

ATTACHMENT 3:

**KENTUCKY WATER WELL INSPECTION FORMS AND
WELL CONSTRUCTION DATA**

JAN 14 1994

KENTUCKY WELL INSPECTION FORM

(1) AKGWA NUMBER 0 0 0 3 - 3 8 8 7

(2) OWNER/FACILITY INFORMATION
Well Owner's Name: Agua KY Under Service Co.
Mailing Address: P.O. Box 178
City: Clinton State: KY Zip: 42031
Well Address (if different)
City: _____ State: _____ Zip: _____
Phone: (502) 653-3621

0003-3887

(3) WELL RECORD LABEL LOCATION:
 well casing pressure tank water pipe
 well cap electric box not labeled
 pump other

(4) USGS Quadrangle Name Clinton County Hickman
WELL LOCATION

(5) PHYSIOGRAPHIC OR HYDROLOGIC REGION
 Blue Grass Ohio River Alluvium
 E. Coal Field W. Coal Field
 Miss. Plateau Jackson Purchase

(6) DRILLER INFORMATION
Who Constructed Well? Layne Control unknown
Address:
City: Memphis State: TN Zip: _____
Date Well Completed: 12 23 64 unknown
Month Day Year

(13) WELL USE (check all that apply)
 domestic livestock not used
 public irrigation abandoned
 industrial monitoring
 other
PWSID# 0530077
Water Withdrawal Permit # _____

(18) ELEVATION
350 ft. AMSL
From ground surface
 top of casing
By map
 survey
 report
 GPS

(7) GENERAL
Type of Construction:
 drilled/augered
 excavate & backfill
 hand dug/blasted
Depth of Well: _____ ft.
 measured
 reported
 unknown
Static Water Level,
ft. below surface:
 measured
 reported
 not measured
 can't be measured
Well Yield:
 gpm gph gpd
 measured
 estimated
 unknown

(9) WELLHEAD
Is Well Located in a PIT?
 yes no unknown
Wellhead (casing top):
 well cap sanitary seal
 flush mount locking cap
 open unknown
Casing Above Ground Level?
 yes no unknown
12 inches above ground.
Discharge Pipe Below Surface?
 yes no unknown
Pitless Adapter Used?
 yes no unknown

(14) WELL SERVICE
Number of People Served: 100
Number of Service Connections: 750
Any Quantity Problems? yes no
Any Quality Problems? yes no
If 'yes', describe in COMMENTS section, below.

(19) TREATMENT SYSTEM
 none
 water softener
 ultraviolet
 chlorination
 aeration
 charcoal filter
 sand filter
 iron treatment
 fluoridation
 other
Treatment Bypass Available? yes no

(8) SURFACE ANNULAR MATERIAL:
 clay drill cuttings
 cement unknown
 open sand gravel
 concrete pad

(10) PUMP DETAILS
Date Installed: 12 23 64
Month Day Year
Pump Type:
 submersible bailer
 turbine jet hand pump
 none other unknown
Intake Level: _____ ft. below surface
Electric Connection:
 2 wire 3 wire unknown

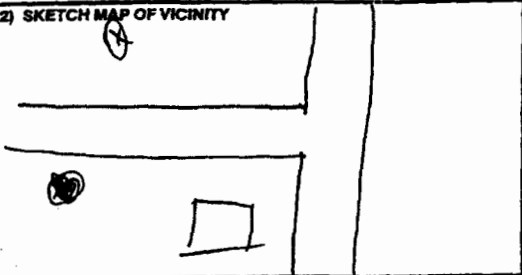
(15) COMPLIANCE TO STANDARDS
Construction in Compliance with KY Standards?
 yes no unknown pre-law
If 'no', describe in COMMENTS section, below.

(16) RELATIVE LOCATION
 upgradient sidegradient unknown
 downgradient varying N/A
(17) INSPECTION INFORMATION
Date of Inspection: 01 05 14
Month Day Year
Water Quality Sample Taken: yes no
Reason for Inspection:
 general survey
 specific complaint investigation
 spill or incident response
 contamination site investigation
 enforcement
 general water quality analysis
 ambient groundwater monitoring
 other well head pro.
Program Name and Facility ID#: _____
Alternate Well ID#: In use

(20) OPTIONAL USE
Will Owner Allow State Access?
 yes no unknown
Extent of Monitoring Allowed:
 collect sample
 measure SWL
 pump well
 complete access
 notification required
 other (describe below)
Monitoring Feasibility:

(11) WELL CONSTRUCTION DETAILS

Feet Below Surface From	To	Casing Inside Dia. (in.)	Casing Type	Casing Wall Thickness (in.)



(21) COMMENTS:

(22) INSPECTOR IDENTIFICATION
Name: Morgan Gary L 555
Last First MI Inspector ID#
Agency: DOW DWM CHR KGS other
Signature of Inspector: Gary Morgan Date: 1/5/94

KENTUCKY WELL INSPECTION FORM

(1) AKGWA NUMBER 0 0 0 3 - 3 8 8 8

0003-3888

(2) OWNER/FACILITY INFORMATION
Well Owner's Name: Agua KY Water Service Co.
Mailing Address: P.O. Box 178
City: Clinton State: KY Zip: 42031
Well Address (if different):
City: State: Zip:
Phone: (502) 653-3621

(3) WELL RECORD LABEL LOCATION:
 well casing pressure tank water pipe
 well cap electric box not labeled
 pump other

(4) USGS Quadrangle Name Clinton County Hickman
WELL LOCATION

(5) PHYSIOGRAPHIC OR HYDROLOGIC REGION
 Blue Grass Ohio River Alluvium
 E. Coal Field W. Coal Field
 Miss. Plateau Jackson Purchase

(6) DRILLER INFORMATION
Who Constructed Well? Layne Conrad unknown
Address:
City: Memphis State: TN Zip:
Date Well Completed: 72 unknown

(13) WELL USE (check all that apply)
 domestic livestock not used
 public irrigation abandoned
 industrial monitoring
 other
Water Withdrawal Permit # 0530077

(18) ELEVATION
350 ft. AMSL
From ground surface top of casing
By map survey report GPS

(7) GENERAL
Type of Construction:
 drilled/augered
 excavate & backfill
 hand dug/blasted
Depth of Well: ft.
 measured reported unknown
Static Water Level, ft. below surface:
 measured reported not measured can't be measured
Well Yield:
 gpm gph gpd
 measured estimated unknown

(9) WELLHEAD
Is Well Located in a PR? yes no unknown
Wellhead (casing top):
 well cap sanitary seal
 flush mount locking cap
 open unknown
Casing Above Ground Level? yes no unknown
12 inches above ground.
Discharge Pipe Below Surface? yes no unknown
Pitless Adapter Used? yes no unknown

(14) WELL SERVICE
Number of People Served: 1800
Number of Service Connections: 750
Any Quantity Problems? yes no
Any Quality Problems? yes no
If 'yes', describe in COMMENTS section, below.

(19) TREATMENT SYSTEM
 none
 water softener
 ultraviolet
 chlorination
 aeration
 charcoal filter
 sand filter
 iron treatment
 fluoridation
 other
Treatment Bypass Available? yes no

(8) SURFACE ANNULAR MATERIAL:
 clay drill cuttings
 cement unknown
 open sand gravel
 concrete pad

(10) PUMP DETAILS
Date Installed: 72
 unknown
Pump Type:
 submersible bailer
 turbine jet hand pump
 none other
Intake Level: ft. below surface
Electric Connection: 2 wire 3 wire unknown

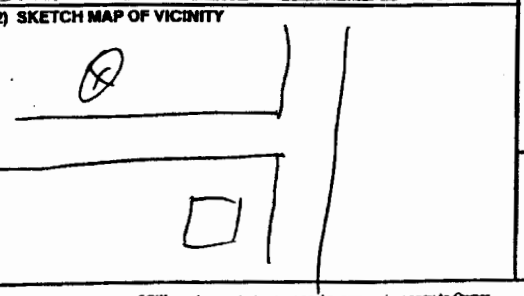
(15) COMPLIANCE TO STANDARDS
Construction in Compliance with KY Standards?
 yes no unknown pre-law
If 'no', describe in COMMENTS section, below.

(16) RELATIVE LOCATION
 upgradient sidegradient unknown
 downgradient varying N/A

(17) INSPECTION INFORMATION
Date of Inspection: 01 05 94
Water Quality Sample Taken: yes no
Reason for Inspection:
 general survey
 specific complaint investigation
 spill or incident response
 contamination site investigation
 enforcement
 general water quality analysis
 ambient groundwater monitoring
Program Name and Facility ID#:
Alternate Well ID# Not in use

(20) OPTIONAL USE
Will Owner Allow State Access? yes no unknown
Extent of Monitoring Allowed:
 collect sample
 measure SWL
 pump well
 complete access
 notification required
 other (describe below)
Monitoring Feasibility:

(11) WELL CONSTRUCTION DETAILS
Feet Below Surface From To Casing Inside Dia. (in.) Casing Type Casing Wall Thickness (in.)

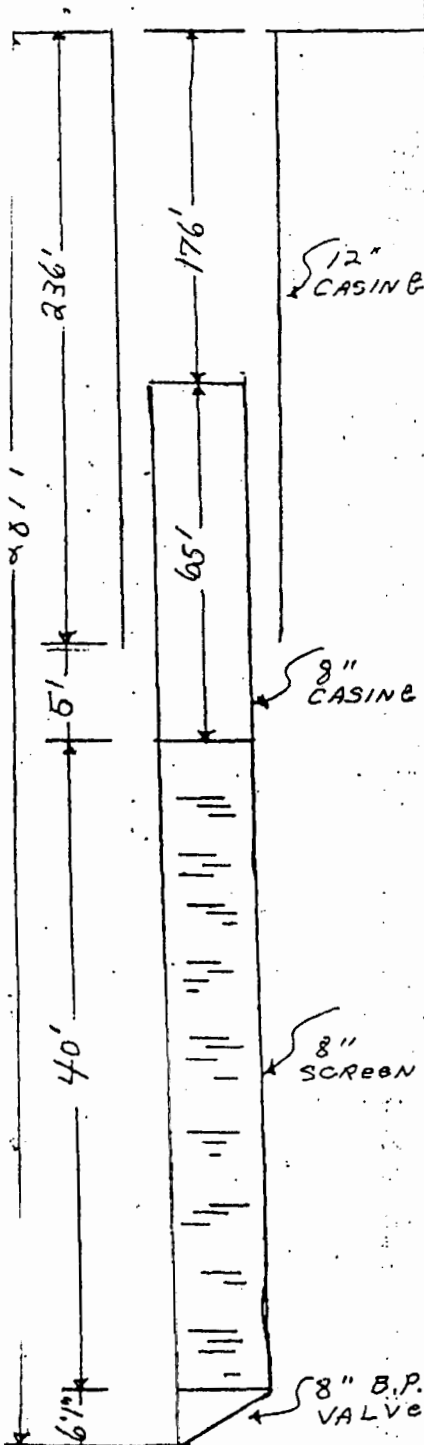


(21) COMMENTS:

(22) INSPECTOR IDENTIFICATION
Name: Morgan Gary L 555
Agency: DOW DWM CHR KGS other
Signature of Inspector: Gary Morgan Date: 1/5/94

ALL MEASUREMENTS TAKEN FROM (GROUND) (TOP OF FOUNDATION) (TOP OF CASING) (TOP BASE PLATE)

DRAWING OF THE WELL



WELL DATA

STARTED WELL 12-2-1964 AND COMPLETED 12-23-1964
 TOTAL DEPTH 287' 1" ELEVATION _____ STATIC WATER LEVEL 28'
 LENGTH SURFACE CASING _____ SIZE _____ THICKNESS _____
 CEMENTED WITH _____ SACKS CEMENT TYPE PACKER _____
 LENGTH WELL CASING 236' SIZE 12" WEIGHT welded
 CEMENTED WITH 200 SACKS CEMENT TYPE PACKER _____
 INNER CASING LENGTH 65' SIZE 8" WEIGHT welded
 WITH 8' from top of guides LOCATED _____ TYPE BACKOFF LHFPI
 LEAD SEAL _____ BACKPRESSURE VALVE _____ GUIDE _____
 WELL STRAINER MAKE Layne SIZE 8" LENGTH 40' OPENING 7 1/2
 TYPE MATERIAL 8. steel WITH _____ CONNECTIONS _____
 SIZE HOLE DRILLED FOR SURFACE CASING _____ WITH _____
 SIZE HOLE DRILLED FOR WELL CASING _____ WITH _____
 SIZE HOLE DRILLED FOR STRAINER _____ WITH _____
 YARDS OF GRAVEL USED 12 HOW PLACED pounded in thru 2" pipe
 HOW WAS WELL DEVELOPED air
 NOTES: _____
 RIG USED Portable Rig #2 DRILLER R. H. Wirsing

PUMP RECORD

SERIAL NUMBER 50795 MAKE Layne TYPE FOUNDATION _____
 LENGTH COLUMN 130' SIZE 5" x 1-1/2" X TYPE oil 10" LENGTHS
 BOWL SIZE PRHC TYPE PRHC STAGES 8 MATERIAL IMPELLER bronze
 MATERIAL BOWL C.I. WITH OPEN PORTS AND _____ SHAFT
 SUCTION SIZE 6" LENGTH 20' SUCTION STRAINER no
 IS PUMP SEALED HOW no WHERE _____ WITH WHAT _____
 LUBRICATOR TYPE solenoid SIZE 1 Qt. VOLTAGE 220
 LENGTH OF AIRLINE none SIZE _____ TYPE MATERIAL _____
 AIR RELEASE VALVE TYPE _____ SIZE _____
 SIZE SURFACE DISCHARGE 6" TYPE _____ DAYTON COUPLING _____
 PRESSURE GAUGE _____ SIZE PULLEY _____ SPEED _____
 NOTES: _____
 RIG USED TO SET PUMP _____ INSTALLER Ralph Wirsing
 DATE PUMP INSTALLED 12-24-1964 DATE IN OPERATION _____

MOTOR

MAKE U.S. HP 20 FRAME A286UP PHASE 3 CYCLE 60 VOLT 220
 SPEED 1800 STYLE _____ SERIAL NUMBER 3679740. 440
 TOP BEARING _____ BOTTOM BEARING _____ RATCHET _____
 STARTER _____ PRESSURE SWITCH _____ FLOAT _____

GEAR

MAKE none STYLE _____ SIZE _____ RATIO _____ NO. _____
 SIZE PULLEY _____ TYPE MOTOR FRAME _____

ENGINE

MAKE none STYLE _____ HP _____ SERIAL NUMBER _____
 SPEED _____ SIZE PULLEY _____ FOUNDATION _____
 TYPE FUEL TANK _____ MAKE MAG. _____ NO. _____
 MAKE STARTER _____ NO. _____ TYPE FUEL _____
 MAKE FLEXIBLE SHAFT _____ SIZE _____ LENGTH _____ BELT LENGTH _____

