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MISSISSIPPI STATE DEPARTMENT OF HEALTH

REPORT OF INSPECTION OF DRINKING WATER SUPPLY

PWS: 0450013 Class: D

An inspection of the CITY OF RIDGELAND water supply in MADISON county was made on 10/29/2013. Present at the time of inspection was MARK B MCMANUS, OPERATOR; JASON JONES, OPERATOR; RENEE BUCKNER, OFFICE MANAGER; WRITER. Official JOHN M MCCOLLUM Address P O BOX 217 RIDGELAND MS 39158 W.W. Operator MARK B MCMANUS Address 6002 MAPLEWOOD FLOWOOD MS 39232 No. Connections 13419 No. Meters ___ Population Served 24661 Field Chemical Analysis: pH ___ Cl2(free) 1.6 Cl2(total) ___ H2S N/A Iron ___ Fluoride 1.0 Point of Sampling DISTRIBUTION - SHOP Water Rates ___ This inspection included a sanitary survey for compliance with the Ground Water Rule.

COMMENTS

Technical: 5 Managerial: 5 Financial: 5
OVERALL CAPACITY RATING: 5.0 / 5.0

- 1. This annual inspection also served as the Sanitary Survey as required under the Groundwater Rule. No significant deficiencies were noted during the Survey.
2. Mr. Jones reported that the system is conducting 4-log virus inactivation to comply with the Groundwater Rule. A review of the MORs showed that the chlorine residual is being properly maintained. During the inspection, all continuous chlorine monitors showed chlorine residuals at or above the minimum required to achieve 4-log virus inactivation while the wells were running.
3. System officials and operators should be commended for the hard work they do to keep this system in good working order.
4. When repairs are made on the distribution system, all lines affected should be properly chlorinated and flushed before they are placed back in service.
5. All dead-end water lines should be flushed on a routine schedule to clear the lines of sediment and stagnant water. Full scale flushing should be carefully planned and carried out, beginning at the well or water plant and going to the outer edges of the distribution system. This flushing should be done during periods of low usage.

6. Whenever system pressure is lost, even for brief periods of time, contaminants may be introduced to the system through back-siphonage and/or back flow. When this occurs, system officials should notify all customers in the affected area to boil their drinking water vigorously for one minute. This boil water notice should remain in effect until clear bacteriological samples have been obtained.

Completed by Amy L. McLeod, E.I. on 11/14/2013.

Reviewed by Greg Caraway, P.E. on 11/18/2013.

If you have any questions, please call (601)576-7518.

pc:

JOHN M MCCOLLUM, OFFICIAL
MARK B MCMANUS, OPERATOR

**MISSISSIPPI STATE DEPARTMENT OF HEALTH
BUREAU OF PUBLIC WATER SUPPLY
MASTER DATA SHEET**

Name of Supply _____ City of Ridgeland _____ Owner _____ City _____

County _____ Madison _____ Class D Date of Last Inspection _____ 10 - 29 - 2013 _____

Master Meter Yes PWS ID # _____ MS0450013 _____

Supply Source: Purchase _____ Surface _____ Ground X Number of Wells Seven (Active) _____

Well Data:

<u>Well ID NO.</u>	<u>Location</u>	<u>Year Const.</u>	<u>Cap. (GPM)</u>	<u>Pres.</u>	<u>Casing</u>	<u>Screen</u>	<u>Depth</u>	<u>Controls</u>	<u>Aux. Power</u>
450013-01	Concrete Plant	1965			10"		690'	ABAND	n/a
450013-02	Peach Orchard	1973	495	65 psi	16"		1113'	AUTO	none
450013-03	Charity Church	1973	700	80 psi	16"		720'	AUTO	rt. angle dr
450013-04	Lake Harbour	1983	700	85 psi	16"		587'	AUTO	175 kW gen
450013-05	School St	1986	950	70 psi	16"		1153'	AUTO	200 kW gen
450013-06	Hardy Street	1993	1600	15 psi	18"		1335'	AUTO	400 kW gen
450013-07	Old Canton Rd.	1999	800		16"	10"	710'	AUTO	rt. angle dr
450013-08	Samuel Ln-West	1968	70	65 psi	6"	4"	706'	INACT	none
450013-09	Samuel Ln-East	1994	150		8"	4"	695'	INACT	generator
450013-10	Walter Peyton Rd.	2010	1600	72 psi	16"	10"	1230'	AUTO	550 kW gen

