



MOHAVE COUNTY DEVELOPMENT SERVICES

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Scott Holtry
Department Director

ENGINEERING REVIEW UNIFORM SITE INVESTIGATION REPORT FORM

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County Manager/County Engineer

Instructions

This form is the site investigation form for on-site wastewater treatment facilities required in accordance with Arizona Administrative Code (A.A.C.) R18-9-A310. This form may also be used in conjunction with A.A.C. R18-9-A310 as guidance to assist in meeting the subdivision requirements, specifically the geological report required per R18-5-408. Alternatively, the departments engineering bulletins may be used but A.A.C. R18-9-A310 is more current. For addition guidance on the geological report, please see the Application for Sanitary facilities for Subdivision at the following link: [Subdivision Application](#).

Please be advised, perc tests and soil borings are both required for on-site subdivision reviews.

An investigator that meets the qualifications of A.A.C. R18-9-A310(H) must perform the site investigation. Both the surface and subsurface characterizations must be done in conformance with A.A.C. R18-9-A310. The site investigator shall utilize this ADEQ form and the appropriate attachments. Submit the results with a Notice of Intent to Discharge application. Space is provided for an Arizona-Registered Professional Engineer, Geologist or Sanitarian to seal their work products.

Site Investigation Report, Item 1: The authorization for site investigation shall be completed by the appropriate person before the field investigation begins.

Site Investigation Report, Items 2 – 10: To be completed by the qualified investigator.

Site Investigation Report Attachments 1, 2, 3, 4, and 5: The qualified investigator shall complete all necessary attachments including color. Attach only those with required information. Identify the attachments submitted on item 9 of the Site Investigation Report (page 3). The investigator shall use the appropriate continuation page for any attachment requiring more than 1 page. Add the page number in the blank spaces at the bottom of each continuation page used. Include the page totals in the Item 9 of the report form. Please use the soil codes (on the next page) for ASTM Method 5921 in Attachment 1.

Geotag Photograph Instructions Attachment A: The qualified investigator shall take photograph(s) of the soil sites during testing and include geotag location data.

| Texture | Structure | | |
|--------------------------|-------------------|------------------|----------------------------|
| Loamy Sand – (LS) | GRADE | | |
| Sandy Loam – (SL) | Structureless (0) | No | |
| Sand – (S) | Weak (1) | aggregation | |
| Silt Loam – (SiL) | Moderate (2) | Barely | |
| Loam – (L) | e (3) | observable | <u>Angular,</u> |
| Sandy Clay Loam – (SCL) | Strong | Distinct peds | <u>Subangular,</u> |
| | | Durable peds | <u>Blocky</u> |
| | | | <u>Prismatic, Columnar</u> |
| | SIZE (VF) | | <5 mm |
| Silty Clay Loam – (SiCL) | Very (F) | <u>Granular,</u> | 5-10 |
| (SiCL) | Fine (M) | <u>Platy</u> | 10-20 |
| Clay Loam – (CL) | Fine (C) | <1 mm | 20-50 |
| Sandy Clay – (SC) | Medium (VC) | 1-2 | >50 |
| Silty Clay – (SiC) | Coarse | 2-5 | |
| Clay – (C) | Very | 5-10 | |
| | Coarse | >10 | |
| | (PL) | | |
| | (PR) | | |
| SAND SIZES | SHAPE | | |
| Very Coarse – (VCo) | (CPR) | | |
| Coarse – (Co) | Platy (BK) | Flat, plate-like | |
| Medium – (M) | Prismatic (ABK) | Taller than wide | |
| Fine – (F) | -- (SBK) | | |
| Very Fine – (VF) | Columnar (GR) | Rounded tops | |
| | r | Cubical | |
| | Blocky (SG) | Sharp edges | |
| | -- (M) | Rounded edges | |
| | Angular | Spherical | |
| | -- | | |
| | Subangular | | |
| | Granular | | |
| | No | Sandy texture | |
| | Structure | Finer textures | |
| | -- | | |
| | Single Grain | | |
| | -- | | |
| | Massive | | |