GENERAL

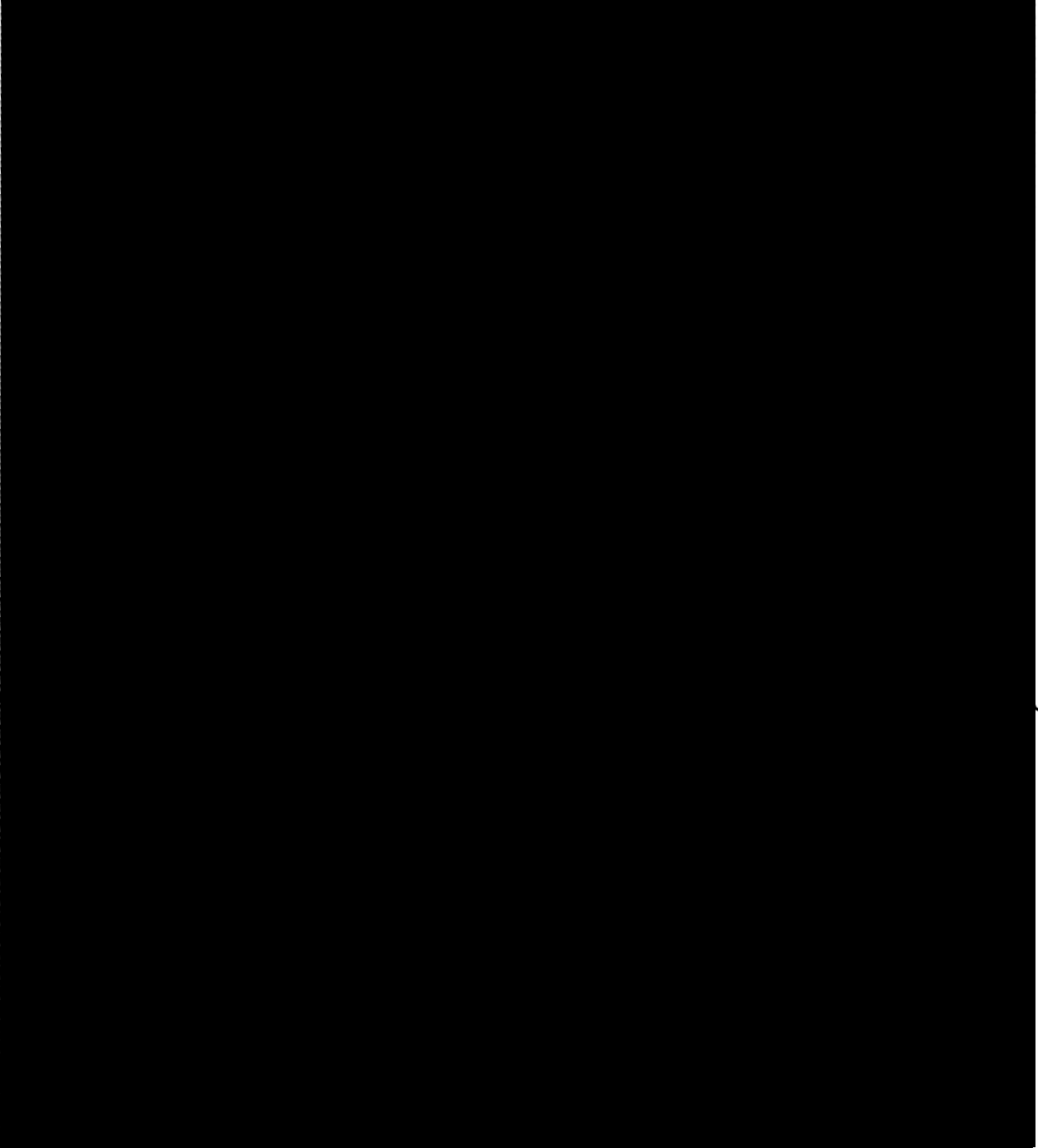
PURPOSE FOR WHICH THIS WATER IS USED _____
 TEMPERATURE _____ IS WATER CLEAR _____ CAPACITY _____
 SAND _____ HARDNESS _____ PH _____ IRON _____ NACL _____
 TYPE TREATMENT USED _____
 IS THERE A DERRICK OVER THE WELL _____ HEIGHT _____ TYPE _____
 CAN TRUCK OR RIG EASILY GET TO WELL _____
 PUMP HOUSE _____ SIZE HATCH _____

CONTRACT NO. 9723 - 100

OUR WELL NO. _____ THEIR WELL NO. 3 IN TEST HOLE NO. _____
 LOCATION OF THE WELL _____ Town Lot _____
 INSTALLED FOR _____ Kentucky Water Service _____
 ADDRESS CITY _____ Clinton _____ COUNTY Hickman STATE KY _____

YEAR 1964

*Group # 41194
SHUT OFF
110 #*



29

*Kentucky Water Service
Clinton, KY 1971*

(Time sheet)

FORMATION LOG OF THE WELL OR TEST HOLE

STARTED TEST HOLE 12-2-1954 FINISHED 12-23-1954 TEST HOLE NUMBER _____
 LOCATION Kentucky Water Serv., Clinton, Ky. SEC. _____ TO _____ RANGE _____ ELEVATION _____

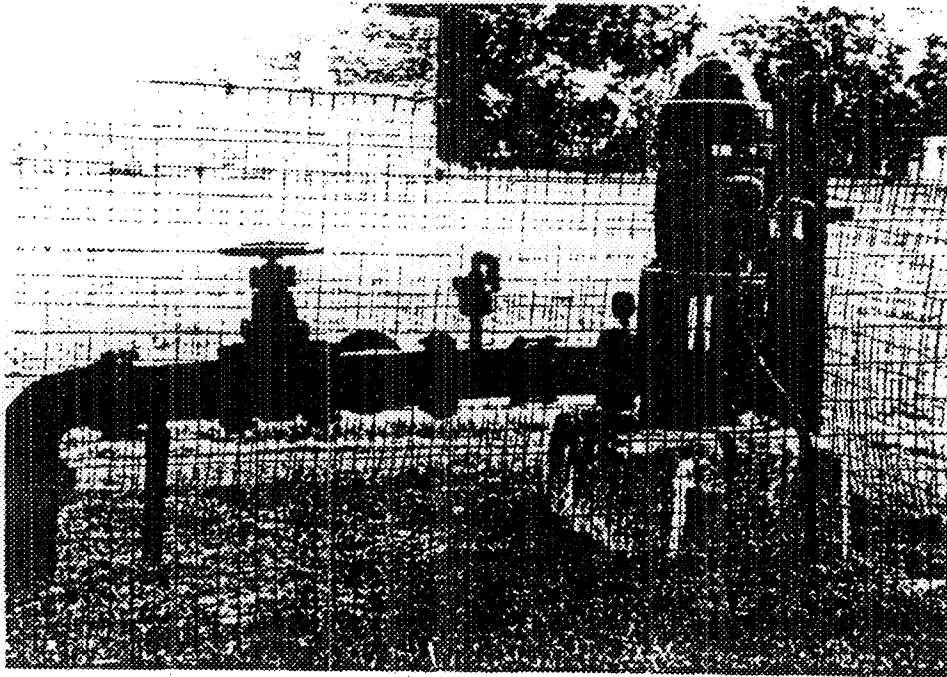
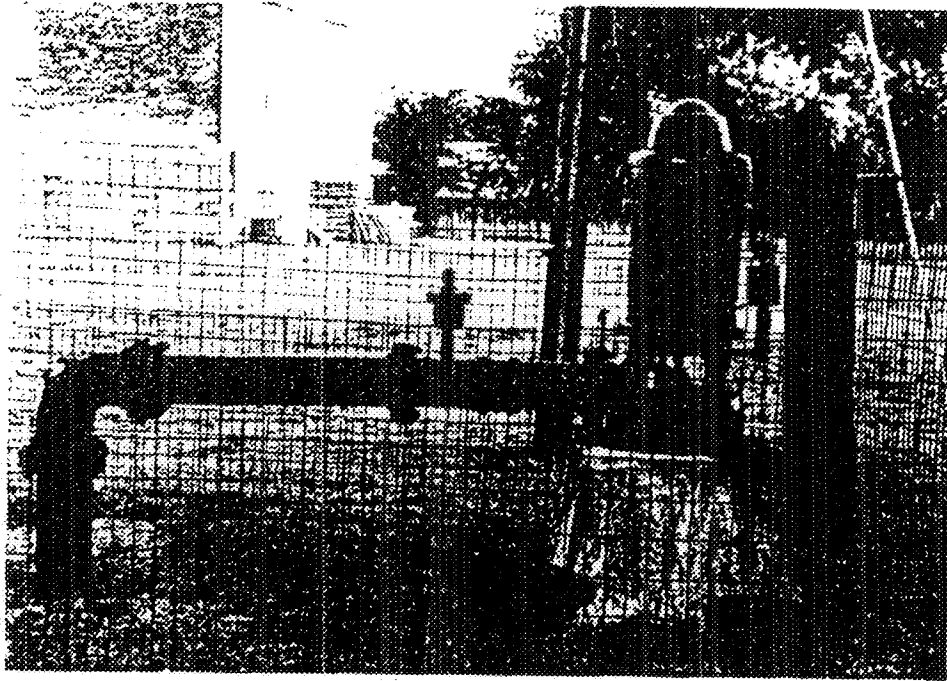
TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION	TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION
0	32	clay			
32					
131	99	muddy sand			
234	103	sandy clay			
249	15	loose sand			
283	34	h.p. sand			
288	5	clay			

MUD PIT SIZE _____ FT. X _____ FT. X _____ FT. DEEP
 TYPE BIT USED TO CUT SAND _____
 SIZE OF TEST HOLE THROUGH SAND _____
 TYPE OF BIT USED TO CUT UPPER FORMATIONS _____
 _____ SIZE _____
 TYPE MUD PUMP USED _____
 DRILLING PRESSURE IN SAND _____
 TYPE OF MUD USED _____
 NOTES _____

TEST DATA	
PRELIMINARY TEST	FINAL TEST
STATIC WATER LEVEL _____	
PUMPED G. P. M. _____	
PRESSURE, POUNDS _____	
DRAWDOWN _____	
G. P. F. D. _____	
GUARANTEED G. P. M. _____	
GUARANTEED PRESSURE _____	
DATE OF TEST _____	

REMARKS _____

DRILLER R. H. Wirsing
 FIELD Supt. H. O. Duckworth



ATTACHMENT 4:

PLANNING TEAM MEMBERS

Bobby Yates, Jr -Manager

John Turner - Operator

~~Joc Pricimias - Purchase ADD~~

ATTACHMENT 5:
PUBLIC NOTICES

WANTED ADVERTISING

FOUND

June 1, on Beeler
py with white feet
hite on face, may be
part Shepherd. Call

NOTICE

**FINAL SETTLEMENT OF Marvin
Counis, Administrator of the Hallie
Brown, estate, has been filed with the
Hickman District Court for final hearing
on June 15, 1998. If no exceptions are
filed the aforesaid will be confirmed and
recorded. This 3rd day of June, 1998.**
Carolyn Kimbrell,
Hickman District Court Clerk

MORY

BEFORE US
By Frances Myers
60, June 7, 1993.

NOTICE OF PUBLIC MEETING
Aqua/KWS, Inc., is developing a
wellhead protection plan in accordance
with 401 KAR 4:220. This regulation
requires all public water suppliers
utilizing groundwater to submit to the
Kentucky Division of Water a Plan to
protect this resource. There will be a
meeting at the Aqua/KWS, Inc. office
on Wednesday, June 17, 1998, at 6
p.m. The purpose of this meeting is to
present the results of Phase 1 and
discuss strategies for Phase 11. Public
participation in the planning process is
needed. Representatives of Aqua/
KWS, Inc., and the Kentucky Rural
Water Association will be present.

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Good Retail or Office Space. Formerly
occupied by Spinning Wheel, Phone 502-
653-4001.

SERVICES

MIDWAY HOME IMPROVEMENT
T. J. Dodge • Arlington, Ky.
(502) 655-2731
Vinyl Siding • Gutters
Replacement Windows

YARD SALE

5 FAMILY YARD SALE - Friday,
June 5 and Saturday, June 6, at home on
58 East, 6 miles from town, 8:00 a.m. to
?? Rain or Shine! Dresser, gas grill,
curtains, stair stepper, jewelry, women's
clothes, sizes 8 & 10, shoes, household
items, knick knacks and misc. items.

MULTI-FAMILY BACKLOT YARD

SALE - June 5 & 6 from 7 to 7 each day.
213 North Jefferson St. Lots of house-
hold goods - one family moving out of
state. Antique items: iron wash pot, leather
bed, old pond scoop, lamps, etc. Some-
thing for everyone. New items added
throughout sale as they arrive. One lot of
FREE ITEMS. Come visit and have fun
with us. Parking off Water Street. Rain
postpones one week.

YARD SALE

YARD SALE at 301 Richmond Dr.
Friday and Saturday, June 5 & 6. Boys
clothes, sizes 2-10, Men's X-Large
sportcoats, Ladies clothing, all sizes.
Household items, twin bedspreads, queen
size comforter with curtains and bedskirt.
All sizes of sheets, lots of boy toys.

**MOVE IN, IN JUNE, NO RENT TILL
JULY!** Henley Park, a senior commu-
nity, now open. All rent based on income.
Rental applications can be picked up at
300 Henley Court, Monday - Friday, 9
a.m. - 12 noon. Georgann Sanders, Site
Manager, (502) 653-2582. "Equal Hous-
ing Opportunity"

Now taking applications for 1 and 2
bedroom units at Clinton Apartments
Section 8 Assisted, Equal Opportunity
Housing. Handicap accessible units avail-
able, Monday and Thursday from 9:00
A.M. to 12:00 Noon. Phone 653-4593

**JDD # for hearing impaired 1-800-247-
2510**
Now taking applications for 1 bed-
room Elderly, Disabled and Handicap
Accessible units. Available immediately
at Clinton Hills Apartments, Section 8

TREE SERVICE
Free Estimates
Tree Trimming • Tree Removal
Storm Clean-Up • Tree Topping
502-655-7009

Rubber stamps made to order. Prompt
service. Fair prices. **GAZETTE OFFICE**
Phone 653-3381.
The County Seal
Wedding Chapel
Ornated & Licensed Minister
502-653-4508
800-551-7179

NOTICE OF PUBLIC MEETING

Aqua/KWS, Inc., is developing a well-head protection plan in accordance with 401 KAR 4:220. This regulation requires all public water suppliers utilizing groundwater to submit to the Kentucky Division of Water a Plan to protect this resource. There will be a meeting at the Aqua/KWS, Inc., office on Wednesday, June 17, 1998, at 6 p.m. The purpose of this meeting is to present the results of Phase I and discuss strategies for Phase II. Public participation in the planning process is needed. Representatives of Aqua/KWS, Inc., and the Kentucky Rural Water Association will be present.

The word "utopia," an imaginary land where everything is perfect, comes from the Greek words *ou* and *topos*, meaning "no place."

Residential

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Mike Pruitt

80
rn, KY 42070 (502) 694-4371

The County Seal
Wedding Chapel
Ordained & Licensed Minister
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Feb. 14 is the day chosen for Valentine's Day, because according to ancient tradition that's the day birds choose their mates for the year.

