MOHAVE COUNTY
DEVELOPMENT SERVICES

P. O. Box 7000 Kingman, Arizona 86402-7000 3250 E. Kino Ave, Kingman www.mohave.gov Telephone (928) 757-0903

Scott Holtry
Department Director

J. David Strahl
County Manager

ENGINEERING REVIEW
UNIFORM SITE INVESTIGATION REPORT FORM

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

Loamy Sand – (LS)
Sandy Loam – (SL)
Sand – (S)
Silt Loam – (SiL)
Loam – (L)
Sandy Clay Loam – (SCL)
Silty Clay Loam – (SiCL)
Clay Loam – (CL)
Sandy Clay – (SC)
Silty Clay – (SiC)
Clay – (C)

SAND SIZES
Very Coarse – (VCo)
Coarse – (Co)
Medium – (M)
Fine – (F)
Very Fine – (VF)

Structure

GRADE

Structureless	(0)
Weak	(1)
Moderate	(2)
Strong	(3)

SIZE

Very Fine	(VF)
Fine	(F)
Medium	(M)
Coarse	(C)
Very Coarse	(VC)

SHAPE

Platy	(PL)
Prismatic	(PR)
--	(CPR)
Columnar	(BK)
Blocky	(ABK)
--	(SBK)
Angular	(GR)
--	
Subangular	(SG)
Granular	(M)
No Structure	
--	
Single Grain	
--	
Massive	

No aggregation			
Barely observable	**Angular, Subangular,**		
Distinct peds	**Blocky**	**Prismatic, Columnar**	
Durable peds	<5 mm	<10 mm	
Granular, Platy	5-10	10-20	
<1 mm	10-20	20-50	
1-2	20-50	50-100	
2-5	>50	>100	
5-10			
>10			

Flat, plate-like
Taller than wide
Rounded tops
Cubical
Sharp edges
Rounded edges
Spherical

Sandy texture
Finer textures

ROCK FRAGMENTS

ROUNDED, SUBROUNDED ANGULAR, IRREGULAR
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

FLAT
Channers – (CH) 2-150 mm
Flagstones – (FL) 150-380 mm
Stones – (ST) 380-600 mm
Boulders – (BO) ≥600 mm

TYPE OF ROCK
Basalt – (BAS)
Cinders – (CIND)
Sandstone – (SST)
Limestone – (LST)

TERMS OF SOIL/ROCK
Cemented – (CEM)
Ice or Frozen – (ICE)
Weathered – (WEA)
Unweathered – (UNWEA)
Fractured – (FRA)
Decomposed – (DEC)
Stratified – (ST)

MOTTLES

QUANTITY
Few (F) -<2%
Common (C) - 2-20%
Many (M) - >20%

SIZE
Fine (1) - <5 mm
Medium (2) - 5 -15 mm
Coarse (3) - >15 mm

MODIFIERS
<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

CONTRAST
Faint – (F)
Distinct – (D)
Prominent – (P)

SOIL COLOR

Hue Value / Chrome

Use Munsell Color Book to determine color: Hue Value / Chroma

NOTE: Report Soil Color in "Comments" when Mottles are Common or Many.

BOUNDARY

DISTINCTNESS
Abrupt (A) – Less than 2 cm
Clear (C) – 2 to 5 cm
Gradual (G) – 5 to 15 cm
Diffuse (D) – More than 15 cm

TOPOGRAPHY
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

CONSISTENCE MOIST

L = Loose
VFR = Very Friable
FR = Friable
FI = Firm
VFI = Very Firm
EFI = Extremely Firm
SR = Slightly Rigid
R = Rigid
VR = Very Rigid

SAR

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 _____ º _____ ‘ _____ “ N _____ Longitude _____ º _____ ‘ _____ “ 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)**

7 Site Investigation Map Showing the Location of Limiting Conditions and Setbacks from Features and Improvements [A.A.C. R18-9-A309(B)(2)(a)]

A. **CHECK** below the features shown on the Site Investigation Map. **WRITE N/A** if item is **NOT PRESENT.** **RECORD** below the separation (feet) that will be maintained between the system and the checked feature.

____ Water supply well ____ (ft)
____ Water main or branch water line ____ (ft)
____ Domestic service water line ____ (ft)
____ Drinking water intake from a surface water source ____ (ft)
____ Perennial or intermittent stream ____ (ft)
____ Lake, reservoir, or canal ____ (ft)
____ Pond or other water feature ____ (ft)
____ Swimming pool ____ (ft)
____ Planned building ____ (ft)
____ Existing building ____ (ft)
____ Boundary of 100-year flood hazard zone ____ (ft)
____ Drainage easement or wash with drainage area more than twenty acres ____ (ft)
____ Other Easement ____ (ft)
____ Downslope cut banks and culvert or roadway ditches ____ (ft)
____ Planned cut bank over 2 feet deep ____ (ft)
____ Wall or planned wall over 2 feet high ____ (ft)
____ Driveway or parking area ____ (ft)
____ Storage Area ____ (ft) ____ Earth fissure _____ (ft)
____ Other ____ (ft) Describe: _____

B. Minimum setback distances are within the limits specified in R18-9-A312(C); ☐ Yes ☐ **UNKNOWN** ☐ No
Check UNKNOWN if the dwelling location or size (including building footprint, bedroom count & fixture unit count), or the location of other improvements is not known to the person performing the site investigation.

