



Arkansas Department of Health

Note to Applicant

This study packet will help you prepare for the Onsite Wastewater System Installer Examination.

The exam consists of four parts:

- Part 1 is 50 multiple-choice questions chosen from the information in this study packet.
- Part 2 is the math section. It consists of 20 multiple-choice questions. A **Math Work Sheet** is included in this packet.
- Part 3 is the wiring section. It requires the applicant to wire a control panel, demonstrate the ability to determine correct wire sizes, and select an appropriate pump using a pump curve.
- Part 4 is the field section. The applicant must record rod readings/elevations and determine if maximum storage of effluent can be achieved. A tenths grade rod and a laser level are provided.

A minimum score of 75% is required to pass every section. The exams start at 8:30 in the morning and you should allow most of the day to complete all four parts.

Exams are given at the Arkansas Rural Water Facility at Lonoke. Exam dates and a map to the facility are included in this packet.

Information Sheet

Useful Websites:

Arkansas Department of Health – www.healthy.arkansas.com

Example: To find the **Authorized Onsite Wastewater Products List** – Start at the website’s homepage and click on the following subjects, in the order listed.

- Quick Links (Left side of page , in red)
- Onsite wastewater
- Approved Products and Materials List

Arkansas Rural Water Association – www.arkansasruralwater.org

Arkansas Department of Environmental Quality – www.adeg.state.ar.us

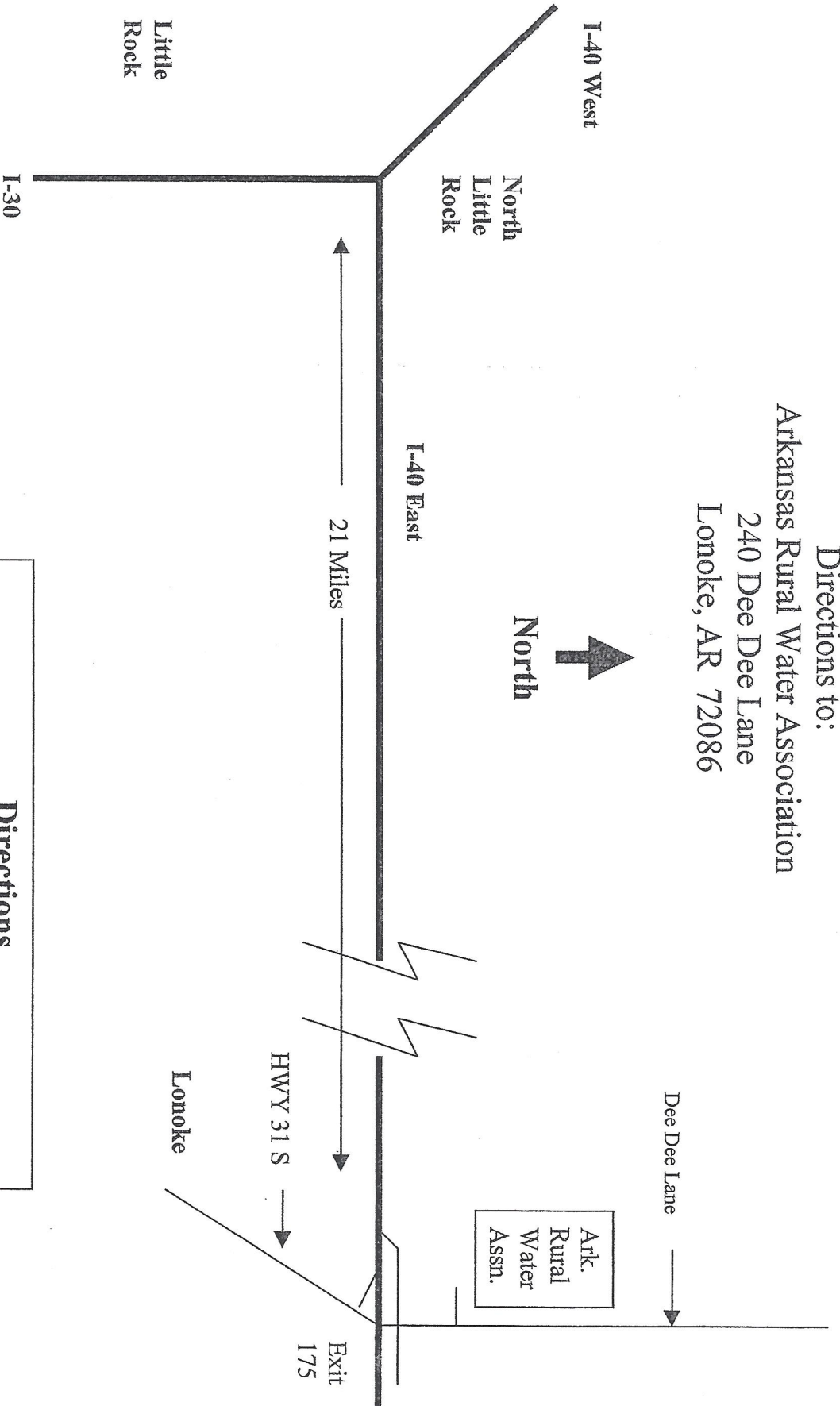
Information you need to know before taking the Field, Wiring & Math Sections of the Exam:

1. Be able to interpret a scaled drawing.
2. For elevation/rod readings, be able to convert tenths of a foot to inches.
3. Be able to determine minimum/maximum fall between the stub-out and the inlet of septic tank.
4. Be able to calculate the volume of a tank.
5. Understand how to install a field line level and on contour.
6. Understand maximum storage in field line trenches.
7. Know how to interpret a wiring schematic for a control panel.
8. Be able to interpret a pump curve for accurate pump selection.
9. Be able interpret the Wire Size Chart, included in this study packet.
10. Be able to use a tenths rod to record ground elevations.

EXAMINATION RULES

1. **No conversations** between applicants are allowed in test areas while testing is underway.
2. **Testing begins at 8:30 a.m.** There will be no admittance after **10:00 a.m.**
3. **No cell phones are allowed in the test areas.**
 - Cell phones are to be left in your vehicle.
 - Anyone observed using a cell phone during any portion of the test will be given a failing grade and asked to leave the premises.
 - Cell phone calls can be made from the parking lot during the break between test sessions.
4. **Restroom breaks may be monitored.** Restroom breaks should be made prior to beginning a portion of the test.
5. **Installer test applicants should bring** waterproof boots, a calculator, and a pencil.

Directions to:
Arkansas Rural Water Association
240 Dee Dee Lane
Lonoke, AR 72086



Directions

Take Exit 175 off of I-40. This is about 21 miles east of North Little Rock or 19 miles west of Hazen. Go north about 0.1 miles on Dee Dee Lane. This will take you past two motels, a gas station, and a McDonalds. The Arkansas Rural Water Association building is on the left. Y'a can't miss it!