Pump test results (Aug. 2013): Well #2 – 632 GPM @ 60 psi, Well #3 – 800 GPM @ 70 psi; Well #4 – 690 GPM @ 80 psi;
Well #5 – 704 GPM @ 70 psi; Well #6 – 1261 GPM @ 10 psi; Well #7 – 1450 GPM @ 70 psi;
Well #10 – 1044 GPM @ 68 psi

Master meter readings: Well #2 – 627 GPM & 98,462,390 gals; Well #3 – 800 GPM & 684,540,000 gals;
Well #4 – 670 GPM; Well #5 – 950GPM & 743,324,000 gals; Well #6 – 1500GPM & 14,374,000 gals;
Well #7 – 1250 GPM & 150,540,000 gals; Well #10 – 1350 GPM & 17,846,000 gals

System controlled by SCADA

Treatment: Iron _____ Softening _____ Corrosion _____ Chlorine X Fluoride X

	<u>Type</u>	<u>Capacity</u>	<u>Settings</u>	<u>Location</u>
Chlorinator	Capital Advance	100 ppd	45 ppd	Well #2
Fluoridator	LMI	10 gph@80 psi	Sp/Str: 50/55	Well #2
Chlorinator	Capital Advance	100 ppd	65 ppd	Well #3
Fluoridator	LMI	10 gph@80 psi	Sp/Str: 60/100	Well #3
Chlorinator	Capital Advance	100 ppd	45 ppd	Well #4
Fluoridator	LMI	10 gph@80 psi	Sp/Str: 65/70	Well #4
Chlorinator	Capital Advance (tons)	100 ppd	55 ppd	Well #5
Fluoridator	LMI	10 gph@80 psi	Sp/Str: 40/45	Well #5
Chlorinator	W&T S10K (tons)	300 ppd	140 ppd	Well #6
Fluoridator	LMI	8 gph@60 psi	Sp/Str: 50/80	Well #6
Chlorinator	Capital Advance (tons)	200 ppd	105 ppd	Well #7
Fluoridator	LMI	10 gph@80 psi	Sp/Str: 60/45	Well #7
Chlorinator	Capital Advance (tons)	200 ppd w/ switchover	95 ppd	Well #10
Fluoridator	LMI	10 gph max	Sp/Str: 70/65	Well #10

**MISSISSIPPI STATE DEPARTMENT OF HEALTH
BUREAU OF PUBLIC WATER SUPPLY
MASTER DATA SHEET**

Name of Supply City of Ridgeland Owner City
 County Madison Class D Date of Last Inspection 10-29-2013
 Master Meter Yes PWS ID # MS0450013
 Supply Source: Purchase Surface Ground X Number of Wells Seven (Active)

Storage:	Location	Material	Capacity	Remarks
Elevated	N. of Northpark	Steel	500,000 gallons	152' to OF
Elevated	N. of Natchez Trace	Steel	300,000 gallons	
Elevated	Old Canton Rd. at Well #7	Steel	1,000,000 gallons	114'6"
Ground	Hardy St. at Well #6	Concrete	1,000,000 gallons	
Pressure	Well #8	Steel	2,500 gallons	offline
Pressure	Well #9	Steel	6,000 gallons	offline
Elevated (2010)	Well #10	Steel	500,000 gallons	155' to OF; 37'6" HR

Booster Stations:

Location	Collector Tank	Pumps	Pressure Tank
Hardy St. at 1.0 MG Tank		2-100 gpm @50 psi (each)	4000 gal pressure tank
Serves approximately 20 connections			
Bridgewater S/D	100 gpm in-line booster station (MSDH approval 4/99) - OFFLINE		



**Mississippi Department of Health
Bureau of Public Water Supply**

STANDARD FORM

FY 2014 Public Water System Capacity Assessment Form

NOTE: This form must be completed whenever a routine sanitary survey of a public water system is conducted by a regional engineer of the Bureau of Public Water Supply

PWS ID#: 0450013 Class: D Survey Date: 10-29-2013 County: MADISON
 Public Water System: CITY OF RIDGELAND Conn: 13419
 Certified Waterworks Operator: MARK B MCMANUS Pop: 24661