C. Show all soil test locations. Show any condition or feature observed during the site investigation which may affect on-site system design & is located within the **SITE INVESTIGATION AREA (defined as the planned excavation boundaries for the treatment works, primary disposal area and reserve disposal area plus the surrounding area out to 100 feet)** including **: (1)** Show land surface contours at appropriate intervals when the elevations across the Site Investigation Area differ by more than 5 feet, and
(2) Any other factor is observed that may affect system design **regardless of property ownership (please include the Site Investigation Map with Attachment 4 if the information cannot be depicted on the below Grid).**

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?
		☐ Yes, total of _____ pages.
		☐ Yes, total of _____ pages.
		☐ 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 1 – ASTM 5921 METHOD FOR SUBSURFACE SOIL CHARACTERIZATION

Facility Address: _____ Parcel Number: _____

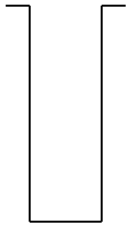
Tested by: _____ Depth to Groundwater: **PLEASE REPORT IN ITEM 8.G**

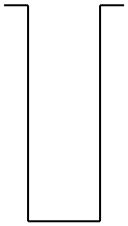
Date Test Completed: _____ Time of Observation: _____ Weather/Lighting: _____

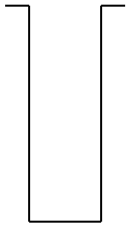
Test Hole #	Depth Interval Below Land Surface (Inches)	Texture	Structure	Color(s) (Hue)	Rock Fragments %	Mottles % (quant, size, contrast)	Boundary	Moist Consistence	SAR

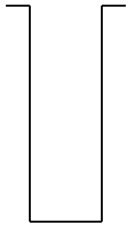
Comments:

Professional Seal


Test ____


Test ____


Test ____


Test ____

ATTACHMENT 1, CONTINUED – ASTM 5921 METHOD FOR SUBSURFACE SOIL CHARACTERIZATION

Facility Address: _____ Parcel Number: _____

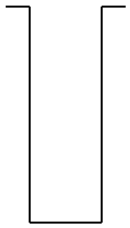
Tested by: _____ Depth to Groundwater: PLEASE REPORT IN ITEM 8.G ON PAGE 3 OF FORM

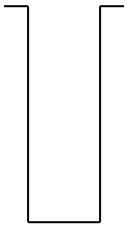
Date Test Completed: _____ Time of Observation: _____ Weather/Lighting: _____

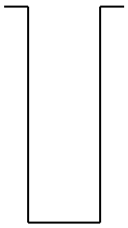
Test Hole #	Depth Interval Below Land Surface (Inches)	Texture	Structure	Color(s) (Hue)	Rock Fragments %	Mottles % (quant, size, contrast)	Boundary	Moist Consistence	SAR

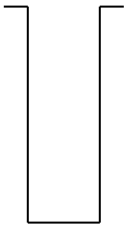
Comments:

Professional Seal


Test ____


Test ____


Test ____


Test ____

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

☐ Diameter _____ inches ☐ 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)

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	$\Delta P/\Delta T$
						N/A	N/A	N/A

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

☐ Diameter _____ inches ☐ 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)

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	$\Delta P / \Delta T$
						N/A	N/A	N/A

Depth to groundwater (feet bls): PLEASE REPORT IN ITEM 8.G ON PAGE 3 OF FORM

Stabilized Percolation Rate (from Graph) _____ minutes per inch

Professional Seal

PERSON WHO PERFORMED THE TEST:

Name: _____

Company: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

ATTACHMENT 3 – SEEPAGE PIT TEST DATASHEET

Facility Address: _____ Parcel Number: _____

Test Hole Number /Location: _____ Depth of Hole Bottom 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.)	$(P_{i+1} - P_i)/P_i * 100\%$

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

Professional Seal

PERSON WHO PERFORMED THE TEST:

Name: _____

Company: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

ATTACHMENT 3, CONTINUED – SEEPAGE PIT TEST DATASHEET

Facility Address: _____ Parcel Number: _____

Test Hole Number /Location: _____ Depth of Hole Bottom 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.)	$(P_{i+1} – P_i)/P_i * 100\%$

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

Professional Seal

PERSON WHO PERFORMED THE TEST:

Name: _____

Company: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

ATTACHMENT 4 – OTHER INFORMATION

Facility Address: _____ Parcel Number: _____

Date Test Completed:

Other Information pertinent to this Site Investigation Report: Please specify the Report Item related to all Attachments or Other Information provided.

_____ Continued on pages _____ through _____

Prepared by (Please Print): _____

Date Report Completed: _____

ATTACHMENT 4, CONTINUED – OTHER INFORMATION

Facility Address: _____ Parcel Number: _____

Date Test Completed:

Other Information continued.

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 every time"
        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 (bottom right)
    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