BASIC WASTEWATER MATH FORMULAS

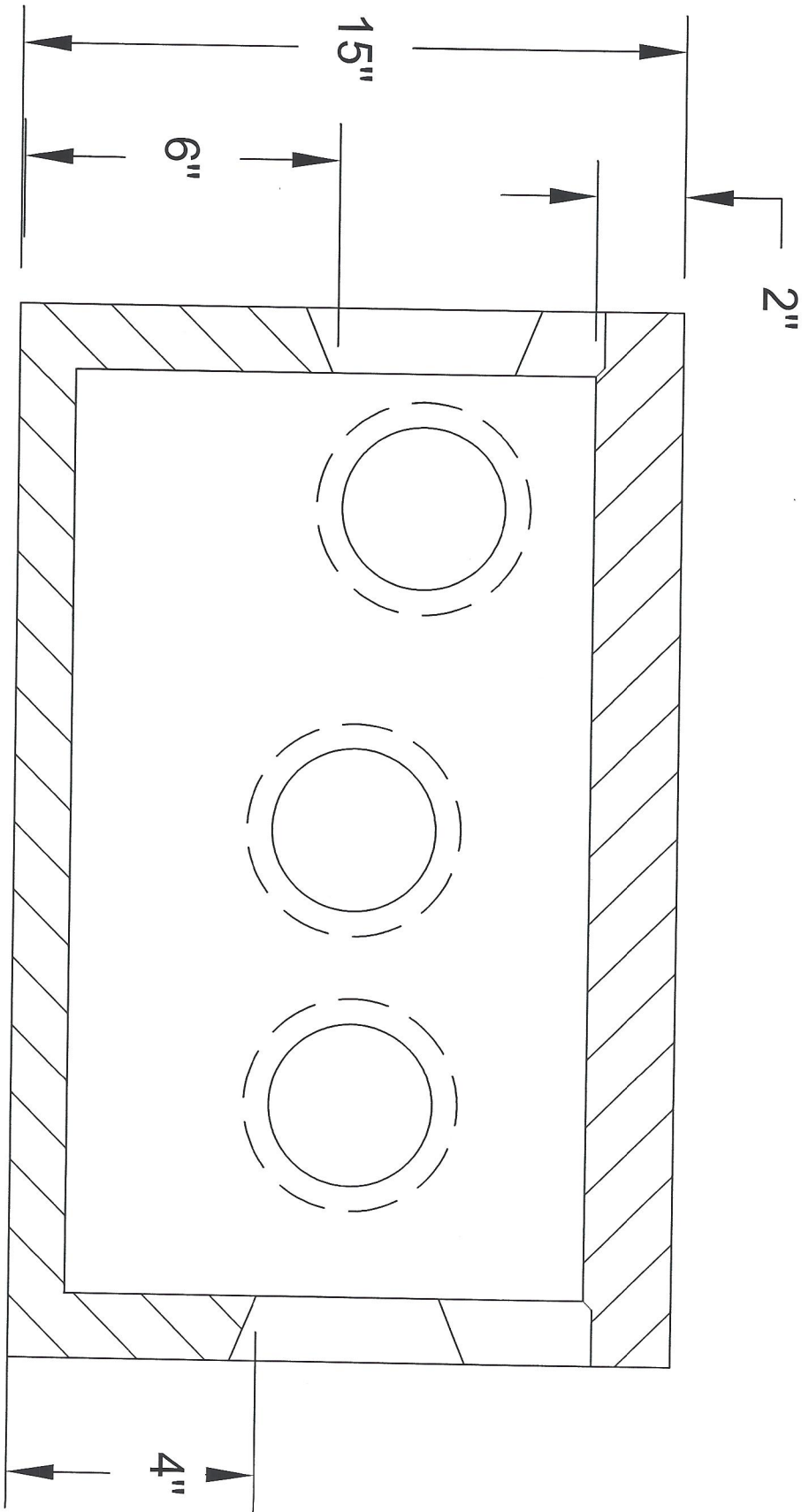
(Conversion Factors) Revised 01/12/2012

Common Symbols or Acronyms Used

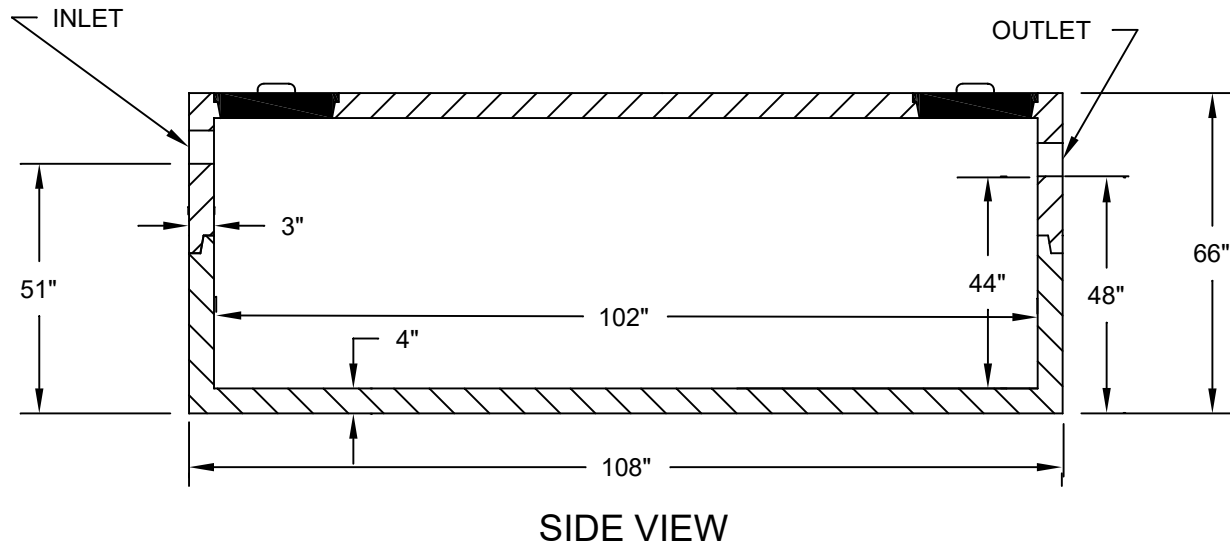
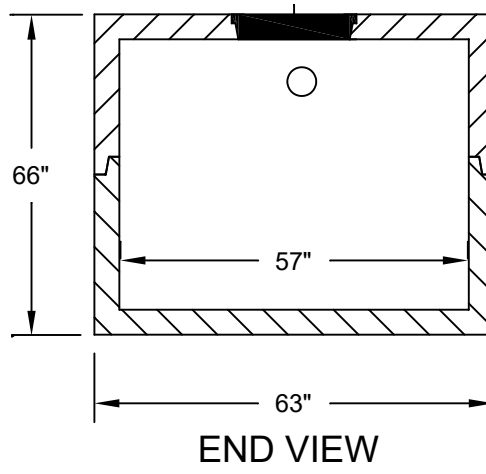
Foot/Feet (') or (ft.)	Gallon per Minute (GPM)	Pounds per Square Inch Gauge (PSIG)	Diameter (D)
Inches (") or (in.)	Gallon per Day (GPD)	Milligrams per Liter (mg/L)	Depth (d)
Square Feet (ft ²)	Million Gallons per Day (MGD)	Hour (hr)	Length (L)
Cubic Feet (ft ³)	Cubic Feet per Second (CFS)	Pounds (lbs.)	Width (W)