Brown Real Estate

Robert Brown - Broker
Billy McGee - Assoc. & AUC.
Martha McGee - Auctioneer
Hwy. 51 • Arlington, KY
655-2611

Arlington-Hobbs St., Brick house & lot; BR, LR, Ki, Bath, Garage, Deck, Front Porch. REDUCED

Mayfield-612 Old Dublin Rd. House and lot. BR, LR, DR, Kitchen, Utility, 1/2 bath, kitchen, fireplace, 1 1/2 bath, CH&A. TO BE SOLD AT AUCTION 6/4/98

Arlington-Mounds St. House & lot. BR, LR, DR, Kitchen, Utility, 1/2 basement, carport. TO BE SOLD AT AUCTION JUNE 27, 1998

**Beardsley Auto Sales
Used Cars & Trucks**

2004 W. Reelfoot Ave.
Union City, TN 38261
901-885-1521

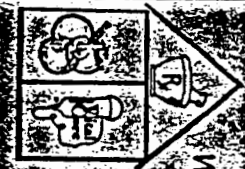
Buy Or Rent To Own • Free Delivery and Set Up

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AND HOME MEDICAL SUPPLY INC.**

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Rental & Sales • Sick Room Supplies
Oxygen Equipment
We Bill Medicare & Medicaid Direct
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Breast Forms & Supplies
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1-800-745-0732 • 502-247-3233

14 S. 9th St. Mayfield, KY
FAX 502-247-4285



ATTACHMENT 6:

PUBLIC COMMENTS AND RECORD OF ATTENDANCE

A public meeting was held on June 17, 1998 to discuss the results of Phase I and to solicit comments for Phase II. The notice was ran weekly for two weeks prior to the meeting. The only attendees were water system personnel and a representative of the KY Rural Water Association.

Beginning at 6:00 pm Joe burns of the KY Rural Water Association presented the purpose of the wellhead protection program and explained the results of the wellhead protection area delineation. Following the Phase I discussion Mr. Burns explained the final three steps in completing the wellhead plan. These steps are: a inventory of potential contaminant sources, development of a management plan, and development of a contingency plan.

After some discussion the planning team decided to conduct a windshield survey to inventory the potential contaminant sources within the wellhead protection area. The management strategies discussion centered around public education such as posting protection area signs, distributing the U.S. EPA's "Citizens Guide to Groundwater Protection" to each home within the protection area, and possibly presenting the principals of wellhead protection in the school system with a groundwater flow model demonstration. The elements of the contingency plan are to be developed by the utility system at a later date.

The meeting was adjourned at 7:00 pm. No additional meeting dates were scheduled.

Public meeting attendees/ AQUA/KWS Clinton 6-17-98

Joe Burns KY Rural Water Assn.
John D. Turner AQUA KWS
Bobby E. Galt Aqua, KWS

ATTACHMENT 7:

REGIONAL GEOLOGY AND HYDROLOGY

The Jackson Purchase region is an extension of the Gulf Coastal Plain and is made up of the eight westernmost counties in Kentucky. The region is bounded by three major rivers, the Mississippi, Ohio, and Tennessee (Kentucky Lake), and differs from the rest of the state physiographically and geologically. The purchase region is a gently rolling plain of low relief, generally less than 100 feet, in many places less than 50 feet. Low rolling generally wooded hills, and shallow, wide valleys to steep river bluffs along the Mississippi River valley and Kentucky Lake marks the landscape of the area. The highest and lowest elevations both occur near the Kentucky - Tennessee line. The highest elevations are south west of Murray in Calloway County, where parts of the plain reach 640 feet. Conversely, the lowest elevation occurs at 290 feet in Fulton County. This is also the lowest elevation in the state.

The Purchase Region is drained internally by five streams that flow north from the upland areas near the KY - TN line then trend westward. The East and West Forks of Clarks River discharge into the Tennessee River. The other three streams, Mayfield Creek, Obion Creek, and Bayou de Chien, discharge into the Mississippi River.

The Purchase region is near the northern apex of the Mississippi Embayment, a syncline which plunges south paralleling the Mississippi River. The Embayment is filled with sediments ranging in age from Late Cretaceous to Holocene which unconformably overlie Paleozoic rocks ranging in age from Ordovician to Mississippian. Paleozoic bedrock of Mississippian age are exposed along most shores of Kentucky Lake. Rocks of Devonian age are exposed in a small area along a fault in Marshall County. Progressively older rocks are present in a southwestward direction but are not exposed. Bedrock and unconsolidated formations are mapped and correlated primarily on interpretation of electric and gamma logs of wells in the Purchase area as well as adjacent states.

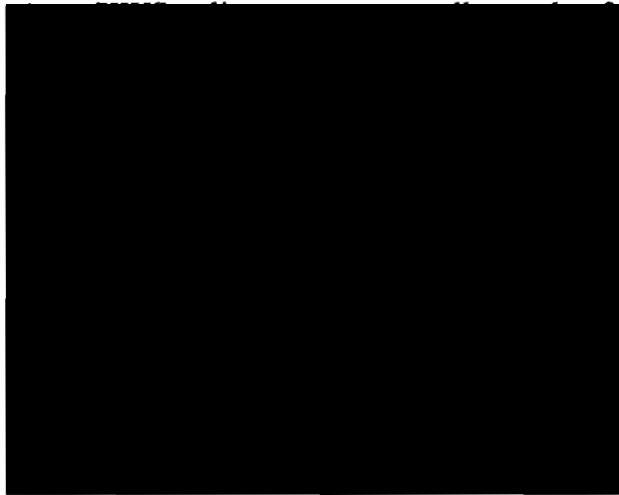
Large amounts of good quality can be obtained from numerous aquifers throughout the region. Aquifers of the Claiborne Group (Eocene Age); McNairy Formation (Upper Cretaceous Age); alluvium along the Tennessee, Mississippi, and Ohio Rivers; Paleozoic Limestone; parts of the Pliocene (?) Gravel; and parts of the undivided Cockfield and Jackson Formations. These aquifers are listed in order of decreasing capability of yielding large quantities of groundwater; however, each formation does not have the same water yielding capability or water quality at all places in an aquifer. The Paleocene Age Porters Creek Clay is not an aquifer, although a few domestic wells produce from sands in the upper part of the formation. The most important feature of the Porters Creek is that it forms the base of groundwater movement in the overlying Eocene aquifers and is a barrier to vertical movement of water from the underlying McNairy Formation. For purposes of this study the Claiborne Group is the only aquifer that will be presented.

The Claiborne Group is subdivided into four formations: Cockfield, Cook Mountain, Sparta Sand, and Tallahatta. The sands of the Claiborne group are the most productive aquifers in the Purchase

Region but, the sand lithology of the Tallahatta Formation is more continuous across the region than the other Claiborne formations. This makes the Tallahatta the most extensive and most important aquifer of the group, yielding more than 1,000 gpm to individual wells in about half the Purchase Region.

ATTACHMENT 8:

HYDROGEOLOGIC INVESTIGATION DATA



Lithologic Log by Layne Central, Inc, 1964

Well #1 (AKGWA # 0003-3887)

0 - 32 ft	clay
32 - 131	muddy sand
131 - 234	sandy clay
234 - 249	loose sand
249 - 283	h.p. sand
283 - 288	clay

The water producing formation is the Eocene age Sparta Sand of the Claiborne Group. The Sparta Sand is reddish-brown to white very coarse to very fine grained sand with white to black lignitic clay and silt. Lateral facies changes are common. The percentage of sand varies greatly over short distances and ranges from 20 to 80 percent. Clay content increases toward the Mississippi River and ranges in thickness from 5 to 25 feet. Sparta Sand where exposed is mantled by Pliocene gravel and Pleistocene loess. Outcrops of Sparta Sand are found in creeks and roadcuts between Mayfield Creek and West Fork Clarks River and between Mayfield creek and the Ohio River.

Well yields from the Sparta Sand aquifer are highly variable owing to facies changes. Wells that are completed in the portion of the aquifer that is largely sand may yield more than 1,200 gallons per minute. The yield decreases inversely with clay content. Average porosity of the Sparta Sand determined from samples collected by the US. Geological Survey is 42.8%.

ATTACHMENT 9:

WHPA DELINEATIONS

WHPA-1: The criteria for WHPA-1 is based on a 180 day time of travel (TOT) or 400 foot radius, whichever is larger. This area is delineated to protect against microbial contamination. The criteria is based upon survivability of viruses in groundwater which has been as long as 180 days according to U.S. EPA research. The 180 day TOT was determined by the volumetric flow equation method. Since the hydrologic parameters have been averaged only one calculation is necessary to describe both wells.

Q=pumping rate (ft³yr) H=column of water in well (ft) π=3.1416
n=aquifer porosity (%) t=time (yrs)

$$r = \sqrt{\frac{(Qt)}{(\pi nH)}}$$

Q=350 gpm H=268 ft. π=3.1416
n=0.428 t=0.5 yrs

Q=[(350 gpm)(.00223 ft³/sec)(86400 sec/day)(365 days/yr)]ft³/yr
Q=24,613,848 ft³

$$r = \sqrt{\frac{(24,613,848 \text{ ft}^3/\text{yr})(0.5 \text{ yr})}{\pi (0.428) (268 \text{ ft})}}$$

r=185 ft This zone defaults to a 400 feet fixed radius.

WHPA-2 The criteria for WHPA-2 is based upon the distance in which groundwater move within a ten year period. This area is delineated to protect against chemical and radiological contaminants from entering the wellfield and to allow for remedial measures in case of an incident. Since the hydrologic parameters have been averaged only one calculation is necessary to describe both wells.

Q=pumping rate (ft³/yr) H=column of water in well (ft) π=3.1416
 n=aquifer porosity (%) t=time (yrs)

$$r = \sqrt{\frac{(Qt)}{(\pi nH)}}$$

Q=350 gpm H=268 ft. π=3.1416
 n=0.428 t=10 yrs

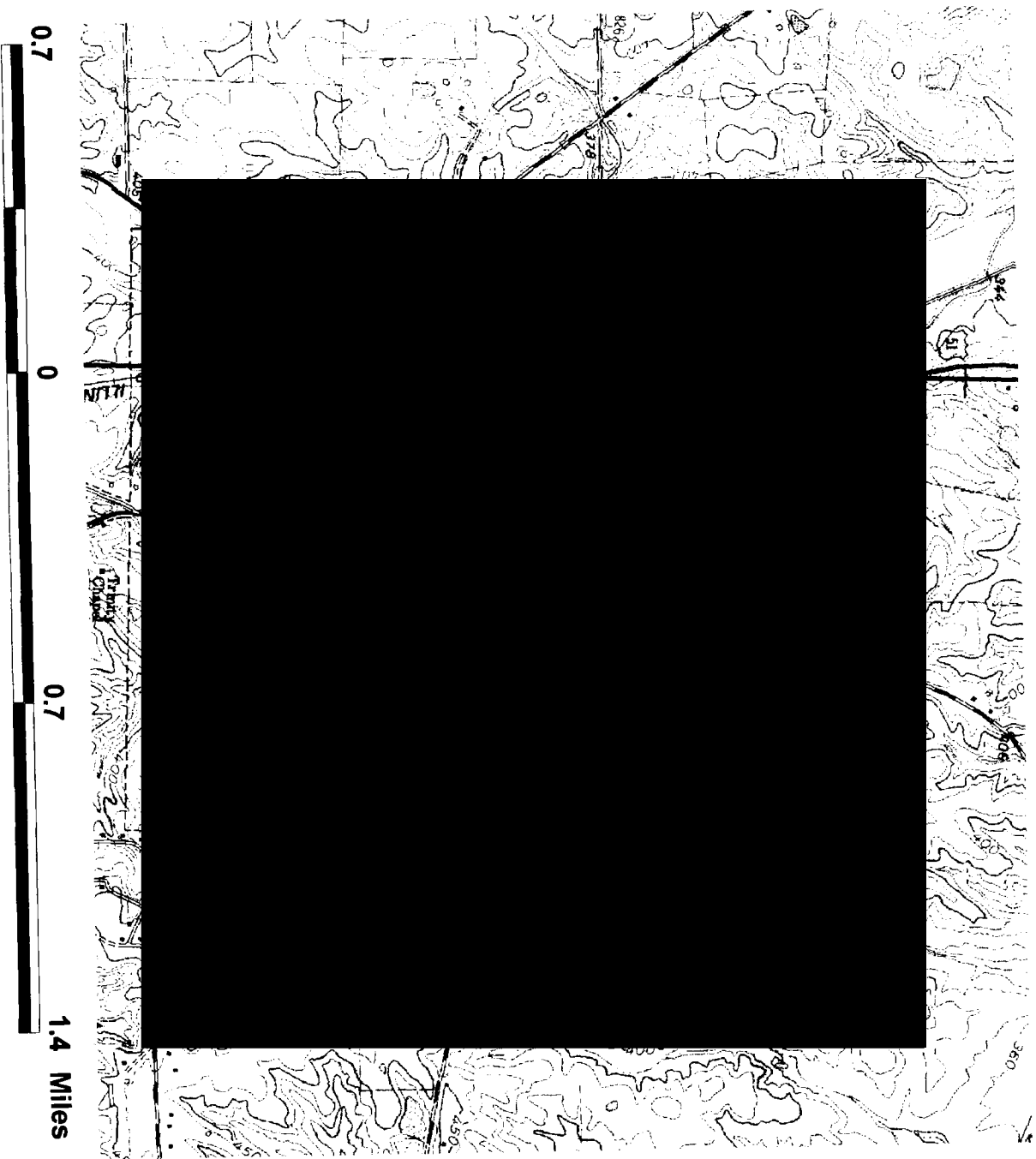
Q=[(350 gpm)(.00223 ft³/sec)(86400 sec/day)(365 days/yr)]ft³/yr
 Q=24,613,848 ft³

$$r = \sqrt{\frac{(24,613,848 \text{ ft}^3/\text{yr})(10 \text{ yr})}{\pi (0.428) (268 \text{ ft})}}$$

r=826 ft

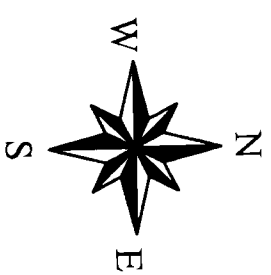
WHPA-3 The criteria for WHPA-3 is based upon the zone of contribution to the well field. This area is delineated to show the maximum area providing water to the wellfield so that future activities may be located outside the area. The zone of contribution was determined by using hydrologic mapping. This boundary is drawn from the Clinton Hydrologic Atlas (HA-175).

Wellhead Protection Area for US Utilities Inc.



- AKGWA 3-3887 and 3-38
- WHPA-1
- WHPA-2
- WHPA-3

Clinton 7.5' USGS map



Wellhead Protection Plan Phase II

For

**U.S. Utilities - Clinton
Hickman County, Kentucky**

RECEIVED

2000 FEB 23 PM 1:36

CLINTON COUNTY
DIVISION OF HEALTH

Prepared by the Kentucky Rural Water Association
In cooperation with the Kentucky Division of Water

*Kentucky
Rural Water
Association*

PART 2: PHASE 2

This document should be added to the approved Phase 1 (Part 1) WHPP document.

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Phase 2 Wellhead Protection Plan – Introduction

Public drinking water in the United States is considered among the safest in the world, however, its safety cannot be taken for granted. The increasing use of chemicals in the American landscape and an aging infrastructure produces new threats to our groundwater quality. The most common drinking water contaminants detected in Kentucky are:

- Bacteria (an indication that water may be contaminated with fecal matter)
- Turbidity or cloudiness (which can interfere with the treatment process and allow pathogens to survive)
- Trihalomethanes (organic chemicals created during the disinfection of water)
- Inorganics (includes nitrates and metals such as mercury and barium)¹

The goal of every public water system is to ensure that drinking water may be safely consumed, and that it meets federal and state Safe Drinking Water Act rules and regulations. The Wellhead Protection Plan (WHPP) assists water systems in meeting this goal through the completion of a potential contaminant source inventory of the Wellhead Protection Areas (WHPAs). This inventory identifies and locates all activities that might pose a threat to the groundwater. Once a water system understands the activities surrounding the water supply, management strategies may be implemented to reduce and prevent the future contamination of the water supply.