CAPACITY RATING DETERMINATION

Technical (T) Capacity Rating: [5] Managerial (M) Capacity Rating [5] Financial (F) Capacity Rating [5]

$$\text{Capacity Rating} = \frac{T + M + F}{3} = \frac{15}{3} = 5$$

Overall Capacity Rating = 5.0

Completed by Amy L. McLeod, E.I. on 11/14/2013

Reviewed by Greg Caraway, P.E. on 11/18/2013

Comments: _____

Technical Capacity Assessment		Point Scale	Point Award
[T1] Does the water system have any significant deficiencies? [<u>Y</u> <u>N</u>]		N - 1pt. Y - 0pt.	1
[T2] 1) Was the water treatment process functioning properly? [<u>Y</u> <u>N</u>] (i.e. Is pH, iron, free chlorine, fluoride, etc. within acceptable range?) 2) Was needed water system equipment in place and functioning properly at the time of survey? [<u>Y</u> <u>N</u>] (NOTE: Equipment deficiencies must be identified in survey report.) 3) Were records available to the regional engineer clearly showing that all water storage tanks have been inspected and cleaned or painted (if needed) within the past 5 years? [<u>Y</u> <u>N</u> <u>NA</u>] (NOTE: All YESs required to receive point)		All Y - 1 pt. Else - 0 pt.	1
[T3] 1) Was the certified waterworks operator or his/her authorized representative present for the survey? [<u>Y</u> <u>N</u>] 2) Was log book up to date and properly maintained and did it show that MSDH Minimum JOB Guidelines for W. W. Operators were being met? [<u>Y</u> <u>N</u>] 3) Was the water system properly maintained at the time of survey? [<u>Y</u> <u>N</u>] 4) Did operator satisfactorily demonstrate to the regional engineer that he/she could fully perform all water quality tests required to properly operate this water system? [<u>Y</u> <u>N</u>] (NOTE: All YESs required to receive point)		All Y - 1 pt. Else - 0 pt.	1
[T4] 1) Does water system routinely track water loss and were acceptable water loss records available for review by the regional engineer? [<u>Y</u> <u>N</u>] 2) Is water system overloaded? (i.e. serving customers in excess of MSDH approved design capacity)? [<u>Y</u> <u>N</u>] 3) Was there any indication that the water system is/has been experiencing pressure problems in any part(s) of the distribution system? [<u>Y</u> <u>N</u>] (based on operator information, customer complaints, MSDH records, other information) 4) Are well pumping tests performed routinely? [<u>Y</u> <u>N</u> <u>NA</u>] (NOTE: YES FOR #1 & YES OR N/A FOR #4 AND NOs FOR #2 & #3 required to receive point)		1)Y - pt. 2)N - pt. 3)N - pt. 4)Y - pt.	1
[T5] 1) Does the water system have the ability to provide water during power outages? (i.e. generator, emergency tie-ins, etc.) [<u>Y</u> <u>N</u>] 2) Does the water system have a usable backup source of water? [<u>Y</u> <u>N</u>] (NOTE: Must be documented on survey report)		All Y - 1 pt. Else - 0 pt.	1
TECHNICAL CAPACITY RATING = [<u>5</u>] (Total Points)			

Managerial Capacity Assessment	Point Scale	Point Award
[M1] Were all SDWA required records maintained in a logical and orderly manner and available for review by the regional engineer during the survey? <input checked="" type="radio"/> Y <input type="radio"/> N	Y - 1pt. N - 0pt.	1
[M2] 1) Have acceptable written policies and procedures for operating this water system been formally adopted and were these policies available for review during the survey? <input checked="" type="radio"/> Y <input type="radio"/> N 2) Have all board members (in office more than 12 months) completed Board Member Training? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA 3) Does the Board of Directors meet monthly and were minutes of Board meetings available for review during the survey? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA (NOTE: Quarterly meetings allowed if system has an officially designated full time manager) <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA (NOTE: ALL YESs or NAs required to receive point. NA - Not Applicable)	All Y - 1 pt. Else - 0 pt.	1
[M3] Has the water system had any SDWA violations since the last Capacity Assessment? <input type="radio"/> Y <input checked="" type="radio"/> N	N - 1pt. Y - 0pt.	1
[M4] Has the water system developed a long range improvements plan and was this plan available for review during the survey? <input checked="" type="radio"/> Y <input type="radio"/> N	Y - 1pt. N - 0pt.	1
[M5] 1) Does the water system have an effective cross connection control program in compliance with MSDH regulations? <input checked="" type="radio"/> Y <input type="radio"/> N 2) Was a copy of the MSDH approved bacti site plan and lead/copper site plan available for review during the survey and do the bacti results clearly show that this approved plan is being followed? <input checked="" type="radio"/> Y <input type="radio"/> N (NOTE: All YESs required to receive point)	All Y - 1 pt. Else - 0 pt.	1
MANAGERIAL CAPACITY RATING = [<u>5</u>] (Total Points)		