- 1 acre = 43,560 ft²
- 1 yard = 3 feet
- 1 yd³ = 27 ft³ (3' x 3' x 3')
- Inches ÷ 12 inches per foot = tenth(s) of foot (ex. 6" ÷ 12 = 0.5 ft.)
- Tenth(s) of foot x 12 inches per foot = inches (0.5 x 12 = 6")
- π (Pi) = 3.14 (Approximate)
- 1 horse power (hp) = 746 watts (W) or 0.746 kilowatts (kW)
- 1 milli (gram, liter, etc.) = 1/1000 or 0.001 (gram, liter, etc.)
- 1 gram, liter, etc. = 1,000 milli (grams, liters, etc.)
- 1 kilo (gram, liter, etc.) = 1000 (grams, liters, etc.)
- 1 percent (%) = 10,000 mg/L
- 1 in. = 25.4 millimeters (mm)
- 1 ft. = 12 inches or 0.305 meters
- 1 mile = 5,280 ft. or 1,609 kilometers
- 1 lb. = 453.6 grams (Approximate)
- 1 kilogram (kg) = 2.2 lbs.
- 1 ounce (oz) = 28.35 grams
- 1 quart = 0.946 liters
- 1 gallon = 3.785 Liters
- 231 in³ = 1 gallon of water
- 1 ft³ = 7.48 gallons
- 1 ft³ of water weights = 62.4 lbs.
- 1 gallon of water = 8.34 lbs.
- 3960 gallons of water to weigh = 33,000 lbs.
- CFS = GPM x 0.00223
- CFS = MGD x 1.547
- GPM = CFS x 450
- GPD = GPM x 1440
- MGD = CFS x 0.646
- 1 MGD = 694.4 GPM
- 1 PSIG = 2.31 ft. or 27.72 inches of water, or 2.04 inches of Hg
- 1 ft. of water = 0.43 PSIG or 0.88 inches of Mercury (Hg)
- To change ft. of water to PSIG, multiply ft. of water times 0.43.
- To change PSIG to ft. of water, multiply the PSIG times 2.31.
35. Area, ft² of a rectangle = L x W
36. Area, ft² of a circle = πr²
37. Area, ft² of a circle = 0.785 x D²
38. Area, ft² of a pond =
43,560 ft² x number of acres
39. Volume, ft³ of a rectangle =
Length x Width x Depth
40. Volume, ft³ of a cylinder = πr²d
41. Volume, ft³ of a cylinder =
0.785 x D² X d
42. Volume, ft³ of a pond =
43,560 x acres x depth
43. Volume, gallons = ft³ x 7.48
44. Velocity, ft/sec =
Distance traveled, ft.
Time, sec.
45. Volume in gallons =
L in. x W in. x D in.
231 in³/gallon
46. Cubic Feet to Cubic Yards =
L ft. x W ft. x D ft.
27 ft³/yd³

NOTE: Standard Rounding Procedure is to round to the nearest hundredth.