The benefits of wellhead protection to the community include reducing potential health risks by preventing groundwater contamination, avoiding clean-up expenses, and avoiding water-supply replacement costs. In addition, the community will become more aware of their source of water and how to protect it.

¹ Excerpted from: *1998-99 State of Kentucky's Environment, Charting a Path of Progress into the Next Century*, The Kentucky Environmental Quality Commission, May 1999.

System Information

Water Supplier: U.S. Utilities – Clinton

Contact Person: Bobby Yates, Jr.

Address: P.O. Box 178

Clinton, KY 42031

Phone #: (270) 653-3621

Fax #: (270) 653-4722

PWS ID#: 0530077 County: Hickman

Local Planning Representative: Joe Primicas

Address: Purchase Area Development District

PO Box 588

Mayfield, KY 42066

Phone: (270) 247-7171

System Certification

(TO BE COMPLETED BY PLANNING REPRESENTATIVE)

"I certify that this document and all attachments were prepared under my direction or supervision. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete."

Signature: *Bobby Yates, Jr.* Date: 10-27-00

Name (typed or printed): Bobby Yates, Jr.

Title: Manager

Attachment 11 - Susceptibility to Contamination

Groundwater can become contaminated from numerous types of land use activities and naturally occurring sources. Residential, industrial, commercial, municipal, and agricultural activities all have the potential to adversely affect groundwater quality. These potential sources may enter an aquifer from activities at the land surface such as infiltration from a chemical spill; from sources below the land surface but above the water table, such as a septic system; or from sources below the water table, such as waste injected into a well. A contaminated drinking water supply threatens public health as well as the local economy. Several communities in Kentucky have faced this problem. In most cases, the contamination could have been prevented or detected before the drinking water supply was compromised. The purpose of a contaminant source inventory (CSI) is to map the location of potential sources of contamination and determine the vulnerability of the aquifer to contamination.

Aquifer vulnerability is determined through a process called susceptibility analysis. A susceptibility analysis is performed to help communities gauge the threats posed to their water supply, and provide technical rationale for management strategies needed to protect their source of drinking water. The degree of susceptibility is related to three factors:

- 1) Contaminant source characteristics and threat to public health
- 2) Proximity of the potential contaminant source to the well
- 3) Hydrologic sensitivity of the aquifer.

Potential sources are numbered individually or by group and plotted as an overlay on the WHPA map. Each source is referenced to a chart that lists the nature of the source and its susceptibility to contaminate the aquifer. The following formula developed by the Kentucky Division of Water was used to calculate the risk associated with each potential contaminant source. Each factor is given a value of 1 to 3. The factors have been weighted in calculating the final susceptibility rating. For example: a fuel storage tank located in WHPA-1 will have a higher ranking than the same tank located in WHPA-3.

$$\text{Numeric Rating} = \text{"Contaminant Value"} \times 3 + \text{"Proximity Value"} \times 2 + \text{Hydrologic Sensitivity}$$

Susceptibility Ranking:	Numeric Rating < 10 = Low
	Numeric Rating 10 - 15 = Medium
	Numeric Rating > 15 = High

Inventory Method

The CSI was approached as a two step process:

- 1) Conduct a field survey of the protection areas to locate all potential sources of contamination.
- 2) Categorize the sources so that similar pollutants may be grouped together.

Potential sources are divided into “point” or “non-point” sources. Pollution from sources that are diffuse and do not have a single point of origin, such as agricultural runoff or septic system lateral fields, are classified as “non-point”. Point sources are those that release pollutants from a single outlet, such as a package wastewater treatment plant or a leaking fuel storage tank. Figure 1 depicts common land uses as possible sources of groundwater contamination and how they can enter an aquifer.

Grouping sources within close proximity to one another makes for cleaner maps and aids in developing a management strategy. Potential contaminant sources were plotted using ArcView® geographic information system software on an aerial photo base map or a digital topographic map.

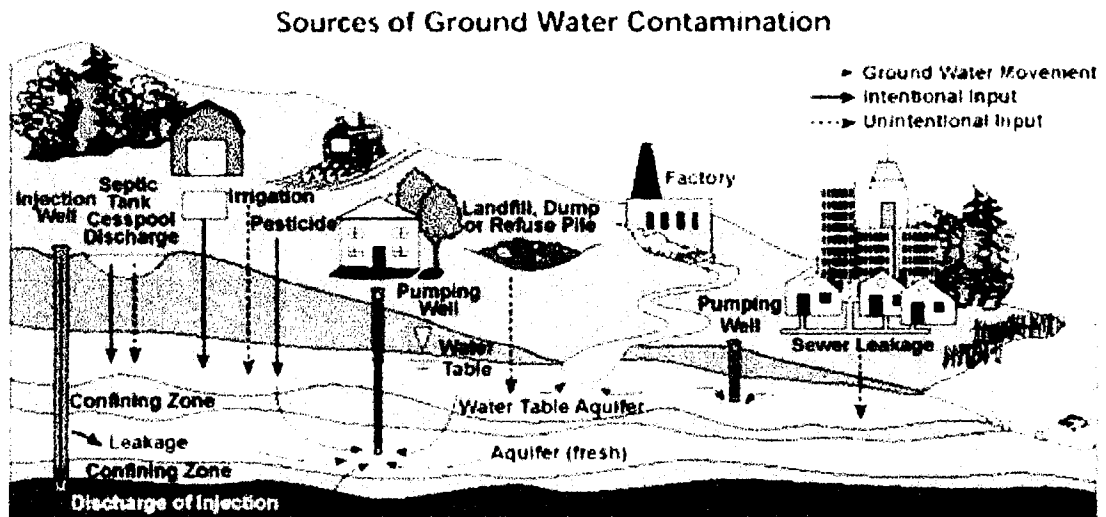


Figure 1. Common sources for groundwater contamination.

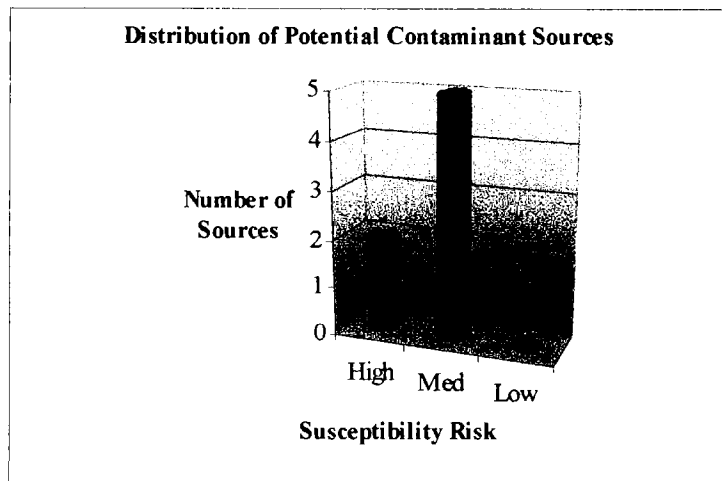
Susceptibility Determination

U.S. Utilities - Clinton withdraws water from two wells drilled nearly 300 feet deep into the Sparta Sand formation of the Claiborne Group. According to the Kentucky Division of Water's Guide for Wellhead Protection, the hydrologic sensitivity value for the aquifer rates as a one on a scale of one to three (three being the most sensitive). The wellhead protection area delineation was completed by the Kentucky Rural Water Association, and approved by the Kentucky Division of Water in 2000.

The delineated protection area covers approximately 177 acres located completely within the jurisdictional boundaries of the city. The surrounding area is primarily rural in nature composed of residential and commercial land use. The city provides sanitary sewer to the entire community thus reducing the potential for non-point source pollution.

Water quality results reveal that the drinking water supply is of very good quality only requiring aeration and chlorination for treatment. There is no indication that the aquifer is impacted at the present time by the existing land use activities.

A total of seven potential sources of contamination are located within the entire wellhead protection area. The majority of potential contaminant sources are classified as medium risk. The chart to the right visually displays the distribution of sources relative to their risk ranking.



The sanitary sewer collection system and the railway are the only high-risk threats to the aquifer. The sewer system crosses through all three wellhead protection areas and therefore was designated overall as a high risk. The remaining potential contaminant sources are ranked as medium risk most of which are fuel storage tanks located within WHPA 2 and 3. There are no low risk sources.

The susceptibility analysis suggests the aquifer's vulnerability to contamination to be a medium risk. This risk ranking is influenced by the low sensitivity rating of the aquifer, the nature of the potential contaminant sources, and historical water quality results.

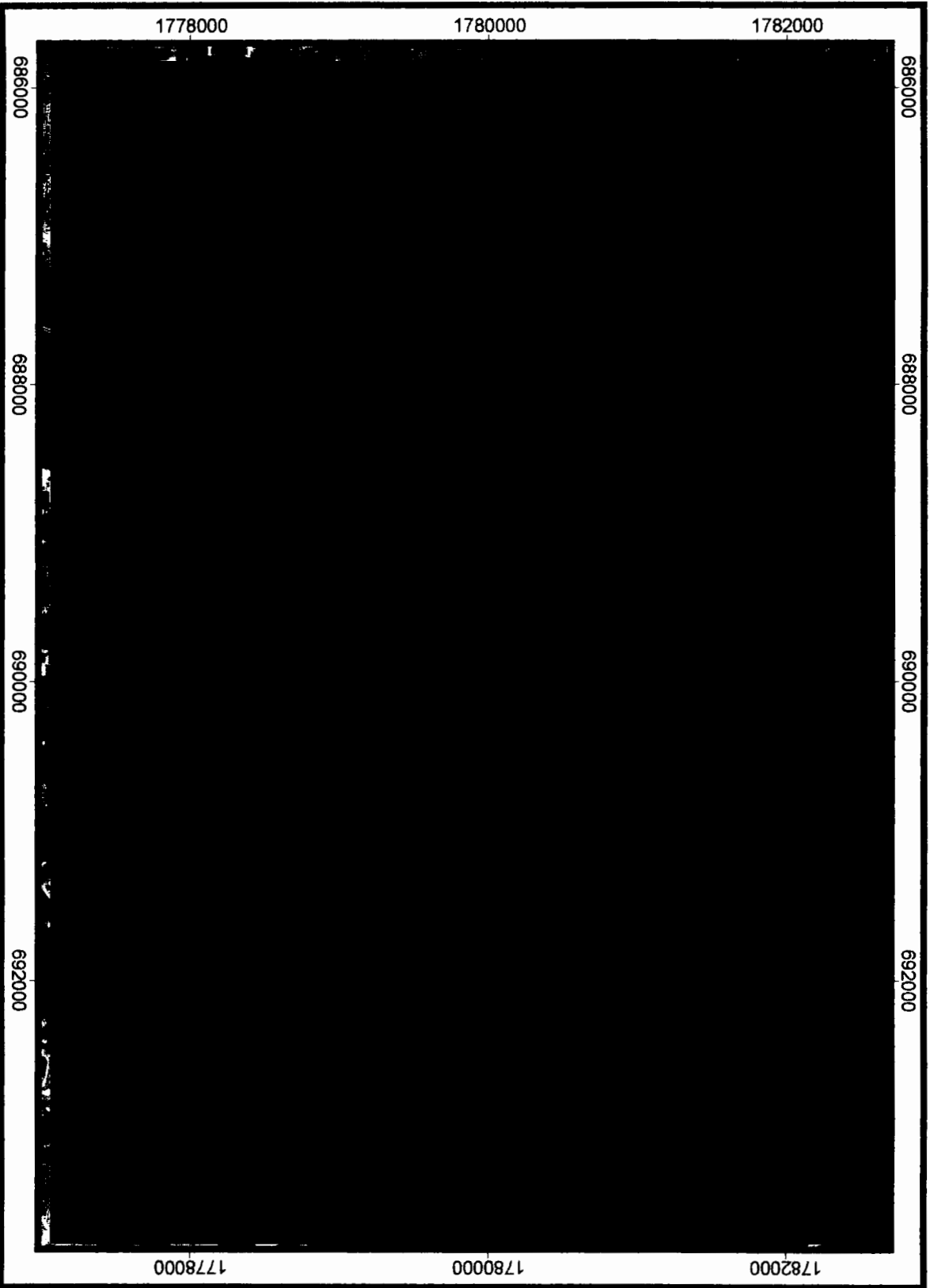
**US Utilities – Clinton Water System
Contaminant Source Inventory and Susceptibility Analysis**

ID	Contaminant Source/Land Use	Contact Address	Quantity	WHPA	Contaminant Value	Proximity Value	Hydrologic Sensitivity	Numeric Rating	Susceptibility Ranking
1	Railway	ICG Rail Road Station Master, Fulton, KY	1	1	3	3	1	16	High
2	Abandoned UST	Shell Service Garage, 305 N. Washington St., Clinton, KY 42031	1	2	3	2	1	14	Med
3	UST	Boaz Conoco 224 N. Washington St., Clinton, KY 42031	1	2	3	2	1	14	Med
4	UST	Jiffy Mart 225 N. Washington St. Clinton, KY 42031	1	2	3	2	1	14	Med
5	Service garage and AST	Hickman CO. Schools, Rt 3, Clinton, KY 42031	2	3	3	1	1	12	Med
*	Sanitary Sewer Collection System	US Utility - Clinton, PO Box 178, Clinton, KY 42031	1	1	3	3	2	17	High

High
 Med
 Low

* Source is calculated in the susceptibility analysis but not numbered on the map. This source is discussed in the document.

U.S. Utilities - Clinton Contaminant Source Inventory Map



- Well
- Pollution Sources
- Water Table Contour
- WHPA-1
- WHPA-2
- WHPA-3



Attachment 12 - Management Strategies

The purpose behind managing a wellhead protection area is to minimize the impact of land uses that threaten the quality and quantity of the public's drinking water supply. The underlying theme is simply to prevent pollution. Preventing pollution is the key to keeping groundwater supplies safe and to protect public health. Once a drinking water supply becomes contaminated, the community is faced with the difficult and costly task of installing additional treatment facilities or locating an alternate source.

Virtually all man-made land use activities have the potential to degrade groundwater quality. There are numerous factors that control the impact of land uses upon groundwater. The two most prominent factors are the geology of the area and the type of land use. The geology controls the direction and rate that a contaminant can travel, whereas the land use dictates the quantity and toxicity of the contaminant. This means that a particular land use in a less sensitive geologic setting may never significantly impact groundwater quality, but the same land use in a geologically sensitive setting can render groundwater unusable for human consumption. This is why a management plan must be tailored to each public water system. The overall strategy of the management plan is to minimize the impact of the threats identified in the contaminant source inventory through regulatory and/or non-regulatory means.

Management Strategies

The US Utilities – Clinton public water system being a private corporation does not have the jurisdictional authority to control/ regulate contaminant sources within the protection areas other than those located within their respective property boundaries. Those sources beyond the legal boundary of the water system can only be directly controlled through local ordinances and existing state and federal regulatory programs. Therefore, the management strategy for protecting the drinking water supply will combine regulatory compliance, public education, and groundwater monitoring. The rationale for this decision is that all of the potential pollution sources identified through the contaminant source inventory are subject to Groundwater Protection Planning regulations (401 KAR 5:037). To achieve environmental compliance and protect the drinking water supply a public education program needs to be developed that informs the surrounding landowners of their legal responsibility. The goal of the management plan is to involve the community in protecting their sole source of drinking water. These strategies should provide an efficient cost-effective means of reducing potential threats of contamination and educate the community as to the importance of their role in maintaining a safe water supply.