| ROCK FRAGMENTS | MOTTLES | SOIL COLOR | BOUNDARY | CONSISTENCE MOIST | SAR | |
|---|---|---|---|---|--|---|
| <u>ROUNDED,</u> <u>SUBROUNDED</u> <u>ANGULAR,</u> <u>IRREGULAR</u> Gravel – (GR) 2-75 mm Fine – (FGR) 2-5 mm Medium – (MGR) 5-20 mm Coarse – (CGR) 20-75 mm Pebbles – (PB) 2-75 mm Fine – (FPB) 2-5 mm Medium – (MPB) 5-20 mm Coarse – (CPB) 20-75 mm Cobbles – (CB) 75-250 mm Stones – (S) 250-600 mm Boulders – (B) ≥600 mm <u>FLAT</u> Channers – (CH) 2-150 mm Flagstones – (FL) 150-380 mm Stones – (ST) 380-600 mm Boulders – (BO) ≥600 mm | <u>TYPE OF ROCK</u> Basalt – (BAS) Cinders – (CIND) Sandstone – (SST) Limestone – (LST) <u>TERMS OF SOIL/ROCK</u> Cemented – (CEM) Ice or Frozen – (ICE) Weathered – (WEA) Unweathered – (UNWEA) Fractured – (FRA) Decomposed – (DEC) Stratified – (ST) | <u>QUANTITY</u> Few (F) - <2% Common (C) - 2-20% Many (M) - >20% <u>SIZE</u> Fine (1) - <5 mm Medium (2) - 5 -15 mm Coarse (3) - >15 mm <u>MODIFIERS</u> <15% None >15 to 35% dominant rock 35 to 60% Dominant rock + very (V) >60% (>10% fines) dominant rock + extremely(X) >60% (<10% fines) dominant rock <u>CONTRAST</u> Faint – (F) Distinct – (D) Prominent – (P) | <u>Hue Value / Chrome</u> Use Munsell Color Book to determine color: Hue Value / Chroma <u>NOTE:</u> Report Soil Color in “Comments” when Mottles are Common or Many. | <u>DISTINCTNESS</u> Abrupt (A) – Less than 2 cm Clear (C) – 2 to 5 cm Gradual (G) – 5 to 15 cm Diffuse (D) – More than 15 cm <u>TOPOGRAPHY</u> Smooth (S) – A plane with few or no irregularities Wavy (W) – Waves wider than deep Irregular (I) – Waves deeper than wide Broken (B) – discontinuous and interrupted | L = Loose VFR = Very Friable FR = Friable FI = Firm VFI = Very Firm EFI = Extremely Firm SR = Slightly Rigid R = Rigid VR = Very Rigid | See Arizona Administrative Code (A.A.C.) R18-9-A312(D) for SAR value. |

1 Authorization For Site Investigation

I certify that I am (check one) the Owner, the Authorized Representative or an Other Person and have authority to grant the investigator access to the property for this site investigation and authorize the work certified in this site assessment.

Name
(Printed) _____
Signature _____

2 Project Identification

Property Owner or Project
Name _____

3 Site Information [A.A.C. R18-9-A309(B)(2)(a)]

Address _____ City _____
Parcel Number _____ Lot Number _____
Township _____ Range _____ Section _____
Latitude _____ ° _____ ' _____ " N _____ Longitude _____ ° _____ ' _____ " W

4 Investigator Information [A.A.C. R18-9-A310(H)]

Name _____ Phone _____
Title _____ Firm Name _____
Mailing Address _____ City _____ State _____
Zip _____ E-Mail _____

5 Surface Characterization [A.A.C. R18-9-A310(C)]

Identify the presence or absence of all of the following possible limiting conditions in the intended location of the treatment works and the primary and reserve areas of the on-site wastewater treatment facility:

- A) The surface slope is greater than 15 % at the intended location of the on-site wastewater facility YES No
- B) Setback distances do NOT meet all the minimum values specified in R18-9-A312(C) YES No
NOTE: Check YES if the location or size of the dwelling or other improvements, or the bedroom count or the fixture unit count is UNKNOWN to the site investigator.
- C) Surface drainage characteristics could adversely affect the ability of the facility to function properly YES No **NOTE: If YES, please describe in Attachment 4.**
- D) A 100-year flood hazard zone, as indicated on the applicable flood insurance rate map, is located within the property on which the on-site wastewater treatment facility will be installed YES No **NOTE: If YES, please specify the FEMA Flood Insurance Map Number or Other Source _____**
- E) An outcropping of rock that cannot be excavated is present and could impair the function of soil receiving the discharge YES No
- F) Fill material deposits are present YES No

If the answer is YES to any of the above potential surface limiting conditions, please show location and note the condition type on Site Investigation Map (Item 7).