D-Box Distribution Box



Septic Tank



Arkansas Department of Health
Environmental Health Protection

Receipt Number

Individual Onsite Wastewater System Permit Application

Permit Type New Installation
 Alteration / Repair

DR Environmental ID #

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Fee Schedule for Structures		√
Structures 1500 sq ft or less	\$ 30.00	<input type="checkbox"/>
Structures more than 1500 sq ft and up to 2000 sq ft	\$ 45.00	<input type="checkbox"/>
Structures more than 2000 sq ft and up to 3000 sq ft	\$ 90.00	<input type="checkbox"/>
Structures more than 3000 sq ft and up to 4000 sq ft	\$120.00	<input type="checkbox"/>
Structures more than 4000 sq ft	\$150.00	<input type="checkbox"/>
Alteration and Repair	\$ 30.00	<input type="checkbox"/>

Part 1 Application

Treatment Type (check one)

Disposal Method (check one)

- | | | | |
|---|---|--|--|
| <input type="checkbox"/> STD = Standard Septic Tank | <input type="checkbox"/> ATU = Aerobic Treatment Plant | <input type="checkbox"/> STD = Standard Absorption Field | <input type="checkbox"/> LPD = Low Pressure Distribution |
| <input type="checkbox"/> ISF = Intermittent Sand Filter | <input type="checkbox"/> RSF = Re-circulating Sand Filter | <input type="checkbox"/> SUR = Surface Discharge | <input type="checkbox"/> HLD = Holding Tank |
| <input type="checkbox"/> PMF = Proprietary Media Filter | <input type="checkbox"/> RGF = Re-circulating Gravel Filter | <input type="checkbox"/> CPF = Capping Fill | <input type="checkbox"/> SRL = Serial Distribution |
| <input type="checkbox"/> OTH = Other (Describe) | <input type="checkbox"/> HLD = Holding Tank | <input type="checkbox"/> OTH = Other | <input type="checkbox"/> DRP = Drip Irrigation |

1. Owner's/Applicant's Name		2. Phone Number	
3. Mailing Address		4. County	
5. Address of Proposed System (If a 911 address is not available, attach detailed directions or map)			
6. Subdivision Name	7. Approval Date	8. Date Recorded	9. Lot Number
10. Lot Dimensions	11. Total Area (Acres)	12. # Bedrooms # People	13. Daily Flow (GPD)
14. Parcel Number or Brief Legal Description of Property (Attach a separate sheet of paper, if necessary)			
15. Water Supply (Specify supplier, if Public Water)		16. GPS Coordinates	
17. Loading Rates (gpd/ft ²)	18. System Specifications		
Primary Area	a. Size of Septic Tank	gal	f. Trench Depth
Secondary Area	b. Size of Dose Tank	gal	g. Trench Spacing
Percolation Test (min/in)	c. Absorption Area	ft ²	h. Trench Media (List Below)
Primary Area Avg	d. Number of Field Lines		i. Trench Width
Secondary Area	e. Length of Field Lines	ft	

TO THE OWNER
The permit for construction may be deemed invalid by the local Environmental Health Specialist before the start of construction, if the site and/or soil conditions have changed after approval of this permit, or if the information within this permit is inaccurate or has been found to be misrepresented. Approval for operation does not constitute a guarantee that the system will function properly. The approval states that the system was designed and installed according to the Arkansas Department of Health, Rules Pertaining to Onsite Wastewater Systems, unless there are exceptions or deviations noted in the comments. A Permit for Construction is valid for one (1) year from the date of approval. The authorized agent must revalidate a permit more than one (1) year old prior to the start of any construction.

19. Utilization Verification
I hereby attest that item 12, the number of bedrooms (number of persons for commercial) and square footage of the structure that will utilize the designed individual onsite wastewater system in this permit application, is accurate. I have reviewed the permit application and understand the layout, installation, maintenance, operation and expense(s) that may be associated with this system.