Regulatory Management Strategy:**Compliance with Groundwater Protection Planning Regulations**

US Utilities - Clinton will develop a groundwater protection plan. The plan will address the operation of the community water wells and the municipal sewer system.

Non-Regulatory Management Strategies:**Public Education and Awareness:**

- 1) Post road signs along transportation corridors that cross the protection area.
- 2) Provide information and contact names to those businesses that would need to develop a groundwater protection plan.
- 3) Coordinate with county DES and local volunteer fire departments to notify the water system of any environmental threat that occurs within the protection area.
- 4) Bolster public awareness through the annual Consumer Confidence Report (CCR) publication. The CCR gives the utility a platform from which all of the customers will be notified that a Wellhead Protection Plan has been developed to protect their drinking water supply from becoming contaminated.

Monitoring Program:

Continue to participate in the "Ambient Groundwater Monitoring Program" sponsored by the Kentucky Division of Water.

Attachment 13 - Contingency and WHP Planning

Contingency planning is important for all systems. Even with careful planning unforeseen contamination can occur due to leaks, spills accidental releases, illegal discharges and other activities in the protection areas. A contingency plan helps ensure the community is prepared to respond to emergency situations and able to provide an alternate water supply if necessary.

Schedule for Update and Review

Contingency plans will likely fail if they are not updated on a routine basis. Therefore, the entire wellhead protection plan will be reviewed annually and be updated as needed.

Future Problems and Solutions

There are two areas of concern based upon the contaminant source inventory that have the potential to contaminate the wellfield. They are the railway and underground storage tanks. The underground storage tanks are of lesser concern since they are regulated by the KY Division of Waste Management. Proper planning and training on the part of the Hickman County Disaster and Emergency Services (DES) can minimize contaminant threats imposed by the railway.

Alternate Water Supplies

If contamination occurs, depending on the nature and extent of the contaminant, long and short-term contingency plans should be in place. Long-term contingency plans include modification of their treatment process, drill new water supply wells, or purchasing water from a nearby utility. Short-term contingency plans include health notification to customers and/or hauling drinking water from outside sources.

Emergency Response Phone List

Local Emergency Response

Fire Department	(270) 653-2531
Police Department	(270) 653-5871
Local Emergency Dispatch	911
Hickman County DES	(270) 653-4360

State and Federal Assistance

Kentucky DES	(502) 564-7815
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State and Federal Assistance continued:

Kentucky Division of Water	(502) 564-3410
Kentucky Division of Water, Paducah	(270) 898-8468
Kentucky Environmental Response Team	(502) 564-2380 or (800) 928-2380 24-hour response line
Kentucky State Fire Marshall	(502) 564-3626
National Response Center	(800) 424-8802

Additional Resources

Kentucky Rural Water Association	(270) 843-2291
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Procedures for Public Notification

In the event of an emergency to the water system that would threaten the health or life of the public, the following procedures should be followed. Prepare a brief statement concerning the nature of the emergency and directions to the public.

1. Contact local radio stations:
2. Contact local television stations:
3. Contact local newspaper:

Attachment 14 - Public Notification

Keeping the public informed and involved with wellhead protection efforts is an important step in completing the wellhead protection plan. Wellhead protection areas often encompass residential, agricultural, and industrial areas. In order to protect the groundwater source, it is necessary to inform the public that they might be within the limits of the protection area, and to be aware of activities that occur on their property that might affect the groundwater.

The water system is required to notify their customers of all the wellhead protection public meetings. Most notification procedures require the water system to publish the public notice in the local newspaper two weeks prior to the scheduled meeting. However, smaller systems, such as trailer parks or schools can post or hand deliver the public notice to their customers. Each water system should make an effort to involve their customers in the planning process.

Public Notice – see following page

OUT IN THE CLASSIFIEDS

WANTED

now taking applica-
registered nursing
lift. If interested in
apply in person at
rising Home, 1004
n, Ky.

mediate job open-
eding or fieldwork.
en. Experience pre-
son experience and
10 or 655-2028.

perienced Travel Agent
Please call CBK
Susan 901-885-9545

FOUND

with fishing tackle.
Columbus Park and
11 Darrell Kelly 653-

ESTATE

er: 2.5 acres in Clin-
& Ky. Hwy. 123. All
jeal commercial site.
st Realty at 302-633-

NOTICE

NOTICE OF PUBLIC MEETING

U.S. Utilities, Inc. of Clinton has completed the groundwater protection phase of water supply planning in accordance with 401 KAR 4:220. This regulation requires all public water suppliers utilizing groundwater to submit to the Kentucky Division of Water a plan to protect this resource.

The purpose of developing a well-head protection plan is to prevent groundwater contamination before it occurs. By taking this proactive approach the water utility can continue to protect public health as well as minimize water treatment costs.

Representative from the Water Utility and the Kentucky Rural Water Association will present the Phase II results of the wellhead protection planning process and discuss the procedures for its implementation. Your ideas and comments on protecting your water supply are greatly appreciated. The meeting will be held on Wednesday, May 10, 2000 at 6:00 PM at the water utility office, 100 Jackson Street, Clinton, Ky.

U-571

Fri: 4:30/7:00/9:15 **PG-13**
Sat: 2:00/4:30/7:00/9:15
Sun: 2:00/4:30/7:00 • M-Th: 7:30

FREQUENCY

Fri: 4:45/7:15/9:30 **PG-13**
Sat: 2:30/4:45/7:15/9:30
Sun: 2:30/4:45/7:15 • M-Th: 7:30

GLADIATOR

Fri: 7:15 **R**
Sat: 2:50/7:15
Sun: 2:30/7:15 • M-Th: 7:00

FLINTSTONES IN VIVA

ROCK VEGAS **PG**

Fri: 4:45/7:15/9:15
Sat: 2:30/4:45/7:15/9:15
Sun: 2:30/4:45/7:15 • M-Th: 7:00

WHERE THE HEART IS

Fri: 4:30/7:00/9:30 **PG-13**
Sat: 2:00/4:30/7:00/9:30
Sun: 2:00/4:30/7:00 • M-Th: 7:15

I DREAM OF AFRICA

Fri: 4:30/7:00/9:15 **PG-13**
Sat: 2:00/4:30/7:00/9:15
Sun: 2:00/4:30/7:00/M-Th: 7:15

PLAYDATES 5/5/2000 - 5/11/2000
County Marketplace • Hwy 51S •
Union City, TN



Attachment 15 - Public Meeting

The Wellhead Protection Plan is a public document and must be made available to the public. Minutes of the scheduled wellhead protection meeting are taken, to keep those who could not attend the meeting informed of public comments and discussions.

Minutes and Comments

A public meeting was held on May 10, 2000 for the water utility to present their final wellhead protection. The public notice was published in the May 4th edition of the "Hickman County Gazette". Attendees include planning team members and a representative of the Kentucky Rural Water Association.

The purpose of the May 10, 2000 public meeting was for the wellhead protection planning committee to present their final wellhead protection plan as required by the Kentucky Division of Water.

Beginning at 6:00PM, Joe Burns of the Kentucky Rural Water Association presented the final document and discussed the purpose for developing a wellhead protection plan. This included discussing potential contaminant sources, proposed management strategies, and contingency plans.

The public meeting adjourned at 7:00PM.

Record of Attendance

**U.S. Utilities-Clinton
Phase II Public Meeting
May 10, 2000**

Name (print)	Representing
<i>Bobby Yates Jr.</i>	<i>U.S. Utilities</i>
JOHN D TURNER	U.S. UTILITIES
JOE BURNS	KRWA

Attachment 16 - Implementation Schedule

In order to fulfill the goal of wellhead protection the following implementation schedule is provided. The schedule works as a timeline to ensure the customers of the Water District will continue to be proactive in protecting public health.

Within six months after approval of Phase II:

- 1) Complete a groundwater protection plan for the wells and sanitary sewer.
- 2) Request groundwater/wellhead protection area road signs from the Kentucky Division of Water.
- 3) Provide information to local emergency response personnel.

Within one year after approval of Phase II:

- 4) Request groundwater protection plans from entities identified in the contaminant source inventory.

Every year:

- 5) Complete review and update of the entire wellhead protection plan.
- 6) Utilize the annual Consumer Confidence Report to inform customers of the approved Wellhead Protection Plan and susceptibility determination.

Every five years:

- 7) Update and re-certify wellhead protection plan with the Division of water.

Contingency Plan

Source Water/Wellhead Protection Contingency Plan for Providing Alternative Drinking Water Supplies

For

Water Service Corporation of Kentucky
Public Water System
PWS I.D. # KY0070282

Primary Contact: James Leonard
(See Section 6 for additional contacts)

Title: Regional Manager

PO Box 818 Middlesboro, Ky. 40965
Address

Work phone: 606-248-5730 Home phone: 276-4 [REDACTED]

Date of Plan: 9-1-09

Review and Update Annually

Date Reviewed	Reviewer	Changes or Comments

CONTENTS

Section 1	PURPOSE AND AUTHORITY FOR THE CONTINGENCY PLAN
Section 2	DESCRIPTION OF THE WATER SYSTEM
Section 3	SUMMARY OF POTENTIAL SOURCES OF CONTAMINATION
Section 4	ALTERNATIVE WATER SUPPLY OPTIONS
Section 5	PRIORITY WATER USERS AND CONSERVATION MEASURES
Section 6	NOTIFICATION ROSTER, PHONE NUMBERS, AND PLAN DISTRIBUTION
Section 7	PUBLIC EDUCATION/MEDIA RELATIONS
Section 8	EVENT AND ACTION LOG
Appendices	<i>The following items may be appended to the plan as needed.</i>
	A. MAP OF THE WATER SYSTEM
	B. TYPICAL BOIL WATER NOTICE
	C. LIST OF EMERGENCY EQUIPMENT AVAILABLE OR NEEDED TO IMPLEMENT ANY OF THE ALTERNATIVE WATER SUPPLY OPTIONS AND THE LOCATION OF THE EQUIPMENT
	D. REFERENCES

Section 1

PURPOSE AND AUTHORITY FOR THE CONTINGENCY PLAN

The purpose of this contingency plan is to establish and to keep up to date the procedures necessary to utilize alternative water supply sources in the event of the contamination or loss of the existing sources.

The plan was produced as part of the five step planning process as developed by the U.S. Environmental Protection Agency and the National Rural Water Association under the Wellhead Protection Program of the Safe Drinking Water Act.

A Comprehensive Wellhead Protection plan includes the following 5 steps:

- Step 1 Select a planning team
- Step 2 Define the wellhead protection area
- Step 3 Identify sources of contamination
- Step 4 Manage sources of contamination
- Step 5 Plan for the future and develop a contingency plan

This plan is designed to meet the requirements as specified in Step 5. It is not designed to fulfill the requirements of a more comprehensive public water supply emergency operating plan that would be designed to deal with a wide array of emergencies beyond the contamination of existing sources.

Section 2

DESCRIPTION OF THE WATER SYSTEM

Basic Water System Information

Name of System: Water Service Corporation of Kentucky

Population Served: 16,500

Number of Service Connections 5830

Average Daily Demand 1,300,000 Maximum Daily Demand 1,600,000

Sources of Supply

Wells or Springs: NONE

Name Name of Lake				
Depth (ft.)				
Diameter (in.)				
Latitude				
Longitude				
Capacity in gpm				
Treatment				

Surface: Fern Lake

Name			
Capacity			

Interconnections with other Public Water Systems: Pineville City Utility

Storage of Finished Water:

Name of Storage Facility	#1 Storage Tank	#2 Storage Tank	Other Finished Water
Location			
Capacity in Gallons			

Sources of Power: _____

Actual Location of System Maps and Records _____

Section 3

SUMMARY OF POTENTIAL SOURCES OF CONTAMINATION

A. Potential Sources of Contamination-

[REDACTED]

B.

[REDACTED]

C. Source Water Assessment-

[REDACTED]

D. Spill Response Activities-

[REDACTED]

Section 4

ALTERNATIVE WATER SUPPLY OPTIONS

A. Procedure for Evaluating Alternative Water Supply Options: An alternate water source exists between Water Service Corp. of Ky. and Pineville Utilities. This connection could be utilized to provide water to the city of Middlesboro. The Division of water could be contacted and with their approval the connection could be reversed to provide water to Middlesboro.

B. Alternative Water Supply Options:

-
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Section 5

PRIORITY WATER USERS AND CONSERVATION MEASURES

A. List major water users and sensitive water users and assign a priority to their use of water.

- -
 -
 -
 -
 -
 -
 -
 -
 -
- 

C. Select conservation measures to be implemented in the event of the need to reduce demand.

- Curtail use by larger users – All non-essential water use can be reduced or stopped for the period of the water contamination. Non Essential use includes Fire department drills, outdoor watering, failure to control water loss due to leaks and car washes.
- Reduce pressure – Some customers in high areas of the system could experience low pressure due to lower than normal storage tank levels.
- Implement metering program – All customers will be entitled to a curtailment of water all excessive use will be billed a normal fee of \$24.00 per 1000 gallons.
- Mandatory water conservation measures – will be enforced by Water Service Corporation of Ky. operators. Any excessive use of water will be billed a normal \$24.00 per 1000 gallons and could led to disruption of service.
- Public education – will be through customer service, the local media including newspaper, television and radio. Also by door to door operator visits.

Section 6

**NOTIFICATION ROSTER, PHONE NUMBERS,
AND PLAN DISTRIBUTION**

Organization	Contact Person	Received Copy of Plan Y/N*	Home Phone	Work Phone	24 Hour Emergency Phone
Water System Management and Employees	James Leonard	Y	276-445-████	606-248-5730	269-████
Community Offices and Officials	Ben Hickman /Mayor	N	606-248-████	606-248-4575	
Police	Jeff Sharp/police Chief	N	606-248-3636	606-248-3636	
Fire	Tim Wilder/ Fire Chief	N	606-242-████	606-248-4683	
State Primacy Agency	Keith Grubb	N	800-928-████	606-873-0157	
State Officials	Julia Roney	N	502-564-3410		
County Officials	County Judge Executive	N	606-337-████		
Schools	Darryl Wilder Supt. Gateway Christian Julian's Catholic school	N N N	606-248-████ 606-248-████ 606-248-████	606-248-5040	
Power Company	Kentucky Utilities	N	800-982-0600		
Telephone Company	Bell South ATT	N	800-252-0803		
Key Vendors	Brenntag ADC Nick-Chem	N	800-234-5236 888-542-8561 270-576-5000		
Military	National Guard	N	606-248-4979		
Civil Defense	Westmoreland	N	615-694-████		
Federal Disaster Assistance	Tim Radar	N	606-337-████		
Hospital	Middlesboro ARH	N	606-242-1100		
Ambulance	Ambulance Service	N	606-248-2121		
State Rural Water Association	Ky. Rural Water Assoc	N	270-843-2291		
Nearby Water Systems	Pineville Utility	N	606-337-6613		
Others					

Section 7

PUBLIC EDUCATION / MEDIA RELATIONS

A. Primary spokesperson for the media and public comment in the event of a contamination incident.

Name James Leonard

Title Regional Manager

Address 1221 East Cumberland Ave. Middlesboro, Ky. 40965

Home Phone 276-445-██████ Work Phone 606-248-5730

B. Information checklist to be conveyed to the public and media

- Name of water system Water Service Corporation of Kentucky
- Contaminant of concern and date _____
- Source of contamination _____
- Public health hazard _____
- Steps the public can take _____
- Steps the water system is taking _____
- Other information _____

C. Media Contacts

- Newspaper
Name Middlesboro Daily News
Address 110 North 11th St.
Phone 606-248-1010
- Television
Name WYMT
Address Hazard, Ky.
Phone 606-248-5757
- Radio
Name WXJB
Address Middlesboro, Ky.
Phone 606-248-0001
- Other (list)

Section 8

EVENT AND ACTION LOG

- Type of Event to be Logged *(i.e. Actual implementation of an alternative water supply option, emergency, training, simulation of this plan, other. Experiences prior to the development of this plan in implementing alternative water supplies or in spill response may also be included.)*

- Date _____

- Time _____

- Action Taken _____

- Evaluation _____

- Costs *(system's own forces)*

- Labor _____

- Equipment _____

- Materials _____

- Contract Services _____

(i.e. This type of information may be needed in the event that the water system attempts to receive federal/state emergency relief funding assistance).

