/4/2003	ordeb
Ammonia as N	EPA 350.1	0.100	mg/L	2/11/2003	rousselled
Arsenic	EPA 200.9	0.013	mg/L	2/12/2003	stranskyj
Calcium	EPA 200.7	7.4	mg/L	2/13/2003	stranskyj
Carbonate alkalinity (as CaCO3)	EPA 310.1	3	mg/L	2/4/2003	ordeb
Chloride	EPA 300.0	6.16	mg/L	2/12/2003	ordeb
Fluoride	EPA 300.0	9.98	mg/L	2/6/2003	ordeb
Hardness (as CaCO3)	EPA 130.2	22	mg/L	2/10/2003	ordeb
Iron	EPA 200.7	0.06	mg/L	2/13/2003	stranskyj
Magnesium	EPA 200.7	0.1	mg/L	2/13/2003	stranskyj
Manganese	EPA 200.7	0.009	mg/L	2/13/2003	stranskyj
pH	EPA 150.1	8.23	pH Units	1/31/2003	bartlettl
Potassium	SM 3111B	0.7	mg/L	2/5/2003	stranskyj
Silica (as SiO2)	EPA 370.1	7	mg/L	2/27/2003	ordeb
Sodium	SM 3111B	65	mg/L	2/5/2003	stranskyj

Reported: Wednesday, April 30, 2003

EPA Laboratory ID: ID00018


Laboratory Supervisor



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Lab Sample ID Number

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IDWR / 2002 Monitoring

Site: Municipal Park

Collected By: Scott Urban

Matrix: Drinking Water

Sample ID: IDWR-MP-4

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Sulfate	EPA 300.0	52.0	mg/L	2/12/2003	ordeb
Sulfide	EPA 376.2	<0.01	mg/L	2/6/2003	ordeb
Total Dissolved Solids	EPA 160.1	200	mg/L	2/4/2003	mathewss



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Lab Sample ID Number

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IDWR / 2002 Monitoring

Site: Municipal Park

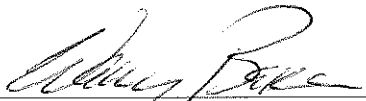
Collected By: Scott Urban

Matrix: Drinking Water

Sample ID: IDWR-MP-5

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Alkalinity (as CaCO3)	SM 2320 B	86	mg/L	2/4/2003	ordeb
Ammonia as N	EPA 350.1	0.124	mg/L	2/11/2003	rousselled
Arsenic	EPA 200.9	0.014	mg/L	2/12/2003	stranskyj
Calcium	EPA 200.7	12.4	mg/L	2/13/2003	stranskyj
Carbonate alkalinity (as CaCO3)	EPA 310.1	<1	mg/L	2/4/2003	ordeb
Chloride	EPA 300.0	7.49	mg/L	2/12/2003	ordeb
Fluoride	EPA 300.0	8.52	mg/L	2/6/2003	ordeb
Hardness (as CaCO3)	EPA 130.2	32	mg/L	2/10/2003	ordeb
Iron	EPA 200.7	0.28	mg/L	2/13/2003	stranskyj
Magnesium	EPA 200.7	0.2	mg/L	2/13/2003	stranskyj
Manganese	EPA 200.7	0.027	mg/L	2/13/2003	stranskyj
pH	EPA 150.1	8.31	pH Units	1/31/2003	bartlett
Potassium	SM 3111B	1.2	mg/L	2/5/2003	stranskyj
Silica (as SiO2)	EPA 370.1	3	mg/L	2/27/2003	ordeb
Sodium	SM 3111B	72	mg/L	2/5/2003	stranskyj