Date _____
Owner/Applicant/Developer/Designated Representative Signature

20. I certify that I have conducted the above tests and that the above listed information is in accordance with the latest requirements of the Arkansas Department of Health Rules and Regulations Pertaining to Onsite Wastewater Systems.

Soil Certified Yes No

Designated Representative Signature _____ Title _____
Print Name _____ Date _____ Phone Number _____

21. Approval of Health Authority
The information and specifications in this application have been reviewed and found to meet the requirements of the Arkansas Department of Health Rules Pertaining To Onsite Wastewater Systems. A PERMIT FOR CONSTRUCTION is hereby issued.

Environmental Specialist Signature _____ EHS Number _____ Date _____

Individual Onsite Wastewater System Permit Application

Receipt Number

22. Soil Criteria (Primary Area)								Indicate the depth to items a-f, if observed in the soil (designate in inches)							
a. Bedrock	b. BSWT	c. MSWT	d. LSWT	e. Adj. MSWT	f. Adj. LSWT	g. H.C./Depth	h. Loading Rate (gpd/ft ²)								
23. Soil Criteria (Secondary Area)								Indicate the depth to items a-f, if observed in the soil (designate inches)							
a. Bedrock	b. BSWT	c. MSWT	d. LSWT	e. Adj. MSWT	f. Adj. LSWT	g. H.C./Depth	h. Loading Rate (gpd/ft ²)								
24. Seasonal Water Table (SWT) Classes Detail															
Primary Area				List Redoximorphic Features and/or Clay Content Restrictions											
Brief		in													
Moderate		in													
Long		in													
Secondary Area				List Redoximorphic Features and/or Clay Content Restrictions											
Brief		in													
Moderate		in													
Long		in													
Comments															

Part 2 Installation Inspection

Septic tank manufacturer	Pump information	
Septic tank material	Trench media and width	
Dose tank manufacturer	Depth of interceptor drain	
Dose tank material	Depth of settled fill	
Name of Installer		License Number
Installation Inspected by <input type="checkbox"/> Environmental Health Specialist <input type="checkbox"/> Designated Representative (original submitter) (check one or installer signs System Installation Verification below)		
_____ Signature		_____ EHS / License Number
System Installation Verification I have installed this system as designed and in compliance with all Rules and Regulations Pertaining to Onsite Wastewater Systems.		
_____ Installer Signature		_____ License Number

Part 3 Permit for Operation

The information contained in Part 1 and 2 of this form has been reviewed and found to meet the requirements of the Arkansas Department of Health. THE PERMIT FOR OPERATION of this system is hereby issued.		
Environmental Health Specialist	Signature	EHS Number
_____ Date		
Comments		
Site Revalidation conducted by <input type="checkbox"/> Environmental Health Specialist <input type="checkbox"/> Designated Representative (original submitter) (check one)		
_____ Signature		_____ EHS / License Number
_____ Date		



**Arkansas Department of Health
Environmental Health Protection**

Receipt No.

Individual Onsite Wastewater System Installation Specifications

(Must be signed and returned to ADH Authorized Agent within five working days.)

Name of Applicant		TB = Trench Bottom Elevation PE = Top of Pipe Elevation GE = Ground Elevation FL = Flow Line Elevation (Top of Pipe Elev. + 4") TE = Tank Lid Elevation
Location of System		
Name of Installer	License #	

Septic Tank Size	Gal	Dose Tank Size	Gal	Drawdown Inches	Benchmark
Type of System				Number and Length of Lines	at ft
Orifice Head	ft	Pump Run	min	sec	Pump Rest min sec

Trench Media	Trench Width
Stub-out	FL GE

Tank Inlet	FL	GE	TE	Dose Tank Inlet	FL	GE	TE
Tank Outlet	FL	GE	TE	Dose Tank Outlet	FL	GE	TE

D-box Inlet	FL	GE	D-box Outlet	FL	GE	Other Devices	GE	PE
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Line 1

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Line 2

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Line 3

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Line 4

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Receipt No. _____

Line 5

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Line 6

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Line 7

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Line 8

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Line 9

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Line 10

Line Length	Beginning	Middle	End
	TB	TB	TB
	GE	GE	GE

Environmental Health Specialist _____ Date _____

I have installed this system as designed and in compliance with all Rules and Regulations Pertaining to Onsite Wastewater Systems.

Installer Signature

License Number

Date