Financial Capacity Assessment	Point Scale	Point Award
[F1] Has the water system raised water rates in the past 5 years? <input checked="" type="radio"/> Y <input type="radio"/> N (NOTE: Point may be awarded if the water system provides acceptable financial documentation clearly showing that a rate increase is not needed, i.e. revenue has consistently exceeded expenditures by at least 10%, etc.)	Y - 1pt. N - 0pt.	1
[F2] Does the water system have an officially adopted policy requiring that water rates be routinely reviewed and adjusted as appropriate and was this policy available for review during the survey? <input checked="" type="radio"/> Y <input type="radio"/> N	Y - 1pt. N - 0pt.	1
[F3] Does the water system have an officially adopted cut-off policy for customers who do not pay their water bills, was a copy of this policy available for review by the regional engineer, and do system records (cut-off lists, etc.) clearly show that the water system effectively implements this cut-off policy? <input checked="" type="radio"/> Y <input type="radio"/> N	Y - 1pt. N - 0pt.	1
[F4] Was a copy of the water system's officially adopted annual budget available for review by the regional engineer and does the water system's financial accounting system clearly and accurately track the expenditure and receipt of funds? <input checked="" type="radio"/> Y <input type="radio"/> N	Y - 1pt. N - 0pt.	1
[F5 - Municipal Systems] 1) Is the municipality current in submitting audit reports to the State Auditor's Office? <input checked="" type="radio"/> Y <input type="radio"/> N 2) Was a copy of the latest audit report available for review at the time of the survey? <input checked="" type="radio"/> Y <input type="radio"/> N 3) Does this audit report clearly show that water and sewer fund account(s) are maintained separately from all other municipal accounts? <input checked="" type="radio"/> Y <input type="radio"/> N (NOTE: Yes answer to all questions required to receive point.)	All Y - 1 pt. Else - 0 pt.	1
[F5 - Rural Systems] 1) Has the rural water system filed the required financial reports with the State Auditor's Office and were these reports available for review? <input type="radio"/> Y <input type="radio"/> N 2) Does the latest financial report show that receipts exceeded expenditures? <input type="radio"/> Y <input type="radio"/> N (NOTE: Yes answer to both questions required to receive point)	All Y - 1 pt. Else - 0 pt.	
FINANCIAL CAPACITY RATING = [<u>5</u>] (Total Points)		

MISSISSIPPI DEPARTMENT OF HEALTH
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DESIGN CAPACITY SHEET

System: **CITY OF RIDGELAND**

ID: **0450013** Class: **D** County: **MADISON**

Date Completed: **11/14/2013**

Connections - Actual: **13419** Equivalent: **12620**

Design Capacity: **17961** Percent Design Capacity: **12620/17961 = 70.3%**

WELL CAPACITY:

Well #1 - abandoned
Well #2 = 632 GPM
Well #3 = 800 GPM
Well #4 = 690 GPM
Well #5 = 707 GPM
Well #6 = 1261 GPM
Well #7 = 1450 GPM
Well #8 - inactive
Well #9 = inactive
Well #10 = 1044 gpm
Total well capacity = 6581 GPM
August 2013 pump tests

STORAGE CAPACITY:

500,000 gallon Elevated Tank at Northpark Mall
300,000 gallon Elevated Tank North of Natchez Trace
1,000,000 gallon Elevated Tank at Well #7
1,000,000 gallon Ground Tank at Well #6
500,000 gallon Elevated Tank at Well #10

Excess storage credit can be given for the tanks at Wells #6 and #7:
1261 gpm x 6 x 60 = 453,960 gallons
1450 gpm x 6 x 60 = 522,000 gallons

Total Storage = 500,000 + 300,000 + 453,960 + 522,000 + 500,000
= 2,275,960 gallons

DESIGN CAPACITY:

Total Design Capacity = Total Well Capacity + Total Storage/200 minutes
= 6581 + (2,275,960/200)
= 17,961 connections

CALCULATE ADJUSTED CONNECTIONS FOR UN-METERED APARTMENTS/MOBILE HOMES:

Total number of apartment units/mobile homes = 4610 at 67 meters
Apartment Adjusted Connections = (4610 X 0.67) - 67 = 3023 connections

CALCULATE ADJUSTED CONNECTIONS FOR THE SCHOOLS:

Notes: Twice the Average Daily Usage are used in the calculations for peak usage
Schools with cafeterias = 40 gpd
Schools with cafeterias and showers = 50 gpd

Ann Smith Elementary and Highland Elementary (total of 3 meters):

Total number of students = 760 + 616 = 1376 students
Equivalent connections = (40 gpd/student x 1376 students)/400gpcd - 3 meters = 135

Olde Towne Middle and Ridgeland High (total of 8 meters):