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IDWR / 2002 Monitoring

Site: Municipal Park

Collected By: Scott Urban

Matrix: Drinking Water

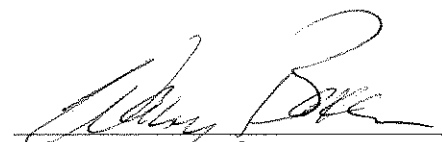
Sample ID: IDWR-MP-5

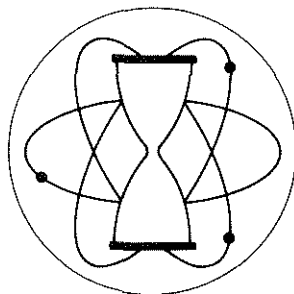
Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Sulfate	EPA 300.0	72.1	mg/L	2/12/2003	ordeb
Sulfide	EPA 376.2	0.02	mg/L	2/6/2003	ordeb
Total Dissolved Solids	EPA 160.1	180	mg/L	2/4/2003	mathewss

Reported: Wednesday, April 30, 2003

EPA Laboratory ID: ID00018


Laboratory Supervisor



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JUN 10 2003

Department of Water Resources

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RADIOCARBON AGE DETERMINATION

REPORT OF ANALYTICAL WORK

Our Sample No. **GX-30182-AMS**

Your Reference: Purchase Order 03-31

Submitted by: Idaho Dept. of Water Resources
Attention: Scott Urban
1301 North Orchard Street
Boise, ID 83706

Date Received: 03/13/2003

Date Reported: 05/30/2003

Sample Name: **IDWR – MP3**

AGE = **1470 ± 50 ¹⁴C years BP (¹³C corrected)**
83.28 ± 0.55 % of the modern (1950) ¹⁴C activity

Description: Sample of ground water

Pretreatment: The sample was rapidly transferred, by aspiration, to an evacuated flask and acidified to recover carbon dioxide from dissolved carbonates for the analysis. ¹³C analysis was performed on a small portion of the same evolved gas.

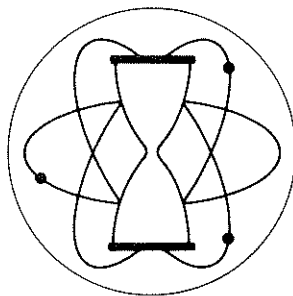
The sample yielded very little carbon and analysis by accelerator mass spectrometry (AMS) was required.

Comments:

$\delta^{13}\text{C}_{\text{PDB}} =$ **-14.3 ‰**

Notes: This date is based upon the Libby half life (5570 years) for ¹⁴C. The error is +/- 1 s as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.



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RADIOCARBON AGE DETERMINATION

REPORT OF ANALYTICAL WORK

Our Sample No. **GX-30183-AMS**

Date Received: 03/13/2003

Your Reference: Purchase Order 03-31

Date Reported: 05/30/2003

Submitted by: Idaho Dept. of Water Resources
Attention: Scott Urban
1301 North Orchard Street
Boise, ID 83706

Sample Name: **IDWR – MP5**

AGE = **12720 ± 70 ¹⁴C years BP (¹³C corrected)**
20.53 ± 0.18 % of the modern (1950) ¹⁴C activity

Description: Sample of ground water

Pretreatment: The sample was rapidly transferred, by aspiration, to an evacuated flask and acidified to recover carbon dioxide from dissolved carbonates for the analysis. ¹³C analysis was performed on a small portion of the same evolved gas.

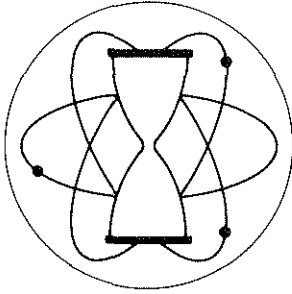
The sample yielded very little carbon and analysis by accelerator mass spectrometry (AMS) was required.

Comments:

$\delta^{13}\text{C}_{\text{PDB}}$ = **-8.1 ‰**

Notes: This date is based upon the Libby half life (5570 years) for ¹⁴C. The error is +/- 1 s as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.



GEOCHRON LABORATORIES

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Idaho Dept. Water Resources
Attn. Scott Urban
1301 North Orchard
Boise, Idaho 83706

Date Received: 03/13/03

Date Reported: 04/18/03

Your Reference: Municipal Park Well

REPORT OF TRITIUM ANALYSES

Date of Analysis - 03/29/2003

Our Lab. No.	Your Sample Number	Tritium Units
T-7535	IDWR - MP3	4.4+/-2.1
T-7536	IDWR - MP5	<2