APPENDICES

- A. MAP OF THE WATER SYSTEM
- B. TYPICAL BOIL WATER NOTICE
- C. LIST OF EMERGENCY EQUIPMENT AVAILABLE OR NEEDED TO IMPLEMENT ANY OF THE ALTERNATIVE WATER SUPPLY OPTIONS AND THE LOCATION OF THE EQUIPMENT
- D. REFERENCES
 - 1. GUIDE TO GROUND WATER SUPPLY CONTINGENCY PLANNING FOR LOCAL AND STATE GOVERNMENTS, USEPA WASHINGTON, D.C. (MAY, 1990). AVAILABLE FROM ERIC CLEARINGHOUSE, COLUMBUS, OH. 1-800-276-0462 (PUB #G-647).
 - 2. WELLHEAD PROTECTION: A GUIDE FOR SMALL COMMUNITIES. USEPA WASHINGTON, D.C. (FEB., 1993) (PUB #EPA/625/R-93/002).
 - 3. EMERGENCY MANAGEMENT MANUAL FOR RURAL WATER ASSOCIATIONS AND UTILITIES, NATIONAL RURAL WATER ASSOCIATION, DUNCAN, OK. (1996).
 - 4. EMERGENCY OPERATIONS PLANNING MANUAL, MISSOURI RURAL WATER ASSOCIATION, COLUMBIA, MO.
 - 5. CONTINGENCY PLAN GUIDE WATER DELIVERY, OKLAHOMA RURAL WATER ASSOCIATION, OKLAHOMA CITY, OK. (1992).



**Groundwater Protection Plan
Clinton Water Treatment Plant**

PWSID: KY0530077

Clinton, KY 42031

1. General Information

A. Location:

Facility Name: Clinton Water Treatment Plant

Facility Address: 414 Short Street, Clinton, KY 42031

Person responsible for implementing the groundwater protection plan (GWPP):
Mr. Mike Pickard, Area Manager

The Clinton Water Treatment Plant is located approximately one mile from the Court Square on the North side of Clinton KY. Elevation of the Clinton Water plant is 356 feet. The Clinton Water Plant treats groundwater from the Memphis Aquifers producing potable water to serve approximately 700 residential and commercial customers representing a population of approximately 3000 people.

The average daily production is 110,000 gallons. The designed maximum flow is 864,000 gallons per day. The process units at the Clinton Water Plant include the following: Two well pumps, Two high service pumps, Chemical addition of 12% Sodium Hypochlorite and 23% Fluorosilicic Acid, and a 30,000 gallon clear well to include a stainless steel tray aerator.

B. Subsurface Conditions:

Soil in the area consists of silts and clays.

C. Site Geology:

The Water Treatment Plant is located in the area characterized by formation that consists of clay and siderite. The area also consists of siltstone and shale.



2. Regulated Activities

The Kentucky Natural Resources and Environmental Protection Cabinet (Division of Water) developed regulations to protect the waters of the Commonwealth and to prevent pollution of waters of the Commonwealth. Regulation 401 KAR 5:037 establishes the requirements to prepare and to implement groundwater protection plans to ensure protection for all current and future users of groundwater and to prevent groundwater pollution. Refer to Regulation KAR: 5:037.

The following areas are regulated activities for the Water Treatment Plant:

- A. Floor Drains within the Water Treatment Plant
- B. Fluoride – Chemical room
- C. Chlorine Bleach – Chemical room
- D. Process Units - Clear Well - This unit was designed by a professional engineer and approved by the KY Division of Water. A GWPP is required per 401 KAR 5:037.

3. Unregulated Activities

- A. Piping systems and valve vaults are located at various areas around the property. This activity is exempted per 401 KAR 5:037.
- B. Water lines serving the City of Clinton are exempt per 401 KAR 5:037.
- C. Hydrofluorosilicic acid is stored in a contained area in a room separated from all. All spills would be contained. This area is exempted per 401 KAR 5:037.
- D. Chlorine distribution lines are located at the facility. Chlorine is in a liquid solution (sodium hypochlorite) and should not impact the groundwater. This area is exempt per 401 KAR 5:037.

4. Groundwater Protection Practices

- A. Floor Drains:
All Floor Drains connected to the on-site sewer system should be checked daily.
- B. Visually inspect Clear Well on a weekly basis.
- C. Chlorine storage: visually inspect the chlorine cylinders for leaks and cracks on a regular basis. A spill kit, absorbent material, broom, shovel, should be readily accessible should a spill occur.



- D. Loading and Unloading Areas: A spill kit should be ready accessible should a spill occur.
- E. Process Units: visually inspect all process units on a weekly basis for cracks or leaks. (pumps, pipes, chlorine analyzer, etc.)

5. Training Schedule

Two weeks after finalization of the GWPP:

Conduct a training session for employees to advise of the GWPP's provisions and implementation schedules. Instruct employees to comply with recommendations listed in this plan.

Annually:

Re-train employees every year in spill response and routine inspection procedures. Training will be conducted in-house and all participants will sign a roster to verify the date and time of training.

As Needed:

Employees will be trained as other GWPP practices are implemented. New employees will receive formal GWPP training within 30 days of the date of their employment.

6. Inspection Schedule

Inspect on a daily, weekly, and/or monthly basis according to this plan's Groundwater Protection Practices to insure all GWPP regulations are followed.

7. Certification

I, Mike Pickard, have reviewed and fully understand the terms of the Groundwater Protection Plan and will implement its provisions. (Review and recertification is due every 3 years.)

Signature

Date



Groundwater Protection Plan Inspection

Clinton Water Treatment Plant

PWSID: KY0530077

Clinton, KY 42031

A. Floor Drains:

1. Have all floor drains connected to the on-site sewer collection system been plugged or covered?
Yes or No? _____
If No, what corrective actions were taken? _____

B. Chlorine Storage:

1. Are the Chlorine Storage Tanks cracked or leaking? Yes or No? _____
If Yes, what Corrective Actions were taken? _____
2. Are spill kits readily accessible? Yes or No? _____
If No, what corrective actions were taken? _____

C. Fluoride Storage:

1. Are the Fluoride Storage tanks cracked or leaking? Yes or No? _____
If Yes, what Corrective Actions were taken? _____
2. Are spill kits readily accessible? Yes or No? _____
If No, what corrective actions were taken? _____

D. 30,000 gallon Clear Well:

1. Is the 30,000 gallon Clear Well tank cracked or leaking? Yes or No? _____
If Yes, what Corrective Actions were taken? _____

E. Chemical Loading/Unloading Area:

1. Are spill kits readily accessible? Yes or No? _____
If No, what corrective actions were taken? _____

F. Process Units (pumps, pipes, chlorine analyzer, etc.):

1. Are any process units cracked or leaking? Yes or No? _____
If Yes, what Corrective Actions were taken? _____

Inspection Signature / Date: _____

GROUNDWATER PROTECTION PLAN

MIDDLESBORO WATER PLANT
MIDDLESBORO, KENTUCKY

PREPARED FOR:

AQUA/KWS, INC.
LEXINGTON, KENTUCKY

PREPARED BY:

HOWARD K. BELL, CONSULTING ENGINEERS, INC.
LOUISVILLE, KENTUCKY

APRIL 1996

Updated 2011



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LIST OF ATTACHMENTS

- ATTACHMENT NO. 1 - SITE SKETCH
- ATTACHMENT NO. 2 - GROUNDWATER PROTECTION REGULATIONS
- ATTACHMENT NO. 3 - GROUNDWATER IMPLEMENTATION SCHEDULE
- ATTACHMENT NO. 4 - GENERIC GROUNDWATER PROTECTION PLAN (SEPTIC TANK)

**GROUNDWATER PROTECTION PLAN
MIDDLESBORO WATER PLANT
FERN LAKE ROAD
MIDDLESBORO, KENTUCKY**

1. GENERAL INFORMATION

A. Location

Facility Name: Middlesboro Water Plant

Facility Address: Fern Lake Road
Middlesboro, Kentucky
Bell County

Person responsible for implementing the groundwater protection plan (GWPP): ~~Mr. Wil Jackson~~ *James Leonard*
Title: ~~Manager~~ *Regional Manager*

The Middlesboro Water Plant is located on a ridge approximately 242 feet (1382' MSL elevation) above the town of Middlesboro, Kentucky. The Middlesboro Water Plant treats water from Fern Lake, producing potable water to serve 5,915 residential and commercial customers representing a population of about 16,500 people.

The average daily production is 1.3 mgd, and is designed for a maximum flow of 3.0 mgd. The process units at the Middlesboro Water Plant include the following: two raw-water pumps, three high service pumps, a quick mix, one flocculation basin, a settling basin (with tube settlers), two mixed media high-rate filters, and two-1.3 million gallon aboveground clearwells. The system is completely gravity fed from these two storage tanks. Chlorine gas, hydrofluorosilicic acid, potassium permanganate, cationic polymer, and lime are fed in the treatment process.

Refer to Attachment No. 1 for the site sketch.

B. Subsurface Conditions

Soils in the area consist of the Gilpin-Shelocta-Sequoia complex.

These soils consist of moderately deep to very deep, well drained, steep and very steep soils on ridgetops, mountain crests, and the upper side slopes in the mountains. In most areas the elevations range from about 1,800 to 2,200 feet and are about 600 to 800 feet above the valley floor. Stones and boulders



Groundwater Protection Plan
Clinton Water Treatment Plant
PWSID: KY0530077
Clinton, KY 42031

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I, Mike Pickard, have reviewed and fully understand the terms of the Groundwater Protection Plan and will implement its provisions. (Review and recertification is due every 3 years.)

Signature

Date



401 KAR 5:037. Groundwater protection plans.

RELATES TO: KRS 151.110, 151.232, Chapter 224, SB 241

STATUTORY AUTHORITY: KRS 224.01-010, 224.10-100, 224.70-100, 224.70-110

NECESSITY, FUNCTION, AND CONFORMITY: KRS Chapter 224 requires the cabinet to adopt administrative regulations to protect waters of the Commonwealth and to prevent pollution of waters of the Commonwealth. This administrative regulation establishes the requirement to prepare and to implement groundwater protection plans to ensure protection for all current and future uses of groundwater and to prevent groundwater pollution.

Section 1. Definitions. The following definitions describe terms used in this administrative regulation. Terms not defined below shall have the meanings given to them by KRS 224.01-010 or if not so defined, the meanings attributed by common use.

(1) "Abandoned well" means a well not currently in use and not intended for future use.

(2) "Agriculture operation" means any farm operation on a tract of land, including all income-producing improvements and farm dwellings, together with other farm buildings and structures incident to the operation and maintenance of farms, situated on ten (10) contiguous acres or more of land used for the production of livestock, livestock products, poultry, poultry products, milk, milk products, or silviculture products, or for the growing of crops such as, but not limited to, tobacco, corn, soybeans, small grains, fruit and vegetables; or devoted to and meeting the requirements and qualifications for payment to agriculture programs under an agreement with the state or federal government.

(3) "Best management practices" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the Commonwealth. Best management practices also include treatment requirements, operating procedures, and practices to control plant site run-off, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

(4) "Bore hole" means a hole drilled into the soil for exploratory or sampling purposes.

(5) "Bulk quantities" means undivided quantities of any substance equal to or greater than fifty-five (55) U. S. gallons liquid measure or 100 pounds net dry weight transported or held in an individual container.

(6) "Commercial" means services at stores, offices, restaurants, warehouses, and other service and nonmanufacturing activities, excluding households and industries.

(7) "Container" means any portable enclosure in which a material is stored, transported, treated, disposed, or otherwise handled.

(8) "Core hole" means a hole drilled for the purpose of obtaining a rock sample.

(9) "Corrective action" means an activity or measure taken to remedy groundwater pollution.

(10) "Floor drain" means an opening in the floor used to collect spills, water, or other liquids.

(11) "Generic groundwater protection plan" means a groundwater protection plan that can be applied to activities conducted at different locations because the activities are substantially



identical and because the potentials of the activities to pollute groundwater are substantially the same.

(12) "Groundwater" means the subsurface water occurring in the zone of saturation beneath the water table and perched water zones below the B soil horizon including water circulating through fractures, bedding planes, or solution conduits.

(13) "Groundwater pollution" means water pollution as defined in KRS 224.01-010 of groundwaters of the Commonwealth.

(14) "Groundwater protection plan" means a document that establishes a series of practices designed to prevent groundwater pollution.

(15) "Hydro geologic sensitivity" means an assessment of the potential ease and speed of vertical infiltration or recharge of a liquid through the soil and the unsaturated zones combined with assessments of the maximum potential flow rate and dispersion potential after entry into the principal or uppermost saturated zone.

(16) "Industrial" means manufacturing or industrial processes, including, but not limited to, the following manufacturing processes: electric power generation; fertilizer or agricultural chemicals; food and related products or by products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing or foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment.

(17) "Karst" means the type of geologic terrain underlain by carbonate rocks where significant solution of the rock has occurred due to flowing groundwater.

(18) "Land treatment" or "land disposal" means the application or incorporation of a pollutant onto or into the soil.

(19) "Loading and unloading areas" means areas used for loading and unloading, and related handling of raw materials, intermediate substances, products, wastes, or recyclable materials. Loading and unloading areas include, but are not limited to, areas used to load and unload drums, trucks, and railcars.

(20) "On-site sewage disposal system" means a complete system installed on a parcel of land, under the control or ownership of any person, which accepts sewage for treatment and ultimate disposal under the surface of the ground. The common terms "on-site sewage system" and "on-site system" also have the same meaning. This definition includes, but is not limited to, the following:

(a) A conventional system consisting of a sewage pretreatment unit, distribution box, and lateral piping within rock-filled trenches or beds;

(b) A modified system consisting of a conventional system enhanced by shallower trench or bed placement, artificial drainage systems, dosing, alternating lateral fields, fill soil over the lateral field, or other necessary modifications to the site, system, or waste load to overcome the site limitations;

(c) An alternative system consisting of a sewage pretreatment unit, necessary site modifications, waste load modifications, and a subsurface soil absorption system using other methods and technologies than a conventional or modified system to overcome site limitations;



(d) Cluster systems which accept effluent from more than one (1) structure's or facility's sewage pretreatment unit and transport the collected effluent through a sewer system to one (1) or more common subsurface soil absorption systems or conventional, modified, or alternative design; and

(e) A holding tank which provides limited pretreatment and storage for off-site disposal where site limitations preclude immediate installation of a subsurface soil absorption system or connection to a municipal sewer.

(21) "Pesticide" means:

(a) Any substance or mixture of substances intended to prevent, destroy, control, repel, attract, or mitigate any pest;

(b) Any substance or mixture of substances intended to be used as a plant regulator, defoliant, or desiccant; or

(c) Any substance or mixture of substances intended to be used as a spray adjuvant.