Total number of students = 701 + 853 = 1554 students
Equivalent connections = (50 x 1554)/400 - 8 = 186

Total equivalent connections for schools = 135 + 186 = 321 equivalent connections

CALCULATE ADJUSTED CONNECTIONS FOR NURSING/RETIREMENT HOMES:

Twice the average daily usage: Nursing homes = 300 gpd/bed
There are six nursing/retirement homes on 12 meters
Total approximate number of beds = 732

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DESIGN CAPACITY SHEET**

CITY OF RIDGELAND 11/14/2013

Equivalent connections = (300 gpd/bed x 732 beds)/400 gpcd - 12 meters = 537 eq. conn.
 Total Actual Connections = metered connections + unmetered = 8,739 + 4,261 = 13,000
 Final Equivalent Connections = 8,739 + 3,023 + 321 + 537 = 12,620
 (NOTE: All usage data obtained from City during 10/30/13 inspection)

THEREFORE THIS SYSTEM IS CURRENTLY AT 12,620/17,961 * 100% = 70.3% CAPACITY.

GROUNDWATER RULE CALCULATIONS:

Minimum free chlorine residual for 4-log inactivation of Viruses:

Well #2:

Based on water temperature = 87F; CT = 1.5 mg/l min

Most recent pump test (8/2013): 632 gpm

Estimated 25 ft. of 8" line from the well to the distribution tee; then 43 ft. of 8" line to the next tee, then 69 ft. of 8" to the first customer connection.

$C = 1.5 \text{ mg/l min} / [(2.6 \text{ gal/ft} * 25 \text{ ft})/632 \text{ gpm} + (2.6 * 43)/316 + (2.6 * 69)/158]$

C = 0.9 mg/l @ 1st customer

Well #3:

Based on water temperature = 78F; CT = 2.0 mg/l min

Most recent pump test (8/2013): 800 gpm

Estimated 60 ft. of 8" line from the well to the first tee; then 130 ft. of 8" line at Fratesi's sign.

$C = 2.0 \text{ mg/l min} / [(2.6 \text{ gal/ft} * 60 \text{ ft})/7800 \text{ gpm} + (2.6 * 130)/400]$

C = 1.9 mg/l @ Fratesi's sign

Well #4:

Temperature = 78F; CT 2.0 mg/l min

Most recent pump test (8/2013): 690 gpm

Estimated 44 ft. of 8" line from the well to the tee; then 110 ft down the 12" main.

$C = 2.0 / [(2.6 * 44 \text{ ft})/690 \text{ gpm} + (5.9 * 110 \text{ ft})/345 \text{ gpm}]$

C = 1.0 mg/l @ tap 110 ft down 12" main

Well #5:

Temperature = 87F; CT = 1.4 mg/l min

Most recent pump test (8/2013): 704 gpm

Estimated 324 ft. of 8" to tee at School St.; then 115 ft. of 8" to police building connection.

$C = 1.4 / [(2.6 * 324 \text{ ft})/704 \text{ gpm} + (2.6 * 115)/352]$

C = 0.7 mg/l @ police building

Well #6:

Temperature = 88F; CT = 1.4 mg/l min

Most recent pump test (8/2013): 1261 gpm

Estimated 84 ft. of 10" pipe to ground storage tank, full volume of standpipe given as contact time because there is a separate inlet and outlet and a baffling curtain inside.

$C = 1.4 / [(4.1 * 84 \text{ ft})/1261 \text{ gpm} + (1,000,000 \text{ gal}/1261 \text{ gal/min})]$

C = <0.1 mg/l (below SDWA minimum of 0.2 mg/l)

Well #7:

Temperature = 78F; CT = 2.0 mg/l min

Most recent pump test (8/2013): 1450 gpm

Estimated 99 ft. of 12" pipe to tee; then 84 ft. of 16" to tank tie-in; then 54 ft. of 16" to the elevated tank.

$C = 2.0 / [(5.9 * 99 \text{ ft})/1450 \text{ gpm} + (10.4 * 84)/725 + (10.4 * 54)/363]$

C = 0.6 mg/l @ elevated tank

Well #9: OFFLINE

Actual measured groundwater temperature = 80F; CT = 1.8 mg/l min

Contact time in pressure tank = 6,000 gallons * 1/6 / 111 gpm = 9 min

C = 1.8 mg/l min / 9 min

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C = 0.2 mg/l

Well #10:

Temperature = $65 + (1300/100) = 78\text{F}$; CT = 1.95 mg/l min

Most recent pump test (8/2013): 1044 gpm