6 Subsurface Characterization Method [A.A.C. R18-9-A310(D)]

Check method used to perform subsurface characterization per A.A.C. R18-9-A310(D)(1) and (3)

- A) ASTM D5921 used? Yes No (if Yes, please enclose Attachment 1)
- B) Percolation test method used? Yes No (if Yes, please enclose Attachment 2)
- C) Seepage performance test method used? Yes No (if Yes, please enclose Attachment 3)
- D) Other ADEQ approved method? Yes No (if Yes, please provide in Attachment 4 the method and data)

8 Subsurface Limiting Conditions [A.A.C. R18-9-A310(D)(2)]

Identify the presence or absence of all of the following possible limiting conditions in the intended location of the primary and reserve disposal areas of the on-site wastewater treatment facility to a depth of at least 12 feet below land surface or to an impervious soil or rock layer if encountered at a shallower depth:

- A) The soil absorption rate determined under A.A.C. R18-9-A312(D)(2) is:
 - 1. More than 1.20 gallons per day per square foot? Yes No
 - 2. Less than 0.20 gallons per day per square foot? Yes No
 - 3. A **site-specific soil absorption rate (SAR)** is required per A.A.C. R18-9-A312 (D)(2)(b)? Yes No
- B) The vertical separation distance from the bottom of the lowest point of the disposal works to the seasonal high water table is less than the minimum vertical separation specified in A.A.C. R18-9-A312(E)(1)? Yes No
- C) Does seasonal saturation occur within surface soils that could affect the performance of the on-site wastewater treatment facility? Yes No If Yes, describe

evidence:

- D) Do any of the following subsurface limiting conditions that may cause or contribute to surfacing of wastewater occur within 12 feet of the land surface:
 - 1. An impervious soil or rock layer? Yes No
 - 2. A zone of saturation that substantially limits downward percolation from the disposal works? Yes No
 - 3. Soil with more than 50 percent rock fragments? Yes No
- E) Do any of the following subsurface limiting conditions that may promote accelerated downward movement of insufficiently treated wastewater occur within 12 feet of the land surface:
 - 1. Fractures or joints in rock that are open, continuous, or interconnected? Yes No
 - 2. Karst voids or channels? Yes No
 - 3. Highly permeable materials such as deposits of cobbles or boulders? Yes No
- F) Does subsurface conditions exist that may convey wastewater to a Water of the State and cause or contribute to an exceedance of a water quality standard established in 18 A.A.C. 11, Articles 1 and 4? Yes No
- G) Depth to groundwater below land surface _____ feet as determined by Trench or boring, Subdivision report, Published groundwater data or Relevant well data.

If the answer is Yes to any of the above subsurface limiting conditions, please show location and note the associated limiting condition type on Site Investigation Map (Item 7).

9 Site Investigation Attachments

| # | Attachment Description | Attached? |
|---|------------------------|---|
| | | <input type="checkbox"/> Yes, total of _____ pages. |
| | | <input type="checkbox"/> Yes, total of _____ pages. |
| | | <input type="checkbox"/> Yes, total of _____ pages. |

10 Investigator Certification

- A) Arizona-registered Professional Engineer Certification Number: _____ Expiration Date: _____
- B) Arizona-registered Professional Geologist Certification Number: _____ Expiration Date: _____
- C) Arizona-registered Sanitarian Registration Number: _____ Expiration Date: _____
- D) A certificate of training from a course recognized by ADEQ
 Course Name: _____ Completion Date: _____

E) Qualifies under another category designated in writing by ADEQ. **Please use Attachment 4 to provide approved Qualification Category & Date Approved.**

| |
|--------------------------|
| Professional Seal |
|--------------------------|

By signing this section, I certify that I am qualified to conduct this investigation as specified in R18-9-A310(H) and have inspected the property identified in Item 3 for purposes of performing a site investigation. I have performed this site investigation in accordance with R18-9-A310 and have completed this investigation to the best of my knowledge.

Printed Investigator _____

Name/ Date of Investigation: _____

Investigator Signature _____

Date Signed _____

ATTACHMENT 2 – PERCOLATION TEST DATASHEET

| | |
|----------------------------------|--|
| Facility Address: _____ | Parcel Number: _____ |
| Test Hole Number/Location: _____ | Depth of Test Hole Bottom Below Land Surface (inches): _____ |
| Date Test Complete: _____ | Test Hole Cross-section: Please check a box and indicate size <input type="checkbox"/> Diameter _____ inches <input type="checkbox"/> Square _____ inches |

Describe the land surface at the top of the Test Hole is (please check one):
 Undisturbed Native Soil Cut Surface Fill Surface Other (describe) _____

SOIL DATA FROM TEST HOLE:

| Depth (inches) | Soil Texture | Soil Structure | Soil Consistence | Mottles | % Rock |
|----------------|--------------|----------------|------------------|---------|--------|
| | | | | | |
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| | | | | | |