(22) "Privately-owned treatment works" means any device or system which is used to treat wastes from any facility whose operator is not the operator of the treatment works and which is not a publicly-owned treatment works.

(23) "Sinkhole" means a naturally occurring topographic depression in a karst area. Its drainage is subterranean and serves as a recharge source for groundwater and it is formed by the collapse of a conduit or the solution of bedrock.

(24) "Sinking stream" means a surface stream in a karst region that disappears underground usually through gradual seepage of flow along the channel bottom.

(25) "Storing" means the containing of materials, products, substances, wastes, or other pollutants on a temporary basis in such a manner as not to constitute disposal.

(26) "Surface impoundment" means a natural topographic depression, manmade excavation, or diked area formed primarily of earthen materials, although it may be lined with manmade materials, which is designed to hold an accumulation of liquids or solids.

(27) "Water well" or "well" means any excavation or opening in the surface of the earth that is drilled, cored, bored, washed, driven, jetted, or otherwise constructed when the actual or intended use in whole or in part of an excavation is the removal of water for any purpose, including but not limited to culinary and household purposes, animal consumption, food manufacture, use of geothermal resources for domestic heating purposes and industrial, irrigation, and dewatering purposes.

(28) "Wellhead protection area" means the surface and subsurface area surrounding a water well, well field, or spring, supplying a public water system, through which pollutants are reasonably likely to move toward and reach the water well, well field or spring or an area defined as a wellhead protection area in a county water supply plan.

(29) "Zone of saturation" means the zone in which all the subsurface voids in the rock or soil are filled with water.

Section 2. Scope and Applicability. (1) Scope. The goal of this administrative regulation is the prevention of groundwater pollution. This administrative regulation identifies certain activities for which groundwater protection plans shall be prepared and implemented. This administrative



regulation also identifies certain activities for which groundwater protection plans are not required.

(2) Applicability. Except for activities as provided in subsections (3) and (4) of this section any person responsible for conducting any of the following activities shall prepare and implement a groundwater protection plan in accordance with the requirements of this administrative regulation:

(a) Storing or related handling of bulk quantities of pesticides or fertilizers for commercial purposes;

(b) Storing or related handling of bulk quantities of pesticides or fertilizers for the purpose of distribution to a retail sales outlet;

(c) Applying of pesticides or fertilizers for commercial purposes;

(d) Applying of fertilizers or pesticides for public right-of-way maintenance or institutional lawn care;

(e) Land treatment or land disposal of a pollutant;

(f) Storing, treating, disposing, or related handling of hazardous waste, solid waste, or special waste in landfills, incinerators, surface impoundments, tanks, drums or other containers, or in piles;

(g) Commercial or industrial storing or related handling in bulk quantities of raw materials, intermediate substances or products, finished products, substances held for recycling, or other pollutants held in tanks, drums or other containers, or in piles;

(h) Transmission in pipelines of raw materials, intermediate substances or products, finished products, or other pollutants;

(i) Installation or operation of on-site sewage disposal systems;

(j) Storing or related handling of road oils, dust suppressants, or deicing agents at a central location;

(k) Application or related handling of road oils, dust suppressants or deicing materials;

(l) Mining and associated activities;

(m) Installation, construction, operation, or abandonment of wells, bore holes, or core holes;

(n) Collection or disposal of pollutants in an industrial or commercial facility through the use of floor drains which are not connected to on-site sewage disposal systems, closed-loop collection or recovery systems, or a waste treatment system permitted under the Kentucky Pollutant Discharge Elimination System;

(o) Impoundment or containment of pollutants in surface impoundments, lagoons, pits, or ditches; or

(p) Commercial or industrial transfer, including loading and unloading, in bulk quantities of raw materials, intermediate substances or products, finished products, substances held for recycling, or other pollutants.

(3) General exclusion. Any person who conducts an activity identified in subsection (2) of this section shall not be required to prepare or to implement a groundwater protection plan for that activity if that person can demonstrate by substantial evidence based on the factors set forth in this subsection, the activity has no reasonable potential of altering the physical, thermal, chemical, biological, or radioactive properties of the groundwater in a manner, condition, or quantity that will be detrimental to the public health or welfare, to animal or aquatic life, to the



use of groundwater as present or future sources of public water supply or to the use of groundwater for recreational, commercial, industrial, agricultural, or other legitimate purposes. The demonstration shall at a minimum consider the following factors:

- (a) Hydrogeologic sensitivity at or near the location of the activity;
- (b) Quantity of the pollutants, including the cumulative potential to pollute from small discharges, spills, or releases which individually would not have the potential to pollute;
- (c) Physical, chemical, and biological characteristics of the pollutants such as solubility, mobility, toxicity, concentration, and persistence;
- (d) Use of the pollutants at the locations of the activities; and
- (e) Present and potential uses of the groundwater.

(4) Specific exclusions. The provisions of this administrative regulation shall not apply to the following activities:

- (a) Normal use or consumption of products sized and packaged for personal use by individuals;
- (b) Retail marketing of products sized and packaged for personal use or consumption by individuals;
- (c) Activities conducted entirely inside enclosed buildings if:
 - 1. The building has a floor sufficient to prevent the release of pollutants to groundwater; and
 - 2. There are no floor drains, or all floor drains within the building are connected to an on-site sewage disposal system, closed-loop collection or recovery system or a waste treatment system permitted under the Kentucky Pollutant Discharge Elimination System;
- (d) Storing, related handling, or transmission in pipelines of pollutants that are gases at standard temperature and pressure;
- (e) Storing municipal solid waste in a container located on property where the municipal solid waste is generated and which is used solely for the purpose of collection and temporary storage of that municipal solid waste prior to off-site disposal;
- (f) Installing and operating sewer lines or water lines approved by the cabinet;
- (g) Storing water in ponds, lakes or reservoirs;
- (h) Impounding storm water, silt, or sediment in surface impoundments;
- (i) Application of chloride-based deicing materials used on roads or parking lots;
- (j) Emergency response activities conducted in accordance with local, state, and federal law;
- (k) Fire fighting activities;
- (l) Conveyance or related handling by motor vehicle, rolling stock, vessel, or aircraft;
- (m) Agricultural activities at agriculture operations; or
- (n) Application by commercial applicators of fertilizers or pesticides on lands used for agriculture operations.

(5) Relationship to other programs. Nothing in this administrative regulation shall abrogate the duty of a person to comply with the statutes and other administrative regulations administered by the cabinet, with the statutes and administrative regulations administered by other state and federal agencies, or with statutes and ordinances administered by a local government.

Section 3. Preparation of Groundwater Protection Plans. (1) General requirements. A groundwater protection plan establishes a series of practices to be followed by the person



required to prepare and to implement it. The practices established by a groundwater protection plan shall be designed and implemented in a manner that will prevent groundwater pollution. This section describes the contents of site-specific and generic groundwater protection plans. Any person conducting an activity identified in Section 2(2) of this administrative regulation shall determine if an exclusion of Section 2(3) or (4) of this administrative regulation applies to that activity.

(2) Deadlines for preparation and implementation. Except for activities excluded by Section 2(3) or (4) of this administrative regulation, any person required to prepare and to implement a groundwater protection plan pursuant to Section 2 of this administrative regulation, shall prepare and implement a site-specific or generic groundwater protection plan within one (1) year of the effective date of this administrative regulation, or upon commencement of the regulated activity, whichever is later.

(3) Elements of generic and site-specific groundwater protection plans. Both generic and site-specific groundwater protection plans shall contain the following:

(a) General information regarding the facility and its operation, including the name of the facility, the address of the facility, and the name of the person responsible for implementing the plan;

(b) Identification of all activities identified in Section 2(2) of this administrative regulation and not excluded by Section 2(3) or (4) of this administrative regulation;

(c) Identification of all practices chosen for the plan to protect groundwater from pollution;

(d) An implementation schedule for the practices selected for the plan;

(e) A description of and implementation schedule for employee training necessary to ensure implementation of the plan;

(f) An inspection schedule requiring regular inspections as needed to ensure that all practices established are in place and properly functioning;

(g) A certification by the person responsible for implementing the plan or a duly authorized representative that the plan complies with the requirements of this administrative regulation, and that the person responsible for implementing the plan has reviewed the terms of the plan and will implement its provisions.

(4) Selection of practices for groundwater protection. Any person required to prepare a groundwater protection plan pursuant to this section shall evaluate technological means for protection of groundwater from pollution that may result from activities addressed by the plan and shall select practices for the plan which protect groundwater from pollution. The groundwater protection practices chosen for a groundwater protection plan may include but are not limited to:

(a) Equipment design;

(b) Operational procedures;

(c) Preventive maintenance techniques;

(d) Construction techniques;

(e) Personnel training;

(f) Spill response capabilities;

(g) Alternative materials or processes;

(h) Implementation of new technology;



- (i) Modification of facility or equipment;
- (j) Spill prevention control and countermeasure plans;
- (k) Best management practices;
- (l) Hazardous waste contingency plans;
- (m) Other plans prepared pursuant to other programs which protect groundwater from pollution;
- (n) Runoff or infiltration control systems;
- (o) Siting considerations; and
- (p) Any other practice which will protect groundwater from pollution.

(5) Specific practices. In selecting practices to protect groundwater for the activities identified in Section 2(2) of this administrative regulation and not excluded by Section 2(3) or (4) of this administrative regulation any person preparing a groundwater protection plan shall consider the nature of the pollutant and the hydrogeologic characteristics at or near the location of the activity and shall comply with the provisions of this subsection in selecting those practices:

(a) Loading and unloading areas. Loading and unloading areas shall have spill prevention and control procedures and operation procedures designed to prevent groundwater pollution. Spill containment and cleanup equipment shall be readily accessible.

(b) On-site sewage disposal systems. No person shall install a new or replace an existing on-site sewage disposal system if a publicly- or privately-owned treatment works capable of treating the pollutants to be discharged is available.

(c) Floor drains. Any person using existing floor drains shall evaluate those floor drains to determine if they discharge to an on-site sewage disposal system, to a closed-loop collection or recovery system, or to a waste treatment system permitted under the Kentucky Pollutant Discharge Elimination System. If drains are identified which do not discharge to an on-site sewage disposal system, a closed-loop collection or recovery system, or a waste treatment system permitted under the Kentucky Pollutant Discharge Elimination System, that person shall terminate the discharge or connect it to an on-site sewage disposal system, a closed-loop collection or recovery system, or a waste treatment system permitted under the Kentucky Pollutant Discharge Elimination System. No person shall install a floor drain unless it is connected to an on-site sewage disposal system, closed-loop collection or recovery system, or a waste treatment system permitted under the Kentucky Pollutant Discharge Elimination System.

(d) Tanks and sumps. Any person using a tank or sump shall prepare and implement good housekeeping practices, operating procedures, operator training, and spill response procedures. In addition, any person using a tank or sump shall consider leak control devices, secondary containment, integrity testing, mechanical inspections, and overfill protection devices. Additional containment is not required for sumps and tanks that are used solely to provide secondary containment.

(e) New surface impoundments, lagoons, pits or ditches. Any person who constructs a new surface impoundment, lagoon, pit or ditch which will contain a pollutant shall evaluate the site's hydrogeology and shall design and operate it to minimize discharges to soil. However, soils may be used to construct liners under appropriate conditions. All necessary and appropriate measures shall be taken to prevent groundwater pollution. The person shall consider the use of liners, secondary containment, leak detection devices, and other appropriate and effective control



systems. Additional containment is not required for new surface impoundments, lagoons, pits, and ditches that are used solely to provide secondary containment.

(6) Exceptions to specific requirements.

(a) The provisions of subsection (5) of this section shall not apply to activities that are governed by other federal, state or regulatory programs that meet the requirements of subsection (7) of this section while the person conducting the activities remains in compliance with the other program.

(b) Variances from the provisions of subsection (5) of this section may be granted by the cabinet upon a showing of good cause, but in no event shall any person required to prepare a groundwater protection plan pursuant to this section take any actions contrary to the provisions of subsection (5) of this section without prior written approval of the cabinet.

(7) Incorporation of requirements of other regulatory programs.

(a) Groundwater protection activities required by other federal, state, or local regulatory programs may be incorporated into a site-specific or generic groundwater protection plan by reference if the other regulatory program contains the following:

1. Management and design standards;
2. Mandatory monitoring for groundwater pollution or methods of detecting discharges, spills, or releases to groundwater; and
3. Specific corrective action criteria.

(b) The plan shall identify each activity covered by the other regulatory program. The person responsible for implementing the plan shall certify compliance with the other regulatory program. The provisions of the other program shall be the groundwater protection plan for purposes of this administrative regulation for the activities covered by the other regulatory program. If activities identified in Section 2(2) of this administrative regulation and not excluded in Section 2(3) or (4) of this administrative regulation are conducted which are not covered by the other regulatory program, the plan shall contain separate practices designed to protect groundwater from pollution for each activity not covered by the other regulatory program.

(8) Generic groundwater protection plans. A generic groundwater protection plan may govern all or part of a person's activities. A generic groundwater protection plan shall not be sufficient by itself if it does not address all activities conducted by the person that are identified in Section 2(2) of this administrative regulation and not excluded by Section 2(3) or (4) of this administrative regulation. A generic groundwater protection plan shall be prepared in accordance with subsections (1) through (7) of this section.

(a) A person responsible for preparing and implementing a groundwater protection plan required by this administrative regulation may apply one (1) provision of the plan to all substantially identical activities if factors identified in Section 2(3) of this administrative regulation do not cause substantial differences in the potential to pollute among locations. If substantial differences do exist, the plan shall provide separate site-specific or region-specific preventive measures, as necessary, for the activities.

(b) A person responsible for preparing a groundwater protection plan governed by this section may use a generic groundwater protection plan prepared by another person or group, including a trade organization, if:



1. The activities identified in the generic groundwater protection plan are substantially identical;

2. The factors identified in Section 2(3) of this administrative regulation do not cause substantial differences in the potentials to pollute among locations; and

3. The groundwater protection plan has been reviewed and approved by the cabinet.

(c) A generic groundwater protection plan may consist of requirements imposed by other regulatory programs designed to protect groundwater or programs offering technical assistance for groundwater protection if the cabinet has approved the requirements of the other program as a generic groundwater protection plan. Any person using a generic groundwater protection plan from another program pursuant to this paragraph as a part of, or all of, his plan shall certify in his plan that he is subject to the program and in compliance with its provisions. Any activities which are not addressed by the program shall be addressed separately in the groundwater protection plan.

(d) Any person conducting an activity listed in this subsection who does not prepare a groundwater protection plan for that activity or does not use another approved generic groundwater protection plan for that activity shall implement the provisions of the generic groundwater protection plan prepared by the cabinet. The cabinet, in cooperation with other appropriate state agencies, shall prepare generic groundwater protection plans for:

1. Use of existing residential septic systems; and
2. Construction, operation, closure, and capping of water wells.

(e) A generic groundwater protection plan that has been approved by the cabinet may be incorporated by reference in a facility's groundwater protection plan; however, each person responsible for implementing the generic plan at a site shall maintain a copy of the plan at an appropriate, accessible location. Any person using a generic groundwater protection plan shall identify the activities governed by the plan and attach the identification to the copy of the generic plan.

(f) Any person preparing a new or revised generic groundwater protection plan to be approved by the cabinet shall submit that plan to the cabinet for approval. When that person submits that plan to the cabinet that person shall also place a notice in a statewide newspaper and a trade publication likely to be read by those affected by the groundwater protection plan. That notice shall provide for a thirty (30) day comment period and shall identify activities that are addressed by the proposed generic groundwater protection plan. The notice shall describe the procedure for review by the public of the plan and the procedures and time frames for providing comments. The cabinet shall also notify by mail anyone who has requested in writing to be placed on a mailing list for purposes of this administrative regulation.

Section 4. Implementation of Groundwater Protection Plans. (1) Record retention requirements.

(a) Any site-specific groundwater protection plan required by Sections 2 through 4 of this administrative regulation, and any documentation evidencing compliance with the provisions of the plan, shall be retained by the person responsible for implementing the plan, at the location of the activity if the location is normally attended at least eight (8) hours per day, or at the nearest office of that person's activity if the facility is not so attended.



(b) Any generic groundwater protection plan and any documentation evidencing compliance with the provisions of the plan, shall be retained by the person responsible for implementing the plan, in as many locations as necessary to ensure compliance. Individual homeowners are not required to maintain a copy of the generic groundwater protection plan for residential septic systems at their residences.

(c) Unless the cabinet approves another retention period for a person, all records evidencing compliance shall be maintained and available for review by the cabinet for a period of six (6) years after their preparation.

(2) Amendment of groundwater protection plans. Prior to conducting any new or modified activity, any person conducting that activity shall amend the groundwater protection plan, as necessary, to address the new or modified activity.

(3) Review and recertification of groundwater protection plans. Each groundwater protection plan shall be reviewed in its entirety every three (3) years, by the persons responsible for the plan, updated if necessary, and recertified. To the extent possible, the review shall include a reevaluation of the design and operation procedures for the pollution prevention practices previously selected for the plan to ensure that they are effective.

(4) Submission of groundwater plans to cabinet.

(a) Upon written request of the cabinet, any person required to prepare a groundwater protection plan pursuant to this administrative regulation shall submit a copy of the plan to the cabinet within thirty (30) days.

(b) Upon written request of the cabinet, any person who has made a determination pursuant to Section 2(3) of this administrative regulation that a groundwater protection plan is not required for a specific activity shall submit a written demonstration to the cabinet within thirty (30) days.

(5) Submission of additional information to the cabinet. Upon review of a groundwater protection plan which has been submitted to the cabinet, the cabinet may require any person responsible for preparation or implementation of a plan to submit any of the following information that the cabinet deems necessary:

(a) For a site-specific groundwater protection plan, and for a generic groundwater protection plan in effect at a specific location, the location of all buildings, structures, roads, utilities, drainage pathways, and boundaries by using a narrative description or by using a map, diagram, or drawing;

(b) For a generic groundwater protection plan that applies to more than one (1) location, identification of the geographic region to which the generic groundwater protection plan applies, and an explanation as to why that region was selected and why one (1) plan is appropriate for all activities addressed by the plan for all sites within the region;

(c) For a generic groundwater protection plan that applies to more than one (1) location, to the extent possible, a description of the nature and number of activities, and their associated facilities, that are expected to be governed by the generic groundwater protection plan;

(d) Summary of reasonably available hydrogeologic information as follows:

1. Identification of location of sinkholes, sinking streams, springs, streams, lakes, ponds, and ditches;

2. Description of soil survey information;



3. Identification and location of currently usable wells, abandoned wells, and wellhead protection areas;

4. Identification of subsidence areas; and

5. Description of any other relevant hydrogeologic data known to the person preparing or implementing the groundwater protection plan; and

(e) Any other site-specific groundwater or geologic information, which is known and readily available to the person responsible for preparing or implementing the plan but not to the cabinet, that the cabinet deems necessary.

(6) Revisions to plans after cabinet review. If the cabinet reviews a groundwater protection plan and determines that it does not meet the requirements of this administrative regulation, the cabinet shall notify the person responsible for preparing or implementing the plan of the deficiency in the plan. That person shall revise the plan to correct the deficiencies identified by the cabinet and submit the revised plan to the cabinet for further review. Unless an extension of time is granted by the cabinet or the notice of deficiency is withdrawn by the cabinet, the person submitting the revised plan shall have thirty (30) days from issuance of the notice of the deficiencies to submit the revised plan. The cabinet shall review the revised plan and notify the person submitting the revised plan of its final determination.

(7) Public inspection of groundwater protection plans.

(a) Any person who desires to review a groundwater protection plan shall send a written request to the person required to prepare and to implement the groundwater protection plan.

(b) Any person who receives a written request to review the groundwater protection plan shall within ten (10) working days:

1. Send a written response to the person requesting to inspect the groundwater protection plan stating that the groundwater protection plan may be reviewed at:

- a. The Division of Water in Frankfort;
- b. A regional office of the Division of Water;
- c. The facility; or
- d. A local public library; or

2. Send a written response to the person requesting to inspect the groundwater protection plan, stating the reason that a groundwater protection plan was not required to be prepared.

(c) Any person who designates a review location for a groundwater protection plan shall send a copy of the groundwater protection plan to the location designated for review within ten (10) working days of receiving a written request to review the plan.

(8) Requirements upon transfer of property. Upon any subsequent transfer of a facility for which a groundwater protection plan has been prepared, the seller shall provide the purchaser with a copy of the most recent groundwater protection plan prepared for the facility pursuant to this administrative regulation. (20 Ky.R. 3128; Am. 21 Ky.R. 25; 1030; eff. 8-24-94.)



BEST MANAGEMENT PRACTICE PLAN
(BMP PLAN)

WATER PLANT DISCHARGE SYSTEM

For

WATER SERVICE CORPORATION OF KENTUCKY

PWSID# KY0070282 / PERMIT# KYG640164

102 WATER PLANT ROAD

MIDDLESBORO, KENTUCKY 40965

PHONE # 606-248-2306

CONTACTS:

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Phone: 606-248-1785, extension 204
E-mail [address: jrleonard@uiwater.com](mailto:jrleonard@uiwater.com)

Gary Mills, Lead Operator Water Plant
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BMP Committee

A.) The Best Management Practice Plan's Committee for Water Service Corporation of Kentucky consists of:

James Leonard, Regional Manager
Gary Mills, Lead Operator
Bruce Haas, Regional Director
Mary Rollins, Regional Compliance and Safety Manager

Reporting of BMP Incidents

B.) Twenty-four hour reporting shall be made in the event of a noncompliance situation that may endanger health or the environment. The information shall be provided orally within 24 hours from the time of awareness and a written submission shall be provided within 5 days following the time of awareness. In addition, Utilities, Inc. has a specific internal Incident Reporting procedure that requires incidents of a severe nature to be initially reported within 2 hours to management and incidents defined as non-severe to be reported within 24 hours to management.

Risk Identification and Assessment

C.) Flooding is the primary risk identified for this type of facility and configuration. Tremendous flooding could cause an overflow of the facility ponds. Operators are on duty and/or on-call at all times. The facility has two standby pumps available in the event of flooding. One 1 ½-inch electric pump that is capable of pumping 125 gpm and one Honda 3-inch pump capable of pumping 400 gpm. The pumps may be used to pump from one pond to another as needed to prevent an overflow situation.

Employee Training

D.) Employee training is completed at the time of hire and continuously enforced through day-to-day observations with experienced employees.

Inspections and Records

E.) A daily log is kept at the Backwash Plant that records chlorine and pH readings. All formal State Inspections are kept at the Water Treatment Facility Office for the required amount of time.

Preventative Maintenance

F.) The filters are thoroughly cleaned by being soaked in a phosphate solution after each use.

Good Housekeeping

G.) The Backwash Facility is inspected and cleaned at a minimum on a weekly basis.

Materials Compatibility

H.) Not Applicable – Only dechlorination is used at the facility.

Security

I.) Fencing is present around all ponds. The backwash plant is monitored by a security camera system.

Materials Inventory

J.) Captor (Calcium Thiosulfate Solution) is formally inventoried on a monthly basis. The facility is visited each day at which time a visual observation is made of the chemical inventory.

Description of Discharge Water System

K.) The discharge system at the water treatment plant consists of a series of sludge lagoons in which the sludge is settled out and clear water is decanted off the top portion of the ponds. A series of different level intakes are utilized to keep from pumping out of the settled sludge bed. All filter backwash water, floc basin water and settling basin water is drained to the lower sludge pond. The water is dechlorinated, filtered, and discharged through a 4-inch line into a blue stream approximately a thousand feet below the water plant. The filter system is a Flow Star bag unit. The unit uses a 200 micron filter inside a screened filter housing. Dechlorination is achieved with an environmentally friendly chemical called Captor (calcium thiosulfite). The Captor injection point is located directly after the Flow Star bag filter unit. This chemical has been found to have no adverse affects to aquatic life. Discharge water is metered and a sample tap is located beyond the discharge meter point.

The sludge in the lower pond is then pumped to two holding ponds on the north side of the water treatment plant which are designated as Farm I & II Ponds (see map attachments). The sludge which is very heavy in nature is washed with water by a high pressure one-inch hose to make it easier to pump. The sludge and water mixture is allowed to settle out. The clear water is pumped back up to the Lower sludge pond and then discharged to blue stream. Annually, the sludge is dipped out of the holding ponds with an excavator and placed in a drying pond to dry for the next 12 months. Dewatered sludge is disposed at a landfill in Lily, Kentucky. The dewatered sludge amount (*approximately 250 - 300 tons per year*) varies due to water quality characteristics.

Purpose of BMP Plan

L.) The purpose of this plan is to:

- Achieve Total Suspended Solids of less than 50 mg/L per day maximum, and of less than 30 mg/L for a 30-day average.
- Dechlorinate discharge water to a "free" DpD residual of zero (0.0 mg/L).
- Maintain pH of discharge water between 6 and 9 SUs.
- Monitor discharge water daily to meet KPDES permit requirements.
- Sample discharge water for turbidity using 2100N turbid meter.
- Record chlorine levels and flow amounts discharged.
- Monitor pond levels to ensure adequate storage area for backwash water and basin drainage.

Procedures for Discharging from Lower Sludge Pond

M.) Procedures for discharging from lower sludge pond:

- Open valve to farm holding ponds to pump water for clarity.
- Start lower sludge pond pump.
- Check for clarity of discharge water (when water becomes clear).
- Close valve to farm holding ponds to discharge water.
- Record discharge water meter reading and captor weight.
- Open valve to discharge water system.
- Check chlorine residual of discharge water at tap after bag filter system. Record on chlorine log sheet.
- Adjust Captor to desired dosage to achieve chlorine residual of “zero”.
- Check chlorine periodically to maintain a zero mg/L reading in discharge water and record results.
- Check filter periodically for clogging using GPM passing through discharge meter.

Summary

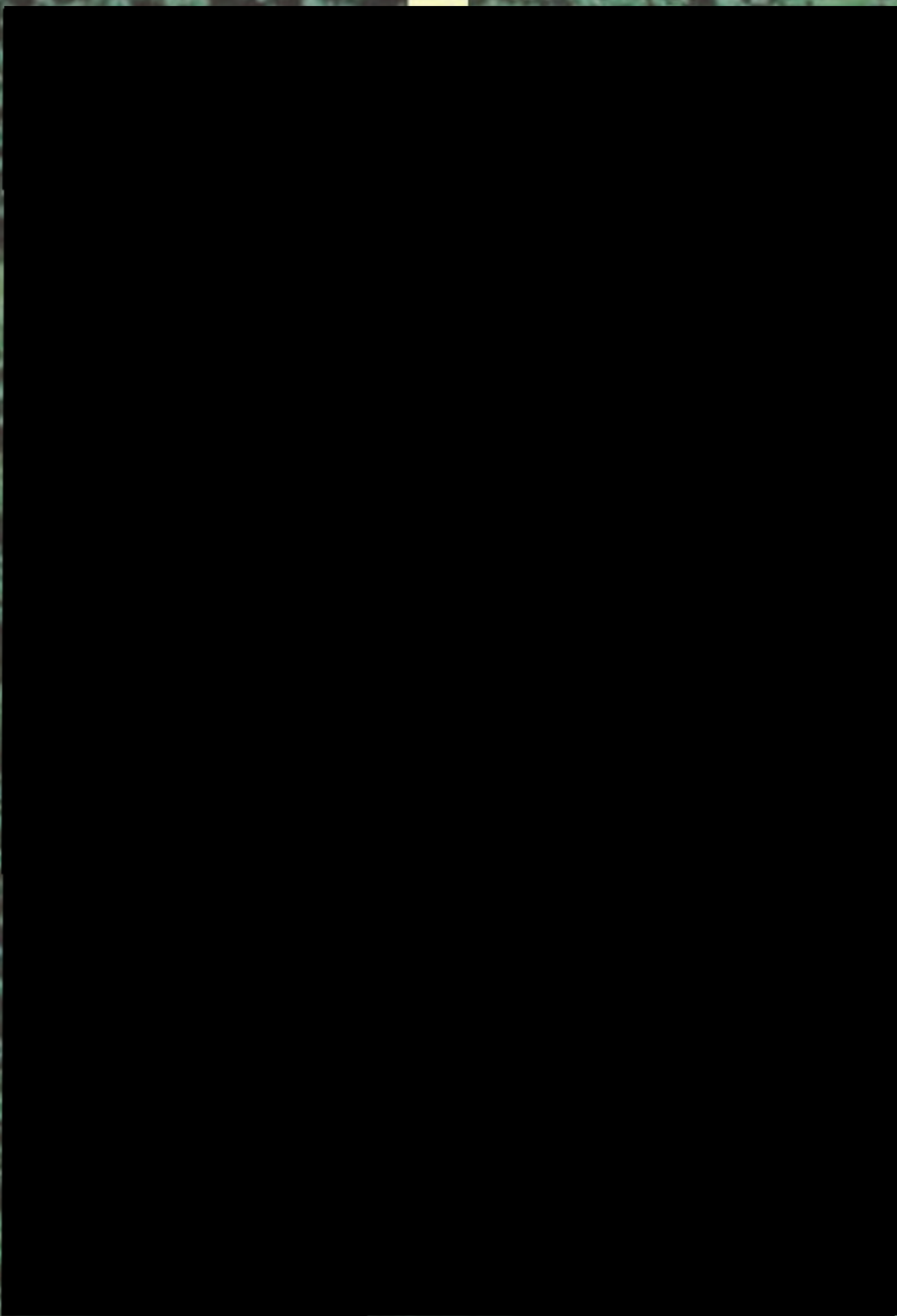
N.) Discharge water is sampled once a month for total suspended solids content. The sample is collected by composite method over a period of 4 to 6 hours. Fouser Environmental Services analyzes the total suspended solids content for this sample. The pH and chlorine residual for the sample is ran in- house and recorded for DMR submittal. PH is analyzed on a Hach HQ-40 pH meter. Chlorine residuals are analyzed on a Hach DR-SOOO instrument. Total suspended solids samples have never exceeded 12 mg/L in any composite sample collected since the inception of this bag filter system in 2004.

Attachments

O.) See attachment maps for pond size and location.

**Middlesboro KY0070282
Water Plant Area**

To Middlesboro



N



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Imags USDA Farm Service Agency

475 ft

Imagery Date: Jun 6, 2007

36°35'36.57" N 83°42'37.36" W elev. 1364 ft

Eye alt 3024 ft



Middlesboro KY0070282
Water Service Corporation
of Kentucky

Image USDA Farm Service Agency

Image © 2011 Commonwealth of Virginia

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**WSCK Discharge
Water System
Permit KYG640164**