TEST HOLE PRESOAKING:

| Run # | Start Date (M:D:Y) | Start Time (H:M::S) | End Time (H:M::S) | Elapsed Time (min) | Initial Depth (inches) |
|-------|--------------------|---------------------|-------------------|--------------------|------------------------|
| | | | | | |
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TEST HOLE PERCOLATION TEST:

| Run # | Start Time (H:M::S) | End Time (H:M::S) | Elapsed Time, T _i (min) | Measured Water Drop (inches) | Percolation Rate, P _i (min/in.) | (T _i + T _{i+1})/2 ΔT(min) | P _{i+1} - P _i ΔP | ΔP/ ΔT |
|-------|---------------------|-------------------|------------------------------------|------------------------------|--|--|--------------------------------------|--------|
| | | | | | | N/A | N/A | N/A |
| | | | | | | | | |
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Depth to groundwater (feet bls): PLEASE REPORT IN ITEM 8.G ON PAGE 3 OF FORM

Stabilized Percolation Rate (from Graph) _____ minutes per inch

PERSON WHO PERFORMED THE TEST:

Name: _____
 Company: _____
 Address: _____
 Phone: _____ Fax: _____
 Email: _____

Professional Seal

ATTACHMENT 2, CONTINUED – PERCOLATION TEST DATASHEET

| | |
|----------------------------------|--|
| Facility Address: _____ | Parcel Number: _____ |
| Test Hole Number/Location: _____ | Depth of Test Hole Bottom Below Land Surface (inches): _____ |
| Date Test Complete: _____ | Test Hole Cross-section: Please check a box and indicate size <input type="checkbox"/> Diameter _____ inches <input type="checkbox"/> Square _____ inches |

Describe the land surface at the top of the Test Hole is (please check one):

- Undisturbed Native Soil Cut Surface Fill Surface Other (describe) _____

SOIL DATA FROM TEST HOLE:

| Depth (inches) | Soil Texture | Soil Structure | Soil Consistence | Mottles | % Rock |
|----------------|--------------|----------------|------------------|---------|--------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

TEST HOLE PRESOAKING:

| Run # | Start Date (M:D:Y) | Start Time (H:M::S) | End Time (H:M::S) | Elapsed Time (min) | Initial Depth (inches) |
|-------|--------------------|---------------------|-------------------|--------------------|------------------------|
| | | | | | |
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TEST HOLE PERCOLATION TEST:

| Run # | Start Time (H:M::S) | End Time (H:M::S) | Elapsed Time, T _i (min) | Measured Water Drop (inches) | Percolation Rate, P _i (min/in.) | (T _i + T _{i+1})/2 ΔT(min) | P _{i+1} - P _i ΔP | ΔP/ ΔT |
|-------|---------------------|-------------------|------------------------------------|------------------------------|--|--|--------------------------------------|--------|
| | | | | | | N/A | N/A | N/A |
| | | | | | | | | |
| | | | | | | | | |
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Depth to groundwater (feet bls): PLEASE REPORT IN ITEM 8.G ON PAGE 3 OF FORM

Stabilized Percolation Rate (from Graph) _____ minutes per inch

PERSON WHO PERFORMED THE TEST:

Name: _____
 Company: _____
 Address: _____
 Phone: _____ Fax: _____
 Email: _____

Professional Seal

ATTACHMENT 3 – SEEPAGE PIT TEST DATASHEET

Facility Address: _____ Parcel Number: _____
 Test Hole Number _____ Depth of Hole Bottom _____
 /Location: _____ Below Land Surface (feet): _____
 Date Test Complete: _____ Test Hole Diameter (inches): _____

Depth to Groundwater below Pit Terminus (feet): PLEASE REPORT IN ITEM 8.G ON PAGE 3 OF FORM

SOIL DATA FROM TEST HOLE:

| Depth (feet) | Soil Lithology |
|--------------|----------------|
| | |
| | |
| | |
| | |

PRESOAKING:

| Run # | Start Date (M:D:Y) | Start Time (H:M::S) | End Time (H:M::S) | Elapsed Time (min) | Initial Water Surface Depth Below Ground Surface (inches) |
|-------|--------------------|---------------------|-------------------|--------------------|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Total gallons of water added to the Test Hole for presoak _____ gallons.

SEEPAGE PIT TEST:

| Run # | Start Time (H:M::S) | End Time (H:M::S) | Elapsed Time, T _i (min) | Measured Water Drop (inches) | Percolation Rate, P _i (min/in.) | $(P_{i+1} - P_i)/P_i * 100\%$ |
|-------|---------------------|-------------------|------------------------------------|------------------------------|--|-------------------------------|
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Stabilized Percolation Rate (from Graph): _____ minutes per inches

PERSON WHO PERFORMED THE TEST:

Name: _____
 Company: _____
 Address: _____
 Phone: _____ Fax: _____
 Email: _____

Professional Seal

ATTACHMENT 3, CONTINUED – SEEPAGE PIT TEST DATASHEET

Facility Address: _____ Parcel Number: _____
 Test Hole Number _____ Depth of Hole Bottom _____
 /Location: _____ Below Land Surface (feet): _____
 Date Test Complete: _____ Test Hole Diameter (inches): _____

Depth to Groundwater below Pit Terminus (feet): PLEASE REPORT IN ITEM 8.G ON PAGE 3 OF FORM

SOIL DATA FROM TEST HOLE:

| Depth (feet) | Soil Lithology |
|--------------|----------------|
| | |
| | |
| | |
| | |

PRESOAKING:

| Run # | Start Date (M:D:Y) | Start Time (H:M::S) | End Time (H:M::S) | Elapsed Time (min) | Initial Water Surface Depth Below Ground Surface (inches) |
|-------|--------------------|---------------------|-------------------|--------------------|---|
| | | | | | |
| | | | | | |
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| | | | | | |

Total gallons of water added to the Test Hole for presoak _____ gallons.

SEEPAGE PIT TEST:

| Run # | Start Time (H:M::S) | End Time (H:M::S) | Elapsed Time, T _i (min) | Measured Water Drop (inches) | Percolation Rate, P _i (min/in.) | (P _{i+1} - P _i)/P _i * 100% |
|-------|---------------------|-------------------|------------------------------------|------------------------------|--|--|
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| | | | | | | |

Stabilized Percolation Rate (from Graph): _____ minutes per inches

PERSON WHO PERFORMED THE TEST:

Name: _____
 Company: _____
 Address: _____
 Phone: _____ Fax: _____
 Email: _____

Professional Seal

ATTACHMENT 5 – GEOTAGGED PHOTO(S) OF SOIL TESTING LOCATION DURING TESTING

| | |
|-------------------------|----------------------------|
| Facility Address: _____ | Parcel Number: _____ |
| | Date Test Completed: _____ |

Other Information pertinent to this Site Investigation Report: Please specify the Report Item related to all Attachments of good quality photos showing soil horizon, soil color, and description

Prepared by (Please Print): _____

Date Report Completed: _____

ATTACHMENT A – GEOTAGGED PHOTO(S) INSTRUCTIONS

Photograph Instructions

1. Take a photo of all soil test holes investigated during that Site Investigation (a panorama of the site is ideal).
2. Ensure that the photo includes:
 - GPS Coordinates for each of soil test holes investigated during that Site Investigation (either a photo of the GPS Handheld unit, a screen shot of the app used to collect the GPS data, or the geotagging feature on your smartphone is acceptable (geotagging instructions are below)).
 - Legible measurement of the depth of the test hole - soil test depth should be a minimum of 144” unless a subsurface limiting layer is encountered at a shallower depth (either a photo of the backhoe bucket inside the hole or a tape measurer is sufficient).

Geotagging on an Android Device

1. Enable Location
 - a. Go to settings
 - b. Location -> Ensure location is ticked
 - c. Location -> App Permissions -> Camera.
 - i. Make sure that location access is enabled for the app
 - ii. You can set it “allow only while using the app” or “ask everytime”
 - iii. Enable “Use precise location”
 - d. Optional: Enable “Google location accuracy” in Location -> Location services -> Google Location accuracy
2. Enable Location Tags
 - a. Open the camera app
 - b. Tap the settings (gear icon) at the top of the screen
 - c. Scroll down to the “General” section
 - d. Enable “Location tags”
3. Testing Geotagging on Android
 - a. Open the camera app
 - b. Take a photo
 - c. Open the gallery app and find your photo
 - d. If you cannot locate it, try going to your Albums tab then open your “camera” album
 - e. Select your picture and tap on the three dots (bottomright)
 - f. Tap “details”
 - g. The photo’s location should be listed here along with date, time, internal storage location.

Geotagging on IOS Device

1. Enable Location services
 - a. Go to settings -> Privacy
 - b. Tap on “location services”
 - c. Find your camera app
 - d. Select “while using the app”
 - e. Turn Precise Location on
2. Checking a photo’s location
 - a. Take your test photo
 - b. Select your photo - either directly from your camera app or through the “photos” app
 - c. Tap on the circled “i”
 - d. You now have access to details such as date and location